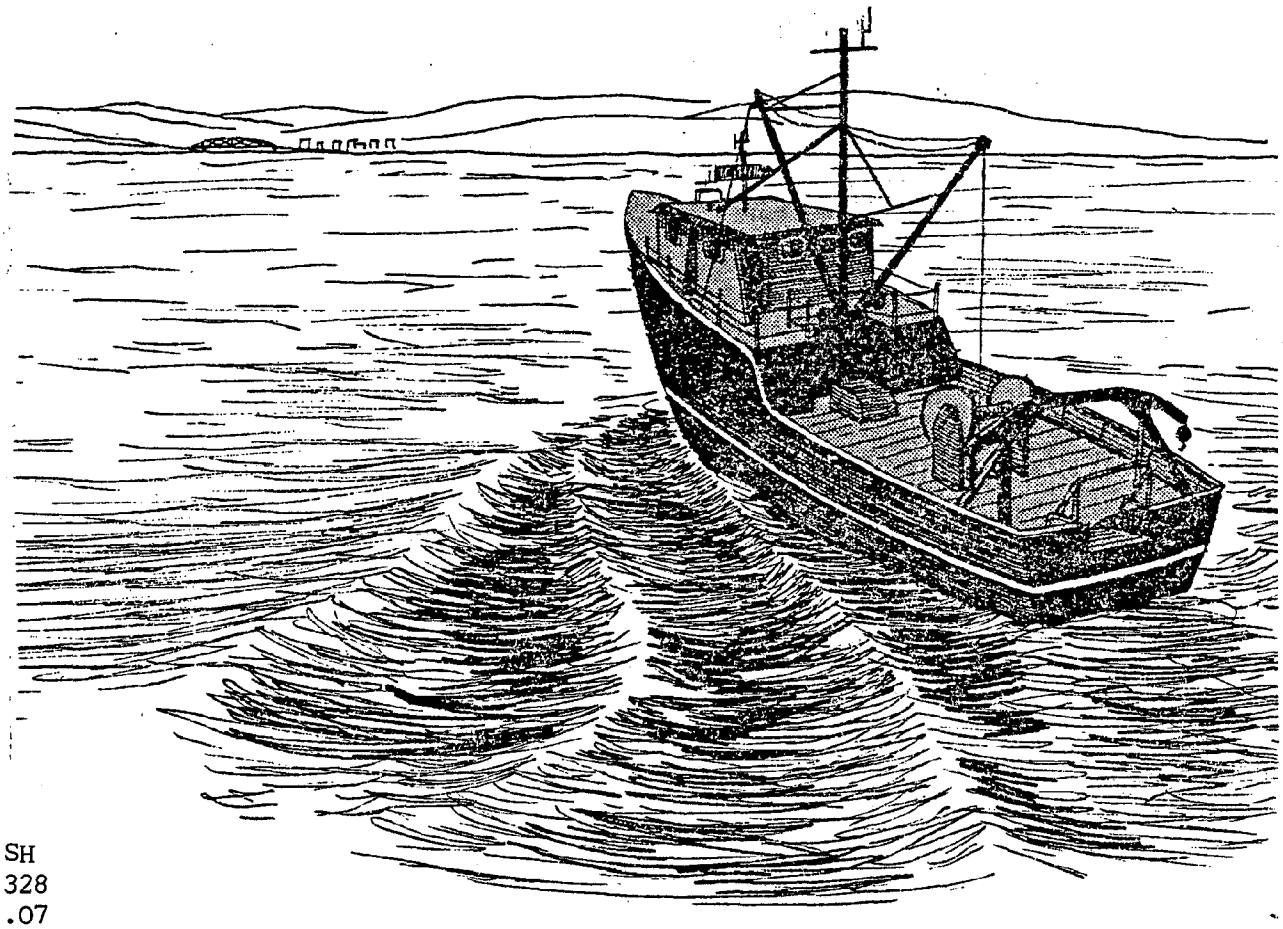
OREGON COASTAL ZONE FISHERY MANAGEMENT ANALYSIS



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OREGON COASTAL ZONE FISHERY MANAGEMENT ANALYSIS

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PREPARED BY

Montagne-Bierly Associates, Inc.
Waterway & Natural Resource
Consultants

FOR **Department of Land Conservation and Development**

AUGUST 1979

U.S. DEPARTMENT OF COMMERCE NOAA
COASTAL SERVICES CENTER
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Fish Resources
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Fishing Industry
Oregon Department of Fish and Wildlife

Fishery Economics
Oregon Department of Fish and Wildlife

Fishery Management
National Marine Fisheries Service

Future Fishery Development
The Daily Astorian

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INTRODUCTION

This report was prepared for the Oregon Department of Land Conservation and Development, and has several objectives. The main objective is to make people more aware of the fishing industry, its role in coastal development, and policies, institutions and other factors which influence fishery development.

With the advent of the Fisheries Conservation and Management Act of 1976 (FCMA), a new era in fishing and fisheries management has begun. American fishermen have been granted access and priority to vast fish resources off the Pacific coast. How the industry responds to this and how this response affects Oregon coastal communities is influenced by many different things.

The fish resources are limited and there is a mandate in the FCMA to harvest them as efficiently as possible without hurting the resource or environment. Markets must be developed for products and processing plants must be capable of processing the increased volumes of fish, often new species. There must be adequate space, resources and services designated for the orderly development of these industries. Industry needs may include moorage, water, electricity, waste treatment and disposal, transportation systems, and other supporting industries.

A political climate conducive to economic growth is as important to the industry as an adequate infrastructure. Government does not necessarily need to directly stimulate development. By removing unnecessary impediments, whether they are policies, laws or economic barriers, and providing predictability, government can help the fishing industry take care of itself. Government can also assure effective coastal zone development by communicating to local planners and decision-makers what reasonable requirements for fishing industry expansion might be.

This study provides an overview of the fishing industry and the management considerations necessary for the expansion of the industry. The report is divided into five sections, each dealing with a particular aspect of fisheries development.

The fish resources are discussed in the first chapter. Fish resources are divided into four major geographic zones: nearshore, offshore, estuaries, and the Columbia River. This division is based on the different types of fish, fisheries and management jurisdiction in each area.

The second chapter discusses the seafood industry including both the harvesting and processing sectors. The support facilities required for the fishing industry are described. Historical landings of various fish species provide a general characterization of the industry and its development prior to the establishment of the 200 mile Fisheries Conservation Zone (FCZ). While future developments can not be predicted on the basis of past trends, the information is useful in revealing the functioning of the industry.

The third chapter describes various aspects of fisheries economics. Characteristics of fishing employment and fishing income are reviewed. The value of fish products to individual ports is discussed as well as the value added by processing and local multipliers. The types of investments that would be necessary to expand fishing and processing capacities are discussed.

The fourth chapter deals with management regulations and policies and how they interact to influence fishery development. Existing legislative and judicial policy is analyzed and the trend of recent policy directions is identified.

The fifth chapter is comprised of a series of scenarios or possible futures which describe potential outcomes of fisheries developments. The onshore impacts are described in general terms and the magnitudes of some of these demands are discussed. With this information a planner can determine if resources are available for locally proposed developments. The type

of facilities and services that must be provided to prevent economic or environmental problems can be determined with adequate knowledge about the fishing industry in Oregon.

Fish Resources

FISH RESOURCES

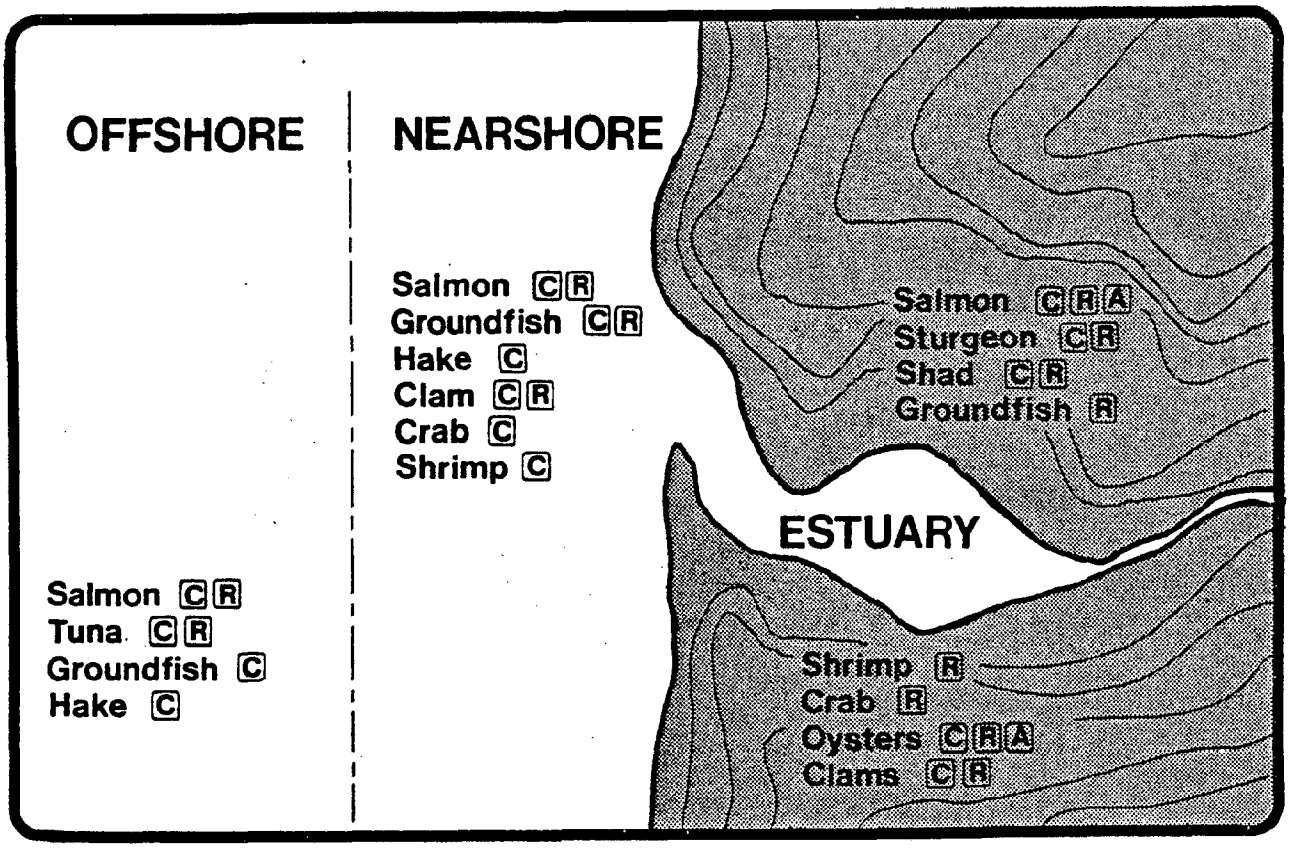
The U. S. fishery can be divided into categories based on a combination of fish resources, harvesters and gear, location and management jurisdiction. The major zones are offshore, nearshore and estuary (Figure 1). Although it is an estuary, the lower Columbia River is distinct and is a major category in Oregon and treated as such.

The four categories are described as follows:

1) Offshore - the continental shelf from three miles off the coast to the 200 mile limit managed by the Fisheries Management Council and fished by larger vessels.
2) Nearshore - the coastal zone within the three mile territorial sea fished by small vessels.
3) Estuarine - the areas within the influence of fresh water used for sport fishing, aquaculture and certain commercial fishing.
4) Columbia River - the estuarine area with its unique fishery and fishery management concerns.

In each of these zones certain fisheries occur and there is considerable overlap in terms of both species harvested and agency jurisdiction. The nearshore and estuarine zones were traditionally managed exclusively by the states, and have been fished by recreational and commercial interests for many years. These areas are of primary importance to recreational fishermen. Since estuaries are protected from storms and heavy wave action, small boats can be used there more frequently. Shore and jetty fishing and other activities are popular in this area also because there is access to both the shore and water. In the nearshore area, public access to the shore generates considerable utilization by recreational interests for clamming, swimming, sight-

Figure 1. Coastal Fisheries Harvest Zones



C COMMERCIAL
R RECREATIONAL
A AQUACULTURE

seeing and fishing. Preservation of the qualities of these areas is of great importance to the general public.

The estuaries are extremely important to the fish and wildlife resources of Oregon as well. These protected areas provide safe nursery grounds for many fish and shellfish, and are of primary importance to anadromous fish such as salmon and steelhead. Some commercial fishing occurs in this area, and oyster culture is restricted to the estuary. In general, however, more commercial fishing activity takes place in the nearshore area, especially for crab, shrimp and salmon, although these are abundant offshore also.

With the passage of the FCMA in 1976, the offshore area came under the jurisdiction of the Fisheries Management Councils. Because fish resources are managed as stocks which often transcend traditional boundaries, the Management Councils' jurisdiction often overlaps that of the states'. This is most notably true of the salmon fishery which transcends state and even national boundaries. The offshore area is utilized primarily by commercial fishermen and includes the crab, shrimp, troll and trawl fisheries.

Many different species are harvested and processed by the Oregon fishing industry (Table 1). These vary in their economic value in terms of both quantity and price, and certain species require more processing than others.

Salmon migrate great distances in both fresh water and saltwater, and are the most highly migratory of the species managed by American agencies. A large portion of the salmon caught in Oregon waters originates in the Columbia River.

Tuna are not under U. S. management, although they occur in great numbers within the U. S. Fishery Conservation Zone. Tuna migrate widely across the Pacific Ocean and are under the jurisdiction of an international commission.

Crab and shrimp occur in all three zones, although they are utilized primarily in the nearshore and offshore zones except by recreational fishermen who concentrate on the estuaries. These shellfish are prone to cyclical

Table 1. Commercially Important Marine Fishes and Shellfish of Oregon

Salmon	
Chinook Salmon	*Oncorhynchus tshawytscha*
Chum Salmon	*O. keta*
Coho Salmon	*O. kisutch*
Pink Salmon	*O. gorbuscha*
Tuna	
Albacore	*Thunnus alalunga*
Skipjack tuna	*Euthynnus pelamis*
Yellowfin tuna	*Thunnus albacares*
Shellfish	
Dungeness crab	*Cancer magister*
Gaper clam	*Tresus capax*
Pacific oyster	*Crassostrea gigas*
Pacific shrimp	*Pandalus jordani*
Razor clam	*Siliqua patula*
Roundfish	
Lingcod	*Ophiodon elongatus*
Pacific cod	*Gadus macrocephalus*
Pacific whiting (hake)	*Merluccius productus*
Sablefish	*Anoplopoma fimbria*

Table 1. (Cont'd)

Rockfish

Black rockfish	Sebastes melanops
Blue rockfish	S. mystinus
Bocaccio	S. paucispinis
Canary rockfish	S. pinniger
Chilipepper	S. goodei
Cowcod	S. levis
Darkblotched rockfish	S. crameri
Longspine thornyhead	Sebastolobus altivelis
Olive rockfish	Sebastes serranoides
Pacific Ocean perch (POP)	S. alutus
Redstripe rockfish	S. proriger
Rougheye rockfish	S. aleutianus
Sharpchin rockfish	S. zacentrus
Shortbelly rockfish	S. jordani
Shortspine thornyhead	Sebastolobus alascanus
Silvergray rockfish	Sebastes brevispinis
Splitnose rockfish	S. diploproa
Stripetail rockfish	S. saxicola
Vermilion rockfish	S. miniatus
Widow rockfish	S. entomelas
Yellowtail rockfish	S. flavidus

Flatfish

Arrowtooth flounder (turbot)	Atheresthes stomias
Butter sole	Isopsetta isolepis
California halibut	Paralichthys californicus
Dover sole	Microstomus pacificus
English sole	Parophrys vetulus
Flathead sole	Hippoglossoides elassodon
Pacific halibut	Hippoglossus stenolepis
Pacific sanddab	Citharichthys sordidus
Petrale sole	Eopsetta jordani
Rex sole	Glyptocephalus zachirus
Sand sole	Psettichthys melanostictus
Starry flounder	Platichthys stellatus

Source: PFMC, ODFW

abundance and great changes in population size occur from year to year. The shrimp population of Oregon appears to have shifted to the south and is now centered around the central and south coast.

The term "groundfish" refers to a large and diverse group of fishes harvested commercially and recreationally on the Pacific Coast. It includes roundfish such as Pacific hake (whiting), Pacific cod, sable fish, lingcod and rockfish. Also included are flatfish such as Dover, English and petrale sole.

Pacific hake are a migratory fish. Spawning occurs seaward of the continental shelf off Mexico and southern California. Afterwards the adult fish migrate toward the coast and northward to Washington and British Columbia. Then, the return migration begins and the schools turn southward. The highest concentrations of hake occur off the central Oregon coast near Coos Bay.

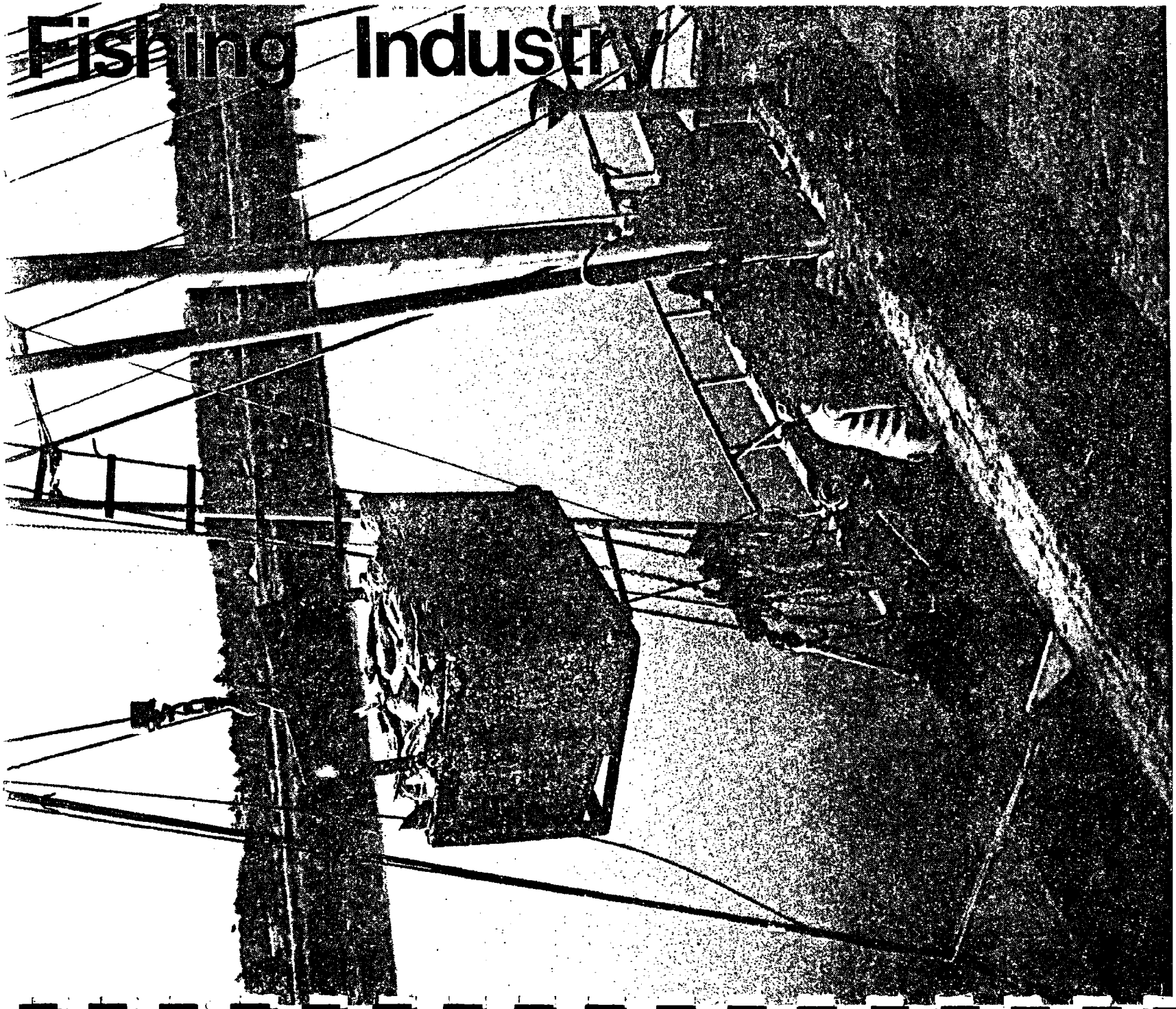
Most rockfish are not migratory to any great extent, except that a pre-spawning migration to deep water often occurs. Rockfish are basically schooling fish and form dense, tightly clustered schools. These schools are found in both nearshore and offshore zones and many rockfish inhabit estuarine environments.

Flatfish also occur in all three zones, depending on the species concerned. Some flatfish, such as English and petrale sole, exhibit seasonal migrations north and south, especially in the Oregon-Washington region. Other species such as Dover sole are much more sedentary and do not make these migrations.

Fish harvest increased rapidly in the 1960's, mostly due to foreign fleets fishing off the coasts of Oregon, Washington and California. The first Japanese and Russian ships fished predominantly for Pacific hake and Pacific Ocean perch. The intense fishing pressure on perch caused stocks to plummet in the late 1960's, and agreements were made to limit catches of this species.

Since 1977 all fish stocks except Pacific hake (whiting) have been harvested exclusively by U. S. fishermen. When U.S. harvesting and processing capacity increases sufficiently to handle the tremendous quantities of whiting off the Pacific coast, the foreign fishing fleets will be completely excluded from the FCZ. The annual harvest of about 286 million pounds of whiting represents a considerable potential economic benefit to the coastal states and communities. Other expanding groundfish and shrimp fisheries will add to the harvests, and one ultimate result will be a large demand for space in the coastal zone for fishing industry infrastructure -- moorage, processing plants, gear storage, and other backup facilities.

Fishing Industry



THE FISHING INDUSTRY

Historical landings have traditionally been used to show trends in the fishing industry. This is no longer possible due to the rapidly changing political, technological, economic and legal environment surrounding the fishing industry. Landings reflect a combination of effort, stock size, markets, and regulations limiting harvest. At present, effort is increasing, stocks and regulations are being evaluated and markets for some underutilized species are undeveloped. These combine to increase the uncertainty facing the industry. Landings are useful, however, to show a perspective and history of the industry and of ports involved in the industry. It would be a mistake to predict the future of the industry on this data.

The major fishing centers are Astoria, Charleston/Coos Bay, and Newport, although many other communities are involved (Figure 2). These centers have processing facilities as well as fishing fleets, but in many cases fish landed at certain ports are shipped elsewhere for processing. Historical landings (provided in Appendix A) indicate that different ports rely more on some species of fish and shellfish than others. For example, troll-caught salmon are more important along the south coast of Oregon, while tuna are more important in Astoria (Table 2). There have been changes in fishing and landing patterns over the years, and the relative importance of various ports to the fishing industry has changed. For instance, from 1972 to 1976 landings at Coos Bay were greater than at Newport. In 1977 (Figure 3) these two ports had nearly identical landings and in 1978 Newport was greater. This reflects increased processing capacity as well as other factors which influence the fishing community.

Figure 2. Relative Volumes of Fish Landings for 1972-1976

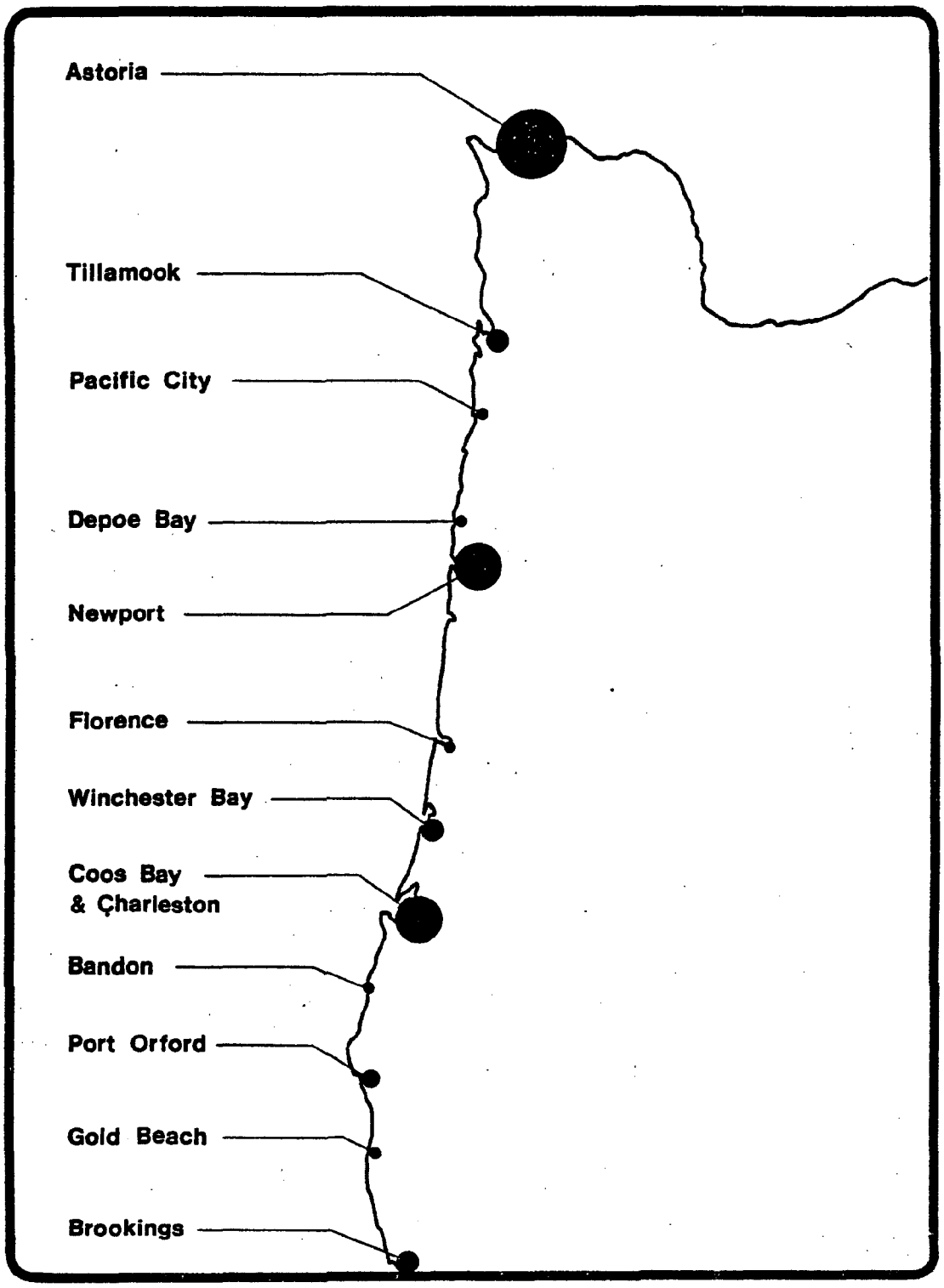
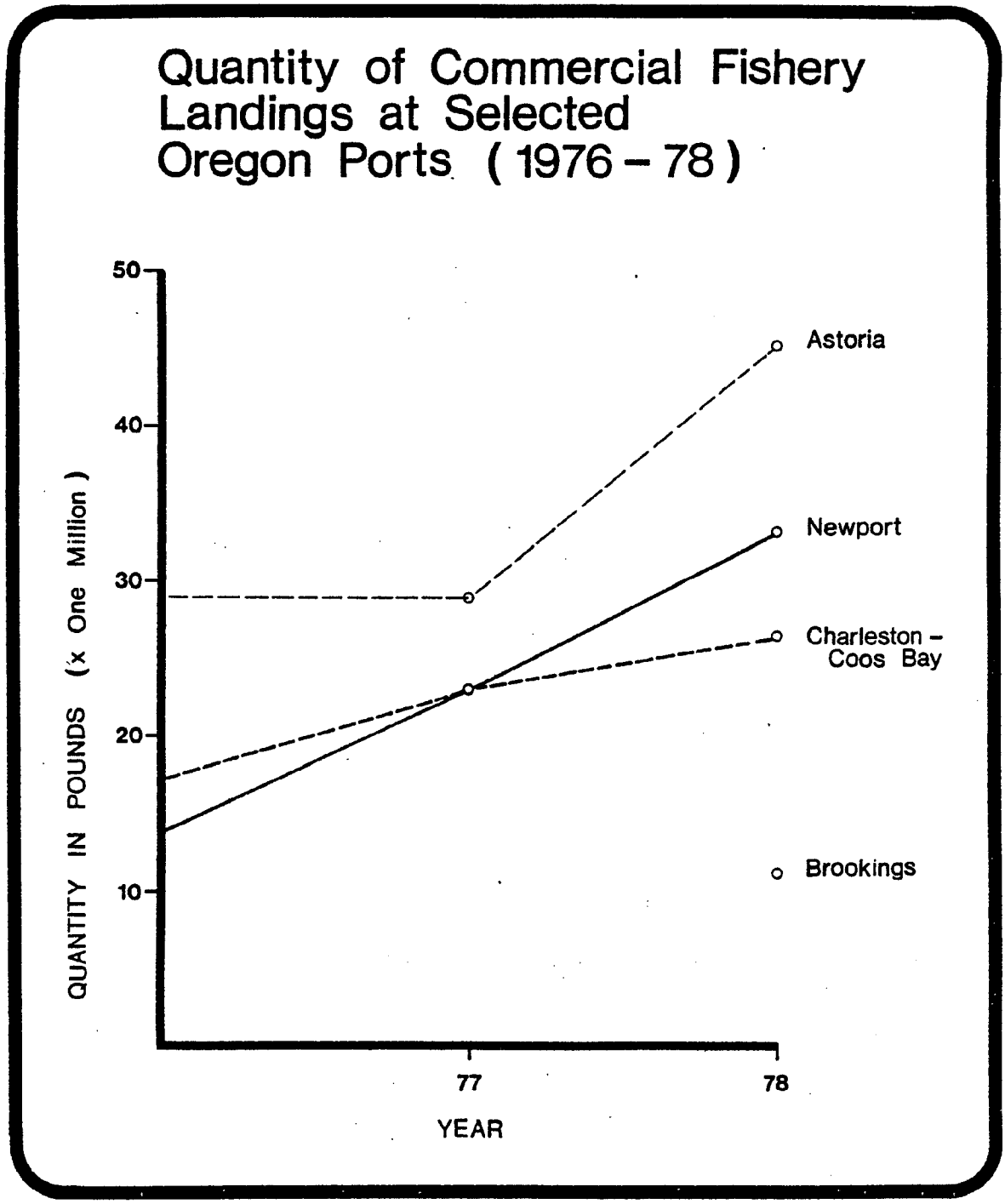


Table 2. Major Fish and Shellfish Landings at Oregon's Coastal Ports
1969 - 1976

	POUNDS LANDED (in millions)							
	ASTORIA							
	1969	1970	1971	1972	1973	1974	1975	1976
Salmon	.44	1.02	.95	.49	.31	.48	.40	1.18
Crabs	3.94	3.81	5.15	3.87	.99	1.40	1.09	1.35
Shrimp	2.68	2.61	1.80	2.36	2.78	6.71	5.06	5.70
Tuna	22.16	23.89	11.29	22.38	19.10	26.72	16.60	16.17
Groundfish	12.45	11.63	10.52	10.62	9.45	9.91	9.37	12.65
All species	41.70	42.97	29.75	39.73	32.65	45.23	32.58	37.16
	NEWPORT							
Salmon	.95	3.16	1.80	1.29	2.67	2.75	1.35	2.46
Crab	1.27	3.15	3.62	1.26	.33	.91	.53	1.12
Shrimp	1.48	3.17	3.60	7.33	6.50	4.39	5.02	7.78
Tuna	4.10	2.14	1.00	3.57	2.67	2.34	2.75	.41
Groundfish	2.22	2.16	2.37	2.60	3.53	2.59	4.00	5.15
All species	10.07	13.82	12.45	16.11	15.76	13.04	13.71	17.00
	COOS BAY/CHARLESTON							
Salmon	1.55	2.48	2.25	2.05	3.02	3.28	2.23	4.01
Crab	1.58	2.72	1.90	.47	.25	.78	.77	1.43
Shrimp	3.55	4.71	1.52	5.41	8.83	4.83	7.43	6.21
Tuna	2.69	.37	.38	2.53	2.12	3.12	3.56	.51
Groundfish	3.65	2.81	2.69	5.59	4.04	3.65	4.20	6.32
All species	13.09	13.18	8.81	16.21	18.30	15.72	18.28	18.59
	BROOKINGS							
Salmon	.66	.96	1.97	.59	.70	.45	.66	.51
Crab	1.21	2.43	1.07	.24	.18	.17	.58	1.58
Shrimp	.15	.52	.77	1.69	1.08	.70	.32	.62
Tuna	.45	.04	.24	.07	.07	.20	.14	.14
Groundfish	1.33	1.04	1.18	1.11	1.72	1.86	1.05	1.28
All Species	3.79	4.99	5.23	3.70	3.75	3.37	2.76	4.13

FIG. 3


Quantity of Commercial Fishery Landings at Selected Oregon Ports (1976 – 78)
50
40
30
20
10
QUANTITY IN POUNDS (x One Million)
Astoria
Newport
Charleston – Coos Bay
Brookings
77
78
YEAR

Salmon

The commercial salmon fishery has two main components on the west coast: the ocean fishery, which is a hook-and-line troll fishery; and the inside (estuarine and river) fishery, which consists of a net fishery utilizing gill nets and purse seines. A third component, which shows a large potential, is salmon aquaculture, but it does not yet contribute significantly to the annual salmon harvest. The troll fishery provides all the salmon catch for most Oregon ports.

Chinook and coho salmon are of primary economic importance in Oregon. Most chinook salmon are caught in the ocean troll fishery. These fish generally bring a higher price due to the quality of the flesh of salmon caught before their bodies begin to metabolize stored fat as they migrate upstream. After a certain time in fresh water, the salmon cannot be marketed fresh or frozen and must be canned, yielding a less profitable product.

Coho salmon are smaller than chinooks and are caught mostly off the coast in the troll fishery. Many more coho than chinook are caught each year, but due to the difference in size and value, the total landed values are similar. The troll fleet concentrates off Coos Bay and Newport, and accounts for nearly half of the total value of coho landings. The majority of the salmon off the Oregon coast move northward as they mature, and salmon caught along the south coast are generally smaller and less mature than those caught farther north and in the Columbia River. Subsequently, they bring a lower market price. The gillnet fishery in the Columbia River accounts for the remaining coho harvest, which in 1976 was roughly 8% of the total landed value.

The other three species of salmon (sockeye, pink and chum) are much less economically important. Sockeye and chum are not usually attracted to troll lures or bait and are rarely caught by hook and line. The sockeye population of the Columbia River system, where most Oregon sockeye salmon originate, has dwindled considerably and has nearly disappeared. Pink

salmon, which are abundant in odd-numbered years, are the smallest of the Oregon salmon and are usually not caught in gillnets. Chum salmon are harvested almost exclusively in gillnets in the Columbia River, and are considered a less valuable fish than the other salmon. Chum are well suited for salmon ranching, however, and may become a much more valuable resource in the future.

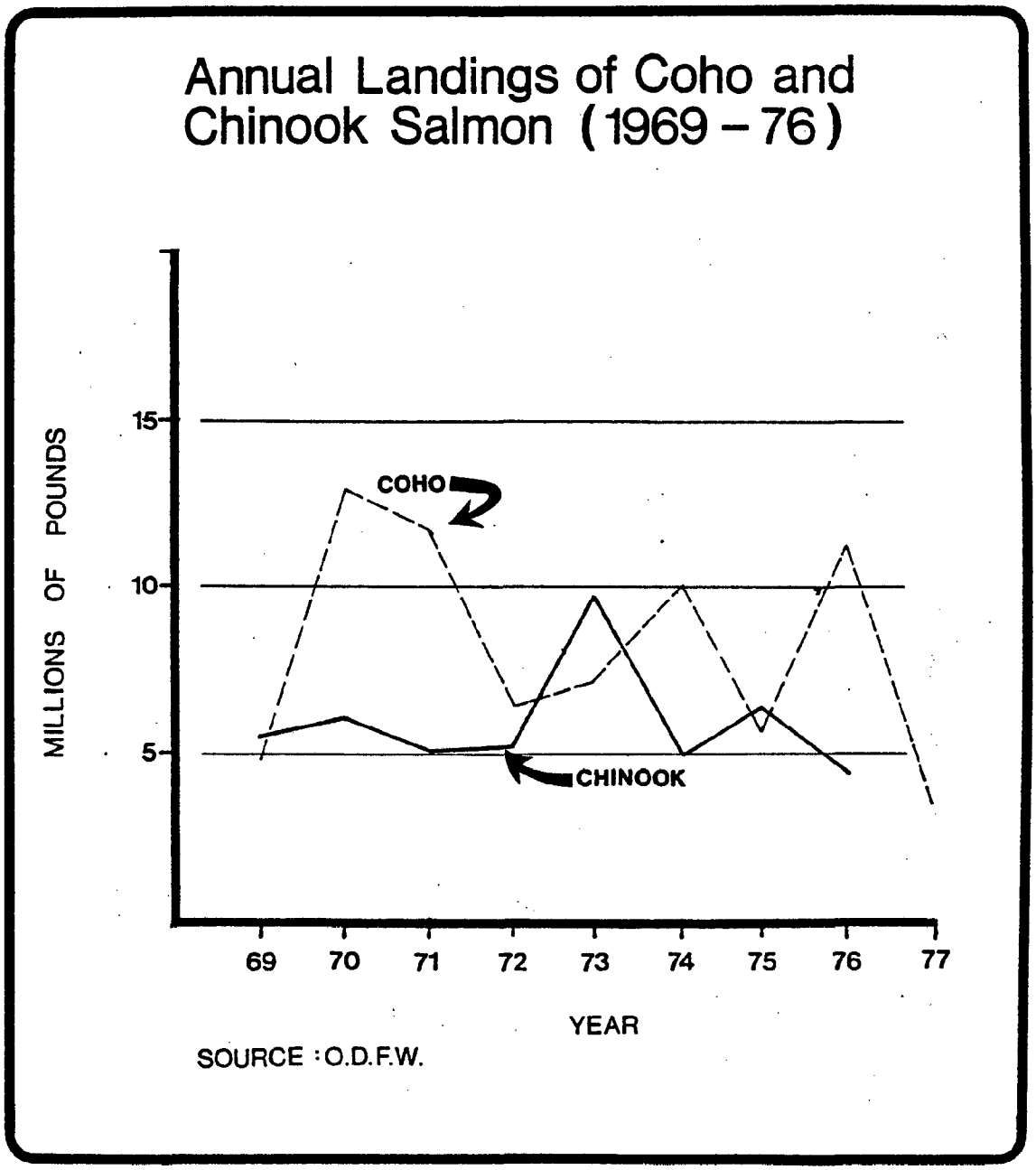
Salmon landings fluctuate from year to year due to a variety of factors. Coho and chinook are the two most important species economically and have also shown these fluctuations (Figure 4). In 1977, salmon production dropped drastically due to drought and related factors, and some natural runs have been pushed to near extinction. This reduced production has prompted the management agencies to limit both commercial and recreation harvest so that stocks can rebuild. The severe harvest restrictions are an economic hardship on the troll and net fisheries and have increased the social and political turmoil which has grown in recent years. The future of the salmon fisheries, both recreational and commercial, is full of uncertainties and harvest quotas will be reassessed annually.

The commercial ocean salmon fishery is primarily a troll fishery. This method of fishing involves dragging a number of baits or lures at various depths behind a slow moving boat. The fishery began as a fleet of small crafts fishing one day at a time, and has evolved to larger boats capable of making extended trips. The development of electronic gear such as radar, ship-to-shore radio, LORAN station navigation, direction finders, and echo sounders has made troll fishing more efficient and comfortable. The fishery is characterized by many small boats and some large boats, many of which fish other species different seasons.

Tuna

The tuna fishery is based on two distinct fishing techniques, depending on the type of tuna harvested. Yellowfin and skipjack tuna are harvested with large purse seines off Central and South America and other tropical

Fig. 4


Annual Landings of Coho and Chinook Salmon (1969 – 76)
MILLIONS OF POUNDS
15
10
5
COHO
CHINOOK
69
70
71
72
73
74
75
76
77
YEAR
SOURCE : O.D.F.W.

areas. This fishery has been forced to change harvest tactics to reduce catches of porpoises, which are often found with tuna. Traditionally, fishermen have looked for schools of porpoises, which can be seen at a distance, and set their nets around these schools, knowing that the tuna are there also. Helicopters have been used to aid in sighting. Since the capture of porpoises is now strictly limited by the Marine Mammal Protection Act, there is increased reliance on tuna schooling around floating seaweed and debris, especially for yellowfin. Most tuna landed in the U.S. are skipjack or yellowfin, but albacore dominates Oregon landings.

The albacore fishery is quite distinct from that for other tuna. Albacore are harvested off the Oregon coast by troll fishermen dragging lures or "tuna jigs" which are bounced along the surface. Albacore are generally much smaller than yellowfin but are prized for their white meat.

Both tuna captured in the high seas fishery and albacore captured by trollers are landed in Oregon. Astoria has traditionally been the center for landings and processing, and fish landed at other ports are usually shipped there or to California.

Tuna landings at Oregon ports have fluctuated widely for various known and unknown reasons. Quotas are set by international authority for skipjack and yellowfin, but albacore are free from quotas at present.

Shrimp

For many years Pacific shrimp were not harvested in great numbers because processing was too labor-intensive. Development of automatic shrimp-peeling machines, which now can process up to 600 pounds per hour, opened a vast fishery in Alaska and along the northern Pacific coast. The improved processing capability made it necessary for fishermen to produce larger catches to supply the processors.

The first sharp increase in harvesting occurred in 1972 (Table 3) when harvests doubled in one year. Harvests remained at about 20 - 25 million

Table 3. Annual Shrimp Landings at Oregon Ports 1969 - 1978 in Thousands of Pounds

	Year									
Port	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Astoria	2682	2609	1797	2360	2777	6709	5062	5683	11,697	7414
Garibaldi	2195	1262	896	1912	2254	2353	3830	3761	5739	3166
Newport	1483	3172	3602	7333	6501	4386	5124	7702	15,361	20,595
Winchester Bay	33	81	81	813	1131	770	1393	578	1921	1034
Coos Bay	3552	4711	1522	5410	8826	4834	7035	6256	12,056	17,476
Bandon	--	--	--	--	--	24	309	13	--	9
Port Orford	178	1215	411	1217	1952	494	833	754	1011	529
Gold Beach	--	--	--	--	--	47	13	--	--	--
Brookings	145	522	766	1686	1076	697	294	640	795	6724
Total	10,268	13,572	9075	20,731	24,517	20,314	23,893	25,392	48,580	56,997

Figures represent only the shrimp poundage landed at each port, not the poundage that was processed. (Some was transhipped to other ports.)

Source: ODFW

pounds per year until 1977 when production doubled again to nearly 48.6 million pounds. These increases were due to improved fishing and processing techniques, better knowledge of shrimp grounds, and larger shrimp populations. In 1978 production rose to nearly 57 million pounds, mostly due to increased fishing pressure (ODFW). Due to the cyclical nature of shrimp populations, production will probably not be consistent, and will probably fluctuate near the 1976 level.

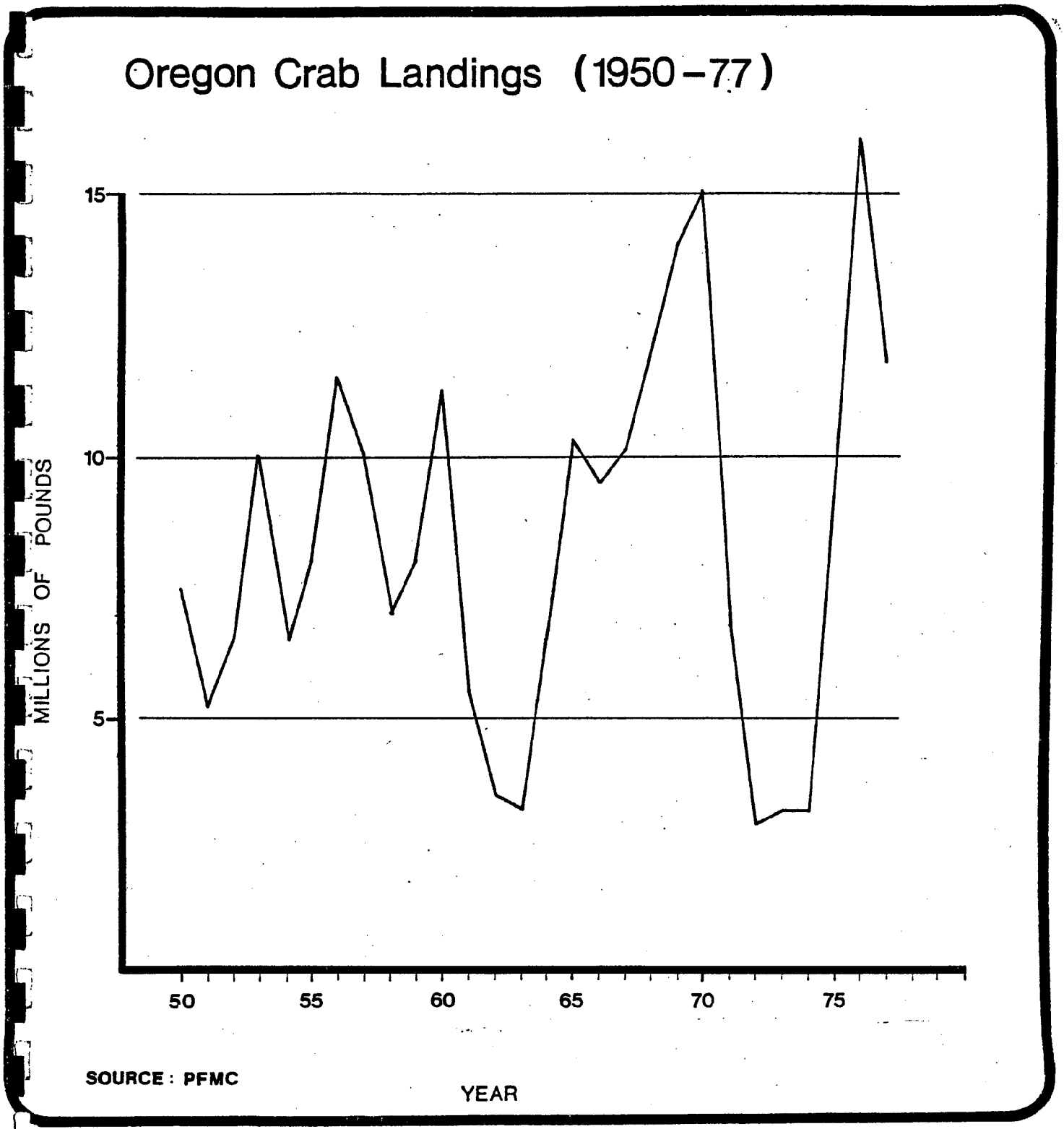
The first vessels to fish shrimp in Oregon were combination boats which were also used to fish salmon, bottomfish, crab and albacore during different seasons. These boats, generally 40 - 80 feet in length, could be converted to shrimp trawlers and towed a single net. About 1969, larger and more powerful shrimp boats from the Gulf of Mexico appeared in the shrimp fishery and introduced double-rigging (ODFW), that is, towing two separate nets side by side, each with its own set of otter doors. This can increase catches by about 60% over the single-rig method. The southern shrimp boats also brought the Gulf of Mexico semi-balloon trawl which made larger catches possible. Recently, the box trawl has been developed which reduces the incidental catch of smelt by allowing them to escape over the net.

The shrimp fishery has expanded greatly since 1970. Record annual harvests were recorded four times between 1971 and 1978. During this period, the number of vessels involved in the fishery tripled to 186 in 1978, and the number of double-rigged boats increased from 6 to 118. This more efficient rigging has helped improve catches as have other gear and technique developments.

Dungeness Crab

The Pacific coast Dungeness crab population fluctuates widely, probably in response to natural phenomena. There are as yet no methods to accurately predict crab abundance prior to the commercial fishing season. Historical landings for Oregon (Figure 5) indicate the lack of consistency from season

Fig. 5


Oregon Crab Landings (1950-77)
15
10
5
MILLIONS OF POUNDS
50
55
60
65
70
75
YEAR
SOURCE: PFMC

to season, and this is expected to continue. Due to the increasing number of boats, the landings per boat have dropped considerably, and total landings reflect crab abundance rather than fishing effort.

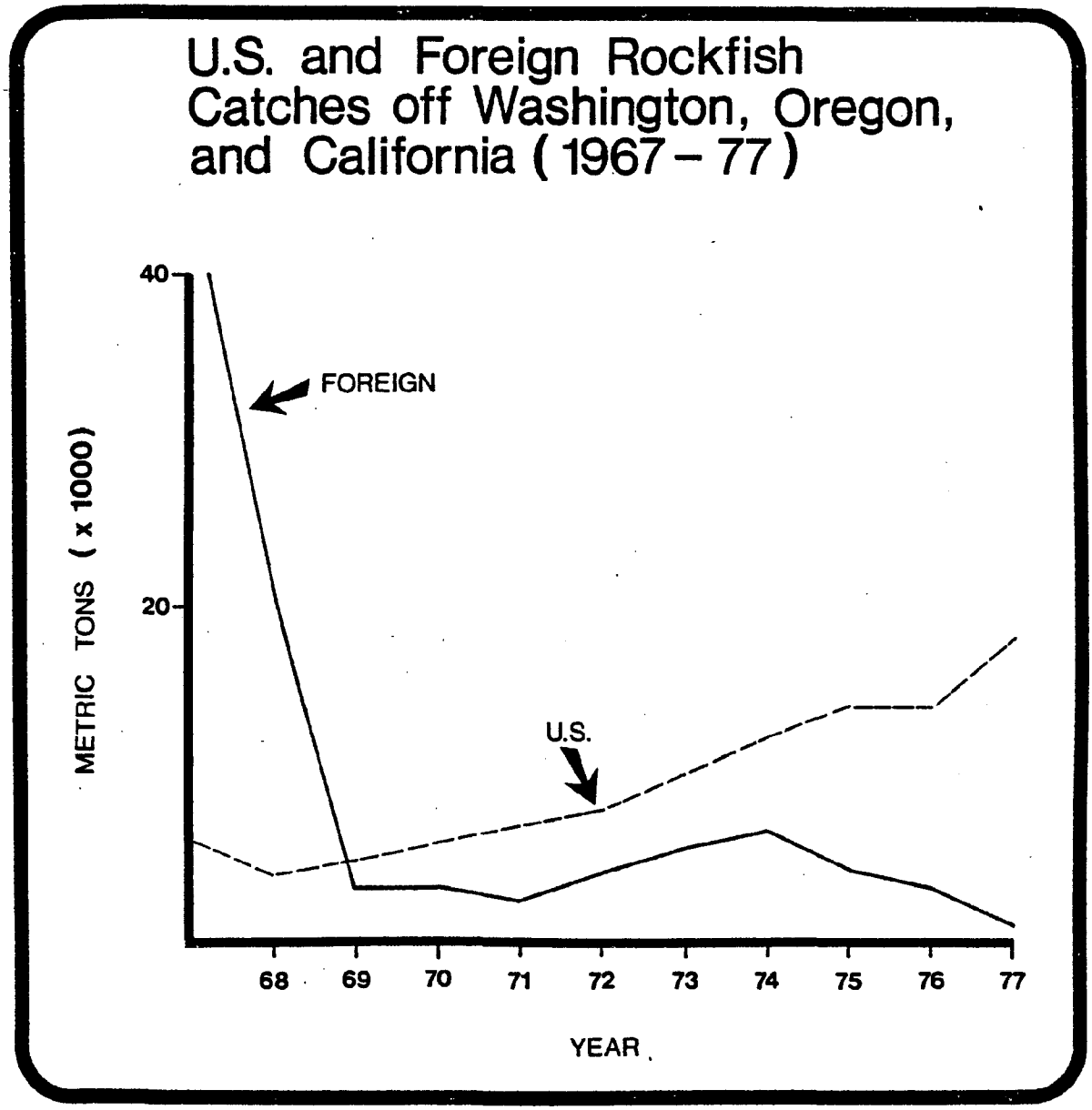
The crab fishery in Oregon has generally not undergone major changes in gear or technology. Often crab vessels, which are generally 25 - 85 feet in length, are combination boats which can be equipped to fish salmon and albacore also. A few larger boats will also trawl for groundfish and shrimp or fish for sablefish. Crabs are harvested with traps called "pots" which are baited and placed on the bottom where crabs are known to be abundant. Crab pots are circular, steel-framed traps covered with stainless steel wire mesh, are generally 3 - 3.5 feet in diameter, and weigh 60 - 120 pounds.

One recent development in the crab fishery represents a radical departure from traditional methods. Helicopters are now being used by some crabbers to set and retrieve pots within about a mile of the landing site. How much impact this will have on the industry is not known.

Groundfish

Most U. S. trawl fishermen traditionally targeted on flatfish, Pacific Ocean perch, and other rockfish. Only recently have they moved heavily toward other species. This was partly due to the crash in perch populations due to overfishing in the late 1960's, and partly due to discovery of under-utilized stocks and new technologies. In some areas the groundfish industry had been declining or only slowly expanding and the Oregon trend has been an unsteady, slow increase. After the Pacific Ocean perch populations were overharvested so drastically, agreements were made with foreign fishing interests to reduce harvests of this species. Since the Fishery Conservation and Management Act was implemented, foreign catches have been nearly eliminated for all rockfish species (Figure 6) and only Pacific hake is available to foreign trawlers.

Fig. 6


U.S. and Foreign Rockfish Catches off Washington, Oregon, and California (1967 – 77)
40
20
METRIC TONS (x 1000)
FOREIGN
U.S.
68
69
70
71
72
73
74
75
76
77
YEAR

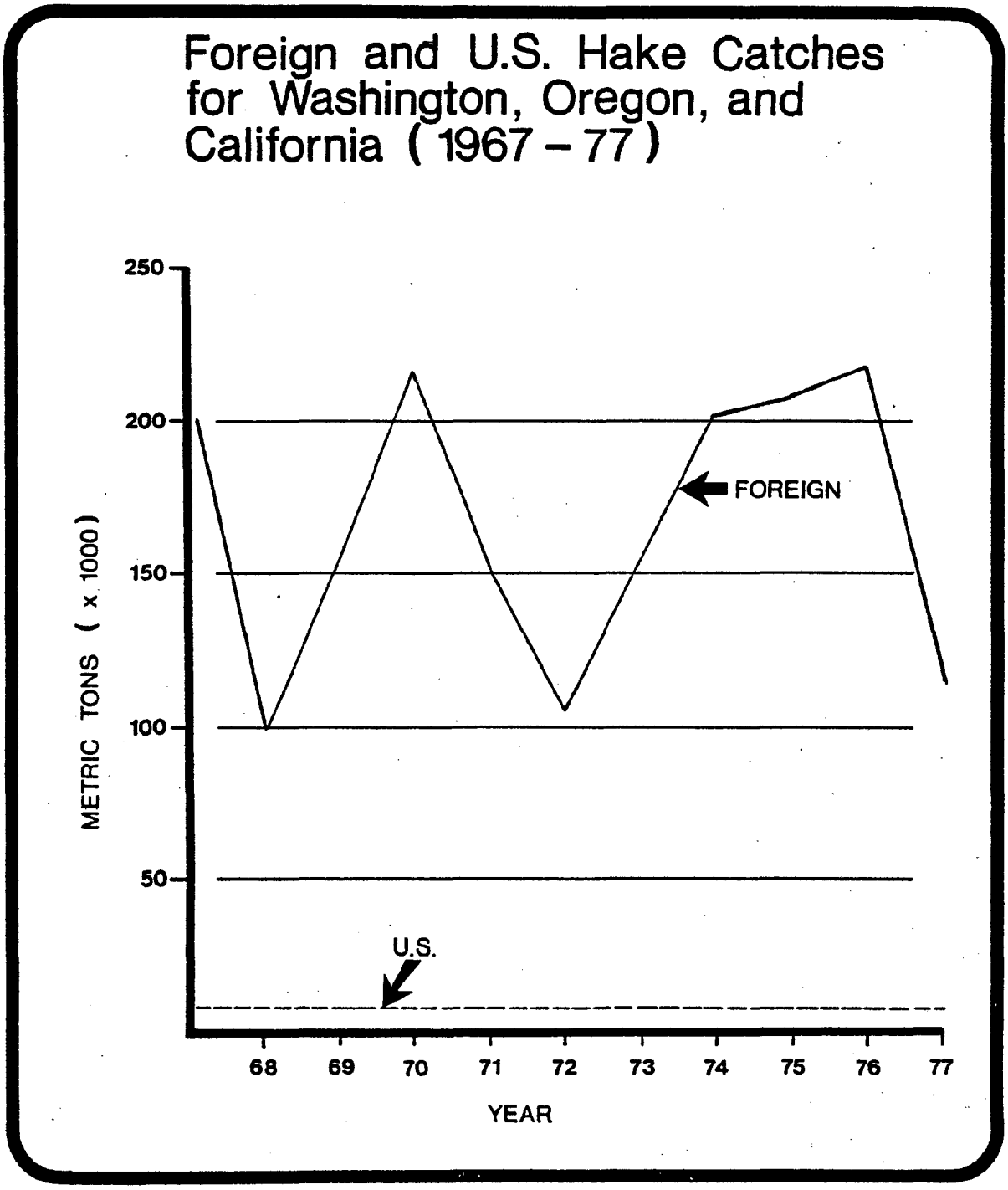
Pacific hake has not been harvested to any great degree by U. S. fishermen. It has been harvested almost exclusively by foreign fishing fleets, especially Russian, Polish and Japanese. Catches of Pacific hake off Oregon have been enormous (Figure 7) and this represents a large potential harvest for the U. S. fishermen.

Methods of stock assessment are still developing and have often been quite inaccurate. Many traditional groundfish fishing grounds have been mapped extensively, and this information is available from the Oregon Department of Fish and Wildlife. These harvest areas for flatfish and many round fish species will continue to be fished extensively, and new fishing grounds are being discovered and fished with the aid of improved technology, gear and harvest methods. It should be possible to assess various fish stocks with a greater degree of accuracy within the next few years. The Pacific Fisheries Management Council is responsible for developing plans and predicting harvest levels, and stock assessments will be made annually. Groundfish harvests by U. S. fishermen will continue to increase until the total allowable catch (TAC) can be harvested and processed by U. S. industry.

Many gear and harvest technique developments have occurred in the groundfish industry in the last decade, and technology is continuing to expand the fishery. Traditionally, bottomfish have been harvested primarily with otter trawl gear dragged along the bottom. This bottom trawl involves a bag net that is pulled behind a trawl vessel which is generally from 31 - 85 feet long or larger. The net is held open by a pair of "doors" or "otter boards", attached so that pulling them ahead pulls them outward, away from each other, spreading the mouth of the net. Floats hold up the top while lead weights hold down the bottom.

In the mid-1960's, large foreign trawlers began to fish just off the Oregon coast. Catcher/processor boats, especially Russian, began to take huge quantities of Pacific hake, a species not utilized by the American

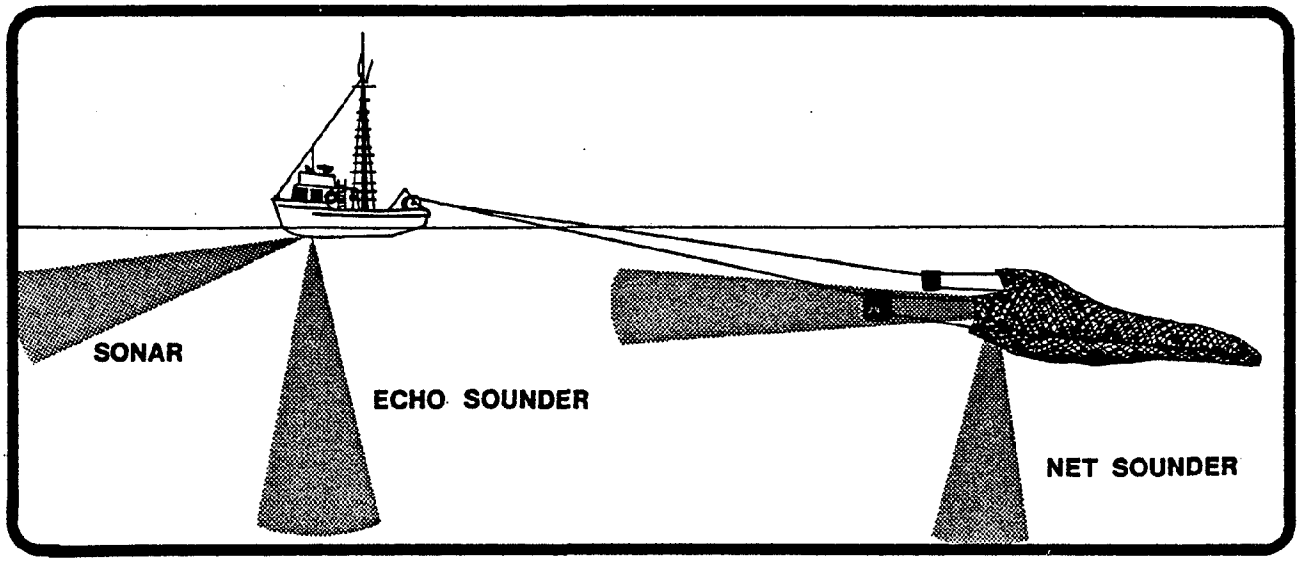
Fig. 7


Foreign and U.S. Hake Catches for Washington, Oregon, and California (1967 – 77)
250
200
150
100
50
METRIC TONS (x 1000)
FOREIGN
U.S.
68
69
70
71
72
73
74
75
76
77
YEAR

industry. By processing the fish immediately, they could eliminate the problem of flesh breakdown that has prevented domestic utilization of hake. Several technological advances made it possible to harvest these fish more efficiently:

1. Mid-water trawl - American fishermen have used bottom trawls that capture fish near the ocean floor for many years. This method can be used for harvesting flatfish, Pacific cod and some rockfish, but it is not effective for fish species that school off the bottom or mid-water. Mid-water trawling utilizes a much larger net and doors than does bottom trawling, and applies several technological advancements to put the net into the fish, a procedure described as "aim trawling". The fish are first located in the water column and then the net is "aimed" at this target with a high degree of accuracy. To accomplish this, several technological developments were necessary. First, accurate means of locating schools of fish had to be developed. Sophisticated echo-sounders and sonar solved this problem. Next, it was necessary to locate the net in relation to the fish. Netsounders were developed for this purpose so that a net can be accurately pulled through the fish (Figure 8).
2. Improved sonar has made it easier to locate fish, whether near the bottom or mid-water. In most cases, it is possible to estimate the size of the school as well as where it is located. It is often possible to tell the species and even whether most of the fish are juveniles or adults. It is also possible to avoid rocks and reefs more effectively.
3. Strong winches and blocks have made it possible to rapidly raise and lower the trawl. Speed is necessary to raise the net to avoid rocks and also to get the net into the boat quickly

Figure 8. Midwater Trawling Equipment



to maintain product quality. This also increases fishing time by decreasing time lost in raising and lowering the net.

4. Track plotters make it possible to return to a particular place after a tow. Thus, a school of fish can be relocated much more quickly and easily.
5. Fish processing equipment has been developed to fillet and skin fish much more quickly than by hand and much of this equipment can be used onboard. The development of processing ships and barges is also increasing the harvest potential of quickly-deteriorating fish such as hake and other fish in isolated areas. Quality fillets of some species must still be cut or trimmed by hand, however.

AQUACULTURE

Aquaculture is raising plants or animals in controlled or semi-controlled aquatic enrionments. By controlling certain factors that affect growth and survival, man can often produce more food than a natural environment can. Two major types of aquaculture are practiced in Oregon: oyster culture, and salmon culture.

Salmon Culture

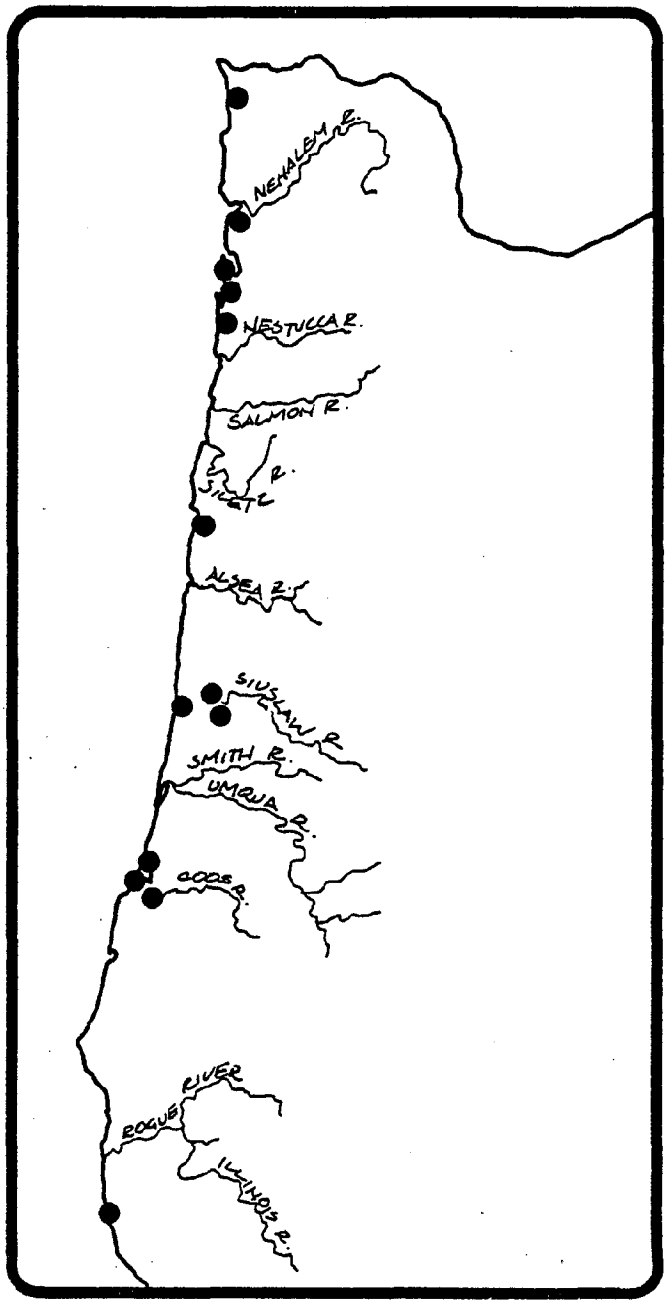
Salmon have been produced in hatcheries since about 1880, but only recently has salmon culture become a significant private enterprise also. Many developments in hatchery technique, nutrition and disease control were necessary to improve survival to a profitable level. The release of salmon smolts into saltwater and later harvest of returning adults has been successfully accomplished in many areas. The three species of salmon used are coho, chinook and chum, although pink and sockeye will probably

be used in the future also. The Oregon Department of Fish & Wildlife has granted 13 permits for salmon ranching (Figure 9) and has authorized the release of 180 million fish from these sites. This could potentially more than double the hatchery salmon production in Oregon. Releases in the first seven years have been far less than this as the private hatchery industry has developed slowly thus far. To date (May 1979) only 22 million fish have been released, but 16% of the coho available off the Oregon coast in 1979 were released by one company (ODF&W). In 1978, approximately 2.6 billion juvenile salmon were raised artifically and released into the North Pacific Ocean. Eighty percent of these were released from hatcheries in Japan and Russia, and the remainder came from Canada, Alaska and the Pacific Northwest.

Oyster Culture

Oyster culture dates back several hundred years, and produces the vast majority of domestically produced oysters today. Little natural reproduction occurs in Oregon, however, and oyster seed generally comes from three sources: 1) natural setting areas such as Dabob Bay, Washington; 2) Japan; and 3) recently from oyster hatcheries. Oyster spat are collected on old oyster shell and then placed in a suitable bay environment. They may be placed directly on the bottom, on racks, or suspended from rafts. Oyster landings in Oregon have dropped drastically over the last ten years due to a variety of factors, many related to water quality. Increasing siltation caused by logging practices and natural erosion have reduced the productivity of many oyster grounds. Various waterborn contaminants also affect production and can force closure of areas for health reasons. There is limited space for expansion of the industry, and the future may lie in new techniques or facilities such as land-based culture tanks. However, in some areas efforts are being made by several growers to increase local production and

Figure 9. Locations of Approved Salmon Ranching Release Sites



to introduce new varieties. Domestic oysters are usually marketed as fresh oysters in the shell or are shucked and packed in jars.

RECREATIONAL FISHERIES*

Coastal recreational fisheries in Oregon have traditionally been for salmon, especially coho and chinook. The increase in recreational demand has been phenomenal and recreational fishing is an important economic factor in many coastal communities. The ocean charter industry is based on this recreational demand, although an increase in one does not necessarily indicate an increase in the other.

The charter industry has characteristics of both commercial and recreational fishing. The charter industry generated only about 2% of the total $243 million generated by Oregon fisheries in 1975 (Fraser, 1978). Gross earnings during the 1975 charter fishing season were estimated at approximately $2 million (Christianson, 1978), and from this figure the total economic impact was estimated at $5.9 million in 1975 dollars (Giles, et al., 1976).

While recreational boating and fishing have increased in recent years, the number of charter boats have declined from 250 in 1974 to 227 in 1978 (Fraser, 1978). Several ports have shown a corresponding decrease in charter boat operations. For example, Newport had 20 charter boats working in 1978 compared to 32 in 1976. In Winchester Bay there were 29 boats operating a few years ago, while in 1978 only 13 boats were fishing. Astoria and Hammond have more charter boats than in the past. This is due in part to an influx of boats from Warrenton and other areas.

The decline in Oregon's charter boat industry can be attributed to several factors. The rapid growth of the private recreational fleet is often seen as a primary cause in the decline. Inflation is also important. The

*This information is based primarily on a draft report prepared for the Economic Development Commission relating to the fisheries and seafood processing industries.

most recent and possibly most severe impact on the industry is the shortage of fuel along the coast. This affects the industry in two major ways. First, it has decreased the fuel available for boats and this may produce mixed results. If fuel is not available for private boats there may be increased reliance on the charter industry for offshore fishing. The shortage of fuel could be severe enough to reduce the number of charter boats, however, and the industry would see an even more rapid decline. The second, more indirect effect of fuel shortages is that fewer people will travel to the coast. This will primarily impact charter services more distant from Portland and other population centers.

Coastal recreational fishing, although traditionally based on salmon, is shifting toward less heavily impacted fish resources. Increased interest in rockfish, flatfish and perch is the immediate result of this. If the trend seen in California recreational fishing spreads to Oregon, this shift to non-traditional species will increase, especially if restrictions on salmon harvests are tightened. Charter services specializing in bottomfish have already appeared on the Oregon and Washington coasts.

Private boating has undergone a phenomenal expansion in the past decades. There was a 352% increase in the number of registrations for private boats between 1960 and 1977, bringing the total to nearly 120,000. Similar increases in jetty fishing, surf fishing and clamming have also occurred. The economic impact of this increased activity is substantial and was estimated at $126.5 million in 1975 (Fraser, 1978). This is based on estimated direct expenditures of $55 million to $82.5 million and consideration of the impact of these expenditures on local and statewide economies.

SEAFOOD PROCESSING INDUSTRY

Seafood processing is in itself a major industry in Oregon. Coastal processing plants which handle fresh or frozen fish employ 2500 - 3000

workers annually and contribute significantly to both local and state economies. Approximately 64 plants in Oregon process seafoods (OSU, 1978), including retail outlets which do some processing (primary or secondary) and canneries. Fresh and frozen products are processed at about 30 plants which are located mostly in Astoria, Newport and Coos Bay.

The processing industry in Oregon consists of a relatively few large firms which may have their home office in Seattle, Astoria, California, or elsewhere. These firms may have 1 - 3 large plants and a number of smaller plants, and generally fall in three major categories: 1) salmon-only buyers; 2) multiple product processing plants; and 3) multiple product buying and selling stations (OSU, 1978). The third category is common only in Puget Sound, although several large firms have buying/shipping stations in Oregon ports. Fish and shellfish are shipped from there by refrigerator trucks to processing plants elsewhere. This system has become especially important to the shrimp fishery because most processing machines are located in Astoria but the shrimp grounds have shifted to the south coast of Oregon.

Multiple product plants are the most common of the large processors. These companies usually process groundfish, crab, shrimp and possibly albacore (OSU, 1978). Often these firms will concentrate on a particular product such as crab or shrimp and process others to a lesser extent. Diversity is the usual approach and enables processors to be less dependent on a particular market. In the future, large "hake only" plants may emerge, but this depends on a combination of developments including economic, environmental and political factors.

Salmon-only buyers are often individuals who buy a wholesale license one year and buy a quantity of salmon only during that season. The next year the buyer may or may not be involved in buying salmon. Several firms buy salmon for canning or smoking, but most Oregon salmon is sold fresh or frozen and canning is less important than in the past.

A processing plant or buying station must have dock space and unloading facilities. The types and numbers of hoists vary from plant to plant, as do dock space and draft. Various plants use their facilities to provide services to the fishermen who supply them. Services which can be provided include showers, transportation, repairs, and space for fishermen to work on boats and gear. Fuel, ice, and bait are provided by some plants also, depending on what facilities are present. Appendix 2 lists several of the major processors and their facilities and services.

Processing methods

Several processing methods are available to the fish processing industry. Primary processing refers to converting raw fish to the product which will be marketed. An example of this would be frozen fish fillets or whole cooked crab. Some products undergo further, or secondary, processing. In this case the original product was merely for convenience in shipping or holding and can often undergo a variety of transformations. An example of this is frozen fish blocks which can be cut into portions and breaded or battered. Secondary processing increases the number of different final products available from the same basic resource.

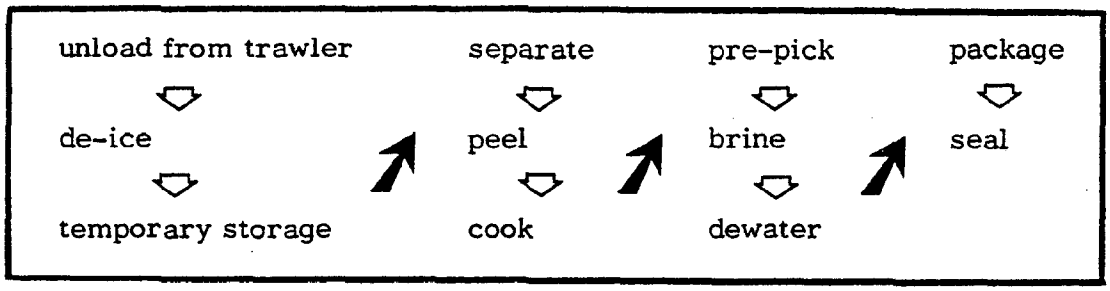
Salmon

The demand for salmon has increased dramatically in the past few years, in large part due to foreign purchasers. The devaluation of the U. S. dollar has reduced the real cost to Japanese buyers who have begun purchasing vast amounts of fresh and frozen salmon. To be considered prime quality, these fish must be hand processed carefully to avoid marring the appearance. The head is left intact and only the entralls removed. If the inside of the body cavity is marred, the value of the product may be reduced. This prevents the use of mechanical gutting machines and slows down processing. Because more salmon is being frozen, demands for freezing and cold storage have increased. Freezing is a slower method than canning, also, so production can be lower than in the past.

Net-caught salmon in Oregon are generally lower in value than troll caught salmon, due to both flesh quality and marks from the nets on the skin. Net-caught salmon are caught in quantities and are cleaned onshore. Troll-caught salmon are processed on board -- that is, the entrails are removed and the fish placed on ice.

Shrimp

About 1970 improved mechanical shrimp peelers were introduced to the processing industry, and since that time no hand-picking takes place. Manual labor is still required for pre-picking. This mechanization made it possible to utilize the small Pacific shrimp, a process which had previously been too labor intensive. Since each peeling machine can process up to 600 pounds per hour, larger harvests are required to make the machines profitable. These machines use 60 - 100 gallons of water per minute, a demand which can strain both supply and purification systems, especially when several machines operate simultaneously. The general shrimp processing procedures (OSU, 1978) is illustrated below:



Crab

Three species of crab are processed in Oregon. Dungeness crabs, which are caught locally, are the most important and undergo primary processing. King crab and snow crab are caught in Alaska, frozen, and

shipped to Oregon for further processing. These two species are much less important to the Oregon processing industry.

Most Dungeness crabs are cooked and marketed whole for the fresh frozen trade. Crabs having broken or missing legs or claws are cooked, cleaned and canned or frozen. A new crab processing system would reduce labor costs, improve product quality and increase processing efficiency.

Groundfish

Various groundfish species can be processed into different types of products. This is determined by both market demands and quality of the fish. The final product may be individually quick frozen (IQF) fillets, blocks, or portions (Figure 10). Pacific hake (whiting), which is not yet processed by U. S. industry in significant quantities, will be marketed primarily as frozen blocks for secondary processing.

There has been a trend in many areas toward replacing hand fillet lines with filleting machines. This has been in response to both increasing labor costs and increasing volumes of fish. Newer machines can fillet up to about 65 fish per minute, depending on the size of the fish, and most machines can be used onboard larger fishing vessels and processing ships. Machine processing is the only way to process large quantities of some fish quickly enough to maintain product quality.

Processing Capacity

A series of interviews with processing firms was conducted to determine present production (Figure 11) and potential processing capabilities. Most processors feel that they are operating at about half capacity and that they could double their production with existing facilities (Table 4). The companies did not distinguish how much of their production was for each type of fish, so it is impossible to determine the potential expansion for groundfish, tuna, etc. At present, considerable elasticity is built into the industry and production can be increased or decreased as markets and supply of fish

Figure 10. Generalized Fish Processing Procedures

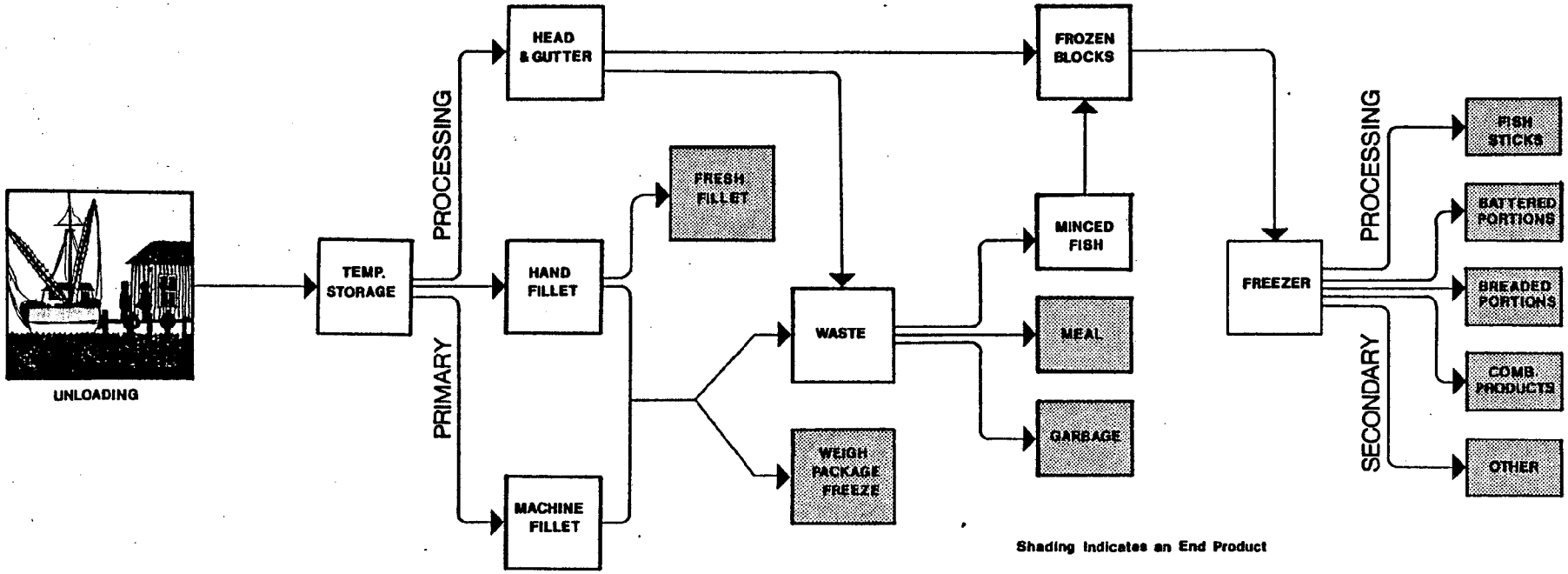
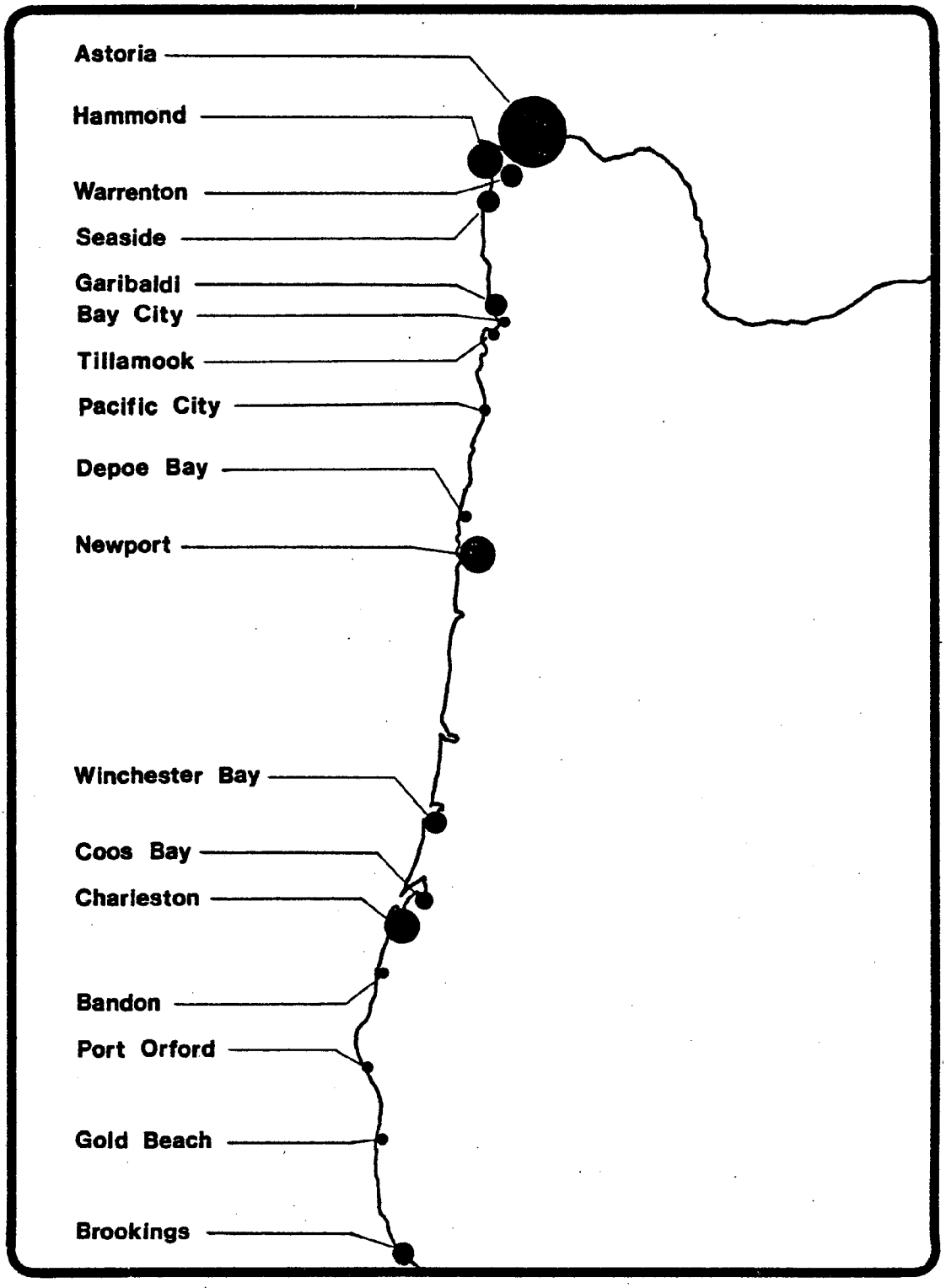


Figure 11. Relative Production of Fish Processing Facilities



fluctuate, at least where more traditional species are concerned. Most processors feel salmon processing potential is unlimited, due to past production levels and present price of salmon. Few firms indicated that Pacific hake are processed at present facilities.

Table 4. Present production and capacity of fish production plants (million pounds)

	Bottomfish pre/pot*		Shrimp pre/pot*		Crab pre/pot*		All Species pre/pot*	
Astoria	8.75	18.5	2.	4.2	1.25	2.25	75.	190.
Hammond	-	-	-	-	-	-	17.	26.
Seaside	-	-	-	-	.6	2.	.87	3.
Garibaldi	.2	.32	1.75	3.	.68	1.3	2.92	7.94
Newport	7.2	12.3	7.75	11.5	2.33	4.3	20.	30.
Charleston/ Coos Bay	3.5	9.5	6.	6.5	1.8	2.5	20.	30.
Brookings	1.25	4.	-	-	-	-	1.25	4.

*present/potential

FISHERY INFRASTRUCTURE

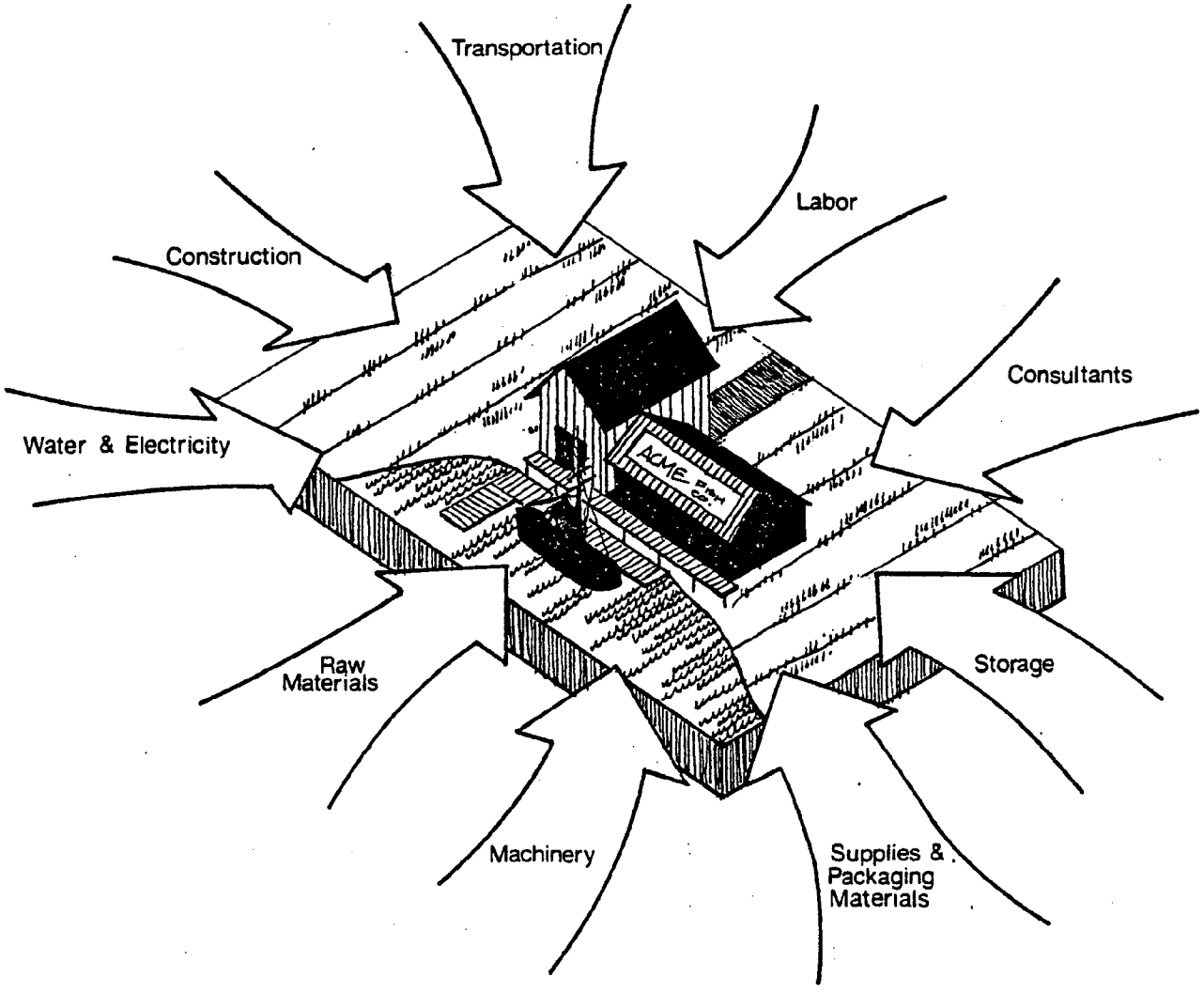
Neither the fishing industry nor the processing industry is independent of the other. They are intertwined extensively and together make up the main element of the fishing industry. But they are both dependent on other industries to provide certain goods and services without which they could not function properly. Those supporting industries, called the "fisheries infrastructure", are essential to the operation of the fishing industry.

The infrastructure can be divided into two major segments: those that exist primarily or exclusively for the fishing industry; and those that exist

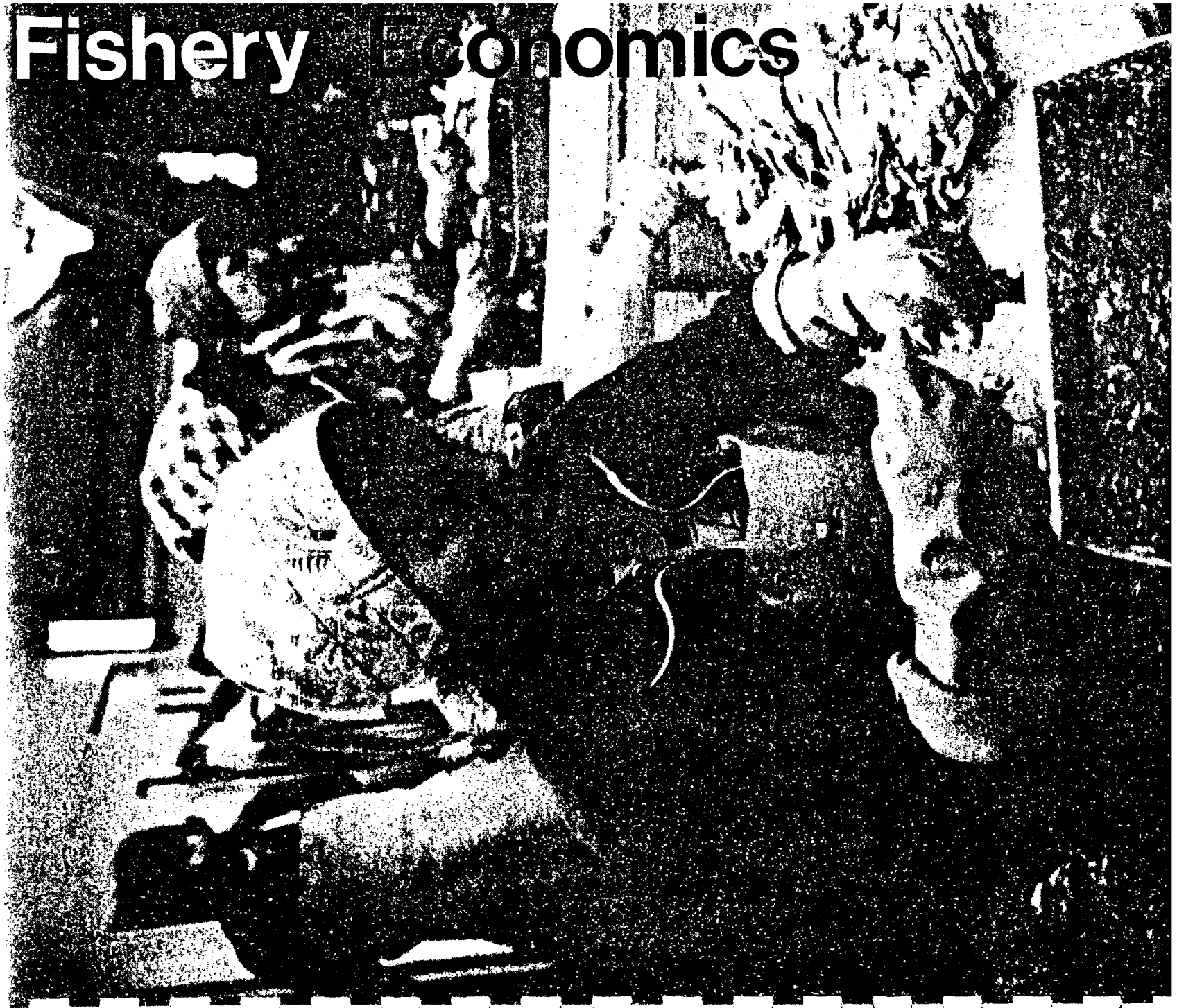
for a variety of industries and are utilized by fishermen or fish processors. Each of these categories is composed of industries that provide either goods or services (Figure 12). Goods required by fishermen include boats, nets, cables and ropes, electronic gear, machine parts, fuel, ice, and food. Processors need fillet knives, processing machines, tin cans and plastic bags, boxes, salt, aprons, gloves, boots, etc. These lists are not exhaustive, but are provided only to give an idea of the wide range of equipment involved in these industries.

A variety of services are also needed (Figure 12). These range from tax and legal consultation to construction, transportation, repair, utilities, and cold storage. Any of these in short supply can reduce productivity or efficiency.

Figure 12. Fisheries Infrastructure



Fishery Economics



FISHERY ECONOMICS

Oregon's coastal area is highly dependent upon scenic and natural resources, with agriculture, fishing and fish processing, forest products and tourism being the major economic sectors. While the fishing industry is only a small part of Oregon's total economy, it plays a crucial role in many coastal and Columbia River communities (Rompa, et al., 1979).

Analysis of the fishing industry is difficult, however, since there are no reliable estimates of the number of fishermen or consistent statistics on fishing activities other than landings (ICCDC, 1974). Many fishermen are part time and/or self-employed and thus do not show up in the Department of Revenue "Covered Employment" statistics. Fishing is often seasonal and is sometimes partially supported by employment in other economic sectors.

FISHING INDUSTRY ECONOMICS

The fishing industry in Oregon is concentrated on the coast and therefore is especially vital to the economy of this region. Of the 8647 commercial fishermen and processing plant employees in Oregon in 1976 (Table 5), 77% were residents of coastal counties. The 1976 landed value of seafood in Oregon was approximately $40 million (ODFW figures), with processing adding about $60 million in value (OSU, 1979). Since 1976 the fishing fleet has expanded considerably, especially the shrimp fleet, and the processing sector has enlarged its processing capabilities correspondingly. Shipbuilding and other supporting industries have also grown.

Along the Oregon coast, Clatsop County leads in both volume and value of landings. This is partially due to the large number of tuna landed and processed in Astoria (Rompa, et al., 1979). Other counties with a strong fishing industry are Lincoln and Coos. Newport and Charleston landed values are nearly equal (Figure 13), but substantially less than Astoria's.

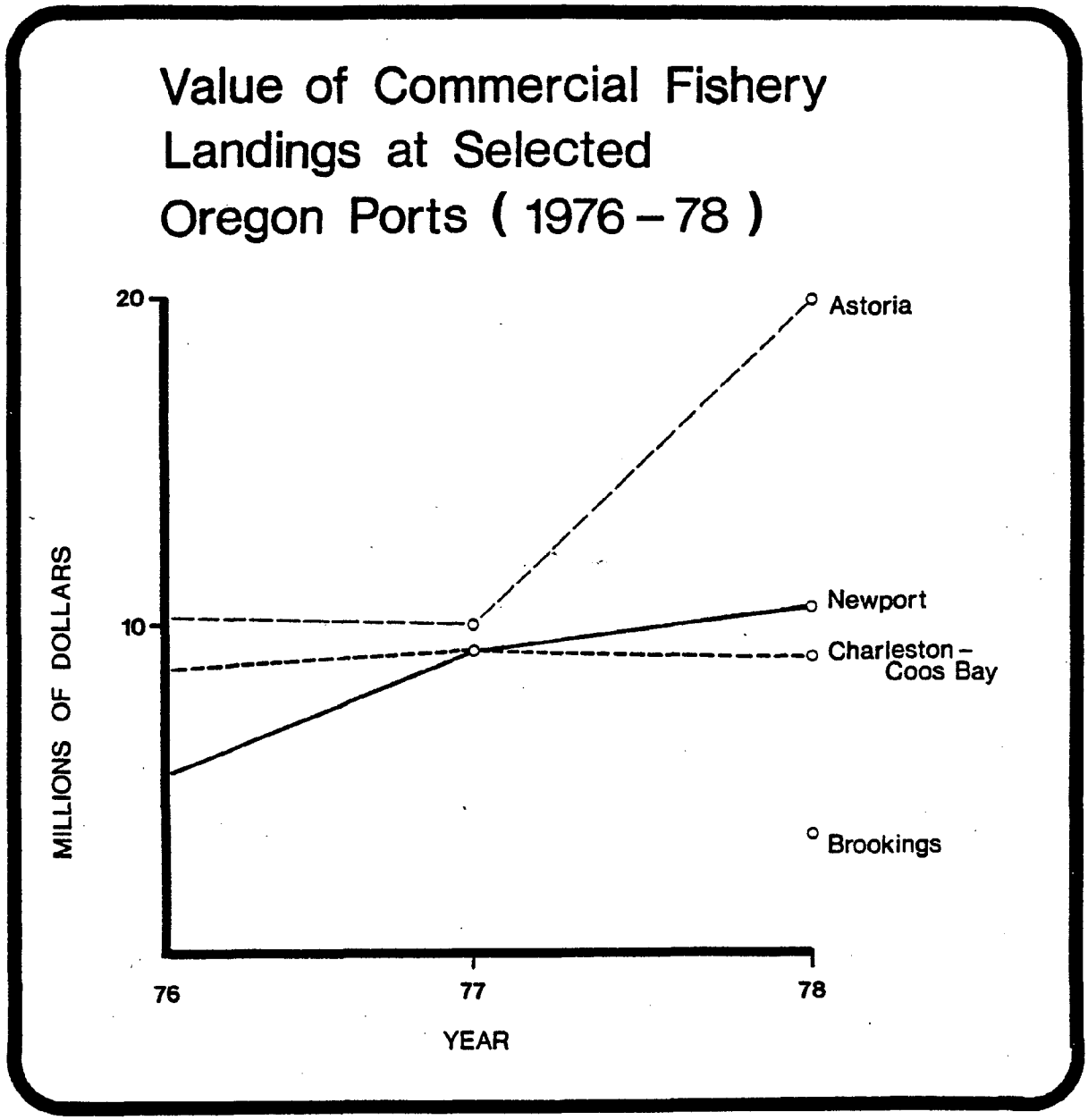
Table 5. Demographic and General Statistics of Oregon's Seafood Industry, 1976.

County	Value of Landings to the fisher (a) (millions of $s)	Employees (d) Normal	Employees (d) Peak	Commercial Fishing License Holders (b)	Ports	Licensed Commercial Boats No.(c)	Boats Values (e) (millions of $s)
Clatsop County	$10.7	1,254	1,592	710	1	399	$22.0
Coos County	8.9	396	615	759	3	408	25.3
Curry County	4.2	50	140	485	3	261	14.6
Douglas County	1.4	60	145	314	1	164	5.6
Lane County	0.2	2	5	483	1	248	7.4
Lincoln County	7.0	218	262	676	3	356	21.4
Tillamook County	3.4	85	146	319	3	172	6.6
SUBTOTAL COASTAL COUNTIES	$35.8	2,065	2,905	3,746	15	2,008	$102.9
OTHER OREGON COUNTIES	$4.7	186	191	1,805	8	939	$28.2
STATE TOTAL	$40.5	2,251	3,096	5,551	23	2,947	$131.1

Source: (a) Oregon Department of Fish and Wildlife
(b) Ibid. (obtained from commercial license application addresses.)
(c) Ibid. (obtained from commercial license applications.)
(d) Oregon State Employment Service (includes processing plant employees only.)
(e) OSU Extension (Data obtained through computerized regression analysis of commercial license information and Marine Advisory Program Marine Data Sheets.)

Table taken from Rompa, et. al., 1979

Fig. 13


Value of Commercial Fishery Landings at Selected Oregon Ports (1976 – 78)
20
10
MILLIONS OF DOLLARS
Astoria
Newport
Charleston – Coos Bay
Brookings
76
77
78
YEAR

Other port communities have markedly less contribution to the total fishing industry in Oregon, yet may have substantial contributions to the local economy.

Two economic concepts to be considered in determining the value of fisheries products to the local economy are "value added" and "multipliers". Fishermen are paid a landed value for their fish, and processing increases the value of the product. Overall, the value added by processing is about 1.5 times the landed value. Thus, the $40 million total landed value of seafood in 1976 had about $60 million added value due to processing and marketing, bringing the total value to $100 million (Rompa, et al., 1979). The second concept, "income multipliers", is a measure of how income from an industry impacts the local economy. Of the money paid to the fisherman, some will remain in the local community being spent locally on food, housing, etc. Income spent stimulates the local economy by increasing local demand for goods and services. The money is also available to be spent again locally, further stimulating the local economy. The higher the multiplier, the greater the economic impact, and income multipliers for the fishing industry range from 1.95 to 3.15, with an average of 2.41. These are relatively high income multipliers and reflect the close local economic connections of the fishing industry.

LANDED VALUES OF FISHERIES PRODUCTS

Fisheries data are collected as landings or the weight of the fish with head and guts intact except for salmon, which trollers gut at sea. Each fish species has a different market value. The market value also varies during the season and with abundance of the catch. The landed value of seafood reflects the species caught, market value at the time of the catch and size of the catch (Table 6).

Table 6. Valuation for Different Fish Products

Fishery	Landed Value	Value after Processing
Shrimp	low	high
Salmon	high	very high
Groundfish	very low	low

Each year the Oregon Department of Fish and Wildlife estimates the value of several fisheries. These totals are calculated by multiplying the average price per pound paid to fishermen by the number of pounds of each species harvested. The total annual landed value of Oregon fisheries has doubled since 1969 (Figure 14), although when inflation is taken into consideration, the real value is much less. Most of the increase in total landed value is due to increased average cost of the fish and increased harvest is of secondary importance overall, although the values of certain fish rose dramatically. The average price per pound for all species combined paid to the harvester in Oregon was $.42 in 1976 comparied to $.21 in 1969 (Table 7). During the same period, chinook salmon increased nearly four-fold from $.53 to $1.95 (NMFS data).

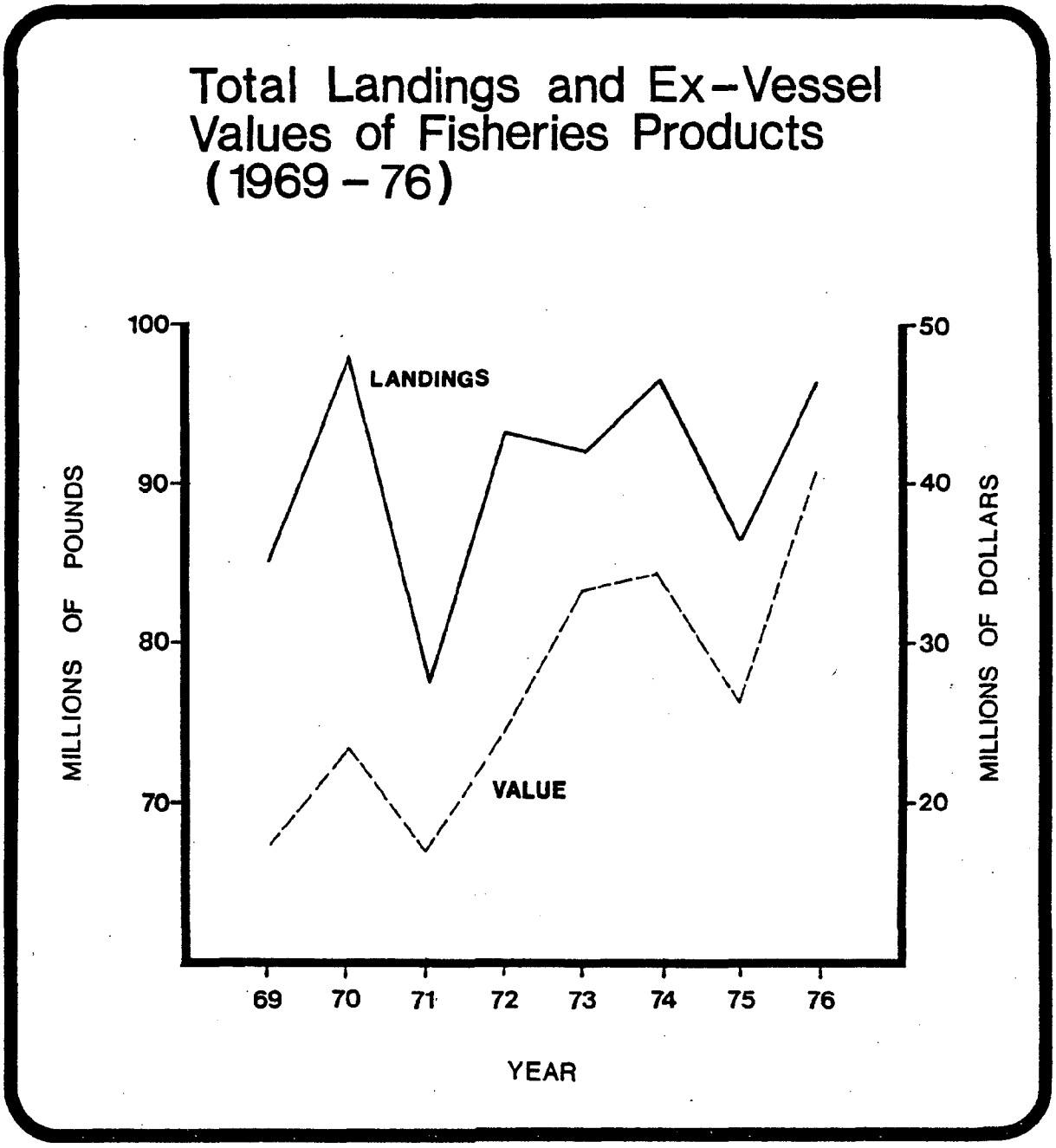
Table 7. Average Price/Pound 1960-76 for Landings in Oregon

Year	1969	1979	1971	1972	1973	1974	1975	1976
Price/lb.	.21	.24	.22	.26	.36	.36	.32	.42

From: ODFW

Clatsop County (Port of Astoria) has landed approximately one-third of the dollar value of fish for the last five years. This area is followed by Lincoln County (Port of Newport) and Coos County (Port of Coos Bay), who together comprise an equal value of landings. Other coastal ports comprise a lesser amount of the total landed value to Oregon's commercial fish catch. Clatsop County landings include substantial amounts of tuna that increase the annual landed values.

Fig. 14


Total Landings and Ex-Vessel Values of Fisheries Products (1969 - 76)
100
90
80
70
MILLIONS OF POUNDS
LANDINGS
VALUE
50
40
30
20
MILLIONS OF DOLLARS
69
70
71
72
73
74
75
76
YEAR

The value of landings in Lincoln County (Port of Newport) and Coos County (Charleston/Coos Bay) together are roughly equal to those of Clatsop County. Since 1977 the total landed values at Newport have slightly surpassed those at Charleston/Coos Bay (Figure 13). Due in part to the price of salmon, landed values in Clatsop County have soared since 1977.

Salmon

Salmon has traditionally been the mainstay of the Oregon fishing industry. In the past, salmon was a "standard commodity", a cheap source of quality protein. Today, salmon is a luxury item quite distinct from "commodity" fish species. Of the five species of salmon, chinook commands the highest price per pound because it is the largest and provides more steaks or fillets per fish. Recent heavy purchasing by the Japanese has helped to drive the price of fresh and frozen chinook and other salmon up. In 1976 the total landed value of salmon in Oregon was over $19 million, 48% of the total landed value of all seafood. This was an increase of $10 million over the 1971-75 average, although the harvest was less than two million pounds above the five-year average. The price of the fish affected the total landed fishery value more than the number of pounds harvested (Figure 15).

Tuna

Tuna has become one of the most highly regarded seafood products in the United States and is the second most valuable fishery in Oregon.

Albacore is the most prized of the tuna species and usually comprises the major part of Oregon's landings. Only albacore can be marketed as "white meat" tuna.

Landings of tuna from 1969 to 1976 have fluctuated considerably (Figure 16) averaging about 24.5 million pounds annually. The landed value per pound rose steadily until 1974 and then dropped during 1975. The total landed value of tuna averaged about $7.5 million from 1969-76, and represented an average of 28% of the annual landed value of all seafoods.

Fig. 15

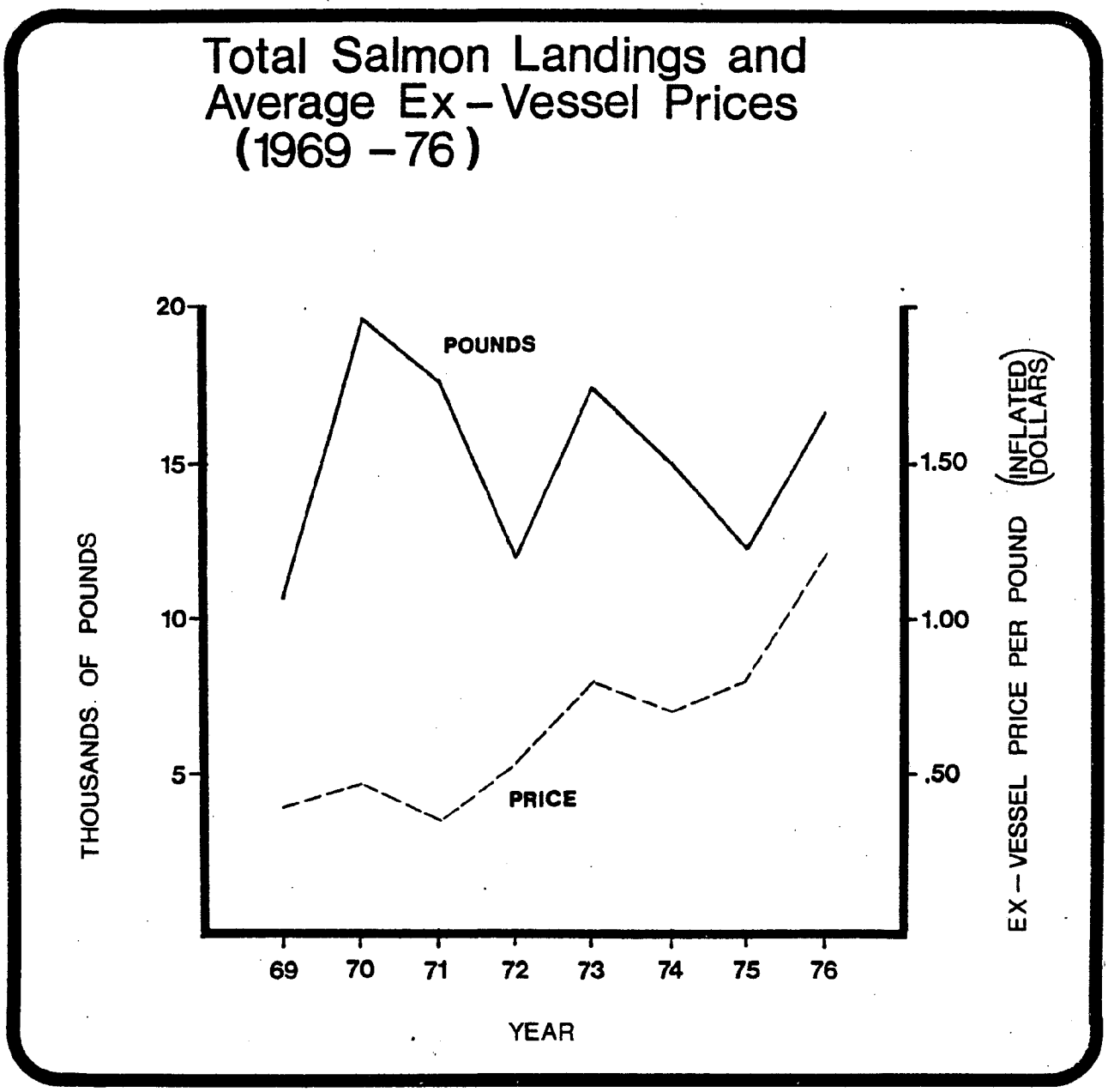
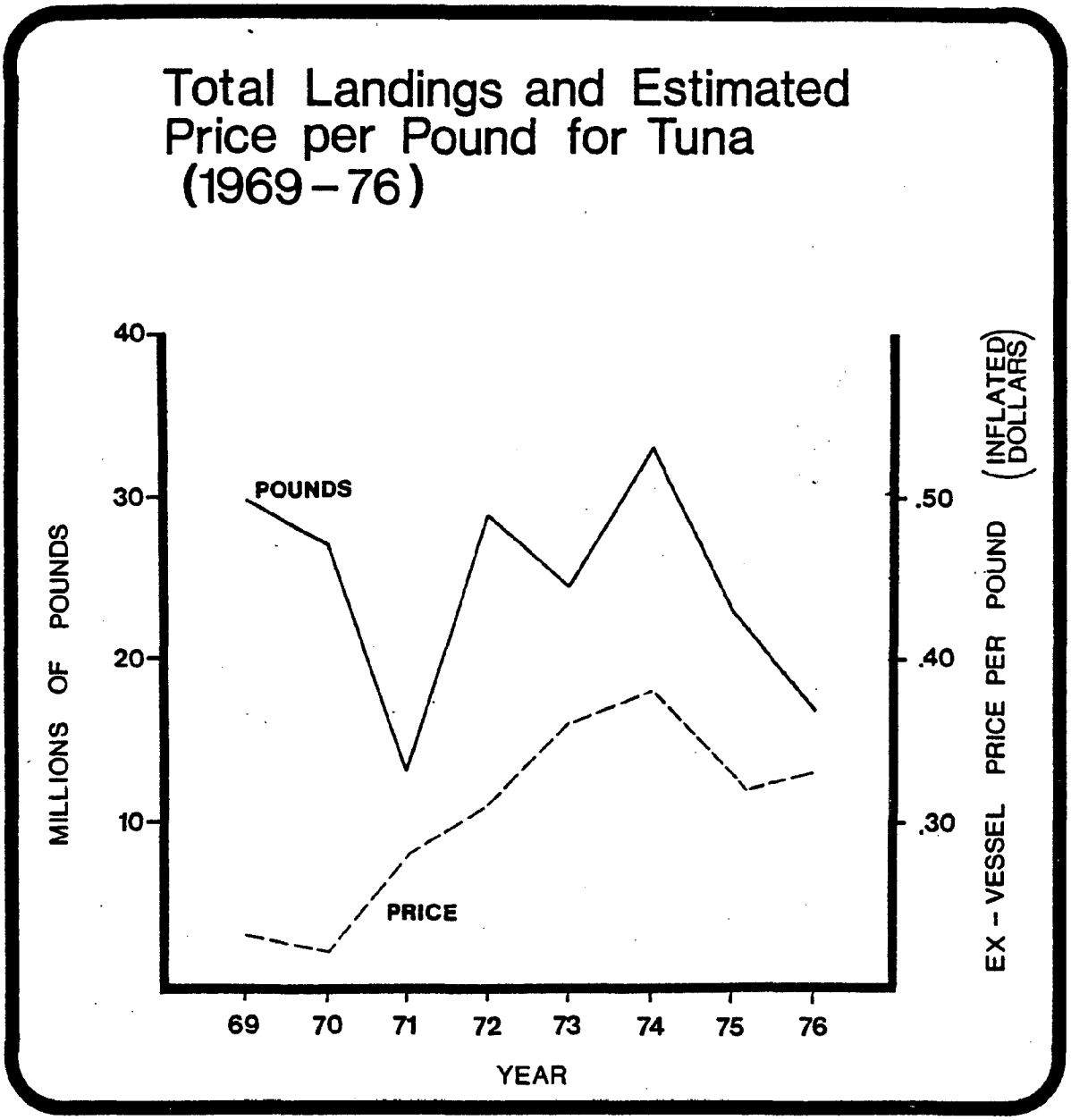

Total Salmon Landings and
Average Ex-Vessel Prices
(1969-76)
POUNDS
PRICE
THOUSANDS OF POUNDS
EX-VESSEL PRICE PER POUND (INFLATED DOLLARS)
20
15
10
5
1.50
1.00
.50
69
70
71
72
73
74
75
76
YEAR

Fig. 16


Total Landings and Estimated Price per Pound for Tuna (1969-76)
MILLIONS OF POUNDS
40
30
20
10
POUNDS
PRICE
69
70
71
72
73
74
75
76
YEAR
.50
.40
.30
EX-VESSEL PRICE PER POUND (INFLATED DOLLARS)

Shrimp

The shrimp industry has expanded greatly during the past decade, especially since 1976. The record landings of 48 million pounds and nearly 58 million pounds for 1977 and 1978 respectively, have made shrimp one of the most valuable fisheries. Because shrimp are prone to cyclic population changes, a consistent harvest rate cannot be maintained. However, the demand for shrimp and shrimp products continues to increase (Figure 18) and the price to the fisherman has generally kept pace. During the first half of 1979, the ex-vessel price was holding at $.35 per pound, 25% above the previous record prices of $.28 in late 1978. Prior to 1977, shrimp generally accounted for about 13% of the total ex-vessel value in Oregon, but the combination of greatly increased harvest and ~~fishing~~ price led to an annual ex-vessel value of over $15 million in 1978, five times the average value from 1969-76. Shrimp has a high added value due to processing, also.

Crab

The Dungeness crab harvest is subject to great fluctuations which have made it difficult to establish stable markets. The ex-vessel price of crab has fluctuated from month to month in many cases. Figure 19 shows only the average price per year and does not show variations during the year. During the first half of 1979, the price varied between $.89 and $1.00 per pound (NMFS).

From 1969-76, the total annual ex-vessel value of crab averaged about $3,300,000, roughly 12% of the total seafood value of the period. In 1976, Curry County accounted for 43% of the $5 million ex-vessel value, a substantial increase over past harvests.

Groundfish

In many ways, groundfish is the backbone and future of the Oregon fishing industry. The groundfish fishery has been the most consistent

Fig. 17

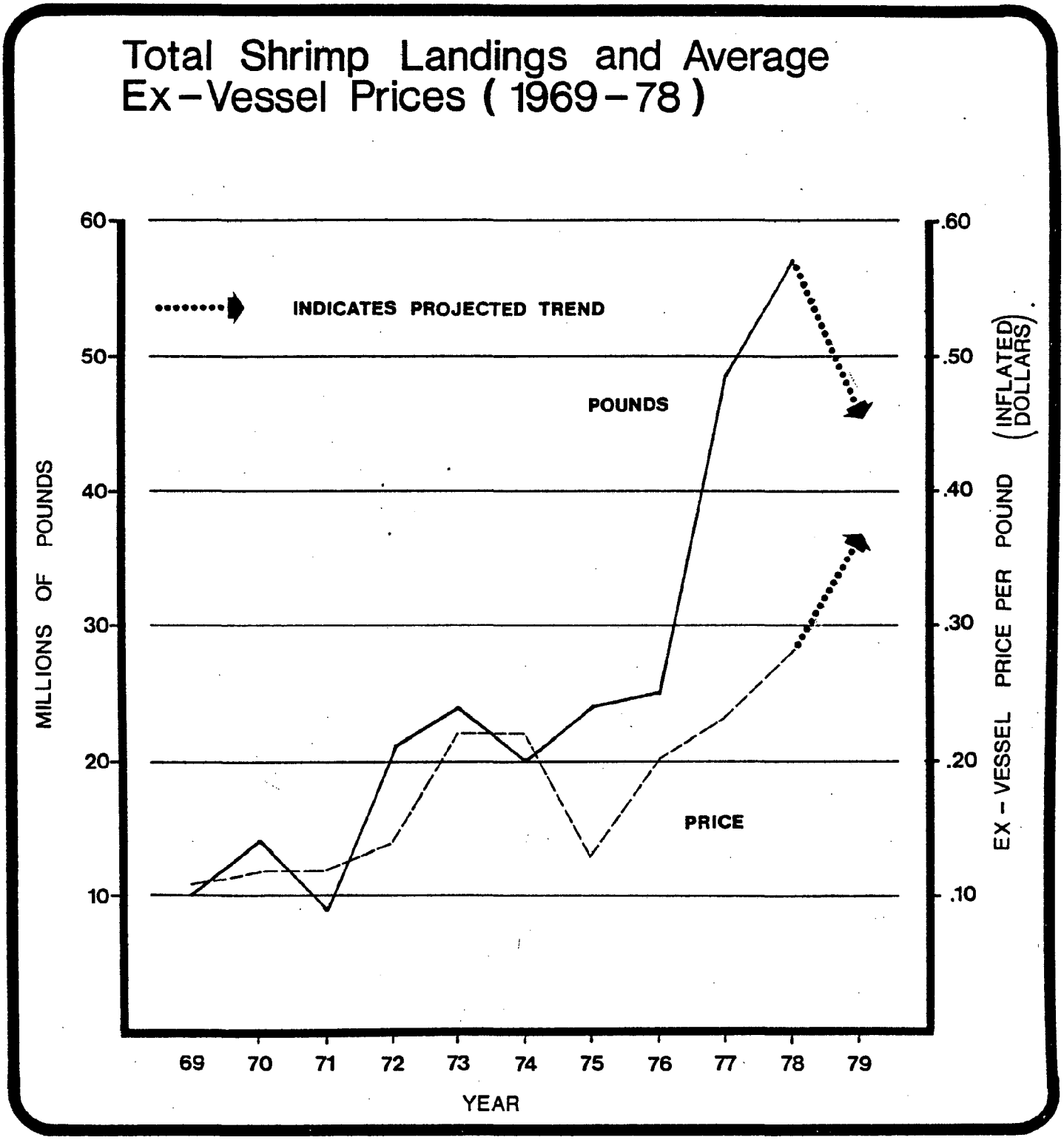
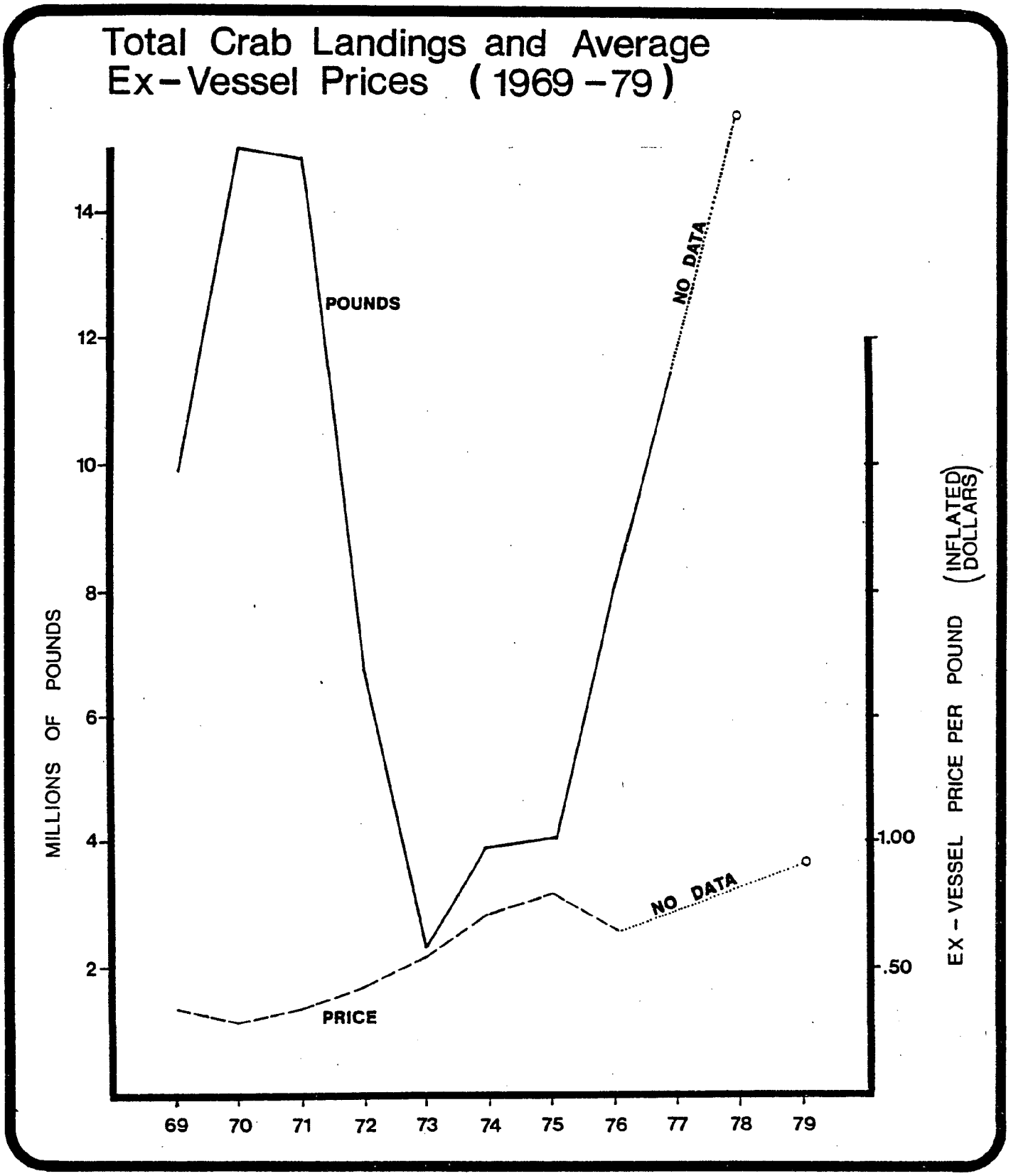

Total Shrimp Landings and Average Ex-Vessel Prices (1969-78)
INDICATES PROJECTED TREND
POUNDS
PRICE
MILLIONS OF POUNDS
EX - VESSEL PRICE PER POUND (INFLATED DOLLARS)
60
50
40
30
20
10
.60
.50
.40
.30
.20
.10
69
70
71
72
73
74
75
76
77
78
79
YEAR

Fig. 18


Total Crab Landings and Average
Ex-Vessel Prices (1969-79)
MILLIONS OF POUNDS
14
12
10
8
6
4
2
POUNDS
NO DATA
PRICE
NO DATA
1.00
.50
EX-VESSEL PRICE PER POUND (INFLATED DOLLARS)
69
70
71
72
73
74
75
76
77
78
79

although of relatively low value. It has the highest potential harvest volume of all Oregon fisheries, more than three times that of all other fisheries combined (PFMC). Marketing and processing problems have slowed development of fisheries for some species (e.g. hake) and will continue to do so in the immediate future. Because of the low price per pound (less than $.10 for hake as opposed to more than $3.00 for some salmon), there has been little incentive to expand production. The groundfish industry has grown slowly to the present time with a total landed value of about $4.3 million in 1976.

The average price to the fisherman for groundfish has more than doubled since 1969 (Figure 19), rising from $.08 in 1969 to $.16 in 1976. Most species in early 1979 were bringing $.20 per pound to trawl fishermen and the 1978 total catch was listed as more than 34 million pounds (ODFW).

FISHERMEN AND FISHING INCOME

Estimates of the number of commercial fishermen on the Oregon coast vary widely. A recent study indicated that there were some 1600 to 2700 fishermen in 1972 (Liao and Stevens, 1975). A majority of the fishermen were specialized salmon fishermen (Table 8).

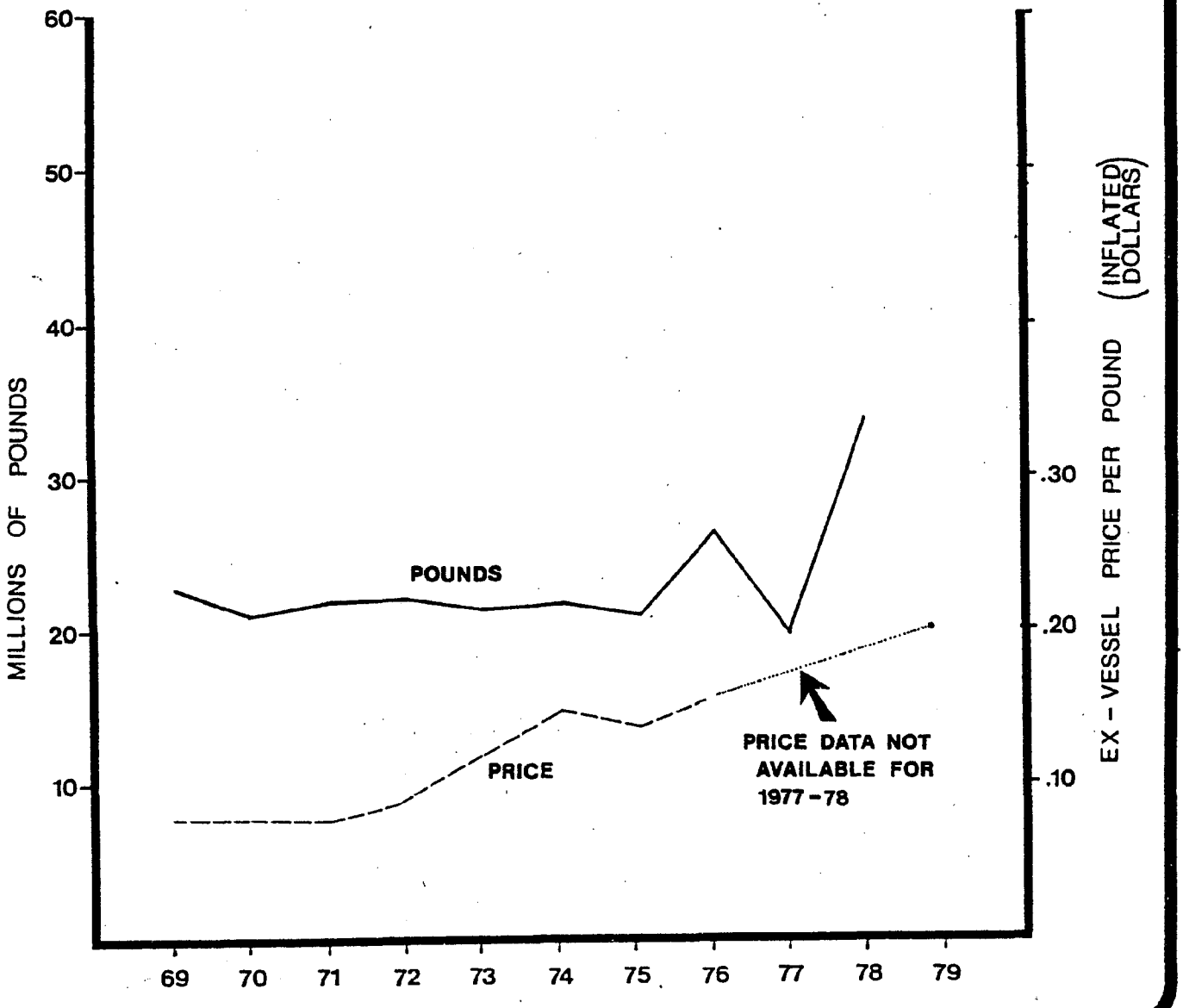
Table 8. Commercial Fishermen Other Than Gill Netters - 1972**

Type of Fishermen	Estimated Population
Specialized	
Salmon	1300 to 2200
Crab	35 to 60
Combination	
Salmon - tuna	120 to 205
Salmon - tuna/crab	95 to 155
Drag (shrimp and/or bottomfish with crab and/or tuna)	50 to 85
TOTAL	1600 to 2705

**From Liao and Stevens, 1975

Fig. 19

Total Groundfish Landings and Average Ex-Vessel Prices (1969-79)



There is a high turnover in the salmon troll fishing group. Changes in salmon abundance, catch regulations and the opening of new markets for bottomfish have changed the distribution of fishermen since the 1972 statistics were gathered.

Commercial fishing is composed of both full-time fishermen who derive their total income from fishing and part-time fishermen who derive a part of their income from other sources. Salmon fishermen are often part-time fishermen while combination fishermen (salmon/tuna/draggers) are more likely to be full-time fishermen and from fishing families (Liao and Stevens, 1975).

Commercial fishing requires a substantial investment in equipment with boat and gear as the major capital investment. Fuel, ice, bait and repairs are annual operation and maintenance expenses. The 1972 data (Liao and Stevens, 1975) indicate that salmon fishermen have substantially less invested in boat and gear than combination fishermen. Drag fishermen (shrimp or bottomfish) have the greatest investment in boat and gear.

Gross returns vary greatly between the type of fishing (Table 9).

Table 9. Gross 1972 Returns for Commercial Fishermen Other Than Gill Netters

Type of Fishermen	Gross Return	Gross Return Per Day
Salmon	$ 6,590	$ 87
Crab	22,438	217
Salmon - tuna	31,848	114
Salmon - tuna - crab	35,679	141
Drag	80,593	273

Salmon fishing generally does not provide a profitable full-time income but drag and combination fishing have a greater profit opportunity.

CAPITAL INVESTMENTS FOR FISHERMEN

With expanding fisheries, fishermen are expanding harvest capabilities by increasing both the number and size of boats. Many fishermen are switching to more profitable or less crowded fisheries, generally away from salmon. Depending upon the similarities in harvest techniques, these changes can require considerable gear modifications and equipment investment. New vessels must be built when it is not possible or economical to convert existing vessels. A fisherman can alter his harvest capability by: 1) purchasing a new vessel; 2) modifying the existing vessel; or, 3) entering into joint venture agreements with foreign fishing fleets.

Many vessels in the Oregon trawl fleet have been brought from the Gulf of Mexico, particularly in the shrimp fishery which had an increase of more than 100 boats from 1976 to 1978. Converting between shrimp trawling and groundfish bottom trawling is a relatively simple operation, as is converting from salmon trolling to long-line fishing for black cod. To have a new vessel built, the main considerations are cost and availability. An 85 foot vessel, costing well over $1 million, may not have a market for all the fish it is capable of harvesting. The vessel may be too efficient for the present industry and be forced to operate less efficiently or frequently.

The most effective technique for harvesting many species of groundfish is midwater trawling. The conversion to midwater trawling from a bottom trawling operation is neither simple nor practical in many cases. Midwater trawling requires much more horsepower to pull the larger net, and adequate winch power can be gained only by installing engines specifically designed for the winches. All deck equipment must be much stronger and it is often impossible to make the necessary changes. Thus, new and larger boats will be required to harvest most of the midwater fish resources.

Existing vessels can be modified for pair trawling instead, i.e., two vessels to pull a single net. This technique has several economic drawbacks

and requires close synchronization of the vessels, but is considered by some economists to be the most practical approach for owners of existing vessels.

Joint ventures are legal enterprises wherein U. S. fishermen catch Pacific hake and sell them directly to foreign processing ships. At present, they are beneficial to the fishermen involved because they provide a market for fish that are not marketed by U. S. processors. When U. S. processing capacity increases and can handle all the harvestable fish, joint venture will be discontinued as required by the Fishery Conservation and Management Act.

There has been considerable controversy over the merits of joint ventures. Because they can sell large quantities of hake without returning to shore, fishermen can maximize their profits. Without joint ventures, they could not harvest Pacific hake in large quantities and a larger portion of the resource would be allocated to foreign fishermen, due to the lack of markets in the U. S.

The argument against joint ventures is also an economic one. Foreign processing vessels can process fish more cheaply with government-subsidized labor, and are free from the environmental restrictions that shore-based processors must confront. Because they can market hake at a lower price, joint ventures are effectively preventing U. S. processors from entering the market. There is also a strong anti-foreign (Communist) sentiment among certain segments of the fishing industry.

At present, joint ventures are allowed off the Oregon and Washington coasts, and will continue until economic or political pressures eliminate them.

Fish Processors

The Oregon seafood processing industry has undergone considerable change since the days of the early salmon canneries. The industry in Oregon

is characterized by a few relatively large firms (16 companies have 52 plant locations) and several smaller firms. Seafood processing capacity is greatest in Clatsop County, with Coos and Lincoln counties as second and third (ODED). The ability to market products directly affects the harvest levels of many species. Traditionally, processors have shown great flexibility in the capacity to process large quantities to supply market demands. The large firms are generally able to process several products while the small firms often specialize.

Labor is a problem to processing firms in several respects. The most consistent problem is the lack of trained help during peak production periods when up to 1000 additional employees are needed (Oregon State Employment Service data). Due to generally low wages and the seasonality of work, fish processing is not attractive to many workers. Because skilled help is often unavailable, production levels are often lower than desired. There is a growing trend towards mechanization in response to labor costs, and an extremely high volume fishery such as hake would require heavy reliance on more rapid mechanical processing.

In general, a small operation can be more efficient using hand labor and provide quality fillets. A large operation depends more heavily on total output and thus mechanical filleting becomes more practical. Processing machinery for fish and shrimp require large quantities of raw material to pay for the high initial cost of the machinery.

Expansion Options

Processing firms have two options for expanding their processing capacities: enlarge existing plants, or build new ones. New plants require large capital outlay for land, construction and machinery, and face competing demands for undeveloped shore space. Environmental regulations can add to construction cost and timing. A moderately large facility would probably cost over $5 million (Pete Harris, 1979). The investment would generate

considerable income if a high volume product flow could be maintained. Expanding an existing plant which has adequate resources for expansion is generally a more profitable option, however. Fewer environmental restrictions are encountered and initial investment is much lower. In general, enlarging existing facilities means increasing processing diversity, but if markets develop for Pacific hake, a few plants may be built to handle this as a single product.

Fishery Management Plan

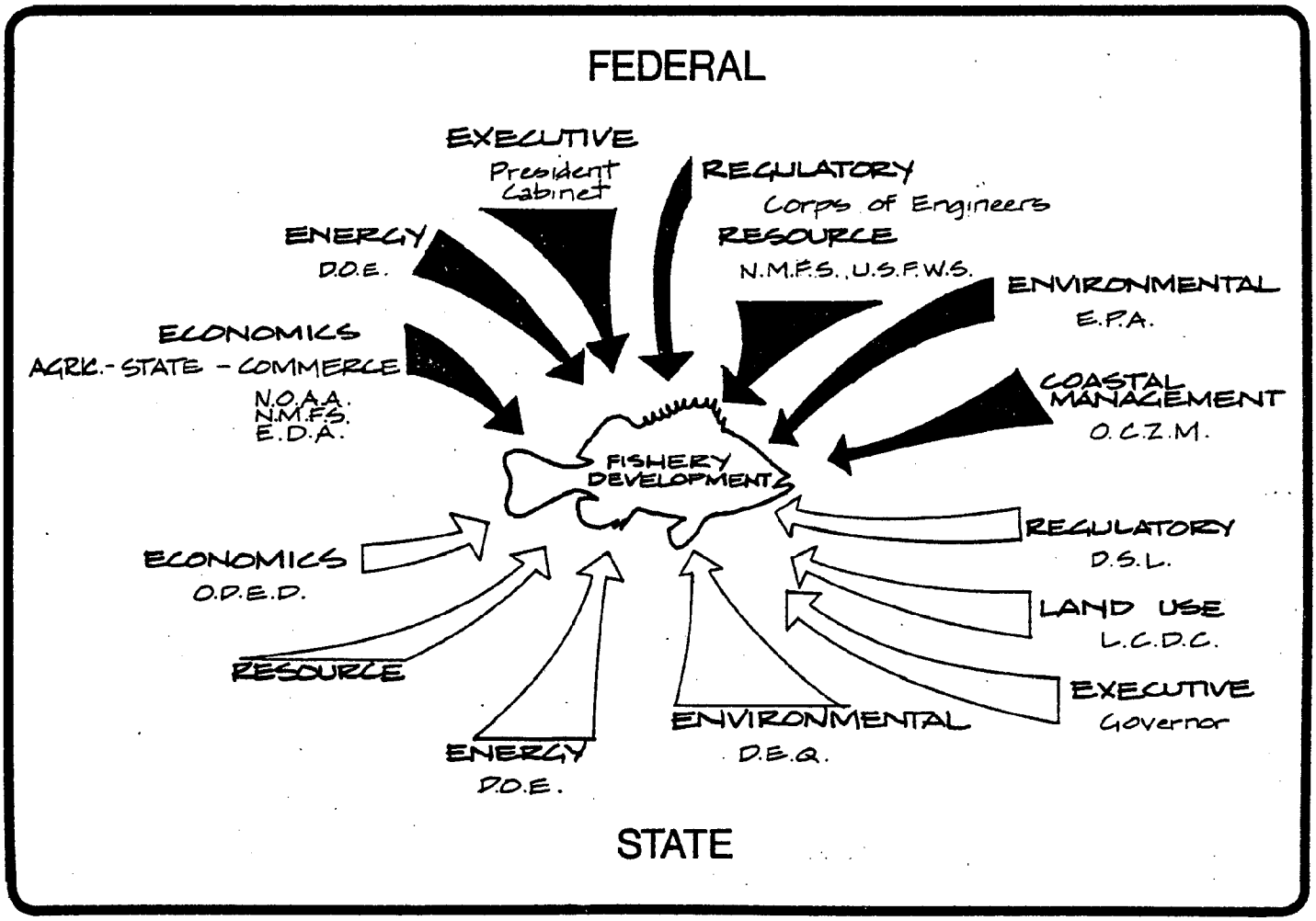
FISHERY MANAGEMENT

The Fishery Conservation and Management Act of 1976 (FCMA) took effect on March 1, 1977, and did much more than merely extend the U. S. fishing zone to 200 miles. The FCMA was the first major step taken toward developing a national fisheries policy and has affected the fishing industry by providing greater economic opportunities. The various state, federal and regional agencies involved in fisheries and other resources have been given greater responsibilities to ensure the orderly development and utilization of the aquatic resources. In the short time since the FCMA was implemented, many changes in regulations, policies and perspectives have occurred, but changes will continue as the act affects more people.

State and federal agencies and special commissions or groups such as the Pacific Fishery Management Council (PFMC) were interviewed to identify existing policies related to fisheries and fisheries development. A wide variety of agencies with direct and indirect controls that influence fisheries development have the responsibilities of environmental protection, resource management, economic development and land use regulation (Figure 20). The realm of influence of these sectors ranges from direct resource management such as the State Department's powers to regulate catches by foreign fleets, to economic stimulation through funding of community development programs.

Agencies were grouped into major areas of influence within state and federal jurisdictions, and no agency-by-agency description of specific legal authorities and regulations is presented. Instead, a broader description of the types of influences and postures of the various sectors is provided, along with a brief summary of general responsibilities. Where an individual agency has more direct influence or differs from others within a

Figure 20. Governmental Influences on Fisheries Development



particular sector, a more detailed description is provided. This general approach was necessary because individual agencies, especially at the federal level, may influence fisheries in a variety of ways, from environmental protection to economic support.

STATE OF OREGON

The State of Oregon has management authority to three miles off the coast and generally maintains exclusive control of the resources within this nearshore zone. Onshore development is of direct importance to the state and is addressed by several agencies. Most agencies deal with broader issues than fisheries and have a statewide perspective. Their influences on fisheries development, both nearshore and onshore, may be direct or indirect (Table 10), and range from direct management of fish stocks to aid forinfrastructure development.

Economic Sector

The State of Oregon does not have a specific policy oriented to fisheries development at this time. Rather, the state supports fishery development in a broad sense. This encouragement of fisheries development is seen through a variety of funding opportunities from the "Port Revolving Fund" by the Department of Economic Development through assistance grants from EDA and HUD for fisheries-related projects. In the past, funds for shoreside facilities such as processing plants, etc., were emphasized. Today, the emphasis is on broader fishery development including marketing and aquaculture as well as shoreside facilities. The economic sector is interested in improving the state's economic export flow by assisting with the development of under-utilized species, an area which would provide a real opportunity for increasing the export markets.

A nonprofit organization, the Fisheries Development Foundation, has been formed to provide substantial funding opportunities from the economic

Table 10. State Agencies with Direct and Indirect Impact on Offshore 200 Mile Fishery and Onshore Impacts

Sector	Agency	Direct/ Indirect	Major Responsibility Influencing Onshore Impacts
Economic	Department of Economic Development	D	1) Promotes business and industry development 2) Provides funding sources 3) Participates in land use planning
Resource	Department of Fish and Wildlife	D	1) Management and allocations of fish stocks 2) Vote and voice on various councils including PFMC 3) Participation in land use planning, local and state 4) Environmental protection and habitat management
Environmental	Department of Environmental Quality Department of Fish and Wildlife Division of State Lands	I	1) Public health and water quality 2) NPDES permits and projects 3) Water quality certification 4) Fish, wildlife and aquatic land protection
Land Use	Department of Land Conservation and Development	D	1) Statewide planning goals and guidelines 2) Federal consistency under the coastal zone management program 3) Advice and assistance to local governments and state agencies
Regulatory	Division of State Lands	I	1) Circulation of fill and removal permits for waterway alterations 2) Leasing of publicly owned beds and banks of navigable waters

sector. The state can work with this organization. Of major concern to the economic sector is public awareness and understanding of the economic needs of fisheries development. The public must have a realistic picture of what is required to harvest, market and process the resource and to plan for and achieve orderly development of current stocks and under-utilized fish stocks.

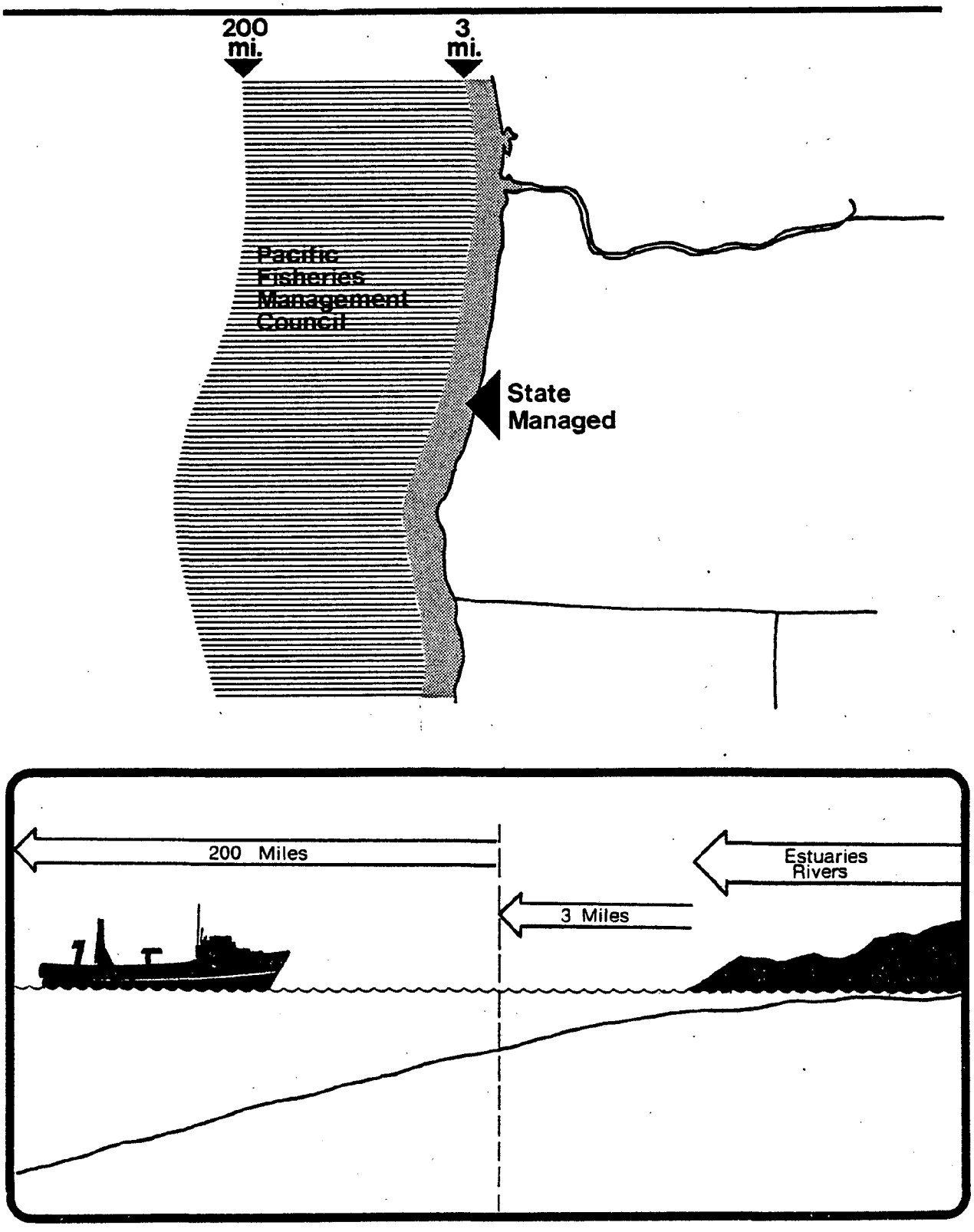
Resource Sector

Most resource management agencies have responsibilities relating to management of individual stocks, and also to protect the environmental qualities that promote continued supply of these stocks. Federal resource agencies may have responsibilities for fishery management and development as well, but no such dichotomy exists at the state level. State resource management agencies have no responsibilities for active promotion of commercial utilization of fisheries resources, facilities or development. State fish management is viewed as a stewardship responsibility with goals of protection and enhancement of the resource. Thus, research and emphasis are directed to biological and environmental matters rather than harvest technology, marketing or industrial development.

The FCMA has changed the scale of responsibility of the resource management agencies, especially since the Pacific Fisheries Management Council (PFMC) has become active. In some respects responsibilities have been diluted and in other respects increased. The ability to unilaterally establish catch and season limits for fish landed in Oregon ports is now more limited. Nearshore fisheries, including some potentially under-utilized species and aquaculture, are still exclusively within the perview of the state resource agencies. Geographically, the direct jurisdiction of the state ends at the three mile limit (Figure 21).

In practical terms, state influence has been extended regionally through the Management Council. This tie is further evidenced in enforce-

Figure 21. Oregon Fisheries Management Zone



ment agreements between the state and federal governments. A special agreement exists between the Oregon State Police and the federal government providing for cross-deputizing of law enforcement officers to facilitate enforcement throughout the fisheries zone. This represents a significant policy step for the state's law enforcement and resource management agencies.

The general policy of the state resource agencies is to protect and regulate the use of fishery resources at its current level and to anticipate future needs and potential uses. Strong fishery and habitat protection policies exist, and no policy changes are anticipated which will give more favorable consideration to fisheries development projects than to other projects. Distinct habitat protection guidelines have been established for the coastal zone which will be applied to all proposed development.

On an interstate and regional level, resource agencies participate in the Columbia River Fisheries Council to facilitate better habitat and passage control through inputs on power dam regulations, water withdrawal, irrigation and other problems to fishlife. Cooperation with the Pacific Marine Fisheries Commission helps coordinate activities with adjacent states in fisheries matters of mutual concern. The state also has a voting position on the Pacific Fisheries Management Council and thus direct input into regional management plans.

The Oregon Department of Fish and Wildlife's overall responsibilities cover recreational and commercial fisheries and nonconsumptive uses such as marine gardens and preserves. The primary tools for implementing fishery management policies are the setting of fishing seasons and harvest allocations, and through a comment role on state and federal permit applications.

Environmental Sector

The environmental sector is composed of a number of agencies in addition to the Department of Environmental Quality. The environmental

branch of the Department of Fish and Wildlife and other agencies contribute to the environmental sector. General policies from this entire group are considered within this section.

The environmental sector's policies relate to public health, fish and wildlife habitat, and broad environmental matters. Portions of the regulations and policies apply to fisheries development. The Department of Environmental Quality (DEQ) functions under an umbrella of both state and federal authority relative to water quality control. The federal Clean Water Act mandates that the state conduct its program to meet federal specifications. The Department does not now have special waste management policies for the fishing industry, but the U. S. Environmental Protection Agency has set up guidelines for the control of fish processing wastes. The state agencies act in accordance with these guidelines. The DEQ issues National Pollutant Discharge Elimination System (NPDES) permits for fish processing wastes, pursuant to the requirements of the Clean Water Act.

The general posture of the agencies is that the policies currently used to certify projects and comment through the Corps of Engineers Section 10 and 404 processes, Division of State Lands Fill and Removal permits, and land use plans, will not be modified for developments related to fisheries. The Department of Environmental Quality does, however, have the flexibility to allow certain innovative methods of disposing of waste within the limits of the law. The key note from the agencies canvassed in this sector was that an informed working relationship with the newly developing fisheries interests needs to be developed, and prudent advice will be provided to assist with development of desirable uses.

Land Use Sector

Cities and counties have the primary responsibility for developing comprehensive land use plans which are reviewed and acknowledged by the Land Conservation and Development Commission (LCDC) as being in

compliance with the Statewide Planning Goals. The State of Oregon has a coastal management program approved by the federal Office of Coastal Zone Management. Oregon's Coastal Management Program consists of the Statewide Planning Goals, acknowledged plans and selected state statutes. The Department of Land Conservation and Development is the designated agency for coastal zone management in the state of Oregon. The most direct link between land use planning and the offshore fisheries zone is LCDC's Goal 19, Ocean Resources (Appendix B).

This goal establishes a general policy of favoring the long term benefits of renewable resources over nonrenewable resources, such as oil or gas. The goal is principally directed toward state and federal agencies since local governments have not traditionally had direct jurisdiction over ocean resources. The goal requires state and federal agencies to develop sufficient inventory information to manage resources and to consider the long term impacts of proposed actions on resources and uses of the continental shelf and nearshore ocean.

An indirect but critical link to fisheries development also exists with the other goals and local government responsibilities to develop land use plans. The other Statewide Planning Goals address estuary and shoreland management, urban development, public facilities and services, etc. Local governments, therefore, have a key role in managing the onshore aspects of developments which may occur in the offshore zone. Because local plans must also be fully coordinated with special districts, ports also have an important role in managing onshore developments.

The Department of Land Conservation and Development plays a role in offshore management actions of federal agencies through the federal consistency provisions of the Coastal Zone Management Act. Essentially, federal agencies conducting or supporting activities directly affecting the coastal zone are required to conduct or support those activities in a manner which is, to the maximum extent practicable, consistent with approved state management programs.

Regulatory Sector

Most of the regulatory sector's impact on fishery development is through the permit authority relating to proposals for modifications to bed and banks of waterways. The greatest direct regulatory functions within the state system, outside of the land use sector, are the state Fill and Removal Law, the state leasing of public submerged and submersible lands, and to a lesser degree, the Department of Fish and Wildlife's leasing of oyster lands and licensing of aquaculture facilities. General policies of the regulatory agencies are that existing policies and regulations will be applied to fishery development the same as other projects. However, public and political support for fisheries projects will influence the decision making process. The agencies will closely scrutinize permits for the development of aquaculture facilities until the Department of Fish and Wildlife policy regarding the expansion and development of new aquaculture facilities has been solidified.

FEDERAL GOVERNMENT

The federal government has a broader opportunity to influence development and associated impacts of offshore fisheries than does the state. The perspective of federal agencies encompasses regional and national developments and often extends into the international arena. Fishery development, especially with regard to under-utilized species, is being stressed by many agencies and a national fisheries policy has been developed. There are also continuing efforts to develop priorities and reduce inconsistencies at the federal level, and much of the current activity and emphasis is focused on this. The general responsibilities of each sector are listed in Table 11.

Table 11. Federal Agencies with Direct and Indirect Impact on Offshore 200 Mile Fishery and Onshore Impacts

Sector	Agency	Direct/ Indirect	Major Responsibility Influencing Onshore Impacts
Executive	State Department Commerce Department	D	1) Regulates foreign catch allocations 2) Influence balance of trade and treaties 3) Approval and implementation of fishery management plans
Economic	Department of Housing and Urban Development Economic Development Administration	I	1) Funding of community development and planning 2) Business loans 3) Special studies
Resource	National Marine Fisheries Service	D	1) Fishery development (gear and marketing) 2) Fisheries Management Council participation 3) Stock assessment and research 4) Endangered species protection and research 5) Preliminary fishery management plans
Environmental	Environmental Protection Agency Fish and Wildlife Service Food and Drug Administration	D	1) Public health and marketing standards 2) Water quality and waste disposal 3) Fish and wildlife environmental and habitat protection 4) Long range land use planning impact 5) Permit issuance and review 6) Product name change
Regulatory	Corps of Engineers Coast Guard	I	1) Issue 404 and Section 10 permits 2) Harbor maintenance and development 3) Law enforcement

Executive Sector

The executive sector includes the President, Commerce Department (at the cabinet level), and the State Department in this study. At the present time there is little direct federal assistance available for fishery development. Inflationary pressures are forcing a more conservative approach to direct economic aid, but other mechanisms are available to aid the industry. A pro-development posture directly affects the policies of other federal agencies, in this case especially the Commerce and State Departments.

The State Department has a major role as an interface between the U. S. government and other nations in negotiating and implementing international fishery agreements and treaties. The State Department represents U. S. fishermen operating in foreign waters when incidents occur. They also represent U. S. interests when foreign fishermen violate U. S. regulations. Under the terms of the FCMA, the Commerce Department approves and implements fishery management plans and the State Department is responsible for catch allocations for foreign countries. A representative from the State Department also advises the PFMC on international developments affecting U. S. fisheries.

Economic Sector

Within the federal system economic development and funding responsibilities are shared by a variety of agencies such as HUD and EDA, as well as the granting capacities of the National Marine Fisheries Service (fishing vessel loan guaranties, capital construction funds, etc.). Fisheries development is viewed as a priority, but federal funding sources make only little direct contribution for construction and shoreside facilities. Marketing and development studies are the main thrust at the present time, along with encouragement through technical and other assistance.

Resource Sector

The federal resource agencies have two primary responsibilities. The first relates to environmental and habitat protection, and the second is devoted to resource development. Two major vehicles of these are the Endangered Species Act and the Fishery Conservation and Management Act (FCMA). Resource development includes such activities as hatchery production of salmon and enhancement of aquatic habitat, and must be distinguished from fishery development which relates to harvest and utilization of the resources. Fish management at the federal level is the responsibility of the Commerce Department, which implements management plans drawn up by the PFMC, and the State Department through allocations to foreign fleets. On an interim basis, preliminary management plans are the responsibility of NMFS, which acts as a management agency only until final plans are established by the PFMC.

The specific policies relating to onshore development and offshore fisheries in the environmental management role continue to be those as outlined in the December 1, 1975, Federal Register, commonly called the Fish and Wildlife Coordination Act. This is the framework in which the environmental protection sector comments on Corps of Engineers Section 10 and 404 permit applications as well as potential federal public works projects. The position of these agencies is very similar to the State of Oregon's environmental protection sector in that environmental protection must be considered in development plans. There is a commitment from federal resource agencies to particpate in the planning process to implement management goals and circumvent short term losses. For this reason, there is a general policy encouraging the federal agencies to participate in planning projects, particularly those relating to regional and statewide efforts.

In the industry development and resource utilization role, the National Marine Fisheries Service is the primary resource agency involved. The

Department of Agriculture has some limited authority affecting aquaculture. Policy related to resource utilization has been historically to develop gear, marketing and processing technology. The primary policy direction has been to provide data and assistance through funding programs, vessel construction, marketing programs and gear research.

Certain functions of the NMFS fisheries development program have been transferred to the newly developed Fishery Development Foundation. Within the resource sector there is an attempt to develop a coordination system between the National Marine Fisheries Service, NOAA, Department of Commerce, and OCZM. There is a concern that with the current pressures for rapid development, confusion could be created between the fisheries development, environmental protection and planning responsibilities within the Department of Commerce. There is an additional concern that the general public and potential developers may believe that simply because a facility is connected with fisheries it is automatically acceptable.

Environmental Sector

The environmental sector is composed of the EPA and the environmental sections of the resource agencies. The main federal agency for environmental protection has public health and protection of fisheries habitat and in-water fisheries environment responsibilities. Water quality protection and effluent discharge control are dealt with directly under the Clean Water Act. The regulations controlling fish processing call for a minimum of fine screening with effluent discharge allowed into the waterway. Solids collected in the screening process must go into either by-product utilization or approved land disposal sites. There is some indication more stringent effluent treatment may be required in the near future for new plants.

There are no new regulations or policies being developed exclusively to meet fisheries development needs. The specific guidelines addressing fish waste disposal have been in existence for a number of years. There are also special guidelines controlling aquaculture discharges.

Regulatory Sector

The major agencies exerting direct regulatory authority are the Corps of Engineers (through Section 10 and 404 permits) and the Bureau of Land Management (through OCS leasing for offshore oil and gas). The Bureau of Land Management does not have any direct relationship to the offshore fishery, but would be a factor if offshore oil and gas finds were made. The Fisheries Protective Fund and coordination program is being developed, in part, to pay for gear damage from offshore oil and gas development.

Onshore facilities which require alterations to a waterway are reviewed by a host of federal, state and local interests through the Corps permit program. Most onshore developments connected with fishery development will require these permits.

SPECIAL COMMISSIONS AND GROUPS

The regional character of fisheries development and the stocks in the 200 mile zone extend beyond traditional jurisdictions. The problem is compounded by the international character of the fishing area and the migratory nature of many of the stocks. In response to this, a number of special groups and commissions have been created (Table 12). Some, such as the PFMC, deal with the broad management issues while others address specific problems such as Indian treaty rights or industry development and marketing. In addition, there are numerous local and national fishing organizations, both commercial and recreational, that exert considerable political pressure on management agencies and legislatures.

Pacific Fisheries Management Council

The FCMA established eight regional councils to devise management plans for fisheries in the fishery conservation zone. The Pacific Fisheries Management Council (PFMC) has management responsibility for the fish resources in the zone from the Canadian border to Mexico. The Council is

Table 12. Special Commissions or Groups with Direct and Indirect Impact on Offshore 200 Mile Fishery and Onshore Impacts

Agency	Direct/ Indirect	Major Responsibility Influencing Onshore Impacts
Pacific Fisheries Management Council	D	1) Prepares management plans for major fisheries within the Fishery Conservation Zone off Washington, Oregon and California
Fisheries Development Foundation	D	1) Funding special fish development programs for industry
Pacific Marine Fisheries Commission	I	1) Stock assessments 2) Coastwide data network 3) Coordination of regional fishery concerns
Indian Tribes and Organizations	D	1) Aquaculture 2) Salmon stock allocations litigation 3) Regulation of harvest on reservations

comprised of 13 voting members who represent resource agencies, industry and recreational interests, and 5 nonvoting members. Nonvoting members include the director of the Pacific Marine Fisheries Commission, the regional director of the U. S. Fish and Wildlife Service and representatives of the Governor's office, the U. S. State Department and the Coast Guard.

The Council is responsible for the management of all marine and anadromous species in the extended fishery zone, with the exception of tuna. The PFMC provides management plans, including draft regulations and allocations to the U. S. Commerce and State Departments for adoption and implementation. Plans are designed to meet the requirements of the FCMA and its National Standards by achieving the following objectives (PFMC, 1978):

1. Promote conservation while providing for the optimum yield from the California, Oregon and Washington fish resources in terms of: providing the greatest overall benefit to the nation with particular reference to food production and recreational opportunities; avoiding irreversible or long-term adverse effects on fishery resources and the marine environment; and ensuring availability of a multiplicity of options with respect to the future uses of these resources.

2. Promote, where possible, efficient use of the fishery resources, but not solely for economic purposes.

3. Promote fair and equitable allocation of identified available resources in a manner such that no particular group acquires an excessive share of the privileges.

4. Base the plan on the best scientific information available.

5. Wherever practicable, adopt management measures which promote efficiency and avoid disruption of existing social and economic structures where fisheries are operated in reasonable conformance with the Act and have evolved over a period of years as reflected in community characteristics, processing capability, fleet size, and distribution.

The plans are prepared by special plan development teams with input from advisory panels including private citizens, representatives from industry and other special interest groups. The Council has identified several fisheries which require fishery management plans, including: 1) salmon; 2) groundfish; 3) pink shrimp; 4) Dungeness crab; 5) anchovy; 6) jack mackerel; 7) billfish; and, 8) Pacific herring.

The Council deals only with management of the fish resources and has no direct role in fisheries development. However, by setting appropriate quotas, PFMC encourages the development of under-utilized species. Consideration is given to the economic impacts and onshore facility development needs, but at this time there is no direct involvement or coordination with state coastal zone management programs.

Fisheries Development Foundation

The Fisheries Development Foundation is a cooperative effort between government and industry to promote fisheries development. The Foundation will act as a funding source for special studies relating to fishery development, and an initial project regarding solid waste disposal has been funded. Federal monies (e.g. Saltonstall-Kennedy (S-K) funds) can be distributed directly through the Foundation as well as through governmental agencies. Projects which would aid particular individuals will be strictly avoided, and emphasis will be on under-utilized species and applied research.

Pacific Marine Fisheries Commission

The Pacific Marine Fisheries Commission (PMFC) is an interstate agency whose goal is to promote the wise management, development and utilization of marine, shellfish and anadromous fish resources. The PMFC has no direct management role but acts as an advisory group in fisheries-related matters to member states and the Management Council. The Commission acts as a major data and analysis source, with resource assessment as an important function along with development of a coastwide data network.

The PMFC works to coordinate state viewpoints on fisheries matters and acts as an intermediary between state and federal agencies and the PFMC. The PMFC has no direct planning or regulatory role, but provides a mechanism for federal sharing in the funding of regional fishery projects.

Indian Tribes

Indian treaty rights are of paramount importance to fishery management, particularly for salmon management in the Columbia River. Input into salmon management comes from the Columbia River tribes through the Columbia River Intertribal Fish Commission and other groups. The Indians have been guaranteed a percentage of the annual salmon harvests by court decree, and they regulate the harvest on tribal lands. Many tribes aid in resource development through hatchery production of salmon and steelhead. Considerable pressure is exerted by these groups on management agencies both through cooperation and judicial action.

POLICY ANALYSIS

The FMCA mandates that U. S. fishermen and processors be given the first opportunity to utilize the offshore fish resources, but does not provide direction for the accommodation of onshore impacts related to fishery development. Thus, the industry is encouraged to develop but must be aware

of environmental protection regulations, marketing problems and land use regulations. These regulations allow for orderly development under the Act. At the present time state and federal agencies with fisheries management and development responsibilities are undergoing changes to accommodate fishery development within existing regulations. Legal, legislative and management processes will develop through the years. Fishery management problems are further complicated by international implications of the 200 mile zone and the lack of domestic market for the currently under-utilized species. The changing legal, political and socio-economic factors related to these fisheries will be major determinants of onshore facility needs and impacts. Analysis of the current policy trends may give some indication of the direction fisheries development and subsequent onshore impacts are taking.

The onshore impact that will be experienced on the Oregon coast will be an indirect reflection of the currently-developing fisheries management and allocation policies. "Policies" in this discussion is used in the broad sense to include the plans, goals and administrative procedures or processes of the various agencies, commissions and regulatory bodies. There is a contrast between the traditional upland or land-based policy development and those from the ocean-based resources. Land-based policy and planning have traditionally been functionally oriented, i.e., energy, food, transportation, etc. Current development of ocean programs is organized by resource bases, i.e., water, land, people, oceans, etc. Four characteristics set ocean activities and resources apart from land-based concerns (Department of Commerce, 1978):

1. Ocean resources are common property, wholly within the public domain.
2. Ocean activities interact and impact one another in more direct ways than comparable land-based activities.

3. Technology needed for developing ocean resources is significantly different than that associated with similar land-based resource development.
4. Oceans constitute an area where U. S. interests abut against other national interests and thus international problems enter into the decision process.

The specific type of developments that may occur along Oregon's coast will depend upon international trade agreements, potential legal actions by user groups and solution of marketing problems.

State of Oregon

The State of Oregon will continue to pursue fishery policies that protect stocks in state waters and increasingly have a coordination role in offshore fishery development. The same environmental constraints and habitat protection requirements currently required for all permits in Oregon will be applied to fisheries-related projects. Resource management agencies are oriented toward research in stock size, user group allocation and fisheries habitat requirements. There is no agency or organization within state government exclusively charged with fisheries development. Development of the fisheries industry is supported by the Executive Department and the State Department of Economic Development, along with other forms of industrial development. The resource agencies currently have serious reservations about expanded salmon aquaculture facilities due to the potential for over-saturation of the ocean environment by salmon stocks. Until additional research data is generated, salmon aquaculture development proposals within the state will be closely examined and conservatively received. Expansion of other aquaculture opportunities (i.e., shellfish, algae, etc.) will be limited due to the relatively small habitat area that can accommodate these uses.

Because distinct policies do not promote specific fisheries, allocations will likely be on the conservative side. The impact of the FCMA on fisheries allocations will be to require a regional perspective through the Pacific Fisheries Management Council. The conservative development stance suggests that development pressures will come from political and industrial sources.

In the state of Oregon, the land use planning agency is becoming aware of the developing fisheries needs and is currently working with state and federal agencies in an effort to prepare for potential onshore impacts. Land use agencies do not have specific policies that relate to fisheries development. Rather, fisheries development will impact local comprehensive plans. The primary thrust of the state land use and coastal zone management effort is to provide technical assistance and information to facilitate local planning. A primary coastal land use concern is to ensure that the state and federal agencies and regional commissions have a clear understanding of the social, economic and onshore impacts of fishery management decisions.

Federal Government

Federal fishery policies will become more diverse as the economic opportunities and environmental impacts of fishery development occur. The environmental sectors of the federal agencies view fisheries development in the same manner as the state agencies. Current regulations and requirements for permit and project development will be as stringent as have been applied to other types of developments. Guidelines recently proposed by the U. S. Fish and Wildlife Service suggest that controls under NEPA and permit review processes may be tightened even more than they are today.

Federal resource agencies do not have direct stock allocations powers, but do have fisheries habitat protection concerns. Federal resource agencies

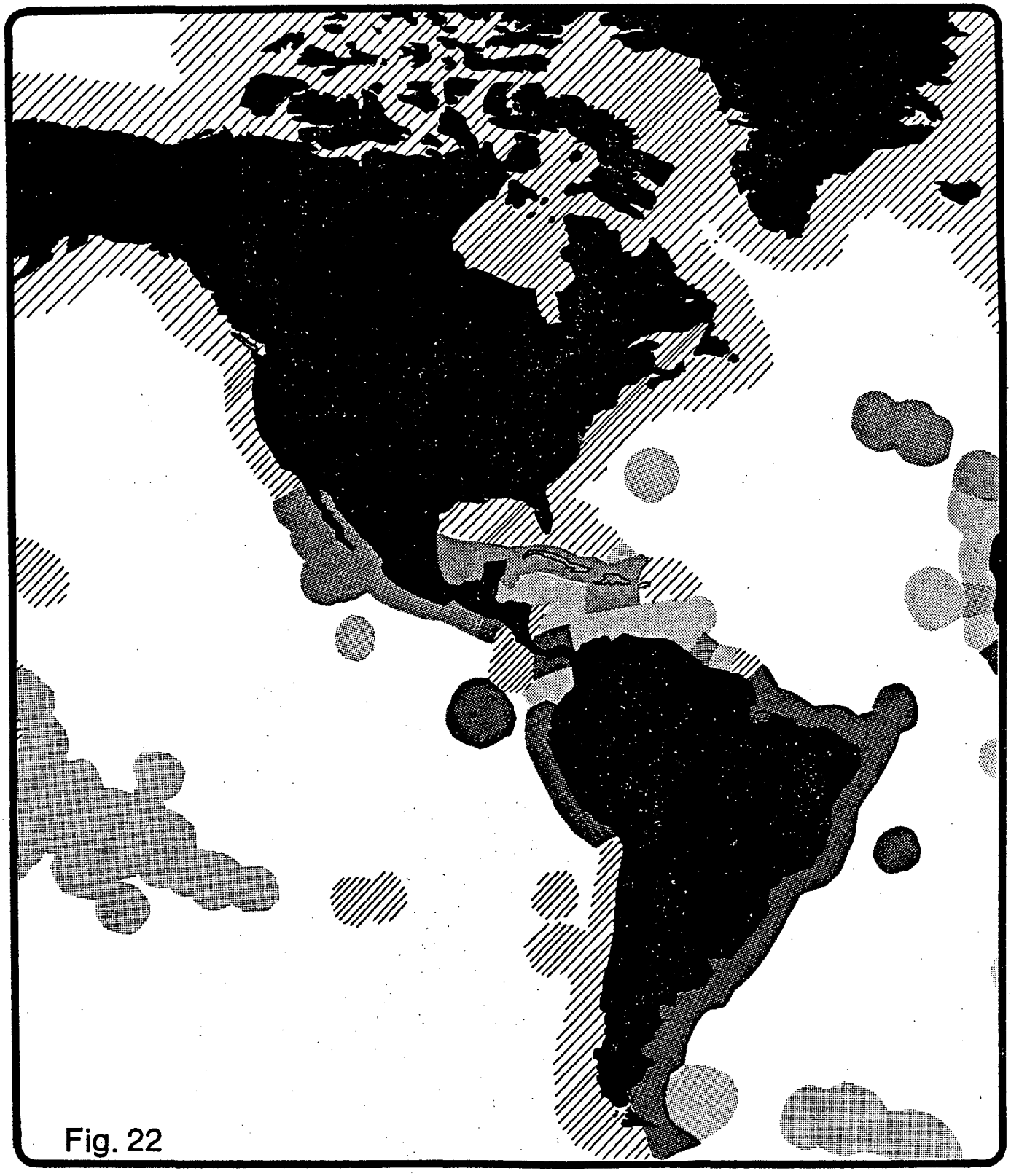
in contrast to the state agencies have some direct fisheries development role which includes funding as well as marketing research. Many of the development responsibilities currently administered by the National Marine Fisheries Service are being transferred to the Fisheries Development Foundation.

A major factor influencing the direction fisheries development will take is the result of ongoing research into stock sizes and marketing currently being conducted by the National Marine Fisheries Service. The agency has incorporated a major proposal in their 1980 budget to:

1. Increase surveillance and enforcement of the fisheries conservation zone.
2. Upgrade the marine recreational statistics program.
3. Provide additional socio-economic data for fisheries management and development.

There has been a shift from monitoring, data collection and permit programs to a more active program directly related to the 200 mile fisheries conservation zone. The major influences this may have on the coastal zone in Oregon are: 1) an underscoring of the importance of the marine recreational fishery; and, 2) a greater awareness of the socio-economic impacts of fishery development.

The State Department has responsibilities for the international aspects of fishery agreements and treaties. Most nations with coastlines have extended offshore jurisdiction (Figure 22). Implications of foreign actions are transmitted to the management councils so that fishery management plans will be consistent with other U. S. treaties and agreements. The State Department is also involved in international trade agreements, along with the Commerce Department. Since domestic markets are lacking for most of the currently under-utilized species, a large portion of the products will be exported. This will impact the balance of trade which is currently at a deficit of more than $2 billion annually for fisheries products.



International Offshore Claims

Territorial Sea
Economic Zone
Fishing Zone
No 200-mile claim

Information from NMFS

The FCMA and its amendments set a hierarchy for the commercial utilization of fish resources within the fishery conservation zone: first, fish caught and processed within the U. S.; second, fish caught by U. S. fishermen and processed by a foreign nation; and, third, fish caught and processed by foreign interests. Currently, in both Oregon and Washington, joint ventures utilizing U. S. fishermen and foreign processing are operating under permit. An expansion of this concept could reduce the potential impact of onshore development from the expanded harvest of under-utilized species off the Oregon coast.

There is an emphasis on development of under-utilized species by U. S. fishermen. At the present time marketing problems frustrate their development. Marketing the volumes available is hampered by a public completely unfamiliar with the taste, texture and appearance of the product. Difficulty is also encountered in marketing a species because of the name associated with it (e.g. hake). The Food and Drug Administration is in charge of approving product name changes. Although changing the name of Pacific hake to Pacific whiting will not solve marketing problems, it will facilitate the development of domestic markets.

Special Commissions and Interest Groups

The Pacific Fisheries Management Council's major responsibility is to suggest allowable catch levels and determine equitable utilization and apportionment between user groups. A major and continuing limitation on the ability of the council to develop management plans is a lack of accurate information on fish stocks in the offshore zone. Until this basic information has been generated, the likelihood of intensive development of any of the species in the conservation zone is low. Because the perspective of the Council is regional, the ability of state political or special interest groups to influence the overall management of stocks off the Oregon coast is relatively small.

The Council's actions so far have had the greatest impact on the salmon troll fishery. By recommending reduced commercial seasons, the PFMC has taken steps to protect the resource and to ensure adequate upriver returns for Indian harvest. In the past when management plans have failed to provide enough fish for upriver harvests the Indians have resorted to forced closures through federal courts. This circumvention of the management agencies is an important development and will continue to affect management policies and actions.

The Fisheries Development Foundation is concentrating on fisheries marketing and development efforts. It is too early at this point to assess the magnitude of the impact this organization will have on fishery development.

Special interest groups will have an increasing impact on nearshore fisheries. Indian nations, instream fishing sportsman groups and marine sport fishing groups may affect fishery policy. Concern and actions of these groups may well impact fisheries other than salmon and steelhead.

On a national scale, recreational fishing is a $3.4 billion industry annually. Interest in the recreational harvest of many species will continue to grow as public pressure mounts. In the state of Oregon the recreational salmon fishery in 1977 was estimated at $65 million. The influence of this user group is certain to exert a heavy influence, particularly where salmon stocks are concerned.

Legal and Legislative Influences

In addition to the specific policies of the agencies, board and commissions at the state and federal level, legislation and litigation will also have major influences on fishery development. Both legislation and litigation have focused on Pacific salmon harvest and allocation. Other fisheries have been affected by recent legislative action.

In the state of Oregon, the 1979 legislature passed the Department of Fish and Wildlife's budget with a strong recommendation to increase releases

of salmon fry as opposed to smolts. While this is not a direct control over the Department of Fish and Wildlife, it will certainly carry weight in the Department's budgetary allocations, and could affect priorities in their fish culture section.

As interest and competition for fish stocks increase, it can be anticipated that stronger legislative pressures will be exerted on the state management agencies. Much of this will take the form of limited entry regulations. Many fishermen and legislators see a need to reduce competition within certain fisheries. The troll salmon, Columbia River gillnet and pink shrimp fisheries were targeted for limited entry legislation. Aquaculture legislation was also passed in the 1979 session.

At the federal level, the Supreme Court has ruled that treaty Indians have the right to harvest up to 50% of the available salmon resources. The decision, however, leaves the door open for Congress to allocate a smaller percentage to the Indians. The decision also put primary management responsibility with the state fishery agencies.

Sportsmen's groups have indicated a desire to push for national legislation declaring steelhead a game fish. This would make it unavailable for commercial harvest of any kind, Indian or non-Indian. At the state level there is a move by sportsmen's groups for legislation to eliminate commercial fishing for spring and summer chinook in Oregon bays and rivers. This could seriously reduce the non-Indian gillnet fishery on the Columbia River. It is apparent that the controversy over fishery allocations in the Columbia system will continue for the forseeable future.

Planning and Coordination Needs

In the new and rapidly developing policy and legal climate of fishery development, a great deal of policy fragmentation and isolation has occurred. Analysis of the currently developing policy indicates that it is more directed toward resource protection and lacks direction for dealing with the potential

onshore impacts resulting from the management and stock allocation policies being developed. There does not seem to be a clear policy connection between the developing marketing efforts and the land use planning process for land-based facilities.

Formal communication between fisheries management agencies and coastal zone planning agencies will facilitate development of a complete policy package. Oregon's coastal zone planning authorities need to communicate their planning goals and guidelines for coastal development to the fishery management agencies and the fishery management agencies need to inform coastal planners of policies and potential impacts of these policies. The recent emphasis by the federal government as well as the Management Council on socio-economic concerns and impacts underscores the recognition of this need for integrated planning.

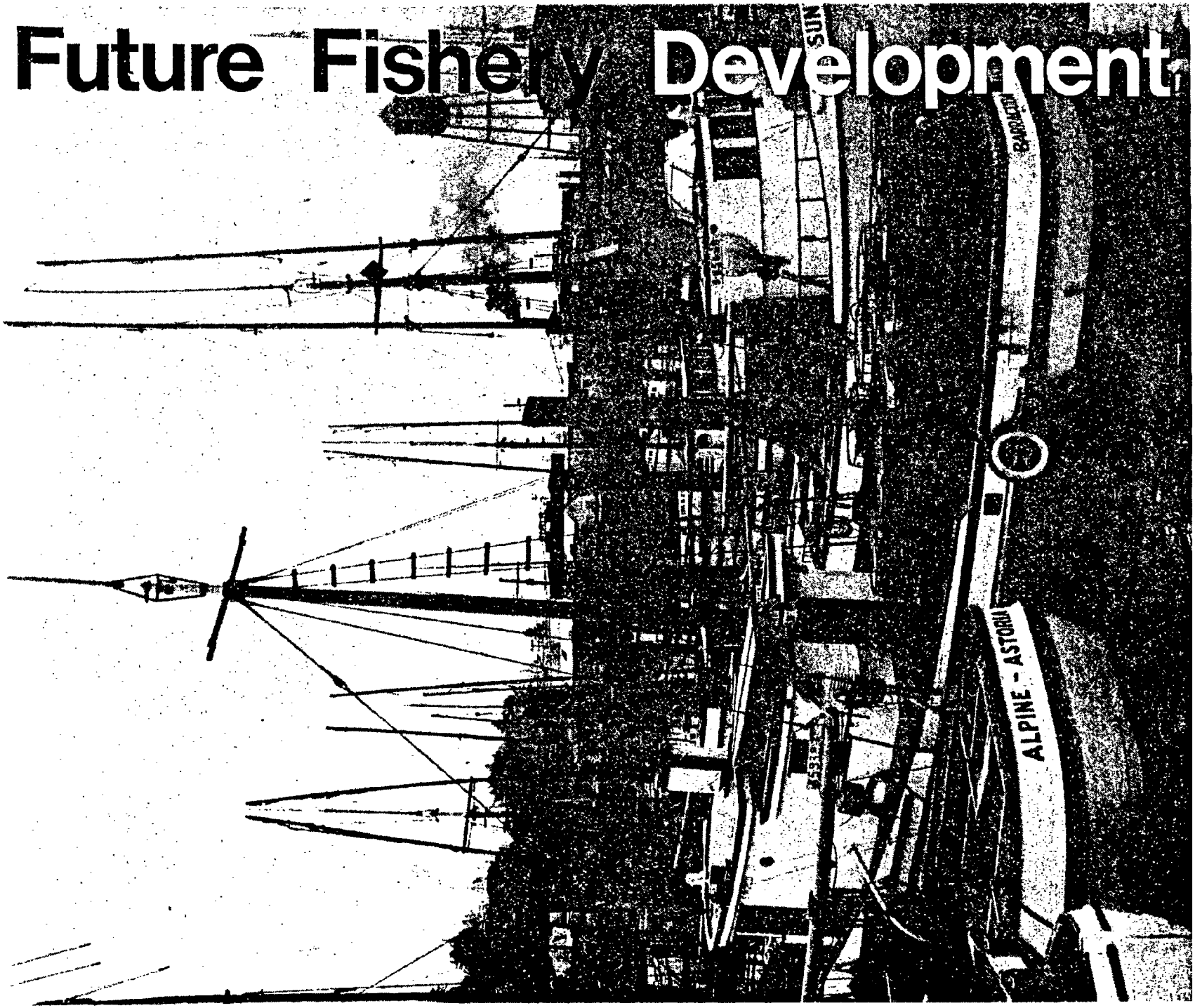
There are ongoing intra- and interagency efforts to solidify a coordination process to resolve conflicts between development, management, research, and environmental protection concerns. Federal policies have developed over the past few years which relate directly to the planning process. Federal policy today is moving away from strict environmental protection as set in the early '70's and is shifting toward a more balanced approach involving both protection and use of the coastal resources (Department of Commerce, 1978). This emphasis has been focused at the federal level by coastal zone planning and the incorporation of the development of the offshore fisheries into this planning process.

The Pacific Marine Fisheries Commission in their 1978 meeting memorialized offshore coastal zone management. They also suggested that the National Marine Fisheries Service support, coordinate and fund plans by state coastal zone agencies and fisheries agencies for fishing port development and improvement within the coastal zone.

Because of the international and regional nature of offshore fishery development, coordination with a single agency is not sufficient. A position

on a regional commission by the coastal planning body would be much more effective means of fully coordinating fisheries development and onshore support facilities. A possible vehicle to achieve this would be a nonvoting membership on the Pacific Fisheries Management Council. Oregon's coastal zone management program is a logical vehicle for expressing the state's interests in onshore facility impacts. Statewide Planning Goal 19 and Oregon's approved coastal management program provide a framework for the required coordination. Together they can ensure orderly development, conservation and utilization of all resources concerned.

Future Fishery Development



FUTURE FISHERY DEVELOPMENT

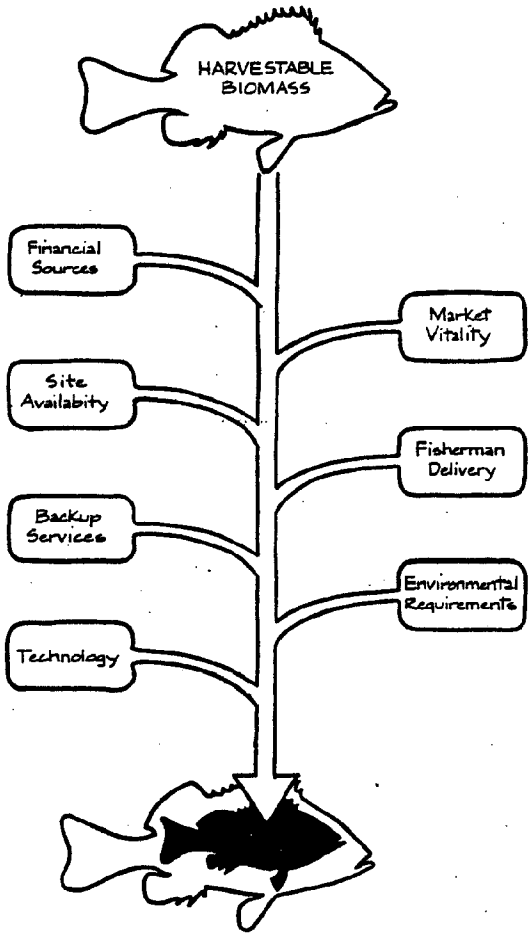
ONSHORE EFFECTS OF FISHERY DEVELOPMENT

Policy developments will influence fishing industry growth along with other factors. The fisheries management agencies establish the allowable catch of various species, but this does not necessarily indicate the actual harvest. Where under-utilized species are concerned, the industry itself often determines the quantity of fish that gets to market. Processing capacity is often the limiting factor, although market vitality can also limit production. Factors ranging from the availability of financial support to harvesting and processing technology (Figure 23) can all influence fishery production.

There are specific physical impacts associated with increased fish harvests that must be planned for. Increased moorage space, expanded transportation networks and increased utility service are some of the facility and service needs of an expanding fishing industry. Some goods and services such as ice and moorage are already in critical supply. Thus, although plans must be made for future growth, there is also a need to address existing problems with support services.

Fishermen have several particular needs, and the most important is for safe and appropriate harbor facilities; that is, harbor facilities including moorage and the marine services available onshore. There is presently a lack of moorage space on the Oregon coast. Boats must occasionally be "rafted", or tied side-by-side to a single dock. Space for fishing gear storage is quite limited by lack of nearshore open land or warehousing. The fishing industry also needs hoists to remove and

Figure 23. Factors Influencing Processing Capacity



replace deck gear. The availability of fuel, ice and cold storage can significantly limit fishing opportunity.

Processors likewise have specific requirements. For new plants, site availability often limits growth. Plants must have direct access to both water and rail or truck transport. If large volumes are harvested, access to container shipping points may become important. Adequate utility service, both water and electricity, must be available, especially as dependence on mechanical processing increases. Large volumes of processed fish will require adequate disposal sites for solid wastes.

Each fishery has its own specific requirements, and will place different demands, either in type or magnitude, on the coastal environment. Figure 24 provides a summary of the impacts of various fisheries developments. In general, species that are already utilized extensively will not require as much development or impact coastal communities as heavily as under-utilized species.

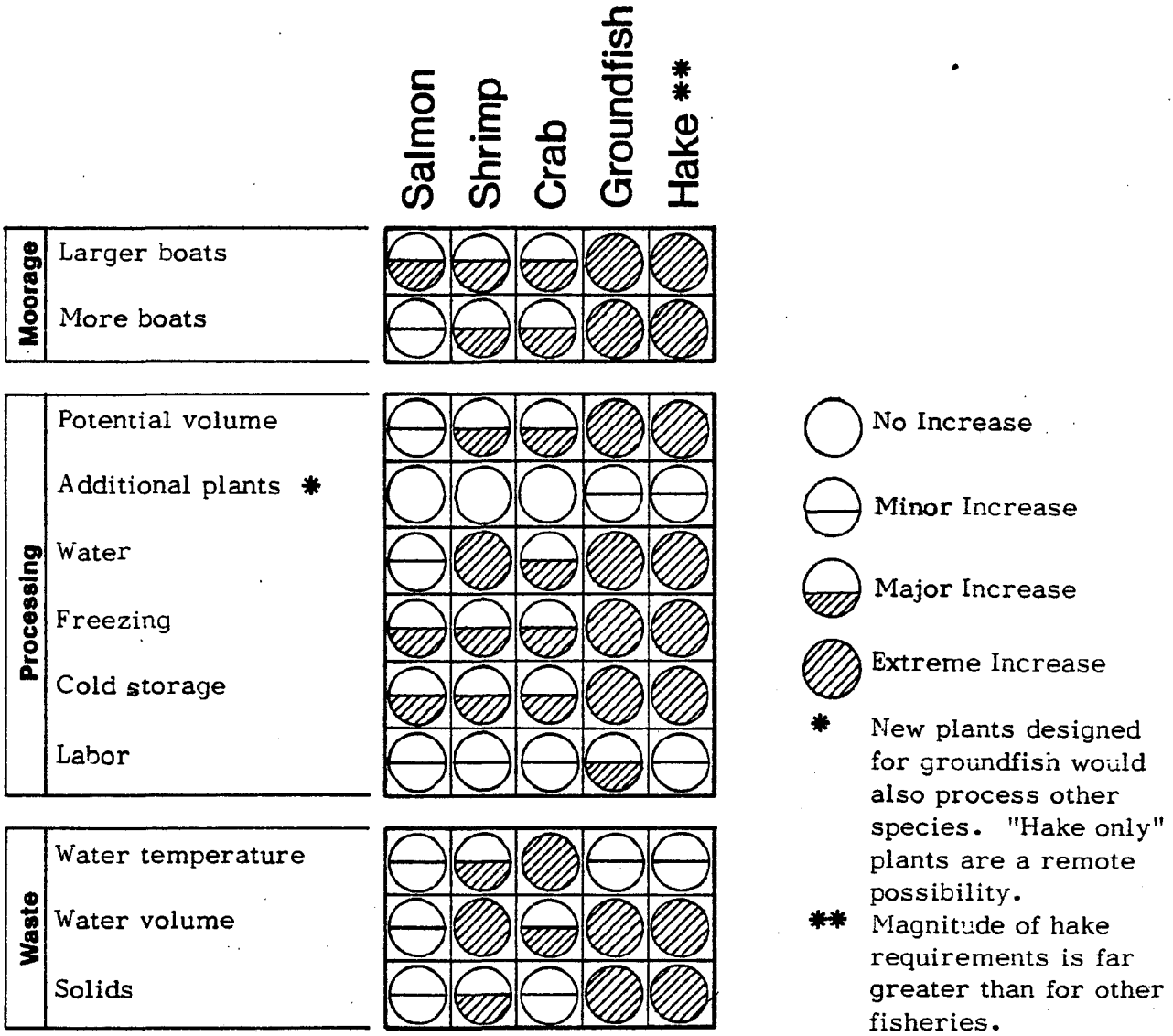
Salmon

Salmon is in many instances the simplest and least demanding to process of all west coast fish. Troll salmon are gutted and cooled on board and often marketed in this form. Large quantities are frozen for shipping to distant markets -- the most rapidly expanding market. Frozen whole or headed salmon are shipped worldwide. Increased troll salmon harvest would require additional freezing and storage space.

Shrimp

The shrimp fishery in Oregon has expanded tremendously over the last decade and probably reached maximum development in 1978. Improved markets and prices make this an attractive fishery dependent primarily on stock size. Stocks are being harvested at near capacity at the present time. Shrimp stocks have moved south along the Oregon coast. Processing has primarily been located in Astoria. Additional peeling machines can be located nearer to the fishing grounds. Shrimp peeling machines use

Figure 24. Physical Impact of Various Fisheries Development



up to 100,000 gallons of water per day which will increase water consumption greatly in areas where new machines are located. If local water supplies cannot meet this demand, processors may have to run alternate shifts or reduce production.

Waste disposal presents additional requirements. Waste water is screened and discharged into the waterway. Solid wastes, which make up a large portion of the harvested volume, can be processed into meal or fertilizer or chemically reduced for use in other types of products, but often large quantities go to landfills for disposal. Changes in waste disposal requirements can have a significant effect on shrimp production costs.

Crab

Crab is harvested at the capacity of existing stocks. Any increased crab harvest will create relatively little impact on coastal development. Markets for crab have often been glutted in the past, and recurrences are probable in the near future. For this reason, future production will quite likely follow historical trends. Most crabs are cooked and sold whole locally or shipped frozen to other markets. The key impacts of the crab fishery are increased water usage and discharge of additional heated effluents.

Groundfish

Groundfish processing is a high volume industry. The upward trend in harvest (excluding hake) will probably increase substantially due to additional fishing pressure. Mechanical filleting will be used to process a major portion of this increase. The potential catch for Oregon is 50 - 70 million pounds annually (PFMC, 1979), as compared to the 1978 catch of 34 million pounds. Thus, a two-fold harvest increase could occur in the near future if stock availability were the major controlling factor. Approximately 70% of the volume of processed groundfish is waste (bone, skin, entrails and small amounts of flesh) which can be further processed (e.g., fish meal and fertilizer) or must be taken to disposal site. This means the waste

potential from bottomfish (excluding Pacific hake) is an increase to 35 - 50 million pounds annually.

Pacific Hake

Pacific hake comprises the largest volume of potentially harvestable fish off the Oregon coast. The Pacific Fisheries Management Council estimates an Oregon harvest potential of over 250 million pounds. This is nearly three times the total fish and shellfish production in Oregon in 1976. Up to 70% of the weight of hake is waste, which will require processing or disposal of 175 million pounds of hake waste. The hake fishery will depend primarily on machine processing due to the short storage time before the flesh breaks down and the phenomenal volumes involved. The effect of development of the hake fishery will be substantially different if processing takes place at sea on factory ships or on land. The major shoreside effect of processing at sea will be increased demand for mooring spaces for large vessels. Water, electricity and waste disposal demands will increase considerably, but labor demand will not substantially increase with on-land processing.

SCENARIOS OF FUTURE COASTAL FISHERY DEVELOPMENT

The fishing industry is changing into a more highly organized and efficient system for harvesting, processing and marketing seafood products. A variety of factors will influence the direction of this rapid development. The outcome of developing policy will not be felt for several years. A series of scenarios has been developed to show some of the possibilities of future development in the Oregon fishing industry.

Nearshore commercial fisheries such as black cod, ling cod and halibut are not specifically included for a variety of reasons. Most of the boats required for this fishery are relatively small and could probably fit into existing marina and service facilities. These fish resources are extensively utilized already and will not expand and impact the coastal zone in any dramatic way. In general, these lower volume, more traditional products can be handled without additional special equipment ~~of~~ facilities.

Crab and shrimp are not included because populations are already being heavily utilized, and harvests will probably not increase greatly. Cyclical fluctuations in populations and harvest will probably continue to occur. Catches will remain at the present high levels due to the relatively high value of these fisheries.

Shellfish aquaculture is increasing in certain areas, especially oyster culture, but is severely restricted by environmental and spatial constraints. Algae cultivation is also limited by lack of suitable environment in Oregon, and both are somewhat limited by lack of proven technology. Both oyster culture and algae culture are excluded from the scenarios.

The scenarios are presented as individual future possibilities and can not be combined into an overall view. They are developed as <u>possible</u> futures and are intended to show the type of impacts that could occur, the way impediments can affect development, and how various factors interact. As such, these scenarios are designed to be both informative and thought provoking.

The future development of Oregon's coastal fisheries depends on a variety of factors that are not predictable. The direction and emphasis of development will depend on political decisions, legal actions, treaty negotiations and other mechanisms that can act as "trigger mechanisms".

The Hake Fishery

Pacific hake is an abundant species of fish which migrates from California along the Oregon coast and north to British Columbia before returning to Southern California to spawn. The highest concentrations of this fish are found around Coos Bay, Oregon. Oregon is geographically in a better position to utilize this resource than any other state. Several problems have prevented utilization of this resource. At the present time interest is growing rapidly and U. S. fishermen, who have harvested very little hake in the past, are beginning to target on this species. The main markets for hake are foreign markets reached through joint ventures. This may be slowing development of the hake processing industry, but by guaranteeing markets to the fishermen, capital is provided for improvement of the fleet. Until U. S. shore-based or sea-based processing is expanded, joint ventures will continue to process the majority of U. S. caught hake.

Other factors are influencing development of the hake industry. At present there is considerable interest in development of the hake fishery, both by the agencies and the industry. The resource represents a large potential economic opportunity. However, because hake is a high volume, low value fish, it must be harvested and processed in great quantities to provide adequate return on investments. Many of the larger processing firms have been hesitant to enter such a fishery while low volume, high value fisheries (such as salmon and king crab) are still available. The magnitude of potential onshore impact is much larger than for any other fishery in terms of waste utilization, water consumption, transportation, etc.

However, the financial opportunity will be pursued by the industry and a series of developments could lead to a great expansion of the hake fishery. In light of these factors, the following scenario is presented.

> The Pacific whiting fishery in Oregon has the opportunity to expand greatly. Major increases in both fishing and processing capacity can lead to an annual Pacific coast harvest of over 385 million pounds, 200 million of which can be landed and processed in Oregon. This is more than twice the total 1976 Oregon landings of all other fish products combined. The landed value will be only about $25 million. With substantial hake development, joint ventures with foreign nations may be replaced with an American version based on vertical integration of the industry. Full development would require two large hake-only plants (Astoria and Coos Bay) with several trawlers. These would directly employ fishermen in order to ensure adequate deliveries. Full development would require some 20 new midwater trawl vessels, mostly over 100 feet long, to fish out of Oregon ports. Moorage facilities at Newport and Astoria will have to be improved to handle these boats and Coos Bay will have to construct a new turning basin and moorage facilities adjacent to its processing plant to accommodate full development.
>
> In addition to fishing vessels, several large transport vessels and barges will have to be introduced by the major processors for full hake development. Fishermen will load their catches onto these vessels at sea to eliminate many trips to shore. Transport vessels reduce both consumption of fuel and demand for ice. The transport vessels will do much of the processing on board, especially heading and gutting. Product quality is improved by this method and the onshore waste disposal problems are minimized.
>
> Waste utilization problems will be reduced by the use of transport vessels. This use can cut the expected 140 million pounds of waste annually in half. Waste utilization studies will be required to find uses for most of the remainder. Water re-use systems to reduce water consumption from the 20 million gallons per year will be required for full hake development. Full development for hake will re-

quire a major cold storage facility at Newport. Frozen seafood products will require shipping in container ships and/or by improved train transport to various markets. Worldwide markets can be supplied with quality whiting products from Oregon if full development of the fishery occurs.

This scenario has the greatest potential to change significantly if certain developments occur differently. Lack of markets could prevent the expansion of domestic processing capacity indefinitely. Environmental regulations could also slow development, and the utilization of 150 million pounds of fish waste material may not be achievable. The water demand could also be an insurmountable barrier to development in some coastal areas. These factors all combine to prevent onshore processing of hake and require development of offshore facilities. The onshore impacts of offshore processing would be increased need for moorage for a relatively few very large vessels, a large cold storage area, and development of a container and overseas shipping point.

The Troll Fishery

The salmon fishery is the most controversial and the most over-utilized of all fisheries in the Pacific Northwest. Many changes will occur in the political, environmental and biological arenas that will affect both the short-term and long-term character of this fishery.

The Pacific salmon resources have been over-harvested for many years, which combined with destruction of fish habitat, has severely reduced many salmon populations. Competition for the remaining salmon has intensified to the point of legal battles and occasional violence. Management and allocation plans have been very controversial. The federal government is mandated to protect Indian treaty rights, which has been interpreted by the courts as reserving 50% of the catch for the treaty Indians.

With increasing pressure from the Indians and recreational fishing sector, it becomes difficult to provide equitable allocations. If dollars

are used to measure the value of commercial and recreational fisheries, the first step is to determine how to evaluate the recreational fishery. By many estimates the recreational fishery is significantly more valuable than the ocean troll fishery. In those economic terms it would be cost effective to reduce the troll fishery. On the other hand, reducing the troll fishery would reduce the commercial availability of fresh and frozen salmon and drive prices higher. These are the types of problems that must be addressed and solved before an equitable management program which provides long-term stock protection can be established. The following scenario describes the many factors influencing the possible outcomes of the ocean salmon fishery:

> Dwindling salmon stocks and allocations to the Indian tribes may force severe cutbacks in the commercial and recreational fishing seasons. If commercial fishermen are restricted to fishing only a few weeks per year, most could not afford to stay in the fishery and either drop out of fishing and go to other jobs or switch to the black cod fishery. If the troll fishery declines, the fishermen hardest hit economically will be those who just make a living and depend on salmon fishing alone for their income. The relatively few remaining salmon fishermen may eventually be highliners who fish other high value fish during the remainder of the year. The price of salmon will quite likely rise substantially as stocks decrease and if commercial fishing is phased out.
>
> If salmon stocks are improved during the 1980's, the recreational sector will quite likely demand more of the available fish. The charter industry will continue to expand by focusing on groundfish as well as salmon. Recreational demands have the potential of placing pressures to reduce the commercial troll fishery. Salmon ranching could provide the vast majority of the salmon commercially marketed in Oregon if legislation allows. Private hatcheries have the potential of producing more than 50% of the recreationally caught salmon.

Limited entry legislation can prevent new fishermen from entering as the old ones leave. With limited entry legislation passed, fewer new boats will enter the ocean fishery and new moorage space will not be required.

This scenario is the most difficult to predict. A commercial troll fishery, although reduced substantially, is likely to remain indefinitely. Private aquaculture could be restricted to low levels of production so fewer salmon would be available. Fuel shortages may force cutbacks in boat traffic to the extent that only net fisheries (gillnet and purse seines) are feasible; or the troll fishery may continue as a small boat, nearshore fishery which depends heavily on private aquaculture to put more harvestable fish into the ocean.

The Trawl Fishery

The Oregon trawl fishery has a regional and international character. Most stocks are managed by PFMC which generates plans and reviews allocations. The trawl fishery includes flatfish and rockfish, including Pacific Ocean perch. This scenario excludes hake and shrimp. Several major factors that may influence development will be resolved over the years. Marketing programs, both domestic and international, will affect development. Policy issues such as gear restrictions and quotas will also impact development. The industry's ability to expand production and ports' ability to provide space and services will also affect development. The following scenario provides one view of what the future might bring.

Ocean coastal ports could have 20 new midwater trawl vessels harvesting groundfish in the fishery conservation zone. These vessels, which would range from 86 feet to 140 feet, would have great difficulty finding even temporary moorage space if the ports do not take an aggressive approach to provide the facilities needed, primarily adequate moorage.

Harvest levels may increase to nearly 78 million pounds annually, more than twice the levels of 1978. Existing processing plants will reach capacity production and new plant construction would be required. If this does not occur much of the

resource may go unutilized due to limited processing capacity. Astoria will most likely be the center for the trawl industry because reserve processing capacity is greatest there. With full development, trawl vessels may travel long distances to unload their fish in Astoria. The smaller ports can expand along traditional lines, including hand filleting with full trawl fishery development. In these areas the labor force will have to expand to handle fish deliveries made by smaller boats. Problems with adequate water supply and limits on deep-draft vessels can prevent significant expansion of processing at the smaller ports.

With significant expansion of the trawl fishery, expansion of processing facilities or construction of new plants will be stalemated until waste disposal and utilization procedures and other environmental impacts are resolved. Water usage will increase greatly with the introduction of more processing machines and the labor force will be slightly reduced with full expansion of the trawl fishery.

This scenario shows how environmental protection regulations can affect industrial growth. Factors that could influence trawl fishery development include provision of adequate moorage for the growing fleet and additional space, service and facilities for processing expansion. The lack of domestic market growth could also slow expansion, as could depletion of stocks of the more favored species. Another option would be to establish joint-ventures similar to those now in operation for Pacific hake, with American fishermen selling directly to foreign processing ships. This avoids most onshore impacts with the exception of moorage, and a limited entry system could reduce this problem.

Salmon Aquaculture

Aquaculture is exclusively under the control of state resource agencies, although federal policy and funding can exert considerable influence. Presently there are unresolved questions regarding the biological

and economic feasibility and desirability of greatly increased private salmon ranching.

Declining natural salmon stocks have forced reductions in harvest by all user groups. The treaty Indians have been guaranteed a large share of salmon stocks which has reduced the amount available to other users. Public outcry for more salmon has led to increasing emphasis on hatchery production. However, hatchery-reared salmon can interfere with natural or wild stocks. The concern over declining wild stocks is shared by agency personnel, sportsmen and other public groups. The agencies are most concerned about the genetic vitality of natural populations, which allows the population to adapt to changing conditions. Sportsmen often feel that hatchery fish are less desirable to catch. Many feel that there is an intrinsic value associated with maintaining wild stocks. However, as fewer fish are available to catch and more inexperienced fishermen want to catch them, pressure will be applied to make more fish, not necessarily quality fish, available.

Because the Indians are guaranteed a percentage and recreational fishing pressure is increasing, the troll fishery is most susceptible to reduction and possibly elimination. A substantial reduction in the number of commercial salmon fishermen would increase the economic efficiency of the existing fishermen, but would cause considerable social impact. The boat buy-back program in Washington, where the state purchases commercial salmon vessels and gear to reduce the number of fishermen, and limited entry legislation recently passed by the Oregon legislature have set the stage for restricting the commercial fishery.

Private aquaculture has the potential to substantially increase salmon stocks. Heavy pressure by commercial salmon harvesters has prevented expansion of this industry. Decreases in troll fishery may reduce the pressure to minimize salmon aquaculture expansion. Salmon ranchers

have already been authorized to more than double the hatchery population of salmon in Oregon. If recreational interests are convinced this means more fish for them, they can press the state to authorize more releases. The joining of these two forces, aquaculture interests and sports fishermen, could exert enough pressure to change the whole structure of salmon production and harvest in Oregon. The following scenario describes how private aquaculture and the salmon fishing industry interact.

> The Oregon state legislature must clear the way for greatly expanded salmon ranching production. The resource agencies will have to determine that the ocean and estuarine resources can sustain a substantial increase in salmon production before they will approve more aquaculture permits for new sites. Production from currently authorized private hatcheries can total in excess of 180 million salmon. Increased facilities can add substantially to this total. Significantly more salmon would be made available to both troll and recreational fisheries off the coast by salmon ranching. At the same time salmon ranchers can maintain good profits. The aquaculture facilities will have to be designed to avoid impacts on the aquatic environment.
>
> Aquaculture produced salmon will primarily be canned if they are caught as they return to the facilities. If hatchery produced fish are allowed to be caught before they deteriorate, they would be fresh frozen. The majority of aquaculture production will more than likely be commercially canned. With increased aquaculture production, existing canneries will be operating nearer to capacity and a few new facilities may be required.
>
> The volume of canned salmon can be increased considerably and the price reduced slightly if ranching increases stocks. Fresh and frozen salmon will probably maintain high prices, even with increased volumes.

This scenario is based on a future change in policy by the fisheries agencies in favor of increased hatchery production. If recreational and troll interests pressure the legislature and agencies to limit salmon ranching, the projected production would never be reached. Conflicts with Canada over the origin of fish stocks could also influence development. If questions about competition between fish stocks in the ocean remain unresolved, the PFMC or the Indian tribes could move to limit private ranching on environmental or biological grounds.

The Recreational Fishery

The coastal recreational fishery in Oregon has traditionally been closely tied to salmon. Both private boat owners and charter boat services have increased every year and the demand for salmon remains strong. Bottomfish, however, are also becoming more popular, especially as salmon limits and seasons are reduced. The following scenario describes the factors influencing Oregon's coastal sport fishery.

> Recreational angling will most likely increase all along the Oregon coast. Demand for moorage space and shore access will increase dramatically if people have extra free time and money for recreation. Increased price and decreased availability of fuel may slow the demand for moorage space for private boats. This may allow the charter fleet to expand. The demand for fishing access will probably increase even during years when a one-salmon-per-day limit is in effect. More emphasis will go toward catching rockfish, ling cod and other species if salmon stocks are less available. If the Oregon salmon culture program increases salmon stocks along the coast, the demand for bottomfish will not rise as dramatically.
>
> The smaller ports will become recreational boating centers and develop local tourist economies with increased recreational fishing. The ocean recreational fishery can continue to draw tourists from all over the county. The location of salmon aquaculture facilities

where past salmon runs were small or nonexistent can develop new areas for recreational fishing.

This scenario would change dramatically if fuel were not available either for boats or for transportation to coastal communities. Fuel is probably the only factor that could radically alter the expansion of recreational fishing in Oregon. Even if salmon disappeared, the demand for fishing would continue, although possibly at a slower rate of increase. The question is not whether the recreational fishery will increase, but where and how much.

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Commercial Food Fish Landings in Pounds Round Weight by State of Oregon
Administrative District for Calendar Year 1969

	Chinook	Steelhead	Sockeye	Coho	Chums	Sturgeon White	Sturgeon Green	Shad	Striped Bass	Smelt	Pinks	Crabs	Clams	Shrimp	Tuna	Bottom Fish	Oysters	Misc.1/	Total
District 1																			
Col. River (Zones 1,2,&7)	2,641,341	195,971	28,168	918,145	1,518	144,040	47,871	33,924	-	38,877	-	-	-	-	-	-	-	-	4,049,855
Astoria	108,148	65	-	320,895	-	146	5,563	-	-	-	10,290	3,941,459	25,124	2,682,059	22,157,884	12,453,118	-	-	41,704,751
Tillamook	37,080	-	-	209,998	-	-	-	-	-	-	16,846	530,815	4,770	2,195,276	259,397	182,117	441,720	-	3,878,019
Pacific City	16,943	-	-	256,528	-	-	-	-	-	48	24,648	-	-	-	6,900	15,601	-	-	320,668
Netarts Bay	-	-	-	-	-	-	-	-	-	-	-	13,140	-	-	-	-	-	-	13,140
Nehalem Bay	-	-	-	2,519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,519
Total	2,803,512	196,036	28,168	1,708,085	1,518	144,186	53,434	33,924	-	38,925	51,784	4,485,414	29,894	4,877,335	22,424,181	12,650,836	441,720	-	49,968,952
District 2																			
Col. River (Zones 3-5)	872,645	117,145	25,664	359,354	1,248	78,231	204	90,146	-	18,156	-	-	-	-	-	-	-	20,368	1,583,161
District 4																			
Waldport	-	-	-	-	-	-	-	-	-	-	-	17,846	16	-	-	-	-	4,324	22,186
Depoe Bay	19,118	-	-	194,471	-	-	-	-	-	-	36,517	208,072	-	-	71,116	21,495	-	-	550,789
Newport	150,224	-	-	718,469	-	-	1,297	-	-	-	80,840	1,274,377	1,581	1,483,224	4,099,892	2,224,281	31,936	-	10,066,121
Total	169,342	-	-	912,940	-	-	1,297	-	-	-	117,357	1,500,295	1,597	1,483,224	4,171,008	2,245,776	31,936	4,324	10,639,096
District 5																			
Florence	1,047	-	-	3,883	-	-	-	10,266	-	-	124	6,859	-	-	-	28	-	-	22,207
District 6																			
Winchester Bay	57,965	-	-	375,621	-	-	450	371,174	19,481	3,686	34,177	85,165	9,862	32,711	82,879	3,005,789	-	-	4,078,960
District 7																			
Coos	523,373	-	-	979,203	-	41	-	32,425	18,337	2,041	50,196	1,581,711	5,772	3,551,949	2,686,768	3,649,811	7,512	-	13,089,139
Bandon	87,381	-	-	103,888	-	-	-	13,485	796	-	4,508	11,665	-	-	127	5,291	-	-	227,141
Port Orford	96,005	3	-	115,738	-	-	-	-	-	-	13,226	906,447	-	178,149	12,667	354,310	-	-	1,676,545
Gold Beach	12,491	-	-	7,222	-	-	-	-	-	-	371	238	-	-	2,056	1,647	-	-	24,025
Brookings	271,916	-	-	358,836	-	-	-	-	-	-	26,812	1,206,204	-	145,065	447,863	1,329,663	-	-	3,786,359
Total	991,166	3	-	1,564,887	-	41	-	45,910	19,133	2,041	95,113	3,706,265	5,772	3,875,163	3,149,481	5,340,722	7,512	-	18,803,209
District 9																			
Col. River	339,655	69,752	17,565	16,263	-	5,399	-	1,809	-	-	-	-	-	-	-	-	-	-	450,443
GRAND TOTAL	5,235,332	382,936	71,397	4,941,033	2,766	227,857	55,385	553,229	38,614	62,808	298,555	9,783,998	47,125	10,268,433	29,827,549	23,243,151	481,168	24,692	85,546,028

1/ Sand Shrimp, 4324 pounds, Crawfish, 5266 pounds, and Eel, 15,102 pounds.

FISH COMMISSION OF OREGON
May 1970

BH-150R

Estimated Value at Fisherman's Level of Commercial Food Fish Landings
by State of Oregon Administrative District for Calendar Year 1969

	Chinook	Steelhead	Sockeye	Coho	Sturgeon White	Sturgeon Green	Shad	Striped Bass	Smelt	Pinks	Crabs	Clams	Shrimp	Tuna	Bottom Fish	Oysters	Misc.1/	Total
District 1																		
Col. River (Zones 1,2,&7)	$ 991,000	$ 61,000	$11,000	$ 294,000	$29,000	$1,000	$ 3,000	$ -	$ 8,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,398,000
Astoria	57,000	-	-	137,000	-	-	-	-	-	2,000	1,182,000	15,000	295,000	4,986,000	996,000	-	-	7,670,000
Tillamook	20,000	-	-	89,000	-	-	-	-	-	4,000	159,000	-	241,000	58,000	15,000	394,000	-	980,000
Pacific City	10,000	-	-	109,000	-	-	-	-	-	5,000	-	-	-	2,000	1,000	-	-	127,000
Netarts Bay	-	-	-	-	-	-	-	-	-	-	4,000	-	-	-	-	-	-	4,000
Nehalem Bay	-	-	-	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	1,000
Total	$1,078,000	$ 61,000	$11,000	$ 630,000	$29,000	$1,000	$ 3,000	$ -	$ 8,000	$11,000	$1,345,000	$15,000	$ 536,000	$5,046,000	$1,012,000	$394,000	$ -	$10,180,000
District 2																		
Col. River (Zones 3-5)	$ 327,000	$ 36,000	$10,000	$ 115,000	$16,000	$ -	$ 7,000	$ -	$ 4,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$5,000	$ 520,000
District 4																		
Waldport	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,000	$ -	$ -	$ -	$ -	$ -	$1,000	$ 6,000
Depoe Bay	11,000	-	-	83,000	-	-	-	-	-	8,000	62,000	-	-	16,000	2,000	-	-	182,000
Newport	87,000	-	-	306,000	-	-	-	-	-	18,000	382,000	-	163,000	922,000	178,000	51,000	-	2,107,000
Total	$ 98,000	$ -	$ -	$ 389,000	$ -	$ -	$ -	$ -	$ -	$26,000	$ 449,000	$ -	$ 163,000	$ 938,000	$ 180,000	$ 51,000	$1,000	$ 2,295,000
District 5																		
Florence	$ 1,000	$ -	$ -	$ 2,000	$ -	$ -	$ 1,000	$ -	$ -	$ -	$ 2,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,000
District 6																		
Winchester Bay	$ 31,000	$ -	$ -	$ 160,000	$ -	$ -	$40,000	$3,000	$ 1,000	$ 7,000	$ 26,000	$ 1,000	$ 4,000	$ 19,000	$ 240,000	$ -	$ -	$ 532,000
District 7																		
Coos	$ 269,000	$ -	$ -	$ 417,000	$ -	$ -	$ 4,000	$3,000	$ -	$11,000	$ 475,000	$ 1,000	$ 391,000	$ 605,000	$ 292,000	$ 6,000	$ -	$ 2,474,000
Bandon	47,000	-	-	44,000	-	-	2,000	-	-	1,000	3,000	-	-	-	-	-	-	97,000
Port Orford	50,000	-	-	49,000	-	-	-	-	-	3,000	272,000	-	20,000	3,000	28,000	-	-	425,000
Gold Beach	7,000	-	-	3,000	-	-	-	-	-	-	-	-	-	-	-	-	-	10,000
Brookings	143,000	-	-	153,000	-	-	-	-	-	6,000	362,000	-	16,000	101,000	106,000	-	-	887,000
Total	$ 516,000	$ -	$ -	$ 666,000	$ -	$ -	$ 6,000	$3,000	$ -	$21,000	$1,112,000	$ 1,000	$ 427,000	$ 709,000	$ 426,000	$ 6,000	$ -	$ 3,893,000
District 9																		
Col. River	$ 127,000	$ 22,000	$ 7,000	$ 5,000	$ 1,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 162,000
GRAND TOTAL	$2,178,000	$119,000	$28,000	$1,967,000	$46,000	$1,000	$57,000	$6,000	$13,000	$65,000	$2,934,000	$17,000	$1,130,000	$6,712,000	$1,858,000	$451,000	$6,000	$17,588,000

1/ Sand Shrimp, $1,000, Crawfish, $4,000, Eel, $1,000.

FISH COMMISSION OF OREGON
May 1970
BM-150R

Commercial Food Fish Landings in Pounds Round Weight by State of Oregon
Administrative District for Calendar Year 1970

	Chinook	Steelhead	Sockeye	Coho	Chums	Sturgeon White	Sturgeon Green	Shad	Striped Bass	Smelt	Pinks	Crabs	Clams	Shrimp	Albacore Tuna	Groundfish	Oysters	Misc.1/	Total
District 1																			
Col. River (Zones 1-2-7)	3,296,111	75,086	14,145	3,517,551	3,448	112,355	29,694	61,687	-	133,754	-	-	-	-	-	-	-	-	7,243,831
Astoria	244,034	45	-	775,496	-	358	3,880	-	-	-	326	3,809,343	14,681	2,609,461	23,888,175 2/	11,627,887	-	-	42,973,686
Tillamook	31,125	-	-	287,197	-	-	-	-	-	-	-	982,908	7,819	1,261,639	300,143	33,595	241,929	770	3,147,124
Pacific City	23,972	14	-	444,614	-	-	-	-	-	-	-	-	-	-	110,585	10,402	-	-	589,587
Netarts Bay	-	-	-	-	-	-	-	-	-	-	-	14,280	2,210	-	-	-	122	-	16,613
Nehalem Bay	54	-	-	1,446	-	-	-	-	-	-	-	6,718	258	-	-	-	-	-	8,476
Total	3,595,296	75,145	14,145	5,026,304	3,448	112,713	33,574	61,687	-	133,754	326	4,813,249	24,968	3,871,100	24,298,903 2/	11,671,884	242,051	770	53,979,317
District 2																			
Col. River (Zones 3-4-5)	811,337	61,362	22,162	856,179	1,435	54,405	225	159,306	-	6,350	-	-	-	-	-	-	-	42,790	2,015,551
District 4																			
Waldport	-	-	-	-	-	-	-	-	-	-	-	3,249	-	-	-	-	-	5,579	8,828
Depoe Bay	40,167	-	-	554,765	-	-	-	-	-	-	28	441,212	-	-	39,658	10,205	-	-	1,086,059
Newport	285,503	-	-	2,869,829	-	-	5,927	-	-	535	363	3,150,766	444	3,171,867	2,136,902	2,155,330	47,530	-	13,824,996
Total	325,690	-	-	3,424,594	-	-	5,927	-	-	535	391	3,595,227	444	3,171,867	2,176,560	2,165,535	47,530	5,579	14,919,879
District 5																			
Florence	5,614	-	-	84,295	-	-	-	9,520	659	-	-	17,641	-	-	7,452	404	-	-	125,585
District 6																			
Winchester Bay	55,727	-	-	556,312	-	-	245	394,018	35,473	7,316	-	268,137	10,631	80,716	43,367	3,229,892	-	-	4,681,824
District 7																			
Coos	568,642	-	-	1,908,440	-	-	46	59,865	13,524	150	270	2,716,861	4,522	4,711,216	373,544	2,809,503	17,229	-	13,183,812
Bandon	152,733	-	-	218,221	-	-	-	7,430	395	-	-	11,116	-	-	-	13,368	-	-	403,263
Port Orford	181,285	-	-	325,975	-	-	-	-	-	-	17	1,072,311	125	1,214,950	-	461,701	-	-	3,256,364
Gold Beach	11,118	-	-	20,112	-	-	-	-	-	-	-	1,242	-	-	-	1,008	-	-	33,480
Brookings	337,791	-	-	619,805	-	-	-	-	-	-	-	2,433,563	-	522,325	37,049	1,039,096	-	-	4,989,629
Total	1,251,569	-	-	3,092,553	-	-	46	67,295	13,919	150	287	6,235,093	4,647	6,448,491	410,593	4,324,676	17,229	-	21,866,548
District 9																			
Col. River (Zones 6-8-9)	266,258	49,863	4,368	44,242	-	5,513	-	6,422	-	-	-	-	-	-	-	-	-	-	376,666
GRAND TOTAL	6,311,491	186,370	40,675	13,084,479	4,883	172,631	40,017	698,248	50,051	148,105	1,004	14,929,347	40,690	13,572,174	26,936,875 2/	21,392,381	306,810	49,139	97,965,370

1/ Sand Shrimp 6,349; Crawfish 39,019; Eel 3,771.
2/ Includes Other Tuna totalling 5,139,167.

FISH COMMISSION OF OREGON
May 1971

BH-150R

Estimated Value at Fishermen's Level of Commercial Food Fish Landings
by State of Oregon Administrative District for Calendar Year 1970

	Chinook	Steelhead	Sockeye	Coho	Chums	Sturgeon White	Sturgeon Green	Shad	Striped Bass	Smelt	Crabs	Clams	Shrimp	Albacore Tuna	Groundfish	Oysters	Misc.1/	Total
District 1																		
Col. River (Zones 1-2-7)	$1,447,000	$24,000	$ 6,000	$1,020,000	$1,000	$26,000	$2,000	$ 6,000	$ -	$33,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,565,000
Astoria	158,000	-	-	401,000	-	-	-	-	-	-	952,000	10,000	313,000	6,086,000 2/	872,000	-	-	8,792,000
Tillamook	22,000	-	-	140,000	-	-	-	-	-	-	246,000	1,000	151,000	83,000	2,000	236,000	1,000	890,000
Pacific City	20,000	-	-	230,000	-	-	-	-	-	-	-	-	-	30,000	1,000	-	-	281,000
Netarts Bay	-	-	-	-	-	-	-	-	-	-	3,000	-	-	-	-	-	-	3,000
Nehalem Bay	-	-	-	1,000	-	-	-	-	-	-	2,000	-	-	- 2/	-	-	-	3,000
Total	$1,647,000	$24,000	$ 6,000	$1,800,000	$1,000	$26,000	$2,000	$ 6,000	$ -	$33,000	$1,203,000	$11,000	$ 464,000	$6,199,000 2/	$ 875,000	$236,000	$ 1,000	$12,534,000
District 2																		
Col. River (Zones 3-4-5)	$ 356,000	$20,000	$ 9,000	$ 248,000	$ -	$12,000	$ -	$16,000	$ -	$ 2,000	$ -	$ -	$ -	$ -	$ -	$ -	$13,000	$ 676,000
District 4																		
Waldport	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,000	$ -	$ -	$ -	$ -	$ -	$ 5,000	$ 6,000
Depoe Bay	30,000	-	-	287,000	-	-	-	-	-	-	110,000	-	-	11,000	1,000	-	-	439,000
Newport	211,000	-	-	1,485,000	-	-	-	-	-	-	788,000	-	381,000	587,000	162,000	56,000	-	3,670,000
Total	$ 241,000	$ -	$ -	$1,772,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 899,000	$ -	$ 381,000	$ 598,000	$ 163,000	$ 56,000	$ 5,000	$ 4,115,000
District 5																		
Florence	$ 5,000	$ -	$ -	$ 43,000	$ -	$ -	$ -	$ 1,000	$ -	$ -	$ 4,000	$ -	$ -	$ 2,000	$ -	$ -	$ -	$ 55,000
District 6																		
Winchester Bay	$ 38,000	$ -	$ -	$ 287,000	$ -	$ -	$ -	$52,000	$6,000	$ 2,000	$ 67,000	$ 1,000	$ 10,000	$ 12,000	$ 242,000	$ -	$ -	$ 717,000
District 7																		
Coos	$ 412,000	$ -	$ -	$ 987,000	$ -	$ -	$ -	$ 9,000	$2,000	$ -	$ 679,000	$ 1,000	$ 565,000	$ 103,000	$ 211,000	$ 15,000	$ -	$ 2,984,000
Bandon	113,000	-	-	113,000	-	-	-	1,000	-	-	3,000	-	-	-	1,000	-	-	231,000
Port Orford	132,000	-	-	168,000	-	-	-	-	-	-	268,000	-	146,000	-	35,000	-	-	749,000
Gold Beach	8,000	-	-	10,000	-	-	-	-	-	-	-	-	-	-	-	-	-	18,000
Brookings	238,000	-	-	320,000	-	-	-	-	-	-	609,000	-	63,000	10,000	78,000	-	-	1,318,000
Total	$ 903,000	$ -	$ -	$1,598,000	$ -	$ -	$ -	$10,000	$2,000	$ -	$1,559,000	$ 1,000	$ 774,000	$ 113,000	$ 325,000	$ 15,000	$ -	$ 5,300,000
District 9																		
Col. River (Zones 6-8-9)	$ 117,000	$16,000	$ 1,000	$ 12,000	$ -	$ 1,000	$ -	$ 1,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 148,000
GRAND TOTAL	$3,307,000	$60,000	$16,000	$5,760,000	$1,000	$39,000	$2,000	$86,000	$8,000	$37,000	$3,732,000	$13,000	$1,629,000	$6,924,000 2/	$1,605,000	$307,000	$19,000	$23,545,000

1 Sand Shrimp $6,000; Crawfish $12,000; Eel $1,000.
2 Includes Other Tuna totalling $930,000.

FISH COMMISSION OF OREGON
May 1971

EM-150R

Commercial Food Fish Landings in Pounds Round Weight by State of Oregon Administrative District for Calendar Year 1971

	Chinook	Steelhead	Sockeye	Coho	Chums	Sturgeon White	Sturgeon Green	Shad	Striped Bass	Smelt	Pinks	Crabs	Clams	Shrimp	Albacore Tuna	Groundfish	Oysters	Misc[1]	Total
District 1																			
Col. River (Zones 1-2-7)	2,585,349	121,133	55,064	1,238,704	3,050	108,240	25,886	31,399	-	84,580	5	-	-	-	-	-	-	-	4,253,410
Astoria	162,631	191	-	788,509	-	501	4,016	-	-	-	110	5,148,741	30,227	1,797,242	11,293,939[2]	10,524,609	-	-	29,750,716
Tillamook	18,449	-	-	777,671	-	-	-	-	-	-	5	987,058	5,948	896,080	118,217	72,689	239,136	688	3,115,941
Pacific City	18,347	-	-	792,773	-	-	-	-	-	-	17	142	-	-	7,924	45,030	-	148	864,381
Neterts Bay	-	-	-	-	-	-	-	-	-	-	-	21,761	1,598	-	-	-	-	-	23,359
Nehalem Bay	-	-	-	524	-	-	-	-	-	-	-	-	589	-	-	262	-	-	1,375
Total	2,784,776	121,324	55,064	3,598,181	3,050	108,741	29,902	31,399	-	84,580	137	6,157,702	38,362	2,693,322	11,420,080[2]	10,642,590	239,136	836	38,009,182
District 2																			
Col. River (Zones 3-4-5)	978,563	92,560	84,678	427,178	-	74,307	369	107,990	-	43,300	-	-	-	-	-	-	-	42,537	1,851,482
District 4																			
Siletz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	176	176
Waldport	-	-	-	-	-	-	-	-	-	-	-	3,914	-	-	-	-	-	6,877	10,791
Depoe Bay	21,577	-	-	626,352	-	-	-	-	-	-	1,410	685,193	-	-	29,551	31,901	-	113	1,396,097
Newport	104,876	-	-	1,695,469	-	-	9,599	-	-	350	1,848	3,624,105	2,039	3,601,879	998,262	2,369,197	39,560	-	12,447,184
Total	126,453	-	-	2,321,821	-	-	9,599	-	-	350	3,258	4,313,212	2,039	3,601,879	1,027,813	2,401,098	39,560	7,166	13,854,248
District 5																			
Florence	6,898	-	-	133,395	-	-	-	8,290	1,242	40	-	134,213	-	-	12,003	2,293	-	-	298,374
District 6																			
Winchester Bay	26,377	-	-	781,611	-	-	50	246,968	56,321	5,976	1,580	809,070	7,459	81,330	13,766	4,561,702	-	-	6,592,210
District 7																			
Coos	128,945	-	-	2,119,332	-	-	-	54,973	8,984	-	929	1,898,998	10,893	1,521,483	376,877	2,688,307	208	-	8,809,929
Bandon	48,113	-	-	440,728	-	-	-	11,607	537	-	1,912	20,328	-	-	660	7,037	-	-	530,922
Port Orford	77,530	-	-	260,046	-	-	-	-	-	-	1,647	469,500	-	410,672	11	552,890	-	-	1,772,296
Gold Beach	45,052	-	-	185,414	-	-	-	-	-	-	45	300	-	-	953	5,830	-	-	237,594
Brookings	492,015	-	-	1,478,040	-	-	-	-	-	-	904	1,072,526	-	766,320	240,004	1,178,134	-	-	5,227,943
Total	791,655	-	-	4,483,560	-	-	-	66,580	9,521	-	5,437	3,461,652	10,893	2,698,475	618,505	4,432,198	208	-	16,578,684
District 9																			
Col. River (Zones 6-8-9)	298,821	99,245	23,698	28,914	-	18,660	-	12,595	-	-	-	-	-	-	-	-	-	-	481,933
GRAND TOTAL	5,013,543	313,129	163,440	11,774,660	3,050	201,708	39,920	473,822	67,084	134,246	10,412	14,875,849	58,753	9,075,006	13,092,167[2]	22,039,881	278,904	50,539	77,666,113

1/ Includes Sand Shrimp 8,002; Crawfish 39,537; Eel 3,000.

2/ Includes Other Tuna totalling 4,672,582.

APRIL 1, 1972

Fish Commission of Oregon

Estimated Value at Fishermen's Level of Commercial Food Fish Landings
by State of Oregon Administrative District for Calendar Year 1971

	Chinook	Steelhead	Sockeye	Coho	Sturgeon White	Sturgeon Green	Shad	Striped Bass	Smelt	Pinks	Crabs	Clams	Shrimp	Albacore Tuna	Groundfish	Oysters	Misc.[1]	Total
District 1																		
Col. River (Zones 1-2-7)	$ 978,000	$36,000	$22,000	$ 310,000	$27,000	$1,000	$ 2,000	$ -	$23,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,399,000
Astoria	75,000	-	-	247,000	-	-	-	-	-	-	1,184,000	18,000	208,000	3,086,000[2]	865,000	-	-	5,683,000
Tillamook	10,000	-	-	243,000	-	-	-	-	-	-	227,000	1,000	109,000	37,000	6,000	270,000	1,000	904,000
Pacific City	10,000	-	-	248,000	-	-	-	-	-	-	-	-	-	3,000	4,000	-	-	265,000
Netarts Bay	-	-	-	-	-	-	-	-	-	-	5,000	-	-	-	-	-	-	5,000
Total	$1,073,000	$36,000	$22,000	$1,048,000	$27,000	$1,000	$ 2,000	$ -	$23,000	$ -	$1,416,000	$19,000	$ 317,000	$3,126,000	$ 875,000	$270,000	$ 1,000	$ 8,256,000
District 2																		
Col. River (Zones 3-4-5)	$ 342,000	$27,000	$34,000	$ 107,000	$18,000	$ -	$11,000	$ -	$12,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$16,000	$ 567,000
District 4																		
Waldport	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,000	$ -	$ -	$ -	$ -	$ -	$ 7,000	$ 8,000
Depoe Bay	$ 12,000	-	-	$ 196,000	-	-	-	-	-	-	206,000	-	-	9,000	3,000	-	-	426,000
Newport	63,000	-	-	531,000	-	1,000	-	-	-	-	1,087,000	-	431,000	302,000	195,000	81,000	-	2,692,000
Total	$ 75,000	$ -	$ -	$ 727,000	$ -	$1,000	$ -	$ -	$ -	$1,000	$1,294,000	$ -	$ 431,000	$ 311,000	$ 198,000	$ 81,000	$ 7,000	$ 3,126,000
District 5																		
Florence	$ 4,000	$ -	$ -	$ 42,000	$ -	$ -	$ 1,000	$ -	$ -	$ -	$ 40,000	$ -	$ -	$ 4,000	$ -	$ -	$ -	$ 91,000
District 6																		
Winchester Bay	15,000	$ -	$ -	$ 245,000	$ -	$ -	$34,000	$ 9,000	$ 2,000	$ -	$ 283,000	$ 1,000	$ 10,000	$ 4,000	$ 375,000	$ -	$ -	$ 978,000
District 7																		
Coos	$ 66,000	$ -	$ -	$ 663,000	$ -	$ -	$ 8,000	$ 1,000	$ -	$ -	$ 665,000	$ 1,000	$ 197,000	$ 112,000	$ 221,000	$ -	$ -	$ 1,934,000
Bandon	27,000	-	-	138,000	-	-	2,000	-	-	1,000	7,000	-	-	-	1,000	-	-	176,000
Port Orford	40,000	-	-	81,000	-	-	-	-	-	1,000	164,000	-	54,000	-	45,000	-	-	385,000
Gold Beach	23,000	-	-	58,000	-	-	-	-	-	-	-	-	-	-	-	-	-	81,000
Brookings	242,000	-	-	463,000	-	-	-	-	-	-	376,000	-	101,000	71,000	97,000	-	-	1,350,000
Total	$ 398,000	$ -	$ -	$1,403,000	$ -	$ -	$10,000	$ 1,000	$ -	$2,000	$1,212,000	$ 1,000	$ 352,000	$ 183,000	$ 364,000	$ -	$ -	$ 3,926,000
District 9																		
Col. River (Zones 6-8-9)	$ 105,000	$26,000	$ 9,000	$ 7,000	$ 5,000	$ -	$ 1,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 153,000
GRAND TOTAL	$2,012,000	$89,000	$65,000	$3,579,000	$50,000	$2,000	$59,000	$10,000	$37,000	$3,000	$4,245,000	$21,000	$1,110,000	$3,628,000[2]	$1,812,000	$351,000	$24,000	$17,097,000

1/ Includes Sand Shrimp $8,000; Crawfish $16,000.
2/ Includes Other Tuna totalling $1,000,000.

APRIL 1, 1972 Fish Commission of Oregon

Commercial Food Fish Landings in Pounds Round Weight by State of Oregon
Administrative District for Calendar Year 1972

	Chinook	Steelhead	Sockeye	Coho	Chums	Sturgeon White	Sturgeon Green	Shad	Striped Bass	Smelt	Pinks	Crabs	Clams	Shrimp	Albacore Tuna	Groundfish	Oysters	Misc.[1]	Total
District 1																			
Col. River (Zones 1-2-7)	2,260,690	208,809	74,829	698,441	9,216	102,844	16,877	14,122		124,625									3,510,451
Astoria	88,724	312		402,791		113	1,154					3,872,563	12,550	2,359,920	22,377,175[2]	10,618,335			39,733,637
Tillamook	26,088			390,887								481,151	9,541	1,911,811	189,605	116,440	132,224	1,129	3,258,876
Pacific City	20,622			430,795								6,321			3,305	28,198		1,501	490,742
Netarts Bay												5,461	914			56		78	6,509
Nehalem Bay	48			562								25	80						715
Total	2,396,172	209,121	74,829	1,923,476	9,216	102,957	18,031	14,122		124,623		4,365,521	23,085	4,271,731	22,570,085	10,763,029	132,224	2,708	47,000,930
District 2																			
Col. River (Zones 3-4-5)	906,048	78,946	50,293	180,528	744	81,574	101	149,661		800								9,597	1,458,292
District 4																			
Siletz																		969	969
Waldport												1,831	70[3]					6,279	8,180
Depoe Bay	65,958			497,213							3	29,004	588		105,794	25,674		492	724,726
Newport	193,783			1,095,714			15,637			750	15	1,263,913	57	7,333,113	3,572,764	2,596,874	36,568	40	16,109,228
Total	259,741			1,592,927			15,637			750	18	1,294,748	715	7,333,113	3,678,558	2,622,548	36,568	7,780	16,843,103
District 5																			
Florence	9,909			73,751				8,151	734		100	46,577			73,944	1,454			214,620
District 6																			
Winchester Bay	43,262			414,687				367,229	42,088	6,779		248,755	6,105	813,027	295,389	2,284,764			4,522,085
District 7																			
Coos	336,591			1,709,860			54	95,413	11,627	451	14	468,683	44,813	5,409,721	2,528,603	5,592,960	6,928		16,205,718
Bandon	70,900			143,442								10,113			16,402	12,499			253,356
Port Orford	174,133			147,327								77,155		1,217,042		399,981			2,015,638
Gold Beach	120,407			41,149								10,248			530	11,525			183,859
Brookings	348,944			236,813								240,459		1,686,517	70,204	1,112,607			3,695,544
Total	1,050,975			2,278,591			54	95,413	11,627	451	14	806,658	44,813	8,313,280	2,615,739	7,129,572	6,928		22,354,115
District 9																			
Col. River (Zones 6-8-9)	419,367	169,209	28,600	18,966		18,134		6,268											660,544
GRAND TOTAL	5,085,474	457,276	153,722	6,482,926	9,960	202,665	33,823	640,844	54,449	133,403	132	6,762,259	74,718[3]	20,731,151	29,233,715[2]	22,801,367	175,720	20,085	93,053,689

1/ Includes Sand Shrimp 10,082, Crawfish 8,750, Eel 1,273.

2/ Includes Other Tuna Totalling 6,177,711.

3/ Mussels 588.

FISH COMMISSION OF OREGON
MAY 1973

BH 150R

Estimated Value at Fishermen's Level of Commercial Food Fish Landings
by State of Oregon Administrative District for Calendar Year 1972

	Chinook	Steelhead	Sockeye	Coho	Chums	Sturgeon White	Sturgeon Green	Shad	Striped Bass	Smelt	Crabs	Clams	Shrimp	Albacore Tuna	Groundfish	Oysters	Misc.[1]	Total
District 1																		
Col. River (Zones 1-2-7)	$1,189,000	$ 93,000	$34,000	$ 363,000	$3,000	$21,000	$1,000	$ 2,000	$ -	$44,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,750,000
Astoria	55,000	-	-	187,000	-	-	-	-	-	-	1,642,000	9,000	283,000	6,805,000[2]	1,009,000	-	-	9,990,000
Tillamook	17,000	-	-	181,000	-	-	-	-	-	-	204,000	1,000	229,000	64,000	11,000	228,000	-	935,000
Pacific City	14,000	-	-	200,000	-	-	-	-	-	-	3,000	-	-	1,000	3,000	-	-	221,000
Netarts Bay	-	-	-	-	-	-	-	-	-	-	2,000	-	-	-	-	-	-	2,000
Nehalem Bay	-	-	-	3,000	-	-	-	-	-	-	-	-	-	-	-	-	-	3,000
Total	$1,275,000	$ 93,000	$34,000	$ 934,000	$3,000	$21,000	$1,000	$ 2,000	$	$44,000	$1,851,000	$10,000	$ 512,000	$6,870,000	$1,023,000	$ 228,000	$ -	$12,901,000
District 2																		
Col. River (Zones 3-4-5)	$ 477,000	$ 35,000	$23,000	$ 94,000	$ -	$16,000	$ -	$19,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$4,000	$ 668,000
District 4																		
Siletz	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Waldport	-	-	-	-	-	-	-	-	-	-	1,000	-	-	-	-	-	-	1,000
Depoe Bay	45,000	-	-	230,000	-	-	-	-	-	-	12,000	-	-	36,000	2,000	-	-	325,000
Newport	137,000	-	-	508,000	-	-	1,000	-	-	-	536,000	-	990,000	1,215,000	247,000	107,000	-	3,741,000
Total	$ 182,000	$ -	$ -	$ 738,000	$ -	$ -	$1,000	$ -	$ -	$ -	$ 549,000	$ -	$ 990,000	$1,251,000	$ 249,000	$ 107,000	$ -	$ 4,067,000
District 5																		
Florence	$ 7,000	$ -	$ -	$ 34,000	$ -	$ -	$ -	$ 1,000	$ -	$ -	$ 20,000	$ -	$ -	$ 25,000	$ -	$ -	$ -	$ 87,000
District 6																		
Winchester Bay	30,000	$ -	$ -	$ 192,000	$ -	$ -	$ -	$51,000	$6,000	$ 2,000	$ 105,000	$1,000	$ 122,000	$ 100,000	$ 217,000	$ -	$ -	$ 826,000
District 7																		
Coos	$ 224,000	$ -	$ -	$ 972,000	$ -	$ -	$ -	$14,000	$3,000	$ -	$ 198,000	$ 7,000	$ 811,000	$ 860,000	$ 531,000	$ 8,000	$ -	$ 3,628,000
Bandon	46,000	-	-	66,000	-	-	-	-	-	-	4,000	-	-	6,000	1,000	-	-	123,000
Port Orford	114,000	-	-	68,000	-	-	-	-	-	-	33,000	-	182,000	-	38,000	-	-	435,000
Gold Beach	81,000	-	-	19,000	-	-	-	-	-	-	4,000	-	-	-	1,000	-	-	105,000
Brookings	242,000	-	-	110,000	-	-	-	-	-	-	102,000	-	253,000	24,000	106,000	-	-	837,000
Total	$ 707,000	$ -	$ -	$1,235,000	$ -	$ -	$ -	$14,000	$3,000	$ -	$ 341,000	$ 7,000	1,246,000	$ 890,000	$ 677,000	$ 8,000	-	$ 5,128,000
District 9																		
Col. River (Zones 6-8-9)	$ 221,000	$ 75,000	$13,000	$ 10,000	$ -	$ 4,000	$ -	$ 1,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 324,000
GRAND TOTAL	$2,899,000	$203,000	$70,000	$3,237,000	$3,000	$41,000	$2,000	$88,000	$9,000	$46,000	$2,866,000	$18,000	$2,870,000	$9,136,000[2]	$2,166,000	$ 343,000	$4,000	$24,001,000

1/ Includes crayfish $4,000.

2/ Includes other tuna totalling $1,297,000.

FISH COMMISSION OF OREGON
April 18, 1973

Commercial Food Fish Landings in Pounds Round Weight by State of Oregon
Administrative District for Calendar Year 1973

	Chinook	Steel head	Sock eye	Coho	Chums	Sturgeon White	Sturgeon Green	Shad	Striped Bass	Smelt	Pinks	Crabs	Clams	Shrimp	Tuna 1/	Ground fish	Oysters	Misc. 2/	Total
District 1																			
Col. River (Zones 1-2-7)	3,603,414	161,452	32	1,102,216	10,389	165,894	14,197	27,210	-	46,915	-	-	-	-	-	121,174	-	-	5,252,893
Astoria	87,311	278	-	217,448	-	424	1,436	-	-	-	4,829	992,973	16,252	2,777,298	19,102,041	9,450,108	-	-	32,650,398
Tillamook	46,509	-	-	220,383	-	-	-	-	-	-	7	293,092	12,052	2,254,430	94,049	99,806	126,392	2,146	3,148,866
Pacific City	38,290	127	-	366,543	-	-	-	-	-	-	-	9	-	-	6,681	17,688	-	152	429,490
Netarts Bay	-	-	-	-	-	-	-	-	-	-	-	1,151	1,231	-	-	319	-	426	3,127
Nehalem Bay	125	-	-	1,602	-	-	-	-	-	-	-	-	329	-	-	94	-	-	2,150
TOTAL	3,775,649	161,857	32	1,908,192	10,389	166,318	15,633	27,210	-	46,915	4,836	1,287,225	29,864	5,031,728	19,202,771	9,689,189	126,392	2,724	41,486,924
District 2																			
Col. River (Zones 3-4-5)	1,308,472	122,565	8,557	263,866	1,399	83,521	198	140,078	-	6,365		-	-	-	-	-	-	9,878	1,944,899
District 4																			
Siletz	-	-	-	-	-	-	-	-	-								-	1,928	1,928
Waldport	-	-	-	-	-	-	-	-	-	-	-	1,413	-	-	-	-	-	6,858	8,271
Depoe Bay	132,962	-	-	381,355	-	-	-	-	-	-	17	46,968	949	-	74,011	37,364	-	1,307	676,933
Newport	952,493	-	-	1,712,495	-	171	6,148	-	-	-	108	327,355	-	6,500,542	2,667,723	3,531,150	58,776	-	15,756,961
TOTAL	1,085,455	-	-	2,093,850	-	171	6,148	-	-	-	125	375,736	949	6,500,542	2,741,734	3,568,514	58,776	10,093	16,444,093
District 5																			
Florence	56,649	-	-	119,306	-	-	-	26,324	1,094	-	16	44,492	-	-	39,481	2,876	-	-	290,238
District 6																			
Winchester Bay	248,996	-	-	515,469	-	-	145	206,654	29,178	4,306	2,861	131,139	786	1,131,376	217,999	2,565,644	-	-	5,054,553
District 7																			
Coos	1,580,838	-	-	1,432,607	-	-	54	30,986	8,799	610	1,923	245,662	2,853	8,825,822	2,118,794	4,641,513	12,904	-	18,303,365
Bandon	212,040	-	-	238,602	-	-	-	6,812	446	-	2,008	10,078	-	-	25,033	22,641	-	-	517,660
Port Orford	243,223	-	-	180,560	-	-	-	-	-	-	930	77,570	-	1,952,086	-	326,393	-	-	2,780,762
Gold Beach	102,605	-	-	100,052	-	-	-	-	-	-	48	1,281	-	-	2,703	9,383	-	-	216,072
Brookings	279,594	-	-	421,253	-	-	-	-	-	4,048	3,616	176,462	-	1,075,640	74,970	1,717,987	-	-	3,753,570
TOTAL	2,418,300	-	-	2,373,074	-	-	54	37,798	9,245	4,658	8,525	511,053	2,853	11,853,548	2,221,500	6,117,917	12,904	-	25,571,429
District 9																			
Col. River (Zones 6-8-9)	702,133	176,907	2,355	31,666	-	18,572	69	12,683	-										944,385
GRAND TOTAL	9,595,654	461,329	10,944	7,305,423	11,788	268,582	22,247	450,747	39,517	62,244	16,363	2,349,645	34,452	24,517,194	24,425,485	21,944,140	198,072	22,695	91,736,521

1/ Includes Albacore Tuna 16,338,827 and other species of Tuna 8,086,658
2/ Includes Sand Shrimp 12,753, Crawfish 9,942

FISH COMMISSION OF OREGON
May 1974

Estimated Value at Fishermen's Level of Commercial Food Fish Landings
by State of Oregon Administrative District for Calendar Year 1973

	Chinook	Steel head	Sock eye	Coho	Chums	Sturgeon White	Sturgeon Green	Shad	Striped Bass	Smelt	Pinks	Crabs	Clams	Shrimp	Tuna[1]	Ground fish	Oysters	Misc.[2]	Total
District 1																			
Col. River (Zones 1-2-7)	$3,491,000	$81,000	$ -	$ 750,000	$5,000	$41,000	$1,000	$ 7,000	$ -	$12,000	$ -	$ -	$ -	$ -	$ -	$ 5,000	$ -	$ -	$ 4,393,000
Astoria	66,000	-	-	138,000	-	-	-	-	-	-	2,000	566,000	12,000	611,000	6,490,000	1,134,000	-	-	9,019,000
Tillamook	39,000	-	-	145,000	-	-	-	-	-	-	-	167,000	3,000	496,000	39,000	12,000	242,000	2,000	1,145,000
Pacific City	34,000	-	-	250,000	-	-	-	-	-	-	-	-	-	-	3,000	2,000	-	-	289,000
Netarts Bay	-	-	-	-	-	-	-	-	-	-	-	1,000	-	-	-	-	-	-	1,000
Nehalem Bay	-	-	-	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,000
TOTAL	$3,630,000	$81,000	$ -	$1,284,000	$5,000	$41,000	$1,000	$ 7,000	$ -	$12,000	$2,000	$ 734,000	$15,000	$1,107,000	$6,532,000	$1,153,000	$242,000	$ 2,000	$14,848,000
District 2																			
Col. River (Zones 3-4-5)	$1,268,000	$61,000	$4,000	$ 179,000	$1,000	$21,000	$ -	$49,000	$ -	$ 2,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,000	$ 1,588,000
District 4																			
Siletz	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,000	$ 1,000
Waldport	-	-	-	-	-	-	-	-	-	-	-	1,000	-	-	-	-	-	5,000	6,000
Depoe Bay	116,000	-	-	273,000	-	-	-	-	-	-	-	27,000	-	-	32,000	4,000	-	1,000	453,000
Newport	856,000	-	-	1,241,000	-	-	-	-	-	-	-	187,000	-	1,430,000	1,107,000	424,000	157,000	-	5,402,000
TOTAL	$ 972,000	$ -	$ -	$1,514,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 215,000	$ -	$1,430,000	$1,139,000	$ 428,000	$157,000	$ 7,000	$ 5,862,000
District 5																			
Florence	$ 48,000	$ -	$ -	$ 85,000	$ -	$ -	$ -	$ 4,000	$ -	$ -	$ -	$ 25,000	$ -	$ -	$ 16,000	$ -	$ -	$ -	$ 178,000
District 6																			
Winchester Bay	$ 215,000	$ -	$ -	$ 354,000	$ -	$ -	$ -	$27,000	$6,000	$ 1,000	$1,000	$ 75,000	$ -	$ 249,000	$ 90,000	$ 308,000	$ -	$ -	$ 1,326,000
District 7																			
Coos	$1,402,000	$ -	$ -	$ 928,000	$ -	$ -	$ -	$ 4,000	$2,000	$ -	$1,000	$ 140,000	$ 1,000	$1,942,000	$ 879,000	$ 485,000	$ 17,000	$ -	$ 5,801,000
Bandon	187,000	-	-	152,000	-	-	-	1,000	-	-	1,000	6,000	-	-	10,000	3,000	-	-	360,000
Port Orford	217,000	-	-	114,000	-	-	-	-	-	-	-	44,000	-	429,000	-	39,000	-	-	843,000
Gold Beach	82,000	-	-	63,000	-	-	-	-	-	-	-	1,000	-	-	1,000	1,000	-	-	148,000
Brookings	258,000	-	-	260,000	-	-	-	-	-	1,000	2,000	100,000	-	237,000	31,000	206,000	-	-	1,095,000
TOTAL	$2,146,000	$ -	$ -	$1,517,000	$ -	$ -	$ -	$ 5,000	$2,000	$ 1,000	$4,000	$ 291,000	$ 1,000	$2,608,000	$ 921,000	$ 734,000	$ 17,000	$ -	$ 8,247,000
District 9																			
Col. River (Zones 6-8-9)	$ 680,000	$88,000	$1,000	$ 22,000	$ -	$ 5,000	$ -	$ 4,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 800,000
GRAND TOTAL	$8,959,000	$230,000	$5,000	$4,955,000	$6,000	$67,000	$1,000	$96,000	$8,000	$16,000	$7,000	$1,340,000	$16,000	$5,394,000	$8,698,000	$2,623,000	$416,000	$12,000	$32,849,000

1/ Includes Albacore Tuna $6,779,000 other species of tuna $1,919,000

2/ Includes Sand Shrimp $9,000, Crayfish $3,000.

FISH COMMISSION OF OREGON
May 1, 1974

Commercial Food Fish Landings in Pounds Round Weight by State of Oregon
Administrative District for Calendar Year 1974

	Chinook	Steel-head	Sock-eye	Coho	Chums	Sturgeon White	Sturgeon Green	Shad	Striped Bass	Smelt	Pinks	Crabs	Clams	Shrimp	Tuna 1/	Ground-fish	Oysters	Misc. 2/	Total
District 1																			
Col. River (Zones 1-2-7)	1,406,705	36,656	-	1,558,992	3,051	193,811	82,409	5,628	-	222,867	-	-	-	-	-	200,508	-	16,081	3,726,708
Astoria	183,430	23	-	300,359	-	-	484	-	-	-	5	1,398,220	8,553	6,708,831	26,723,583	9,907,149	-	-	45,230,637
Tillamook	54,637	-	-	408,083	-	-	-	-	-	-	-	276,460	9,309	2,352,628	69,206	116,829	163,968	4,249	3,455,369
Pacific City	31,991	24	-	757,229	-	-	-	-	-	-	-	-		-	8,289	18,624	-	170	816,327
Netarts Bay		-	-	-	-	-	-	-	-	-	-	-	2,049	-	-	-	488	482	3,019
Nehalem Bay	129	-	-	192	-	-	-	-	-	-	-	-	882	-	-	-	-	-	1,203
TOTAL	1,676,892	36,703	-	3,024,855	3,051	193,811	82,893	5,628	-	222,867	5	1,674,680	20,793	9,061,459	26,801,078	10,243,110	164,456	20,982	53,233,263
District 2																			
Col. River (Zones 3-4-8)	399,386	19,824	-	164,286	221	59,044	358	31,385	-	195,732	-	-	-	-	-	23	-	-	870,259
District 4																			
Siletz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,731	1,731
Waldport	41	-	-	112	-	-	-	-	-	-	-	2,740	-	-	-	-		7,257	10,150
Depoe Bay	74,834	-	-	612,265	-	-	-	-	-	-	-	2,592	-	-	25,950	37,203	-	605	753,449
Newport	448,820	-	-	2,301,323	-	-	2,083	-	-	430	37	912,618	398	4,386,054	2,344,296	2,587,209	55,144	134	13,038,546
TOTAL	523,695	-	-	2,913,700	-	-	2,083	-	-	430	37	917,950	398	4,386,054	2,370,246	2,624,412	55,144	9,727	13,803,876
District 5																			
Florence	15,703	-	-	84,404	-	-	-	14,279	197	-	-	17,057	-	-	127,389	2,006	-	-	261,035
District 6																			
Winchester Bay	46,642	-	-	733,378	-	-	180	161,545	26,610	2,513	32	257,797	194	769,595	326,781	3,431,585	-	-	5,756,854
District 7																			
Cons	1,127,186	-	-	2,148,789	-	-	257	32,543	8,344	83	7	782,518	3,518	4,834,286	3,119,027	3,649,716	13,928	13	15,720,215
Bandon	241,950	-	-	286,963	-	-	-	-	-	-	-	1,940	53	23,577	56,454	57,128	-	-	668,065
Port Orford	209,684	-	-	270,780	-	-	-	-	-	-	-	98,510	-	494,050	27,527	224,370	-	-	1,324,921
Gold Beach	34,816	-	-	123,073	-	-	-	-	-	-	-	-	-	47,413	11,153	7,356	-	-	223,811
Brookings	160,196	-	-	286,521	-	-	-	-	-	3,000	-	167,173	-	697,326	200,271	1,858,017	-	-	3,372,504
TOTAL	1,773,832	-	-	3,116,126	-	-	257	32,543	8,344	3,083	7	1,050,141	3,571	6,096,652	3,414,432	5,796,587	13,928	13	21,309,516
District 9																			
Col. River (Zones 6-8-9)	475,134	72,887	21	17,992	-	18,348	-	19,129	-	-	-	-	-	-	-	-	-	-	603,507
Total Col. R.	2,281,225	129,367	21	1,741,270	3,272	271,203	82,767	56,138	-	418,599	-	-	-	-	-	200,531	-	16,081	5,200,474
Total Ocean	2,690,059	47	-	8,313,471	-	-	3,004	208,367	35,151	6,028	81	3,917,625	24,956	20,313,760	35,039,926	21,897,192	233,528	14,641	90,637,856
GRAND TOTAL	4,911,284	129,414	21	10,054,741	3,272	271,203	85,771	264,505	35,151	424,627	81	3,917,625	24,956	20,313,760	35,039,926	22,097,723	233,528	30,722	95,838,310

1/ Includes 7,815,206 other tuna, 25,224,720 albacore.
2/ Includes 12,094 crayfish, 4,000 eel, and 14,628 sand shrimp.

March 20, 1975

DEPARTMENT OF FISH AND WILDLIFE July 3, 1975

Estimated Value at Fisherman's Level of Commercial Food Fish Landings in Thousands of Dollars
by State of Oregon Administrative District for Calendar Year 1974

	Chinook	Steel-head	Coho	Chum	Sturgeon White	Sturgeon Green	Shad	Striped Bass	Smelt	Crabs	Clams	Shrimp	Tuna[1]	Ground-fish	Oysters	Misc.[2]	Total
District 1																	
Col.River (Zones 1-2-7)	$1,055	$14	$ 798	$2	$48	$4	$ -	$ -	$22	$ -	$ -	$ -	$ -	$ 8	$ -	$ 9	$ 1,960
Astoria	143	-	197	-	-	-	-	-	-	973	7	1,227	9,982	1,475	-	-	14,004
Tillamook	50	-	267	-	-	-	-	-	-	210	2	433	28	20	406	2	1,418
Pacific City	30	-	495	-	-	-	-	-	-	-	-	-	3	2	-	-	530
Netarts Bay	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
TOTAL	$1,278	$14	$1,757	$2	$48	$4	$ -	$ -	$22	$1,183	$ 9	$1,660	$10,013	$1,505	$407	$11	$17,913
District 2																	
Col.River (Zones 3-4-5)	$ 298	$ 7	$ 88	$-	$15	$-	$ 3	$ -	$20	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 431
District 4																	
Waldport	$ -	$ -	$ -	$-	$-	$-	$ -	$ -	$ -	$ 2	$ -	$ -	$ -	$ -	$ -	$ 4	$ 6
Depoe Bay	69	-	395	-	-	-	-	-	-	1	-	-	11	10	-	-	486
Newport	426	-	1,497	-	-	-	-	-	-	574	-	973	961	409	156	-	4,996
TOTAL	$ 495	$ -	$1,892	$-	$-	$-	$ -	$ -	$ -	$ 577	$ -	$ 973	$ 972	$ 419	$156	$ 4	$ 5,406
District 5																	
Florence	$ 15	$ -	$ 59	$-	$-	$-	$ 3	$ -	$ -	$ 13	$ -	$ -	$ 52	$ -	$ -	$ -	$ 142
District 6																	
Winchester B.	$ 41	$ -	$ 497	$-	$-	$-	$29	$ 8	$ -	$ 203	$ -	$ 190	$ 134	$ 489	$ -	$ -	$ 1,591
District 7																	
Coos	$1,036	$ -	$1,465	$-	$-	$-	$ 6	$ 3	$ -	$ 550	$ 1	$1,255	$ 1,279	$ 516	$ 19	$ -	$ 6,130
Bandon	225	-	195	-	-	-	-	-	-	-	2	6	23	7	-	-	458
Port Orford	192	-	183	-	-	-	-	-	-	87	-	133	11	33	-	-	639
Gold Beach	33	-	82	-	-	-	-	-	-	-	-	13	5	1	-	-	134
Brookings	152	-	193	-	-	-	-	-	2	148	-	190	82	264	-	-	1,031
TOTAL	$1,638	$ -	$2,118	$-	$-	$-	$ 6	$ 3	$ 2	$ 785	$ 3	$1,597	$ 1,400	$ 821	$ 19	$ -	$ 8,392
District 9																	
Col.River (Zones 6-8-9)	$ 309	$18	$ 5	$-	$ 5	$-	$ 2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 339
Total Col.R.	$1,662	$39	$ 891	$2	$68	$4	$ 5	$ -	$42	$ -	$ -	$ -	$ -	$ 8	$ -	$ 9	$ 2,730
Total Ocean	$2,412	$ -	$5,525	$-	$ -	$-	$38	$11	$ 2	$2,761	$12	$4,420	$12,571	$3,226	$582	$ 6	$31,566
GRAND TOTAL	$4,074	$39	$6,416	$2	$68	$4	$43	$11	$44	$2,761	$12	$4,420	$12,571	$3,234	$582	$15	$34,296

1/ Includes $2,230 Other Tuna, $10,341 Albacore
2/ Includes $9 Crayfish, $6 Sand Shrimp

DEPARTMENT OF FISH AND WILDLIFE
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Commercial Food Fish Landings in Pounds Round Weight by State of Oregon
Administrative District for Calendar Year 1975

	Chinook	Steel-head	Sock-eye	Coho	Chums	Sturgeon White	Sturgeon Green	Shad	Striped Bass	Smelt	Plaice	Crabs	Clams	Shrimp	Tuna 1/	Ground-fish	Oysters	Misc. 2/	Total
District 1																			
Col. River (Zones 1-2-7)	2,782,263	-	-	925,789	1,894	205,500	25,942	4,022	-	2,421	52	-	-	-	-	73,700	-	26,559	4,048,142
Astoria	122,139	-	-	276,785	-	697	885	-	-	-	456	1,090,353	40,656	5,075,528	16,599,703	9,372,629	-	38	32,580,049
Tillamook	42,203	-	-	343,718	-	-	-	-	-	-	-	316,914	4,637	3,734,385	78,840	60,784	142,144	7,559	4,731,184
Pacific City	39,624	-	-	448,434	-	-	-	-	-	-	-	-	-	-	7,694	21,752	-	285	517,789
Netarts Bay	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	299	371
Nehalem Bay	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	2,986,229	-	-	1,994,726	1,894	206,197	26,827	4,022	-	2,421	508	1,407,247	45,293	8,809,913	16,686,237	9,529,065	142,216	34,740	41,877,535
District 2																			
Col. River (Zones 3-4-5)	302,668	-	-	186,811	2,731	85,924	652	197,055	-	200	-	-	-	-	-	226	-	3,138	779,405
District 4																			
Siletz	-	-	-	-	-	-	-	-	-	-	-	1,673	-	-	-	-	-	-	1,673
Waldport	133	-	-	603	-	-	-	-	-	-	-	-	347	-	-	101	-	9,670	10,854
Depoe Bay	46,577	-	-	268,247	-	-	-	-	-	-	204	565	-	-	55,100	15,235	-	1,470	387,398
Newport	342,126	-	-	1,010,606	-	265	4,868	-	-	700	139	525,516	-	5,017,210	2,748,056	3,997,369	58,312	-	13,705,167
TOTAL	388,836	-	-	1,279,456	-	265	4,868	-	-	700	343	527,754	347	5,017,210	2,803,156	4,012,705	58,312	11,140	14,105,092
District 5																			
Florence	73,148	-	-	53,104	-	-	-	14,473	133	-	41	12,643	-	-	36,733	1,450	-	-	191,725
District 6																			
Winchester Bay	115,808	-	-	402,754	-	-	70	160,130	12,617	1,096	22	212,587	463	1,353,798	293,754	2,032,624	-	-	4,585,723
District 7																			
Coos	1,047,535	-	-	1,183,151	-	-	512	40,584	4,954	-	13	774,489	22,832	7,431,766	3,560,942	4,196,999	12,608	65	18,276,450
Bandon	252,952	-	-	158,290	-	-	-	25,509	315	-	-	710	38	304,182	52,637	39,978	-	-	834,611
Port Orford	452,381	-	-	166,204	-	-	-	-	-	-	-	512,408	-	826,067	8,760	154,519	-	147	2,120,486
Gold Beach	73,084	-	-	114,354	-	-	-	-	-	-	15	-	-	16,197	338	5,850	-	-	209,838
Brookings	383,324	-	-	275,100	-	-	45	-	-	4,730	99	579,099	-	324,435	141,852	1,050,323	-	-	2,759,007
TOTAL	2,189,276	-	-	1,897,099	-	-	557	66,093	5,269	4,730	127	1,866,706	22,870	8,902,647	3,764,529	5,447,669	12,608	212	24,180,392
District 9																			
Col. River (Zones 6-8-9-)	478,990	26,529	7	9,590	-	8,898	-	14,985	-	-	-	-	-	-	-	-	-	-	538,999
Total Col. R.	3,563,921	26,529	7	1,122,190	4,625	300,322	26,594	216,062	-	2,621	52	-	-	-	-	73,926	-	29,697	5,366,546
Total Ocean	2,971,034	-	-	4,701,350	-	962	6,380	240,696	18,019	6,526	989	4,026,937	68,973	24,083,568	23,584,409	20,949,813	213,136	19,533	80,892,325
GRAND TOTAL	6,534,955	26,529	7	5,823,540	4,625	301,284	32,974	456,758	18,019	9,147	1,041	4,026,937	68,973	24,083,568	23,584,409	21,023,739	213,136	49,230	86,258,871

1/ Includes 6,418,872 other tuna, 17,165,537 albacore

2/ Includes 26,559 crayfish, 3,138 eel and 19,533 sand shrimp

Estimated Value in Thousands of Dollars at Fishermen's Level of Commercial Food Fish Landings
by State of Oregon Administrative District for Calendar Year 1975

	Chinook	Steel-head	Sock-eye	Coho	Chums	Sturgeon White	Sturgeon Green	Shad	Striped Bass	Smelt	Pinks	Crabs	Clams	Shrimp	Tuna[1]	Ground-fish	Oysters	Misc.[2]	Total
District 1																			
Col. River																			
(Zones 1-2-7)	$2,365			$ 861	$1	$62	$1	$ 1	$-	$-	$-	$ -	$ -	$ -		$ 7	$ -	$16	$ 3,314
Astoria	95	$ -	$ -	184	-	-	-	-	-	-	-	872	34	682	$5,142	1,242	-	-	8,251
Tillamook	37	-	-	231	-	-	-	-	-	-	-	254	1	502	27	7	250	4	1,313
Pacific City	37	-	-	301	-	-	-	-	-	-	-	-	-	-	3	3	-	-	344
Netarts Bay	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nehalem Bay	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	$2,534	$ -	$ -	$1,577	$1	$62	$1	$ 1	$-	$-	$-	$1,126	$35	$1,184	$5,172	$1,259	$250	$20	$13,222
District 2																			
Col. River																			
(Zones 3-4-5)	$ 257	$ -	$ -	$ 174	$2	$26	$-	$28	$-	$-	$-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 487
District 4																			
Siletz	$ -	$ -	$ -	$ -	$-	$ -	$-	$ -	$-	$-	$-	$ 1	$ -	$ -	$ -	$ -	$ -	$ -	$ 1
Waldport	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	5
Depoe Bay	43	-	-	180	-	-	-	-	-	-	-	-	-	-	19	3	-	1	246
Newport	315	-	-	674	-	-	-	-	-	-	-	420	-	674	927	647	120	-	3,777
TOTAL	$ 358	$ -	$ -	$ 854	$-	$ -	$-	$ -	$-	$-	$-	$ 421	$ -	$ 674	$ 946	$ 650	$120	$ 6	$ 4,029
District 5																			
Florence	$ 67	$ -	$ -	$ 36	$-	$ -	$-	$ 3	$-	$-	$-	$ 10	$ -	$ -	$ 12	$ -	$ -	$ -	$ 128
District 6																			
Winchester B.	$ 102	$ -	$ -	$ 266	$-	$ -	$-	$30	$4	$-	$-	$ 170	$ -	$ 182	$ 99	$ 288	$ -	$ -	$ 1,141
District 7																			
Coos	$ 934	$ -	$ -	$ 784	$-	$ -	$-	$ 8	$2	$-	$-	$ 620	$ 5	$ 999	$1,202	$ 602	$ 17	$ -	$ 5,173
Bandon	217	-	-	106	-	-	-	6	-	-	-	1	-	41	18	5	-	-	394
Port Orford	425	-	-	110	-	-	-	-	-	-	-	410	-	111	3	19	-	-	1,078
Gold Beach	66	-	-	75	-	-	-	-	-	-	-	-	-	2	-	1	-	-	144
Brookings	342	-	-	181	-	-	-	-	-	-	-	463	-	44	48	150	-	-	1,228
TOTAL	$1,984	$ -	$ -	$1,256	$-	$ -	$-	$14	$2	$-	$-	$1,494	$ 5	$1,197	$1,271	$ 777	$ 17	$ -	$ 8,017
District 9																			
Col. River																			
(Zones 6-6-9)	$ 354	$ 21	$ -	$ 8	$-	$ 3	$-	$ 2	$-	$-	$-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 388
Total Col. R.	$2,976	$ 21	$ -	$1,043	$1	$91	$1	$31	$-	$-	$-	$ -	$ -	$ -	$ -	$ 7	$ -	$16	$ 4,189
Total Ocean	$2,680	$ -	$ -	$3,128	$-	$ -	$-	$47	$6	$-	$-	$3,221	$40	$3,237	$7,500	$2,967	$387	$10	$23,223
GRAND TOTAL	$5,656	$ 21	$ -	$4,171	$1	$91	$1	$78	$6	$-	$-	$3,221	$40	$3,237	$7,500	$2,974	$387	$26	$27,412

1/ Includes $5,794 received for albacore, $1,706 received for other tuna species.
2/ Includes $16 for crayfish, $9 for sand shrimp, $1 for other miscellaneous species.

DEPARTMENT OF FISH AND WILDLIFE
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Commercial Food Fish Landings in Pounds Round Weight by State of Oregon
Administrative District for Calendar Year 1976

	Chinook[1]	Steel-head	Sock-eye	Coho[1]	Sturgeon Chums	Sturgeon White	Sturgeon Green	Shad	Smelt	Pinks[1]	Crabs	Clams	Shrimp	Tuna[2]	Ground-fish	Oysters[3]	Misc.[4]	Total
District 1																		
Col. River																		
(Zones 1-2-7)	1,788,074	-	13	760,817	8,978	310,497	35,149	7,038	1,914	-	-		-	-	55,162	-	13,545	2,994,656
Astoria	308,484	-	-	868,830	-	6,386	2,911	-	-	7	1,353,092	117,476	5,700,549	16,166,021	12,653,359	-	551	37,164,197
Tillamook	78,589	-	-	744,206	-	-	-	8	-	-	375,216	875	3,794,571	7,756	92,872	118,168	13,922	5,226,183
Pacific City	34,766	-	-	911,771	-	-	-	8	-	62	337	-	-	-	16,254	-	879	964,077
Netarts Bay	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	368	368
Nehalem Bay	60	-	-	2,035	-	-	-	-	-	-	-	-	-	625	244	-	248	3,212
TOTAL	2,209,973	-	13	3,287,659	8,978	316,883	38,060	7,054	1,914	69	1,728,645	118,351	9,495,120	16,174,402	12,817,891	118,168	29,513	46,352,693
District 2																		
Col. River																		
(Zones 3-4-5)	284,009	-	-	220,358	1,133	144,777	76	161,437	17,588	-	-		-	-	70	-	-	829,448
District 4																		
Siletz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	24
Waldport		-	-		-	-	-	-	-	-	973	480	-	-	-	-	9,775	12,641
Depoe Bay	37,666	-	-	565,803	-	-	-	-	-	-	-	-	-	267	11,551	-	764	616,051
Newport	384,781	-	-	2,079,597	-	180	2,536	196	-	444	1,117,154	-	7,779,329	414,896	5,146,880	39,416	39,269	17,003,265
TOTAL	422,447	-	-	2,645,400	-	180	2,536	196	-	444	1,118,127	480	7,779,329	415,163	5,158,431	39,416	49,832	17,631,931
District 5																		
Florence	29,916	-	-	113,329	-	-	-	11,875	-	-	47,577	-	-	481	4,898	-	-	208,076
District 6																		
Winchester B.	80,792	-	-	637,128	-	-	-	136,553	-	98	319,996	-	575,450	76,097	1,203,942	-	45,310	3,075,366
District 7																		
Coos	610,196	-	-	3,393,572	-	-	273	9,089	259	3,741	1,427,844	87,192	6,214,827	512,827	6,315,464	8,544	5,957	18,589,785
Bandon	153,660	-	-	399,835	-	-	-	6,485	-	1,958	15,611	-	13,420	18,481	31,396	-	-	640,846
Port Orford	170,757	-	-	229,525	-	-	-	-	-	63	1,903,188	22	758,239	9,524	111,114	-	2,951	3,185,383
Gold Beach	119,079	-	-	163,418	-	-	-	216	-	5	-	-	-	3,601	10,379	-	-	296,638
Brookings	201,069	-	-	311,288	-	-	-	44	-	-	1,573,077	-	619,622	138,834	1,276,391	-	9,463	4,129,788
TOTAL	1,254,761	-	-	4,497,638	-	-	273	15,834	259	5,767	4,919,720	87,214	7,606,108	683,267	7,744,744	8,544	18,371	26,842,500
District 9																		
Col. River																		
(Zones 6-8-9)	538,106	33,548	386	12,196	-	22,055	-	79,686	-	-	-		-	-	-	-	-	685,977
Total Col. R.	2,610,189	33,548	399	993,371	10,111	477,329	35,225	248,161	19,502	-	-	418		-	55,232	-	13,545	4,510,681
Total Ocean	2,209,815	-	-	10,420,337	-	6,566	5,720	164,474	259	6,378	8,134,065	205,627	25,456,007	17,349,410	26,874,744	166,128	129,481	91,115,960
GRAND TOTAL	4,820,004	33,548	399	11,413,708	10,111	483,895	40,945	412,635	19,761	6,378	8,124,065	206,045	25,456,007	17,349,410	26,929,976	166,128	143,026	95,626,041

1/ Chinook, coho and pink salmon are landed at ocean ports in dressed form. Conversion to pounds round weight was made by multiplying dressed weight by a factor of 1.15.
2/ Includes 5,933,617 pounds albacore, 11,415,793 pounds of other tuna species.
3/ Oyster harvest is reported in gallons and converted to pounds by multiplying by a factor of 8.0.
4/ Miscellaneous includes landings of crayfish, sand shrimp, herring, mackerel, eel, octopus, anchovies, and surf perch.
DEPARTMENT OF FISH AND WILDLIFE July 1978

Estimated Value in Thousands of Dollars at Fishermen's Level of Commercial Food Fish Landings
by State of Oregon Administrative District for Calendar Year 1976

	Chinook	Steel-head	Sockeye	Coho	Chums	Sturgeon White	Sturgeon Green	Shad	Smelt	Pinks	Crabs	Clams	Shrimp	Tuna[1]	Ground-fish	Oysters	Misc.[2]	Total
District 1																		
Col. River																		
(Zones 1-2-7)	$2,521	$ -	$-	$ 913	$7	$145	$4	$ 1	$-	$-	$ -	$ -	$ -	$ -	$ 7	$ -	$ 7	$ 3,605
Astoria	435	-	-	940	-	3	-	-	-	-	880	105	1,140	5,093	1,910	-	-	10,506
Tillamook	117	-	-	819	-	-	-	-	-	-	244	-	759	4	14	250	7	2,214
Pacific City	53	-	-	1,001	-	-	-	-	-	-	-	-	-	-	-	-	-	1,054
Netarts Bay	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nehalem Bay	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2
TOTAL	$3,126	$ -	$-	$ 3,675	$7	$148	$4	$ 1	$-	$-	$1,124	$105	$1,899	$5,097	$1,931	$250	$14	$17,381
District 2																		
Col. River																		
(Zones 3-4-5)	$ 391	$ -	$-	$ 264	$1	$ 62	$-	$37	$1	$-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 756
District 4																		
Siletz	$ -	$ -	$-	$ -	$-	$ -	$-	$ -	$-	$-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Waldport	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	5	7
Depoe Bay	59	-	-	617	-	-	-	-	-	-	-	-	-	-	2	-	-	678
Newport	605	-	-	2,294	-	-	-	-	-	-	726	-	1,556	199	906	93	1	6,379
TOTAL	$ 664	$ -	$-	$ 2,911	$-	$ -	$-	$ -	$-	$-	$ 727	$ -	$1,556	$ 199	$ 908	$ 93	$ 6	$ 7,064
District 5																		
Florence	$ 47	$ -	$-	$ 125	$-	$ -	$-	$ 3	$-	$-	$ 31	$ -	$ -	$ -	$ 1	$ -	$ -	$ 207
District 6																		
Winchester B.	$ 125	$ -	$-	$ 703	$-	$ -	$-	$29	$-	$-	$ 208	$ -	$ 115	$ 37	$ 201	$ -	$ 1	$ 1,418
District 7																		
Coos	$ 946	$ -	$-	$ 3,741	$-	$ -	$-	$ 2	$-	$4	$ 928	$ 17	$1,242	$ 246	$1,030	$ 12	$ 1	$ 8,169
Bandon	244	-	-	442	-	-	-	1	-	2	10	-	3	9	4	-	-	715
Port Orford	272	-	-	250	-	-	-	-	-	-	1,237	-	152	5	16	-	1	1,933
Gold Beach	191	-	-	179	-	-	-	-	-	-	-	-	-	2	1	-	-	373
Brookings	316	-	-	345	-	-	-	-	-	-	1,023	-	124	67	210	-	2	2,087
TOTAL	$1,969	$ -	$-	$ 4,957	$-	$ -	$-	$ 3	$-	$6	$3,198	$ 17	$1,521	$ 329	$1,261	$ 12	$ 4	$13,277
District 9																		
Col. River																		
(Zones 6-8-9)	$ 355	$28	$-	$ 10	$-	$ 10	$-	$17	$-	$-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 420
Total Col. R.	$3,267	$28	$-	$ 1,187	$8	$217	$4	$55	$1	$-	$ -	$ -	$ -	$ -	$ 7	$ -	$ 7	$ 4,781
Total Ocean	$3,410	$ -	$-	$11,458	$-	$ 3	$-	$35	$-	$6	$5,288	$122	$5,091	$5,661	$4,295	$355	$18	$35,742
GRAND TOTAL	$6,677	$28	$-	$12,645	$8	$220	$4	$90	$1	$6	$5,288	$122	$5,091	$5,661	$4,302	$355	$25	$40,523

1/ Includes $2,848 received for albacore, $2,813 received for other tuna species.
2/ Includes $7 for crayfish, $12 for sand shrimp, $3 for octopus and lesser amounts for the other species.

DEPARTMENT OF FISH AND WILDLIFE
July 1978

19. OCEAN RESOURCES

GOAL

OVERALL STATEMENT

To conserve the long-term values, benefits and natural resources of the nearshore ocean and the continental shelf.

All local, state, and federal plans, policies,projects, and activities which affect the territorial sea shall be developed, managed and conducted to maintain, and where appropriate, enhance and restore, the long-term benefits derived from the nearshore oceanic resources of Oregon. Since renewable ocean resources and uses, such as food production, water quality, navigation, recreation, and aesthetic enjoyment, will provide greater long-term benefits than will non-renewable resources, such plans and activities shall give clear priority to the proper management and protection of renewable resources.

INVENTORY REQUIREMENTS

As local governments and state and federal agencies implement plans or carry out actions, projects, or activities related to or affecting ocean resources, they shall develop inventory information necessary to understand the impacts and relationship of the proposed activity to continental shelf and nearshore ocean resources. As specific actions are proposed, inventory information shall be gathered by the unit of government considering the action with assistance from those agencies and governments which use or manage the resources. The inventory shall be sufficient to describe the long-term impacts of the proposed action on resources and uses of the continental shelf and nearshore ocean.

IMPLEMENTATION REQUIREMENTS

(1) State and federal agencies with planning, permit, or review authorities affected by the Ocean Resources Goal shall review their procedures and standards to assure that the objectives and requirements of the goal are fully addressed. The following authorities are of special concern:

Division of State Lands	
Fill and Removal Law	ORS 541.605 --541.665
Mineral Resources	ORS 273.775 --273.780
Submersible and Submerged lands	ORS 274.005 --274.940
Kelp Law	ORS 274.885--274.895
Department of Economic Development	
Ports Planning	ORS 777.835
Department of Geology and Mineral Industries	
Mineral Extraction	ORS 520.005
Oil and Gas Drilling	--520.095
Department of Energy	
Regulation of thermal power and nuclear installation	ORS 469.300 --469.570
Department of Environmental Quality	
Water Quality Permits	ORS 468.700 --468.775
Oil spillage Regulation	ORS 468.780 --468.815
Department of Fish and Wildlife	
Fisheries regulation	ORS Chapter 506

(2) Each state and federal agency, special district, city and county

within the limits of its jurisdiction and as necessary to:

(i) determine the impact of proposed projects or actions; and
(ii) for the sound conservation of ocean resources; shall:

(a) Fishery Resources

(i) Develop scientific information on the stocks and life histories of commercially, recreationally, and ecologically important species of fish, shellfish, marine mammals and other marine fauna.
(ii) Designate and enforce fishing regulations to maintain the optimum sustainable yield (OSY) while protecting the the natural marine ecosystem.
(iii) Develop and encourage improved fishing practices and equipment to achieve the OSY while protecting the natural marine ecosystem.
(iv) Develop scientific understanding of the effects of man's activities, including navigation, mineral extraction, recreation, and waste discharge, on the marine ecosystem.

(b) Biological Habitat

(i) Identify and protect areas of important biological habitat, including kelp and other algae beds, seagrass beds, rock reef areas and areas of important fish, shellfish and invertebrate concentration.
(ii) Identify and protect important feeding areas; spawning areas; nurseries; migration routes; and other biologically important areas or marine mammals, marine birds, and commercially and recreationally important fish and shellfish.
(iii) Determine and protect the integrity of the marine ecosystem, including its natural biological productivity and diversity.

(c) Navigation and Ports

(i) Determine for the state as a whole, the navigation needs for the coast of Oregon. Such needs will reflect, in part, the capability of each port to handle differing types of ship traffic, consistent with other statewide planning goals.
(ii) Maintain appropriate navigation lanes and facilities free from interference by other uses to provide safe transportation along and to the Oregon Coast.

(d) Aesthetic Use

Maintain the aesthetic enjoyment and experiences provided by ocean resources.

(e) Recreation

Identify, maintain and enhance the diversity, quality, and quantity of recreational opportunities on and over the Oregon continental shelf, as consistent with the Beaches and Dunes Goal and Estuarine Resources Goal.

(f) Waste Discharge and Mineral Extraction

Provide that ~~extraction~~ of materials from or discharge of waste products into or affecting the Oregon territorial sea do not substantially interfere with or detract from the use of the continental shelf for fishing, navigation, recreation, or aesthetic purposes, or from the long-term protection of renewable resources.

(g) Dredged Material Disposal

Provide for suitable sites and practices for the open sea discharge of dredged materials, which do not substantially interfere with or detract from the use of the continental shelf for fishing, navigation, or recreation, or from the long-term protection of renewable resources.

(h) Archaeological Sites

Identify and protect, whenever possible, significant underwater archaeological sites of the continental shelf.

(3) Contingency Plans

Before issuing permits for development on the Oregon continental shelf, state and federal agencies, in coordination with the permitee, shall establish contingency plans and emergency procedures to be followed in the event that the operation results in conditions which threaten to damage the environment.

GUIDELINES

A. Implementation

The Ocean Resources Goal does not include any specific plan requirements. It primarily sets implementation requirements, giving priority to certain uses and requiring that actions affecting Ocean Resources must be preceded by an inventory and based on sound information.

These requirements address all units of government. Examples of plans, actions or programs of local government which might affect the identified ocean resources include construction and expansion of port and navigation facilities, recreation use, and disposal of chemical, thermal, sewage or dredged material wastes. Other kinds of actions in ocean resource and continental shelf areas are primarily under the regulatory authority of state and federal agencies; these activities must be closely coordinated with local government to avoid or minimize impact on adjacent and affected upland areas.

B. Inventory

The goal does not intend that local government and state and federal agencies develop complete inventories of ocean resources. Rather, it requires that actions affecting the nearshore ocean and continental shelf areas be based upon a sound understanding of the resources and potential impacts. Therefore, the inventory should identify the affected ocean area and describe the extent and significance of:

1. Hydrographic conditions and processes, including characteristics of ocean waves, current, tidal, water quality, and bottom;
2. Geology;
3. Biological features, including fish and shellfish stocks; other biologically important species; important habitat areas including sea grass and algae beds; and other elements important to maintaining the biological resource such as plankton and benthos;
4. Mineral deposits, including sand and gravel and hydrocarbon resources; and
5. Present and projected uses, use patterns, and values associated with the ocean resource, including commercial fishing, port and navigation uses, recreational activities, and waste discharges.

C. Research

Resource agencies and research organizations should continue to develop complete and comprehensive information on ocean resources to promote their proper management and protection.

D. Fish Harvest

State and federal agencies should encourage, where appropriate and in keeping with sound practices for conservation of ocean resources, the exploitation of unutilized and underutilized fish species.

E. Permits

Permits for development on the Oregon continental shelf should:

1. Designate areas within the proposed development where activities such as exploration and extraction, will be prohibited;
2. Specify methods and equipment to be used and standards to be met;
3. Require the developer to finance monitoring and inspection of the development by the appropriate state agency;
4. Require that pollution abatement utilize the best available technology when needed to protect coastal resources;
5. Require the developer to be liable for individual or public damage caused by the development and to post adequate bonding or other evidence of financial responsibility to cover damages;

6. Specify the extent of restoration that must be accomplished, where appropriate, when the development is finished;

7. Specify that the state or federal government may revoke or modify a permit to prevent or halt damage to the environment and that such revocation or modification will recognize vested rights of the developer;

8. Require the developer to describe the extent and magnitude of onshore support and operation facilities and their social, economic and environmental impacts on the Oregon coast; and

9. Be available for public review and comment before issuance.

APPENDIX C - OREGON COASTAL ZONE FISHERY MANAGEMENT CONTACTS

Name	Agency	Location
Dave Johnson	Salmon Troller	Astoria
Betty Fowler	Oyster Grower	Newport
Larry Qualman	Oyster Grower	Charleston
Lee Hanson	Oyster Hatchery	Netarts Bay
Bob Olson	Olson Oyster Co.	Garibaldi
Neal Coenen	DLCD	Salem
Glen Carter	DEQ	Portland
Duane Karna	EPA	Seattle
Jack Kincheloe	USF&W	Portland
Keith Stewart	PEA	Portland
Floyd Shelton	ODED	Portland
Bill Dickinson	NMFS	SEattle
Bill Wagner	Daily Astorian	Astoria
Bill Wick	OSU Sea Grant	Corvallis
Bob Kuhn	ODFW	Portland
Jeff Tobolski	Earl R. Combs, Inc.	Seattle
Wilbur Ternyik	OCZMA	Florence
Pat Amadeo	Governor's Office	Salem
Barry Fisher	Seawest Fisheries	South Beach
Chuck Moulton	Eureka Fisheries, Inc.	Brookings
Jerry Bates	Depoe Fish Co.	Newport
Sue Harrington	Tom Lazio Fish Co.	Newport
Mike Sehayler	New England Fish Co.	Newport
Doug Stafford	Charter Ocean Products	Charleston

Name	Agency	Location
Tom Bourns	Eureka Fisheries, Inc.	Coos Bay
Nick Bulgaris	Bumble Bee	Astoria
Roy Haug	Astoria Fish Packers	Astoria
Dana Besecker	Barkey Packing Co.	Astoria
W. Alder	Ocean Sea Foods	Astoria
Ray Kraatz	NMFS	Seattle
Bob Balkovic	NMFS	Seattle
Dr. Alverson	NMFS	Seattle
Lorry Nakatsu	NMFS	Seattle
Larry Six	PFMC	Portland
John Bishop	NMFS	Seattle
Kay Brown	ODFW	Portland
Rich Berry	ODFW	Portland
Cristopher Carter	ODFW	Portland
Ken Hall	ODFW	Portland
Jerry Lukas	ODFW	Newport
Robert Schoning	OSU	Corvallis
Merritt Tuttle	NMFS	Portland
Chuck Walters	NMFS	Portland
Kim Larson	Corps of Engineers	Portland
Bruce Cole	National Fisherman	Seattle
Ray Lewis	Alaska Packers	Seattle
Pete Harris	New England Fish Co.	Seattle
Terry Nosho	Sea Grant	Seattle
Tom Libby	Alaska Packers	Hammond
Ed Cummings	ODFW	Portland
Wally Perera	Marine Resources	Seattle

Name	Agency	Location
John Harvill	PMFC	Portland
Mike Fraser	PMFC	Portland
Wayne Johnson	NEFCO	Newport
Jack Damron	Oregon Trawl Commission	Astoria
Bob Hudson	All Coast Fishermen's Marketing Association	Charleston
Dick Nelson	NMFS	Seattle
Bob Jacobson	OSU Sea Grant	Newport
Kirk Beiningen	ODFW	Portland
Dick Carruthers	Bioproducts	Astoria
Tom Gaumer	ODFW	Newport
Jack Robinson	ODFW	Newport
Clyde Hamstreet	Fisheries Development	Newport
Mike Hosie	ODFW	Charleston
Jim Bergeron	Extension Agent	Astoria
Harry A. Utti	Port of Astoria	Astoria
Steve Felkins	Port of Coos Bay	Coos Bay
Darold G. Richcreek	Port of Newport	Newport
Joseph W. Sabia	Port of Brookings	Brookings
Basil Edmans	Port Manager	Garibaldo
Jim Lannon	OSU-MSC	Newport
Duncan Law	OSU Seafood Lab	Astoria
Mr. Harris	Tillamook Oyster Co.	Tillamook
Mrs. Jim Irwin	Fishermen's Wives Association	Brookings
Jim Irwin	Fishermen's Marketing Association	Brookings
Fred Wingard	Fishermen's Marketing Association	Brookings

Name	Agency	Location
Larry Carlson	Oregon Trawl Commission	Brookings
Joe Easly	Fishermen's Marketing Association	Brookings
Mike Storey	Trawler	Astoria
Wayne Viakola	Bottom Trawler	Astoria
Jim Copenhauer	Shrimper	Astoria
Ray Toste	Shrimper	Warrenton
Dave Duncan	Shrimper	Astoria
Edlon Korpela	Economic Development Commission	Astoria
Bill Neff	Pacific Whiting	Astoria
RoySigardson	Bell Buoy Crab Co.	Seaside
Harry Howard	Meredith Fish Co.	Brookings
Jessie Hayes	Hayes Oyster Co.	
	Hoy Bros.	Garibaldi
	Phil and Joe's Crab Co.	Garibaldi
	Smith's Pacific Shrimp	Garibaldi

This is a data compilation for the Oregon Coastal Zone Fishery Management Analysis Report. It contains information on salmon aquaculture firms; port-owned commercial fishing facilities; public and private marinas with commercial fishing facilities; and information about various seafood processing firms.

A. OREGON PRIVATE SALMON HATCHERIES

OREGON PRIVATE SALMON HATCHERIES
Department of Fish & Wildlife
May 1979

Name-Address	Date of Original Permit	Species			Site Location
		Coho	Chinook	Chum	
Keta Corporation c/o Linton Whittles 22930 Sandlake Rd. Cloverdale 97112	12/1/71			X	Sand Creek, Sand Lake
Siuslaw Fisheries 31766 Freedom Lane Eugene 97401 Attn: Gary Brain	3/19/72			X	Sweet Creek, Siuslaw River
Alfred Hampson 505 Pacific Bldg., 520 SW Yamhill St. Portland 97204	10/31/73			X	Sand Creek, Sand Lake
Cecil D. Harris & Don Hugie 3460 Bayocean Road N.W. Tillamook 97141	8/23/72			X	Dick Creek, Tillamook Bay
Ceratodus Fisheries C/O John S. Marshall 6523 E. Street Springfield 97477	12/28/73			X	Divide Creek, Siuslaw R.
Oregon Aqua Foods, Inc. PO Box 1218 Newport 97365	11/1/72			X	Wright Creek and South Beach Yaquina Bay
Send Mail to: Oregon Aqua Foods, Inc. 88700 Marcola Road Springfield 97477	3/19/74	X	X		
Anadromous, Inc. Ernest R. Lewis, Pres. Rt 2, Box 2013 Deer Island, OR 97054	10/24/74	X	X		Jordan Point, Coos Bay

OREGON PRIVATE SALMON HATCHERIES (cont'd)

Name-Address	Date of Original Permit	Species			Site Location
		Coho	Chinook	Chum	
Arnold L. Manseth & Jon Jaqua 34320 McKenzie View Dr. Eugene 97401	3/4/76			X	Vosberg Creek--Nehalem Bay
Calvin W. Heckard Rt. 4, Box 152 Coos Bay 97420	3/4/76			X	Unnamed tributary of Coos Bay
Robert Stricklin Rt. 1, Box 538 Warrenton 97146	3/4/76			X	Unnamed tributary of Skipanon R.
Oregon Aqua Foods 88700 Marcola Road Springfield 97477	7/30/76	X	X	X	Manmade trib. of Coos Bay
Domsea Farms, Inc. 510 Washington Avenue Bremerton, WA 98310	5/5/78	X	X	X	Siuslaw Estuary
Burnt Hill Salmon Ranch, Inc.[1/] P. O. Box 40521 Portland 97240	4/25/78		X		Burnt Hill C.
TOTAL		4	5	11	

1/ Authorized but not issued pending completion of zoning and funding details.

B. EXISTING COMMERCIAL FISHING SPACE, MOORAGE FACILITIES AND BACK-UP FACILITIES FOR SELECTED OREGON PORTS (FROM INTERVIEWS WITH PORT MANAGERS)

PORT	SPACE MOORAGE	BACK UP FACILITIES	
Astoria	East End Basin-Currently trying to find funds for expansion and construction of breakwater will be capable of accomodating 40 vessels _ 85' long West End Basin: Expand for additional 300 boats primarily gill netters, small trollers and draggers and pleasure boats	Ice Plants:	CRPA cold storage at Bumble Bee. Only those selling fish to Bumble Bee are allowed to use facility
		Hoist:	On Pier 2. Can handle small fishing boats. The cargo for larger boats, No hoists for smaller gear.
		Gear Storage:	Pier #1 warehouse, 60,000 sq. ft. good condition. Two section of warehouse on Pier #3 now used for processing. Use determined by commissioners.
		Fuel Docks:	One Union Oil, one Chevron 1 mile east fishermans dock/marina owned by Port of Astoria. Fuel docks open to anyone needing fuel.
		Boat Repair:	AMCO (Astoria Marina) on Lewis and Clark River. Has two marine ways and two 250' covered areas for repair. Also one outfitting dock for _ 4 or 5 60' vessels. Bumble Bee (CRPA) shipyard
Bay City-Garibaldi		Ice Plants:	P.M. Seafoods - 24 tons/day, 50 ton storage Hoy Brothers - 50 ton storage Smith's - Produce and store very little Ice is only for their own boats
		Hoist:	Processors own their hoists. Boat yard & boat launching yds. have cranes to move boat. Also 100 ton floating dry dock.
		Gear Stroage:	Very little space fisherman store gear off port property.
		Fuel Docks:	Every plant has own fuel dock. Own fishermen use docks first.
		Boat Repair, Etc:	Minimal facilities for engine repair mechanics from Port must be called down to do engine repair. Marine Hardware has good supplies and availability.

PORT	SPACE	MOORAGE
Newport	6 acres land 45' high water South Beach 26 acres high water	Not definite on % moorage sport-comm. 90% pleasure out of 500 boats. S. Beach all plea- sure, sport

The Port of Newport does want a larger fishing industry.
They are increasing the size of present moorage slips and realigning slips to improve movement in and out of harbor.
After renovation the port will be able to accomodate boats in the 75'-80' range.
The port does not expect the Oregon fishing industry to expand rapidly to boats of 100' or greater.

Warrenton	Enlarged port for draggers, shrimpers over 55' 1st year. Plans for gas dock and 30 boat dock for boats 55'.	343 Moorage slips 240=sports 103=commercial 23 slips for vessel 70' 30 for 30-50' 50 for 20-30'

BACK UP FACILITIES

Ice Plant:	Port does not operate a plant. All ice is presently supplied through the processors. There is a severe ice shortage in Newport. The port is considering a plan to add ice facilities.
Hoist:	One at Port Office, 3500 lbs lift. A fee is charged for its use and it does not meet needs in peak use periods.
Gear Storage:	In parking lot. 2-3 acres for storage. Use is subject to space availability. Storage used for crab pots, crab tanks, other gear.
Fuel Docks:	Three at the Port of Newport. New one at So. Beach. Moderate use and congestion. Fuel allotment only 96% of last year.
Boat Repair:	GMC at So. Beach Catapilliar, GMC in town 3 electronic stores 3 marine stores in town 2 boat repairs upriver and 1 in Toledo 1 private boat repair facility has been proposed for the port.

Ice Plants:	Port has no ice facilities. Ice presently obtained from New England and Alaska Pakcers. Anyone can buy ice from these processors.
Hoist:	Presently putting in new 2500 pound hoist at new dock. Hoist is open to the public.
Gear Storage:	Most private all around town. Many new or in good condition. Capacity not known.
Fuel Docks:	Plans for one in the future.
Boat Repair:	"Jim's Diesel" on the basin. Warrenton Auto-Marine Grants Union gas dock Warrenton Boat yard Bumble Bee Boat yard Availability is good but high prices prevail.

PORT	SPACE	MOORAGE
Coos Bay	7,000 acres (6,000 can't be developed as it is wet-lands) 650 acres now developed	Of the developed port about 50% of the moorage slips are commercial 180 new moorage slips planned to accomodate an additional 70 boats, 2 80'

Port of Coos Bay does want a larger fishing industry. To enlarge the fishing industry the port must phase out sport expansion. All expansion is presently for commercial boats. Charleston boat basin is being enlarged and there are plans for an industrial park (processor) complex (284 acres) on the north spit.
State agencies are not coordinated to commercial needs and port's planning proposals. Ports and processing plants need to shift plans to accomodate larger trawl boats and greater processing demand. Processors need 5-10 acres for plant sites. Product must be shipped by trucking industry and larger amount of space is needed for this. New plants cost $7 million.
Coos Bay needs dredging, jetty extensions.

BACK UP FACILITIES

Ice Plants:	Three plants owned by processors plus one independent company - 70 tons per day. Still shortages of supply. Also short on cold storage facilities. Plan to build storage unit at industrial park.
Hoist:	Port does not manage any docks. Docks are leased out to processors who put up hoists.
Gear Storage:	96 unit dry storage. ½ for boat storage, ½ for gear at Charleston boat basin. Industrial Park will add storage as needed.
Fuel Docks:	Port's leased out to Hillstrom Marine. Also additional 6 private marine fuel docks. Three in Charleston, one in Empire, and two in Coos Bay.
Boat Repair:	Three ship yards. Two under construction will have capacity of 300' boats. Capacity presently at 110' Hillstrom Ship Builders - Coos Bay Mid-coast Marine - East side One in Charleston

PORT	SPACE	MOORAGE
Brookings	Land = 30 acres	50-50 sport
	Water = 30 acres	Commercial 200 on each side waiting to get in.

This port does want larger fishing industry and would like to expand upriver or into the old deep water port.
Generally the port has good rapport with state agencies; however, the port feels agencies limited ability of port to expand and operate. E.G. the harbor cannot be dredged to 7 22' max, thus making it a shallow port. Port generates $31 million in income all uses combined. This money turns over 2.4x to generate $84 million for county.

BACK UP FACILITIES

Ice Plants:	Eureka Fish only plant; inadequate for the fleet Need more cold storage. Presently there is "Randy's" cold storage at port and one more cold storage facility in town.
Hoist:	Two hoists, one light duty, one heavy duty (1500 lb) Also mobile crane w/3000 pounds capacity. The fish buyers also have one apiece, one of which is 2500 pound capacity.
Gear Storage:	A lease has been signed and a new 2-story 40 unit building is proposed to be built this year within 5 months.
Fuel Docks:	Only one fuel dock, owned by Eureka Fish. Capacity of 2-3 boats (inadequate for the fleet).
Boat Repair:	Hillstroms Ship Buildings. Eureka Fish owns trailer that can lift 30-35' boats out of water. Need new facilities. These present facilities are over crowded and in poor condition.

C. MARINAS (PUBLIC AND PRIVATE) AND ASSOCIATED FACILITIES
(FROM ECONOMIC CONSULTANTS OF OREGON)

Facility Name	Location	Ownership	Water Surface Acres	Max. Boat Size	Permanent Moorage Spaces	Transient Moorage Spaces	Percent Commercial	Covered Dry Storage	Open Dry Storage	Hoist Capacity (T=tons)	Fuel	Ice	Shower	Repair	Drydoc
Siuslaw Pacific Moorage	Siuslaw R.	Private	2.54	150'	90	20	?		25 spaces	5T; 7T	□	□			
Bay Bridge Marina	Siuslaw R.	Private	2.45	30'	110	--	5%				□	□	□		
Port of Siuslaw Comm. Moor. Basin	Siuslaw R.	Port	2.61	70'	65	28	100%	2400'^{2}	20,000'^{2}	□	□	□	□	□	
Siuslaw Marina	Siuslaw R.	Private	1.03	30'	30	10	50%			2T				□	
Salmon Harbor Moorage	Umpqua R.	County & Port	36.00	90'	944	100	40%				□		□		
Coho Marina	Umpqua R.	Private	.73	40'	60	15	10%		25 spaces		□	□	□	□	
Charleston Boat Basin	Coos Bay	Port	25.88	90'	558		70%	94 sp.	50 spaces		□	□	□	□	
Hanson's Landing	Coos Bay	Private	6.17	80'	100		75%		60 spaces	32'				□	
City of Coos Bay Moorage	Coos Bay	Municipal	.41	50'	18	5	50%	--	--	--					
Port Orford Harbor		Port					100%		40 spaces	42'	□		□		
Port of Gold Beach	Rogue R.	Port	77.00	50'	285	24	50%	4500'^{2}			□				
Rogue Bay Wharf	Rogue R.	Private	.23	30'	20		< 10%	5000'^{2}							
Port of Brookings Moorage	Chetco R.	Port	56.00	75'	1053	8	36%				□		□	□	
Hillstroms	Chetco R.	Private							50 spaces					□	□

Facility Name	Location	Ownership	Water Surface Acres	Max. Boat Size	Permanent Moorage Spaces	Transient Moorage Spaces	Percent Commercial	Covered Dry Storage	Open Dry Storage	Hoist Capacity (T=tons)	Fuel	Ice	Shower	Repair	Drydoc
Garibaldi Basin	Tillamook	Port	22.96	70'	350	--	50%	--	--	50T; 4T	□	□	□	□	□
Garibaldi Marina	Tillamook	Private	1.14	24'	60		<10%				□	□			
Garibaldi & Tillamook Marina	Tillamook	Private	.19	35'	11	1	20%	200'	1200'				□	□	
Depoe Bay	Depoe Bay	Municipal	3.00	55'	124	41	60%								
Neptune's Wharf	Yaquina Bay	Private	.34	35'	12	1	50%								
Seagull Landing	Yaquina Bay	Port (leased)	.20	27'	24	4	36%								
Port of Newport Commer. Boat Basin	Yaquina Bay	Port	22.00	90'	498	75	85%								
Embarcadero	Yaquina Bay	Private	6.50	50'	232	6	25%				□	□			
Yaquina Marina	Yaquina R.	Private	.50	27'	54	3	20%				□	□			
Riverbend Moorage	Yaquina R.	Private	1.30	36'	175	--	10%	100'		36'	□	□	□	□	
Criteser Moorage	Yaquina R.	Private	1.14	40'	75	--	100%			25'				□	
Port of Toledo Moorage	Yaquina R.	Port	.31	45'	16	--	75%								

D. SELECTED SEAFOOD PROCESSORS INVENTORY (FROM INTERVIEWS)

PROCESSOR	EMPLOYEES	PAYROLL	SPECIES PROCESSED	POUNDS PROCESSED ANNUALLY	ANNUAL CAPACITY	LANDING FACILITIES	SERVICE FACILITIES
Astoria Seafoods (Astoria)	100		btm fish (some hake)	3-3.5 million	6-7 million	110' boats	none
			shrimp	1.0 million	1.2 million	draft no problem 3	
			troll salmon	150,000 (silver)			
			gillnet salmon	3-500,00 (chinook)			
			dungeness	500,000	50,000/day		
Bumble Bee (Astoria)	1000		tuna crab salmon shrimp btm fish smelt (fish-meal, oil, & pet food)	60 million	120 million	225' bts 24' draft 5 hoists	shipyard (95' limit) GM dealor for engines, no fuel
Alaska Packers Association (Newport 80 Hammond 260 Charleston 60)	400		btm fish (no hake) shrimp salmon crab	27 million	40 million	Newport 140'bts draft no prob 2 hoists Charleston 100' bts draft 7' low tider 2 hoists Hammond 200' bts draft no prob 3 hoists	

PROCESSOR	EMPLOYEES	PAYROLL	SPECIES PROCESSED	ANNUALLY PROCESSED ANNUALLY	ANNUAL CAPACITY	LANDING FACILITIES	SERVICE FACILITIES
Bio-Products (Warrenton)	50		All btm fish except fish food Mid-water round & flat fish	2.5 million	2.5 million	160' bts 30' draft 1 hoist	No service
Barbey Packing Corp. (Astoria)	150		dungeness shrimp salmon btm fish shad sturgeon	12.0 total million	36.0 million	175' bts 25' draft 7 hoists	No service
Pacific Whiting (Astoria)	100		hake blk cod shrimp skate dog fish btm fish salmon		2 million 2 million 2 million 1 million 2 million 1 million 3-500,000	150' bts 12' draft 2 hoists will have 200 ton transport ship to deliver every two days	No service
Astoria Fish Factors	20		btm fish	.75 million	4-5 million	2-300' bts 60-70 drafts 2 hoists	No service
Ocean Foods (Astoria)	75-100		btm fish shrimp albacore smelt salmon crab	4.5 million 1.0 million 15,000 300,000 100,000 750,000	7.0 million 3.0 million 40-45,000 --------- --------- 1.5 million	100' bts draft no limit 3 hoists Have machine shop for welding	No service

PROCESSOR	EMPLOYEES	PAYROLL	SPECIES PROCESSED	POUNDS PROCESSED ANNUALLY	ANNUAL CAPACITY	LANDING FACILITIES	SERVICE FACILITIES
Bell Buoy Crab Co. (Seaside)	50		shrimp crab clams silvers chinook sturgeon	 600,000 200,000 10-15,000 50-60,000 10-15,000	 1.5-2.0 mill 1.0 million 100,000 150,000 30,000	dock & hoist in Warrenton 2/49' boats draft no problem	Boats only
Phil & Joes Crab Co. (Garibaldi)	50		Bottom fish crab	120,000 500,000	240,000 1 million	100' boats draft prob only low tide 1 hoist	bait for crab fishermen
Smiths Pacific Shrimp (Garibaldi)	50		shrimp	1.25 million	50,000/ [1] day	83' max no entry on low tide 2 hoists can unload 2/60' boats at same time	None
Hoy Brothers (Garibaldi)	40		shrimp	500,000	.75-1.0 million	86' max 7-9'draft 1 hoist 1 pneumatic unloading system unloading cap. 2 bts	ice, fuel space facilities for people to work on boats limited amount diesel

1. daily capacity

PROCESSOR	EMPLOYEES	PAYROLL	SPECIES PROCESSED	(ANNUALLY) POUNDS PROCESSED	ANNUAL CAPACITY	LANDING FACILITIES	SERVICE FACILITIES
Olson Oyster Co. (Garibaldi)	10	6-8,000/ month	crab btm fish salmon oysters	150-175,000 200,000 200,000 150 bushels/ week	300,000 200,000 200,000 200/week	60' bt draft no prob 1 hoist conveyer belt for unloading oysters	gas, no diesel

CHARLESTON/COOS BAY

PROCESSOR	EMPLOYEES	PAYROLL	SPECIES PROCESSED	(ANNUALLY) POUNDS PROCESSED	ANNUAL CAPACITY	FACILITIES
Charter Ocean Product. Has working agreement w/LaZios in Charleston and docks next to Eureka Fish in Empire (Charleston/ Coos Bay)	40	160,000	crab btm. fish salmon shad sturgeon tuna trout	2.0 Total	2.0 Total	100' Empire, 80' Charleston draft 26' Empire draft 6' LaZios 1 Empire. Unload 8000 lbs/hr btm fish, shrimp.
Peterson Seafoods 13 acres 400' water frontage	150		Bottom fish other species	2.5 2.5	8.0 4.0	90' boats, 10' draft 6 hoists Provide fuel, showers, bait, ice transportation.
Hallmark Fisheries Plant 300 x 120 ground 450 x 140 320 x 100	120	665,000	Shrimp crab bottom fish	3.5 800,000 1.0	4.0 1.5 1.5	80' boats, 11' max draft, 3 hoists. Provide fuel and ice.
Eureka Fisheries, land 100' x 440' water-6' off 100' dock Leased also 200" finger dock. (40-60,000 lbs hake/day in Eureka)	40		shrimp crab clams	2.5 1.0 variable	2.5 1.0 1500lb/ day	Charleston 85' boats, 5-6' draft low tide 3 hoists, unload 2 boats, simult. rarely 3. Provide ice and fuel.

PROCESSOR	EMPLOYEES	PAYROLL	SPECIES PROCESSED	(ANNUALLY) POUNDS PROCESSED	ANNUAL CAPACITY	FACILITIES
New England Fish Com. 175" (dock frontage) x 120' = after expansion (Newport)	125	750,00	Bottom fish shrimp crab salmon	5.0 2.5 850,000 39,000	10.0 2.5 2 no limit	85' boats, 1 hoist eventually (3) unload 2-boats/day supply ice for fleet
DePoe Bay Fish Com. 100' x 180' frontage is (Newport)	100-115	3-325,000	Bottom fish crab shrimp salmon	2.0 800-1.0 3.5 300,000	2.0 1.0 5-6 no limit	NEWPORT 100' Boats, 12' limit on draft 2 hoists, service facilities-none
Bumble Bee 300' x 100' (Newport)	150	---	btm fish crab shrimp salmon tuna	Can handle 75' boats. Have 6 hoists. Unloading capacity 30-40 boats per day. Provide only ice.		

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