THE SPATIAL CHARACTERISTICS OF THE SEAFOOD PROCESSING INDUSTRY

by

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DEDICATION

This paper is dedicated to the memory of Ed Condon whose ready smile and words of encouragement were an inspiration to all who knew him.

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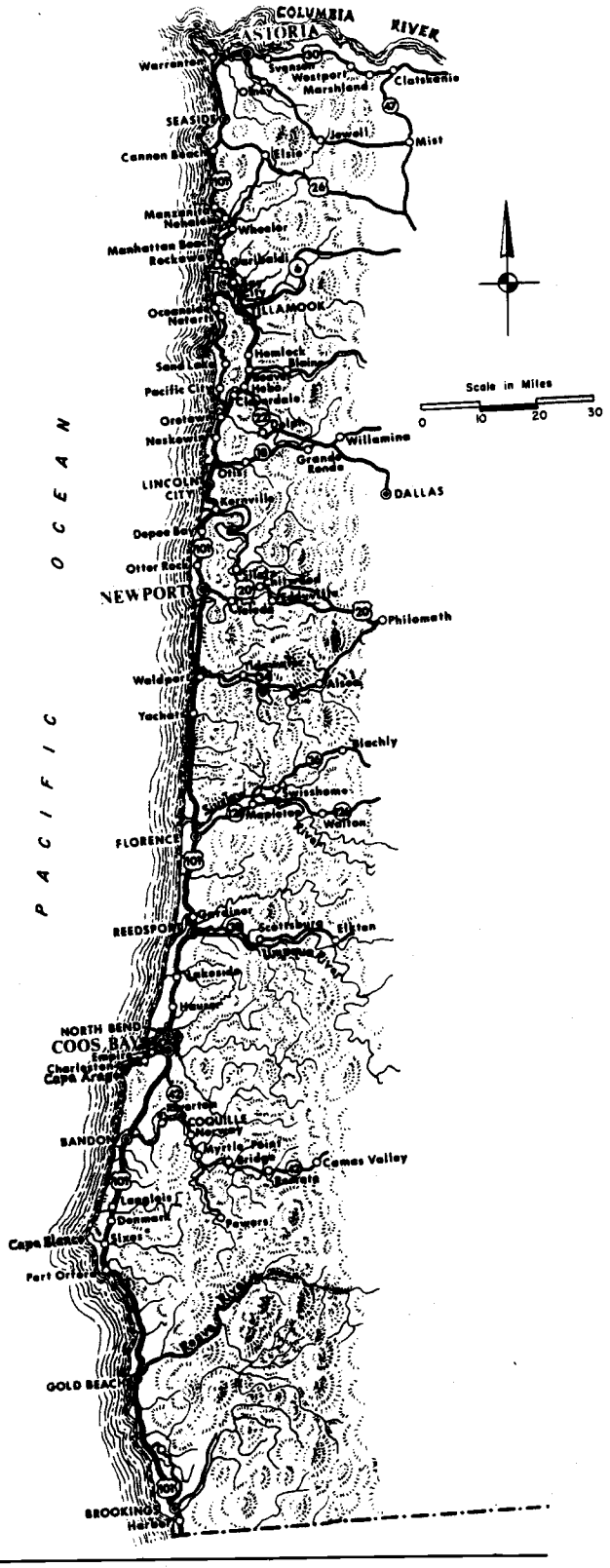

FIGURE 1. Map of the Oregon Coast

THE SPATIAL CHARACTERISTICS OF THE SEAFOOD PROCESSING INDUSTRY

ABSTRACT: This study examines the spatial characteristics of the seafood processing industry on the Oregon Coast. Three study areas are discussed: the Astoria area, the Newport area, and the Coos Bay area. The industry is categorized by four types of seafood processors. Types and uses of processing and nonprocessing space are defined. Comparisons are made between types of processors and their uses of space, between spatial use and distribution among the study areas, and the processing spaces within each study area. Present and future expansion is discussed.

INTRODUCTION

Background

The seafood processors of Oregon produce more than two hundred types of seafood products from more than forty varieties of fish and crustaceans.[1] In the past, the seafood industries have not always been so diverse, nor have the fisheries upon which the processors depend for raw materials been as varied. In order to appreciate the spatial characteristics of the seafood processing industry,

the historical development of Oregon seafood industries will be reviewed.

The salmon industry was a subsistence fishery until 1866. The innovation of canning salmon changed the fishery to an industry with worldwide distribution. Within a twenty-five-year period, twenty-one processors appeared on the Columbia River, and eight on the Oregon coast.[2] Salmon has maintained itself over the years as the major fishery in Oregon for landed value. The demand for salmon has increased greatly in the last few years, predominately because of foreign purchases.

Salmon processed in Oregon are caught in one of two ways: gillnet and ocean troll. The gillnet fishery is restricted to the lower Columbia River. The fish caught in this manner are delivered with the gut still intact and are priced less than troll-caught salmon. This is attributed to the stage of the life cycle when the fish are caught and to the marring of the skin that may take place because of the net.

Most of the salmon landed in Oregon are troll-caught by ocean trollers ranging from near shore to forty or more miles to sea. The fish have their entrails removed on board the fishing vessel shortly after being caught and are packed in ice. Chinook, or "king," is the largest salmon, while coho, or "silver," is the most frequently caught salmon. Because of a lower price for coho, and a smaller size, total

landed values for the two salmon are usually very close. Limited numbers of pinks, sockeyes, and chums are also caught, but contribute little to the total salmon catch.

Salmon is smoked, canned, frozen or marketed fresh. The most profitable methods of processing are the frozen and fresh methods, which, to be considered prime, must be hand-processed to avoid marring the appearance. The gill-net caught fish is usually canned.

Another fishery which developed more recently is the pilchard industry. In 1935 the Oregon Legislature changed regulations to allow the reduction of pilchard, a herring-like fish, into oil. Although trawling for pilchard did not materialize into the fishery its investors had hoped for, the use of trawling for other seafoods was initiated. By 1942 the pilchard fishery had died, and most trawling was adapted for groundfish. The term, "groundfish," refers to a large and diverse group of fishes harvested on the Oregon coast. It includes roundfish such as Pacific cod, sablefish (black cod), ling cod, rockfish and Pacific hake (whiting). Also included are flatfish such as Dover, English and Petrale sole, plus Pacific halibut. Although historically not a rapid growth fishery, the groundfish industry has been Oregon's most stable fishery.

There are a variety of ways in which the many different types of groundfish may be processed. Individually quick-frozen fillets, blocks and portions are common final

products. These may be marketed at this stage or sent to secondary processors for breading or other special handling. Hand-filleting is being replaced in many areas with mechanical filleting machines. The machines which can process about sixty-five fish per minute are the only way to process large quantities of fish rapidly and maintain product quality.

The trawl fishery was responsible for the introduction of the albacore fishery. Trawl fishermen scouting for pilchards encountered albacore in 1936. The fishery has had growth and decline cycles ever since. The albacore are harvested by troll fishermen dragging tuna jigs or lures along the surface of the water. Some albacore are marketed fresh, but the vast majority are canned. Only the albacore can be marketed as white meat tuna. Over the years, tuna caught with purse seines off South and Central America and other tropical areas have been shipped to Astoria for processing. At times these warm-water tuna make up the bulk of the processing activity.

Just as the salmon fishery received its commercial initiative with a technological development, so did the shrimp fishery. The introduction of the shrimp peeler in the mid-1950's made the shrimp fishery economically feasible. Prior to the peeler, the shrimp were handpicked which made for a very marginal fishery. The fishery's high volume-low price character did not lend itself to hand-

processing. The industry has expanded from seven vessels in 1957 to 186 vessels in 1978, and a greater than ten-fold increase in pounds of shrimp landed.[3] The increase in catches are attributed to improved harvesting techniques and better knowledge of the shrimp grounds. Like the albacore, most of the shrimp caught is canned and the remainder is usually frozen or sold fresh.

Three species of crab are also processed in Oregon, but only one is caught locally: the Dungeness. The Dungeness crab is caught in traps called pots which are baited and placed on the sea bottom. The fishery and the associated processing have undergone few major changes in technology or gear. Most Dungeness crabs are cooked and marketed whole for the fresh-frozen market. Crabs that are marred or are missing legs are cooked, cleaned and canned or frozen.

Relevance

As fisheries have come and gone, and as the landings fluctuate from season to season, the processors who handle their product have had to adjust. Generally, those factors which have the most extensive influence on the seafood industry in both harvesting and processing are politics, available fish stock, technology and marketing. At present all four of these factors are at work on the Oregon coast.

Since March of 1977, the U.S. fisherman has had near-exclusive fishing rights within a two-hundred-mile zone off the U.S. coast line and its possessions. This zone was

created by the Fishery Conservation and Management Act of 1976. The extension of this zone is just beginning to bear economic fruit, and the full impact of the FCZ (Fishery Conservation Zone) is presently a matter of speculation. The extended jurisdiction will undoubtedly open new markets for species not caught by U.S. fishermen at present.

The Pacific hake (whiting) is one specie which has become available for use because of the FCZ. This fish was not formerly caught by U.S. fishermen in significant volumes. Because of this political event, the hake fishery is changing from a foreign industry to a domestic one.

Technology is another factor which affects the fishing industry. Two previously discussed innovations were the process of canning salmon and the mechanized shrimp peeler. The hake also affords an example of the influence of technology. The increase in hake fishing has spurred technological improvements in harvesting and processing; such as the adoption of mid-water trawling and the solution of the rapid decay of hake after capture.[4]

The operation of technology also has affected the last factor, marketing. The feasibility now exists to extend both domestic and foreign markets. The Pacific hake (whiting) has had the most media attention, but other trawl fish are experiencing the same change in exploitation. The fish that were being thrown overboard in the recent past as trash fish are now becoming cash catches. Still other fish,

yet unused, await the breakthrough in harvesting gear, processing or the establishment of a new market. The prospects of the seafood industry at large appear bright enough that banks and other lending institutions, including the government, are making it easier to secure capital for all seafood investments, i.e., processing plants, boats, gear, etc. The need for an examination of the seafood industry was noted in a recent Office of Technology Assessment report.[5] This report mentioned the need to evaluate the opportunities for future developments in the fishing industry.

All of this attention on what was once an industry of only local importance is creating a spirit of competition between coastal communities for their share of the expected economic development and benefits. A part of the fishing industry's development will occur from the expansion of the seafood processing industry. The effect this expansion will have on the respective communities in regard to expected economic growth is the subject of study. However, the effect this expansion may have on space and the character of the space has not been completely analyzed.

STATEMENT OF PROBLEM

Study Areas

This paper concerns itself with the description of the spatial character of the seafood processing industry at select sites on the Oregon coast. An understanding of the spatial character of the industry should provide insight into its likely expansion potential. The research focuses on the three most productive seafood processing areas on the Oregon coast: Astoria, Newport and Coos Bay.

For the purposes of this paper, the Astoria area is defined as the Port of Astoria, the Port of Hammond, and the Port of Warrenton. This area is located near the mouth of the Columbia River. The Astoria area has historically led the entire coast with about 43% of the total landings.[6] This is due in part to the large numbers of tuna landed and processed in Astoria proper. Warrenton and Hammond land and process mostly salmon and shrimp. The Port of Astoria is in the process of designing a long-range master plan for overall port improvements and its immediate plans call for the soliciting of new fish-processing plants.

The Port of Newport is located at the mouth of the Yaquina River on the north-central portion of the coast. Newport is the leading Oregon processor of shrimp and crab, and is second only to Astoria for the processing of groundfish.[7] The number of salmon reaching Newport processors

will increase, according to proponents of a private salmon aquaculture release-and-capture facility. This facility is located on the Yaquina estuary where Newport is situated. In an economic study prepared for the City of Newport, seafood processing expansion was cited as a possible source of economic growth because of the FCZ.[8]

The Coos Bay area includes the Port of Coos Bay and Charleston Harbor. The area is located on the Coos Bay estuary along the south-central portion of the coast. The Coos Bay area lands and processes slightly less than 50% of Oregon's coastal caught salmon, and is also the site of a salmon release-and-capture facility.[9] In 1976 the Coos Bay area was the number two commercial fish landing port in Oregon, excluding imported tuna coming into Astoria.[10] The ocean area adjacent to the Coos Bay area reportedly has contained within it over 50% of the Pacific hake biomass between Vancouver Island and Monterey Bay, California.[11] Coos Bay identified seafood processing increases as an adopted economic goal and objective as a part of its Overall Economic Development Program.[12]

These three areas are characterized by outdated processing plants and port facilities in general. The areas differ in the mix of seafood products handled by the respective processing facilities. Expanded processing capabilities that handle under-used fish species are particularly attractive to Oregon coast communites. The processing

industry would become more stable by increasing year-round jobs on the coast. At present, mostly seasonal work is offered in the industry. This increase in employment would add to the stability of coastal economy in general.

These areas not only share common characteristics, but also share competition. The goal of each is to become the first trawler basin to provide dockage for the mushrooming fleet of commercial boats up to one hundred feet or longer, plus expanded cold storage, ice production, seafood processing facilities and other support operations. Port authorities from all three areas have stated that there will be enough growth from trawler basins and other facilities for all to share. However, these authorities do not believe that the sharing will be on an equal basis.[13]

METHODOLOGY

Data Gathering

A literature search was the first step in data-gathering. Information concerning the economic, technical, and architectural aspects of processing was found in abundance. Also plentiful were many references pertaining to harvesting techniques, resource management, and fisheries research. These various searches revealed that no work concerning the spatial character of the seafood processing industry was available. This dearth of information led to the development of the particular methods of categorization

used in this paper. Before categorization could take place, a thorough knowledge of the industry was necessary.

At the study sites, interviews with people involved in and around the seafood processing industry were conducted during a three-week period. City and county planners, port managers, fishermen, fishery biologists, fish buyers, fish processors, food technologists, marine extension agents, real estate investors and industrial investors were among those contacted. The interviews were followed up with written and/or telephone communications and in a few cases a second interview was arranged. The follow-up procedure was necessary because of the currently dynamic nature of the seafood processing industry.

Not only local individuals, but also a number of regional, state and local agencies were contacted in the same three weeks. These contacts procured reports and data pertinent to the industry. Those involved were the Department of Land Conservation and Development, Environmental Protection Agency, U.S. Fish and Wildlife, Oregon Department of Fish and Wildlife, Oregon Department of Economic Development, Oregon Coastal Zone Management Association, Oregon Trawl Commission and the All Coast Fisherman's Marketing Association.

A questionnaire was developed for distribution to the seafood processors within the study areas. Questions were asked dealing with the percent of total volume of products handled and changes in their current product mix. Estimates

of space allocations, anticipated expansion and desirable site factors were requested. The questionnaires were distributed by mail and are included as Appendix C.

Tax lot maps for the various processors were obtained at the appropriate county seat. City and county plan maps were also collected. The most recent air photography of the study sites were assembled.[14] After preliminary data analysis, the study sites were revisited to fill gaps in the data base.

Data Analysis

Before analysis of the data was possible, the space used by seafood processors needed to be categorized and defined. The following categories and definitions were used in the compilation and analysis of the data:

Plant space. The space which is used to prepare seafood for its next handler.

Dock and loading space. The space which is used for offloading of fish and fish products from boats, and the space used for the loading of trucks and rail cars for transport to the next handler.

Ancillary space. The space which is used for offices separate from the processing plant, employee parking, storage of equipment, company boat docks and idle space.

Processing space. The space which is used for processing; including plant space, dock and loading space and

ancillary space.

Nonprocessing space. The space which is owned by an operating seafood processor, but is not currently being used for seafood processing. It may or may not be found in association with processing space.

Land area. The portion of the seafood processor-owned property which is on land.

Water area. The portion of the seafood processor-owned property which is over water. This space is measured from the mean higher high water line.

Potential processing space. The space meeting the criteria for development as a seafood processing space which is either owned by an operating seafood processor, or has been earmarked by local planners for potential marine industrial development.

Criteria for potential processing space. A space which is waterfront property, is zoned industrial and has adequate utilities (water, electricity, sewage treatment and transportation). The space must be a five-acre parcel minimum, or may be an existing seafood processing facility of less than five acres which is not presently in operation.

Salmon buyers. A processor who deals primarily with salmon and mainly with the fresh and fresh-frozen market. Some salmon buyers may do limited filleting of incidentally caught groundfish.

Multiple product plants. A processor who usually concentrates on a particular product such as shrimp, tuna or crab, but also processes others to a lesser extent.

Multiple product buying/shipping plants. A plant which buys for a parent plant at another location. This plant ships refrigerated or frozen products, but complete processing is done at the parent plant.

Bi-product plants. A processor which utilizes seafood waste products or low-cost, high-volume fish for human and nonhuman use, e.g., fish oil, fish meal, protein additive, fertilizer, etc.

After definition and categorization of the allocation of spatial use was completed, the spatial extent of the various categories was measured with an electronic planimeter. The level of accuracy was determined by comparison with ground measurements and those derived electronically. It was found that accuracy diminished rapidly beyond .01 acres (approximately 436 square feet). All measurements were rounded to the nearest one-hundredth of an acre. The measurements were compiled in tabular form for comparisons of space allocations by use. Several comparisons were made: allocations of space within each study area, between each study area, and allocations of space between processor types. Descriptive statistics were generated from the tables and their comparisons.

The results from the questionnaire were statistically insignificant because of low return. Questionnaire results were compared with data collected through interviews and reports.

RESULTS AND DISCUSSION

Astoria

Each study area has particular spatial characteristics concerning the seafood processing industry. The Astoria area is the oldest seafood processing site on the Oregon coast, a fact which plays a large part in the spatial character of the industry. Four hundred and seventy-five acres of the study area are under seafood-processor ownership. Eighty percent of this area is not associated with currently operating processing facilities. Most of this space possesses no potential for conversion to active seafood processing. For example, 181 acres of this space is found on sandbars in the Columbia River. This intermittent land was once used for harvesting salmon by horse-drawn seine nets. The remainder of this unusable space is either land-locked, of too small parcels, or in a restrictive location. Approximately 168 acres--44% of this nonprocessing space owned by processors--does have some potential for conversion to active seafood processing. Much of this space consists of old processing facilities which today are either empty or leased to other concerns (Fig. 2).

Twenty percent of the total processor-owned property is found in association with active processing, but 62% of this space is not used for any aspect of processing. This space is the result of processors not building over the entire extent of their holdings. The vast majority of this 20% is over water.

Of the four processor types, the Astoria area has representatives of all but buyer/shippers (Table 1). The lack of buying/shipping processors is due to the area's large capacity to process seafood products. The Astoria area is usually on the receiving end of shipping. This is not to say that no fish are shipped from the Astoria area for further processing. At certain times of the year when production capacity is nearing its maximum, lower priority fish may be shipped out of the area for processing. An example would be the shad which has a catching season that overlaps with the highly prized salmon. Shad have been transported as far as the Coos Bay area for processing.[15] The Astoria area and the Coos Bay area have different peak salmon production times, so that when the Astoria area is reaching peak production the Coos Bay area's production is dropping off.

Multiple product processors have the vast majority of the total processing space in the Astoria area. Within this category is 89% of the total processing space, 88% of the plant space, 82% of the loading and docking space (Table 1).

TABLE 1. Astoria area processing space components

Processor type	Processing space/ac.	Plant space/ac.	Loading space/ac.	Ancillary space/ac.
Salmon Buyer	.34	.24	.10	-
"	.53	.47	.06	-
Multiple Product	1.13	.73	.27	.13
"	16.89	4.18	2.07	10.64
"	1.26	.52	.44	.30
"	.40	.32	.08	-
"	1.12	.85	.27	-
"	6.60	2.23	1.07	3.30
Byproduct	2.45	.54	.79	1.12
TOTAL	30.72	10.08	5.15	15.49
Average	3.41	1.12	.57	1.72

The tuna is the principal fish utilized by multiple product processors in this area, although their use of shrimp and trawl-caught fish is growing rapidly.[16]

Salmon processors take up only 3% of the total processing space, 7% of the plant space, 3% of the loading and docking space and none of the ancillary space (Table 1). There is only one byproduct processor in the area, but this processor type is receiving the most attention concerning the development of new processors in the area. U.S. fishermen in the past have concentrated in low-volume, high-priced food fish. The extension of U.S. fishing jurisdiction has reduced foreign competition for high-volume, low-value

fishes, and this reduction has made it feasible for American fishermen to harvest these fish. The processing component of the fishing industry has been lagging behind the ability to harvest.[17] Presently most of these high-volume, low-value fish are being bought and processed on foreign factory ships through a joint-venture operation.

A recent agreement combines purchase agreements and financial assistance from Mexico with technological and financial assistance from U.S. concerns for the operation of a fish-concentrate processing plant.[18] The spatial impact on the Astoria area is an additional acre of processing space for the pilot program, with an option on at least two more acres. All of this space is unused port docking warehouse space, and all of it is over water. This addition of processing space is the result of the impact of all four of the aforementioned influential factors affecting fishery industrial development.

One of these factors--biotic abundance--is causing decline rather than growth for an established processor in the area. The Bumble Bee plant has recently made it known that it is planning to close the tuna canning portion of its Astoria operation. Their concern is for economic viability, which is in danger because of fluctuating albacore harvests.[19] As long as albacore makes up the greater portion of the tuna they harvest, it is economic to land tuna for processing caught at great distances from Astoria. In

recent years, the availability of albacore has been so poor that imported tuna have made up the greater portion of tuna processed by Bumble Bee.[20]

The loss of Bumble Bee to the Astoria area does not mean the loss of albacore processing, nor the demise of the local processing industry. Barbey Packing Company presently processes albacore, and is one of the most rapidly growing processors on the Oregon coast. In addition to the expansion of Barbey, negotiations are under way to acquire the rights to portions of the unused Tongue Point docks and warehouses. Astoria area marine industrial growth in general is looking to a brighter future.[21]

Newport

The spatial character of the seafood processors located in Newport is markedly different from Astoria. The total processing space for Newport is slightly more than five acres and, with one exception, all the processors are located along one section of wharf frontage. All of the property owned by processors in Newport is used for processing and 47% of the space is over water. Probably the most visible spatial feature of the industry is its almost total lack of truck loading space. Eighty-one percent of the loading and docking space category is attributed to boat docking space. The loading of processed goods onto trucks takes place along the public street, which all the processors share (Fig. 3).

Salmon processors dominate the scene for numbers of processors, but occupy only 31% of the area's processing space. The newest processor in the area is a salmon processor. The new processor is the only one to have ancillary space and is also the only one to be located away from the remainder of the processors along the congested wharf area of "Oldtown." Salmon buyers have 36% of the plant space and 19% of the loading and docking space to be found in Newport.

TABLE 2. Newport processing space components

Processor type	Processing space/ac.	Plant space/ac.	Loading space/ac.	Ancillary space/ac.
Salmon Buyer	.13	.10	.03	-
"	.16	.13	.03	-
"	.40	.33	.07	-
"	.43	.36	.07	-
"	.36	.26	.09	.01
"	.10	.10	-	-
Multiple Product	.43	.36	.07	-
"	.85	.61	.24	-
"	.93	.61	.22	-
"	.77	.49	.28	-
Buying/Shipping	.50	.07	.43	-
TOTAL	5.06	3.52	1.53	.01
Average	.46	.32	.14	-

Fifty-nine percent of this area's processing is owned by multiple product processors as well as 62% of the plant

space and 53% of the loading and docking space. Multiple product processors of this area process primarily crab and shrimp, although they have become more willing to take bottom fish. One of the multiple product processors makes mink food from fish scraps, but this is only a limited production item.

There is only one buyer/shipper in Newport, and it is responsible for 10% of the processing space, 2% of the plant space, and 28% of the loading and docking space. The imbalance between plant space and loading space is that this plant is composed of three mobile refrigeration units, and the loading and docking space is the remaining 86% of the total processing space. There are no byproduct processors in Newport.

Small amounts of on-site expansion are possible, but large-scale future expansion will be dependent on the development of new sites (Figs. 4 and 5). Present expansion in Newport is restricted for the time being to construction presently being undertaken by the New England Fish Company. By expanding their existing building to nearly twice its present size, they expect to double their processing capabilities.[22] Two locations other than those used for current processing operations have been the subject of speculation. One is Sunset Terminals up the bay from the moorage basin. Slightly more than ten acres are waterfront property suitable for seafood processing. To date, there has been no

indication as to what use this property will be put, other than for marine industrial development. The other location is the Oregon-Aqua Foods release-capture facility. Company officials have said they are planning to build their own processing plant in the near future.[23]

Coos Bay

The Coos Bay area seafood processors are the newest group of processors being considered in this paper. Their total processing space is comprised of a little more than nine acres, of which 34% is over water. More than one-half of this total processing space is attributed to one multiple-product processor, with nearly four acres of ancillary space on land. Without considering this processor, 60% of the processing space is over water, a feature which is more characteristic of the remaining nine processors (Fig. 6). There is no property owned by this area's processors which is not in seafood processing use.

There is only one salmon buyer in the study area, which contributes 3% of the total processing space, 3% of the plant space, and 15% of the loading and docking space. This plant's product mix is approaching that of a multiple product processor, a trend many of the larger salmon buyers are taking.

The multiple product processors make up the largest group of processors in this area, just as they have done in

the other study areas. Ninety-six percent of the total processing space, 97% of the plant space, 80% of the loading and docking space and 100% of the area's ancillary space are attributed to this processor category. The newest processor in Charleston Harbor is a multiple product processor. This particular processor is landlocked in that it has no dock space. It sets primarily as a secondary processor, which is one that packages for the frozen-breaded and prepackaged retail market.

TABLE 3. Coos Bay area processing space components

Processor type	Processing space/ac.	Plant space/ac.	Loading space/ac.	Ancillary space/ac.
Salmon Buyer	.28	.07	.21	-
Multiple Product	.41	.14	.15	.12
"	1.36	.56	.27	.53
"	1.01	.50	.21	.30
"	4.74	.70	.32	3.72
"	.75	.35	.06	.34
"	.71	.33	.08	.30
Buying/Shipping	.01	-	.01	-
"	.07	.01	.06	-
"	.01	.01	-	-
TOTAL	9.35	2.67	1.37	5.31
Average	.94	.27	.14	.53

The buyer/shippers take up only 1% of the total processing space, 1% of the plant space and 5% of the docking and

loading space. These processors are little more than a weighing station and a couple of portable refrigeration units (Fig. 7).

Although there is room for on-site expansion for many of the processors, the future expansion of the industry for this area will most likely be developed on new sites. The Port of Coos Bay has plans for a major full-service marine industrial seafood processing complex.[24] Port property located on north spit, a large sand spit separating the sea from the estuary, has been earmarked for a development which will occupy approximately 42 acres of land.[25] This area will include two independent seafood processors, and a conglomerate of seven companies consisting of two multiple product processors, one byproduct processor, a cold storage company, a marketing firm, a shipbuilding firm, and an energy facility. The energy facility will generate electricity by using processors' waste as well as municipal waste for fuel. This entire development is currently tied up because of incompleted land use planning, and because of debates over the environmental impact on the area. Two other sites, both private, have approximatly 165 acres of land in which the owners have expressed interest in developing. Both sites have deep channel capabilities.[26]

DISCUSSION

In a recent study conducted for the Department of Land Conservation and Development, seafood processors in these study areas were interviewed to determine present production capacity (Table 4). A comparative look at the ratio of processing space to production capacity reveals the relative efficiency of each study area's use of processing space. Astoria has the best ratio, with one acre to six million pounds of product. Coos Bay and Newport have ratios of 1:5 and 1:4, respectively. Space-to-production ratios do not include ancillary space. Ancillary space was dropped from the tabulations because often one processor would occupy most of the ancillary space, making ratios using this space irrelevant.

TABLE 4. Spatial and production components by study area.

	Processing space/ac.	Plant space/ac.	Loading space/ac.	Ancillary space/ac.	Processing capacity—pre./pot.*[27]
Astoria	30.72	10.08	5.15	15.49	92/216
Newport	5.06	3.52	1.53	.01	20/30
Coos Bay	9.35	2.67	1.37	5.31	20/30

*Present/potential capacity in millions of pounds per year.

Astoria's lead can, in part, be attributed to its high percentage of multiple product processors; 67% are this type. Coos Bay and Newport have 40% and 36% multiple product

processors, respectively. This processor can handle many products, keeping it active most of the year. The viability of a single specie processor is poor because of the reliance on only one source of raw material. The Bumble Bee cannery in Astoria is an example of over-dependence on one specie, i.e., albacore.

The fact that seafood processing expansion is going to take place is evident. Ongoing projects and plans at each of the study sites attest to this growth. The above-mentioned L.C.D.C. study also determined the potential production capacity without expansion. Within these study areas, it was found that Astoria could increase production of principally exploited fishes by 135%, and that Newport and Coos Bay could each increase productivity by 50%, all without expansion. There is no obvious need to expand for the processing of the principal species. The expansion which will occur will generally take place to cover fishes either unused or underused by processors at present. For example, many processors are putting limits on the volume of rockfish they will accept from fishermen. The demand for rockfish has already outstripped the processors' ability to handle this specie.

It would be doubtful if salmon buyers and buyer/shippers will expand, particularly to new sites. Salmon buyers would not be expected to expand because salmon has a declining catch record.[28] The buying/shipping processors can

greatly increase production without increasing their space needs, because their product is shipped out for further processing relatively rapidly.

Multiple product processors that target groundfish as their principal product should be on the increase. Most of these processors already handle some bottomfish, so market connections already exist. Their large size, which averages over 2.5 acres, permits them to handle large quantities of fish (Table 5). Byproduct processors will also be an expansion processor. The byproduct processor will take advantage of the vast amounts of waste, 70%, which is associated with most groundfish.[29]

TABLE 5. Spatial components by processor type

Processor type	Processing space/ac.	Plant space/ac.	Loading space/ac.	Ancillary space/ac.	Number of Processors
Salmon Buyer	2.73	2.06	.66	.01	10
Multiple Product	39.36	13.58	6.10	19.68	15
Buying/ Shipping	.59	.09	.50	0	4
Byproduct	2.45	.54	.79	1.12	1

The question concerning the location of expansion is a bit superfluous, because expansion is occuring in all study areas. What is more pertinent is where the expansion will be the greatest. Astoria definitely has the most space that

is easily convertible to processing use. Newport already has the largest trawler fleet afloat.[30] Coos Bay has 50% of the harvestable hake within its service area. All the areas have space necessary for expansion, and industrial inertia. Each area exhibits particular geographic advantages. It will be up to each port to capitalize on its advantages if it is to take a leading role in the expected expansion. The greatest expansion will probably take place in the area which can supply all of the needs of the expanding fishing industry: adequate mooring, expanded processing, cold storage, ice production, and other support facilities.

FOOTNOTES

[1] Jerry Babbitt, Governor's Conference on the Pacific Whiting Industry, 8 May 1979.

[2] William S. Jensen, The Salmon Processing Industry, part one: The Institutional Framework and Its Evolution, Circular of Information No. 654, Agriculture Experiment Station, May 1976, p. 5.

[3] Jerry Lukas, 1978 Oregon Shrimp Fishery, Information Report 79-1, Oregon Department of Fish and Wildlife, February 1979, pp. 1-2.

[4] Mid-water trawling is the technique used to harvest fish which occupy any portion of the water column except the surface and the bottom. Sounding devices and maneuverable nets allow the fisherman to identify and direct his nets to targeted schools of fish.

[5] Oceans Programs Staff, Establishing a 200-Mile Fisheries Zone, Office of Technology Assessment, June 1977, p. 18.

[6] Oregon Department of Fish and Wildlife, Commercial Food Fish Landings in Pounds Round Weight by State of Oregon Administration District for Calendar Year 1969, 70, 71, 72, 73, 74, 75, 76.

[7] Montagne-Bierly Associates, Oregon Coastal Zone Fishery Management Analysis, Department of Land Conservation

and Development, August, 1979, p. 39.

[8] W. Ed Whitelaw, S. Lance Zaklan, Robert Helsley and Harold Richter, The Economics of Lincoln County and the Cities of Newport, Toledo, Lincoln City, Depoe Bay, Waldport and Siletz, February 1979, pp. 30-31.

[9] Oregon Department of Fish and Wildlife, "Commercial Food Fish Landing in Pounds Round Weight by State of Oregon Administration District for Calendar Years 1969-1976," September, 1979.

[10] _____, 1976, September 1979.

[11] Hake Committee, Port of Coos Bay, "Summary of Pacific Hake Task Force Findings," August 1977, p. 10.

[12] Coos County, Coos County Comprehensive Plan, Background Document, 1978, pp. 6-57.

[13] Darrel Richcreek, Newport Port Manager, Steve Felkins, Coos Bay Port Manager and George Grove, Astoria Port Manager, July 1979, personal communications.

[14] Airphotos: Astoria, 1976; Newport, 1976; and Coos Bay, 1978.

[15] Jim Bergeron, Clatsop County Marine Extension Agent, personal communication, October 1979.

[16] Ibid.

[17] Don Samuelson, Fishery Biologist, personal communication, November 1979.

[18] Port of Astoria Engineer, personal communication, October 1979.

[19] Ibid.

[20] Ibid.

[21] The U.S. Army Corps of Engineers has just released a preliminary report on the modification of a critical breakwater and the construction of an additional 400 commercial boat slips.

[22] "The Log," photo and caption, August 10, 1979, p. 1.

[23] Bill McNeil, Oregon-Aqua Foods, Inc., personal communication, November 1979.

[24] Steve Felkins, Port of Coos Bay Manager, personal communications, June 1979.

[25] Ibid.

[26] Hake Committee, Port of Coos Bay, "Summary of Pacific Hake Task Force Findings," August 1977, pp. 41-42.

[27] Montagne-Bierly Associates, Oregon Coastal Zone Fishery Management Analysis, Department of Land Conservation and Development, August 1979, p. 39.

[28] Oregon Department of Fish and Wildlife, "Commercial Food Fish Landings in Pounds Round Weight by State of Oregon Administration District for Calendar Years 1969-1976," personal communication, September 1979.

[29] Steve Felkins, Port of Coos Bay Manager, personal communication, June 1979.

[30] Terry Thompson, trawl fisherman, personal communication, October 1979.

APPENDIX A: Figures

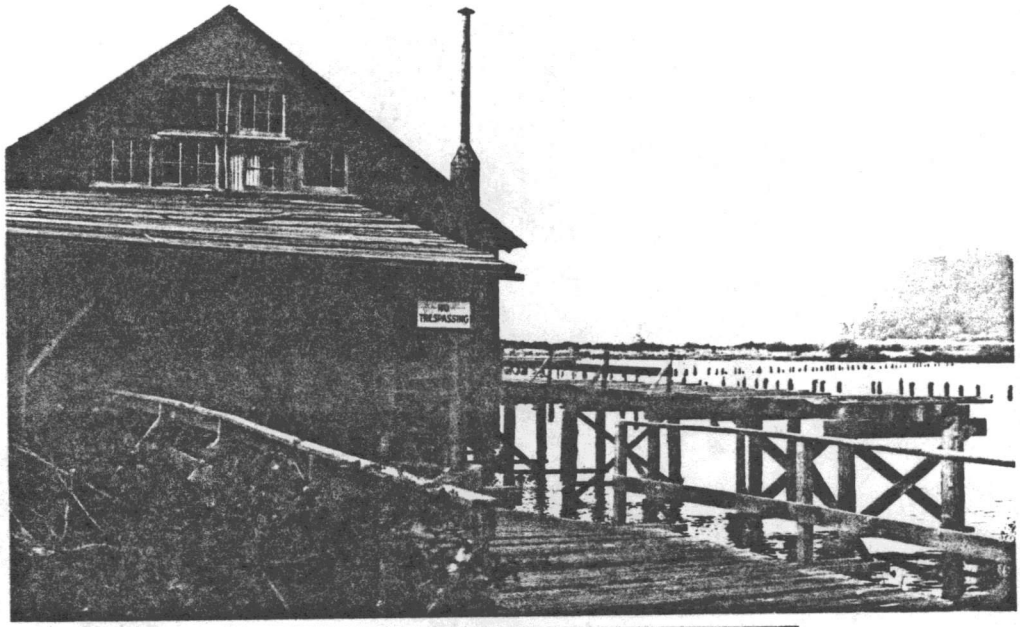

FIGURE 2. Old seafood processing site, Astoria

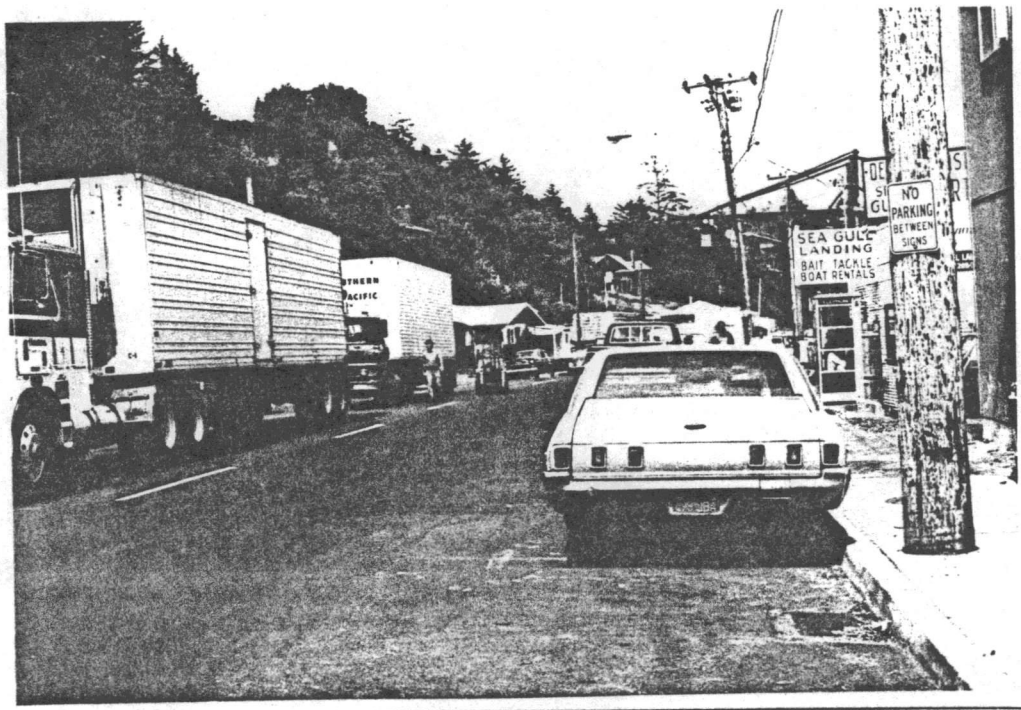

FIGURE 3. Use of public street to load seafood products, Newport

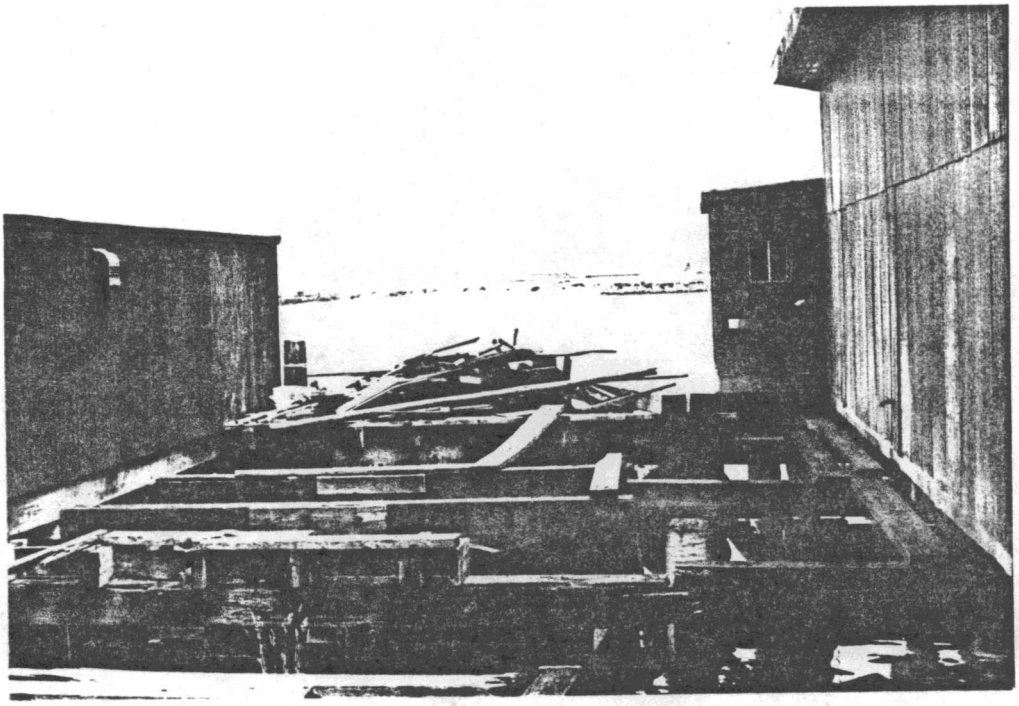

FIGURE 4. Possible on-site expansion, Newport

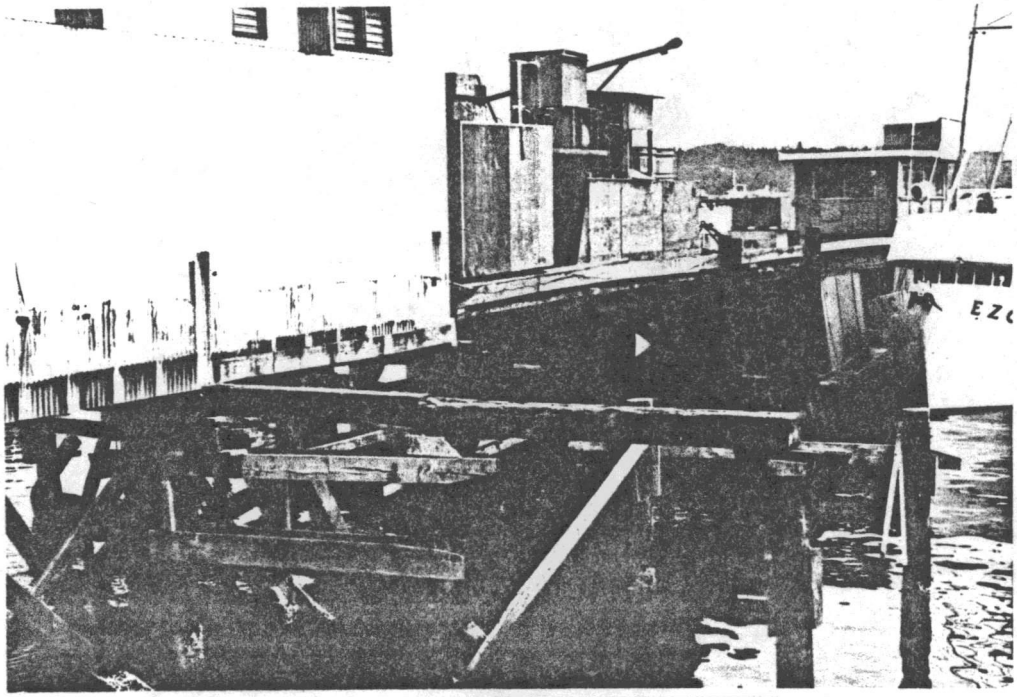

FIGURE 5. Possible on-site expansion, Newport

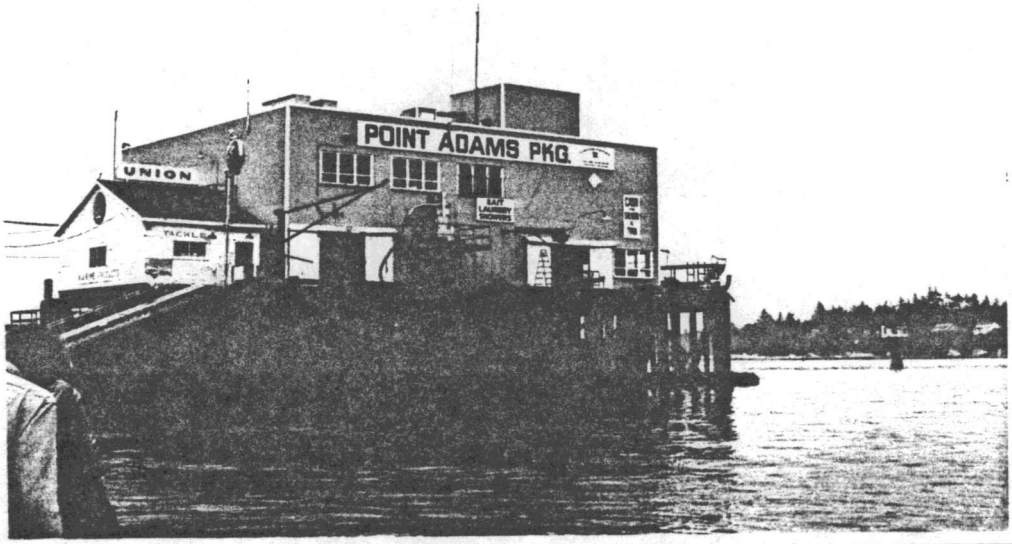

FIGURE 6. Multiple product processor built on pilings, Charleston Harbor

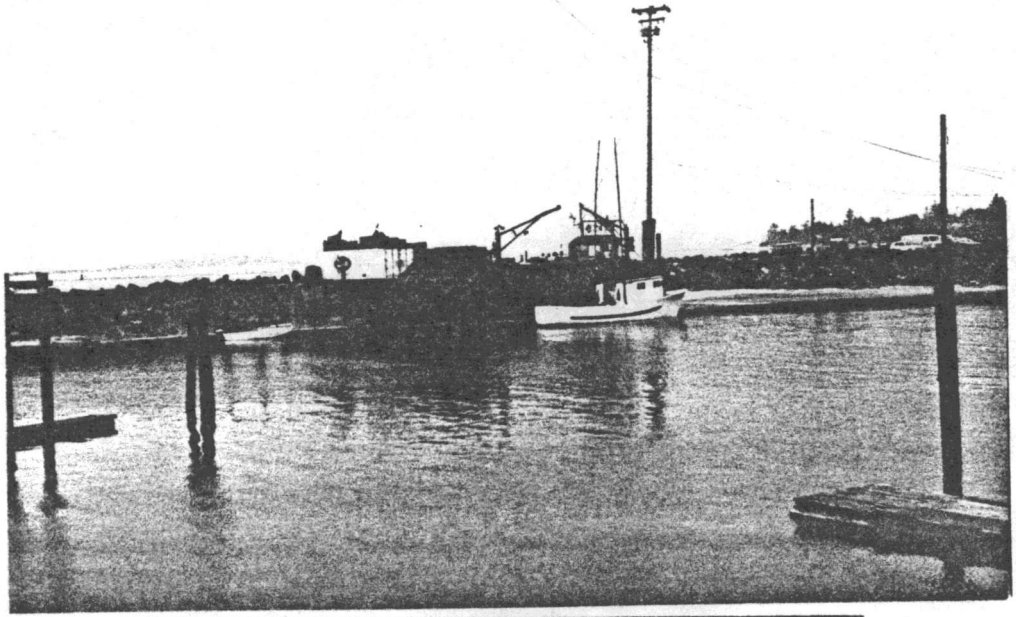

FIGURE 7. Buying/Shipping Plant, Charleston Harbor

APPENDIX B

INTERVIEWS AND PERSONAL REPORTS
May - November, 1979

Bergeron, Jim. O.S.U. Marine Extension Service, Astoria.

Dement, Anna Belle. Indian Economic Development, N. Bend.

Felkins, Steve. Port Manager, Coos Bay.

Granger, Oscar. County Planner, Newport.

Grile, Bob. City Planner, Coos Bay.

Grove, George. Port Manager, Astoria.

Heikkela, Paul. Marine Extension Agent, Coos Bay.

Hilderbrand, Ken. Marine Advisory Program, Newport.

Hudson, Bob. Allcoast Fisherman's Marketing Assoc., Charleston.

Jacobs, Bob. Marine Extension Agent, Newport.

Law, Duncan. O.S.U. Seafood Labs, Astoria.

Lewis, Steve. O.D.F.W., Newport.

Marston, Linda. O.S.U. Marine Science Center, Newport.

McNeil, Bill. Oregon-Aqua Foods, Inc. Personal communication, June, 1979.

Monroe, Jan. City Planner, Newport.

Rettig, Bruce, O.S.U., Corvallis.

Richcreek, Darrell. Port Manager, Newport.

Robinson, Jack. O.D.F.W., Newport.

Rompa, Bill. O.S.U., Corvallis.

Rudy, Paul. University of Oregon, Charleston.

Smith, Courtland. O.S.U., Corvallis.

Smith, Fredrick. O.S.U., Corvallis.

Spangler, Mat. Mutual Aid Planning Service, Newport.

APPENDIX C

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To whom it may concern,

I am a graduate student at O.S.U. in geography. Presently I am engaged in research dealing with the space requirements of the seafood processing industry at select sites on the Oregon coast. The accompanying guestionnaire is an essential part of this study.

The questionnaire was designed to reveal the present demands being made by the industry as well as the characteristics which the industry feels would make an optimum setting. All responses will be kept confident. This study should provide both planners and industrial concerns the criteria to aid development decisions being made on the Oregon coast. It is not the intent of this study to make recommendations for specific sites but only to reveal the extent and character of spatial demand expected to be made by the seafood processing industry along the Oregon coast.

The study will be made available to anyone that would like a copy providing I have enough prior notice. If there are any questions or comments feel free to contact me through the Geography Department. Your assistance in this research is greatly appreciated.

Sincerly yours,

Redacted for privacy

Gregg Bonacker

(Check appropriate response)

1. Number of employees, year around ____ less than 10 ____ 10-25 ____ 26-50 ____ 51-100 ____ over 100

2. Number of employees, seasonal ____ less than 10 ____ 10-25 ____ 26-50 ____ 51-100 ____ over 100

3. Products handled, as percent of total volume

A.____ Salmon..... ____ less than 5% ____ 5-10% ____ 10-25% ____ 25-50% ____ 50-75% ____ 75-100%

B.____ Tuna..... ____ less than 5% ____ 5-10% ____ 10-25% ____ 25-50% ____ 50-75% ____ 75-100%

C.____ Bottom fish..... ____ less than 5% ____ 5-10% ____ 10-25% ____ 25-50% ____ 50-75% ____ 75-100%

D.____ Mid-water fish.... ____ less than 5% ____ 5-10% ____ 10-25% ____ 25-50% ____ 50-75% ____ 75-100%

E.____ Shrimp..... ____ less than 5% ____ 5-10% ____ 10-25% ____ 25-50% ____ 50-75% ____ 75-100%

F.____ Crab..... ____ less than 5% ____ 5-10% ____ 10-25% ____ 25-50% ____ 50-75% ____ 75-100%

G.____ Other_____.. ____ less than 5% ____ 5-10% ____ 10-25% ____ 25-50% ____ 50-75% ____ 75-100%

4. Form of product handled A.____ fresh B.____ frozen in the round C.____ fillet-blocks D.____ canned E.____ breaded&frozen F.____ oil and/or meal

5. Are you currently considering any changes in the mix of products handled?

____ yes ____ no

6. If yes, which products are being considered for deletion? (See question #3)

____ A. ____ B. ____ C. ____ D. ____ E. ____ F. ____ G.

7. Which products are being considered for addition to present product mix?

____ A. ____ B. ____ C. ____ D. ____ E. ____ F. ____ G.

8. Percent of total product handled that goes to other processors.

____ less than 5% ____ 5-10% ____ 10-25% ____ 25-50% ____50-75% ____75-100%

9. Percent of total product handled that goes to wholesalers or brokers.

____ less than 5% ____ 5-10% ____ 10-25% ____ 25-50% ____ 50-75% ____ 75-100%

10. Percent of total product handled that goes to retailers.

____ less than 5% ____ 5-10% ____ 10-25% ____ 25-50% ____ 50-75% ____ 75-100%

11. Percent of plants capacity currently being used, peak of season.

____ 100% ____ 95% ____ 90% ____ 85% ____ less than 85%

12. Approximately how much covered area is used for processing?

____ less than 1000 sq.ft. ____ 1000-2000 sq.ft. ____ 2000-5000 sq.ft.

____ 5000-10,000 sq.ft. ____ greater than 10,000 sq.ft.

13. Approximately how much area is used for docking, loading and employee parking?

____ less than .25 acre ____ .25 acre ____ .5 acre ____ 1 acre ____ 1-3 acre

____ greater than 3 acre

14. Is on site expansion anticipated? ____ yes ____ no , if yes, within ____ 1yr.

____ 2yr. ____ 3yr. ____ 4yr. ____ 5yr.

15. Is relocation of processing facility anticipated? ____ yes ____ no , if yes,

within ____ 1yr. ____ 2yr. ____ 3yr. ____ 4yr. ____ 5yr.

16. If relocation is a possibility, what site factors are most desireable. Please

place in order of importance. (1=most important)

____ railroad service

____ highway access

____ deepwater (26ft.) moorage

____ air freight service

____ industrial park location

____ isolated location

____ skilled lobor supply

____ municiple services (fire, police, etc.

____ supportive industries (boat repair, gear storage, ice making, etc.)

____ restaurant, coffee shops, pubs, etc.

17. If relocating, optimum space desired. ____ acres (fill in)

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p. 13, cols. 1, 2, 3.

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