Technical Report

Report Number 51

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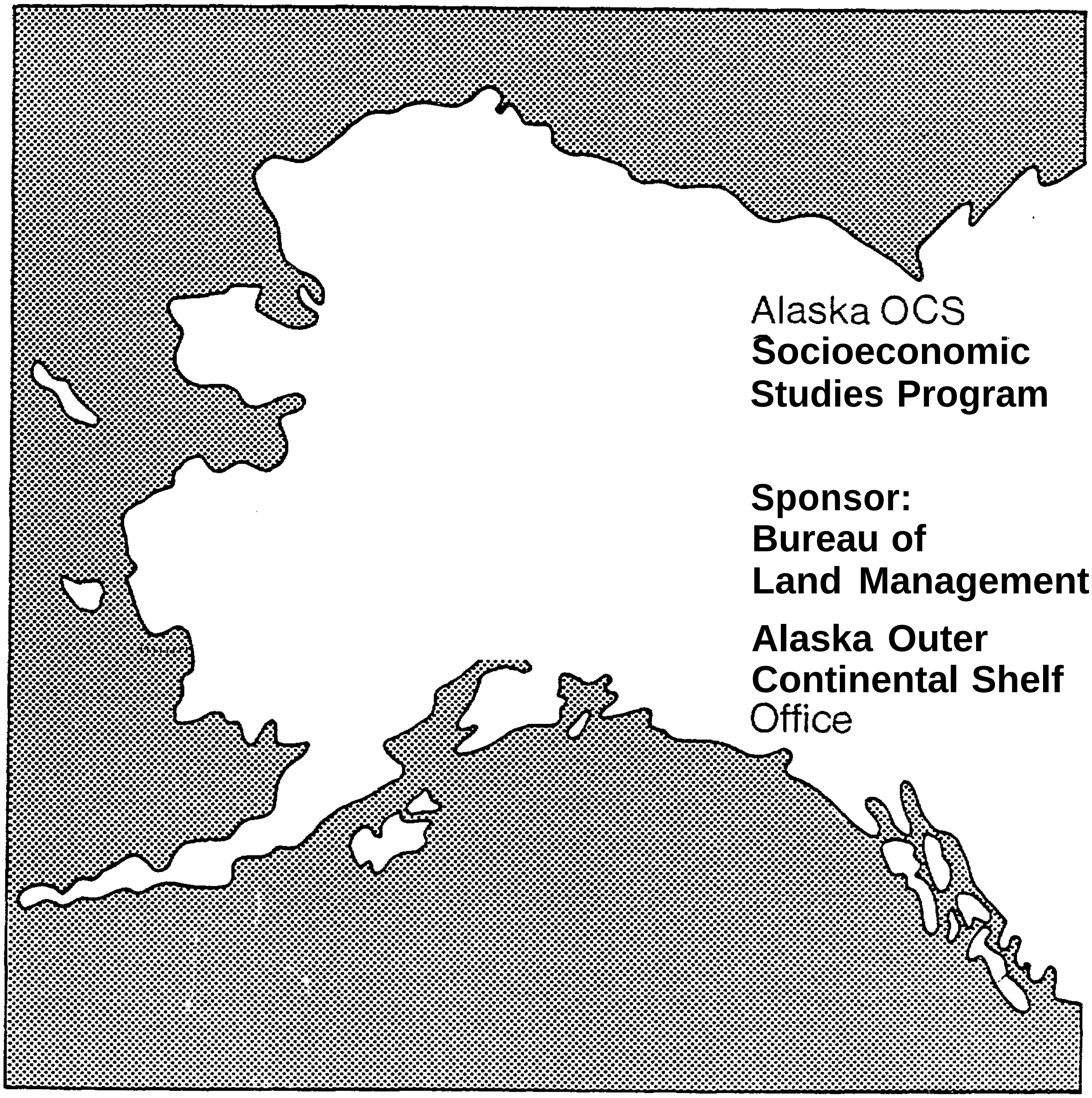

Western Alaska and Bering-Norton Petroleum Development Scenarios Commercial Fishing Industry Analysis

The United States Department of the Interior was designated by the Outer Continental Shelf (OCS) Lands Act of 1953 to carry out the majority of the Act's provisions for administering the mineral leasing and development of offshore areas of the United States under federal jurisdiction. Within the Department, the Bureau of Land Management (BLM) has the responsibility to meet requirements of the National Environmental Policy Act of 1969 (NEPA) as well as other legislation and regulations dealing with the effects of offshore development. In Alaska, unique cultural differences and climatic conditions create a need for developing additional. socioeconomic and environmental information to improve OCS decision making at all governmental levels. In fulfillment of its federal responsibilities and with an awareness of these additional information needs, the BLM has initiated several investigative programs, one of which is the Alaska OCS Socioeconomic Studies Program (SESP).

The Alaska OCS Socioeconomic Studies Program is a multi-year research effort which attempts to predict and evaluate the effects of Alaska OCS Petroleum Development upon the physical, social, and economic environments within the state. The overall methodology is divided into three broad research components. The first component identifies an alternative set of assumptions regarding the location, the nature, and the timing of future petroleum events and related activities. In this component, the program takes into account the particular needs of the petroleum industry and projects the human, technological, economic, and environmental offshore and onshore development requirements of the regional petroleum industry.

The second component focuses on data gathering that identifies those quantifiable and qualifiable facts by which OCS-induced changes can be assessed. The critical community and regional components are identified and evaluated. Current endogenous and exogenous sources of change and functional organization among different sectors of community and regional life are analyzed. Susceptible community relationships, values, activities, and processes also are included.

The third research component focuses on an evaluation of the changes that could occur due to the potential oil and gas development. Impact evaluation concentrates on an analysis of the impacts at the statewide, regional, and local level.

In general, program products are sequentially arranged in accordance with BLM's proposed OCS lease sale schedule, so that information is timely to decisionmaking. Reports are available through the National Technical Information Service, and the BLM has a limited number of copies available through the Alaska OCS Office. Inquiries for information should be directed to: Program Coordinator (COAR), Socioeconomic Studies Program, Alaska OCS Office, P. O. Box 1159, Anchorage, Alaska 99510.

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WESTERN ALASKA AND BERING-NORTON PETROLEUM DEVELOPMENT SCENARIOS:

COMMERCIAL FISHING INDUSTRY ANALYSIS

PREPARED FOR

BUREAU OF LAND MANAGEMENT
ALASKA OUTER CONTINENTAL SHELF OFFICE
ALASKA OCS SOCIOECONOMIC STUDIES PROGRAM

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WESTERN ALASKA AND BERING-NORTON PETROLEUM DEVELOPMENT SCENARIOS:
COMMERCIAL FISHING INDUSTRY ANALYSIS

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August, 1980

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

LIST OF TABLES

LIST OF TABLES (continued)

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LIST OF TABLES (continued)

LIST OF FIGURES

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I. INTRODUCTION

This report is a product of the Alaska Outer Continental Shelf Socio-economic Studies Program. The Alaska Outer Continental Shelf Office of the Bureau of Land Management has sponsored the Socioeconomic Studies Program (SESP) in an attempt to forecast and analyze potential impacts and changes likely to occur at the state, regional, and community levels as a result of proposed Outer Continental Shelf (OCS) lease sales in OCS areas adjacent to Alaska. The SESP has completed studies for the Beaufort Sea, the Northern and Western Gulf of Alaska, and Lower Cook Inlet; and it is conducting studies for Western Alaska. The subjects of this report are (1) the commercial fishing industry of Western Alaska and (2) the potential interactions that are likely to occur between this industry and the OCS oil and gas industry as a result of the proposed Norton Basin Lease Sale Number 57. The lease sale is currently scheduled for November 1982.

General Objective and Methodology

The objectives of this study are to document the development of the commercial fishing industry of Western Alaska, to project its development in the absence of lease sales in Western Alaska, to increase our understanding of the potential interactions of the commercial fishing and oil and gas industries, and to project the potential impacts on the tom-mercial fishing industry that may occur as a result of the proposed OCS lease sale. The potential impacts on the commercial fishing industry are of particular importance in analyzing the regional economic growth impacts of OCS oil and gas development because the commercial fishing industry has been, and is expected to continue to be, an important source of employment and income in the coastal communities of Western Alaska. The factors that are expected to stimulate the growth of the industry include: (1) the Fisheries Conservation and Management Act of 1976 in which the United States claimed the right to fishery resources within 200 miles of its coastline, (2) improving fishery resource management, rehabilitation, and enhancement programs, and (3) generally favorable long-run market conditions.

The methodology used to meet these objectives is as follows:

- The history and current trends of the Western Alaska commercial fishing industry were documented and examined to develop a basis for projecting fishery development and potential interaction with the oil and gas industry.

- Methods were developed and used to forecast the level of commercial fishing industry activity in the absence of oil and gas industry activities pursuant to the proposed lease sale.

- The nature and magnitude of projected activities of the commercial fishing and oil and gas industries were analyzed to determine the potential impacts of the proposed lease sale.

The projections of commercial fishing industry activity in the absence of OCS activity, that is, the non-OCS case projections, serve two purposes. They provide a measure of the importance of the commercial fishing industry which may be jeopardized by OCS activities, and they provide a development scenario of the commercial fishing industry that, together with the OCS petroleum development scenarios, can be used to analyze the potential impacts of the Lease Sale Number 57 and other proposed lease sales in Western Alaska. The term "OCS activity" as used in this paragraph and throughout this report refers to activities of the oil and gas industries related to OCS operations.

The SESP impact evaluation process is divided into three parts: preparation of petroleum development scenarios, analysis of statewide and regional impacts, and analysis of community impacts. The scenarios presented in Technical Report Number 49, Bering-Norton Petroleum Development Scenarios, are the oil and gas development hypotheses driving the impact analysis. Four scenarios were prepared for the proposed lease sale. One scenario was constructed for each of three U.S. Geological Survey (USGS) resource estimates and the fourth was constructed assuming that exploration occurs but that commercial quantities of gas and/or oil are not found. The petroleum development scenarios provide a range of potential direct employment and equipment characteristics together with the hypothesized timing and location of both in a region. The latter two parts of the evaluation process are dependent on the petroleum' development scenarios and are themselves interdependent.

The studies that are summarized in the following reports and in Technical Report Number 49 were used in analyzing potential interactions between the commercial fishing industry and the OCS industry:

- Technical Report Number 50
  Bering - Norton
  Petroleum Development Scenarios
  Economic and Demographic Analysis
- Technical Report Number 52
  Bering - Norton
  Petroleum Development Scenarios
  Transportation Systems Analysis
- Technical Report Number 53
  Bering - Norton
  Petroleum Development Scenarios
  Local Socioeconomic Systems Analysis

These studies hypothesize: (1) the OCS petroleum activity that may occur, (2) economic and demographic condit· ens, (3) the nature of the transportation system that will serve and . nteract with the commercial fishing industry, and (4) the availability of the infrastructure upon which the industry is dependent. In short, these studies project many of the characteristics of the environment in which the commercial fishing industry will operate and which affects the development of the fisheries.

Scope

For the purposes of this study Western Alaska is defined to consist of the regions of Alaska that are west of the Kodiak Management Area, and south of Point Hope (see Figure 1.1). This area encompasses some of the most productive finfish and shellfish fisheries in Alaska. The com-

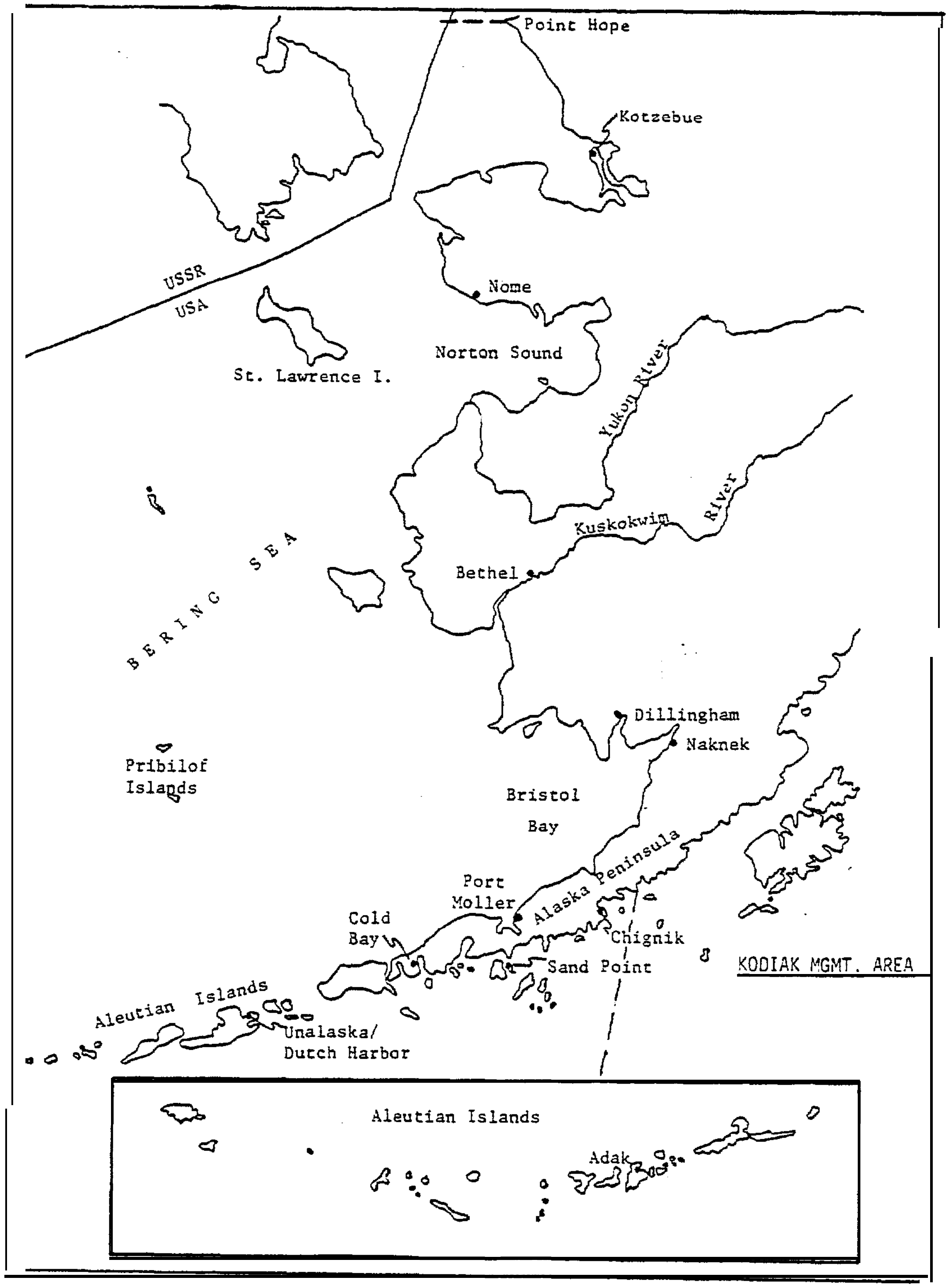


Figure 1.1: Western Alaska Study Area

mercial fisheries of Western Alaska considered in this study are as follow:

- Domestic -salmon
- Domestic Herring
- Domestic Halibut
- Domestic Groundfish
- Domestic King Crab
- Domestic Tanner Crab
- Domestic Shrimp
- Foreign and Domestic Incidental Catch to Groundfish
- Foreign Groundfish
- Foreign Tanner Crab

These are the principal commercial fisheries of Western Alaska. The level of aggregation varies among fisheries. The analysis of each foreign fishery is at the study area level. With the exception of the domestic groundfish fishery, in which the Aleutian Islands are used to divide the study area into two fisheries, the analysis of the domestic fisheries is at the management area level. The salmon and herring management areas considered are:

- Chignik
- Peninsula
- Bristol Bay
- Kuskokwim

- Yukon
- Norton Sound
- Kotzebue Sound.

The shellfish and halibut management areas are:

- Peninsula
- Eastern Aleutians
- Western Aleutians
- Bering Sea

The Bering Sea King Crab Management Area is disaggregated to provide information on the king crab fisheries of Norton Sound.

The processing sector of the Western Alaska commercial fishing industry is analyzed by the following census divisions:

- Aleutian Islands
- Bristol Bay Borough/Bristol Bay
- Bethel
- Wade Hampton
- Kuskokwim
- Yukon - Koyukuk
- Nome
- Kobuk

Figures 1.2 through 1.4 depict the management areas and census division of Western Alaska.

The measures of harvesting and processing activity used to document the recent development of the commercial fishing industry, to describe its projected development through 2000 in the absence of OCS petroleum activity pursuant to the proposed lease sale, and to describe potential impacts associated with each OCS petroleum development scenario are as follow:

- weight and value of harvest by species and/or species groups,
- number of boats,
- harvesting employment and income,
- frequency and seasonality of ocean and harbor space use,
- number of processing plants,
- processing employment and income,
- processing capacity,

The items that are discussed in the development and assessment of the forecasts of these indexes of commercial fishing industry activity include:

- availability of and requirements for electric power and water,
- local participation in harvesting and processing activities,
- market channels and arrangements,

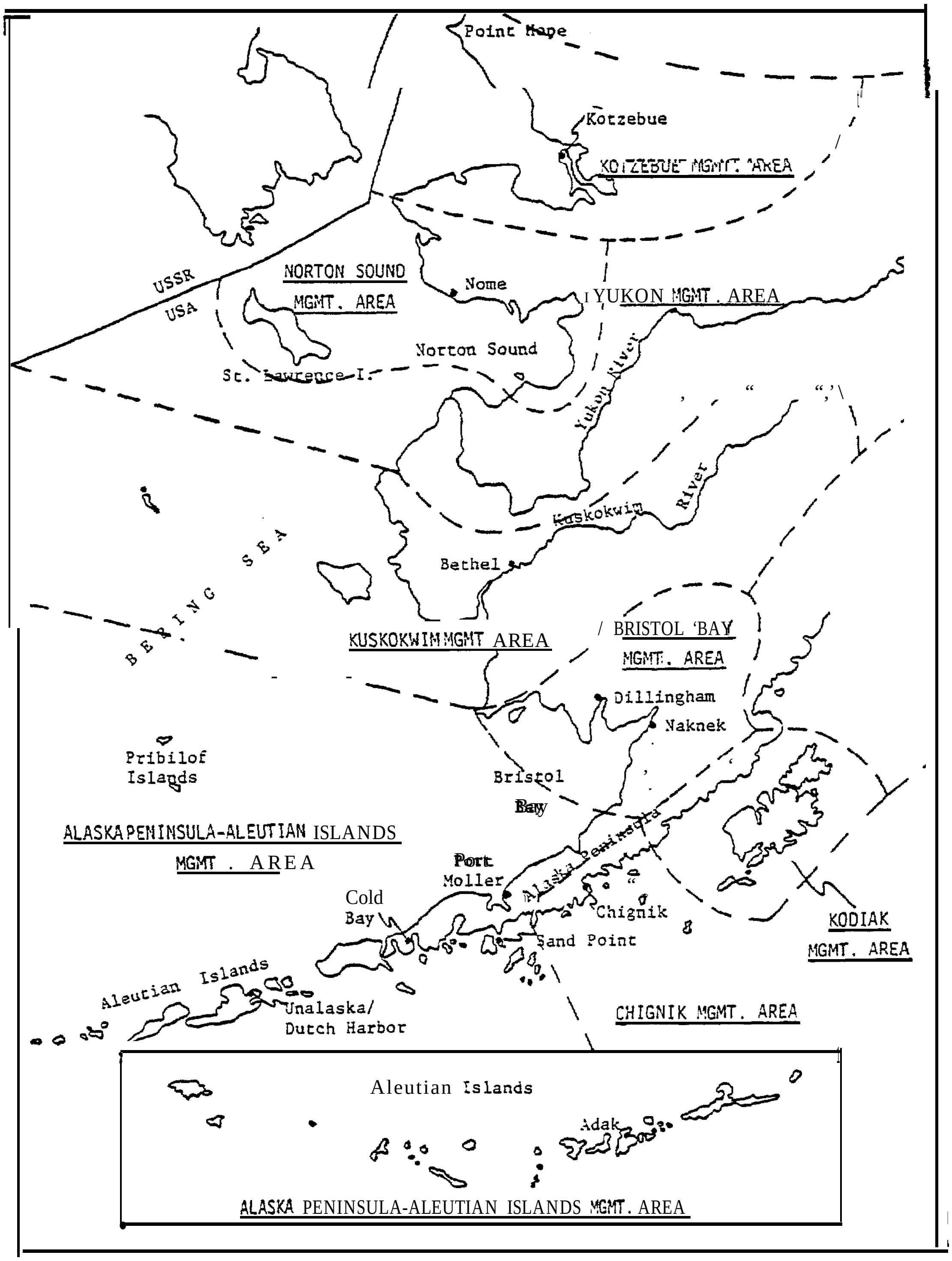


Figure 1.2: ADF&G Western Alaska Salmon and Herring Management Areas

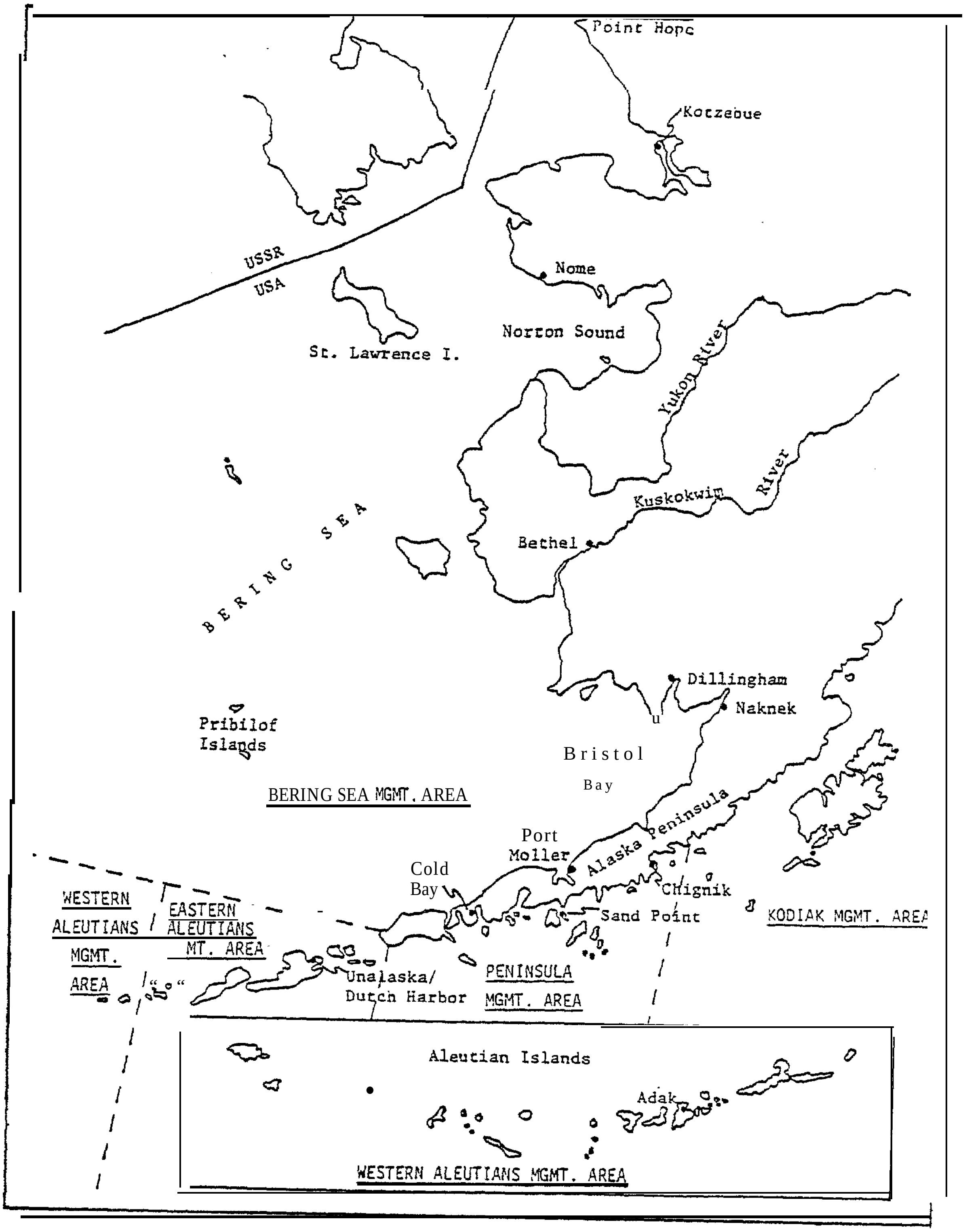
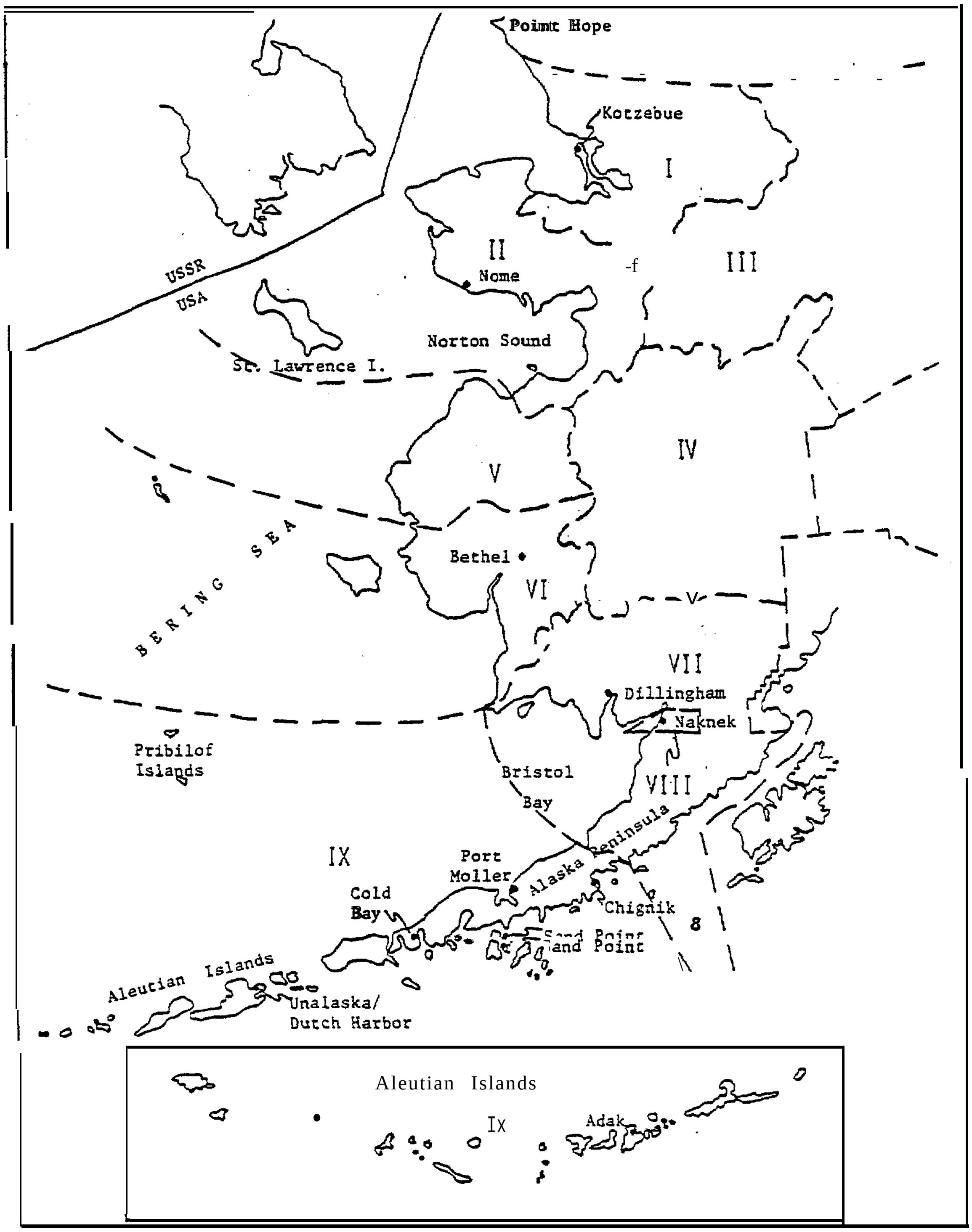


Figure 1.3: ADF&G Western Alaska Shellfish and Halibut Management Areas



Census Division Boundaries

I Kobuk	IV Kuskokwim	VII Bristol Bay
II Nome	V Made Hampton	VIII Bristol Bay Borough
III Yukon-Koyukuk	VI Bethel	IX Aleutian Islands

Figure 1.4: Western Alaska Census Divisions

- factors of change,
- ocean space use conflicts,
- conflicts between recreational and commercial fisheries,
- the organization of the commercial fishing industry and potential critical economic and political trends.

The Nature of the Non-OCS Projections

There are two reasons one cannot predict with complete certainty the level of activity of a commercial fishing industry: (1) the level of activity is determined by complex and generally poorly understood relationships among the level of activity and the elements of the biological, physical, governmental, and market environments a fishery inhabits and (2) the future characteristics of these environments are not known with certainty. However, based both on the past relationships between industry activity and a small number of elements of these environments and on the expected characteristics of these elements, one can determine how the level of activity is expected to change. The projections presented in this study, therefore, indicate how a commercial fishing industry is expected to change and not necessarily how it will, in fact, change. For example, if the probability of an industry expanding is 90 percent and the probability that it will decline is 10 percent, we would expect the industry to expand although it may, in fact, decline. The projections, therefore, indicate where an industry appears to be headed. The models on which the projections are based and the projections themselves are presented and discussed in later chapters.

The Nature of the Impact Analysis

This study considers three potential sources of OCS impacts on the commercial fishing industry of Western Alaska. They are the competition for (1) labor, (2) components of a community's infrastructure, and (3) ocean space. The competition can potentially have beneficial and/or adverse impacts on a commercial fishing industry. It is generally not possible to quantify the potential impacts and thus calculate the level of fishing industry activity in the presence of OCS activity. The reasons for this are as follow:

- Past experiences of interactions between the commercial fishing and OCS petroleum industries such as have occurred in the North Sea, the Gulf of Mexico, or Upper Cook Inlet, are not sufficiently well documented to indicate whether changes which occurred in the associated fisheries once OCS activity began were a result of the OCS activity or other factors.

- The nature of the fisheries, OCS activity, and other economic activities are sufficiently different in the current study area that experiences elsewhere may not indicate the type or magnitude of potential impacts associated with Lease Sale Number 57.

- The impacts that occur will be determined by the degree of compatibility which exists between the activities of these industries and efforts that are taken to reduce the adverse effects and increase the beneficial effects; however since the SESP is not planning study seeking alternative or mitigating solutions and is not intended to make recommendations for actions, it is inappropriate to make impact projections on the basis of assumptions as to what mitigating actions will be taken.

- Although the fisheries will potentially be impacted by the changes in the biological environment that will result from OCS activities, the potential biological effects are so varied and at this time so poorly understood that there is not sufficient information to generate scientifically defendable projections of either the biological changes that will occur or the resulting impacts on commercial fishing industry activity.

This does not, however, mean that no meaningful impact analysis is possible, but it does mean that neither an empirically nor a theoretically sound basis exist's which can, for example, be used to forecast a 15 percent reduction in catch in 1995 due to the OCS activity associated with the high-find case. The characteristics of the activities of these industries and, in some instances, the data of past experiences can be used to analyze the nature of the interactions that are expected to occur and to determine which aspects of commercial fishing activity may potentially be affected.

It should be remembered that projected impacts are based on hypothetical levels, timings, and locations of OCS activity interacting with hypothetical levels of fishing activity and, therefore, indicate what may happen if the commercial fishing and OCS petroleum industries attempt particular activities at a particular time and place; the projected impacts, therefore, indicate what can happen and not what will necessarily happen.

Study Outline

The remainder of this chapter consists of a brief outline of the subjects addressed in subsequent chapters and appendixes.

- Chapter II includes a discussion of the specific methods and assumptions, (i.e., the models) used to forecast the levels of activity of the Western Alaska commercial fishing industry in the absence of OCS activity associated with the proposed Bering - Norton Lease Sale Number 57.

- Chapter III, is divided into two sections. The first, which consists of the documentation and analysis of baseline harvesting activity, is presented by species by area. The second section includes the documentation and analysis of processing activity and community infrastructure by census division.

- Chapter IV presents the non-OCS case commercial fishing industry development scenarios for Western Alaska. The structure of this chapter is similar to that of Chapter III.

- Chapter V consists of: (1) a summary presentation of both the OCS petroleum scenarios and the associated pertinent projections of economic conditions, physical systems, and transportation systems presented in other SESP reports, (2) an analysis of the potential impacts on the commercial fishing industries of projected OCS activity, and (3) a summary of potential impacts.

- Appendix A contains the specifications of the forecast models.

- Appendix B includes a discussion of aspects of the Alaska commercial fishing industry which are not area specific but which are useful in understanding the Western Alaska commercial fishing industry and the nature of potential impacts. The topics discussed include conflicts among commercial fisheries, recreational fisheries, and non-fishing marine traffic; fishing vessel accidents; Alaska marine oil spills; and the market environment of the commercial fishing industry.

- Appendixes A and B of Northern and Western Gulf of Alaska Petroleum Development Scenarios: Commercial Fishing Industry Analysis contain information which is useful in understanding the commercial fisheries of Western Alaska. They include a discussion of fishery biology and an overview of the development of the Alaska commercial fishing industry.

II. MEASURING AND FORECASTING COMMERCIAL FISHING INDUSTRY ACTIVITY

Two of the principal objectives of this study are to document the past levels of activity of the commercial fishing industry of Western Alaska and to develop forecast models of fishery activity. The indexes of industry activity used in this documentation and the models used to project the value of these indexes are the subject of this chapter.

Measures of the Activity of a Commercial Fishing Industry

A commercial fishing industry consists of a harvesting sector and a processing sector. There are also industries or sectors of industries that are directly and perhaps wholly dependent on one or both sectors of the fishing industry but are not strictly part of the fishing industry. Examples of this include firms which sell fuel, repair services, and mechanical or electronic gear to fishing boats and firms that provide transportation, construction, and/or maintenance services for fish processing plants. Although the levels of activities of these industries are interdependent, the focus of this study is on the commercial fishing industry, and therefore the measures or indexes of activity discussed in the following two sections are those for the harvesting and processing sectors of the commercial fishing industry and not those for peripheral industries.

HARVESTING

a Several of the measures of harvesting activity addressed in this study are quite straightforward and require little explanation; others due to their less frequent usage and/or more ambiguous meanings require a more complete explanation. Both types of measures are defined and discussed in this section.

Catch

Catch refers to the weight and/or value of a harvest during a specific period of time. Typically the weight is stated in pounds and the value is in dollars, however, for herring and groundfish the weight is often stated in tons. When catch is measured in terms of dollars, it is typi-tally the value of the harvest to the fishermen that is being measured. This will, of course, equal the product of the average exvessel price of the fish harvested and pounds harvested, where the exvessel price is the price, in dollars per pound, paid by whoever buys the fish from a fisherman.

It should be noted that there are two sources of bias in the harvest value and exvessel price data that are available: (1) accurate records of the exvessel price of each sale have not been kept by the Alaska Department of Fish and Game (ADF&G) or the other governmental agencies (e. g., Commercial Fisheries Entry Commission (CFEC)) which publish average exvessel price and/or harvest value data; therefore, these data are estimates and at times rather rough estimates of prices and values, and (2) in addition to the direct payments per pound of fish, processors may on occasion also pay bonuses to fishermen or provide non-monetary rewards such as storage space or assistance in obtaining credit. These monetary and non-monetary payments that are not made per pound of fish sold are indeed part of the value of the catch to fishermen but they are not included in ADF&G or CFEC estimates of either values or average exvessel price.

Number of Boat Months

The number of boats that participate in a fishery is a limited measure of fishery activity since the degree of participation measured in terms of the number of landings, days fished, or catch varies greatly among boats. A more comprehensive measure of participation is the number of boat months (i.e., the number of boats in a fishery by month summed over all months). Data on the number of boats by month are available from the ADF&G and CFEC and, as will be seen, they serve as a basis for estimating employment.

Employment

Employment statistics for the harvesting sector of a commercial fishing industry are not available from the Alaska Department of Labor because fishermen, including crew members, are typically considered to be self-employed and, therefore, are excluded from the Department of Labor's chief source of employment statistics, the quarterly reports of employers. In the absence of historical employment data, employment is defined as participation in a fishery, and the historical and projected time series data of employment by fishery are calculated based on estimates of the number of boats and the average crew size by fishery; that is, employment is defined as the product of the two. Both monthly and annual data are available.

Income

There are numerous ways to define income in the harvesting sector, but the data that are available dictate which definition is used in this study. Alternative measures of income and a discussion of the measure used are presented below.

Gross income, net income, and fishermen's income are three alternative measures of income. Gross income equals the income directly generated by harvesting activities and as such would include all payments both monetary and non-monetary made in exchange for the harvesting activity of vessels. Net income equals gross income minus non-labor costs, and fishermen's income equals the pre-tax monetary and non-monetary income received by the crews including skippers in exchange for the labor services they provide.

The measure of income that is used in this study, harvest value, is an approximation of gross income which in turn is the basis of the other measures of income. As was mentioned in a previous section, the harvest value data that are available exclude bonuses and non-monetary payments that are made in exchange for harvesting activities and, therefore, understate gross income. But the values of the excluded payments are not available, therefore, the harvest value data as reported by the ADF&G and CFEC are used to approximate gross income. Time series data on net income and fishermen's income are not available nor are the data necessary to accurately estimate them. It is, therefore, not possible to estimate net or fishermen's income on the basis of estimates of gross income. Changes in gross income, however, accurately reflect changes in the other two measures of income if the three measures of income change proportionately. If the cost of fuel and other non-labor costs increase more rapidly than gross income, the rate of growth of gross income will exceed that of net income; however, in the past large increases in ex-vessel prices have tended to prevent this from happening and expected increases in exvessel prices may do the same in the future. Differences in the rates of growth of gross and net income and/or changes in crew share agreements can cause a divergence between the rates of growth of gross income and fishermen's income. Due to the complexity and variety of crew share agreements within a fishery and among fisheries, it is not possible to determine if the average crew share is becoming a larger or smaller fraction of gross or net income; it is, therefore, not known which will tend to grow more rapidly, gross income or fishermen's income. Industry sources have indicated, however, that the ratio of fishermen's income to gross income may be decreasing. If this assessment is and continues to be correct, the forecasted rates of increase in gross income will tend to overstate the rates of increase in fishermen's income.

In add· tion to being the most readily available measure of income, gross income may also be the most useful concept in terms of community impact analysis. Some of the expenses that are subtracted from gross income in calculating net income are for goods and services purchased locally; and the boat's or owner's share that is not included in fishermen's income may be income to a local resident and, therefore, part of the economic base, as is local fishermen's income.

Frequency and Seasonality of Ocean Space and Harbor Use

The frequency and seasonality of ocean space and harbor use is the final index of harvesting activity considered. There is very little historical data concerning the movements of fishing vessels. Their use of ocean and harbor space has not been as well monitored and reported as that of larger vessels. ADF&G and CFEC data on the number of boats by fishery, by month, however, provide measures of the frequency and seasonality of ocean space and harbor use.

Local Fishing Activity

Due to the mobility of fishermen and boats among geographically dispersed fisheries, it is difficult to define local fishing effort in a meaningful way; and, due to the lack of data concerning the expenditure and work patterns of fishermen, it is difficult to measure local effort once a definition is selected. The difficulties of defining and measuring local effort in a way that is useful for local economic base analysis is demonstrated by the following example. Consider two fishermen (1) a fisherman from Cordova who fishes for salmon in Prince William Sound and in Oregon and Washington and who resides in Hawaii during the winter, and (2) a shrimp fisherman from Washington who resides in Kodiak with his family during the shrimp season. The proportions of the Cordova fisherman's Prince William Sound fishing income that is spent in Cordova may not be greater than the proportion of the Washington fisherman's Kodiak fishing income that is spent in Kodiak.

Although precise definitions and measures of local fishing effort are neither meaningful nor feasible, rough measures of local participation are available. They include the numbers of gear permit holders and commercial fishermen in a community. Such data are presented by community and by area as quantitative measures of local participation.

PROCESSING

The indexes of processing activity to be addressed in this study require only brief explanations.

Number of Plants

A fish processing plant is defined as a semi-autonomous fish processing facility, therefore, a single firm may have more than one plant in a community or in a management area. Two factors which make it difficult to determine the number of processing plants should be noted: (1) due in part to the extensive use of floating processors in Western Alaska the number of processing plants in a particular region can change dramatically from season to season, and (2) ADF&G records do not always make a distinction between buying stations and processing plants. Fish are purchased at buying stations and are prepared for shipment to processing plants. Fish processing does not occur at buying stations, therefore including buying stations as processing plants would greatly inflate the number of plants in an area.

Employment

Average monthly and/or average annual employment statistics are used.

Income

Annual income data are used. For the regions of the study area, more income and employment data are available for manufacturing than for food processing or fish processing alone due to either confidentiality requirements or reporting procedures. Manufacturing, however, is dominated by fish processing in the study area; therefore, manufacturing employment statistics provide acceptable approximations of processing employment arid income. The less extensive data that are available for fish processing, storage, and wholesaling are used to indicate the degree to which manufacturing in each region is dominated by the commercial fishing industry.

Existing Capacity

There are two closely related problems associated with the concept of processing plant capacity; the concept is ambiguous and capacity can change rapidly in response to changing market conditions. There are two sources of ambiguity. Typically there are a number of constraints of varying strengths and durations which can increase or decrease over time; and the quantity of fish which can be processed is in part determined by the degree of processing which occurs. An example of the first source is as follows: a canning operation in a plant with unused floor space may be able to process 50 metric tons (110,000 pounds) of fish per day using two ten-hour shifts, but if the machinery cannot be operated at this rate for long before it wears out, the long-term and short-term capacities differ. The long-term capacity is, however, not necessarily less than the short-term capacity since, given time, equipment can be replaced and/or additional equipment can be installed. An example of the second source of ambiguity is that a plant's capacity will be quite different if it only guts and ices fish in preparation of shipment for further processing elsewhere rather than cans fish. The second problem, the potential rapid changes n capacity, is particularly acute in Western Alaska due to the importance of floating processors in this area. The estimates of processing capacity presented in this report reflect historical levels of processing and are not considered to be constraints on processing activity.

REAL VERSUS NOMINAL DOLLARS

Values and prices can be stated in real (i.e., constant) dollars or in nominal (i.e., current) dollars, the difference being that a nominal measure is the number of dollars whereas a real measure is the number of dollars adjusted for changes in the value of a dollar since a base period. For example, the nominal value of the Alaska red salmon harvest increased from $17.5 million in 1961 to $19.2 million in 1975, but since the U.S. Consumer Price Index (CPI) for all goods increased by 80 percent during this period, the real value of the 1975 harvest in terms of 1961 dollars was $10.6 million. In this example, the number of dollars received from the harvest (i.e., the nominal value) increased by 9.7 percent while the amount of goods and services that could be purchased with the dollars received for the harvest (the real value) decreased by 39.4 percent. Since intertemporal comparisons of nominal dollar measures are relatively meaningless during periods of inflation (i.e., during periods in which the CPI is increasing and, therefore, the value or purchasing power of the dollar is decreasing) and since the forecast period of 1980 through 2000 is expected to be characterized by inflation, projections of values and prices are presented in real dollars. But since many people are accustomed to thinking in terms of current or nominal dollars, the projections are also presented in nominal dollars and the real dollar projections use 1980 as the base year. In terms of 1967 dollars, the 1980 U.S. CPI for all goods and services is expected to be 240; therefore, real prices and values with 1980 as the base year can be converted into real prices and values with 1967 as the base year by dividing by 2.4.

Forecasting Traditional Commercial Fishing Industry Activity in the Absence of the OCS Development Associated with Lease Sale Number 57

The models used to forecast the development of the traditional commercial fishing industries of Western Alaska in the absence of OCS activity pursuant to the proposed lease sale are the topic of the remainder of this chapter.

The fishery development forecasts or scenarios that are constructed are similar to the OCS petroleum development scenarios in 'chat they are based upon estimated or hypothesized levels of resource abundance. A brief outline of the forecast methodology used precedes a detailed discussion of how the resource abundance hypotheses are used to forecast harvesting and processing activity. The methodology is as follows:

- Forecasts of resource abundance provided by the Alaska Department of Fish and Game (ADF&G) or the North Pacific Fisheries Management Council (NPFMC) or based on historical catch data are used to forecast catch.

- The catch forecasts serve as bases for projecting the other indexes of harvesting and processing activity.

- The feasibility of the projections is evaluated in terms of the economic and demographic conditions, transportation systems, and local infrastructure hypothesized in associated SESP reports or elsewhere in this report.

HARVESTING

Resource abundance is the principal determinant of harvesting and subsequent processing activity in all but a few of the traditional fisheries of Alaska. In a majority of these fisheries, quotas set by the Alaska Department of Fish and Game (ADF&G) or the North Pacific Fisheries Management Council (NPFMC) on the basis of its assessments of resource abundance are binding constraints, that is, in any one year and fishery the catch would be larger if it were not for the quotas. The salmon, halibut, king crab, Tanner crab, and shrimp fisheries of Western Alaska are typically in this group of fisheries. For a small number of developing fisheries, such as the domestic herring and groundfish fisheries, resource abundance is a major, but perhaps not the principal, determinant of fishery activity. In these fisheries, the economic conditions are such that it is not profitable for fishermen to harvest the maximun amount the ADF&G or the NPFMC thinks is acceptable; and therefore, market constraints are binding, not the quotas based on resource abundance. Market constraints are, however, in part determined by resource abundance. Catch per unit effort and thus costs per unit harvested are related to resource abundance, and the exvessel price is directly related to the quality of the fish which, in turn, is related to stock abundance. The quality of the catch is influenced by resource abundance because changes in abundance are often accompanied by changes in age and size structure of the stock.

The dependence of commercial fishing activity on resource abundance creates forecasting problems because the prediction of resource abundance, within reasonable confidence limits, presupposes detailed knowledge of a number of physical and biological processes operating in the marine environment. The need for detailed information can be seen in the prediction that a 0.8°C temperature anomaly in the southern Bering Sea can result in a 11,300 metric ton (24.9 million pound) change in the biological production of herring (Laevastu, 1978). Pioneering efforts in the short-term assessment of fisheries production are now taking place in the form of complex computer simulation models. Since the extension of these pioneering efforts to the fisheries of Western Alaska is beyond the scope of this study, such models have not been used to forecast resource abundance. The forecasts of stock abundance that are used are provided by the ADF&G and the NPFMC or are based on historical catch. It should be noted that, with the exception of the ADF&G salmon projections which take into account potential enhancement and rehabilitation programs, the projections are based on estimates of current stock abundance and short-term trends. The use of these forecasts of stock abundance as a basis for projecting the indexes of harvesting activity is discussed in the following sections.

Catch by Weight

Similar types of resource abundance forecasts are not available from the

ADF&G and/or NPFMC for all the commercial fisheries in the study area, therefore, it is not appropriate to apply the same method of forecasting catch to all the fisheries. The nature of the resource abundance forecasts and the ways they are used to project catch are discussed by species in Chapter IV.

Catch by Value, Income

The measure of the value of catch or harvesting income being used in this report is the product of the catch by weight and the exvessel price; therefore, projections of catch by value require forecasts of both the catch by weight and the exvessel price. The methods used to forecast the former are discussed in Chapter IV; the methods used to forecast exvessel prices are the subject of this section.

Exvessel salmon prices are estimated by management area fishery using a two-stage process:

- Each statewide exvessel price is forcasted using an empirically-determined relationship between exvessel prices and the determinants of exvessel prices.

- Each management area exvessel price is projected using the management area real price for 1979 and the projected increases in the appropriate statewide price.

With the exception of the Bering Sea Tanner crab fishery, estimates of statewide shellfish and halibut prices are used directly as estimates of regional prices. This is done because regional prices are closely approximated by statewide prices for these fisheries but not for the salmon fisheries. The Bering Sea Tanner crab prices are adjusted downward to reflect the dominance of a lower valued species in the Bering Sea. The specifications of the statewide exvessel price models and the past and expected values of the determinants of exvessel prices are presented in Appendix A.

An example of how a forecast of a statewide salmon price is used to forecast a management area price is as follows: if the statewide model for king salmon forecasts exvessel prices of $1.00 and $1.50, respectively, for 1980 and 1986 and if the 1979 exvessel price of king salmon is .$0.90 in management area A, the 1986 exvessel price forecast for area A king salmon is $1.35 ($0.90X $1.50/$1.00). This method of forecasting management area prices based on forecasts of statewide prices is valid if statewide prices and management area prices change proportionately. Each management area price was regressed on a constant and the corresponding statewide price to determine if prices change proportionately, Typically, the estimated coefficient on the constant term was insignificant. This indicates that prices tend to change proportionately.

There were two reasons for using statewide exvessel price models to forecast management area prices rather than directly forecasting area prices: (1) greater precision is usually achieved in forecasting with a longer time series, and longer time series are typically available for statewide prices than for management area prices and (2) the number of exvessel price models required was greatly reduced.

The salmon exvessel price forecast methodology outlined above results in each 1980 management area nominal and real price being set equal to the real price for 1979, and it results in each nominal price increasing from 1980 through 2000 at the rate projected for the corresponding statewide price. A brief justification for the 1980 price forecast is as follows. The 1980 prices are set equal to the 1979 prices rather than extrapolating a 1980 price from the 1979 price and the statewide movers because a number of market conditions including large cold storage inventories and record salmon runs in 1980 have resulted in what appear to be atypically low exvessel salmon prices. The use of 1979 prices as the 1980 bases partially allows for the market conditions of 1980 but more importantly it provides a price basis that reflect long-run market conditions. Such bases are appropriate for the long-range projections presented in this report.

The nominal and real prices forecasts are the same for 1980 because 1980 is used as the base year in determining real prices, that is, the real prices are in terms of 1980 dollars.

Structural changes and the lack of adequate time series data precluded the use of regression analysis to forecast exvessel prices for the herring and groundfish fisheries. The statewide price of herring is difficult to project using historical data because there are distinct markets and prices for herring products such as roe herring, roe on kelp, and bait; because the relative importance of these products has dramatically changed in the last ten years as a market for Alaska roe products has been established and expanded; and because the roe price has fluctuated dramatically in recent years. In 1961 the statewide exvessel price for herring was $0.01 per pound, in 1979 the exvessel price for roe herring, which now dominates the herring fisheries, approached $1.00 per pound, and in 1980 the price is expected to be approximately $0.20 per pound. This phenomenal increase in the price of herring during the past 18 years was due to a change in product mix and improvements in marketing opportunities that are not expected to occur again. The large price increases have resulted in a significant increase in fishery activity which is expected to moderate future price increases. The exceptionally high price in 1979 resulted from a set of market conditions that are not expected to occur again in the immediate future. The domestic groundfish fishery has just begun to develop and there is not adequate time series data to estimate exvessel price models. In the absence of models or data that suggest otherwise it is assumed that real exvessel herring and groundfish prices will remain constant.

Number of Boat Months

In projecting the number of boat months, where boat months equal the product of the number of boats that participate in a fishery and the average number of months per year boats participate in a fishery, it is useful to distinguish between the fisheries in which entry is restricted by the Commercial Fisheries Entry Commission (CFEC) and those in which entry is not limited. The CFEC limits the number of boats that can operate in any one Western Alaska salmon fishery at any one time by 'requiring that a gear permit holder be on each boat and by limiting the number of permits issued for each fishery; and in practice, the number of boats participating in each fishery is therefore constrained. If the policies of the CFEC impose a binding constraint on the number of gear permit holders and boats that participate in a fishery, the CFEC's policies alone determine the number of boats. The gear permits are transferable, and the high market values of permits indicate that the constraints are in fact binding. Therefore, to successfully forecast the number of boats in a fishery, one must know what the CFEC will do. Unfortunately, no one, including the CFEC, knows when, or if, or to what extent, it will increase the number of permits by issuing more permits or decrease the number of permits by initiating a buy-back program for a particular fishery. Due to the technical and political problems associated with changing the number of permits, the CFEC is not expected to radically change the number of gear permits. Another reason for expecting the number of permits to be held relatively constant is that a principal objective of the CFEC is to assure that the fisheries are economically viable; that is, that they provide a fair return to participants in the fishery. But once entry is limited and as long as the market value of permits is greater than zero, the market mechanism tends to assure fair rates of return. If the rate of return is exceptionally high in one fishery, the price of a permit in that fishery will increase, the cost of participating in that fishery will increase, and the rate of return will decrease until it equals the expected rate of return in other fisheries. Similarly, if the rate of return is exceptionally low in one fishery, the price of a permit will decrease, the cost of participation will decrease, and the rate of return will increase until it equals the expected rate of return in other fisheries. Due to this automatic adjustment mechanism, it is not necessary for the CFEC to adjust the number of gear permits to maintain fair rates of return.

The expectation that the CFEC will not dramatically change the number of permits is also reflected in the high market values of permits; if it were generally believed within the industry that additional permits would soon be readily available, the permits would not be selling for tens of thousands of dollars. It should also be noted that the harvesting capacity of the existing number of boats in each fishery exceeds the projected catch for the forecast period, so it will not be necessary to increase the number of permits to allow full utilization of the fishery resources. Therefore, the number of boats in each salmon fishery is held constant for 1980 through 2000, and the number of boat months is set equal to the product of the number of boats and the historically determined number of months per year that the average boat participates in a fishery.

For the fisheries in which entry is not limited by the CFEC, the numbers of boats and boat months are projected based on the historical relationship between catch, the number of boats, and the number of boat months.

The specifications of these relationships for each fishery are summarized in Appendix A.

Number of Fisherman Months

The number of fisherman months is used as the measure of harvesting employment. For each fishery, the employment forecast is the product of the projected number of boat months and the average crew size. The latter is held constant for the forecast period since crew sizes are expected to remain relatively constant. I-t should be noted that since a single boat or fisherman may participate in more than one fishery during a month, the sum of boat months or fisherman months across fisheries defined by area, gear type, and species can result in double counting. This problem is not however as great as it would be if the number of fishermen or boats is summed because the mobility among fisheries is substantially greater in a year than in a month.

PROCESSING

Processing plant activity is measured in terms of the quantity of inputs used and in terms of the income of processing plant employees. The methods used to project these measures of activity are discussed in the following sections.

Input Requirements

The requirement for a particular input such as labor, electric power, or water can change due to a change in any or all of the following:

- the quantity of fish processed,
- the product mix,
- the technology,
- the price of one input relative to the prices of other inputs.

The potential effect on input requirements of each type of change and a method of dealing with the uncertainty they present for input requirements are presented in this section.

For a particular area, the quantity of fish processed equals the quantity of fish landed if fish in the round are neither imported nor exported. Unfortunately this condition is not met in any of the management areas being studied, and the data required to determine the relationship between catch and processing within each area are not available. If, however, the relationship between catch and processing is relatively stable, the quantities harvested and processed increase at the same rate. Due to the lack of time series data on interregional movements of fish in the round and due to the rapid changes that are possible in such movements, there is substantial uncertainty concerning how the relationship between the quantities harvested and processed will change, An additional source of uncertainty as to the quantity of fish that will be processed is the domestic groundfish industry. This industry has not developed sufficiently to determine the quantity of groundfish that will be processed in each area.

Another source of uncertainty is the relationship between the quantity of fish processed and the per-unit of product requirement for a particular input. If there are economies of scale, the per-unit input requirement decreases as output increases, and therefore input requirements increase less rapidly than output. Conversely, if the production process is characterized by diseconomies of scale, input requirements increase more rapidly than output. The level of output can also affect the per-unit input requirement of a particular input if the desirable input mix changes with output. For example, a relatively capital-intensive method of production may only be feasible at high levels of output. If the increase in the optimal capital to labor ratio associated with the increase in output results in average total cost decreasing, this is an example of economies of size. The difference between economies of scale and of size are that economies of scale are said to occur if when all inputs are increased proportionately output increases more than proportionately; economies of size are said to occur if increases in output are accompanied by decreases in average total cost. The existence of economies of scale will assure economies of size; however, the converse is not true. For a more complete treatment of the issues of economies of scale and of size refer to Miller, Intermediate Microeconomics; Hirshberfer, Price Theory and Applications; or Leflwich, The Price System and Resource Allocation. The nature of the production function for fish processing is not sufficiently well understood to determine how the per-unit requirement for each input is related to output.

The product mix, that is the species that are processed and the product forms of each species that are produced, affects the input requirements. For example, relatively more labor and electric power are required to produce frozen salmon than to produce canned salmon, and relatively more water is required to process shrimp than to process crab. The data required to account for the changes in input requirements that will result from changes in product mix in terms of species processed are not available; however, there are discernable impacts due to changes in product mix with respect to product form. Frozen products have steadily increased in importance relative to canned products. This is true for most finfish and shellfish species. This change is expected to continue; therefore, everything else being constant, the requirements for labor and electric power are expected to increase more rapidly than the quantity processed.

The effect of technical progress on the requirement of a particular input is ambiguous. If technical progress is characterized by proportional increases in the productivity of all inputs, the input requirements per unit of output will be reduced for all inputs. However, if it is characterized by a more rapid increase in the productivity of one input, the requirement for that input may increase as it is substituted for what have become relatively less productive inputs. The effect on input requirements therefore depends on both the rate and type of technical progress that will occur, and neither can be forecasted with much certainty.

Changes in relative input prices tend to change the input mix that processing plants use. For example, f the price of labor increases relative to the price of physical cap tal, processors will tend to substitute capital for labor; and everything else being constant, the labor requ rement will decrease and the requirements for more automated processing equipment and electric power will increase. The change in input requirements that will occur due to changes in relative input prices will depend on both the extent to which relative prices change and the responsiveness of processors to such changes. Although few definitive statements can be made about either, it appears that the relative price of electric power will continue to increase and that the increase will be substantial enough that processors will tend to substitute other inputs for electric power. Fe-r example, more expensive but more efficient freezer units will be used, The aforementioned micro-economics texts can be referred to for a more complete understanding of the determinants of input mixes.

The preceding discussion of the factors that will determine input requirements indicates that there are a variety of reasons that input requirements cannot be forecasted with a high degree of certainty. To account for the uncertainty associated with both the rate of development: of the domestic groundfish industry and the factors that determine processing input requirements per unit of harvest, three sets of input requirement forecasts are presented. A set of forecasts is presented for the traditional fisheries with and without a 2 percent annual decrease in per-unit input requirements, and a set of forecasts is presented for the groundfish industry. The forecasts for the traditional fisheries are based on the projected changes in management area catch for the traditional fisheries. For example, if the total traditional catch is projected to increase by 50 percent between 1980 and 1991, input requirements are projected to increase by 50 percent assuming per-unit requirements do not change, or by 20 percent assuming a 2 percent annual decrease in per-unit requirements. The 1991 input requirements would be 120 percent of the 1980 requirements in the latter case, since 0.98^{11} equals 0.80, and the product of 0.80 and 150 percent is 120 percent.

The sets of forecasts that do not allow for decreases in per-unit input requirements tend to set an upper bound on input requirements since the requirements are not expected to increase as rapidly as catch. Technical progress, economies of size resulting from larger harvests and more uniform rates of production, increasing input prices, and the gradual substitution of capital for labor will tend to reduce processing labor, electric power, and water input requirements per unit of catch. Therefore, the sets of forecasts that allow for decreasing per-unit requirement are perhaps more realistic. A 2 percent rate of decrease in per-unit requirements is consistent with the 2.2 percent rate of increase in real income per capita used by the SESP and the long-term historical rate of increase in efficiency for the U.S.

Income

The income of processing plants, defined to equal their payrolls, is the product of employment measured in units of labor services and the average wage rate. Therefore, to forecast income, it is necessary to project the average wage rate and employment. The method used to project the latter was discussed in the previous section. The method used to project the wage rate is based on the historical relationship between the rates of increase in the CPI and the average hourly food processing wage in Alaska, for July and August. Between 1961 and 1979, the average hourly wage tended to increase 1.073 times faster than the C?I. Based on the assumption that this relationship will continue during the forecast period and based on the Studies Program's optimistic assumption that the CPI will increase at an annual rate of 7.56 percent, the average nominal wage rate will increase by approximately 8.1 percent a year.

The Nature of the Forecasts

The forecasting methodology described in this chapter and in Chapter IV does not generate projections of harvesting and/or processing activity which exhibit the cyclical fluctuations which have historically been characteristic of the commercial fisheries. In this section, the reasons for not attempting to project cycles and the nature of the forecasts are clarified.

There are four reasons cycles are not forecasted; they are as follow:

- For many species, the length and amplitude of the cycles are not constant over time, and the determinants of cycles are not sufficiently well understood and/or predictable to allow one to successfully project cycles.

- A major objective of the ADF&G, with respect to salmon, is to reduce the cyclical fluctuation in the commercial fisheries.

- The accuracy of the forecasts is not sufficient that forecasts of cyclica deviations would be meaningful.

- The compar son of cyclical fishing industry with hypothesized tim ngs of OCS activity is of little value if the hypothesized Cyc ical activity of either industry is off schedule.

The accuracy problem in fishery forecasting is one that deserves additional attention. One example of the potential magnitude of the forecasting error is provided by the comparison of the ADF&G 1978 preseason estimate of the Bristol Bay pink salmon return of 3.2 million fish and the actual return of 13.3 mill ion. The preseason forecasts are typically more successful than this one was, and perhaps a better measure of the magnitude of error that can normally be expected is provided by "The Preliminary Forecasts and Projections for 1979 Salmon Fisheries. " In this publication, the point estimate of the statewide salmon harvest is

72 million fish and the range about this estimate is 50 to 100 million fish; that is, there is approximately a 40 percent range about the point estimate within which the actual harvest can fall without surprising anyone. Another example of the potential error associated with fishery forecasts is provided by the experience of the Kodiak shrimp fishery. Between 1969 and 1977, the shrimp catch ranged from 14,200 metric tons (31.5 million pounds) to 37 300 metric tons (92.2 million pounds) and averaged 24,900 metric tons (54.9 million pounds); in 1978 it fell to 10,300 metric tons (22.8 mi" lion pounds), in 1979 it fell to 6,600 metric tons (14.5 million pounds), and is now expected to decline even further. Had long-range catch forecasts been made in the mid-1970s, they would have tended to overstate the catch in the late 1970s and early 1980s by a factor of three or 'our. This experience and others provide sufficient proof that unforeseen changes in the physical, biological, market, and/or governmental environments of the fisheries can cause a rapid decline in a booming fishery; and they can just as readily create new fisheries or turn marginal fisheries into very productive ones.

The inability to forecast cyclical changes in activity can be minimized by thinking in terms of expected or probabilistic levels of fishery activity; for example, if the 1985 salmon catch forecast for a management area is 20,000 metric tons, the implication is that in the mid-1980s, the catch will on average be 20,000 metric tons. The inability to identify secular trends that are or will be developing is a more fundamental problem for which there is no simple solution. Dramatic fluctuations are expected, they are however typically not predictable. As a result of this problem, the forecasts presented in the following chapter indicate the levels of commercial fishing industry activity that are expected given the past and present performance of the industry.

Methods Used to Project Harvesting and Processing Activity for the Domestic Ground-Fish Industry

At this early stage in the development of the domestic Alaska groundfish industry, it is not known now or at what rate the industry will develop. Questions as to the size and type of vessels that will dominate the industry, the importance of onboard versus onshore processing, the number of processing lines per fish processing plant, the average productivity per vessel, and the processing labor requirements have yet to be answered. In the absence of such information, the forecasts of the development of this fishery are by necessity based on a set of assumptions. These assumptions are as follow:

- The maximum sustainable yield (MSY) for the various groundfish species in the Bering Sea and the Gulf of Alaska will remain at the levels presented in the North Pacific Fisheries Management Council's management plans for the Bering Sea (1979) and the Gulf of Alaska (1978).

- The domestic fisheries will have completely replaced foreign fisheries by the year 2000.

- Domestic catch by species or species group will exhibit constant annual rates of growth from the actual catch in 1978 to the MSY in 2000.

- Half of the harvest will be taken by catcher/processors and processed offshore, and half will be taken by trawlers and delivered to onshore processing plants.

- Average annual catch per trawler will equal 2,700 metric tons (6 million pounds).

- Average annual catch per catcher/processor will equal 10,000 metric tons (22 million pounds) of pollock or 5,900 metric tons (13 million pounds) of cod and other groundfish species.

- Trawlers will typically be 37.5 meters (123 feet) in length and have a crew of six including the skipper.

- Catcher/processors will typically be 61 meters (200 feet in length and have a crew of 28 or 24 when targeting on po' lock or other species, respectively. All but five of the crew will operate the onboard processing equipment.

- The annual nominal wage per man for those who operate the onboard processing equipment will increase at an annual rate of 3.1

percent from S20,000 in 1979, and the annual wage per man for the rest of a catcher/processor's crew and a trawler's crew will increase at the same rate from S30,000 in 1979.

- An onshore plant with 12 fillet lines and accompanying equipment will process 54,000 metric tons (119 million pounds) of fish in the round.

- Such a plant will employ 403 people, pay nominal wages that will increase at an annual rate of 8.1 percent from $3.9 million in 1979, and operate two shifts per day.

The basis of each assumption is as follows, The data required to forecast the MSY for each species are not available. Some data suggest that the MSY for pollock may tend to increase and that the MSY for other species may also tend to change, but the magnitude of the change or, in some cases, the direction of change is not known ; the current MSY's thus provide the best available forecasts. If an estimate of allowable biological catch (ABC) but not MSY is available, the former is used as an estimate of MSY.

The domestic groundfish fishery has begun to develop but it is too early to know with a high degree of certainty how rapidly the domestic fishery will develop. There are, however, several reasons for believing that the domestic groundfish fishery will replace the foreign fishery in the next 20 to 25 years; they are as follow: a goal of the Alaska Bottomfish Development Program is, "-" develop within a period of approximately 20 years the domestic utilization of Alaska bottomfish resources to the fullest optimum yield." (PDBI, 1979, p. 4); the Arthur D. Little report to the Office of the Governor states that, "Full development of Alaska's bottomf· sh industry will require 15 to 20 years" (Little, 1978, p. 39); and many of the vessels that have been built for the Alaska shellfish fleets in the past few years have been designed to allow them to enter the groundfish fishery as it becomes more profitable and as the shellfish seasons become shorter. It should be noted that there is no concensus within the industry as to whether this goal is feasible; it has been suggested that rapid development may riot be possible without substantial increases in real exvessel prices (Stokes, 1979).

The history of the development of other fisheries and the current impediments to the development of the Alaska groundfish industry suggest that the annual increases in catch will at first be rather small but will become continuously larger as the initial impediments are removed. A growth path resulting from a constant annual rate of growth exhibits these characteristics. The current impediments to development which must be removed for the Alaska groundfish industry to develop and which will be removed as it develops include: the absence of both marketing arrangements between harvesters and processors and well established marketing channels, inadequate harvesting and processing knowledge, the high profitability of alternative traditional fisheries, and the uncertainty of the relative profitability of alternative methods of harvesting and processing.

In the absence of a well-developed trend toward either onboard or onshore processing, it is assumed that half the processing will occur onshore in Alaska and that half will occur on the fishing grounds. Processing pollock onshore has proved to be economically feasible in the case of Icicle Seafoods (Martin, 1978); however, Jaeger (1977) indicates that an onshore processor would have to offer a 75 percent price premium to compete with offshore processors due to the additional costs associated with delivering fish to an onshore processor as opposed to a processor located on the fishing grounds. It is not clear whether onshore processing is cost effective if such a premium is paid. The development plans of a number of *onshore* processors suggest, however, that they think it will be. 3ut it is not known whether the industry will be dominated by the existing processors or by new entrants to fish processing with different perspectives as to the relative profitability of various methods of processing. The levels of harvesting and processing activity associated with either onshore or offshore processing are presented in such a manner that the implications of various mixes of onshore and offshore processing can readily be determined.

Theassumption concerning the input requirements in terms of the numbers of trawlers, catcher/processors, fishermen, and processing plants, and the corresponding wages are based on information provided by Robert Stokes, The ,rate of increase in annual nominal wages is based on a previously mentioned relationship between the annual rates of increase in the CPI and nominal wage rates.

It should be noted that the forecast of the number of boats is in fact a forecast of full-time equivalent boats since the assumed levels of catch per boat are those that may be expected for a boat that participates in the groundfish fishery twelve months per year. Particularly in the early stages of the development of the fishery, many boats will participate in the fishery *on* a part-time basis; therefore, the number of boats in the fishery will tend to exceed the forecast of full-time equivalents. The same is true for the forecast of fishermen; the forecast is of fishermen years and will therefore understate the number of fishermen who participate in the fishery during any one year.

The forecast of the number of fish processing plants is based on the forecasted catch arid an assumed level of output per plant; the characteristics of the plant on which the estimate of plant productivity is based are described above. If the characteristics of plants differ from those of the plant on which the estimate of productivity is eased, the forecast of the number of plants will not be correct. For example, if the processing sector is characterized by a large number of plants with two to four groundfish lines, the forecasts will understate the number of processing plants by a factor of three to six. A plant with 12 lines is thought to be the optimal size with respect to economies of size. Many plants however are expected to be smaller than this, particularly during the next few years, because the initial onshore processing lines will probably be added a few at a time to existing processing facilities and because the risk associated with a new 12 line plant will be very high until the development of the fishery can be planned with greater certainty.

Forecasts of the number of plants based on other assumptions concerning plant size can readily be made by dividing the forecast of the total number of lines by alternative plant sizes. The forecast of the number of plants is also based on the assumption that there are two shifts per day throughout the year. If there are fewer shifts, the forecast will tend to understate the actual number of plants. The forecasts of processing plant labor requirements are based on estimates of the input requirements per unit of whole fish, and are therefore somewhat independent of plant size because the overhead employment costs per line that are reduced with a large plant are also reduced when groundfish lines are added to existing facilities.

111. AN OVERVIEW OF THE WESTERN ALASKA COMMERCIAL FISHING INDUSTRY

The commercial fisheries of Western Alaska are among the most productive fisheries in Alaska. This chapter presents an overview of the harvesting and processing activities of these fisheries.

Harvesting

The commercial fisheries of Western Alaska are managed by species *or* species group and by area. The overview of the harvesting activity contained in this section is therefore presented by species or species group and by area.

SALMON

The sa'mon fisheries of Western Alaska are extremely productive; between 1969 and 1979 the weight and value of the annual harvest have ranged from 19,600 metric tons (43.2 million pounds) to 94,440 metric tons (208.2 million pounds) and from $9.7 million to $?95.3 million, respectively (see Table 3." .1). Although Bristol Bay has dominated the fishery, there are other very productive areas including Chignik and the Peninsula (see Table 3.1.2). The fisheries in other areas of Western Alaska are less productive but are not necessarily of less importance to the local economies of their respective areas.

Table 3.1.1
Western Alaska Salmon Harvest
1969-1979

Pounds
(1,000)

Year	Chignik	Peninsula	Bristol Bay	Kuskokwim	Lower Yukon	Upper Yukon	Norton Sound	Kotzebue	Western Alaska	Alaska
1969	10559	17110	46035	2924	3507	20	932	442	81529	219150
1970	17(-)97	29972	115834	2274	4177	28	934	1296	171612	346465
1971	12369	21016	66660	1913	4430	36	938	1265	10EI627	251705
1972	3897	10570	20838	2159	4461	28	9(-)4	1543	44400	189784
1973	7385	7350	14493	3560	5807	123	1161	3326	43205	136493
1974	5400	4277	16007	3673	7438	745	1661	5349	44550	131603
1975	3692	4034	29714	2980	6311	1664	1533	4881	54809	139790
1976	11316	20892	48554	3545	5451	1672	1027	1416	93873	245858
1977	20789	143(-)4	47792	5713	6544	1682	1721	1847	100392	307000
1978	17067	36296	83363	4184	4448	890	2451	1077	149775	408000
1979	16858	47779	130058	5061	4395	079	1917	1257	208204	459000

Value
(1 ,000)

Year	Chignik	Peninsula	Bristol Bay	Kuskokwim	Lower Yukon	Upper Yukon	Norton Sound	Kotzebue	Western Alaska	Alaska
1969	1607	2285	10607	391	517	4	94	66	15571	42428
1970	2882	4776	26967	362	603	5	91	194	35880	67975
1971	2770	3117	16608	262	767	7	152	202	23885	51411
1972	993	1997	5231	345	780	6	102	262	9724	4 5 2 9 6
1973	3065	1926	4.232	839	1196	23	434	931	12646	60059
1974	4869	1890	6641	1057	1880	402	420	1819	18978	65579
1975	1780	1658	11675	779	1557	308	359	1367	19483	55927
1976	5486	6417	23?59	1547	2306	507	337	397	40256	117957
1977	15908	5954	28478	4012	3646	488	547	1072	60105	1710(-)0
1978	16543	17126	57038	2550	2563	513	743	735	97811	238000
1979	15183	32288	139547	2998	2987	597	728	1064	195392	317000

Sources: CFEC Gross Earnings Files and ADF&G Catch Reports.

Table 3.1.2

Management Area Harvest as a Percentage of the Western Alaska Salmon Harvest
1969-1979

Percentage by Weight

Year	Chignik	Peninsula	Bristol Bay	Kuskokwim	Lower Yukon	Upper Yukon	Norton Sound	Kotzebue	Western Alaska
1969	13.0	21.0	56*5	3.6	4.3	0.0	1.1	O*5	100*O
1970	10.0	17*5	67.5	1.3	2.4	O*O	0.5	0.8	100.0
1971	11.4	19.3	61.4	1.8	4.1	0.0	0*9	1.2	100.0
1972	8.8	23.8	46*9	4.9	10.0	0*1	2*0	3.5	100.0
1973	17*1	17.0	33.5	8.2	13.4	0.3	2.7	7*7	100.0
1974	12*1	9.6	35.9	8.2	16.7	1.7	3.7	12*0	100.0
1975	6.7	7.4	54.2	5*4	11.5	3.0	2.8	8.9	100.0
1976	12.1	22.3	51.7	3.8	5.8	1.8	1*1	1.5	100.0
1977	20.7	14.2	47.6	5.7	6.5	1.7	1*7	1.8	100.0
1978	11.4	24.2	55.7	2.8	3.0	0.6	1.6	O*7	100.0
1979	8.1	22.9	62.5	2.4	2.1	0.4	O*9	0.6	100.0

Percentage by Value

Year	Chignik	Peninsula	Bristol Bay	Kuskokwim	Lower Yukon	Upper Yukon	Norton Sound	Kotzebue	Western Alaska
1969	10.3	14*7	68.1	2.5	3.-3	0.0	0.6	0.4	100.0
197(-)	8.0	13, -'3	75.2	1*O	1*7	0.0	0.3	0.5	100.0
1971	11.6	13.1	69.5	1.1	3.2	0.0	0.6	0.8	100.0
1972	10.2	20.5	53.8	'3.5	8.1	0*1	1.0	2.7	100*O
1973	24.2	15.2	33.5	6.6	9.5	0*2	3.4	7.4	100.0
1974	25.7	10*O	35.0	5.6	9.9	2*1	2.2	9.6	100.0
1975	9*1	8.5	59.9	4.0	8.0	1.6	1.8	7.0	100.0
1976	13.6	15.9	57.8	3.8	5.7	1.3	0.8	1*0	100.0
1977	26.5	9.9	47.4	6.7	6.1	0.8	0.9	1.8	100.0
1978	16.9	17.5	58.3	2.6	2.6	0.5	0.8	0.8	100.0
1979	7.8	16.5	71.4	1.5	1.5	0.3	0.4	0.5	100.0

sources: CFEC Gross Earnings Files and ADF&G Catch Reports.

The salmon fisheries of Western Alaska are productive in relat ve term as well as in absolute terms. Between 1969 and 1979 the annua Western Alaska harvest ranged from 23.4 percent to 49.5 percent of the total annual Alaskan salmon harvest weight and from 21.1 percent to 61.6 percent of the total annual Alaskan harvest value (see Table 3.1.3). The locations of the regional salmon fisheries are depicted in Figure 3.1.

Chignik

The annual harvest weight of the Chignik salmon fishery ranged from 1,675 metric tons (3.7 million pounds) to 9,430 metric tons (20.8 million pounds) and averaged 5,216 metric tons (11.5 million pounds) between 1969 and 1979. The annual real harvest value ranged from S1.9 million to S21.0 million and averaged $9.0 million (see Table 3.1.4). Annual harvest weight has not exhibited a secular trend for the period as a whole; the real harvest value has, however, tended to increase due to increasing real exvessel prices. The numbers of boat and fisherman months have remained relatively stable.

The Chignik fleet consists of purse seiners which are typically between 9 to 13 meters (30 to 42 feet) in length have a *crew* of five including the skipper, and on average participate in the fishery 3 months per year, The boats are predominately operated out of local communities and crewed by local residents. Their catch is landed for processing in the local area or tendered to other areas such as Kodiak. The season extends from

Table 3 1.3
Management Area Harvest as a Percentage of the Alaska Salmon Harvest
1969-1979

Percentage by Weight

Year	Chignik	Penin-sula	Bristol Bay	Kuskokwim	Lower Yukon	Upper Yukon	Norton Sound	Kotzebue	Western Alaska	Alaska
1969	4.8	7.8	21.0	1.3	1.6	0.0	0.4	0.2	37.2	100.0
1970	4.9	8.7	33.4	0.7	1.2	0.0	0.3	0.4	49.5	100.0
1971	4.9	8.3	26.5	0.8	1.8	0.0	0.4	0.5	43.2	100.0
1972	2.1	5.6	11.0	1.1	2.4	0.0	0.5	0.8	23.4	100.0
1973	5.4	5.4	10.6	2.6	4.3	0.1	0.9	2.4	31.7	100.0
1974	4.1	3.2	12.2	2.8	5.7	0.6	1.3	4.1	33.9	100.0
1975	2.6	2.9	21.3	2.1	4.5	1.2	1.1	3.5	39.2	100.0
1976	4.6	8.5	19.7	1.4	2.2	0.7	0.4	0.6	38.2	100.0
1977	6.8	4.7	15.6	1.9	2.1	0.5	0.6	0.6	32.7	100.0
1978	4.2	8.9	20.4	1.0	1.1	0.2	0.6	0.3	36.7	100.0
1979	3.7	10.4	28.3	1.1	1.0	0.2	0.4	0.3	45.4	100.0

Percentage by Value

Year	Chignik	Penin-sula	Bristol Bay	Kuskokwim	Lower Yukon	Upper Yukon	Norton Sound	Kotzebue	Western Alaska	Alaska
1969	3.8	5.4	25.0	0.9	1.2	0.0	0.2	0.2	36.7	100.0
1970	4.2	7.0	39.7	0.5	0.9	0.0	0.1	0.3	52.8	100.0
1971	5.4	6.1	32.3	0.5	1.5	0.0	0.3	0.4	46.5	100.0
1972	2.2	4.4	11.5	0.8	1.7	0.0	0.2	0.6	21.5	100.0
1973	5.1	3.2	7.0	1.4	2.0	0.0	0.7	1.6	21.1	100.0
1974	7.4	2.9	10.1	1.6	2.9	0.6	0.6	2.8	28.9	100.0
1975	3.2	3.0	20.9	1.4	2.8	0.6	0.6	2.4	34.8	100.0
1976	4.7	5.4	19.7	1.3	2.0	0.4	0.3	0.3	34.1	100.0
1977	9.3	3.5	16.7	2.3	2.1	0.3	0.3	0.6	35.1	100.0
1978	7.0	7.2	24.0	1.1	1.1	0.2	0.3	0.3	41.1	100.0
1979	4.8	10.2	44.0	0.9	0.9	0.2	0.2	0.3	61.6	100.0

Sources: CFEC Gross Earnings Files and ADF&G Catch Reports.

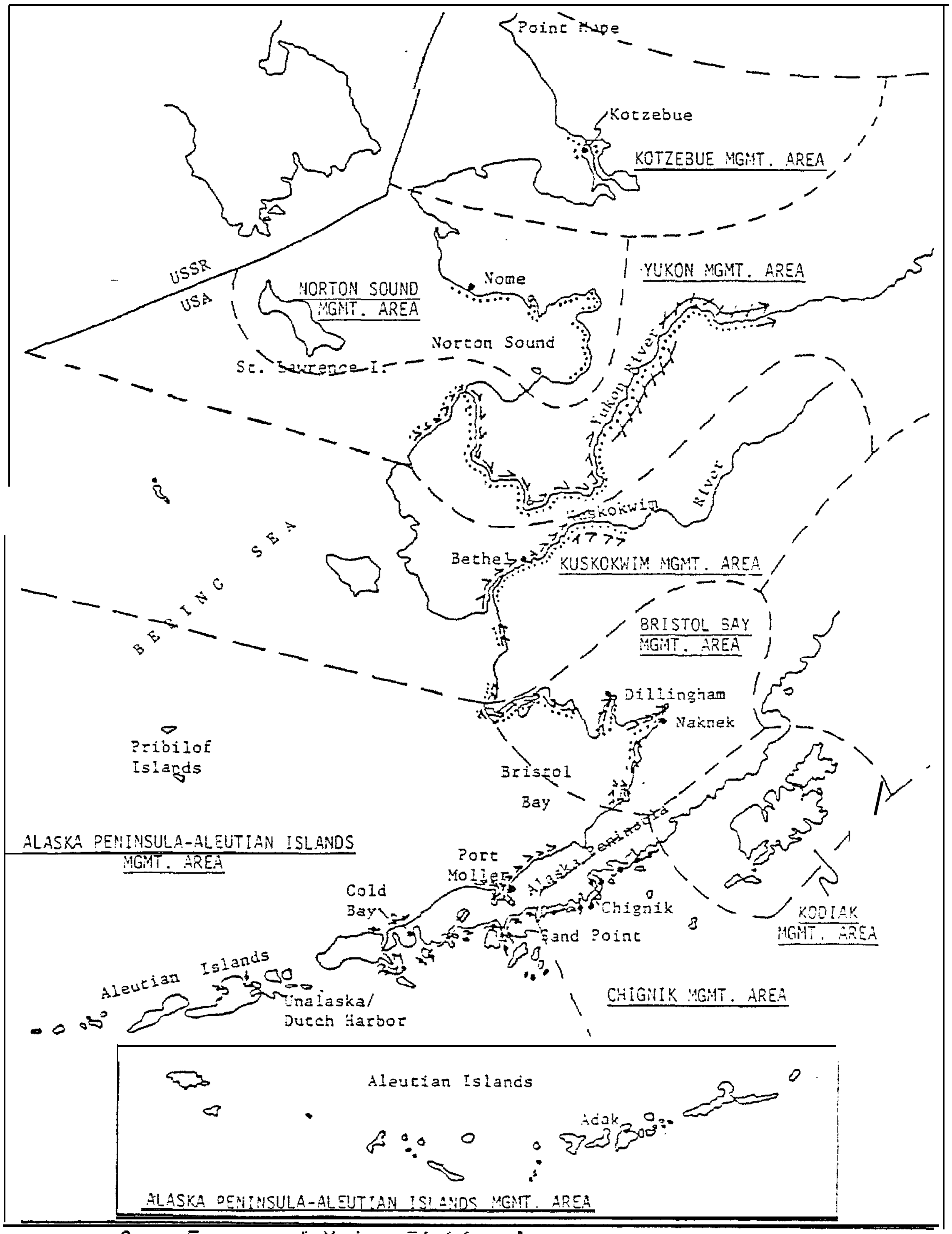
Table 3.1.4
Harvesting Activity
Chignik Purse Seine Salmon Fishery
1969-197,9

	Catch				Exvessel Price ($/Pound)		Number of		Catch per Boat Month		
	Weight		Value (millions)[1]						Weight	Value ($1,000)	
Year	Pounds (millions)	Metric Tons	Nominal	Real	Nominal	Real	Boat Months	Fisherman Months	Pounds (1,000)	Nominal	Real
1969	10.6	4790	1.6	3.5	0.15	0.33	222	1110	47.6	7.2	15.8
1970	17.1	7755	2.9	5.9	0.17	0.35	207	1035	82.6	13.9	28.7
1971	12.4	5611	2.8	5.5	0.22	0*44	?39	1195	51.8	11.6	22.9
1972	3.9	1768	1.0	1.9	0.25	0.49	153	765	25.5	6.5	12.4
1973	7.4	3350	3.1	5.5	0.42	0.75	217	1085	34.0	14.1	25.5
1974	5.4	2449	4.9	7.9	0.90	1.47	271	1355	19.9	18.0	29.2
1975	3.7	1675	1.8	2*7	0.48	0.72	205	1025	18.0	8.7	12.9
1976	11*3	5133	5.5	-?.7	0.48	0.68	255	1275	44*4	21.5	30.3
1977	20.8	9430	15.9	21.0	(-).77	1.01	277	1385	75.1	57.4	75.9
19-r8	17.1	7741	16.5	20.3	0.97	1.19	Data not available				
1979	16.9	7647	15.2	16.8	0.90	1.00					

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game Reports.

[1]The real values and prices were calculated usinn the U.S. C,PI; 1980 is the base period.

NOTE: 1978and 1979 data are preliminary.



Gear Types and Major Fishing Areas:

Drift Gill Net — Purse Seine

Set Gill Net — Fish Wheel

ADF&G Management Area Boundaries

Figure 3.1 : Major Salmon Fishing Areas, Western Alaska

Source: Alaska Department of Fish and Game, Alaska's Fisheries Atlas, 1978.

June through September. The seasonality of the fishery is summar· zed in Tables 3.1.5 through 3.1.8.

Peninsula

There are purse seine, drift gill net, and set gill net salmon fisheries in the Alaska Peninsula Management Area. The total annual harvest weight of the three fisheries ranged from 1,830 metric tons (4.0 million pounds) to 21,672 metric tons (47.8 million pounds) between 1969 and 1979 and averaged 8,812 metric tons (19.4 million pounds). The total annual real harvest value ranged from $2.5 million to $35.7 million and averaged $9.7 million (see Table 3,1.9). As Tables 3.1.10 through 3.1.12 indicate, the purse seine fishery is the most productive of the three, the drift gill net fishery is second, and the set net fishery is a distant third. For the period as a whole, neither annual harvest weight nor real value exhibits a secular trend for any of the fisheries.

The boats in the purse *seine* fleet are up to 17.7 meters (58 feet) *in* length but are typically 10.7 meters (35 feet) in length. The average crew size is five, including the skipper. The drift gill netters and set gill netters are typically 9.1 meters (30 feet) and 7.6 meters (25 feet) in length, respectively. The average crew size is 1.5 for both gill net fisheries. The boats are predominately operated from local communities, such as, Sand Point, King Cove, False Pass, Nelson Lagoon, and Belkofski and they have local crews. Their catch is landed and processed in local communities or tendered to other management areas.

Table 3.1.5
Chignik Purse Seine Salmon Fishery
Number of Boats and Catch by Month
1969-1977

Number of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	66	68	67	21	0	0	0	68
1970	0	0	0	0	0	69	70	68	0	0	0	0	72
1971	0	0	0	0	0	76	77	77	9	0	0	0	77
1972	0	0	0	0	0	0	79	74	0	0	0	0	79
1973	0	0	0	0	0	76	77	58	6	0	0	0	79
1974	0	0	0	0	0	94	94	78	5	0	0	0	94
1975	0	0	0	0	0	3	86	76	40	0	0	0	86
1976	0	0	0	0	0	75	77	77	26	0	0	0	78
1977	0	0	0	0	0	87	93	86	11	0	0	0	88

Catch (1,000 pounds)

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	677	1984	7814	83	0	0	0	10559
1970	0	0	0	0	0	7810	6374	2912	0	0	0	0	17097
1971	0	0	0	0	0	1375	6204	4744	46	0	0	0	12369
1972	0	0	0	0	0	0	2929	968	0	0	0	0	3897
1973	0	0	0	0	0	3827	2516	1033	9	0	0	0	7385
1974	0	0	0	0	0	1329	3310	733	28	0	0	0	5400
1975	0	0	0	0	0	-0	1267	2059	353	0	0	0	3692
1976	0	0	0	0	0	3384	3682	3991	259	0	0	0	11316
1977	0	0	0	0	0	3383	11809	5548	59	0	0	0	20789

Source: CFEC Gross Earnings Files.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.6
Chignik Purse Seine Salmon Fishery
The Number of Boats and Catch by Month as a Percentage of Annual Activity
1969-1977

Percentage of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	97.1	100.0	98.5	30.9	0	0	0	100.0
1970	0	0	0	0	0	95.8	97.2	94.4	0	0	0	0	100.0
1971	0	0	0	0	0	98.7	100.0	100.0	11.?	0	0	0	100.0
1972	0	0	0	0	0	0	100.0	93.7	0	0	0	0	100.0
1973	0	0	0	0	0	96.2	97.5	73.4	7.6	0	0	0	100.0
1974	0	0	0	0	0	100.0	100.0	83.0	5.3	0	0	0	100.0
1975	0	0	0	0	0	3.5	100.0	88.4	46.5	0	0	0	100.0
1976	0	0	0	0	0	96.2	98.7	98.7	33.3	0	0	0	10(-).0
1977	0	0	0	0	0	98.9	105.7	97.7	12.5	0	0	0	100.0

Percentage of Catch

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	6.4	18.8	74.0	0.8	0	0	0	100.0
1970	0	0	0	0	0	45.7	37.3	17.0	0	0	0	0	100.0
1971	0	0	0	0	0	11.1	50.2	38.4	0.4	0	0	0	100.0
1972	0	0	0	0	0	0	75.2	24.8	0	0	0	0	100.0
1973	0	0	0	0	0	51.8	34.1	14.0	0.1	0	0	0	100.0
1974	0	0	0	0	0	24.6	61.3	13.6	0.5	0	0	0	100.0
1975	0	0	0	0	0	-0.0	34.3	55.[illegible]	9.6	0	0	0	100.0
1976	0	0	0	0	0	29.9	3?.5	35.3	2.3	0	0	0	100.0
1977	0	0	0	0	0	16.3	56.8	26.7	0.3	0	0	0	100.0

Source: CFEC Gross Earnings Files.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.7
Chignik Purse Seine Salmon Fishery
Number of Fishermen by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Ott.	Nov.	Dec.	Total
1969	o	0	0	o	0	330	340	335	105	0	0	0	1110
1970	0	0	0	0	0	345	350	340	0	0	0	0	1035
1971	o	0	0	0	0	380	385	385	45	0	0	0	1195
1972	0	0	0	0	0	0	395	370	0	0	0	0	765
1973	0	0	0	0	0	380	385	290	30	0	0	0	1085
1974	0	0	0	0	0	470	470	390	25	0	0	0	1355
19-?5	0	0	0	0	0	15	430	380	200	0	0	0	1025
1976	0	0	0	0	0	375	305	385	130	0	0	0	1275
1977	0	0	0	0	0	435	465	430	55	0	0	0	1385

Source: CFEC Gross Earnings Files.

Table 3. .8
Chignik Purse Seine Salmon Fishery
Percentage of Fisherman Man Months by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	0	29.7	30.6	30.2	9.5	0	0	0	100.0
1970	0	0	0	0	0	33.3	33.8	32.9	0	0	0	0	100.0
1971	0	0	0	0	0	31.8	32.2	32.2	3.8	0	0	0	100.0
1972	0	0	0	0	0	0	51.6	48.4	0	0	0	0	100.0
1973	0	0	0	0	0	35.0	35.5	26.7	2.8	0	0	0	100.0
1974	0	0	0	0	0	34.7	34.7	28.8	1.8	0	0	0	100.0
1975	0	0	0	0	0	1.5	42.0	37.1	19.5	0	0	0	100.0
1976	0	0	0	0	0	29.4	30.2	30.2	10.2	0	0	0	100.0
1977	0	0	0	0	0	31.4	33.6	31.0	4.0	0	0	0	100.0

Source: CFEC Gross Earnings Files.

Table 3.1.9
Peninsula Salmon Harvest
1969-1979

Year	Catch: Weight: Pounds (1,000)	Catch: Weight: Metric Tons	Catch: Value ($1,000): Nominal	Catch: Value ($1,000): Real [1]	Exvessel Price ($/Pound): Nominal	Exvessel Price ($/Pound): Real
1969	17110	7761	2285	4995	0.13	0.29
1970	29972	13595	4776	9856	0.16	0.33
1971	21016	9533	3117	6167	0.15	0.29
1972	10570	4795	1997	3825	0.19	0.36
1973	7350	3334	1926	3473	0.26	O*47
1974	4277	1940	1890	3071	0.44	0.72
1975	4034	1830	1658	2468	0.41	0.61
1976	20892	94-77	641”7	9033	0.31	0.43
1977	143(-)4	6488	5954	7B73	0.42	0.55
1978	36296	16464	17126	?1035	O*47	0.58
1979	477”79	21672	32288	35710	0.68	0.75

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska [department of Fish and Game Reports.

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

NOTE: 1973 and 1979 data are preliminary.

ab e 3. .10
Harvesting Activity
Peninsu a-Aleutians Purse Seine Salmon Fishery
1969-1977

	Catch				Exvessel Price		Number of		Catch per Boat Month		
	Weight		Value (millions)		($/Pound)				Weight	Value ($1,000)	
Year	Pounds (mil ions)	Metric Tons	Nominal	Real[1]	Nominal	Real	Boat Months	Fisherman Months	Pounds (1,000)	Nom na	Real
969	9.	4 14	1.9	2.2	0.11	0.24	84	920	49.3	5.4	11.7
70	19.5	8859	2.8	5.8	0. 4	0.30	269	1345	72.6	10.5	21.7
7	12.7	576	.7	3.3	0.13	0.26	261	1305	48.7	6.4	12.6
[illegible]	3.4	55	0.7	[illegible]	0. 9	0.37	152	760	22.5	4.3	8.3
973	2.3	[illegible]	0.5	0.9	0.2	0.39	97	485	24.1	5.2	9.3
1974	1.4	645	0.5	0.9	0.39	0.63	69	345	20.6	8.0	12.9
[illegible]	.4	6 4	0.5	0.7	0.35	0.53	82	410	6.5	5.8	8.7
1976	13.1	5957	3.7	5.3	0.28	.40	202	010	65.0	8.5	26.
1977	8.	3772	2.5	3.3	0.3[illegible]	0.39	174	870	47.8	4.3	18.9

Sources This table was generated from data contained in (1) Commercial F sheries Entry Commission Gross Earn ngs Files, and (2) Alaska Department of Fish and Game Catch Reports.

[1] The rea va ues and prices were calc ated us ng the U.S. CPI; 980 is tle base period.

Table 3.1.11
Harvesting Activity
Peninsu a-Aleutians Drift Gill Net Sa mon F shery
1969-1977

Year	Catch: Weight: Pounds (millions)	Catch: Weight: Metric Tons	Catch: Value (millions): Nominal	Catch: Value (millions): Real[1]	Exvessel Price ($/Pound): Nominal	Exvessel Price ($/Pound): Real	Number of: Boat Months	Number of: Fisherman Months	Catch per Boat Month: Weight: Pounds (1,000)	Catch per Boat Month: Value ($1,000): Nominal	Catch per Boat Month: Value ($1,000): Real
969	7.	3234	1.1	2.5	0.16	0.35	255	383	28.0	4.5	9.8
0	9.0	406	1.7	3.4	0. 9	0.38	318	477	28.2	5.2	0.8
1971	7.4	3352	1.3	2.5	0. 7	0.34	300	450	24.6	4.3	8.4
972	6.6	3)	.2	2.4	0. 9	0.36	303	455	21.9	4.	7.8
1973	4.	1870	1.2	2.	0.28	0.50	336	504	12.3	3.4	6.2
1974	2.0	888	0.9	1.5	0.47	0.76	223	335	8.8	4.	6.7
5	2.3	5	.	.5	0.44	0.65	228	342	10.2	4.5	6.6
1976	6.6	2988	2.3	3.2	0.34	0.48	256	384	25.7	8.8	12.4
	4.8	2 66	2.8	3.7	0.58	0.77	313	470	15.3	8.9	11.8

Sources: This table was generated from data contained in (1) Commerc al Fisheries Entry Comm ss on Gross Earnings Files, and (2) Alaska Department of Fish and Game Catch Reports

The ea va ues and pr ces were ca culated us ng the S CP ; 1980 is the base period.

Table 3.1.12
Harvesting Activity
Peninsula-Aleutians Set Gill Net Salmon Fishery
1969-1977

Year	Catch: Weight, Pounds (millions)	Catch: Weight, Metric Tons	Catch: Value (millions), Nominal	Catch: Value (millions), Real[1]	Exvessel Price ($/Pound)[1], Nominal	Exvessel Price ($/Pound)[1], Real	Number of Boats Months	Number of Fisherman Months	Catch per Boat Month: Weight, Pounds (1,000)	Catch per Boat Month: Value ($1,000), Nominal	Catch per Boat Month: Value ($1,000), Real
1969	0.9	413	0.2	0.3	0.17	0.37	144	216	6.3	1.1	2.3
1970	1.5	675	0.3	0.6	0.19	0.39	130	195	11.4	2.2	4.4
1971	0.9	420	0.2	0.4	0.19	0.38	116	174	8.0	1.5	3.0
1972	0.5	234	0.1	0.2	0.20	0.39	99	149	5.2	1.1	2.0
1973	0.9	403	0.3	0.5	0.31	0.55	125	188	7.1	2.2	3.9
1974	0.9	408	0.4	0.7	0.47	0.77	150	225	6.0	2.8	4.6
1975	0.4	162	0.2	0.2	0.45	0.67	96	144	3.[illegible]	1.7	2.5
1976	1.2	532	0.4	0.6	0.35	0.50	139	209	8.4	3.0	4.2
1977	1.2	550	0.7	0.9	0.57	0.75	155	233	7.8	4.4	5.9

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game Reports.

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

The season lasts from June into September for all three fisheries; typically however, the purse *seine* fishery is relatively inactive in September. The seasonality of the Peninsula salmon fisheries is summarized in Tables 3.1.13 through 3.1.24. On average, each boat in the purse seine, drift gill net, and set gill net fisheries are active during 1.7, 1.9, and 2.0 calendar months per year respectively.

Bristol Bay

As was indicated earlier, the Bristol Bay salmon fishery is a dominant fishery both for Western Alaska and Alaska as a whole (refer back to Tables 3.1.1 through 3.1.3). The annual harvest weight of the total Bristol Bay salmon fishery ranged from 6,574 metric tons (14.5 million pounds) to 58,994 metric tons (130.1 million pounds) between 1969 and 1979 and averaged 25,540 metric tons (56.3 million pounds). The real value of the annual harvest ranged from $7.6 million to $154.3 million and averaged $41.1 million (see Table 3.1.25).

Two gear types are used in the Bristol Bay salmon fishery, drift gill nets and set gill nets. As is indicated by Tables 3.1.26 and 3.1.27, the drift gill net fishery is the dominant of the two. The boats in each fleet range in length from under 6.1 meters (20 feet) to 9.8 meters (32 feet) in length; the drift netters are typically closer to the upper range and the set netters are typically closer to the lower range. The average crew sizes are three and two, respectively, for the drift and set gill net fleets. Both fleets operate out of local communities

Table 3.1.13
Peninsula Purse Seine Salmon Fishery
Number of Boats and Catch by Month
1969-1977

Number of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	37	88	57	2	0	0	0	97
1970	0	0	0	0	0	37	111	120	1	0	0	0	131
1971	0	0	0	0	0	36	115	108	2	0	0	0	118
1972	0	0	0	0	0	29	86	37	0	0	0	0	89
1973	0	0	0	0	0	16	67	12	2	0	0	0	70
1974	0	0	0	0	0	9	55	5	0	0	0	0	55
1975	0	0	0	0	0	23	15	44	0	0	0	0	62
1976	0	0	0	0	2	35	80	85	0	0	0	0	109
1977	0	0	0	0	6	76	76	6	0	0	0	0	88

Catch 1,000 pounds)

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	2394	1413	5240	-0	0	0	0	9070
1970	0	0	0	0	0	7168	6767	5579	-0	0	0	0	19531
1971	0	0	0	0	0	2103	5605	4987	-0	0	0	0	12700
1972	0	0	0	0	0	1782	1375	263	0	0	0	0	3419
1973	0	0	0	0	0	595	1294	430	-0	0	0	0	2340
1974	0	0	0	0	0	61	330	31	0	0	0	0	1421
1975	0	0	0	0	0	895	41	419	0	0	0	0	1354
1976	0	0	0	0	-0	1631	3820	7672	0	0	0	0	13133
1977	0	0	0	0	757	2182	4942	42	0	0	0	0	8316

Source: CFEC Gross Earnings Files.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.14
Peninsula Purse Seine Salmon Fishery
The Number of Boats and Catch by Month as a Percentage of Annual Activity
1969-1977

Percentage of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Ott.	Nov.	Dec.	Annual
1969	0	0	0	0	0	38.1	90.7	58.8	2.1	0	0	0	100.0
1970	0	0	0	0	0	28.2	84.7	91.6	0.8	0	0	0	100.0
1971	0	0	0	0	0	30.5	97.5	91.5	1.7	0	0	0	100.0
1972	0	0	0	0	0	32.6	96.6	41.6	0	0	0	0	100.0
1973	0	0	0	0	0	22.9	95.7	17.1	2.9	0	0	0	100.0
1974	0	0	0	0	0	16.4	100.0	9.1	0	0	0	0	100.0
1975	0	0	0	0	0	37.1	24.2	71.0	0	0	0	0	100.0
1976	0	0	0	0	1.8	32.1	73.4	78.0	0	0	0	0	100.0
1977	0	0	0	0	18.2	86.4	86.4	6.8	0	0	0	0	100.0

Percentage of Catch

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Ott.	Nov.	Dec.	Annual
1969	0	0	0	0	0	26.4	15.6	57.8	-0.0	0	0	0	100.0
1970	0	0	0	0	0	36.7	34.6	28.6	-0.0	0	0	0	100.0
1971	0	0	0	0	0	16.6	44.1	39.3	-0.0	0	0	0	100.0
1972	0	0	0	0	0	52.1	40.2	7.7	0	0	0	0	100.0
1973	0	0	0	0	0	25.4	55.3	18.4	-0.0	0	0	0	100.0
1974	0	0	0	0	0	4.3	93.6	2.2	0	0	0	0	100.0
1975	0	0	0	0	0	66.1	3.0	30.9	0	0	0	0	100.0
1976	0	0	0	0	-0.0	12.4	29.1	58.4	0	0	0	0	100.0
1977	0	0	0	0	9.1	26.2	59.4	0.5	0	0	0	0	100.0

Source: CFEC Gross Earnings Files.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.15
Peninsula Purse Seine Salmon Fishery
Number of Fishermen by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	0	185	440	285	10	0	0	0	920
1970	0	0	0	0	0	185	555	600	5	0	0	0	1345
1971	0	0	0	0	0	180	575	540	10	0	0	0	1305
1972	0	0	0	0	0	145	430	185	0	0	0	0	760
1973	0	0	0	0	0	80	335	60	10	0	0	0	485
1974	0	0	0	0	0	45	275	25	0	0	0	0	345
1975	0	0	0	0	0	115	75	2’?0	0	0	0	0	410
1976	0	0	0	0	10	175	400	425	0	0	0	0	1010
1977	0	0	0	0	80	380	380	30	0	0	0	0	870

Source: CFEC Gross Earnings Files.

Table 3.1.16
Peninsula Purse Seine Salmon Fishery
Percentage of Fisherman Man Mon hs by Month
1969- 977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	0	20.1	47.8	31.0	1.1	0	0	0	100.0
1970	0	0	0	0	0	13.8	41.3	44.6	0.4	0	0	0	100.0
1971	0	0	0	0	0	13.8	44.1	4 .4	0.6	0	0	0	100.0
1972	0	0	0	0	0	19.1	56.6	24.3	0	0	0	0	100.0
1973	0	0	0	0	0	16.5	69.1	12.4	2.1	0	0	0	00.0
1974	0	0	0	0	0	13.0	79.7	7.2	0	0	0	0	00.0
1975	0	0	0	0	0	28.0	18.3	53.7	0	0	0	0	100.0
1976	0	0	0	0	1.0	17.3	39.6	42.1	0	0	0	0	100.0
1977	0	0	0	0	0.2	43.7	43.7	3.4	0	0	0	0	100.0

Source CFEC Gross Earnings Files.

Table 3.1.17
Peninsula Drift Gill Net Salmon Fishery
Number of Boats and Catch by Month
1969-1977

Number of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969		0	0	0	2	25	76	35	17	0	0	0	135
1970	0	0	0	0	1	167	95	51	4	0	0	0	176
1971	0	0	0	0	0	133	125	34	8	0	0	0	136
1972	1	0	0	0	0	153	109	37	4	0	0	0	160
1973	0	0	0	0	2	144	126	53	11	0	0	0	158
1974	0	0	0	0	0	56	106	50	11	0	0	0	131
1975	0	0	0	0	0	106	55	52	15	0	0	0	131
1976	0	0	0	0	0	124	73	52	7	0	0	0	135
1977	0	0	0	0	0	127	89	80	17	0	0	0	146

Catch (1,000 pounds)

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	-0	5339	1341	381	67	0	0	0	7129
1970	0	0	0	0	-0	7061	1438	447	6	0	0	0	8953
1971	0	0	0	0	0	4049	2672	656	12	0	0	0	7389
1972	0	0	0	0	0	5045	1221	368	2	0	0	0	6636
1973	0	0	0	0	-0	2887	1052	175	7	0	0	0	4122
1974	0	0	0	0	0	282	1356	269	49	0	0	0	1957
1975	0	0	0	0	0	1175	588	499	59	0	0	0	2322
1976	0	0	0	0	0	3500	2540	540	7	0	0	0	6587
1977	0	0	0	0	0	2293	2184	655	37	0	0	0	4776

Source: CFEC Gross Earnings Files.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.18
Peninsula Drift Gill Net Salmon Fishery
The Number of Boats and Catch by Month as a Percentage of Annual Activity
1969-1977

Percentage of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	1.5	92.6	56.3	25.9	12.6	0	0	0	100.0
1970	0	0	0	0	0.6	94.9	54.0	29.0	2.3	0	0	0	100.0
1971	0	0	0	0	0	97.8	91.9	25.0	5.9	0	0	0	100.0
1972	0	0	0	0	0	95.6	68.1	23.1	2.5	0	0	0	100.0
1973	0	0	0	0	1.3	91.1	79.7	33.5	7.0	0	0	0	100.0
1974	0	0	0	0	0	42.7	80.9	38.2	8.4	0	0	0	100.0
1975	0	0	0	0	0	80.9	42.0	39.7	11.5	0	0	0	100.0
1976	0	0	0	0	0	91.9	54.1	38.5	5.2	0	0	0	100.0
1977	0	0	0	0	0	87.0	61.0	54.8	11.6	0	0	0	100.0

Percentage of Catch

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	-0.0	74.9	18.8	5.3	0.9	0	0	0	100.0
1970	0	0	0	0	-0.0	78.9	16.1	5.0	0.1	0	0	0	100.0
1971	0	0	0	0	0	54.8	36.2	8.9	0.2	0	0	0	100.0
1972	0	0	0	0	0	76.0	18.4	5.5	0.0	0	0	0	100.0
1973	0	0	0	0	-0.0	70.0	25.5	4.2	0.2	0	0	0	100.0
1974	0	0	0	0	0	14.4	69.3	13.7	2.5	0	0	0	100.0
1975	0	0	0	0	0	50.6	25.3	21.5	2.5	0	0	0	100.0
1976	0	0	0	0	0	53.1	38.6	8.2	0.1	0	0	0	100.0
1977	0	0	0	0	0	48.0	45.7	13.7	0.8	0	0	0	100.0

Source: CFEC Gross Earnings Files.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.19
Peninsula Drift Gill Net Salmon Fishery
Number of Fishermen by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	3	188	114	53	26	0	0	0	383
1970	0	0	0	0	2	251	143	77	6	0	0	0	477
1971	0	0	0	0	0	200	188	51	12	0	0	0	450
1972	0	0	0	0	0	230	164	56	6	0	0	0	455
1973	0	0	0	0	3	216	189	80	17	0	0	0	504
1974	0	0	0	0	0	84	159	75	17	0	0	0	335
1975	0	0	0	0	0	159	83	78	23	0	0	0	342
1976	0	0	0	0	0	186	110	78	11	0	0	0	384
1977	0	0	0	0	0	191	134	120	26	0	0	0	470

Source: CFEC Gross Earnings Files.

Table 3. .20
Peninsula Drift Gill Net Salmon Fishery
Percentage of Fisherman Man Months by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	0.8	49.0	29.8	13.7	6.7	0	0	0	00.0
1970	0	0	0	0	0.3	52.5	29.9	16.0	1.3	0	0	0	00.0
1971	0	0	0	0	0	44.3	41.7	11.3	2.7	0	0	0	00.0
972	0	0	0	0	0	50.5	36.0	12.2	1.3	0	0	0	100.0
[illegible]				0	0	42.9	37.5	5.8	3.3	0	0	0	00.0
1974	0	0	0	0	0	25.1	47.5	22.4	4.9	0	0	0	100.0
[illegible]	[illegible]				0	46.5	24.1	22.8	6.6	0	0	0	100.0
1976	0	0	0	0	0	48.4	28.5	20.3	2.7	0	0	0	100.0
[illegible]		[illegible]		[illegible]	0	4[illegible].6	28.4	25.6	5.4	0	0	0	00.0

Source: CFEC Gross Earnings Files.

Table 3.1.21
Peninsula Set Gill Net Salmon Fishery
Number of Boats and Catch by Month
1969-1977

Number of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969		0	0	0	0	60	45	24	15	0	0	0	72
1970	1	1	0	1	0	41	41	29	17	0	0	0	60
1971	1	0	0	0	0	34	44	20	18	0	0	0	51
1972	0	0	0	0	0	30	40	26	3	0	0	0	50
1973	0	0	0	0	2	36	48	29	10	0	0	0	67
1974	0	0	0	0	2	50	71	17	10	0	0	0	86
1975	0	0	0	0	0	33	33	16	14	0	0	0	49
1976			0		1	50	43	34	11	0	0	0	67
1977				0	0	42	52	46	15	0	0	0	68

Catch (1,000 pounds)

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969		0	0	0	0	342	406	111	51	0	0	0	911
1970	0	-0	0	-0	0	694	552	207	32	0	0	0	1488
1971	0	0	0	0	0	264	581	65	17	0	0	0	927
1972	0	0	0	0	0	193	246	74	-0	0	0	0	515
1973	0	0	0	0	-0	394	386	103	5	0	0	0	888
1974	0	0	0	0	-0	223	617	33	26	0	0	0	899
1975	0	0	0	0	0	87	174	47	51	0	0	0	358
1976	0	0	0	0	-0	615	353	188	15	0	0	0	1172
1977	0	0	0	0	0	327	664	256	34	0	0	0	1212

Source: CFEC Gross Earnings Files

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.22
Peninsula Set Gill Net Salmon Fishery
The Number of Boats and Catch by Month as a Percentage of Annual Activity
1969-1977

Percentage of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	83.3	62.5	33.3	20.8	0	0	0	100.0
1970	0	1.7	0	1.7	0	68.3	68.3	48.3	28.3	0	0	0	100.0
1971	0	0	0	0	0	66.7	86.3	39.2	35.3	0	0	0	100.0
1972		0	0	0	0	60.0	80.0	52.0	6.0	0	0	0	100.0
1973	[illegible]	0	0	0	3.0	53.7	71.6	43.3	14.9	0	0	0	100.0
1974	0	0	0	0	2.3	58.1	82.6	19.8	11.6	0	0	0	100.0
1975	0	0	0	0	0	67.3	67.3	32.7	28.6	0	0	0	100.0
1976	0	0	0	0	1.5	74.6	64.2	50.7	16.4	0	0	0	100.0
1977	[illegible]	0	0	0	0	61.8	76.5	67.6	22.1	0	0	0	100.0

Percentage of Catch

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	[illegible]	0	0	0	37.5	44.6	12.2	5.6	0	0	0	100.0
1970	0	-0.0	0	-0.0	0	46.6	37.1	13.9	2.2	0	0	0	100.0
1971	0	[illegible]	0	0	0	28.5	62.7	7.0	1.8	0	0	0	100.0
1972	0	[illegible]	0	0	0	37.5	47.8	14.4	-0.0	0	0	0	100.0
1973	0	[illegible]	0	0	-0.0	44.4	43.5	11.6	0.6	0	0	0	100.0
1974	0	[illegible]	0	0	-0.0	24.8	68.6	3.7	2.9	0	0	0	100.0
1975	0	[illegible]	0	0	0	24.3	48.6	13.1	14.2	0	0	0	100.0
1976	0	[illegible]	0	0	-0.0	52.5	30.1	16.0	1.3	0	0	0	100.0
1977	0	[illegible]	0	0	0	27.0	54.8	21.1	2.8	0	0	0	100.0

Source: CFEC Gross Earnings Files.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.23
Peninsula Set Gill Net Salmon Fishery
Number of Fishermen by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	0	90	68	36	23	0	0	0	216
1970	0	2	0	2	0	62	62	44	26	0	0	0	195
1971	0	0	0	0	0	51	66	30	27	0	0	0	174
1972	0	0	0	0	0	45	60	39	5	0	0	0	149
1973	0	0	0	0	3	54	72	44	15	0	0	0	188
1974	0	0	0	0	3	75	107	26	15	0	0	0	225
1975	0	0	0	0	0	50	50	24	21	0	0	0	144
1976	0	0	0	0	2	75	65	51	17	0	0	0	209
1977	0	0	0	0	0	63	78	69	23	0	0	0	233

Source: CFEC Gross Earnings Files.

80

Table 3.1.24
Peninsula Set Gill Net Salmon Fishery
Percentage of Fisherman Man Months by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969		0	0	0		41.7	31.3	16.7	[illegible]	0	0	0	100.0
1970	0	0.[illegible]		0.8	0	31.5	31.5	22.3	13.1	0	0	0	100.0
1971			0	0		29.3	37.9	17.2	15.5	0	0	0	100.0
1972		0	0		0	30.3	40.4	26.3	3.0	0	0	0	100.0
1973			0	0	1.6	28.8	38.4	23.2	8.0	0	0	0	100.0
1974					1.3	33.3	47.3	11.3	6.7	0	0	0	100.0
1975	0			0		34.4	34.4	16.7	14.6	0	0	0	100.0
1976				0	.7	36.0	30.9	24.5	7.9	0	0	0	100.0
1977				0		27.1	33.5	29.7	9.7	0	0	0	100.0

Source: CFEC Gross Earnings Files.

Table 3.1.25
Bristol Bay Salmon Harvest
1969-1979

Year	Catch: Weight: Pounds (1,000)	Catch: Weight: Metric Tons	Catch: Value ($1,000): Nominal	Catch: Value ($1,000): Real[1]	Exvessel Price ($/Pound): Nominal	Exvessel Price ($/Pound): Real
1969	46035	20881	10607	23185	0.23	0.50
1970	115834	52542	26967	55650	0.23	0.48
1971	66660	30237	16608	32860	0.25	0.49
1972	20838	9452	5231	10019	0.25	0.48
1973	14493	6574	4232	7631	0.29	0.53
1974	16007	7261	6641	10791	0.41	0.67
1975	29714	13478	11675	17382	0.39	0.58
1976	48554	22024	23259	32740	0.48	0.67
1977	47792	21678	28478	37657	0.60	0.79
1978	83363	37813	57038	70057	0.68	0.84
1979	130058	58994	139547	154337	1.07	1.19

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game Reports.

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

NOTE: 1978 and 1979 data are preliminary.

Table 3.1.26
Harvesting Activity
Bristol Bay Drift Gill Net Salmon Fishery
1969-1977

Year	Catch: Weight: Pounds (millions)	Catch: Weight: Metric Tons	Catch: Value millions: Nominal	Catch: Value millions: Real[1]	Exvessel Price ($/Pound): Nominal	Exvessel Price ($/Pound): Real	Number of: Boat Months	Number of: Fisherman Months	Catch per Boat Month: Weight: Pounds ,000	Catch per Boat Month: Value ($1,000): Nominal	Catch per Boat Month: Value ($1,000): Real
1969	40.9	18553	9.4	20.6	0.23	0.50	2811	8433	14.6	3.3	7.3
1970	108.0	49000	25.2	51.9	0.23	0.48	3433	10299	31.5	7.3	15.1
1971	60.0	27227	14.9	29.5	0.25	0.49	300	900	200.1	49.8	98.5
1972	1[illegible].[illegible]	8839	4.9	9.4	0.25	0.48	3119	9357	6.2	1.6	3.0
1973	1[illegible].7	6207	4.0	7.2	0.29	0.52	336	1008	40.7	11.9	21.4
1974	1[illegible].7	6215	5.6	9.2	0.41	0.67	1329	3987	10.3	4.2	6.9
1975	27.1	12270	10.6	15.8	0.39	0.58	1942	5826	13.9	5.5	8.1
1976	44.3	20117	21.3	29.9	0.48	0.68	3008	9024	14.7	7.1	10.0
1977	43.4	19701	25.9	34.2	0.60	0.79	1499	4497	29.0	17.3	22.8

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game Reports

[1] The real values and prices were calculated using the U.S. CP ; 1980 is the base period.

Table 3.1.27
Harvesting Activity
Bristol Bay Set Gill Net Salmon Fishery
1969-1977

Year	Catch: Weight, Pounds (millions)	Catch: Weight, Metric Tons	Catch: Value (millions), Nominal	Catch: Value (millions), Real[1]	Exvessel Price ($/Pound), Nominal	Exvessel Price ($/Pound), Real	Number of Boat Months	Number of Fisherman Months	Catch per Boat Month: Weight, Pounds (1,000)	Catch per Boat Month: Value ($1,000), Nominal	Catch per Boat Month: Value ($1,000), Real
1969	5.1	2329	1.2	2.6	0.23	0.51	938	1876	5.5	1.3	2.8
1970	7.8	3542	1.8	3.7	0.23	0.48	1184	2368	6.6	1.5	3.1
1971	6.6	3010	1.7	3.3	0.25	0.50	1017	2034	6.5	1.6	3.3
1972	1.4	613	0.3	0.6	0.24	0.46	977	1954	1.4	0.3	0.6
1973	0.8	367	0.2	0.4	0.31	0.56	695	1390	1.2	0.4	0.6
1974	2.3	1046	1.0	1.6	0.44	0.71	443	886	5.2	2.3	3.7
1975	2.7	1208	1.1	1.6	0.40	0.59	649	1298	4.1	1.6	2.4
1976	4.2	1907	2.0	2.8	0.47	0.67	952	1904	4.4	2.1	2.9
1977	4.4	1977	2.6	3.4	0.59	0.78	428	856	10.2	6.0	8.0

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game Reports.

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

during the salmon season; the communities include Dillingham, Naknek, and Togiak. Approximately 60 percent of the boats and crews *are* from the Bristol Bay area, the remainder are from elsewhere in Alaska or from other states.

Although the Bristol Bay salmon season lasts from June into September, it is heavily concentrated during brief periods in June and July (see Tables 3.1.28 through 3.1.35), The average number of calendar months of participation per year is 1 .4 for a drift gill net boat or 1.5 for a set gill net boat.

Kuskokwim

The Kuskokwim salmon fishery is not as productive as that of Bristol Bay, but it is an important source of income and employment to residents of the Bethel Census Divison. The annual harvest 'weight ranged from 868 metric tons (1,9 million pounds) to 2,591 metric tons (5.7 million pounds) and averaged 1,565 metric tons (3.4 million pounds) between 1969 and 1979. The annual real harvest value ranged from S0.5 million to S5.3 million and averaged $1.9 million (see Table 3.1.36). Harvest weight has tended to increase moderately during this period and real harvest value has increased dramatically.

Although the set gill net boats used in this fishery range in length from 4.9 to 10.7 meters (16 to 35 feet), the typical boat is 7.3 meters (24 feet) in length and has a crew of one, the skipper. The boats

Table 3.1.28
Bristol Bay Drift Gill Net Salmon Fishery
Number of Boats and Catch by Month
1969-1977

Number of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969				0	46	343	6[illegible]	203	66	2	0	0	1674
1970	0	0	0	1	24	1611	1680	114	3	0	0	0	1723
1971	0	0	0	0	0	133	125	34	8	0	0	0	1718
1972	0	3	1	0	0	1346	1479	270	19	1	0	0	1544
1973					2	144	126	53	11	0	0	0	1291
1974	0	0	0	0	16	334	707	245	27	0	0	0	788
1975	0	0	0	0	0	369	1342	192	39	0	0	0	1376
1976	0	2	1	3	1	176	1470	315	38	2	0	0	1522
1977	0	0	0	0	3	969	482	28	7	0	0	0	1557

85

Catch (1,000 pounds)

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Annual
1969	0	0	0	0	36	7782	32611	393	78	-0	0	0.40901
1970	0	0	0	-0		6.35147	72699	155	-0	0	0	0.******
1971	0	0	0	0	0	4049*	2672	656	12	0	0	0.60025
1972	0	0	-0	0	0	6233	12808	427	13	-0	0	0.19486
1973	0	0	0	0	-0	2887	1052	175	7	0	0	0.13685
1974	0	0	0	0	8	1068.	11791	796	40	0	0	0.13702
1975	0	0	0	0	0	352.	26135	458	105	0	0	0.27051
1976	0	-0	-0	-0	-0	6462.	36862	962	48	-0	0	0.44349
1977	0	0	0	0	3	5346	2917	49	5	0	0	0.43433

Source: CFEC Gross Earnings Files.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3 29
Bristol Bay Drift Gill Net Salmon Fishery
The Number of Boats and Catch by Month as a Percentage of Annual Activity
1969-1977

Percentage of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	2.7	50.4	98.6	12.1	3.9	0.1	0	0	100.0
1970	0	0	0	0.1	1.4	93.5	97.5	6.6	0.2	0	0	0	100.0
1971	0	0	0	0	0	7.7	7.3	2.0	0.5	0	0	0	100.0
1972	0	0.2	0.1	0	0	87.2	95.8	17.5	1.2	0.1	0	0	100.0
1973	0	0	0	0	0.2	11.2	9.8	4.1	0.9	0	0	0	100.0
1974	0	0	0	0	2.0	42.4	89.7	31.1	3.4	0	0	0	100.0
1975	0	0	0	0	0	26.8	97.5	14.0	2.8	0	0	0	100.0
1976	0	0.	0.1	0.2	0.1	77.3	96.6	20.7	2.5	0.1	0	0	100.0
1977	0	0	0	0	0.8	62.2	31.0	1.8	0.4	0	0	0	100.0

Percentage of Catch

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0.1	19.0	79.7	1.0	0.2	-0.0	0	0	100.0
1970	0	0	0	-0.0	0.0	32.5	67.3	0.1	-0.0	0	0	0	100.0
1971	0	0	0	0	0	6.7	4.5	1.1	0.0	0	0	0	100.0
1972	0	-0.	-0.0	0	0	32.0	65.7	2.2	0.1	-0.0	0	0	100.0
1973	0	0	0	0	-0.0	21.1	7.7	1.3	0.1	0	0	0	100.0
1974	0	0	0	0	0.1	7.8	86.1	5.8	0.3	0	0	0	100.0
1975	0	[illegible]	0	0	0	1.3	96.6	1.7	0.4	0	0	0	100.0
1976	0	[illegible]	-0.	-0.0	-0.0	14.6	83.1	2.2	0.1	-0.0	0	0	100.0
1977	0	[illegible]	0	0	0.0	12.3	6.7	0.1	0.0	0	0	0	100.0

Source: CFEC Gross Earnings Files.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3 1.30
Br s l Bay Dr ft Gill Net Salmon Fis ery
Number of Fishermen by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	38	2529	495	60[illegible]	198	6	0	0	8433
					72	48[illegible]3	[illegible]40	342	9	0	0	0.	10299
1 7	0	0	0	0	0	399	375	102	24	0	0	0	900
1 2					0	4[illegible]8	4437	8	57	3	0		9357
1973	0	0	0	0	6	432	378	159	33	0	0	0	[illegible]08
1974	0	0	0	0	48	1002	212	735	8		0	0	3987
1				0		[illegible]	[illegible]26	576	1[illegible]7	[illegible]	0	[illegible]	5826
1976	0	6	3	9	3	3528	4410	945	114	6	0	0	9024
977	0	0	0	0	39	2[illegible]07	446	84	21	0	0	0	4497

Source: CFEC Gross Earn ngs Fi es.

Table 3. 3
Bristol Bay Drift Gill Net Salmon Fishery
Percentage of Fisherman Man Months by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	1.6	30.0	58.7	7.2	2.3	0.1	0	0	100.0
1970	0	0	0	0.6	0.7	46.9	48.9	3.3	0.1	0	0	0	00.0
[illegible]						[illegible]	[illegible]	.3	2.7		0	0	[illegible]
[illegible]		[illegible]	[illegible]		[illegible]	43.[illegible]	47.[illegible]	8.7	0.6	[illegible]	0	0	00.0
1973	0	0	0	0	0.6	42.9	37.5	15.8	3.3	0	0	0	100.0
1974	0	0	0	0	1.2	25.1	53.2	18.4	2.0	0	0	0	00.0
1975	0	0	0	0	0	9.0	69.1	9.9	2.0	0	0	0	00.0
[illegible]			[illegible]	[illegible]	.6	[illegible]	48.[illegible]	.5	.3	0.1	0	0	00.0
1977	0	0	0	0	0.9	64.6	32.2	1.9	0.5	0	0	0	00.0

Source: CFEC Gross Earnings Files.

Table 3.1 .3.2
Bristol Bay Set Gill Net Salmon Fishery
Number of Boats and Catch by Month
1969-1977

Number of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	1	242	595	90	10	0	0	0	624
1970	0	1	1	0	1	487	604	86	3	1	0	0	657
1971	0	0	0	0	0	426	544	45	2	0	0	0	564
1972	1	1	0	0	0	379	501	93	2	0	0	0	539
1973	0	0	0	0	0	258	354	77	6	0	0	0	406
1974	0	0	0	0	0	56	288	94	5	0	0	0	312
1975	0	0	0	0	0	68	480	92	9	0	0	0	498
1976	0	0	0	0	1	314	517	104	16	0	0	0	543
1977	1	0	0	0	0	258	168	1	0	0	0	0	541

Catch (1,000 pounds)

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	-0	695	4310	119	11	0	0	0	5134
1970	0	-0	-0	0	-0	1568	6127	112	-0	-0	0	0	7809
1971		0	0	0	0	635	5942	56	-0	0	0	0	6635
1972	-0	-0	0	0	0	243	1054	54	-0	0	0	0	1352
1973	0	0	0	0	0	248	476	81	2	0	0	0	808
1974	0	0	0	0	0	53	2022	226	4	0	0	0	2305
1975	0	0	0	0	0	35	2518	98	11	0	0	0	2663
1976	0	0	0	0	-0	275	3680	240	10	0	0	0	4205
1977	-0	0	0	0	0	688	540	-0	0	0	0	0	4359

Source: CFEC Gross Earnings Files.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Tab e 3 1 33
Bristol Bay Set Gill Net Sa mon Fishery
The Number of Boats and Catch by Month as a Percentage of Annua Activ ty
1969-1977

Percentage of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	[illegible]	[illegible]	0	[illegible]	0.2	38.8	95.4	14.4	1.6	0	0	0	100.0
1970	0	[illegible].2	0.2	0	0.2	74.1	91.9	13.1	0.5	0.2	0	0	100.0
1971	0	[illegible]	0	0	0	75.5	96.5	8.0	0.4	0	0	0	100.0
1972	0.	0.2	0	0	0	70.3	92.9	17.3	0.4	0	0	0	100.0
1973	0	0	0	0	0	63.5	87.2	19.0	1.5	0	0	0	100.0
1974	[illegible]	[illegible]	0	0	0	17.9	92.3	30.1	1.6	0	0	0	100.0
1975	[illegible]	[illegible]	[illegible]	0	0	13.7	96.4	18.5	1.8	0	0	0	100.0
1976	[illegible]	[illegible]	[illegible]	[illegible]	0.2	57.8	95.2	19.2	2.9	0	0	0	100.0
1977	[illegible]	[illegible]	[illegible]	[illegible]	0	47.7	31.1	0.2	0	0	0	0	100.0

90

Percentage of Catch

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969			0	[illegible]	-0.0	13.5	84.0	2.3	0.2	0	0	0	100.0
1970	[illegible]	-0.[illegible]	0.	[illegible]	-0.0	20.1	78.5	1.4	-0.0	-0.	0	0	100.0
1971	[illegible]	0[illegible]	0	[illegible]	0	9.6	89.6	0.8	-0.0	0	0	0	100.0
1972	-[illegible]	-0.[illegible]	0	[illegible]	0	16.0	78.0	4.0	-0.0	0	0	0	100.0
1973	[illegible]	[illegible]	[illegible]	0	0	30.7	58.9	10.0	0.2	0	0	0	100.0
1974	[illegible]	[illegible]	0	0	0	2.3	87.7	9.8	0.2	0	0	0	100.0
1975	[illegible]	0	0	0	0	1.3	94.6	3.7	0.4	0	0	0	100.0
1976	[illegible]	0	0	[illegible]	-0.0	6.5	87.5	5.7	0.2	0	0	0	100.0
1977	[illegible]	0	0	[illegible]	0	15.8	12.4	-0.0	0	0	0	0	100.0

Source: CFEC Gross Earnings Fi es

No e: A minus sign indicates months in which the catch is conf dertial because fewer than four boats participated in the fishery.

Table 3.1.34
Bristol Bay Set Gill Net Salmon Fishery
Number of Fishermen by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	2	484	1190	180	20	0	0	0	1876
1970	0	2		0	2	974	1208	172	6	2	0	0	2368
1971	0	0	0	0	0	852	1088	90	4	0	0	0	2034
1972	2	2	0	0	0	758	1002	186	4	0	0	0	1954
1973	0	0	0	0	0	516	708	154	12	0	0	0	1390
1974	0	0	0	0	0	112	576	188	10	0	0	0	886
1975	0	0	0	0	0	136	960	184	18	0	0	0	1298
1976	0	0	0	0	2	628	1034	208	32	0	0	0	1904
1977	2	0	0	0	0	516	336	2	0	0	0	0	856

Source: CFEC Gross Earnings Files.

Table 3.1.35
Bristol Bay Set Gill Net Salmon Fishery
Percentage of Fisherman Man Months by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	0.1	2[illegible].8	63.4	9.6	1.[illegible]	0	0	0	100.0
19[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	5[illegible].0	7.3	0.3	0.[illegible]	0	0	100.0
1971	0	0	0	0	0	41.9	53.5	4.4	0.2	0	0	0	100.0
1972	0.1	0.1	0	0	0	38.8	51.3	9.5	0.2	0	0	0	100.0
[illegible]		[illegible]			[illegible]	[illegible]	50.[illegible]	[illegible]	0.9	0	0	0	100.0
[illegible]				[illegible]		[illegible]	65.0	[illegible]	[illegible]	[illegible]	0	0	[illegible]
[illegible]			[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	1.4			0	[illegible]
[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	0	0	100.0
1977	[illegible]	0	0	0	0	60.3	39.3	0.2	0	0	0	0	100.0

Source: CFEC Gross Earnings Files.

able 3 36
Harvesting Activity
Kuskokw m Set Gill Net Salmor Fishery
1969-1977

Yea	Catch: Weight: Pounds (millions)	Catch: Weight: Metric Tons	Catch: Value (millions): Nominal	Catch: Value (millions): Real[1]	Exvessel Price ($/Pound): Nominal	Exvessel Price ($/Pound): Rea	Number of: Boat lonths	Number of: Fisherman Months	Catch Per Boat Month: Weight: Pounds (1,000)	Catch Per Boat Month: Value ($1,000): Nominal	Catch Per Boat Month: Value ($1,000): Real
969	2.9	1326	0.4	0.9	0.13	(.2	899	89	3.3	0.4	1.0
970	2.3	103	0.4	0.7	(.16	0.33	926	926	2.5	0.4	0.8
97	1.9	86	1.	0.5	.14	0.27	821	82	2.3	0.3	0.6
1972	2.2	979	0.3	0.7	. 6	.3	977	977	2.2	0.4	0.7
9	.6	6	.8	.5	.24	0.42	390	39	2 6	0.6	.
974	3.7	1666	1.	1.7	0.29	.47	2027	2027	.8	0.5	0.8
75	.	52	0.8	1.2	.26	.39	1848	848	.6	0.4	0.6
6	.5	6 38	1.5	2.2	.44	.6	921	92	.8	0.8	1.1
7	5.7	259	4.0	5.3	0.70	.93	2053	2053	2.8	2.	2.6
9 8	. 2	899	2.5	3.	0.6	.75	Data not avai al e				
9	5.	2296	3.	.	.5	.66					

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game Reports.

The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

NO E: 1978 and 979 data are preliminary.

predominately operate out of Bethel and the skippers are typically local residents. Bethel is the principal point of landing for salmon harvested in the Kuskokwim Management Area.

Theseason begins in June and ends in September, a month in which relatively little harvesting activity occurs. The seasonality of this fishery is summarized in Tables 3,1,37 through 3.1.40. The average length of participation by each boat is 2.2 months per year.

Lower Yukon

The annual harvest weight of the Lower Yukon Salmon fishery ranged from 1,591 metric tons (3.5 million pounds) to 3,374 metric tons (7.4 million pounds) and averaged 2,350 metric tons (5.2 million pounds) between 1969 and 1979. The annual real harvest value ranged from $1.1 million to $4.8 million (see Table 3.1.41). The harvest weight has tended to increase at a moderate rate while the real harvest value has increased rapidly.

The boats in this set gill net fishery are typically 5.5 to 6.1 meters (18 to 20 feet) in length and have a crew of one, the skipper. The skippers and boats are predominately from the local area. The boats operate out of and land fish in local communities. The lower Yukon salmon harvest is processed on floating processors or shipped elsewhere for processing.

able 3. 37
Kuskokw m Set G Net Salmon Fishery
Number of Boats and Catch by Month
969-1977

Number of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	1	404	172	310	12	0	0	0	451
1970	0	0	0	0	0	417	120	337	52	0	0	0	457
1971	0	0	0	0	0	444	241	122	14	0	0	0	484
1972	0	0	0	0	0	443	267	259	8	0	0	0	496
1973	0	0	0	0	0	532	374	460	24	0	0	0	600
1974	0	0	0	0	0	720	588	655	64	0	0	0	830
19[illegible]	0	0	0	0	1	572	667	608	0	0	0	0	853
1976						69	6	602	18	°	0	0	787
				0		7	630	716	°		0		810

Catch (1,000 pounds

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
197	0	(	0	0	-0	1162	848	903	11	0	0	0	2924
1970	0	0	0	0	0	417	163	69	-0	0	0	0	650
1971	0	[illegible]	0	0	0	1117	726	62	8	0	0	0	1913
1972	0	[illegible]	0	0	0	1225	743	190	1	0	0	0	2159
1973	(	0	0	0	0	1686	960	905	8	0	0	0	3560
1974	[illegible]	0	0	0	0	737	1537	1375	23	0	0	0	3673
1975	0	0	0	0	-0	641	1309	940	0	0	0	0	2980
1976	0	0	0	0	0	1169	1507	856	14	0	0	0	3545
1977	0	0	0	0	0	2012	1448	2080	0	0	0	0	5713

Source: CFEC Gross Earnings F les

Note: A minus sign indicates months in wh ch the catch is confident al because fewer than four boats participated in the fishery.

able 3. .38
Kuskokwim Set Gill Net Salmon Fishery
The Number of Boats and Ca ch by Month as a Percentage of Annual Activity
1969- 977

Percentage of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
19			0		0.2	89.6	38.1	68.7	2.7	0	0	0	100.0
1970	0	0	0	0	0	91.2	26.3	73.7	1.4	0	0	0	100.0
1971	0	0	0	0	0	91.7	49.8	25.2	2.9	0	0	0	100.0
1972	0	0	0	0	0	89.3	53.8	52.2	1.6	0	0	0	100.0
1973	0	0	0	0	0	88.7	62.3	76.7	4.0	0	0	0	100.0
1974	0	0	0	0	0	86.7	70.8	78.9	7.7	0	0	0	100.0
1975	0	0	0	0	0.1	67.1	78.2	71.3	0	0	0	0	100.0
1976	0	0	0	0	0	87.7	77.6	76.5	2.3	0	0	0	100.0
1977	0	0	0	0	0	87.3	77.8	88.4	0	0	0	0	100.0

Percentage of Catch

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
[illegible]	0	0	0	0	-0.0	39.7	29.0	30.9	0.4	0	0	0	100.0
[illegible]	0	0	0	0	0	64.2	25.1	10.6	-0.0	0	0	0	100.0
[illegible]	0	0	0	0	0	58.4	38.0	3.2	0.4	0	0	0	100.0
[illegible]	0	0	0	0	0	56.7	34.4	8.8	0.0	0	0	0	100.0
[illegible]	0	0	0	0	0	47.4	27.0	25.4	0.2	0	0	0	100.0
[illegible]	0	0	0	0	0	20.1	41.8	37.4	0.6	0	0	0	100.0
[illegible]	0	0	0	0	-0.0	21.5	46.9	31.5	0	0	0	0	100.0
[illegible]	0	0	0	0	0	33.0	42.5	24.1	0.4	0	0	0	100.0
[illegible]	0	0	0	0	0	35.2	25.3	36.4	0	0	0	0	100.0

Source: CFEC Gross Earnings Files.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3 39
Kuskokwim Set Gi Net Sa mon F shery
Number of Fishermen by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Tota
1969	0	0	0	0	1	404	172	310	12	0	0	0	899
1970	0	0	0	0	0	417	120	337	52	0	0	0	926
1971	0	0	0	0	0	444	241	122	14	0	0	0	821
1972	0	0	0	0	0	443	267	259	8	0	0	0	977
1973	0	0	0	0	0	532	374	460	24	0	0	0	1390
1974	0	0	0	0	0	720	588	655	64	0	0	0	2027
1975	0	0	0	0	1	572	667	608	0	0	0	0	1848
1976	0	0	0	0	0	690	611	602	8	0	0	0	1921
1977	0	0	0	0	0	707	630	716	0	0	0	0	2053

Source: CFEC Gross Earnings Files.

Table 3 1.#°
Kuskokwim Set Gill Net Salmon Fishery
Percentage of Fisherman Man Months by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	0.1	44.9	19.1	34.5	1.3	0	0	0	100.0
1970	0	0	0	0	0	45.0	13.0	36.4	5.6	0	0	0	100.0
1971	0	0	0	0	0	54.1	29.4	14.9	1.7	0	0	0	100.0
1972	0	0	0	0	0	45.3	27.3	26.5	0.8	0	0	0	100.0
1973	0	0	0	0	0	38.3	26.9	33.1	1.7	0	0	0	100.0
1974	0	0	0	0	0	35.5	29.0	32.3	3.2	0	0	0	100.0
1975	0	0	0	0	0.1	31.0	36.1	32.9	0	0	0	0	100.0
1976	0	0	0	0	0	35.9	31.8	31.3	0.9	0	0	0	100.0
1977	0	0	0	0	0	34.4	30.7	34.9	0	0	0	0	100.0

Source: CFEC Gross Earnings Files.

88

Tab e 3.1 41
Harvesting Activity
ower Yukon Set Gill Net Salmon F shery
1969-1977

	Catch				Exvessel Price		Number of		Catch per Boat Month		
	Weight		Value (millions)		($/Pound)				Weight	Value ($1,000)	
Year	Pounds (m llions)	Metric Tons	Nominal	Real[1]	Nominal	Real	Boat Months	Fisherman Months	Pounds (1,000)	Nominal	Real
969	3.5	5	0.5	1.	.5	. 2	822	822	4.3	0.6	1.4
19 0	4.2	895	0.6	1.2	0.14	0.30	056	1056	4.0	0.6	1.2
	4.4	2 09	0.8	1.5	0.17	0.34	3	1	3.4	0.6	1.2
2	4.	2	.8	.5	.18	0.34	438	1438	3.1	0.5	1.0
1973	5.8	2634	1.2	2.2	.21	0.37	655	1655	3.5	0.7	1.3
4	4	4	.9	.	0.25	0.41	521	1521	4.9	1.2	2.0
1975	6.3	2863	.6	2.3	0.25	0.37	644	644	3.8	0.9	1.4
1976	5.5	2473	2.	3.2	0.42	0. 0	1802	802	3.0	1.3	1.8
1977	6.5	2968	3.6	4.8	0.56	.74	678	678	3.9	2.2	2.9
1978	4.4	20 8	2.6	3.1	0.58	.7			Data not availab e		
1	.4	4	.0	.3	.63	.5					

Sources: This able was generated rom data contained in (1) Commercial Fisheries Entry Commiss on Gross Earn ngs Files, and (2) Alaska Department of Fish and Game Reports.

[1] The real va ues and pr ces were calculatec us ng the U.S. CPI; 980 is the base period.

NO E: 978 and 979 data are prelim nary.

The season begins in June and ends in August or September;however,the activity is heavily concentrated in June and July. The seasonality of the fishery is depicted in 'Tables 3,1.42 through 3.1.45. The average length of participation of a boat in this fishery is 2.3 calendar months per year.

Upper Yukon

Both set gill nets and fish wheels are used in the Upper Yukon Salmon fishery. The annual harvest weight ranged from 9 metric tons (20,000 pounds) to 763 metric tons (1.7 million pounds) and averaged 320 metric tons (705,000 pounds) between 1969 and 1979. The annual real harvest value ranged from $8,700 to $714,000 and averaged $350,000 (see Table 3.1.46). Both harvest weight and real value have tended to increase rapidly during this period. As is indicated by Tables 3.1.47 and 3.1.48 the fish wheel fishery has become the dominant fishery in recent years.

The boats in the set net fishery are typically 5.5 to 6.1 meters (18 to 20 feet) in length and have a crew of one, the skipper. Fish wheel gear is also manned by one individual. Both fisheries are almost exclusively local with fishing activity occurring adjacent to many communities along the Interior rivers.

The salmon season begins in June or July and ends in September; the harvesting activity is, however, heavily concentrated in July and August. The seasonality of harvesting activity is summarized in Tables 3.1.49

Table 3.1.42
Lower Yukon Set Gill Net Salmon Fishery
Number of Boats and Catch by Month
1969-1977

Number of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	482	0	44	3	0	0	0	490
1970	0	0	0	0	0	455	365	236	0	0	0	0	486
1971				0	0	[illegible]1	485	287	18	0	0	0	567
1972	0	0	0	0	0	[illegible]	508	307	33	0	0	0	637
1973	0		0	0	1	[illegible]4	551	441	38	0	0	0	710
1974	0	0	0	1	0	6[illegible]4	538	327	1	0	0	0	699
1975	0	0	0	0	0	689	644	411	0	0	0	0	699
1976	0	0	0	0	3	665	689	444		0	0	0	743
1977	0	1	0	0	0	594	580	502		0	0	0	647

Catch (1,000 pounds)

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1[illegible]					0	2394	511	505	-0	0	0	0	3507
1[illegible]					0	2089	118	903	0	0	0	0	4177
1[illegible]1				0		2194	125	975	10	0	0	0	4430
1[illegible]						2500	106	882	10	0	0	0	4461
1973		0	1	0	-0	2387	2396	015	9	0	0	0	5807
1974		0	0	-0	0	4546	230[illegible]	587	-0	0	0	0	7438
1975		0	0	0	0	1762	358[illegible]	965	0	0	0	0	6311
1[illegible]		1			-0	26[illegible]3	2594	222	-0	0	0	0	5451
1[illegible]			0	0	0	269[illegible]	2265	5[illegible]0	-0	0	0	0	6544

Source: CFEC Gross Earnings Files.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3 1 43
Lower Yukon Set Gill Net Salmon Fishery
The Number of Boats and Catch by Month as a Percentage of Annual Act vity
969-1977

Percentage of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969			0	0		98.4	39.4	29.4	0.6	0	0	0	100.0
1970	0	0	0	0	0	93.6	75.1	48.6	0	0	0	0	100.0
1971	0	0	0	0	0	91.9	85.5	50.6	3.2	0	0	0	100.0
1972	0	0	0	0	0	92.6	79.7	48.2	5.2	0	0	0	100.0
1973			0		0.1	87.9	77.6	62.1	5.4	0	0	0	100.0
1974				[illegible]	0	93.6	77.0	46.8	0.1	0	0	0	100.0
1975	0	0	0	0	0	84.3	92.1	58.8	0	0	0	0	100.0
1976	[illegible]	[illegible]	0	0	0.4	89.5	92.7	59.8	0.1	0	0	0	100.0
1977	[illegible]	[illegible]	0	0	0	91.8	89.6	77.6	0.2	0	0	0	100.0

Percentage of Catch

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	[illegible]	0	68.3	14.6	17.0	-0.0	0	0	0	100.0
1970	0	0	0	[illegible]	0	50.0	28.3	21.6	0	0	0	0	100.0
1971	0	0	0	[illegible]	0	49.5	28.2	22.0	0.2	0	0	0	100.0
1972	0	0	0	[illegible]	0	56.0	24.0	19.8	0.2	0	0	0	100.0
1973	[illegible]	0	0	[illegible]	-0.0	41.1	41.3	17.5	0.2	0	0	0	100.0
1974	0	0	0	[illegible]	0	61.1	31.0	7.9	-0.0	0	0	0	100.0
1975	[illegible]	[illegible]	0	[illegible]	0	27.9	56.8	15.3	0	0	0	0	100.0
1976	0	0	0	0	-0.0	[illegible]	47.6	4.1	-0.0	0	0	0	100.0
1977	[illegible]	-0.0	0	0	0	[illegible]	34.6	23.1	-0.0	0	0	0	100.0

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Source: CFLC Gross Earnings Fi es

Note: A minus sign indicates months in wh ch the catch s confident al because fewer than four boats participated in the fishery.

Table 3 1.44
Lower Yukon Set Gill Net Salmon Fishery
Number of Fishermen by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Tota
1969	0	0	0	0	0	482	193	144	3	0	0	0	822
1970	0	0	0	0	0	455	365	236	0	0	0	0	1056
1971	0	0	0	0	0	521	485	287	8	0	0	0	1311
1972	0	0	0	0	0	590	508	307	33	0	0	0	1438
1973	0	0	0	0	1	624	551	441	38	0	0	0	1655
1974	0	0	0	1	0	654	538	327	1	0	0	0	1521
1975	0	0	0	0	0	589	644	411	0	0	0	0	1644
1976	0	0	0	0	3	665	689	444	1	0	0	0	1802
1977	0	1	0	0	0	594	580	502	1	0	0	0	1678

Source: CFEC Gross Earnings Files.

Table 3.1 45
Lower Yukon Set Gill Net Salmon Fishery
Percentage of Fisherman Man Months by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	0	58.6	23.5	17.5	0.4	0	0	0	100.0
1970	0	0	0	0	0	43.1	34.6	22.3	0	0	0	0	100.0
1971	0	0	0	0	0	39.7	37.0	2 .9	1.4	0	0	0	100.0
1972	0	0	0	0	0	4 .	5.3	2 .3	2.3	0	0	0	100.0
1 73		0		0	.	37.7	33.3	26.6	2.3	0	0	0	00.0
1974	0	0	0	0.1	0	43.0	35.4	2 .5	0.1	0	0	0	00.0
1975	0	0	0	0	0	35.8	39.2	25.0	0	0	0	0	00.0
1976	0	0	0	0	0.2	36.9	38.2	24.6	0.	0	0	0	100.0
1977	0	0.1	0	0	0	35.4	34.6	29.9	0.	0	0	0	100.0

Source: CFEC Gross Earnings Files.

Table 3 1 46
Upper Yukon Salmon Harvest
1969-1979

Year	Catch: Weight: Pounds (1,000)	Metric Tons	Value ($1,000): Nominal	Real[1]	Exvessel Price ($/Pound): Nominal	Real
1969	20	9	4	9	0.20	0.44
1970	28	13	5	10	0.18	0.37
1971	36	16	7	14	0.19	0.38
1972	28	13	6	11	0.21	0.41
1973	123	56	23	41	0.19	0.34
1974	745	338	402	653	0.54	0.88
1975	1664	755	308	459	0.19	0.28
1976	1672	758	507	714	0.30	0.43
1977	1682	763	488	645	0.29	0.38
1978	890	404	513	630	0.58	0.71
1979	879	399	597	661	0.68	0.75

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game Reports.

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

NOTE: 1978 and 1979 data are preliminary.

Table 3 47
Harvesting Activity
Upper Yukon Set Gill Net Salmon Fishery
1969-1977

	Catch				Exvessel Price		Number of		Catch per Boat Month		
	Weight		Value (millions)		($/Pound)				Weight	Value ($1,000)	
Year	Pounds (millions)	Metric Tons	Nominal	Real	Nominal	Real	Boat Months	Fisherman Months	Pounds (1,000)	Nominal	Real
19 9	.	4	.)	.	0.22	0.49	9	9	1.0	0.2	0.5
1970	0.0	7	0.0	0.0	0.20	0.41	15	15	1.0	0.2	0.4
1971	0.0	9	0.0	0.0	0.20	0.40	6	6	1.3	0.3	0.5
1972	0.0	7	0.0	0.0	0.27	0.51	4	4	.	.3	0.5
1973	0.0	22	0.0	0.0	0.20	0.37	28	28	1.8	0.4	0.6
1974	0.1	43	0.0	0.0	0.27	0.43	67	67	1.4	0.4	0.6
1975	0.2	85	0.1	0.1	0.27	0.41	92	92	2.0	0.6	0.8
1976	0.2	74	0.	0.1	0.43	0.60	104	104	1.6	0.7	0.9
1977	0.3	120	0.1	0.2	0.5	0.67	90	90	2.9	1.5	2.0

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game Reports.

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 3.[illegible].48
Harvesting Activity
Upper Yukon Fish Wheel Salmon Fishery
1969-1977

	Catch				Exvessel Price		Number of		Catch per Boat Month		
	Weight		Value (millions)		($/Pound)				Weight	Value ($1,000)	
Year	Pounds (millions)	Metric Tons	Nominal	Real[1]	Nominal	Real	Boat Months	Fisherman Months	Pounds (1,000)	Nominal	Real
1969	0.0	5	0.0	0.0	0.18	0.40	12	12	0.9	0.2	0.4
1970	0.0	6	0.0	0.0	0.15	0.32	10	10	1.3	0.2	0.4
1971	0.0	7	0.0	0.0	0.19	0.37	18	18	0.9	0.2	0.3
1972	0.0	6	0.0	0.0	0.15	0.29	12	12	1.1	0.2	0.3
1973	0.1	[illegible]	0.0	0.0	0.18	0.32	48	48	1.5	0.3	0.5
1974	0.7	[illegible]9	0.4	0.6	0.58	0.94	164	164	4.0	2.3	3.7
1975	[illegible].5	670	0.3	0.4	0.17	0.26	240	240	6.2	1.1	1.6
1976	1.5	6[illegible]4	0.4	0.6	0.29	0.41	247	247	6.1	1.8	2.5
1977	[illegible].4	6[illegible]3	0.4	0.5	0.25	0.33	224	224	6.3	1.6	2.[illegible]

Sources: This Table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game Reports

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 3.1.49
Upper Yukon Set Gill Net Salmon Fishery
Number of Boats and Catch by Month
1969-1977

Number of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969			0	0			8	0	0	0	0	0	8
1970	0			0			12	2	1	0	0	0	13
1971	0	0	0	0	0	0	12	2	1	1	0	0	14
1972	0	0	0	0	0	2	12	0	0	0	0	0	13
1973	0	0	0	0	0	3	17	8	0	0	0	0	23
1974	0	0	0	0	0	14	29	16	8	0	0	0	37
1975	0	0	0	0	0	0	57	30	5	0	0	0	66
1976	0	0	0	0	0	1	70	26	7	0	0	0	76
1977	0	0	0	0	0	1	56	18	5	0	0	0	60

Catch (1,000 pounds)

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969		0	0	0	0	-0	9	0	0	0	0	0	9
1970	0	0	0	0	0	0	13	-0	-0	0	0	0	15
1971	[illegible]	0	0	0	0	0	13	-0	-0	-0	0	0	20
1972	0	0	0	0	0	-0	15	0	0	0	0	0	15
1973	0	0	0	0	0	-0	22	27	0	0	0	0	49
1974	0	0	0	0	[illegible]	10	44	19	21	0	0	0	94
1975	0	0	0	0	[illegible]	0	115	66	6	0	0	0	187
1976	0	0	0	0	[illegible]	-0	130	15	5	0	0	0	164
1977	0	0	0	0	0	-0	187	22	44	0	0	0	264

Source: CFEC Gross Earnings Files

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3 I 50
Upper Yukon Set Gill Net Salmon Fishery
The Number of Boats and Catch by Month as a Percentage of Annual Activity
1969-1977

Percentage of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	12.5	100.0	0	0	0	0	0	100.0
1970		0		0	0	[illegible]	92.3	15.4	7.7	0	0	0	100.0
1971	0	0	0	0	0	[illegible]	85.7	14.3	7.1	7.1	0	0	100.0
1972		0	0	0	0	[illegible]	92.3	0	0	0	0	0	100.0
1973		0	0	0	0	[illegible]	73.9	34.8	0	0	0	0	100.0
1974				0		37.8	78.4	43.2	21.6	0	0	0	100.0
1975		0	0	0	0	0	86.4	[illegible]	7.6	0	0	0	100.0
1976		0	0	0	0	1.3	92.1	34.2	9.2	0	0	0	100.0
1977		0	0	0	0	1.7	93.3	30.0	25.0	0	0	0	100.0

Percentage of Catch

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0		0	0	0	-1.1	100.0	0	0	0	0	0	100.0
1970	0		0	0	0	0	86.7	-0.7	-0.7	0	0	0	100.0
1971	0	0	0	0	0	0	65.0	-0.5	-0.5	-0.5	0	0	100.0
1972	0	0	0	0	0	-0.7	100.0	0	0	0	0	0	100.0
1973	0	0	0	0	0	-0.2	44.9	55.1	[illegible]	0	0	0	100.0
1974	0	0	0	0	0	10.6	46.8	20.2	[illegible]	0	0	0	100.0
1975	0	0	0	0	0	0	61.5	35.3	[illegible]	0	0	0	100.0
1976	0	0	0	0	0	-0.1	79.3	9.1	[illegible]	0	0	0	100.0
1977	0	0	0	0	0	-0.0	70.8	8.3	[illegible]	0	0	0	100.0

Source: CFEC Gross Earnings Files.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3 51
Upper Yukon Set Gill Net Salmon Fishery
Number of Fishermen by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	0	1	8	0	0	0	0	0	9
1970	0	0	0	0	0	0	2	2	[illegible]	0	0	0	15
1971	0	0	0	0	0	0	12	2	1	1	0	0	16
1972	0	0	0	0	0	2	12	0	0	0	0	0	14
1973	0	0	0	0	0	3	17	8	0	0	0	0	28
1974	0	0	0	0	0	14	29	16	8	0	0	0	67
1975	0		0	0	0	0	57	30	5	0	0	0	92
1976	0	0	0	0	0	1	70	26	7	0	0	0	104
1977	0	0	0	0	0	1	56	18	15	0	0	0	90

Source: CFEC Gross Earnings Files

Table 3.1.52
Upper Yukon Set Gill Net Salmon Fishery
Percentage of Fisherman Man Months by Month
1969-1977

Year	Jan.	Feb	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
[illegible]	0	0	0	0	0	11.[illegible]	88.9	0	0	0	0	0	100.0
[illegible]							8[illegible]	[illegible]	6.7		0	0	100.0
1971	0	0	0	0	0	0	75.0	12.5	6.3	6.3	0	0	1[illegible].0
1972	0	0	0	0	0	14.3	85.7	0	0	0	0	0	100.0
1[illegible]						10.7	60.7	28.6	0	0	0	0	100.0
1[illegible]						[illegible]	4[illegible].3	23.9	11.9	0	0	0	100.0
1[illegible]			[illegible]			[illegible]	6[illegible]	2[illegible]	[illegible].4	0	0	0	100.0
1[illegible]					[illegible]	1.[illegible]	67.3	2[illegible]	6.[illegible]	0		0	100.0
1[illegible]	[illegible]				[illegible]	[illegible].1	62.2	20.0	16.7	0	0	0	100.0

Source: CFEC Gross Earnings Files.

Table 3. .53
Upper Yukon Fish Wheel Salmon Fishery
Number of Boats and Catch by Month
1969-1977

Number of Boats

Year	Jan.	Feb.	March	Apr 1	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	[illegible]	[illegible]	0	0	0	0	7	3	1	1	0	0	7
1970	[illegible]	[illegible]	0	0	0	0	8	2	0	0	0	0	8
1971	[illegible]	[illegible]	0	0	0	0	14	3	1	0	0	0	15
1972	0	0	0	0	0	0	7	3	2	0	0	0	8
1973				[illegible]	[illegible]		22	26	0		0	0	38
1974	[illegible]				[illegible]	[illegible]	52	6	36	0	0	0	82
1975	0	0	0	0	0	0	97	97	46	0	0	0	134
1976	0	0	0	0	0	5	125	77	40	0	0	0	162
1977	0	0	0	0	0	3	105	49	67	0	0	0	140

Catch ,000 pounds

Year	Jan.	Feb.	March	Apr 1	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	[illegible]	[illegible]	0	0	0	8	-0	-0	-0	0	0	11
1970	0	[illegible]	[illegible]	0	0	0	11	-0	0	0	0	0	13
1971	0	0	[illegible]	0	0	0	13	-0	-0	0	0	0	16
1972	0	0	[illegible]	0	0	0	5	-0	-0	0	0	0	13
1973	0	0	0	0	0	0	16	58	0	0	0	0	74
1974	0	0	0	0	0	13	187	233	218	0	0	0	651
1975	0	0	0	0	0	0	900	394	183	0	0	0	1477
1976	[illegible]	0	[illegible]	0	0	14	1307	69	118	0	0	0	1508
1977	[illegible]	0	0	0	0	-0	950	172	225	0	0	0	1418

Source: CFEC Gross Earnings F es.

Note: A minus sign indicates months in which the catch is conf dential because fewer than four boats partic pated in the fishery.

Table 3 .54
Upper Yukon Fish Wheel Salmon Fishery
he Number of Boats and Catch by Mont as a Percentage of Annual Act vity
1969- .977

Percentage of Boats

Year	Jan.	Feb.	March	Apr l	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	0	100.0	42.9	4.3	14.3	0	0	100.0
1970		0	0	0	0	0	100.0	25.0	0	0	0	0	100.0
1971		0	0	0	0	0	93.3	20.0	6.7	0	0	0	100.0
1972				0	0		8[illegible].5	37.5	25.0	0	0	0	100.0
1973		0		0		0	5[illegible].9	68.4	0	0	0	0	100.0
1974		0	0	0	0	0	63.4	74.4	43.9	0	0	0	100.0
1975		0	0	0	0	0	72.4	72.4	34.3	0	0	0	100.0
[illegible]			0		0	[illegible]	7[illegible].2	47.5	24.7	0	0	0	100.0
1[illegible]						[illegible].1	[illegible]5.0	35.0	47.9	0	0	0	100.0

Percentage of Catch

Year	Jan.	Feb.	March	Apr l	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0		0	0	0	0	72.7	-0.9	-0.9	-0.9	0	0	100.0
1970	0	0	0	0	0	0	84.6	-0.8	0	0	0	0	100.0
1971	0	0	0	0	0	0	81.3	-0.6	-0.6	0	0	0	100.0
1972	0	0	0	0	0	0	38.5	-0.8	-0.8	0	0	0	100.0
1973	0	0	0	0	0	0	21.6	78.4	0	0	0	0	100.0
1974	0	0	0	0	0	2.0	28.7	35.8	33.5	0	0	0	100.0
1975	0	0	0	0	0	0	60.9	26.7	12.4	0	0	0	100.0
1976	0	0	0	0	0	0.9	86.7	4.6	7.8	0	0	0	100.0
1977	0	0	0	0		-[illegible].0	67.0	12.1	15.9	0	0	0	100.0

Source CFEC Gross Ear r ngs Fi es

Note: A minus sign indicates months in wh ch the catch is confidentia because fewer than four boats partic pated in the fishery.

Table 3 1 55
Upper Yukon Fish Wheel Salmon Fishery
Number of Fishermen by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969		0						3	1	1	0	0	12
1970	0	0	0	0	0	0	8	2	0	0	0	0	10
1971	0	0	0	0	0	0	14	3	1	0	0	0	18
1972	0	0	0	0	0	0	7	3	2	0	0	0	12
1973	0	0	0	0	0	0	22	26	0	0	0	0	48
1974	[illegible]				[illegible]	5	52	61	36	0	0	0	164
1975	0	0	0	0	0	0	97	97	46	0	0	0	240
1976			[illegible]			5	125	77	40	0	0	0	247
1977	[illegible]					3	105	49	67	0	0	0	224

Source: CFEC Gross Earnings Files.

through 3.1.56. The average lengths of participation per year are 1.3 and 1.5 calendar months for the gill net and fish wheel fisheries respectively.

Norton Sound

The annual harvest weight of the Norton Sound salmon fishery has ranged from 410 metric tons (0.9 million pounds) to 1,112 metric tons (2.5 million pounds) and averaged 625 metric tons (1.4 million pounds) between 1969 and 1979. The annual real harvest value ranged from $188,000 to $913,000 and averaged $528,000 (see Table 3.1.57). Both harvest weight and real value have tended to increase during this period.

The boats in this set gill net fishery are typically less than 7.3 meters (24 feet) in length and have a crew of one, the skipper. It is principally a local fishery, and the fishermen and boats are from Norton Sound communities such as Elim, Golovin, Moses Point, Nome, St. Michael and Unalakleet. The harvesting activity is based in these communities, and the harvest is landed in these communities. Although Nome is the population center of the area, it is not the center of harvesting or processing activity.

The salmon season begins in June and ends in August or September. July is typically the most productive month and in September there is relatively little harvesting activity. The seasonality of the fishery is depicted in Tables 3.1.58 through 3.1.61. The average boat participaes in this

Table 3 1 56
Upper Yukon Fish Wheel Salmon Fishery
Percentage of Fisherman Man Months by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	0	0	58.3	25.0	8.3	8.3	0	0	100.0
1970	0	0	0	0	0	0	80.0	20.0	0	0	0	0	100.0
[illegible]	[illegible]		[illegible]			0	77.8	16.7	5.6	0	0	0	100.0
1972	0	0	0	0	0	0	58.3	25.0	16.7	0	0	0	100.0
1973	0	0	0	0	0	0	45.8	54.2	0	0	0	0	100.0
1974	0	0	0	0	0	9.1	31.7	37.2	22.0	0	0	0	100.0
[illegible]				[illegible]			40.4	[illegible]	9.2	[illegible]	0	0	100.0
1976	0	0	0	0	0	2.0	50.6	31.2	16.2	0	0	0	100.0
1977	0	0	0	0	0	1.3	46.9	21.9	29.9	0	0	0	100.0

Source: CFEC Gross Earnings Files.

able 3 1.57
Harvesting Activity
Norton Sound Set Gill Net Salmon Fishery
1969-1977

	Catch				Exvessel Price		Number of		Catch per Boat Month		
	Weight		Value (millions)		($/Pound)				Weight	Value ($1,000)	
Year	Pounds (millions)	Metric Tons	Nominal	Real	Nominal	Real	Boat Months	Fisherman Months	Pounds (1,000)	Nominal	Real
1969	.9	4	.	0.2	0.10	0.22	291	291	3.2	0.3	0.7
1970	0.9	424	0.1	0.2	0.10	0.20	257	257	3.6	0.4	0.7
1971	0.9	425	0.2	0.3	0.16	0.32	286	286	3.3	0.5	1.
1972	0.9	410	0.1	0.2	0. 1	0.22	302	302	3.0	0.3	0.6
1973	1.2	527	0.4	0.8	0.37	0.67	477	477	2.4	0.9	1.6
4	1.	5	.4	.7	.25	.4	527	527	3.2	0.8	1.3
1975	1.5	695	0.4	0.5	0.23	0.35	326	326	4.7	.1	1.6
1976	.0	466	0.3	0.5	0.33	0.46	434	434	2.4	0.8	1.
1 [illegible]	1.	[illegible]	[illegible]	.	.	.4	88	88	4.4	.Y	.
8	.5	12	0.	0.9	0.30	0.37	Data not available				
[illegible]	.9	869	0.7	0.8	0.38	0.42					

Sources: This table was generated from data contained in (1) Commerc al F sheries Ent y Commiss on Gross Earnings Files, and (2) Alaska Department of Fish and Game Reports.

The rea values and pr ces were ca cu a ed us ng the U.S. CPI; 980 s the base period.

NOTE: 1978 anc 1979 data are prelim nary.

Table 3.1.58
Norton Sound Set Gill Net Salmon Fishery
Number of Boats and Catch by Month
1969-1977

Number of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	105	139	47	0	0	0	0	145
1970	0	0	0	0	0	85	110	54	8	0	0	0	111
1971	0	0	0	0	0	71	142	63	10	0	0	0	144
1972	0	0	0	0	0	126	145	30	1	0	0	0	158
1973	0	0	0	0	0	80	278	119	0	0	0	0	307
1974	0	0	0	0	0	219	272	36	0	0	0	0	316
1975	0	0	0	0	2	10	226	88	0	0	0	0	228
1976	0	0	0	1	0	145	213	75	0	0	0	0	218
1977	0	0	0	0	0	113	201	50	24	0	0	0	198

Catch (1,000 pounds)

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	195	664	72	0	0	0	0	932
1970	0	0	0	0	0	168	715	50	1	0	0	0	934
1971	0	0	0	0	0	56	793	87	2	0	0	0	938
1972	0	0	0	0	0	285	602	16	-0	0	0	0	904
1973	0	0	0	0	0	48	1012	101	0	0	0	0	1161
1974	0	0	0	0	0	576	1063	22	0	0	0	0	1661
1975	0	0	0	0	-0	1	1404	126	0	0	0	0	1533
1976	0	0	0	-0	0	192	754	80	0	0	0	0	1027
1977	0	0	0	0	0	169	1443	78	13	0	0	0	1721

Source: CFEC Gross Earnings Files.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3-59
Norton Sound Set Gill Net Salmon Fishery
The Number of Boats and Catch by Month as a Percentage of Annual Activity
1969-1977

Percentage of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	72.4	95.9	32.4	0	0	0	0	100.0
1970		0	0	0		76.6	99.1	48.6	7.2	0	0	0	100.0
1971		0	0	0	0	49.3	98.6	43.8	6.9	0	0	0	100.0
1972	0	0	0	0	0	79.7	91.8	19.0	0.6	0	0	0	100.0
1973						[illegible]	90.6	38.8	0	0	0	0	100.0
1974		0				[illegible]	86.1	11.4	0	0	0	0	100.0
1975	0	0	0	0	0.9	[illegible]	99.1	38.6	0	0	0	0	100.0
1976	0	0	0	0.5	0	66.5	97.7	34.4	0	0	0	0	100.0
1977	0	0	0	0	0	[illegible]	[illegible]	25.3	12.1	0	0	0	100.0

Percentage of Catch

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969		0	0	0		20.9	[illegible]	7.7	[illegible]	0	0	0	100.0
1970	0	0	0	0		[illegible]	[illegible]	5.4	[illegible]	0	0	0	100.0
1971	0	0	0	0	0	6.0	84.5	9.3	[illegible]	0	0	0	100.0
1972	0	0	0	0	0	31.5	66.6	1.8	[illegible]	0	0	0	100.0
1973	0	0	0	0	0	4.1	87.2	8.7	0	0	0	0	100.0
1974	0	0	0	0		34.7	[illegible]	1.3	0	0	0	0	100.0
1975	0	0	0	0	-0.0	0.1	91.6	8.2	0	0	0	0	100.0
1976	0	0	0	[illegible]	0	8.7	73.4	7.8	0	0	0	0	100.0
1977	0	0	0	0		9.3	83.8	4.5	0.8	0	0	0	100.0

Source: CFEC Gross Earnings Files.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.160
Norton Sound Set Gill Net Salmon Fishery
Number of Fishermen by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	0	105	139	47	0	0	0	0	291
1970	0	0	0	0	0	85	110	54	8	0	0	0	257
1971	0	0	0	0	0	71	142	63	10	0	0	0	286
1[illegible]						126	45	30	1	0	0	0	302
1973	0	0	0	0	0	80	278	119	0	0	0	0	477
1974	0	0	0	0	0	219	272	36	0	0	0	0	527
1[illegible]							226	8	[illegible]	0	0	0	326
1[illegible]				1		14	2[illegible]3	75	0	0	0	0	434
1977	0	0	0	0	0	113	201	50	24	0	0	0	388

Source: CFEC Gross Earnings Files.

Table 3.1.61
Norton Sound Set Gill Net Salmon Fishery
Percentage of Fisherman Man Months by Mont
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
[illegible]					[illegible]	36.[illegible]	47.8	16.2	0	0	0	0	[illegible]00.0
1970	0	0	0	0	0	33.1	42.8	21.0	3.1	0	0	0	100.0
1971	0	0	0	0	0	24.8	49.7	22.0	3.[illegible]	0	0	0	100.0
[illegible]	[illegible]		[illegible]			4[illegible].7	48.0	[illegible].9	0.3	0	0	0	100.0
1973	0	0	0	0	0	16.8	58.3	24.9	0	0	0	0	100.0
1974	0	0	0	0	0	41.6	51.6	6.8	0	0	0	0	100.0
1975	0	0	0	0	0.6	3.1	69.3	27.0	0	0	0	0	100.0
[illegible]		[illegible]	0	[illegible]		[illegible].4	4[illegible]	[illegible]		[illegible]	0		[illegible]
[illegible]				[illegible]		[illegible]	[illegible]	[illegible].9	[illegible].2		0		[illegible]00.0

Source: CFEC Gross Earn ngs Files.

fishery during 1.9 calendar months per year.

Kotzebue Sound

The Kotzebue Sound salmon fishery is also a set gill net fishery. Its annual harvest weight ranged from 200 metric tons (0.4 million pounds) to 2,426 metric tons (5.3 million pounds) and averaged 977 metric tons (2.2 million pounds) between 1969 and 1979. The annual real harvest value ranged from $0.1 million to $3.0 million and averaged $1.1 million (see Table 3 1.62). Both average harvest weight and real value are greater for 973 through 1977 than for the period as a whole. This indicates that both harvest weight and real value have tended to increase.

The boats in the Kotzebue salmon fishery are typically less than 7.6 meters (25 feet) in length and have a crew of one, the skipper. It is a predominately local fishery; most of the fishermen are local residents and the boats operate out of and land fish in local communities, primarily Kotzebue.

The salmon season typically begins in July and ends in September. August is the most productive month. The seasonality of this fishery is summarized in Tables 3.1.63 through 3.1.66. The average length of participation by boats in this fishery is 1.8 months per year.

Table 3 .62
Harvesting Activity
Kotzebue Set Gill Net Salmon Fishery
1969-197

	Catch								Catch per Boat Month		
	Weight		Value (millions)[1]		Exvessel Price ($/Pound)		Number of		Weight	Value ($1,000)	
Year	Pounds (millions)	Metric Tons	Nominal	Real	Nominal	Real	Boat Months	Fisherman Months	Pounds (1,000)	Nominal	Real
1 69	.4		.	0.1	0.15	0.33	10	(	4.4	0.7	1.4
9	1	08	.	.4	.	0.	1	1	8.6	.3	2.
1971	1.3	574	0.2	0.4	0.16	0.32	206	206	6.1	1.0	.9
1 7	.5	.	.	.5	. 7	.3	9	197	.8	.	2.5
	3.	15	.	.	0 8	0.		0	.8	.0	5.5
1974	5.3	2426	1.8	3.0	0.34	0.55	608	608	0.5	3.6	5.8
5		4	1.4	2.0	0.28	0.42	45	450	.8	.	4.5
1976	1.4	642	0.4	0.6	0.28	0.39	4 0	4 0	3.5	1.0	1.4
1977	1.8	838	1.1	1.4	0.58	0.77	396	396	4.7	2.7	3.6
1	1	481	.7	.9	.68	84	Data not available				
	.3	5	1.1	.	.35	4					

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game Reports.

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

NOTE: 1978 and 1979 data are preliminary.

Table 3.1.63
Kotzebue Set Gill Net Salmon Fishery
Number of Boats and Catch by Month
1969-1977

Number of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	0	36	48	17	0	0	0	49
1970	0	0	0	0	0	0	62	75	14	0	0	0	78
1971		0	0	0	0	0	70	94	42	0	0	0	95
1972	0	0	0	0	0	0	89	97	11	0	0	0	106
1973	0	0	1	0	0	0	135	171	0	0	0	0	183
1974	0	0	0	0	0	0	204	293	11	0	0	0	321
1975	1	0	0	0	0	0	197	251	1	0	0	0	266
1976	0	0	0	0	0	0	192	218	0	0	0	0	228
1977	0	0	0	0	0	0	190	206	0	0	0	0	249

Catch ("1,000 pounds)

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	0	70	355	17	0	0	0	442
1970	0	0	0	0	0	0	290	1003	4	0	0	0	1296
1971	0	0	0	0	0	0	128	1069	68	0	0	0	1265
1972	0	0	0	0	0	0	496	1039	7	0	0	0	1543
1973		0	-0	0	0	0	1024	2300	0	0	0	0	3326
1974	0	0	0	0	0	0	1767	3571	6	0	0	0	5349
1975	-0	0	0	0	0	0	1011	3868	-0	0	0	0	4881
1976	0	0	0	0	0	0	616	800	0	0	0	0	1416
1977	0	0	0	0	0	0	438	403	0	0	0	0	1847

Source: CFEC Gross Earnings Files.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.64
Kotzebue Set Gill Net Salmon Fishery
The Number of Boats and Ca ch by Month as a Percentage of Annual Act [illegible]ty
1969-1977

Percentage of Boats

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
[illegible]							[illegible]	98.0	34.7	0	[illegible]	0	100.0
[illegible]							[illegible]	96.2	17.9	0	0	0	100.0
[illegible]							[illegible]	98.9	44.2	0	0	0	100.0
[illegible]						0	[illegible]	91.5	10.4	0	0	0	100.0
[illegible]						0	[illegible]	93.4	0	0	0	0	100.0
[illegible]	0	0	0	0	0	0	63.6	91.3	3.4	0	0	0	100.0
1975	[illegible]	0	0	0	0	0	74.1	94.4	0.4	0	0	0	100.0
1976	0	0	0	0	0	0	84.2	95.6	0	0	0	0	100.0
[illegible]	0	0	0	0	0	0	76.3	82.7	0	0	0	0	100.0

Percentage of Catch

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
[illegible]							5.8	[illegible]	3.8	0	0	0	100.0
[illegible]						0	22.4	77.4	0.3	0	0	0	100.0
[illegible]						0	0.1	84.5	[illegible]	0	0	0	100.0
[illegible]							[illegible]	[illegible]	0.5	0	0	0	100.0
[illegible]							30.8	69.2	[illegible]	0	0	0	100.0
[illegible]							[illegible]	66.8	[illegible]	0	0	0	100.0
[illegible]							[illegible]	79.2	[illegible]	0	0	0	100.0
[illegible]						0	[illegible]	56.5	[illegible]	0	0	0	100.0
[illegible]						0	[illegible]	21.8	[illegible]	0	0	0	100.0

Source: CF C Gross Earnings F les.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.65
Kotzebue Set Gill Net Salmon Fishery
Number of Fishermen by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
[illegible]	[illegible]		[illegible]			[illegible]	36	48	17				[illegible]
[illegible]	0	0	[illegible]	0	0	0	62	75	14	0	0	0	151
1971	0	0	0	0	0	0	70	94	42	0	0	0	206
[illegible]			[illegible]				89	[illegible]	1	0	0	0	197
[illegible]	[illegible]			0			[illegible]		0	0	0	0	307
[illegible]		[illegible]	[illegible]	0	[illegible]		[illegible]	[illegible]				0	508
[illegible]		0	[illegible]	0	0	0	197	[illegible]	1	0	0	0	450
[illegible]			[illegible]				[illegible]	218	0	0	0	0	410
		[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	0	0		[illegible]

Source: CFEC Gross Earnings Files.

Table 3-66
Kotzebue Set Gill Net Salmon Fishery
Percentage of Fisherman Man Months by Month
1969-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
[illegible]							[illegible].6	[illegible]7.5	6.8	0	0	0	[illegible]00.0
[illegible]							4[illegible].1	40.7	9.3	0	0	0	[illegible]00.0
[illegible]						.	5[illegible]	[illegible].6	36.1	0	0	0	[illegible]
19[illegible]	0	0	0	0	0	0	45.2	49.2	5.6	0	0	0	[illegible]00.0
[illegible]		[illegible]	0.		0	[illegible]	44.0	55.7			0	[illegible]	[illegible]00.
[illegible]					[illegible]		4[illegible].2	57.[illegible]	2.2	[illegible]	[illegible]	0	[illegible]00.0
197[illegible]	[illegible]	0	0	0	0	0	43.8	55.8	0.2	0	0	0	10[illegible].
[illegible]							[illegible].8	[illegible].2	[illegible]			0	[illegible].
[illegible]						[illegible]	40.0	5[illegible].			[illegible]		[illegible]0.[illegible]

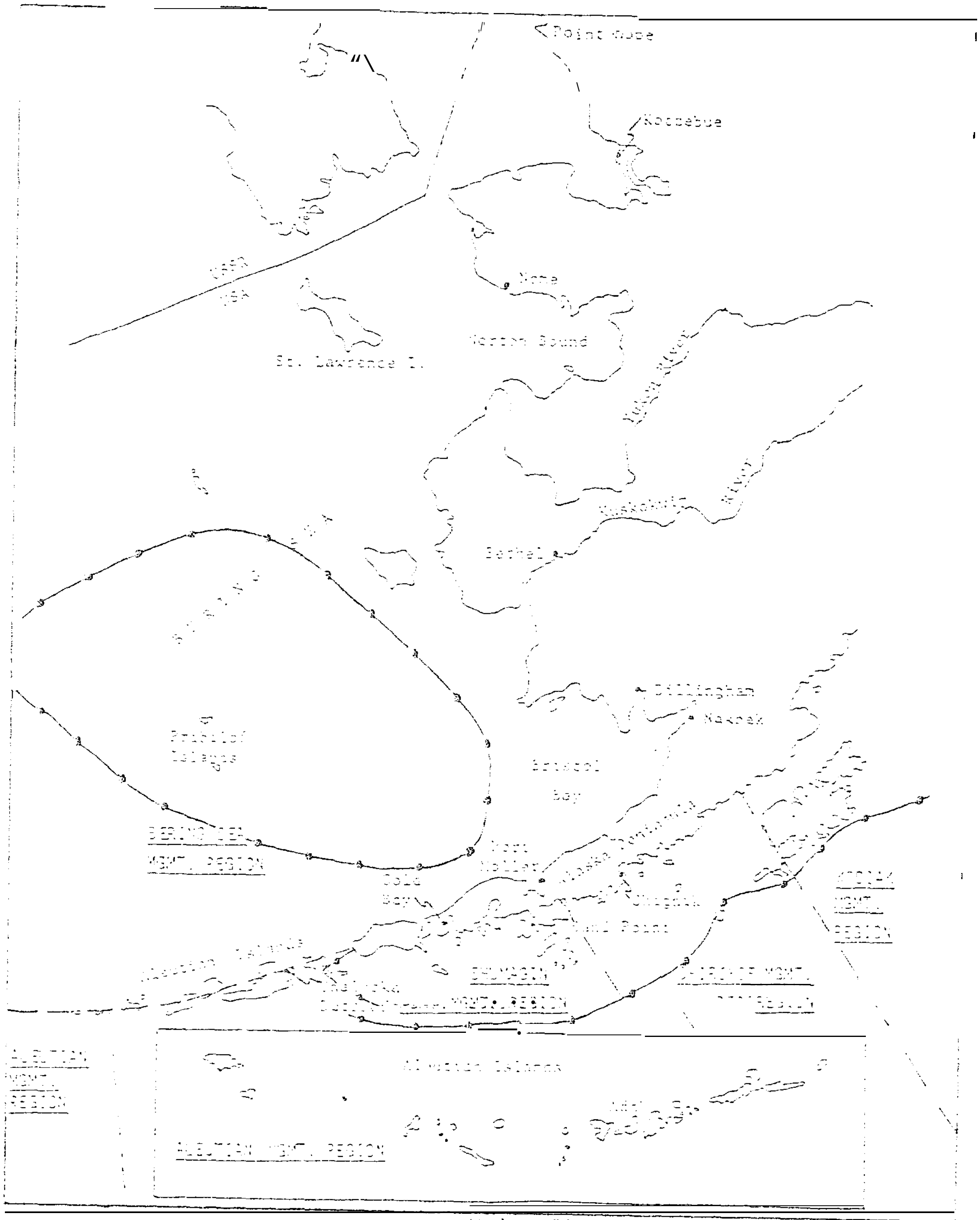
Source: CFEC Gross Earnings Files.

HALIBUT

There are two distinct halibut fleets in Western Alaska, a large boat fleet that ranges throughout the Gulf of Alaska and the Eastern Bering Sea and a small boat fleet. The boats in the latter fleet tend to fish in protected waters in the general vicinity of their home ports and are primarily associated with other fisheries. Until recently the International Pacific Halibut Commission (IPHC) collected data on the large and licensed vessel fleet including both the U.S. and Canad an boats, and the Alaska Department of Fish and Game (ADF&G) collecte data on the domestic fleets, including both small and large vessels. Another difference between the IPHC and ADF&G data is that they are for slightly different regions (see Figures 3.2 and 3.3).

IPHC data for Chirikof through the Bering Sea indicate that between 1969 and 1979, annual harvest weight ranged from 800 metric tons (1.8 million pounds) to 7,175 metric tons (15.8 million pounds) and average harvest value ranged from $1.9 million to $6.6 million (see Table 3.1.57). Both harvest weight and nominal value have decreased since the late 1960s; the decrease in harvest weight has been more dramatic since increases in the nominal exvessel price have moderated the decrease in nominal harvest value.

The annual harvest weight for the domestic fleets of Western Alaska ranged from 405 metric tons (0.9 million pounds) to 1,182 metric tons (2.6 million pounds) between 1972 and 1979, the years for which data are



Major Fishing Areas
IPHC Management Regions Boundaries

Figure 3.2: Major Halibut Fishing Areas and IPHC Management Regions

Source: International Pacific Halibut Commission, Technical Report No. 6; Alaska Department of Fish and Game.

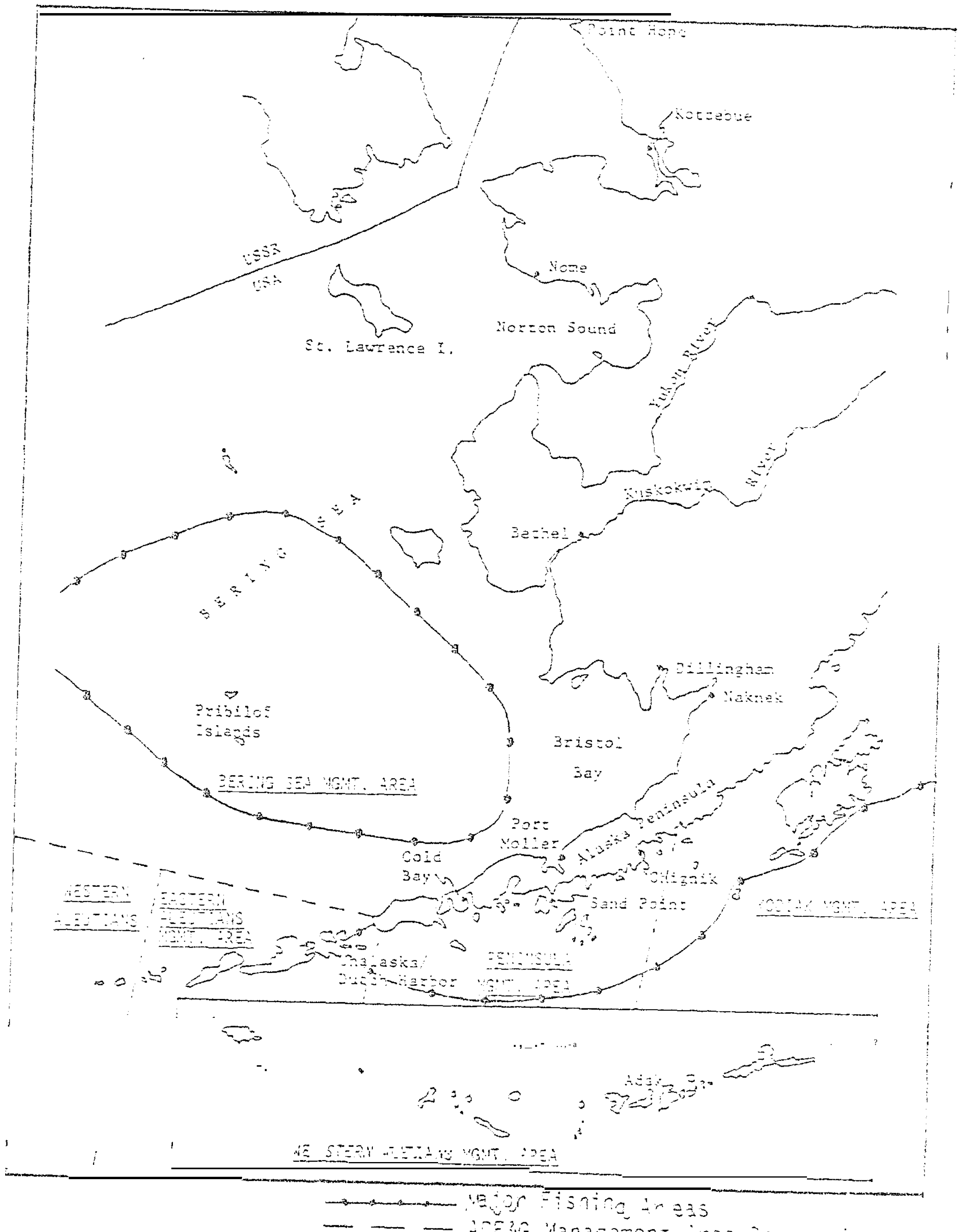


Figure 3.3: Major Halibut Fishing Areas and ADF&G Management Regions

available. The annual nominal harvest value ranged from $0.6 million to $3.3 million (see Table 3.1.67). Harvest weight does not exhibit a secular trend for this period as a whole, however, nominal harvest value has tended to increase. The relative importance of each Western Alaska halibut fishery and of the Western Alaska fishery as a whole is summarized in Tables 3.1.68 and 3.1.69.

Peninsula Halibut Fishery

The annual harvest weight ranged from 71 metric tons (0.2 million pounds) to 922 metric tons (2.0 million pounds) between 1972 and 1979 and averaged 485 metric tons (1.1 million pounds). The annual real harvest value ranged from $0.3 million to $2.7 million (see Table 3.1.70). Annual harvest weight and value have fluctuated without exhibiting secular trends.

The fleet includes both local and non-local boats which range in length from 6.1 to 22.9 meters (20 to 75 feet), but which are typically between 9.1 and 15.2 meters (30 and 50 feet) in length and have a crew of five including the skipper. This fishery is dominated by larger vessels which land fish in and operate out of non-local ports such as Kodiak. The smaller boats operate out of Alaska Peninsula communities including Chignik, Sand Point, and Unalaska.

The season typically extends from May into September. Fishing activity is fairly evenly distributed from June through September. The seasonality

Table 3.1.67

Western Alaska Halibut Harvest
1969-1979

Pounds
(1,000)

Year	Peninsula	Dutch Harbor	Western Aleutians	Bering Sea	ADF&G Western Alaska	IPHC Western Alaska	Alaska
1969	[illegible]		0	0	0	15817	45226
1970	[illegible]		0	0	0	15147	44420
1971	[illegible]	[illegible]	0	0	0	12120	36489
1972	[illegible]032	[illegible]	0	376	2408	10302	32381
1973	1544	46	0	189	1878	5313	24787
1974	680	83	0	120	892	2375	16498
1975	1132	87	0	356	1575	3185	20331
1976	872	[illegible]	0	461	1389	3443	20168
1977	1609	1[illegible]	336	562	2606	4407	16414
1978	[illegible]31	[illegible]	683	658	1911	2673	17484
1979	156	6	431	938	1531	1759	18025

Value
$1,000

Year	Peninsula	Dutch Harbor	Western Aleutians	Bering Sea	ADF&G Western Alaska	IPHC Western Alaska	Alaska
1969	[illegible]	[illegible]	[illegible]	[illegible]	0	6485	18542
1970	[illegible]	[illegible]	0	0	0	5907	17324
1971	[illegible]	[illegible]	0	0	0	4484	13501
[illegible]	1[illegible]6	[illegible]	0	228	1416	6593	20724
[illegible]	1[illegible]0	[illegible]	0	133	135[illegible]	[illegible]10	20573
[illegible]	[illegible]	[illegible]		8	[illegible]10	1853	12868
[illegible]	1608	79	0	316	1402	3121	19924
[illegible]	1698	70	0	579	1744	4200	24605
[illegible]	[illegible]04[illegible]	[illegible]	[illegible]	68	3302	5553	20682
[illegible]	70		293	[illegible]	2772	3876	25352
	[illegible]	1	780	16[illegible]	2770	3184	32625

Sources: IPHC Fishing Earnings Files, ADF&G Catch Reports, and IPHC Annual Reports.

Note: 1978 and 1979 data are preliminary.

Table 3.1.68

ADF&G Management Area Harvest as a Percentage of the Western Alaska Harvest
1969-1979

Percentage by Weight

Year	Peninsula	Dutch Harbor	Western Aleutians	Bering Sea	ADF&G Western Alaska	IPHC Western Alaska
1969		0	0	0	0	100.0
1970		0	0		0	100.0
1971	0	0	0	0	0	100.0
1972	19.7	0	0	3.6	23.4	100.0
1973	29.1	2.7	0	3.6	35.3	100.0
1974	29.0	3.5	0	5.1	37.6	100.0
1975	35.6	2.7	0	11.2	49.5	100.0
1976	25.3	1.6	0	13.4	40.3	100.0
1977	36.5	2.6	7.7	12.3	59.1	100.0
1978	19.9	1.3	25.7	24.6	71.5	100.0
1979	8.9	0.3	24.5	53.3	87.0	100.0

Percentage by Value

Year	Peninsula	Dutch Harbor	Western Aleutians	Bering Sea	ADF&G Western Alaska	IPHC Western Alaska
1969	0	0	0	0	0	100.0
1970	0	0	0	0		100.0
1971	0	0	0	0	0	100.0
1972	18.6	0	0	3.5	22.1	100.0
1973	24.7	2.3	0	3.6	30.0	100.0
1974	25.6	3.1	0	4.2	32.9	100.0
1975	32.3	2.5	0	10.1	44.9	100.0
1976	26.1	1.7	0	13.8	41.5	100.0
1977	36.8	2.6	7.8	12.3	59.5	100.0
1978	19.9	1.3	25.7	24.6	71.5	100.0
1979	8.9	0.3	24.5	53.3	87.0	100.0

Sources: CFEC Gross Earnings Files, ADF&G Catch Reports, and IPHC Annual Reports.

NOTE: 1978 and 1979 data are preliminary.

[illegible]le 3 [illegible]

ADF&G Management Area Harvest as a Percentage of the Alaska Harvest 1969-1979

Percentage by Weight

Year	Peninsula	Dutch Harbor	Western Aleutians	Bering Sea	ADF&G Western Alaska	IPHC Western Alaska	Alaska
1969	0	0		0	0	35.0	100.0
1970	0	[illegible]			0	34.1	100.0
1971	0	[illegible]	0	0	0	33.2	100.0
1972	6.3	[illegible]	0	1.2	7.4	31.8	100.0
1973	[illegible]	[illegible].6	0	0.8	7.6	21.4	100.0
1974	4.2	[illegible]	0	0.7	5.4	14.4	100.0
1975	5.6	[illegible]	0	1.8	7.7	15.7	100.0
1976	4.3	[illegible]	0	2.3	6.9	17.1	100.0
1977	9.8	[illegible]	2.1	3.3	15.9	26.8	100.0
1978	3.0	[illegible]	3.9	3.8	10.9	15.3	100.0
1979	0.9	[illegible]	2.4	6.2	8.5	9.8	100.0

Percentage by Value

Year	Peninsula	Dutch Harbor	Western Aleutians	Bering Sea	ADF&G Western Alaska	IPHC Western Alaska	Alaska
[illegible]		0	0	0	0	35.0	100.0
[illegible]		0	0	0	0	34.1	100.0
[illegible]	0	0	[illegible]		0	33.2	100.0
[illegible]	[illegible]	0	0	[illegible]	7.0	31.8	100.0
[illegible]	[illegible]	[illegible]	0	[illegible]	6.4	21.4	100.0
[illegible]	[illegible]	[illegible]	[illegible]	0.6	[illegible]	14.4	100.0
[illegible]	[illegible]	[illegible]	0	1.6	[illegible]	15.7	100.0
[illegible]	[illegible]	[illegible]	0	2.4	7.1	17.1	100.0
[illegible]	[illegible]	[illegible]	[illegible]	3.3	[illegible]	26.8	100.0
[illegible]	[illegible]	[illegible]	[illegible]	3.8	[illegible]	15.3	100.0
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	9.8	100.0

[illegible] [illegible] files, ADF&G Catch Reports, and IPHC Annual Reports.

NOTE [illegible] 197[illegible] an[illegible] 79 data are p[illegible]liminary

Table 3.1.70

Ha vesting Activity
Penirsula Halibut Fishery
969 979

Year	Catch Weight Pounds (millions)	Catch Weight Metric Tons	Catch Value (million $) Nominal	Catch Value (million $) Real[1]	Exvessel Price ($/Pound) Nominal	Exvessel Price ($/Pound) Real	Number of Boat Months	Number of Fisherman Months	Catch per Boat Month Weight Pounds (1,000)	Catch per Boat Month Value ($1,000) Nominal	Catch per Boat Month Value ($1,000) Real
1969	0	0	0	0	0	0	0	0	0	0	0
[illegible]			(	)				0	(		
1971	0	0	0	0	0	0	0	0	0	0	0
1972	2.0	922	.2	2.3	0.6	.16	165	825	12.3	.4	4.2
[illegible]3	[illegible]	[illegible]	1 1	2.	[illegible]	[illegible]	[illegible]	[illegible]45	2.0	8.4	15.2
[illegible]74	1	1[illegible]	[illegible]	1.8	[illegible]69	[illegible]2	66	[illegible]	10.4	7.2	.7
1[illegible]	1	[illegible]3	1.	[illegible]	[illegible]	[illegible]3	4	[illegible]5	7.7	6.	.2
[illegible]76		[illegible]6	.	.5	.26	.77	68	340	2.8	6.1	22.7
[illegible]77	1.6	730	2.0	2.7	.27	1.68					
[illegible]78	0.5	241	0.8	0.9	.[illegible]5	.[illegible]3		Data not avai ab e			
1[illegible]		1	.	[illegible]	1 8	2.[illegible]					

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commiss on Gross Earnings Files, and (2) Alaska Department of Fish and Game reports.

[1]The real va ues and prices were ca culated using the U.S. CP ; 1980 is the base period.

: 1978 an 1979 values are preliminary estimates.

of this fishery is summarized in Tables 3.1.71 through 3.1.74. The average length of participation by a boat in this fishery is 2.1 calendar months per year.

Eastern Aleutians Halibut Fishery

The annual harvest weight ranged from 2.5 metric tons (5,600 pounds) to 66 metric tons (145,000 pounds) between 1973 and 1979 and averaged 34 metric tons (75,000 pounds). The annual real harvest value ranged from $11,000 to $190,400 and averaged $108,000 (see Table 3.1.75). Neither harvest weight nor value has exhibited a strong secular trend.

Both local and non-local boats and fishermen participate in this fishery, the former primarily as a secondary fishery. The boats range in length from 7.9 to 22.9 meters (26 to 75 feet) and on average are approximately 13.7 meters (45 feet) in length. The average crew size is approximately five, including the skipper. The small boats operate out of and land fish in the communities of the Eastern Aleutians including Dutch Harbor/Unalaska and Sand Point. The large boats which dominate the fishery operate out of non-local ports such as Kodiak.

The season typically begins in May and ends in September. The distribution of harvesting activity during the season is variable from year to year. The seasonality is summarized in Tables 3.1.76 through 3.1.79. The average length of participation by a boat in this fishery is 1.5 months per year.

Table 3.17

Peninsula Halibut Fishery
Number of Boats and Catch by Month
1969-1977

Number of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
[illegible]	[illegible]	[illegible]	0	0	0	0	0	0	0	0	0	0	0
[illegible]				[illegible]	[illegible]		[illegible]		0		[illegible]		0
[illegible]			[illegible]	[illegible]		[illegible]	0	[illegible]	[illegible]		[illegible]	0	0
[illegible]					[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]
[illegible]			[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	24	6	0	[illegible]	51
[illegible]			[illegible]	0	[illegible]	[illegible]	[illegible]	[illegible]	11	1	0	[illegible]	32
[illegible]				0	[illegible]	[illegible]	[illegible]	[illegible]	18	0	0	[illegible]	64
[illegible]				0	[illegible]	[illegible]	[illegible]	13	0	0	0	0	50
								0	0	0	0	0	68

Catch (1,000 Pounds)

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
[illegible]					[illegible]	[illegible]	[illegible]			[illegible]	0	0	0
[illegible]				[illegible]	[illegible]			[illegible]		[illegible]	0	0	0
[illegible]								0	0	0	0	0	0
			[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	226	0	0	0	2032
[illegible]						[illegible]	[illegible]	[illegible]	[illegible]	86	0	0	1544
[illegible]							[illegible]	[illegible]	[illegible]		0	0	689
[illegible]		[illegible]			[illegible]		[illegible]	386	[illegible]	0	0	0	1132
		[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			0	0	872
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	0	[illegible]	0	0	0	0	0	1609

Source: CFEC Gross Earnings Files.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Tab e 3. .72

Perinsula Halibut Fishery
Percentage of Boats and Catch by Mon h
1969 1977

Percen age of Boa s

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
[illegible]					[illegible]		[illegible]			[illegible]	0	0	0
[illegible]		[illegible]			[illegible]	[illegible]	[illegible]		[illegible]	0	0	0	0
1 71					[illegible]		[illegible]			0	0	0	0
[illegible]		[illegible]			18.7	13.3	54.7	82.7	46.7	0	0	0	100.0
[illegible]		[illegible]		[illegible]	7.8	43.[illegible]	58.8	70.4	47.1	11.8	0	0	100.0
1 76				[illegible]	[illegible]	50.[illegible]	37.5	75.0	34.4	3.1	0	0	100.0
[illegible]			0		14.1	25.0	81.3	81.3	28.1	0	0	0	100.0
[illegible]		[illegible]	0		8.0	26.0	76.0	26.0	0	0	0	0	100.0
[illegible]							[illegible]	0	0	0	0	0	100.0

Percentage o Ca ch

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	0	0	0	0	0	0	0	0
									0	0	0	0	0
[illegible]				[illegible]		[illegible]	[illegible]	[illegible]	0	0	0	0	0
			[illegible]	[illegible]	20.6	9.6	22.0	34.9	11.1	0	0	0	100.0
					[illegible]	[illegible]	27.4	31.4	13.6	5.6	0	0	[illegible]
			[illegible]		[illegible]	17.[illegible]	21.[illegible]	31.5	39.0	0.0	0	0	[illegible]
[illegible]					[illegible]	[illegible]	26.[illegible]	[illegible]	13.7	0	0	0	[illegible]
					[illegible]	11.[illegible]	36.[illegible]	31.7	0	0	0	0	100.0
						[illegible]	0	0	0	0	0	0	100.0

Sour e: C-FC Gross Earnings Files

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.173

Peninsula Halibut Fishery
Number of Fishermen by Month
1969-1977

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	15	70	50	205	310	175	0	0	0	825
1973	0	0	0	0	20	125	50	200	120	30	0	0	645
1974	0	0	0	0	10	80	60	120	55	5	0	0	330
1975	0	0	0	0	45	80	260	260	90	0	0	0	735
1976	0	0	0	0	20	65	190	65	0	0	0	0	340
1977	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: CFEC Gross Earnings Files

Table 3.74

Peninsula Halibut Fishery
Percentage of Fisherman Man Months by Month
1969-1977

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
[illegible]	[illegible]			[illegible]		[illegible]			[illegible]	[illegible]		0	
[illegible]				[illegible]				[illegible]		[illegible]	[illegible]		
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]				1.	[illegible]	6.	24.8	37.6	21.2	0	0	0	100.0
[illegible]		[illegible]			[illegible]	[illegible]		31	8.6	4.7	0	0	100.0
[illegible]					[illegible]	[illegible]	18.2	[illegible]	[illegible]	[illegible]	0	[illegible]	[illegible]
[illegible]					[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		0	0	[illegible]
						[illegible]	[illegible]	[illegible]		[illegible]		[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	0	0	0	0	0	0	0	0

Source: [illegible] Gross Earnings Files

Table 3.1.75

Harvesting Activity
Eastern Aleutians Halibut Fishery
1969-1979

Year	Catch: Weight: Pounds (millions)	Catch: Weight: Metric Tons	Value (millions)[1]: Nominal	Value (millions)[1]: Real	Exvessel Price ($/Pound): Nominal	Exvessel Price ($/Pound): Real	Number of: Boat Months	Number of: Fisherman Months	Catch per Boat Month: Weight: Pounds (1,000)	Catch per Boat Month: Value ($1,000): Nominal	Catch per Boat Month: Value ($1,000): Real
[illegible]	-		[illegible]	[illegible]		[illegible]		0			
[illegible]			[illegible]		-					0	
1971	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]			0			[illegible]	4	2	[illegible]	0	[illegible]
1973	0.1	66	0.1	0.2	0.70	1.27	11	55	13.2	9.3	16.7
[illegible]	1.1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	24	[illegible]	3.5	2.4	[illegible]
1975	[illegible]	[illegible]		0.1	0.90	1.33	16	80	5.4	4.9	7.3
[illegible]	[illegible]	[illegible]	[illegible]	0.1	[illegible]	[illegible]	[illegible]	[illegible]	8.0	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Data not available				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game reports.

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

The 1978 and 1979 values are preliminary estimates.

Table 3.1.76

E[illegible]tern Aleutians Halibut Fishery
Number of Boats and Catch by Month
1969-1977

Number of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]			[illegible]	[illegible]			[illegible]	[illegible]		0	0	0	0
[illegible]					[illegible]	[illegible]		[illegible]	0	0	0	0	0
[illegible]	[illegible]			1	[illegible]	[illegible]	1	1	1	0	0	0	3
[illegible]					3	[illegible]	0	2	1	0	0	0	8
[illegible]			[illegible]	0	[illegible]	[illegible]	6	[illegible]	[illegible]	0	0	0	3
[illegible]			[illegible]	[illegible]		[illegible]	[illegible]	4	1	0	0	0	7
[illegible]				[illegible]	[illegible]	0	4	3	0	0	0	0	4
[illegible]77				[illegible]	[illegible]	0	0	0	0	0	0	0	6

142

Catch (1,000 Pounds)

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
		[illegible]		[illegible]		[illegible]	0		0	0	0	0	0
[illegible]						[illegible]	[illegible]		[illegible]	0	0	0	0
									0	0	0	0	0
								-0	0	0	0	0	0
								-0	0	0	0	0	45
							8	[illegible]	4	0	0	0	83
							0	8	0	0	0	0	[illegible]7
				[illegible]			37	-[illegible]	0	0	0	0	[illegible]6
										0	0	0	[illegible]6

Source: [illegible]EC Gross Earnings File

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.77

Eastern Aleutians Halibut Fishery
Percentage of Boats and Catch by Month
1969-1977

Percentage of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
						[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
					[illegible]		[illegible]				[illegible]	[illegible]	
[illegible]				[illegible]				[illegible]			[illegible]	[illegible]	
[illegible]					[illegible]	[illegible]		[illegible]			[illegible]	[illegible]	[illegible]
					[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	100.0
[illegible]				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		100.0
[illegible]				[illegible]	[illegible]	[illegible]	71.4	57.1	14.3	[illegible]	[illegible]		[illegible]
[illegible]							[illegible]	[illegible]			[illegible]		[illegible]
[illegible]							[illegible]			[illegible]			[illegible]

Percentage of Catch

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]							[illegible]		[illegible]		[illegible]	[illegible]	[illegible]
								[illegible]					[illegible]
			[illegible]				[illegible]	[illegible]	[illegible]	[illegible]			[illegible]
[illegible]					[illegible]		[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	100.0
					[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	100.0
[illegible]		[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	100.0
[illegible]				[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	100.0
									[illegible]	[illegible]	[illegible]	[illegible]	100.0

Source: CFEC Gross Earnings Files

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.78

Eastern Aleutians Halibut Fishery
Number of Fishermen by Month
1969-1977

Year	Jan.	Feb	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov	Dec	Total
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	5	0	0	5	5	5	0	0	0	20
1973	0	0	0	[illegible]	15	25	[illegible]	10	5	0	0	0	55
1974	0	0	0	[illegible]	10	20	[illegible]	40	20	0	0	0	120
1975	0	0	0	0	[illegible]	[illegible]	25	20	5	0	0	0	80
1976	0	0	0	0	0	0	20	15	0	0	0	0	35
1977	0	0	0	0	0	[illegible]	[illegible]	0	0	0	0	0	0

Source: CFEC [illegible]

able 3.1.79

Eastern Aleutians Halibut Fishery
Percentage of Fisherman Man Months by Month
969-977

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
[illegible]						[illegible]				0	0	0	[illegible]
[illegible]									[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]				[illegible]				[illegible]		0		[illegible]	[illegible]
[illegible]				[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	0	0	100.0
[illegible]						[illegible]		[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
[illegible]			[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		0	0	[illegible]
[illegible]					[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	0	0	[illegible]
[illegible]						[illegible]	[illegible]	[illegible]		[illegible]	0	0	[illegible]
[illegible]			[illegible]			[illegible]			[illegible]			0	

Source: CFEC Gross Earnings File

Western Aleutians Halibut Fishery

The Western Aleutians halibut fishery did not exhibit much activity between 1973 and 1977. Only three boats participated in the fishery in 1974; therefore, the harvest statistics are confidential. Six boats participated in the fishery in 1977. In that year the annual harvest weight and real value were 154 metric tons (339,000 pounds) and $571,000, respectively (see Table 3.1.80).

Both local and non-local boats participate in the fishery primarily as a secondary fishery. The boats range in length from 14.0 to 22.9 meters (46 to 75 feet) and average approximately 16.8 meters (55 feet) in length. Crew size varies greatly depending upon a boat's principal fishery. The average crew size is approximately five. The smaller boats operate out of and land fish in Western Aleutian communities. The larger boats which dominate the fishery land fish in and operate out of non-local ports such as Kodiak.

The season typically begins in May and ends in August or September. The limited information that is available concerning seasonality is summarized in Tables 3.1.81 through 3.1.84. In 1974, the one year for which seasonal data are available, the average length of participation by a boat in this fishery was 1.3 months per year.

Table 3-80

Harvesting Activity
Western Aleutians Halibut Fishery
1969-1979

	Catch								Catch per Boat Month		
	Weight		Value (millions)[1]		Exvessel Price ($/Pound)		Number of		Weight	Value ($1,000)	
Year	Pounds (millions)	Metric Tons	Nominal	Real[1]	Nominal	Real	Boat Months	Fisherman Months	Pounds (1,000)	Nominal	Real
1969	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	0	0	0	0
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	0	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	[illegible]	[illegible]	20	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	0
1976	0	0	0	0	0	0	0	0	0	0	0
[illegible]	[illegible]	54	0.4	0.6	.27	1.69	Data not available				
1978[2]	[illegible]	[illegible]	1.0	[illegible]	[illegible]	[illegible]					
1979[2]	[illegible]	[illegible]	[illegible]	[illegible]	.81	2.00					

Source: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game reports.

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

[2] The 1978 and 1979 values are preliminary estimates.

Ta[illegible]e 3 [illegible]

Western Aleutians Halibut Fishery
Number of Boats and Catch by Month
1969-1977

Number of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
[illegible]			[illegible]		[illegible]		[illegible]	[illegible]	[illegible]		[illegible]		[illegible]
[illegible]				[illegible]				[illegible]			[illegible]	[illegible]	[illegible]
[illegible]		[illegible]			[illegible]				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]					[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]				[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]						[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]			[illegible]	[illegible]					[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Catch (1,000 Pounds)

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
						[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]								[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]			[illegible]				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]									[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]						[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
					[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
								[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Sou[illegible]: [illegible]

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.82

Western Aleutians Halibut Fishery
Percentage of Boats and Catch by Month
1969-1977

Percentage of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
[illegible]													[illegible]
[illegible]													[illegible]
[illegible]													[illegible]
[illegible]													[illegible]
[illegible]													[illegible]
[illegible]													[illegible]
[illegible]													[illegible]
[illegible]													[illegible]
[illegible]													[illegible]

Percentage of Catch

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
[illegible]													[illegible]
[illegible]													[illegible]
[illegible]													[illegible]
[illegible]													[illegible]
[illegible]													[illegible]
[illegible]													[illegible]
[illegible]													[illegible]
[illegible]													[illegible]
[illegible]													[illegible]

Source: [illegible]

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.83

Western Aleutians Halibut Fishery
Number of Fishermen by Month
1969-1977

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
972	0	0	0	0	0	0	0	0	0	0	0	0	0
973			[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	0	0	0
1974	0	0	0	0	5	10	0	5	0	0	0	0	20
975	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0			0	0	0	0	0	0	0	0	0
9	0	[illegible]		[illegible]	[illegible]	0	0		[illegible]	0	[illegible]	[illegible]	

Source: [illegible]

Table 3.1.84

Western Aleutians Halibut Fishery
Percentage of Fisherman Man Months by Month
1969-1977

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969			0			0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0			0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	
1972	0	0	0	0	0	0	0	0	0		0	0	0
1973	0	0	0	0	0	0	0		0	0	0	0	0
1974					[illegible].0	5[illegible]	0	25.0	0	0	0	0	[illegible]00.[illegible]
1975	0	0	0	0	0	0	0		0	0	0		0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0
1977											0		0

Source: CFEC Gross Earnings Files.

Bering Sea Halibut Fishery

The annual harvest weight of the Bering Sea halibut fishery ranged from 54 metric tons (120,000 pounds) to 425 metric tons (938,000 pounds) between 1972 and 1979 and averaged 206 metric *tons ('455,000* pounds). The annual real harvest. value ranged from 3127,000 to $1,878,000 and averaged 5765,000 (see Table 3,1.S5).

The boats in this fishery range in length from under 12.2 meters (40 feet) to over -7.7 9 meters (75 feet); the smaller boats are primarily participants in other fisheries. Both local and non-local boats participate in this fishery and crew size varies depending upon the principal fishery of a boat. The average crew size is approximately five. The small boats operate out of and land fish *in* Aleutian Island communities. The large non-local boats which dominate the fishery operate out of and land fish in non-local ports such as Kodiak.

Although harvesting activity has occurred in April, June, and August through November, it has typically been concentrated in April and September through November. The seasonality is summarized in Tables 3.1.86 through 3.1.89. The average length of participation of a boat in this fishery is 1.4 months peryear.

HERRING

There have been four distinct phases in the development of the Western Alaska commercial herring fisheries (Wespestad 1979). Phase one began

Table 3.1.85

Harvesting Activity
Bering Sea Halibut Fishery
1969-1979

Year	Catch: Weight Pounds (millions)	Catch: Weight Metric Tons	Catch: Value (millions) Nominal	Catch: Value (millions) Real[1]	Exvessel Price ($/Pound) Nominal	Exvessel Price ($/Pound) Real	Number of Boat Months	Number of Fisherman Months	Catch per Boat Month: Weight Pounds (1,000)	Catch per Boat Month: Value ($1,000) Nominal	Catch per Boat Month: Value ($1,000) Real
1969	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0
1972	0.4	171	0.2	0.4	0.61	1.16	10	50	37.6	22.8	43.7
1973	0.2	86	0.1	0.2	[illegible]	1.27	12	60	15.8	11.1	20.0
1974	0.1	54	0.1	0.1	0.65	1.06	9	45	13.3	8.7	14.1
1975	0.4	161	0.3	0.5	0.89	1.32	11	55	32.4	28.7	42.8
1976	0.5	209	0.6	0.8	1.26	1.77	19	95	24.3	30.5	42.9
1977	0.5	246	0.7	0.9	1.26	1.66					
1978	0.7	298	1.0	[illegible]	1.45	1.78			Data not available		
1979	0.9	425	1.7	1.9	1.81	2.00					

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game reports.

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

The 1978 and 1979 values are preliminary estimates.

able 3.1.86

Bering Sea Halibut Fishery
Number of Boats and Catch by Month
1969-1977

Number of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	3	0	0	0	0	2	3	2	0	6
1973	[illegible]	0	[illegible]	7	0	0	0	1	1	2	1	0	9
1974	[illegible]	0	0	1	0	2	0	1	3	2	0	0	8
1975	0	0	0	4	0	1	0	0	0	5	1	0	8
1976	0	0	0	6	0	0	0	0	8	4	1	0	11
1977	0	0	0	0	0	0	0	0	0	0	0	0	23

Catch (,000 Pounds)

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	[illegible]	[illegible]	[illegible]	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	-0	0	0	0	0	-0	-0	-0	0	376
1973	0	0	0	114	0	0	0	-0	-0	-0	-0	0	189
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-0	0	-0	-0	-0	0	0	120
[illegible]	[illegible]	0	[illegible]	[illegible]	[illegible]	-0	0	0	0	152	-0	0	356
[illegible]	[illegible]	0	[illegible]	[illegible]	[illegible]	[illegible]	0	0	148	137	-0	0	461
1977	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	0	0	0	0	0	542

Source: CFEC Gross Earn ngs F es.

Note: A minus sign indicates months which the catch s conf dent a because fewer thar four boats participated in the fishery.

Table 3.1.87

Bering Sea Halibut Fishery
Percentage of Boats and Catch by Month
1969-1977

Percentage of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	[illegible]		0		0	0			0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	[illegible]	0	0	50.[illegible]	0	0	0	0	33.3	50.0	33.3	0	100.0
1973	[illegible]	0	0	77.8	0	0	0	11.1	11.1	22.2	11.1	0	100.0
1974	[illegible]	[illegible]		[illegible].5	0	2[illegible].0	0	12.5	37.5	25.0	0	0	100.0
1975		0	0	5[illegible].0	0	[illegible]2.5	0	0	0	62.5	12.5	0	100.0
1976	[illegible]	0	0	54.5	0	0	0	0	72.7	36.4	9.1	0	100.0
1977	[illegible]	0	0	0	0	0	0	0	0	0	0	0	100.0

Percentage of Catch

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969		[illegible]	0	0	0	0	0	0	0	0	0	0	0
1970		[illegible]	0	[illegible]	0	0	0	0	0	0	0	0	0
1971											0	0	0
1972				[illegible]	0	0	[illegible]	0	-0.0	-0.0	-0.0	0	100.0
1973			0	[illegible]	0	0	0	-0.1	-0.1	-0.1	-0.1	0	100.0
1974			0	-0.[illegible]	0	-0.1	0	-0.1	-0.1	-0.1	0	0	100.0
1975				[illegible]	0	-0.0	0	0	0 *	42.7	-0.0	0	100.0
1976		[illegible]		[illegible]	0	0	0	0	32.1	29.7	-0.0	0	100.0
1977					0	0	0	0	0	0	0	0	100.0

Source: CFEC Gross Earnings Files.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.[illegible].88

Bering Sea Halibut Fishery
Number of Fishermen by Month
1969-1977

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	5	0	0	0	0	0	15	0	0	50
973	0	0	0	35	0	0	0	5	5	10	5	0	60
974	0	0	0	5	0	10	0	5	15	10	0	0	45
975	0	0	0	20	0	5	0	0	0	25	5	0	55
1976	0	0	0	30	0	0	0	0	40	20	5	0	95
977	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: CFEC Gross Earnings Files.

Table 3. .89

Bering Sea Halibut Fishery
Percentage of F sherman Man Months by Month
1969-1977

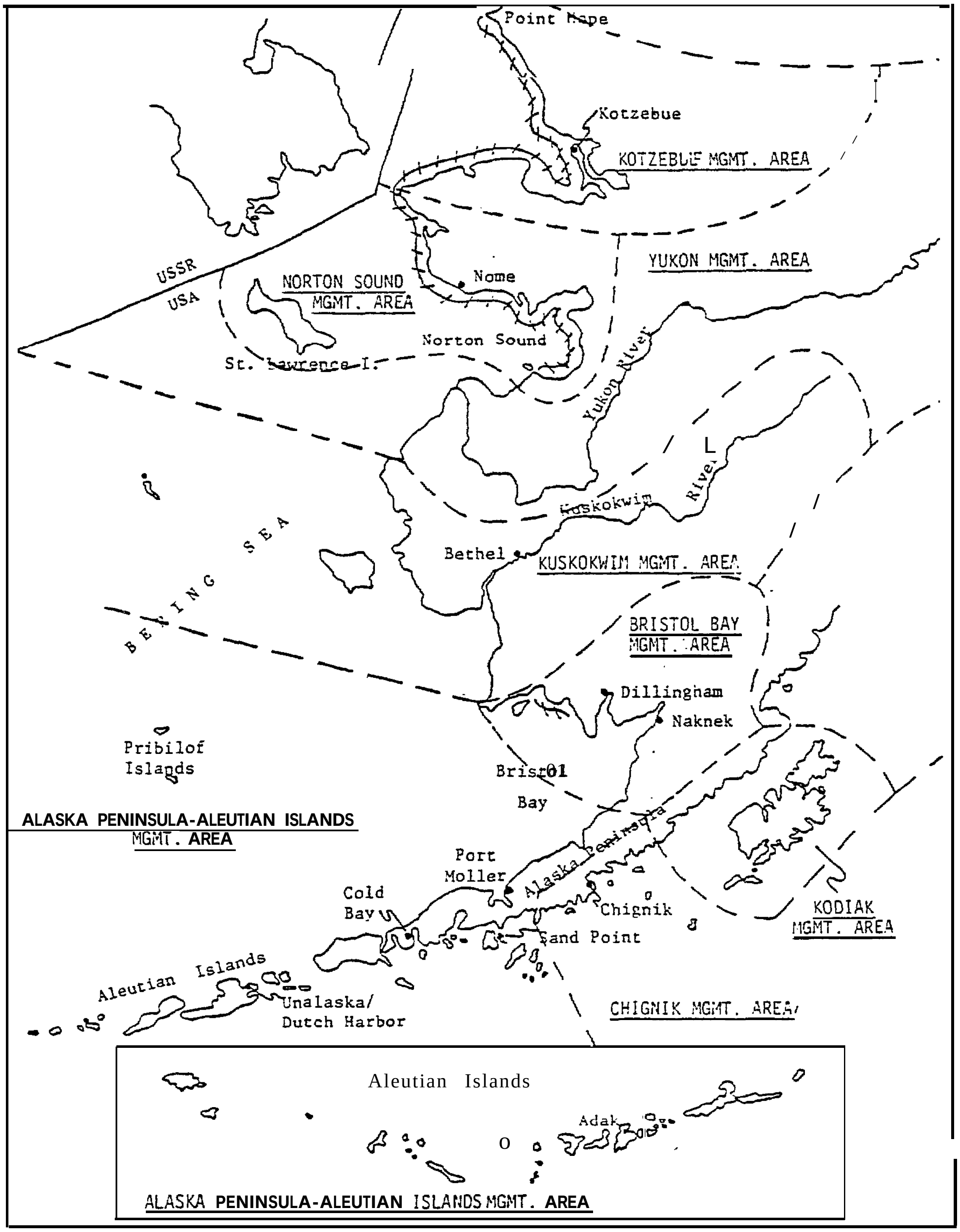
Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
			0	0	0	0	0	0	0	0	0	0	0
97[illegible]			0	0	0	0	0	0	0	0	0	0	0
971	0	0	0	0	0	0	0	0	0	0	0	0	0
972		0	0	30.0		0	0	0	20.0	30.0	20.0	0	[illegible]
3	0	0	0	58.3	0	0	0	8.3	8.3	16.7	8.3	0	[illegible]
974	0	0	0	.	0	22.2	0	11.1	33.3	22.2	0	0	100.0
1975	0	0	0	36.4	0	9.	0	0	0	45.5	9.	0	100.0
76	0	0	0	3 .6	0	0	0	0	42.	21.1	5.3	0	100.0
1977	0	0			0	0	0	0	0	0	0	0	0

Source: CFEC Gross Earnings Files.

in the early 1900s and consisted of small scale fisheries which supplied salted herring. Phase two began in 1928 and continued through 1945; it included the establishment of large scale salteries in Dutch Harbor and resulted in annual harvests of 1,000 to 2,000 metric tons (2.2 to 4.4 million pounds) from the late 1920s through 1937. Market conditions, not resource abundance, ended this phase of development. The third phase consisted of Soviet and Japanese exploitation; it began in 1959, peaked in 1970 with a harvest of 145,579 metric tons (321 million pounds), and was limited to incidental catch in the late 1970s. The fourth and current phase consists of the development of domestic herring roe fisheries in the Norton Sound, Bristol Bay, and Kuskokwim-Yukon management areas (see Figure 3.4).

As is indicated by the harvest data in Table 3.1.90, the Western Alaska domestic herring roe fishery began in Norton Sound in 1964 and was characterized by moderate and sporadic annual harvests prior to 1977. Since 1977 the fishery has exhibited rapid growth which has been prompted by growing markets for Western Alaska herring roe products and which has been facilitated by increases in resource abundance. The strong markets for Western Alaska herring roe and the associated high exvessel prices are explained by low or depleted herring stocks off Japan and in the North Atlantic.

Exvessel prices for Bristol Bay roe herring for the past few years are indicative of Western Alaska prices. The average exvessel price increased from $110 per metric ton in 1976, to $155 in 1977, to $330 in 1978, and then to a record high of $650 in 1979 before decreasing to $200 in 1980.



Major Fishing Areas

— ADF&G Management Area Boundaries

Figure 3.4 : Major Herring Fishing Areas, Western Alaska.

Source: Alaska Department of Fish and Game, Alaska's Fisheries Atlas, 1978.

Table 3.1.90

Western Alaska Domestic Herring
and Herring on Kelp Harvest
1964 - 1980
(Metric Tons)

	Bristol Bay	Kuskokwim-Yukon	Norton Sound	Total
1964	0	0	18	18
1965	0	0	0	
1966	0	0	11	
1967	122	0	0	11;
1968	107	0	0	107
1969	47	0	2	49
1970	43	0	7	50
1971	24	0	18	42
1972	103	0	15	118
1973		0	32	84
1974	1 %	0	2	171
1975	101	0	0	101
1976	134	0	8	142
1977	2,660	0	10	2,670
1978	7,180	259	17	7,456
1979	10,303	466	1,184	11,953
1980	17,774	1,632	2,215	21,162

Source: ADF&G, Statistics of Herring Stocks and Fisheries in the Eastern Bering Sea, 1979. ADF&G, Memorandums, 1980.

Note: The 1980 values are preliminary estimates.

An unsuccessful attempt of one company to corner the herring roe market in 1979 resulted in both exceptionally high prices that were not sustainable and large inventories which in part explain the depressed prices in 1980.

The relative importance of the Western Alaska herring fisheries is depicted in Tables 3.1.91 through 3.1.93 and recent information concerning the various herring fleets is summarized in Table 3.1.94.

The herring resources of the Eastern Bering Sea have only just begun to be utilized by Alaska fishermen; there is, therefore, a tremendous potential for growth. The growth of the fishery will in part be determined by the gear restrictions that are imposed. In recent years non-local purse seiners have taken a large proportion of the Western Alaska herring harvest. This has lead to requests by Bristol Bay and Arctic Alaska fishermen that the herring fisheries be limited to gill netters which would tend to be local boats. There are two basic reasons why limiting the fishery to gill netters would greatly increase the ability of local fishermen to participate in the fishery. Many local fishermen have gill net boats that are currently used in the salmon fisheries; and the cost of entering a gill net fishery is a fraction of the cost of entering a purse seine fishery due to the large differences between the prices of boats and gear in the two fisheries.

Table 3.1.91

Western Alaska Herring Harvest
1969-1979

Pounds
(1,000)

Year	Bristol Bay	Kuskokwim	Norton Sound	Western Alaska	Alaska
1969	0	0	0	0	13131
1970	82	0	0	82	7418
1971	52	0	0	52	10117
1972	0	0	0	0	14050
1973	0	0	20	20	34870
1974	0	0	81	81	38862
1975	166	0	0	166	35575
1976	296	0	0	296	33429
1977	586	0	0	586	24744
1978	15832	571	38	16441	38023
1979	23510	1030	2584	27124	529th

Value
($1,000)

Year	Bristol Bay	Kuskokwim	Norton Sound	Western Alaska	Alaska
1969	0	0	0	0	257
1970	8	0	0	8	164
1971	5	0	0	5	269
1972	0	0	0	0	418
1973	0	0	n	0	2661
1974	0	0	6	6	4130
1975	47	0	0	47	1874
1976	127	0	0	127	2524
1977	149	n	0	149	1905
1978	2755	97	10	2862	8927
1979	7762	403	775	8940	24436

Sources: CFEC Gross Earnings Files and ADF&G Catch Reports.

NOTE: 1978 and 1979 data are preliminary.

Table 3.1.92

Herring Management Area Harvest as a Percentage of the Western Alaska Harvest
1969-1979

Percentage by Weight

Year	Bristol Bay	Kuskokwim	Norton Sound	Western Alaska
1969	0	0	0	0
1970	100.0	0	0	100.0
1971	100.0	0	0	100.0
1972	0	0	0	0
1973	0	0	1(-)(-).13	100.0
1974	0	0	100.0	100.0
1975	100.0	0	0	100.0
1976	100.0	0	0	100.0
1977	100.0	0	0	100.0
1978	96.3	3.5	0.2	100.0
1979	86.7	3.0	9.5	100.0

Percentage by Value

Year	Bristol Bay	Kuskokwim	Norton Sound	Western Alaska
1969	0	0	0	0
1970	100.0	0	()	10000
1971	1(-)0.(-)	0	0	100.0
1972	0	0	0	0
1973	0	0	100.(-)	100.0
19”74	0	0	100.0	100.0
1975	100.0	0	0	100.0
1976	100.0	0	0	10000
1977	100.0	0	0	100.0
1978	96.3	3.4	0.3	100.0
1979	86.8	4.5	8.7	100*O

Sources: CFEC Gross Earnings Files and ADF&G Catch Reports.

NOTE: 1978 and 1979 data are preliminary.

Table 3.1.93

Herring Management Area Harvest as a Percentage of the Alaska Harvest
1969-1979

Percentage by Weight

Year	Bristol Bay	Kuskokwim	Norton Sound	Western Alaska	Alaska
1969	0	0	0	0	100.0
1970	1.1	0	0	1.1	100.0
1971	0.5	0	0	0.5	100.0
1972	0	0	0	0	100.0
1973	0	0	0.1	0.1	100.0
1974	0	0	0.2	0.2	100.0
1975	0.5	0	0	0.5	100.0
1976	0.9	0	0	0.9	100.0
1977	2*4	0	0	2.4	100.0
1978	41.6	1.5	0.1	43.2	100.0
1979	44.4	1.9	4.9	51.2	100.0

Percentage by Value

Year	Bristol Bay	Kuskokwim	Norton Sound	Western Alaska	Alaska
1969	0	0	0	0	100.0
1970	4.9	0	0"	4.9	10(-).0
1971	1.9	0	0	1.9	100.0
1972	0	0	0	0	100.0
1973	0	n	0*CI	0.0	100.0
1974	n	0	0.1	0.1	100.0
1975	2.5	n	0	2.5	100.0
1976	5.0	0	0	5.0	100.0
1977	7.8	0	0	7,8	100.0
1978	30.9	1.1	0.1	32.1	100.0
1979	31.8	1.6	3.2	36.6	100.0

Sources: CFEC Gross Earnings Files and ADF&G Catch Reports.

Table 3.1.94

‘derring Fleet by Gear Type and Area

	Bristol Bay Gill Net	Bristol Bay Purse Seine	Kuskokwim-Yukon Gill Net	Norton Sound Gill Net	Norton Sound Purse Seine
			Number of Boats		
1978	40			x	0
1979	350	1;;	1:2	46	17
1980	363	140	319	289	0
			Harvest (Metric Tons)		
1978	574	6,606	259	17	0
1979	4,121	6,182	466	343	841
1980	2,843	14,930	1,632	2,215	0
			Percent of Harvest		
1978	8	92	100	100	0
1979	40	60	100	29	71
1980	16	84	100	100	0
			Harvest Per Boat (Metric Tons)		
1978	14.4	264.2	x	x	
1979	11.8	35.3	4.6	7.5	49.:
1980	7.8	106.6	5.1	7.7	0

Source: ADF&G 1979, 1980

NOTE: An x appears if the datum is not available.

Bristol Bay

Between 1969 and 1979 there have been a variety of gear types used in the Bristol Bay herring fishery. The total annual harvest weight ranged from zero to 10,664 metric tons (23.5 million pounds) and averaged 3,664 metric tons (8.1 mi' lion pounds) during the last five years. The total annual real harvest value ranged from $0 to $8.6 million and averaged $2.5 million (see Table 3. 1.95). These figures however, greatly understate both the harvest for 1980 and the potential harvest. Preliminary figures indicate a 1980 harvest of 17,774 metric tons (39.2 million pounds) with a nominal value of $3.3 million. Harvesting activity by gear type is summarized in Tables 3.1.96 through 3.1.98.

The boats used in these fisheries, excluding the seiners that have dominated the fishery in recent years, are typically under 7.9 meters (26 feet) in length and have a crew of four including the skipper. The crews and boats are predominately local. The seiners range in length from 9.2 to 17.6 meters (30 to 58 feet) and have a crew of four or five. They are not primarily local boats.

The herring fishery is concentrated in near shore areas in northern and northwest Bristol Bay. Harvesting activity is heavily concentrated in a very short period during May or June. The seasonality of the Br· Stol Bay herring fishery for all gear types is summarized in Tables 3.1 99 through 3.1.102.

Table 3.1.95
Bristol Bay Herring Harvest
1969-1979

	Catch				Exvessel Price	
	Weight		Value ($1,000)[1]		($/Pound)	
Year	Pounds (1,000)	Metric Tons	Nominal	Real	Nominal	Real
1969	0	0	0	0	0	0
1970	82	37	8	17	0.10	0.20
1971	52	24	5	10	0.10	0019
1972	0	0	0	0	0	0
1973	0	0	0	0	0	0
1974	0	0	0	0	0	0
1975	166	75	47	70	0428	0.42
1976	296	134	127	179	0.43	0.60
1977	586	266	'149	197	0.25	0.34
1978	15832	7181	2755	3384	0.17	0.21
1979	23510	10664	7762	8585	0.33	0.37

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game Reports.

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

NOTE : 1978 and 1979 data are preliminary.

Table 3.1.96

Harvesting Activity
Bristol Bay Beach Seine Herring Fishery
1969-1977

	Catch								Catch per Boat		
	Weight		Value ($1,000)[1]		Exvessel Price ($/Pound)		Number of		Weight	Value ($1,000)	
Year	Pounds m	Metric Tons	Nominal	Real[1]	Nominal	Real	Boats	Fishermen	Pounds (1,000)	Nominal	Real
1969	0	0	0	0	0	0	0	0	0	0	0
1970	43	20	2	4	0.05	0.10	19	76	2	0	0
1971	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game Reports.

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 3.1.97

Harvesting Activity
Bristol Bay Drift Gill Net Herring Fishery
1969-1977

Year	Catch: Weight: Pounds (1,000)	Catch: Weight: Metric Tons	Catch: Value[1] ($1,000): Nominal	Catch: Value[1] ($1,000): Real[1]	Exvessel Price ($/Pound): Nominal	Exvessel Price ($/Pound): Real	Number of Boats	Number of Fishermen	Catch per Boat: Weight: Pounds (1,000)	Catch per Boat: Value ($1,000): Nominal	Catch per Boat: Value ($1,000): Real
1969	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0
1975	63	29	3	4	0.05	0.07	24	96	3	0	0
1976	0	0	0	0	0	0	0	0	0	0	0
1977	310	141	25	33	0.08	0.11	20	80	16	1	2

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game Reports.

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 3.1.98

Harvesting Activity
Bristol Bay Herring Spawn on Kelp Fishery
1969-1977

	Catch								Catch per Boat		
	Weight		Value ($1,000)[1]		Exvessel Price ($/Pound)		Number of		Weight	Value ($1,000)	
Year	Pounds (1,000)	Metric Tons	Nominal	Real	Nominal	Real	Boats	Fishermen	Pounds (1,000)	Nominal	Real
1969	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0
1975	103	47	44	66	0.43	0.64	39	156	3	1	2
1976	[illegible]	134	127	179	0.43	0.60	52	208	6	2	3
1977	276	125	124	164	0.45	0.59	61	244	5	2	3

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game Reports.

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 3.1.99
Bristo' Bay Herring Fishery
Number of Boats and Catch by Month
1969-1977

Number of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	26	0	0	0	0	0	0	0	26
1971	0	0	0	0	12	0	0	0	0	0	0	0	12
1972	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	63	5	0	0	0	0	0	0	63
1976	0	0	0	0	24	45	0	0	0	0	0	0	52
1977	0	0	0	0	75	4	0	0	0	0	0	0	81

Catch (,000 Pounds)

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	82	0	0	0	0	0	0	0	82
1971	0	0	0	0	52	0	0	0	0	0	0	0	52
1972	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	164	3	0	0	0	0	0	0	166
1976	0	0	0	0	74	222	0	0	0	0	0	0	296
1977	0	0	0	0	524	55	0	0	0	0	0	0	586

Source: CFEC Gross Earnings Fi es.

Note: A minus sign indicates months in which the catch s conf dentia because fewer than four boats participated in the fishery.

Table 3.1.100
Bristol Bay Herring Fishery
Percentage of Boats and Catch by Month
1969-1977

Percentage of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	100.0	0	0	0	0	0	0	0	100.0
1971	0	0	0	0	100.0	0	0	0	0	0	0	0	100.0
1972	0	0	0	0		0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	98.0	7.9	0	0	0	0	0	0	100.0
1976	0	0	0	0	46 *2	86.5	0	0	0	0	0	0	100.0
1977	0	0	0	0	92 *6	4.9	0	0	0	0	0	0	100.0

Percentage of Catch

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	100.4	0	0	0	0	0	0	0	100.0
1971	0	0	0	0	100.0	0	0	0	0	0	0	0	100.0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	98.8	1.8	0	0	0	0	0	0	100.0
1976	0	0	0	0	25.0	75.0	0	0	0	0	0	0	100.0
1977	0	0	0	0	89.4	9.4	0	0	0	0	0	0	100.0

Source: CFEC Gross Earnings F es.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

173

Table 3.1.101
Bristol Bay Herring Fishery
Number of Fishermen by Month
1969-1977

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
969	0	0	0	0	0	0	0	0	0	0	0	0	0
970	0	0		0	104	0	0	0	0	0	0	0	104
7			0	0	48	0	0	0	0	0	0	0	48
972	0	0	0	0	0	0	0	0		0	0	0	0
973	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
975	0	0	0	0	252	20	0	0	0	0	0	0	272
976	0	0	0	0	96	80	0	0	0	0	0	0	276
977		0	0	0	300	16	0	0	0	0	0	0	316

Source: CFEC Gross Earnings Files.

Table 3.1.1°2

Bristol Bay Herring Fishery
Percentage of F·sherman Man Months by Month
1969-1977

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
9 9			(	.	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	100.0	0	0	0	0	0	0	0	100.0
971	0	0	0	0	00.0	0	0	0	0	0	0	0	00.0
972	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	[illegible]	0	0	0	0	0	0	0	0	0	0	0	0
1975	[illegible]	[illegible]	0	0	92.6	7.4	0	0	0	0	0	0	100.0
1976	[illegible]	0	[illegible]	0	34.8	65.2	0	0	0	0	0	0	100.0
1977	0	0	[illegible]	0	94.9	5.1	0	0		0	0	0	100.0

Source: CFEC Gross Earnings Files.

Kuskokwim - Yukon

The Kuskokwim - Yukon roe herring fishery has been developing rapidly since 1978. It is a gill net fishery in which the boats are typically under 9.8 meters (32 feet) in length and have a crew of four including the skipper. Harvesting activity occurs in mid to late June and is concentrated in three areas; Goodnews Bay, Security Cove, and Cape Romanzo.

Norton Sound

The Norton Sound herring fishery was a set gill net fishery dominated by local fishermen from 1969 through 1977. Since then purse seiners from other areas have entered and dominated the fishery. The annual harvest weight ranged from zero to 1,172 metric tons (2.6 million pounds) between 1969 and 1979. The annual real harvest value ranged from $0 to $0.8 million (see Table 3.1.103). The 1979 harvest is thought to be more indicative of the potential of this fishery than are previous harvests. The potential of this and other Western Alaska herring fisheries is depicted in Table 3.1.104 which compares commercial harvest and resource abundance.

The gill netters are typically under 7.9 meters (26 feet) in length and have a crew of two including the skipper. The fishermen are primarily from local communities. Harvesting activity is concentrated in the eastern and southern parts of Norton Sound. The fishery usually occurs

Table 3.1.103

Harvesting Activity
Norton Sound Set Gill Net Herring Fishery
1969-1979

	Catch				Exvessel Price		Number of		Catch per Boat Month		
	Weight		Value						Weight	Value	
	Pounds	Metric	(millions)[1]		($/Pound)		Boat	Fisherman	Pounds	($1,000)	
Year	(millions)	Tons	Nominal	Real	Ncminal	Real	Months	Months	(1,000)	Nominal	Real
1969	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	2	4	0	0	0
1973	0.0	9	0.0	0.0	0.02	0.04	5	10	4.0	0.1	0.1
1974	0.1	37	0.0	0.0	0.07	0.12	8	16	10.1	0.8	1.2
1975	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0
1978	0.0	17	0.0	0.0	0.26	0.32					
1979	2.6	1172	0.8	0.9	0.30	0.33			Data not available		

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game reports.

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

The 1978 and 1979 values are preliminary estimates.

Table 3.1.104

Western Alaska Herring Resource Exploration

	Commercial Harvest (metric tons)	Herring Biomass Estimations (metric tons)	Exploration Rate %
Bristol Bay			
1978	7,030	172,600-308,300	2.2-4.0
1979	10,115	216,800-568,500	1.8-4.6
1980	20,274	69,300-146,000	13.9-29.3
Security Cove and Goodnews Bay			
1978	259	9,800-15,900	1.6-2.6
1979	466	36,600-56,600	0.1-1.0
1980[1]	611	2,700- 4,500	13.6-22.6
Norton Sound			
1978	14	4,800-10,500	0.1-0.3
1979	1,173	7,000-15,300	7.6-16.8
1980	2,215	10,300-23,800	9.3-20.5

Source: ADF&G, Preliminary Report on the 1980 Western Alaska Herring Fishery. ADF&G/NPFMC, Assessment of Spawning Herring and Capelin Stocks at Selected Coastal Areas in the Bering Sea.

[1] This 1980 data are for Security Cove alone.

NOTE : The dramatic changes in biomass estimates reflect measurement difficulties as well as changes in resource abundance.

during a brief period in June. The seasonality of the fishery is summarized in Tables 3.1.105 through 3.1.108.

KING CRAB

The Western Alaska king crab fishery has dominated the Alaska king crab fishery since the mid-1970s. The annual Western Alaska harvest weight ranged from 16,068 metric tons (35.4 million pounds) to 62,265 metric tons (137.2 million pounds) and averaged 32,749 metric tons (72.2 million pounds) between 1969 and ?979. The real and nominal harvest values ranged from $16.3 million to $213.2 million and from $7.91 million to $173.5 million, respectively; the average real and nominal harvest values were $68.4 million and $150.6 million (see Table 3.1. 109). The dominance of the Western Alaska fishery, and the relative importance of each fishery within Western Alaska are summarized in Tables 3.1.110 and 3.1.111. The data indicate that Western Alaska has accounted for up to 88.9 percent of the total Alaska king crab harvest and of this, up to 94 percent has come from the Bering Sea Management Area. The locations of the Western Alaska king crab Management Areas are depicted in Figure 3.5.

Peninsula

The annual harvest weight for the Alaska Peninsula king crab fishery ranged from 355 metric tons (783,000 pounds) to 2,242 metric tons (4.9 million pounds) and averaged 1,592 metric tons (3.5 million pounds)

Table 3. . 05
Norton Sound Herring Fishery
Number of Boats and Catch by Month
1969- 977

Number of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	2	0	0	0	0	0	0	2
1973	0	0	0	0	1	4	0	0	0	0	0	0	4
1974	0	0	0	0	1	7	0	0	0	0	0	0	8
1975	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	2

Catch (1,000 Pounds

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	-0	0	0	0	0	0	0	0
1973	0	0	0	0	-0	20	0	0	0	0	0	0	20
1974	0	0	0	0	-0	53	0	0	0	0	0	0	81
1975	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: CFEC Gross Earnings Files

Note: A minus sign indicates months in which the catch s confidential because fewer than four boats participated in the fishery.

Table 3.1.106
Norton Sound Herring Fishery
Percentage of Boats and Catch by Month
1969-1977

Percentage of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	100.0	0	0	0	0	0	0	100.0
1973	0	0	0	0	25.0	100.0	0	0	0	0	0	0	100.0
1974	0	0	0	0	12.5	87.5	0	0	0	0	0	0	100.0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	100.0

Percentage of Catch

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	-0.5	100.0	0	0	0	0	0	0	100.0
1974	0	0	0	0	-0.1	65.4	0	0	0	0	0	0	100.0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: CFEC Gross Earnings Files.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.107
Norton Sound Herring Fishery
Number of Fishermen by Month
1969-1977

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	4	0		0	0	0	0	4
1973	0	0	0	0	2	8	0	0	0	0	0	0	10
1974	0	0	0	0	2	14	0	0	0	0	0	0	16
1975	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: CFEC Gross Earnings Files.

Table 3.1.8

Norton Sound Herring Fishery
Percentage of Fisherman Man Months by Month
1969-1977

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969			0	0	0	0	0	0	0	0	0	0	0
1970	0		0	0	0	0	0	0	0	0	0	0	0
1971	0	0		0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	100.0	0	0	0	0	0	0	100.0
1973	0	0	0	0	20.0	80.0	0	0	0	0	0	0	100.0
1974	0	0	0	0	2.5	87.5	0	0	0	0	0	0	100.0
1975			0	0	0	0	0	0	0	0	0	0	0
1976			0		0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: CFEC Gross Earnings Files.

Table 3.1.109
Western Alaska King Crab Harvest
1969-1979

Pounds
(1,000)

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Western Alaska	Alaska
1969	4942	7492	18063	10018	40515	57730
1970	3685	10719	12425	8594	35423	52061
1971	4218	11110	25850	12847	54025	70703
1972	4338	11297	16235	20963	52833	74427
1973	4780	12723	11246	28240	56989	76824
1974	4497	13069	1335	49374	68275	95214
1975	2933	15049	5142	52112	75236	97629
1976	882	11471	386	70411	83150	105899
1977	783	4131	2	76406	81322	99575
1978	3092	6847	953	98277	109169	122925
1979	4453	13065	808	118922	137248	154387

Value
($1,000)

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Western Alaska	Alaska
1969	1334	1648	3277	2204	8463	15644
1970	921	2573	2705	1719	7918	13190
1971	1097	2777	5639	2569	12082	19077
1972	1301	2937	4190	5241	13669	20519
1973	3107	7634	5847	14685	31273	44702
1974	1799	5097	240	19256	26392	39154
1975	1202	5719	900	18239	26060	38251
1976	564	7112	166	43631	51473	68689
1977	783	4001	2	72585	77371	100481
1978	4916	10887	1515	156261	173579	195451
1979	4162	12212	755	111156	128285	144305

Source: CFEC Gross Earnings Files and ADF&G Catch Reports.
1978 and 1979 data are preliminary.

Table 3.1.110

King Crab Management Area Harvest as a Percentage of the Western Alaska Harvest

1969-1979

Percentage by Weight

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Western Alaska
1969	1?.2	18.5	44.6	24.7	10(-).0
1970	10.4	3(-)*3	35.1	24.3	100.0
1971	7.8	20.6	47.8	23.8	100.0
1972	8.2	21.4	30.7	39.7	100*0
1973	8.4	22.3	19.7	49.6	100.0
1974	6.6	19*I	2.0	72.3	100.0
1975	3.9	20.0	6.8	69.3	1(-')0.0
1976	1.1	13.8	0.5	84*7	100.0
1977	1.0	5*I	().0	94.0	100.0
197P	2.8	6.3	0.9	90.0	100.0
1979	3.2	9,5	0.6	86.6	100.0

Percentage by Value

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Western Alaska
1969	15.8	19.5	38.7	26.0	100.0
1970	11.6	32.5	34.2	21.7	100.0
1971	9.1	23.0	46.7	21.3	100.0
1972	9.5	21.5	30.7	38*3	100.0
1973	9.9	24.4	18.7	47*(-J	100.0
1974	6.8	19.3	0.9	73.0	100.0
1975	4.6	21.9	3.5	70.0	100.0
1976	1*1	13.8	0.3	84.8	100.0
1977	1.0	5.2	0.0	93.8	100.0
1978	2.8	6.3	0.9	90.0	100.0
1979	3.2	9.5	0.6	86.6	100.0

Sources: CFEC Gross Earnings Files and ADF&G Catch Reports.

1978 and 1979 data are preliminary.

Table 3.1.111
King Crab Management Area Harvest as a Percentage of the Alaska Harvest
1969-1979

Percentage by Weight

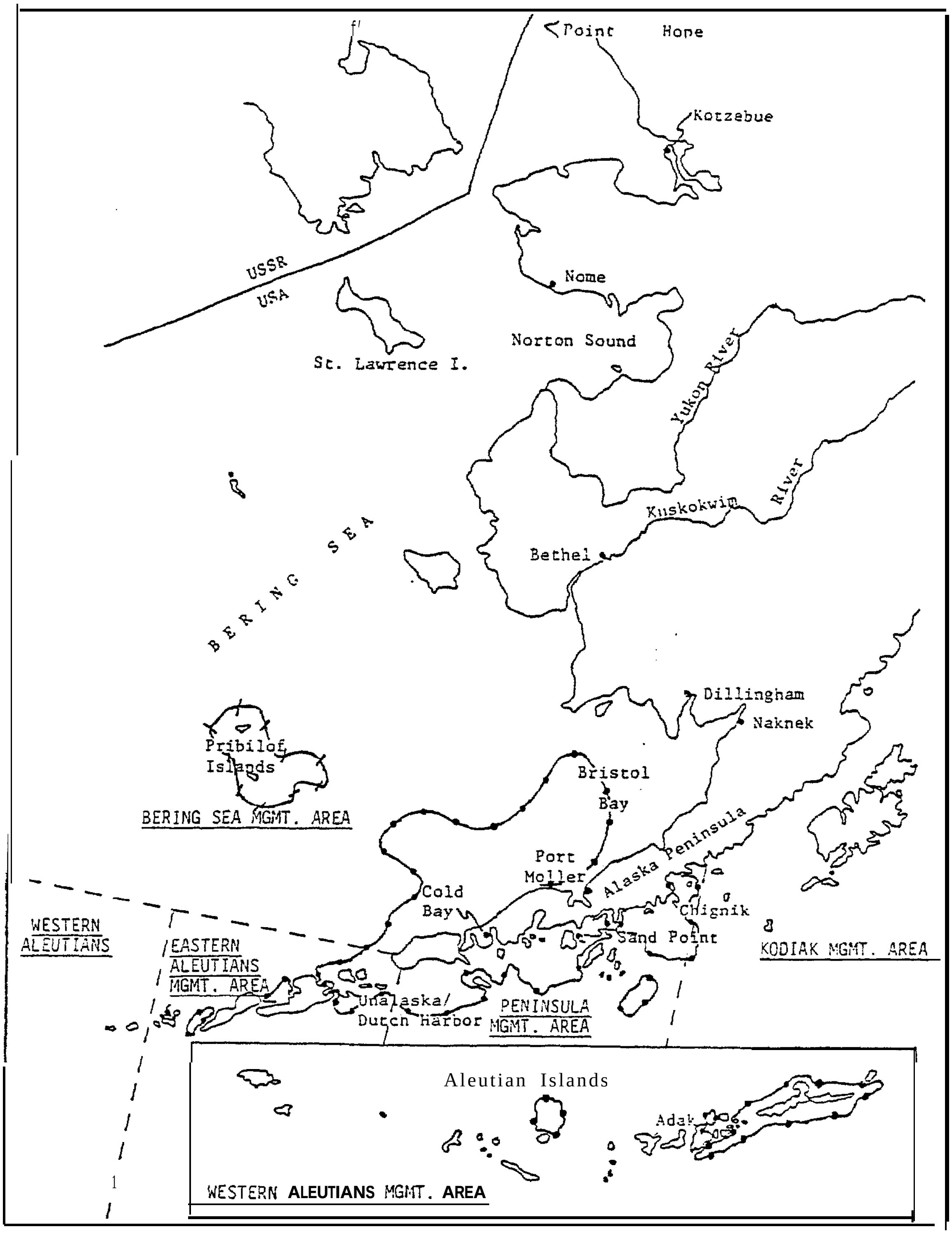
Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Western Alaska	Alaska
1969	8.6	13.0	31.3	17.4	70.2	100.(-)
1970	7.1	20.6	23,9	16.5	68.0	1(-)0.(-)
1971	6.0	15.7	36.6	18.2	76.4	100.(-)
1972	5.8	15.2	21.8	28.2	71.0	100.0
1973	6.2	16.6	14.6	36.8	74.2	100.0
1974	4.7	13.7	1.4	5109	71.7	100.0
1975	3.0	15.4	5.3	53.4	77.1	100.0
1976	0.8	10*R	0*4	66.5	78.5	100.0
1977	0.8	4.1	0*0	76.7	81.7	100.0
197P	2.5	5.6	0.8	79*9	88.8	100.0
1979	2.9	8.5	0.5	77.0	88.9	100.0

Percentage by Value

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Western Alaska	Alaska
1969	8.5	10.5	20.9	14.1	54.1	100.0
1970	7.0	19.5	20.5	13.0	60.0	100.0
1971	5.8	14.6	29.6	13.5	63.3	100*O
1972	6.3	14.3	20.4	25.5	66.6	100.0
197-3	7.0	17.1	13.1	32.9	70.0	100.0
1974	4.6	13.0	0.6	49.2	67.4	100.0
1975	3*1	15.0	2.4	47.7	68.1	100.0
1976	0.8	10.4	O*2	63.5	74.9	10(-)*O
1977	0.8	4.0	0.0	72.?	77.0	100.0
1978	2.5	5.6	0.8	79.9	88.8	100.0
1979	2.9	8.5	0.5	77.0	88.9	100.0

Sources: CFEC Gross Earnings Files and ADF&G Catch Reports.

1978 and 1979 data are preliminary.



Major Blue King Crab Fishing Areas
Major Red King Crab fishing Areas
ADF&G Management Area Boundaries

Figure 3,5: Major King Crab Fishing Areas, Western Alaska

Source: Alaska Department of Fish and Game, Alaska's Fisheries Atlas, 1978.

between 1969 and 1979. The annual real harvest value ranged from $0.8 million to $6.0 million and averaged $2.9 million (see Table 3.1.112). Neither harvest weight nor real value has exhibited a secular trend for the period as a whole.

Alaska Peninsula king crab boats range in length from 7.9 to 29.0 meters (26 to 95 feet) and are typically 16.7 meters (55 feet) in length. The average crew size is four including the skipper. The boats operate out of and land crab in Kodiak and Aleutian Island and Peninsula communities, such as Dutch Harbor and Sand Point.

Since 1977 the season has begun in September and ended in January; however, harvesting activity has been concentrated in September through November. The seasonality of this fishery is summarized in Tables 3.1.113 through 3.1.116. During the past three seasons (1977-1979) the average boat participated in this fishery during 2.7 calendar months per year.

Eastern Aleutians

The annual harvest weight for the Eastern Aleutians Management Area king crab fishery ranged from 1,874 metric tons (4.1 million pounds) to 6,826 metric tons (15.0 million pounds) and averaged 4,825 metric tons (10.6 million pounds) between 1969 and 1979. The annual real harvest value ranged from $3.6 million to $13.8 million and averaged $8.4 million (see Table 3.1.117). Harvest weight has not exhibited a secular trend; however, real harvest value has tended to increase.

Table 3.1.112

Harvesting Activity
Peninsula King Crab Fishery
1969-1979

Year	Catch: Weight: Pounds (millions)	Catch: Weight: Metric Tons	Catch: Value (millions)[1]: Nominal	Catch: Value (millions)[1]: Real	Exvessel Price ($/Pound): Nominal	Exvessel Price ($/Pound): Real	Number of: Boat Months	Number of: Fisherman Months	Catch per Boat Month: Weight: Pounds (1,000)	Catch per Boat Month: Value $1,000: Nominal	Catch per Boat Month: Value $1,000: Real
1969	4.9	2242	1.3	2.9	0.27	0.59	204	816	24.2	6.5	14.3
1970	3.7	1672	0.9	1.9	0.25	0.5?	171	684	21.5	5*4	11.1
1971	4.2	1913	1.1	?.?	0.26	0.51	127	508	33.2	8.6	17.1
1972	4.3	1968	1.3	?.5	(--).30	0.57	100	400	43.4	13.0	24.9
1973	4.8	2168	3.1	5.6	0.65	1.17	123	492	38.9	25.3	45.5
1974	4.5	2040	1.8	2.9	(-).4(-I	0.65	108	432	41.6	16.7	27.1
1975	?.9	1330	1.2	1.8	0.41	0.61	116	464	25.3	10.4	15.4
1976	(-).9	400	0.6	0.8	0.64	0.90	58	232	]5.2	9.7	13,7
1977	0.8	355	0.8	1.0	1.00	1.32	34	136	?3.0	23.0	30.5
1978	3.1	1403	4.9	6.0	1.59	1.95	85	340	36.4	57.8	71.0
1979	4.5	2020	4.?	4.6	0.93	1.03	127	508	35*1	32.8	36.2

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game reports.

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

The 1978 and 1979 values are preliminary estimates.

Table 3.1 113
Peninsula King Crab Fishery
Number of Boats and Catch By Month
1969-1979

Number of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1969	32	23	2	0	0	0	0	19	39	43	8	38
1970	36	12	0	0	0	0	0	14	21	30	31	28
1971	54	4	0	0	0	0	0	0	27	26	23	23
1972	7	0	0	0	0	0	0	21	30	32	0	0
1973	0	0	1	1	0	0	1	38	37	33	6	6
1974	6	0	1	0	0	0	0	0	34	35	20	12
1975	3	0	0	0	0	0	0	0	29	33	29	22
1976	0	0	0	0	0	0	0	13	27	0	2	16
1977	5	0	0	0	0	0	0	0	7	10	4	2
1978	3	0	0	0	0	0	0	0	19	24	24	3
1979	1	0	0	0	0	0	0	0	28	46	36	3

Catch (1,000 Pounds)

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1969	473	303	-1	0	0	0	0	495	1451	1589	53	572
1970	358	102	0	0	0	0	0	340	868	946	650	422
1971	240	124	0	0	0	0	0	0	1391	1211	702	550
1972	269	0	0	0	0	0	0	421	2216	1432	0	0
1973	0	0	-1	-1	0	0	-1	1432	2148	628	87	140
1974	86	0	-1	0	0	0	0	0	1613	1967	661	160
1975	-1	0	0	0	0	0	0	0	723	924	491	622
1976	0	0	0	0	0	0	0	155	554	0	-1	122
1977	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.114
Peninsula King Crab Fishery
Number of Boats and Catch by Month as a Percentage of Annual Activity
1969-1979

Percentage of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	50.8	36.5	3.2	0	0	0	0	30.2	61.9	68.3	12.7	60.3	100.0
1970	77.8	26.7	0	0	0	0	0	31.1	46.7	66.7	68.9	62.2	100.0
1971	77.4	12.9	0	0	0	0	0	0	87.1	83.9	74.2	74.2	100.0
1972	51.5	0	0	0	0	0	0	63.6	90.9	97.0	0	0	100.0
1973	0	0	2.6	2.6	0	0	2.6	97.4	94.9	84.6	15.4	15.4	100.0
1974	16.2	0	2.7	0	0	0	0	0	91.9	94.6	54.1	32.4	100.0
1975	7.5	0	0	0	0	0	0	0	72.5	82.5	72.5	55.0	100.0
1976	0	0	0	0	0	0	0	46.4	96.4	0	7.1	57.1	100.0
1977	56.0	0	0	0	0	0	0	0	70.0	100.0	40.0	20.0	100.0
1978	12.5	0	0	0	0	0	0	0	79.2	100.0	100.0	12.5	100.0
1979	2.2	0	0	0	0	0	0	0	60.9	100.0	78.3	6.5	100.0

Percentage of Catch

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	9.6	6.1	-0.0	0	0	0	0	10.0	29.4	32.2	1.1	11.6	100.0
1970	9.7	2.8	0	0	0	0	0	9.2	23.6	25.7	17.6	11.5	100.0
1971	5.7	2.9	0	0	0	0	0	0	33.0	28.7	16.6	13.0	100.0
1972	6.2	0	0	0	0	0	0	9.7	51.1	33.0	0	0	100.0
1973	0	0	-0.0	-0.0	0	0	-0.0	30.0	44.9	13.1	1.8	2.9	100.0
1974	2.0	0	-0.0	0	0	0	0	0	35.9	43.7	14.7	3.6	100.0
1975	-0.0	0	0	0	0	0	0	0	24.7	31.5	16.7	21.2	100.0
1976	0	0	0	0	0	0	0	17.6	62.8	0	-0.1	13.8	100.0
1977	0	0	0	0	0	0	0	0	0	0	0	0	100.0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.115
Peninsula King Crab Fishery
Number of Fishermen by Month
1969-1979

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1969	128	92	8	0	0	0	0	76	156	172	32	152	816
1970	140	48	0	0	0	0	0	56	84	120	124	112	684
1971	96	16	0	0	0	0	0	0	108	104	92	92	508
1972	68	0	0	0	0	0	0	84	120	128	0	0	400
1973	0	0	4	4	0	0	4	152	148	132	24	24	492
1974	24	0	4	0	0	0	0	0	136	140	80	48	432
1975	12	0	0	0	0	0	0	0	116	132	116	88	464
1976	0	0	0	0	0	0	0	52	108	0	8	64	232
1977	20	0	0	0	0	0	0	0	28	40	16	8	112
1978	12	0	0	0	0	0	0	0	76	96	96	12	292
1979	4	0	0	0	0	0	0	0	112	184	144	12	456

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Table 3.1.116
Peninsula King Crab Fishery
Percent of Fisherman Man Months by Month
1969-1979

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
969	15.7	11.3	1.0	0	0	0	0	9.3	19.1	21.1	3.9	18.6	100.0
1970	20.[illegible]	7.[illegible]	0	0	0	0	0	8.2	12.3	17.5	18.1	16.4	00.0
197	8.[illegible]	3.	0	0	0	0	0	0	21.3	20.5	18.1	8.1	00.0
1972	7.0	0	0	0	0	0	0	21.0	30.0	32.0	0	0	100.0
1973	0	0	0.8	0.8	0	0	0.8	30.9	30.	26.8	4.9	4.9	100.0
[illegible]	5.6		.9	0	0	0	0	0	31.5	32.4	18.5	11.1	00.0
[illegible]	2.6			0	0	0	0	0	25.0	28.4	25.0	9.0	100.0
197	0	0	[illegible]	0	0	0	0	22.4	46.6	0	3.4	27.6	100.0
1977	17.9	0	[illegible]	0	0	0	0	0	25.0	35.7	4.3	7.1	100.0
1978	4.1	0	0	0	0	0	0	0	26.0	32.9	32.9	4.1	100.0
79	0.9	0	0	0	0	0	0	0	24.6	40.4	31.6	2.6	100.0

Sources: CFEC Gross Earnings F es and ADF&G Western Alaska Monthly Shellf sh Reports for 1977-1979.

Table 3.1.117

Harvesting Activity
Eastern Aleutians King Crab Fishery
1969-1979

Year	Catch: Weight: Pounds (millions)	Catch: Weight: Metric Tons	Catch: Value (millions)[1]: Nominal	Catch: Value (millions)[1]: Real	Exvessel Price $/Pound: Nominal	Exvessel Price $/Pound: Real	Number of Boat Months	Number of Fisherman Months	Catch per Boat Month: Weight: Pounds (1,000)	Catch per Boat Month: Value ($1,000): Nominal	Catch per Boat Month: Value ($1,000): Real
1969	7.5	3398	1*6	3.6	0.22	0.48	155	620	48.3	10.6	23.2
1970	10.-/	4862	2.6	5.3	().24	0.50	156	624	68.7	16.5	34.0
1971	11.1	5039	2.8	5.5	0.25	0.49	90	360	123.4	30.9	61.0
1972	11.3	51?4	2.9	5.6	0.26	0.50	84	336	134.5	35.0	67.0
1973	1?.7	5771	7.6	13.8	0.60	1.08	77	308	165.2	99.1	178.8
1974	13.1	5928	5.1	8.3	0.39	0.63	96	384	136.1	53.1	86.3
1975	1') .(-I	6826	5.7	R.5	0.38	().57	141	564	106.7	40.6	60.4
1976	11.5	5203	7*1	in. o	0.62	0.87	137	548	83.7	51.9	73.1
1977	4.1	1874	4.0	5.3	0.97	1.28	119	476	34.7	33.6	44.5
1978	6.8	3106	100	13.4	1.59	1.95	99	396	69.2	110.0	135.1
1979	13.1	5926	1?. ?	13.5	0.93	1.03	203	812	64.4	60.2	66.5

Sources: This table was generated from data contained in' (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game reports.

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

The 1978 and 1979 values are preliminary estimates.

The boats in this fishery range *in* length from 10.7 meters (35 feet) to over 38.1 meters (125 feet). The average length is approximately 30.5 meters (100 feet) and the average crew size is four. These boats operate out of and land crab in Kodiak, Dutch Harbor, and Akutan. The boats and fishermen are almost exclusively non-local being predominately from Seattle.

Since 1977 the king crab season has begun in September and ended in December or January. Harvesting activity has been minimal in January since 1978. The seasonality of the fishery is summarized in Tables 3.1.118 through 3.1.121. During the past three seasons (1977-1979) the average boat participated in this fishery during 2.2 calendar months per year,

Western Aleutians

The annual harvest weight for the Western Aleutians king crab fishery ranged from 1.0 metric tons (2,200 pounds) to 11,726 metric tons (25.9 million pounds) and averaged 3,812 metric tons (8.4 million pounds) between 1969 and 1979. The annual real harvest value ranged from $2,900 to $11.2 million and averaged $4.3 million (see Table 3.1.122). There have been dramatic declines in both harvest weight and real value since the early 1970s.

The king crab boats range in length from 23.2 meters (76 feet) to over 38.1 meters (125 feet); they are typically over 30.5 meters (100 feet)

Table 3.1.118

Eastern Aleutians King Crab Fishery
Number of Boats and Catch by Month
1969-1979

Number of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1969	18	15	1	0	0	1	1	n	?2	34	27	36
1970	35	24	2	0	0	1	1	0	12	27	26	28
1971	25	0	2	1	0	1	1	1	24	33	1	1
1972	4	3	1	0	0	7	2	2	3	58	4	0
1973	0	0	0	n	n	0	0	0	0	0	58	19
1974	0	0	1	0	0	n	n	0	0	o	85	10
1975	7	0	0	0	0	0	0	0	0	2	76	56
1976	32	0	0	0	0	n	0	0	0	0	5 7	48
1977	23	0	0	n	0	n	0	0	30	30	19	1-7
1978	1	0	0	n	0	0	0	0	19	25	54	0
1979	0	0	0	n	0	0	0	0	30	60	74	39

195

Catch (1,000 Pounds)

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1969	528	290	-1	n	0	-1	-1	0	929	2364	533	2788
1970	2000	256	-1	0	0	-1	-1	0	810	3129	23n7	2148
1971	1109	0	-1	-1	0	-1	-1	-1	3071	6693	-1	-1
1972	65	-1	-1	n	0	192	-1	-1	-1	10433	264	0
1973	0	0	0	n	0	0	0	0	0	0	11704	1019
1974	0	0	-1	0	0	0	0	0	0	0	12168	863
1975	959	0	0	0	0	0	0	0	0	-1	100R9	39q2
1976	1700	0	0	0	0	0	0	0	0	" 0	6998	2773
1977	0	0	0	0	0	0	0	0	o	0	0	0
1978	0	0	n	0	0	0	n	0	0	0	0	n
1979	0	0	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1 1 9

Eastern Aleutians King Crab Fishery
Number of Boats and Catch by Month as a Percentage of Annual Activity
1969-1979

Percentage of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	31.0	25.9	1.7	0	0	1.7	1.7	0	37.9	58.6	46.6	62.1	100.0
1970	61.4	42.1	3.5	0	0	1.8	1.8	0	21.1	47.4	45.6	49.1	100.0
1971	65.8	0	5.3	2.6	0	2.6	2.6	2.6	63.2	86.8	2.6	2.6	100.0
1972	5.9	4.4	1.5	0	0	0.3	2.9	2.9	4.4	85.3	5.9	0	100.0
1973	0	0	0	0	0	0	0	0	0	0	98.3	32.2	100.0
1974	0	0	1.1	0	0	0	0	0	0	0	97.7	11.5	100.0
1975	8.6	0	0	0	0	0	0	0	0	2.5	93.8	69.1	100.0
1976	43.2	0	0	0	0	0	0	0	0	0	77.0	64.9	100.0
1977	76.7	0	0	0	0	0	0	0	00.0	100.0	63.3	56.7	100.0
1978	1.9	0	0	0	0	0	0	0	35.2	46.3	100.0	0	100.0
1979				0	0		0	0	40.5	81.1	100.0	52.7	100.0

Percentage of Catch

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	7.0	3.9	-0.0	0	0	-0.0	-0.0	0	12.4	31.6	7.1	37.2	100.0
1970	18.7	2.4	-0.0	[illegible]	0	-0.0	-0.0	0	7.6	29.2	21.5	20.0	100.0
1971	10.0	0	[illegible]	-0.0	0	-0.0	-0.0	-0.0	27.6	60.2	-0.0	-0.0	100.0
1972	0.5	-0.0	[illegible]	[illegible]	0	1.7	-0.0	-0.0	-0.0	92.4	2.3	0	100.0
1973	0	[illegible]	[illegible]	[illegible]	0	0	0	0	0	0	92.0	8.0	100.0
1974	0	[illegible]	[illegible]	[illegible]	0	0	0	0	0	0	93.1	6.6	100.0
1975	[illegible]	[illegible]	[illegible]	[illegible]	0	0	0	0	0	-0.0	67.0	26.5	100.0
1976	[illegible]	[illegible]	[illegible]	[illegible]	0	0	0	0	0	0	61.0	24.2	100.0
1977	0	0	[illegible]	[illegible]	0	0	0	0	0	0	0	0	100.0
1978	0	[illegible]	[illegible]	[illegible]	0	0	0	0	0	0	0	0	0
1979	0	[illegible]	[illegible]	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.120

Eastern Aleutians King Crab Fishery
Number of Fishermen by Month
1969-1979

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1969	72	60	4	0	0	4	4	0	88	136	108	144	620
1970	140	96	8	0	0	4	4	0	48	108	104	112	624
1971	100	0	8	4	0	4	4	4	96	132	4	4	360
1972	16	12	4	0	0	28	8	8	12	232	16	0	336
1973	0	0	0	0	0	0	0	0	0	0	232	76	308
1974	0	0	4	0	0	0	0	0	0	0	340	40	384
1975	28	0	0	0	0	0	0	0	0	8	304	224	564
1976	128	0	0	0	0	0	0	0	0	0	228	192	548
1977	92	0	0	0	0	0	0	0	120	120	76	68	476
1978	4	0	0	0	0	0	0	0	76	100	216	0	396
1979	0	0	0	0	0	0	0	0	120	240	296	156	812

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Table 3.1.121

Eastern Aleutians King Crab Fishery
Percent of Fisherman Man Months by Month
1969-1979

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	11.6	9.7	6.6	0	0	0.6	0.6	0	14.2	?1.9	1?.4	23.2	100.0
1970	22.4	15.4	1.3	0	0	0.6	0.6	0	-?*7	17.3	16*7	17.9	100.0
1971	27.8	0	2.2	1.1	0	1.1	1*1	1.1	26.-7	36.?	1*L	1.1	100.0
1972	4.8	3.6	1.2	0	0	8.3	2.4	2.4	3.6	69.0	4.8	0	100.0
1973	0	0	0	0	0	0	0	0	0	0	75.3	24.7	100.0
1974	0	0	1.0	0	0	0	0	0	0	0	88.5	10.4	100.0
1975	[illegible]	0	0	0	0	0	0	0	0	1.4	53.9	39.7	100.0
1976	23.4	0	0	0	0	0	0	0	0	0	41.6	35.0	lo(-).(-)
1977	19.3	0	0	0	0	0	0	0	25.2	25.2	16.0	14.3	loon
1978	1.0	0	0	0	0	0	0	0	19.2	25.3	54.5	0	100.0
1979	0	0	0	0	0	0	0	0	14.8	29.6	36.5	19.2	100.0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Table 3.1.122

Harvesting Activity
Western Aleutians King Crab Fishery
1969-1979

	Catch				Exvessel Price		Number of		Catch per Boat Month		
	Weight		Value (millions)		($/Pound)				Weight	Value $1,000)	
Year	Pounds (millions)	Metric Tons	Nominal	Real[1]	Nominal	Real	Boat Months	Fisherman Months	Pounds (1,000)	Nominal	Real
1969	18.1	8193	3.3	7.7	0.18	().4(-)	190	760	95.1	17.2	37.7
1970	1?.4	5636	2.7	5.6	0.22	0.45	135	540	92.0	20.0	41.3
19’71	25.8	11725	5.6	11.2	0.22	0.43	189	756	136.8	29.8	59. (-)
1972	16.?	?36 4	4*?	8.0	0.26	0.49	t-17	348	186.6	48.2	92.2
1973	11.?	5101	5.8	in.5	0.52	0.94	141	564	79.8	41.5	74.8
1974	1.3	60 6	o.?	0.4	0.18	0.?9	28	112	47.7	8.6	13.9
1975	5.1	2332	[).9	1.3	0.18	0.26	64	256	80.3	14.1	20.9
1976	0.4	175	0.2	f).?	0.43	0.61	9	36	42.9	18.4	26.0
1977	0.0	I	0.0	0.0	0.97	1.28	2	8	1.2	1.1	1.5
1978	1.()	43?	1.5	1.9	1.59	1.95	11	44	86.6	137.8	169.2
1979	0.8	367	0.8	0.8	0.93	1.03	13	52	62.2	58.1	64.3

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game reports.

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

The 1978 and 1979 values are preliminary estimates.

in length and have a crew of four including the skipper. The boats operate out of and land crab in Adak, Dutch Harbor, Akutan, and Kodiak. The boats and fishermen are primarily from Seattle, and a few are from Kodiak.

In ?978 and 1979 harvesting activity was limited to March. The seasonality of the fishery is summarized in Tables 3.1.123 through 3.1.126. During the past three seasons (1977-1979) the average boat participated in the fishery during 1.0 calendar months per year.

Bering Sea

The Bering Sea Management Area king crab fishery is the premier Alaska king crab fishery. Since 1977 it has accounted for over 50 percent of the Alaska king crab harvest (refer back to Table 3.1.111). The annual harvest weight for the Bering Sea Management Area ranged from 3,898 metric tons (8.6 million pounds) to 53,943 metric tons (118.9 million pounds) between 1969 and 1979 and averaged 22,522 metric tons (49.7 million pounds). The annual real harvest value ranged from $3.5 million to $191.9 million and averaged $52.8 million (see Table 3.1.127). Both harvest weight and real value have increased dramatically during this eleven year period. The most recent harvests are therefore, thought to be more indicative of the potential of the fishery than are the average figures.

Table 3.1.123
Western Aleutian King Crab Fishery
Number of Boats and Catch by Month
1969-1979

Number of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1969	36	29	19	0	0	0	0	0	19	29	28	36
1970	33	39	0	0	0	0	0	0	0	0	31	33
1971	34	36	37	0	0	0	0	0	0	0	41	41
1972	0	0	0	0	0	0	0	0	0	1	43	43
1973	23	24	10	0	1	4	0	0	0	0	39	40
1974	0	23	5	0	0	0	0	0	0	0	0	0
1975	15	26	20	0	0	0	0	0	0	0	3	0
1976	0	0	9	0	0	0	0	0	0	0	0	0
1977	2	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	11	0	0	0	0	0	0	0	0	0
1979	0	0	13	0	0	0	0	0	0	0	0	0

Catch (1,000 Pounds)

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1969	2749	2127	1496	0	0	0	0	0	1220	3716	1703	4147
1970	4492	2509	0	0	0	0	0	0	0	0	2668	2614
1971	2857	5317	2276	0	0	0	0	0	0	0	7231	7945
1972	0	0	0	0	0	0	0	0	0	-1	11647	4501
1973	1070	732	181	0	-2	40	0	0	0	0	7275	1157
1974	0	1316	19	0	0	0	0	0	0	0	0	0
1975	769	1349	586	0	0	0	0	0	0	0	-1	0
1976	0	0	386	0	0		0	0	0	0	0	0
1977	0	0	221	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.124
Western Aleutian King Crab Fishery
Number of Boats and Catch by Month as a Percentage of Annual Activity
1969-1979

Percentage of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	50.8	49.2	32.2	0	0	0	0	0	32.2	49.2	47.5	61.0	100.0
1970	62.5	73.1	0	0	0	0	0	0	0	0	59.6	63.5	100.0
1971	60.7	64.3	66.1	0	0	0	0	0	0	0	73.2	73.2	100.0
1972	0	0	0	0	0	0	0	0	0	2.2	93.5	93.5	100.0
1973	44.2	46.2	19.2	0	1.9	7.7	0	0	0	0	75.0	76.9	100.0
1974	0	95.8	20.8	0	0	0	0	0	0	0	0	0	100.0
1975	46.5	70.3	54.1	0	0	0	0	0	0	0	8.1	0	100.0
1976	0	0	00.0	0	0	0	0	0	0	0	0	0	100.0
1977	00.0	0	0	0	0	0	0	0	0	0	0	0	100.0
1978	0	0	100.0	0	0	0	0	0	0	0	0	0	100.0
1979	0	0	100.0	0	0	0	0	0	0	0	0	0	100.0

Percentage of Catch

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	17.6	13.6	9.6	0	0	0	0	0	7.8	23.8	10.9	26.6	100.0
1970	38.2	21.3	0	0	0	0	0	0	0	0	22.7	22.2	100.0
1971	11.1	20.7	8.9	0	0	0	0	0	0	0	28.2	31.0	100.0
1972	0	0	0	0	0	0	0	0	0	-0.0	72.3	27.9	100.0
1973	10.1	6.9	1.7	0	-0.0	3.8	0	0	0	0	68.4	10.9	100.0
1974	0	214.3	3.1	[illegible]	0	0	0	0	0	0	0	0	100.0
1975	29.0	52.4	22.8	[illegible]	0	0	0	0	0	0	-0.0	0	100.0
1976	0	0	41.9	[illegible]	0	0	0	0	0	0	0	0	100.0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	[illegible]	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.125
Western Aleutian King Crab Fishery
Number of Fishermen by Month

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	120	116	76	0	0	0	0	0	76	116	112	164	[illegible]
1970	132	152	0	0	0	0	0	0	0	0	124	132	540
1971	136	144	148	0	0	0	0	0	0	0	164	164	756
1972	0	0	0	0	0	0	0	0	0	4	172	172	348
1973	92	96	40	0	4	16	0	0	0	0	156	160	564
1974	0	92	20	0	0	0	0	0	0	0	0	0	112
1975	60	104	80	0	0	0	0	0	0	0	12	0	256
1976	0	0	36	0	0	0	0	0	0	0	0	0	36
1977	8	0	0	0	0	0	0	0	0	0	0	0	8
1978	0	0	44	0	0	0	0	0	0	0	0	0	44
1979	0	0	52	0	0	0	0	0	0	0	0	0	52

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Table 3.1.126
Western Aleutian King Crab Fishery
Percent of Fisherman Man Months by Month
1969-1979

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	15.8	15.3	10.0	0	0	0	0	0	10.0	15.3	14.7	18.9	100.0
1970	24.4	28.1	0	0	0	0	0	0	0	0	23.0	24.4	100.0
1971	18.0	19.0	19.6	0	0	0	0	0	0	0	21.7	21.7	100.0
1972	0	0	0	0	0	0	0	0	0	1.1	49.4	49.4	100.0
1973	16.3	17.0	7.1	0	0.7	2.8	0	0	0	0	27.7	28.4	100.0
1974	0	82.1	17.9	0	0	0	0	0	0	0	0	0	100.0
1975	23.4	40.6	31.3	0	0	0	0	0	0	0	4.7	0	100.0
1976	0	0	100.0	0	0	0	0	0	0	0	0	0	100.0
1977	100.0	0	0	0	0	0	0	0	0	0	0	0	100.0
1978	0	0	100.0	0	0	0	0	0	0	0	0	0	100.0
1979	0	0	100.0	0	0	0	0	0	0	0	0	0	100.0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Table 3.1.127

Harvesting Activity
Bering Sea King Crab Fishery
1969-1979

Year	Catch: Weight: Pounds (millions)	Catch: Weight: Metric Tons	Catch: Value (millions)[1]: Nominal	Catch: Value (millions)[1]: Real	Exvessel Price ($/Pound): Nominal	Exvessel Price ($/Pound): Real	Number of: Boat Months	Number of: Fisherman Months	Catch per Boat Month: Weight: Pounds (1,000)	Catch per Boat Month: Value ($1,000): Nominal	Catch per Boat Month: Value ($1,000): Rea 1
1969	10.0	4544	2.2	4.8	0.22	0.48	187	748	53.6	11.8	25.8
1970	8.6	3898	1*7	3.5	().?0	0.41	173	692	49*7	9.9	20.5
1971	12.8	5827	2.6	5.1	0.20	0.40	188	752	68.3	13.7	27.0
1972	21.0	9509	5.2	10.0	().25	0.48	284	1136	73.8	18.5	35.3
1973	28.2	12810	14.7	26.5	0.52	0.94	?45	980	115.3	59.9	108.1
1974	49.4	22396	19.3	31.3	0.39	0.63	315	1260	156.7	6101	99.3
1975	52.1	23638	18.2	?-f.?	0.35	0.52	270	1080	193.0	67.6	100.6
1976	70.4	31938	43.6	61.4	0.62	0.87	448	1792	157.2	97.4	137.1
1977	76.4	34658	72.6	96.0	0.95	1.26	458	1832	166.8	158.5	209.6
1978	98.3	44578	156.3	191.9	1.59	1.95	369	]476	266.3	423.5	520.1
1979	118.9	53943	111.2	122.9	0.93	1.03	601	2404	197.9	185.0	204.6

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game reports.

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

The 1978 and 1979 values are preliminary estimates.

Bering Sea crab boats range in length from 15.2 meters (50 feet) to well over 45.7 meters (150 feet) and are typically between 30.5 and 38.1 meters (100 and 125 feet) in length. The average crew size including the skipper is four. These boats principally operate out of and land crab in Dutch Harbor and Akutan and less frequently in Adak and Kodiak. Seattle is the dominant home port for Bering Sea crab boats and crews. Kodiak and other Alaskan communities are also included among the fleet's home ports.

The Bering Sea Management Area king crab season has changed significantly since the early 1970s, when it lasted most of the year. Primarily due to the tremendous increase in the size of the fleet, the length of the season has been dramatically reduced. In 1979 the season began in earnest in September and was all but over in November. The seasonality of the fishery is depicted in Tables 3.1.128 through 3.1.131. During the past three seasons (1977-1979) the average boat participated in this fishery during 2.7 calendar months per year.

Norton Sound King Crab Fisheries.

Although Norton Sound is within the Bering Sea King Crab Management Area, the king crab fisheries in Norton Sound are to some degree distinct from the Bering Sea fishery, and each of the Norton Sound fisheries is distinct from the other. The dominant fishery occurs in the summer and is participated in by large non-local crab boats that are part of the Bering Sea fleet. The other fishery occurs in the spring and is partici-

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Table 3.1.128
Bering Sea King Crab Fishery
Number of Boats and Catch by Month
1969-1979

Number of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1969	7	14	23	16	7	25	40	39	13	1	2	0
1970	[illegible]	17	33	29	13	14	25	30	6	2	0	2
1971	1	5	9	10	6	7	33	38	37	28	9	5
1972	18	2[illegible]	19	0	0	3[illegible]	44	49	48	31	5	4
1973	5	9	13	11	0	34	63	58	50	2	0	0
1974	0	0	0	0	24	15	0	96	87	93	0	0
1975	0	0	0	0	0	0	0	2	91	99	66	1?
1976	1[illegible]	12	0	2	34	0	[illegible]	2	42	1?3	11[illegible]	103
1977	0	0	0	0	0	0	8	1	90	118	125	116
1978	3	26	7	27	0	0	1	11	134	160	0	0
1979	36	0	0	0	0	0	1	17	205	233	915	13

Catch (1,000 Pounds)

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1969	407	224	1057	669	389	1764	3478	1893	100	-1	-1	0
1970	-1	173	1172	749	144	1105	1652	3274	53	-1	0	-1
1971	-1	85	196	390	83	411	3257	3774	2563	1415	2-70	395
1972	437	945	750	0	0	3062	7040	4045	2671	1446	346	201
1973	360	517	1309	1236	0	2446	8979	8098	5170	-1	0	0
1974	0	0	0	0	2147	545	0	16088	16966	13627	0	0
1975	0	0	0	0	0	0	0	-1	11873	29242	9242	1018
1976	604	575	0	-1	2367	0	0	-1	4221	29557	23111	[illegible]
1977	0	0	0	0	0	0	0	0	0	0	0	0
1978	1	0	0	0	0	0	0	0	0	0	0	0
1979	[illegible]	0	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.129
Bering Sea King Crab Fishery
Number of Boats and Catch by Month as a Percentage of Annual Activity
1969-1979

Percentage of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	10.1	20.3	33.3	23.2	10.1	36.2	58.0	56.5	in.f?	1.4	2.9	0	100.0
1970	3.5	29.8	57.9	50.9	22.8	24.6	43.9	52.6	10.5	3.5	0	3.5	100.(-)
1971	1.8	8.9	16.1	17.9	10.7	12.5	58.9	67.9	66.1	50.0	16.1	8.9	100.0
1972	24.3	39.2	25.7	0	0	50.0	59.5	66.?	64.9	4109	6.8	5.4	100.0
1973	7.4	13.2	19.1	16.2	0	50.0	92.6	85.3	73.5	2.9	0	0	100.0
1974	0	0	0	0	22.9	14.3	0	91.4	82.9	88.6	0	0	100.0
1975	0	0	0	0	0	0	0	1.9	87.5	95.2	63.5	11.5	100.0
1976	8.5	8.5	0	1.4	23.9	0	0	1.4	29.6	86.6	83.1	72.5	100.0
1977	0	0	0	0	0	0	6.4	0.8	72.0	94.4	100.0	92.8	100.0
1978	1.9	16.3	4.4	16.9	0	0	0.6	6.9	83.8	100.0	0	0	100.0
1979	15.5	0	0	0	0	0	0.4	7.3	88.0	100.0	41.2	5.6	Loo.(-)

Percentage of Catch

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	4.1	2.2	10.5	6.7	3.9	17.6	34.7	18.9	1..0	-0.0	-0.0	0	100.0
1970	-0.0	2.0	13.6	8.7	1.7	12.9	19.2	38.1	0.6	-0.0	0	-(-).0	100.0
1971	-0.0	0.7	1.5	3.0	0.6	3.2	25.4	29.4	20.0	11.0	2.1	3*1	100.0
1972	2.1	4.6	3.6	0	0	14.6	33.6	19.3	12.7	6.9	1.7	1.0	100.0
1973	1.2	1.8	4.6	4.4	0	8.7	31.8	28.7	18.3	-(-).()	0	o	100.0
1974	0	0	0	0	4.3	1.1	0	32.6	34.4	27.6	0	0	100.0
1975	0	0	0	0	0	0	0	-0.0	22.8	56.1	17.7	2.0	100.0
1976	0.0	0.3	0	-0.0	3.4	0	0	-0.0	6.0	42.0	32.8	13.8	100.0
1977	0	0	0	0	0	0	0	0	n	0	0	n	100.0
1978	0	0	0	0	0	0	0	0	n	0	0	0	0
1979	0	0	0	0	0	0	0	0	n	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.130
Bering Sea King Crab Fishery
Number of Fishermen by Month
1969-1979

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	28	56	92	64	28	100	160	156	52	4	8	0	748
1970	8	68	132	116	52	56	100	120	24	8	0	8	692
1971	4	20	36	40	24	28	132	152	148	112	36	20	752
1972	72	116	76	0	0	148	176	196	192	124	20	16	1136
1973	20	36	52	44	0	136	252	232	200	8	0	0	980
1974	0	0	0	0	96	60	0	384	348	372	0	0	1260
1975	0	0	0	0	0	0	0	8	364	396	264	48	1080
1976	48	48	0	8	136	0	0	8	168	492	472	412	1792
1977	0	0	0	0	0	0	32	4	360	472	500	464	1832
1978	12	104	28	108	0	0	4	44	536	640	0	0	1476
1979	144	0	0	0	0	0	4	68	820	932	384	52	2404

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Table 3.1.131
Bering Sea King Crab Fishery
Percent of Fisherman Man Months by Month
1969-1979

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	3.7	7.5	12.3	8.6	3.7	13.4	21.4	20.9	7.0	0.5	1.1	0	100.0
1970	1.	9.8	19.1	16.8	7.5	8.1	14.5	17.3	3.5	1.2	0	1.2	100.0
1971	0.5	2.7	4.8	5.3	3.2	3.7	17.6	20.2	19.7	14.9	4.8	2.7	100.0
1972	[illegible]	10.2	6.7	0	0	13.0	15.5	17.3	16.9	10.9	1.8	1.4	100.0
1973	2.1	3.7	5.3	4.5	0	13.9	25.7	23.7	20.4	0.8	0	0	100.0
1974		0	0	0	7.6	4.8	0	30.5	27.6	29.5	0	0	100.0
1975	0	0	0	0	0	0	0	0.7	33.7	36.7	24.4	4.4	100.0
1976	2.7	2.7	0	0.4	7.6	0	0	0.4	9.4	27.5	26.3	23.0	100.0
1977	0	0	0	0	0	0	1.7	0.2	19.7	25.8	27.3	25.3	100.0
1978	.8	7.1	.9	7.3	0	0	0.3	3.0	36.3	43.4	0	0	100.0
1979	6.0			0	0		[illegible]	2.8	34.1	38.8	6.0	2.2	100.0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

pated in by residents of the Nome area using *snow* machines and dog sleds to transport crab that is harvested through the ice.

The summer fishery began in 1977 when the Northern District of the Bering Sea Management Area was opened to commercial fishing. Norton Sound is part of the Northern District. The ADF&G reports that 12 boats of 28.0 to 32.9 meters (92 to 108 feet) in length participated in the 1977 Northern District king crab fishery. After fishing in the St. Matthew area, seven of these boats participated in the Norton Sound fishery. The 1977 Norton Sound harvest totaled 236 metric tons (519, 900 pounds) of which 97 metric tons (214,000 pounds) or 41 percent was dead loss. The probable causes of the high dead loss are high water temperature and a high freshwater content in the crab boats' holding tanks. It should be noted that dead crabs are not purchased by processing plants, therefore, a boat's catch is stored in live holding tanks until it is delivered to a processor. Ten boats participated in the Northern District fishery in 1978 and harvested 911 metric tons (2 million pounds). The ADF&G records are not clear as to what part of the harvesting activity occurred in Norton Sound, but it is estimated that the Norton Sound harvest was approximately 680 metric tons (1.5 million pounds). The harvest of the large boat fleet has been landed in the Aleutians due to the lack of adequate harbor and processing facilities in Norton Sound. An exvessel price of one dollar per pound was received in 1978.

ADF&G data indicate that 133 permits were issued for the spring ice fishery in 1978. The harvest which totalled 11.4 metric tons (25,193 pounds) and which was valued at $22,670 was taken by 37 fishermen. The participants in this fishery have been residents of the Nome area and the catch has been landed in and processed in Nome. The 1978 fishery occurred from February through April.

TANNER CRAB

The Western Alaska Tanner Crab fishery has dominated the Alaska Tanner crab harvest in recent years and it has, itself, been dominated by the Bering Sea Management Area harvest. The annual harvest weight for the Western Alaska Tanner crab fishery ranged from 810 metric tons (1.8 million pounds) in 1969 to 29,547 metric tons (87.2 million pounds) in 1979 and averaged 13,528 metric tons (29.8 million pounds) for the eleven-year period. The annual real harvest value ranged from $0.4 million to $54.2 million and averaged $14.3 million during the same period; the range and average of annual nominal harvest value are $0.2 million to $49.0 million and $11.6 million, respectively (see Table 3.1.132). Since 1977, the Western Alaska Tanner crab harvest has accounted for over 64 percent of the Alaska harvest, and over 80 percent of the Western Alaska Tanner crab harvest has been from the Bering Sea Management Area (see Tables 3.1.133 and 3.1.134). The Tanner crab fishery grounds and management areas of Western Alaska are depicted in Figure 3.6.

Table 3.1.132
Western Alaska Tanner Crab Harvest
1969-1979

Pounds
(1 ,000)

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Western Alaska	Alaska
1969	653	27	2	1103	1785	11207
1970	2094	363	0	1101	3558	14473
1971	2293	0	0	162	2455	12880
1972	3968	39	0	112	4119	30135
1973	6?51	24	169	302	6746	61719
1974	11556	499	71	5044	17170	63906
1975	8550	77	3	7028	15659	46857
1976	16752	551	62	22324	39689	80771
1977	12178	1302	0	51876	65356	98476
1978	12060	2533	23H	69496	84327	130626
1979	11192	1092	19”/	74705	87186	131381

Value
($1 ,000)

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Western Alaska	Alaska
1969	65	3	0	110	178	1133
1970	188	33	0	99	320	1417
1971	229	0	0	15	244	1369
1972	436	0	0	11	447	3731
1973	1000	4	29	51	1084	10756
1974	2311	105	15	1059	3490	13052
1975	1197	10	0	914	2121	7019
1976	3350	105	12	4242	7709	16166
1977	3944	472	0	19713	24(379	35465
1978	5536	1163	109	31898	38706	59957
1979	6285	613	111	41953	48962	73781

Source: CFEC Gross Earnings Files and ADF&G Catch Reports.

1978 and 1979 data are preliminary.

Table 3.1.133
Tanner Crab Management Area Harvest as a Percentage of the Western Alaska Harvest
1969-1979

Percentage by Weight

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	MeStern Alaska
1969	36.6	1.5	0.1	61.8	100.(-I
1970	58.9	10.2	0	30.9	100.0
1971	93.4	0	0	6.6	100.0
1972	96*3	0.9	0	2.7	100*O
1973	92.7	0*4	2.5	4.5	100.0
1974	67.3	?*9	0.4	29.4	100.0
1975	54.6	0.5	0.0	44.9	100.0
1976	4?.2	1.4	0.2	56.2	100.0
1977	18.6	2*0	0	79.4	100.O
1978	14.3	3.()	0.3	82.4	100.0
1979	12.8	1*3	0.2	85.7	100.0

Percentage by Value

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	MeStern Alaska
1969	36.5	1*7	0.1	61.7	100.0
1970	58.8	10.3	0	30.9	100.0
1971	93.9	0	0	6.1	100.0
197?	97.5	0.1	0	2.5	100.0
1973	92.3	0.4	?.7	4.7	100.(-)
1974	66.2	3.(-I	0.4	30.3	100.0
1975	56.4	0.5	0*0	43.1	100.0
1976	43.5	1.4	0.2	55.(-)	100.0
1977	16.4	1.8	0	81.9	10(-).0
1978	14.3	3.0	0.3	82.4	100.0
1979	12.8	1.3	0.2	85.7	100.0

Source: CFEC Gross Earnings Files and ADF&G Catch Reports.

1978 and 1979 data are preliminary.

Table 3.1.134
Tanner Crab Management Area Harvest as a Percentage of the Alaska Harvest
1969-1979

Percentage by Weight

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Western Alaska	Alaska
1969	5.8	0.2	0.0	9.8	15.9	100.0
1970	14.5	2.5	0	7.6	24.6	100.0
1971	17.8	0	0	1.3	19.1	100.(-)
1972	13.2	0.1	0	0.4	13.7	100.0
1973	10.1	0.0	0.3	0.5	10.9	100.0
1974	18.1	0.8	0.1	7.9	26.9	100.0
1975	18.2	0.2	O*O	15.0	33.4	100.0
1976	20.7	0.7	0.1	27.6	49.1	1OO.(-I
1977	12.4	1.3	0	5?.7	66.4	100.0
1978	9.?	1.9	0.2	53.?	64.6	100.0
1979	8.5	0.8	0.1	56.9	66.4	100.0

Percentage by Value

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Western Alaska	Alaska
1969	5.7	I-).3	0.0	9*7	15.7	100.0
1970	13.3	2.3	0	7.0	22.6	100.0
1971	16.7	()	0	1.1	17.8	100.0
1972	11.7	0.0	0	0.-3	12.0	100.0
1973	9.3	0.0	0.3	O*5	10.1	100.0
1974	17.”/	0.8	0.1	8.1	26.7	100.0
1975	17*1	0.1	0.0	13.0	30.2	LOO*(-I
1976	?0.7	(-).6	0.1	26.?	47.7	100.0
1977	11.1	1.2	0	55.6	67.9	10(--).0
1978	9.2	1.9	0.2	53.2	64.6	100.0
1979	8.5	0.8	0.1	56.9	66.4	100.0

Sources: CFEC Gross Earnings Files and ADF&G Catch Reports.

1978 and 1979 data are preliminary.

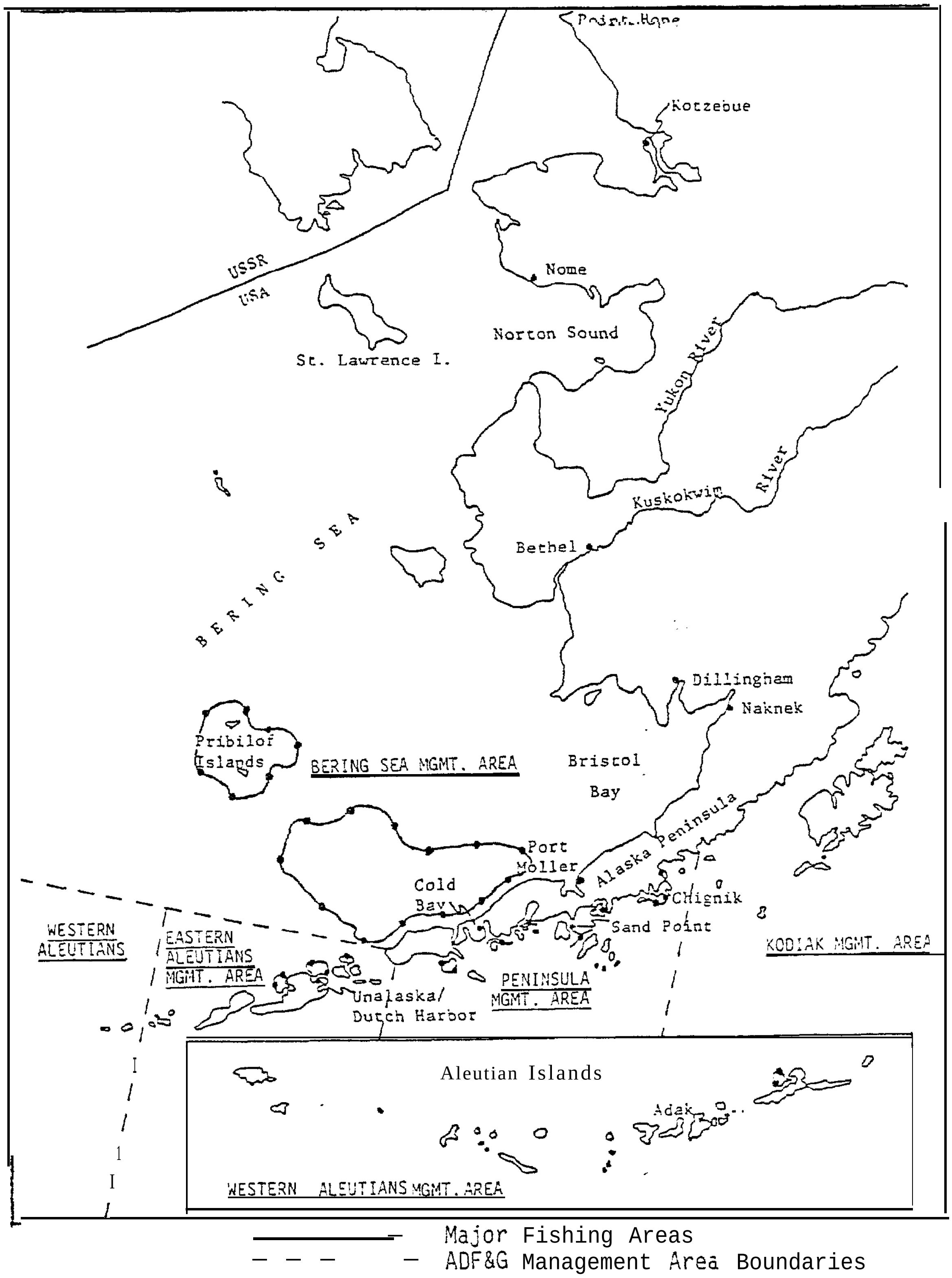


Figure 3.6: Major Tanner Crab Fishing Areas, Western Alaska

Source: Alaska Department of Fish and Game, Alaska's Fisheries Atlas, 1978.

Peninsula

The annual harvest weight for the Peninsula Management Area Tanner crab fishery ranged from 296 metric tons (0.7 million pounds) to 7,599 metric tons (16.8 million pounds) between 1969 and 1979 and averaged 3,610 metric tons (8.0 million pounds), The annual real harvest va"lue ranged from $0.1 million to $7.0 million and averaged $3.0 million (see Table 3.1.135). The annual harvest weights since 1974 have typically been significantly greater than those for 1969 through 1973. The same is true for annual real harvest values.

Peninsula Tanner crab boats range in length from 11.0 meters (36 feet) to over 38.1 meters (125 feet). The average length is approximately 25.9 meters (85 feet). The average crew size, including the skipper, is four. This fleet predominately operates out of and lands crab in Kodiak, and Kodiak is the home port of much of the fleet.

Since 1976 the Peninsula Tanner crab season has begun in November and ended in May. The seasonality is summarized in Tables 3,1.136 through 3.1.139. During the past three seasons (1977-1979) the average boat participated in the fishery during 4.8 calendar months per year.

Eastern Aleutians

The annual harvest weight for the Eastern Aleutians Management Area Tanner crab fishery ranged from zero to 1,149 metric tons (2.5 million

Table 3.1.135

Harvesting Activity
Peninsula Tanner Crab Fishery
1969-1979

	Catch				Exvessel Price		Number of		Catch per Boat Month		
	Weight		Value [millions)		$/Pound)				Weight	Value ($1,000)	
Year	Pounds (millions)	Metric Tons	Nominal	Real[1]	Nominal	Real[1]	Boat Months	Fisherman Months	Pounds (1,000)	Nominal	Real[1]
1969	0.7	296	0.1	0.1	0.10	0.?2	86	344	7.6	0.8	1.7
1970	2.1	950	0.2	0.4	0.09	0.19	116	464	18.1	1.6	3.3
1971	2.3	1040	0.2	0.5	0.10	0.20	93	37?	24.7	2.5	4.9
1972	4.0	1800	0.4	0.8	0.11	0.?1	9n	392	40.5	4.4	8.5
1973	6.3	2835	1.0	1.8	0.16	0.29	19?	768	32.6	5.2	9.4
1974	11.6	5242	2.3	3.8	0.20	0.32	188	752	61.5	12.3	20.0
1975	8.5	3878	1.2	1.8	0.14	0.21	121	484	70.7	9.9	14.7
1976	16.8	7599	3.3	ft.?	0.?()	0.28	227	908	73.8	14. f!	20.8
1977	12.2	55?4	3.9	5.2	0.3?	0.43	203	812	60.0	19.4	25.7
1978	12.1	5470	5.5	6.8	0.46	0.56	214	856	56.4	25.9	31.8
1979	11.2	5077	6.3	7.0	0.56	0.62	227	9n8	49.3	27.7	30.6

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game reports.

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

The 1978 and 1979 values are preliminary estimates.

Table 3-·-36
Pe insu a Tanner Crab Fishery
Number of Boats and Catch by Month
969-1979

Number of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1969	9	10	5	5	4	0	1	1	0	21	3	27
1970	27	26	13	14	11	2	0	0	0	0	3	15
1971	16	14	14	12	11	2	2	0	0	0	9	13
1972	13	9	12	14	15	3	3	1	0	2	10	16
1973	19	22	24	21	23	16	11	2	2	8	21	23
1974	17	15	35	40	37	24	18	2	0	0	0	0
1975	0	[illegible]	9	26	32	26	8	0	0	0	0	20
1976	23	31	38	51	53	13	0	0	0	0	1	17
1977	15	24	28	27	26	0	0	0	0	0	6	17
1978	22	27	28	27	19	0	0	0	0	0	1	15
1979	18	28	35	40	17	0	0	0	0	0	12	5

Catch (.000 Pounds)

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1969	8	35	148	128	37	0	-1	-1	0	167	-1	98
1970	183	497	612	500	229	-1	0	0	0	0	-1	60
1971	212	183	357	584	402	-1	-1	0	0	0	54	94
1972	263	297	513	973	957	-1	-1	-1	0	-1	302	436
1973	419	956	476	863	910	572	491	-1	-1	57	523	707
1974	43	660	2295	3908	2043	1328	842	-1	0	0	0	0
1975	0	0	727	2212	2664	2250	342	0	0	0	0	355
1976	207	1848	3194	5320	4045	475	0	0	0	0	-1	649
1977	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.137
Peninsula Tanner Crab Fishery
ber of Boats and Catch by Month as a Percentage of Annual Activity
1969-1979

Percentage of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	26.5	29.4	14.7	14.7	11.8	0	2.9	2.9	0	61.8	8.8	79.4	100.0
1970	81.8	78.8	54.5	42.4	33.3	6.1	0	0	0	0	9.1	45.5	100.0
1971	88.9	77.8	77.8	66.7	61.1	11.1	11.1	0	0	0	50.0	72.2	100.0
1972	43.3	30.0	40.0	46.7	50.0	10.0	10.0	3.3	0	6.7	33.3	53.3	100.0
1973	47.5	55.0	60.0	52.5	57.5	40.0	27.5	5.0	5.0	20.0	52.5	57.5	100.0
1974	26.2	23.1	53.8	61.5	56.9	36.9	27.7	3.1	0	0	0	0	100.0
1975	0	0	19.1	55.3	68.1	55.3	17.0	0	0	0	0	42.6	100.0
1976	32.9	44.3	54.3	72.9	75.7	18.6	0	0	0	0	1.4	24.3	100.0
1977	53.6	85.7	100.0	96.4	92.9	0	0	0	0	0	21.4	60.7	100.0
1978	78.6	96.4	100.0	96.4	67.9	0	0	0	0	0	3.6	53.6	100.0
1979	45.0	70.0	87.5	90.0	42.5	0	0	0	0	0	30.0	12.5	100.0

Percentage of Catch

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	[illegible]	5.4	22.7	19.6	5.7	0	-0.2	-0.2	0	25.6	-0.2	15.0	100.0
1970	[illegible] 7	23.7	29.2	23.9	10.9	-0.0	0	0	0	0	-0.0	2.9	100.0
1971	[illegible]	8.0	15.6	25.5	17.5	-0.0	-0.0	0	0	0	2.4	4.1	100.0
1972	1.6	7.5	12.9	24.5	24.1	-0.0	-0.0	-0.0	0	-0.0	7.6	11.0	100.0
1973	[illegible]	6.3	7.6	13.9	14.6	9.2	7.9	-0.0	-0.0	0.9	8.4	11.3	100.0
1974	[illegible]	6.7	19.9	33.8	17.7	11.5	7.3	-0.0	0	0	0	0	100.0
1975	[illegible]	0	8.5	25.9	31.2	26.3	4.0	0	0	0	0	4.2	100.0
1976	[illegible]	1.0	19.1	31.9	24.1	2.8	0	0	0	0	-0.0	3.9	100.0
1977	0	0	0	0	0	0	0	0	0	0	0	0	100.0
1978	[illegible]	[illegible]	0	0	0	0	0	0	0	0	0	0	0
1979	[illegible]	[illegible]	0	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.138
Peninsula Tanner Crab Fishery
Number of Fishermen by Month
1969-1979

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	36	40	20	20	16	0	4	4	0	84	12	108	344
1970	108	104	72	56	44	8	0	0	0	0	12	60	464
1971	64	56	56	48	44	8	8	0	0	0	36	52	372
1972	[illegible]	36	48	56	60	12	12	4	0	8	40	64	392
1973	76	88	96	84	92	64	44	8	8	32	84	92	768
1974	68	60	140	160	148	96	72	8	0	0	0	0	752
1975	0	0	36	104	128	104	32	0	0	0	0	80	484
1976	[illegible]	124	152	204	212	152	0	0	0	0	4	68	908
1977	60	96	112	108	104	0	0	0	0	0	24	68	572
1978	88	108	112	108	76	0	0	0	0	0	4	60	556
1979	72	112	140	160	68	0	0	0	0	0	48	20	620

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Table 3.1.139
Peninsula Tanner Crab Fishery
Percent of Fisherman Man Months by Month
1969-1979

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	10.5	11.6	5.6	5.8	4.7	0	1.2	1.2	0	24.4	3.5	31.4	100.0
1970	23.3	22.4	15.5	12.1	9.5	1.7	0	0	0	0	2.6	12.9	100.0
1971	17.2	15.1	15.1	12.[illegible]	11.8	2.2	2.2	0	0	0	9.7	14.0	100.0
1972	13.3	[illegible]	12.2	14.3	15.3	3.1	3.1	1.0	0	[illegible]	10.2	16.3	100.0
1973	9.9	11.5	12.5	10.9	12.0	8.3	5.7	1.0	1.0	4.2	10.9	12.0	100.0
1974	9.6	8.0	18.6	21.3	19.7	12.8	9.6	[illegible]	0	0	0	0	100.0
1975	0	0	7.4	21.5	26.4	21.5	6.6	0	0	0	0	16.5	100.0
1976	10.1	13.7	16.7	22.5	23.3	5.[illegible]	0	0	0	0	0.4	7.5	100.0
1977	10.[illegible]	16.8	19.6	18.9	18.2	0	0	0	0	0	4.2	11.9	100.0
1978	[illegible]	[illegible]	26.1	19.4	13.7	0	0	0	0	0	[illegible]	[illegible]	100.0
1979	11.6	18.1	22.6	25.8	11.0	0	0	0	0	0	7.[illegible]	3.2	100.0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

pounds) between 1969 and 1979 and averaged 268 metric tons (0.6 million pounds). The annual real harvest value ranged from zero to $1.4 million and averaged $0.3 million (see Table 3.1.140). The annual harvest. weights of the past three years have been significantly greater than the average, as have the annual real harvest values.

The boats in this fishery range in length from 20.1 meters (66 feet) to over 35.1 meters (115 feet) and average approximately 27.4 meters (90 feet). The average crew size including the skipper is four. The fleet principally operates out of and lands crab in Dutch Harbor and Akutan. Seattle is the home port for many of the boats and crews, and Kodiak and other Alaska communities are home ports for part of the fleet.

In 1979 the season extended from December through June with little harvesting activity occurring in December, February, or June. The seasonality of the Eastern Aleutians Management Area Tanner crab fishery is summarized in Tables 3.1.141 through 3.1.144. During the past three seasons the average boat participated in the fishery during 3.4 calendar months per year.

Western Aleutians

The Western Aleutians Management Area Tanner crab fishery has been inactive four of the past 11 years, and the level of harvesting activity has been minimal in the other seven years. Between 1969 and 1979,

Table 3.1.140

Harvesting Activity

Eastern Aleutians Tanner Crab Fishery

1969-1979

	Catch								Catch per Boat Month		
	Weight		Value (millions)[1]		Exvessel Price ($/ Pound)		Number of		Weight	Value ($1,000)	
Year	Pounds (millions)	Metric Tons	Nominal	Real	Nominal	Real	Boat Months	Fisherman Months	Pounds (1,000)	Nominal	Real
1969	0.0	12	0*0	0.0	0.11	0.24	13	52	2.1	0.2	0.5
1970	0.4	165	0.0	0.1	0.09	0.19	6	74	60.5	5.5	11.3
1971	0	0	0	0	0	0	1	4	0	0	0
1972	0.0	18	0.0	0.0	0.01	0.02	2	f?	19.5	0.2	0.4
1973	0.0	11	0.0	0*0	0.17	0.30	4	16	6.0	1.0	1.8
1974	0.5	226	0.1	0.2	0.21	0.34	13	52	38.4	8.1	13.1
1975	0.1	35	0.0	0.0	0.13	0.19	2	8	38.6	5*O	7.5
1976	0.6	250	0.1	0.1	0.19	().?7	12	48	45.9	8.8	12.3
1977	1.3	591	0.4	0.6	0.32	0.43	28	112	46.5	15* I	19.9
1978	2.5	1149	1.2	1.4	0.46	0.56	50	200	50.7	23.3	28.6
1979	1.1	495	0.6	0.7	0.56	0.62	40	160	27.3	15.3	17.0

Sources: This table was generated from data contained in (1) Commercial Fisheries Entrv Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game reports. "

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

The 1978 and 979 values are preliminary estimates.

Table 3.1.14

Eastern Aleutians Tanner Crab Fishery
Number of Boats and Catch by Month as a Percentage of Activity
1969-1979

Percentage of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0.0	60.0	0	0	0	0	0	0	0	10.0	0	10.0	100.0
1970	0	25.0	0	25.0	25.	25.0	50.0	0	0	0	0	0	100.0
1971	0	0	00.0	0	0	0	0	0	0	0	0	0	100.0
1972	0	0	0	0	0	0	0	0	0	50.0	50.0	0	100.0
1973	0	[illegible]	0	0	0	0	0	0	25.0	25.0	0	50.0	100.0
1974	14.3	[illegible]	57.1	28.6	42.9	42.9	0	0	0	0	0	0	100.0
1975	0	50.0	50.0	0	0	0	0	0	0	0	0	0	100.0
1976	0	22.2	33.3	44.4	22.2	11.1	0	0	0	0	0	0	100.0
1977	42.9	57.1	100.0	57.1	28.6	14.3	0	0	0	0	42.9	57.1	100.0
1978	40.0	60.0	70.0	100.0	90.0	30.0	0	0	0	0	20.0	90.0	100.0
1979	50.0	[illegible]	91.7	100.0	66.7	8.3	0	0	0	0	0	8.3	100.0

Percentage of Catch

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	[illegible]	51.9[a]	0	0	0	0	0	0	0	-3.7	0	-3.7	100.0
1970	0	[illegible]	0	-0.	-0.3	-0.3	-0.3	0	0	0	0	0	100.0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	-4.2	-4.2	0	-4.2	100.0
1974	-0.2	0	20.6	-0.2	-0.2	-0.2	0	0	0	0	0	0	100.0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	-0.2	-0.2	29.8	-0.2	-0.2	0	0	0	0	0	0	100.0
1977	0	0	0	0	0	0	0	0	0	0	0	0	100.0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.142

Eastern Aleutians Tanner Crab Fishery
Number of Boats and Catch by Month
1969-1979

Number of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1969	1	6	0	0	0	0	0	0	0	1	0	1
1970	0	1	0	1	1	1	2	0	0	0	0	0
1971	0	0	1	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	1	1	0
1973	0	0	0	0	0	0	0	0	1	1	0	2
1974	1	0	4	2	3	3	0	0	0	0	0	0
1975	0	1	1	0	0	0	0	0	0	0	0	0
1976	0	2	3	4	2	1	0	0	0	0	0	0
1977	3	4	7	4	2	1	0	0	0	0	3	4
1978	4	6	7	10	9	3	0	0	0	0	2	9
1979	6	1	11	12	8	1	0	0	0	0	0	1

Catch (1,000 Pounds)

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1969	11	11	0	0	0	0	0	0	0	-1	0	-1
1970	0	-1	0	-1	-1	-1	-1	0	0	0	0	0
1971	0	0	-1	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	-1	-1	0
1973	0	0	0	0	0	0	0	0	-1	-1	0	-1
1974	-1	0	103	-1	-1	-1	0	0	0	0	0	0
1975	0	-1	-1	0	0	0	0	0	0	0	0	0
1976	0	-1	-1	164	-1	-1	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.]43

Eastern Aleutians Tanner Crab Fishery
Number of Fishermen by Month
1969-1979

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov."	Dec.	Total
1969	20	24	0	0	0	0	0	0	0	4	0	4	52
1970	0	4	0	4	4	4	8	0	0	0	0	0	24
1971	0	0	4	0	0	0	0	0	0	0	0	0	4
1972	0	0	0	0	0	0	0	0	0	4	4	0	8
1973	0	0	0	0	0	0	0	0	4	4	0	8	16
1974	4	0	16	8	12	12	0	0	0	0	0	0	52
1975	0	4	4	0	0	0	0	0	0	0	0	0	8
1976	0	[illegible]	12	16	8	4	0	0	0	0	0	0	40
1977	12	16	28	16	8	[illegible]	0	0	0	0	12	16	112
1978	16	24	28	40	36	12	0	0	0	0	8	36	200
1979	24	4	44	48	32	4	0	0	0	0	0	4	160

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Month"ly Shell-fish Reports for 1977-1979.

227

Table 3.1.144

Eastern Aleutians Tanner Crab Fishery
Percent of Fisherman Man Months by Month
1969-1979

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	38.5	46.2	0	0	0	0	0	0	0	7.7	0	7.7	100.0
1970	0	16.7	0	16.7	16.7	16.7	33.3	0	0	0	0	0	100.0
1971	0	0	100.0	0	0	0	0	0	0	0	0	0	100.0
1972	0	0	0	0	0	0	0	0	0	50.0	50.0	0	100.0
1973	0	0	0	0	0	0	0	0	25.0	25.0	0	50.0	100.0
1974	[illegible]	[illegible]	[illegible]	[illegible]	23.	23.	0	0	0	0	0	0	100.0
1975	0	50.0	50.0	0	0	0	0	0	0	0	0	0	100.0
1976	0	16.7	25.0	[illegible]	[illegible]	6.3	0	0	[illegible]	0	0	0	100.0
1977	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.6	0	0	0	0	[illegible]	4.3	100.0
1978	[illegible]	12.0	14.0	20.0	18.0	6.0	0	0	0	0	4.0	18.0	100.0
1979	15.0	2.5	27.5	30.0	20.0	2.5	0	0	0	0	0	2.5	100.0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

annual harvest weight ranged from zero to 108 metric tons (238,000 pounds) and averaged 31 metric tons (67,500 pounds). The annual real harvest value ranged from zero to $134,000 and averaged .$32,000 (see Table 3.1.145). The fishery has been active in the last two years, but a trend is *not* readily discernible.

The boats in this fishery range in length from 26.2 meters (86 feet) to over 38.1 meters (125 feet); typically they are over 30.5 meters (100 feet) and have a crew of four, including the skipper. The fleet operates out of and lands crab in Adak, Dutch Harbor, Akutan, and Kodiak. Seattle is the home port for many of the boats and crews, and Kodiak and other Alaskan communities are home ports for part of the fleet.

In 1978 and 1979, harvesting activity was limited to two months between February and April. The seasonality of the Western Aleutians Management Area Tanner crab fishery is summarized in Tables 3.1.146 through 3.1.149. During the past two seasons (1978-1979) the average boat participated in the fishery during 1.2 calendar months per year.

Bering Sea

The Bering Sea Management Area Tanner crab fishery has accounted for over 79 percent of the Western Alaska harvest and over 52 percent of the Alaska Tanner crab harvest since 1977 (refer back to Tables 3.1.133 and 3.1.134). The annual Bering Sea harvest weight ranged from 51 metric *tons* (0.1 million pounds) to 33,888 metric tons (74.7 million pounds)

Table 3.1 45

Harvesting Activity
Western Aleutians Tanner Crab Fishery
1969-1979

Year	Catch: Weight: Pounds (millions)	Catch: Weight: Metric Tons	Catch: Value (millions)[1]: Nominal	Catch: Value (millions)[1]: Real	Exvessel Price ($/Pound): Nominal	Exvessel Price ($/Pound): Real	Number of: Boat Months	Number of: Fisherman Months	Catch per Boat Month: Weight: Pounds (1,000)	Catch per Boat Month: Value ($1,000): Nominal	Catch per Boat Month: Value ($1,000): Real
1969	0.0	1	0.0	0.0	0.10	0.22	1	4	2.2	0.2	0.5
970	0	0	0	0	0	0	0	0	0	0	0
971		0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0
1973	0.2	77	0.	0.1	0.17	0.3	16	64	10.6	1.8	3.3
974	0.1	32	0.0	0.0	0.21	0.34	7	28	10.1	2.1	3.4
[illegible]	[illegible]		0.0	0.0	0.13	0.19	1	4	3.3	0.4	0.6
1976	0.1	28	0.0	0.0	0.19	0.27	2	8	31.1	5.9	8.3
1977	0	0	0	0	0	0	0	0	0	0	0
1978	0.2	108	0.1	0.1	0.46	0.56	6	24	39.7	18.2	22.4
979	0.2	89	0.1	0.1	0.56	0.62	7	28	28.1	15.8	7.5

Sources: This table was generated from data contained in 1) Commercial Fisheries Entry Commission Gross Earnings Files, and 2) Alaska Department of Fish and Game reports.

[1]The real values and prices were calculated using the U.S. CPI; 980 is the base period.

The 1978 and 1979 values are preliminary estimates.

Table 3.1.146
Western Aleutian Tanner Crab Fishery
Number of Boats and Catch by Month
1969-1979

Number of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1969	0	0	0	0	0	0	0	0	1	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0
1973	1	5	1	0	2	1	0	0	0	0	0	6
1974	4	2	0	1	0	1	0	0	0	0	0	0
1975	0	0	1	0	0	0	0	0	0	0	0	0
1976	0	0	2	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	1	5	0	0	0	0	0	0	0	0	0
1979	0	0	6	1	0	0	0	0	0	0	0	0

Catch (1,000 Pounds)

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1969	0	0	0	0	0	0	0	0	-1	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0
1972	[illegible]	0	0	0	0	0	0	0	0	0	0	0
1973	-1	26	-1	0	-1	-1	0	0	0	0	0	98
1974	-1	-1	0	-1	0	-1	0	0	0	0	0	0
1975	0	0	-1	0	0	0	0	0	0	0	0	0
1976	0	0	-1	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.147
Western Aleutian Tanner Crab Fishery
Number of Boats and Catch by Month as a Percentage of Annual Activity
1969-1979

Percentage of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969						[illegible]	0	0	100.0	0	0	0	100.0
1970	0	[illegible]	0	[illegible]	0	0	0	0	0	0	0	0	0
1971	0	[illegible]	0	[illegible]	0	0	0	0	0	0	0	0	0
1972	0	[illegible]	0	[illegible]	0	0	0	0	0	0	0	0	0
1973	7.7	38.5	7.7	0	5.4	7.7	0	0	0	0	0	46.2	100.0
1974	50.0	33.3	0	16.7	0	16.7	0	0	0	0	0	0	100.0
1975	0	0	100.0	0	0	0	0	0	0	0	0	0	100.0
1976	0	[illegible]	100.0	0	0	0	0	0	0	0	0	0	100.0
1977	0	[illegible]	0	0	0	0	0	0	0	0	0	0	0
1978	0	[illegible]	100.0	0	0	0	0	0	0	0	0	0	100.0
1979	0	[illegible]	100.0	6.7	0	0	0	0	0	0	0	0	100.0

Percentage of Catch

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	-0.7	15.4	-[illegible]	0	-0.6	-0.6	0	0	0	0	0	58.0	100.0
1974	-1.4	-1.4	[illegible]	-1.4	0	-1.4	0	0	0	0	0	0	100.0
1975	0	0	[illegible]	0	0	0	0	0	0	0	0	0	0
1976	0	0	[illegible]	0	0	0	0	0	0	0	0	0	0
1977	0	0	[illegible]	0	0	0	0	0	0	0	0	0	0
1978	0	0	[illegible]	0	0	0	0	0	0	0	0	0	0
1979	0	[illegible]	0	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.148
Western Aleutian Tanner CrabFishery
Number of Fishermen by Month
1969-1979

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	0	0	0	0	4	0	0	0	4
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	4	20	4	0	8	4	0	0	0	0	0	24	64
1974	12	8	0	4	0	4	0	0	0	0	0	0	28
1975	0	0	4	0	0	0	0	0	0	0	0	0	4
1976	0	0	8	0	0	0	0	0	0	0	0	0	8
1977	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	4	20	0	0	0	0	0	0	0	0	0	24
1979	0	0	24	4	0	0	0	0	0	0	0	0	28

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly ShellfishReports for 1977-1979.

Table 3.1.149
Western Aleutian Tanner Crab F shery
Percent of Fisherman Man Months by Month
1969-1979

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	0	0		0	100.0	0	0	0	100.0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	6.3	31.3	6.3	0	12.5	6.3	0	0	0	0	0	37.5	00.0
4	42.[illegible]	2[illegible].6		4.3	0	4.3	0	0	0	0	0	0	00.0
1975	0	0	100.0	0	0	0	0	0	0	0	0	0	00.0
1976	0	0	100.0	0	0	0	0	0	0	0	0	0	100.0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	16.7	83.3	0	0	0	0	0	0	0	0	0	100.0
1979	0	0	[illegible].7	14.3	0	0	0	0	0	0	0	0	100.0

Sources: CFEC Gross Earn ngs F es and ADF&G Western A aska Monthly She lfish Reports for 977- 9 9.

between 1969 and 1979 and averaged 9,819 metric tons (21.2 million pounds). The annual real harvest value ranged from $21,000 to $46.4 million and averaged $11.0 million (see Table 3.1.150). The annual harvest weight and real value have increased dramatically in the last four years. The more recent harvests are therefore thought to be more indicative of the potential of this fishery than are the averages for the eleven-year period as a whole.

Bering Sea Tanner crab boats range in length from 17.1 meters (56 feet) to over 45.7 meters (150 feet). They are typical" y over 30.5 meters (100 feet) and have a crew of four, including the skipper. The fleet principally operates out of and lands crab in Dutch Harbor and Akutan; secondary points of landings include Adak and Kodiak. Many of the boats and crews are from the Seattle area. Others are from Kodiak and other Alaskan communities.

In 1979, harvesting activity occurred from January through July and was most heavily concentrated in March through May. The seasonality of the Bering Sea Management Area Tanner crab fishery is summarized in Tables 3.1.151 through 3.1,154. During the past three seasons (1977-1979) the average boat participated in the fishery during 3.4 calendar months.

SHRIMP

The Western Alaska shrimp fishery with only minor exceptions, has been limited to the Peninsula and Eastern Aleutians Management Areas. The

Table 3.1.150

Harvesting Activity
Bering Sea Tanner Crab Fishery
1969-1979

Year	Catch: Weight: Pounds (millions)	Catch: Weight: Metric Tons	Catch: Value (millions)[1]: Nominal	Catch: Value (millions)[1]: Real	Exvessel Price ($/Pound): Nominal	Exvessel Price ($/Pound): Real	Number of: Boat Months	Number of: Fisherman Months	Catch per Boat Month: Weight: Pounds (1,000)	Catch per Boat Month: Value ($1,000): Nominal	Catch per Boat Month: Value ($1,000): Real
1969	1.1	500	0.1	0.2	0.10	0.22	80	320	13.8	1.4	3.0
1970	1.1	499	0.1	0.2	0.09	0.19	48	192	22.9	2.1	4.3
1971	0.2	73	0.0	0.0	0.09	0.18	16	64	10.1	0.9	1.9
1972	0.1	51	0.0	0.0	0.10	0.19	20	80	5.6	0.6	1.1
1973	0.3	137	0.1	0.1	0.17	0.30	39	156	7.7	1.3	2.4
1974	5.0	2288	1.1	1.7	0.21	0.34	48	192	105.1	22.1	35.8
1975	7.0	3188	0.9	1.4	0.13	0.19	52	208	135.2	17.6	26.2
1976	22.3	10126	4.2	6.0	0.19	0.27	167	668	133.7	25.4	35.8
1977	51.9	23531	19.7	26.1	0.38	0.50	282	1128	1 [14.0	69.9	92.4
1978	69.5	31523	31.9	39.2	0.46	0.56	426	1704	163.1	74.9	92.0
1979	74.7	33886	42.0	46.4	0.56	0.62	431	1724	173.3	97.3	107.7

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game reports.

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

The 1978 and 1979 values are preliminary estimates.

Table 3.1.151
Bering Sea Tanner Crab Fishery
Number of Boats and Catch by Month
1969-1979

Number of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1969	[illegible]	5	15	12	6	11	17	9	1	0	0	0
1970	1	4	7	3	8	10	6	8	0	1	0	0
1971	[illegible]	1	3	2	1	1	1	2	2	0	2	1
1972	4	5	7	0	0	2	1	0	0	0	1	0
1973	3	0	8	6	2	6	5	1	1	1	0	0
1974	1	0	4	9	17	18	0	0	0	0	0	0
1975	[illegible]	0	3	7	11	21	14	0	0	0	0	1
1976	[illegible]	11	15	42	42	43	10	0	0	0	1	1
1977	6	12	22	54	80	78	1	0	0	0	2	27
1978	31	45	68	102	105	54	3	1	0	0	3	13
1979	16	[illegible]	113	135	113	40	7	0	0	0	0	0

Catch (1,000 Pounds)

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1969	7	14	116	8	28	113	480	219	-1	0	0	0
1970	-1	31	154	-1	281	375	149	72	0	-1	0	0
1971	0	-1	-1	-1	-1	-1	-1	-1	-1	0	-1	-1
1972	[illegible]	28	65	[illegible]	0	-1	-1	0	0	0	-1	0
1973	1	30	51	3[illegible]	-1	41	27	-1	-1	-1	0	0
1974	0	0	[illegible]	[illegible]	1415	1674	0	0	0	0	0	0
1975	0	-1	-1	-1	2299	3290	1014	0	0	0	0	-1
1976	1	[illegible]	302	[illegible]	5577	7824	373	0	0	0	-1	-1
1977	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0
1979		0	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.152
Bering Sea Tanner Crab Fishery
Number of Boats and Catch by Month as a Percentage of Annual Activity
1969-1979

Percentage of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
[illegible]	[illegible]	11.[illegible]	35.7	28.6	14.3	26.2	40.5	21.4	2.4	0	0	0	100.0
[illegible]	3.7	14.8	25.9	11.1	29.6	37.0	22.2	29.6	0	3.7	0	0	100.0
[illegible]	0	[illegible].1	33.3	22.2	11.1	11.1	11.1	22.2	22.2	0	22.2	11.1	100.0
[illegible]	30.8	[illegible]	53.8	0	0	15.4	7.7	0	0	0	7.7	0	100.0
1973	13.6	27.3	36.4	27.3	9.1	27.3	22.7	4.5	4.5	4.5	0	0	100.0
1974	0	0	15.4	34.6	65.4	69.2	0	0	0	0	0	0	100.0
1975	0	0	11.1	7.4	40.7	77.8	51.9	0	0	0	0	3.7	100.0
1976	3.0	16.7	22.7	63.6	63.6	65.2	15.2	0	0	0	1.5	1.5	100.0
1977	7.5	[illegible]	27.5	67.5	100.0	97.5	1.3	0	0	0	2.5	33.8	100.0
1978	[illegible]	43.8	[illegible]	97.1	100.0	51.4	2.9	1.0	0	0	2.9	12.4	100.0
1979	11.[illegible]	[illegible].2	83.7	100.0	83.7	29.6	5.2	0	0	0	0	0	100.0

Percentage of Catch

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
[illegible]	[illegible]	1.3	[illegible]	[illegible]	2.5	10.2	43.5	19.9	-0.1	0	0	0	100.0
[illegible]	[illegible]	2.5	14.0	-0.1	25.5	34.1	13.5	6.5	0	-0.1	0	0	100.0
[illegible]	[illegible]	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	0	-0.6	-0.6	100.0
[illegible]	7.1	[illegible]	[illegible]	0	0	-0.9	-0.9	0	0	0	-0.9	0	100.0
[illegible]	[illegible]	[illegible]	[illegible]	12.9	-0.3	13.6	8.9	-0.3	-0.3	-0.3	0	0	100.0
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	28.1	33.2	0	0	0	0	0	0	100.0
[illegible]	[illegible]	[illegible]	[illegible]	-0.0	32.7	46.8	14.4	0	0	0	0	-0.0	100.0
[illegible]	[illegible]	[illegible]	[illegible]	23.6	25.0	35.0	1.7	0	0	0	-0.0	-0.0	100.0
[illegible]	[illegible]	0	0	0	0	0	0	0	0	0	0	0	100.0
[illegible]	[illegible]	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	[illegible]	0	0	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Fi es and ADF&G Western A aska Month y She fis Reports for 977- 979.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3 1. 53
Bering Sea Tanner Crab Fishery
Number of Fishermen by Month
1969-1979

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	[illegible]	[illegible]		[illegible]	54	44	68	36	4	0	0	0	320
1970	4	16	28	12	32	40	24	32	0	4	0	0	192
1971	0	4	12	8	4	4	4	8	8	0	8	4	64
1972	16	20	28	0	0	8	4	0	0	0	4	0	80
1973	12	24	32	24	8	24	20	4	4	4	0	0	156
1974	0	0	16	36	68	72	0	0	0	0	0	0	192
1975	0	0	12	8	44	84	56	0	0	0	0	4	208
1976	8	44	60	168	168	172	40	0	0	0	4	4	668
1977	24	48	88	216	320	312	4	0	0	0	8	108	1128
1978	124	184	272	408	420	216	12	4	0	0	12	52	1704
1979	64	28	452	540	452	160	28	0	0	0	0	0	724

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Tab'e 3.1.154
Bering Sea Tanner Crab Fishery
Percent of Fisherman Man Months by Month
1969-1979

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	[illegible]	6.3	18.8	15.0	7.5	13.8	21.3	11.3	1.3	0	0	0	100.0
1970	[illegible]	8.	14.6	[illegible]	6.7	20.8	12.5	16.7	0	2.	0	0	[illegible]
1971	0	[illegible]	18.8	12.5	6.3	6.3	6.3	12.5	12.5	0	12.5	6.3	100.0
1972	20.0	[illegible]	[illegible]	0	0	10.0	5.0	0	0	0	5.0	0	100.0
[illegible]	[illegible]	15.4	[illegible]	[illegible]	[illegible]	15.4	2.8	2.6	2.6	2.6	0	0	100.0
1974	0	0	8.3	18.8	35.4	37.5	0	0	0	0	0	0	100.0
1975	0	0	[illegible]	3.8	21.2	46.4	26.9	0			[illegible]	.9	100.0
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	25.7	6.0	0	0	0	0.6	0.6	100.0
1977	[illegible]	4.3	7.8	19.1	28.4	27.7	0.4	0	0	0	0.7	9.6	00.0
1978	[illegible]	11.8	16.0	23.9	24.6	12.7	0.7	0.2	0	0	0.7	3.1	00.0
1979	[illegible]	1.6	26.2	31.3	26.2	9.3	1.6	0	0	0	0	0	00.0

Sources: CFEC Gross Earn ngs Fi es and ADF&G Western A'aska Month'y She' fish Repor s for 1977- 979.

annual harvest weight for the Western Alaska shrimp fishery ranged from 1,393 metric tons (3.1 million pounds) to 34,847 metric tons (76.8 million pounds) between 1969 and 1979 and averaged 14,977 metric tons (35.2 million pounds). The annual real harvest value ranged from S0.3 million to $12.1 million and averaged 85.0 million; the range and average of the annual nominal harvest value were S0.1 million to $9.1 million and S3.6 million, respectively (see Table 3.1,155). Both the annual harvest weights and real value have increased substantially since the early 1970s. The average harvest data, therefore, tends to understate the potential of this fishery.

The Peninsula Management Area fishery has dominated the Western Alaska shrimp fishery, accounting for over 94 percent of the harvest prior to 1978 and over 84 percent of the harvest in 1978 and 1979 (see Table 3.1.156). The Peninsula shrimp fishery has also been an important part of the Alaska shrimp fishery, and has accounted for over 42 percent of the Alaska shrimp harvest since 1974 (see Table 3.1.157). The locations of the Western Alaska shrimp fishery grounds and management areas are depicted in Figure 3.7,

Peninsula

The Peninsula Management Area shrimp fishery annual harvest weight ranged from 1,393 metric tons (3.1 million pounds) to 32,904 metric tons (72.5 million pounds) between 1969 and 1979 and averaged 14,946 metric tons (32.9 million pounds). The annual real harvest value ranged from

Table 3.1.155
Western Alaska Shrimp Harvest
1969-1979

Pounds
(1,000)

Year	Peninsula	Eastern Aleutians	Western Alaska	Alaska
1969	3072	0	3072	47851
1970	5290	0	5290	74256
1971	6324	0	6324	94891
1972	18613	95	18708	83830
1973	39367	456	39823	119964
1974	46175	5749	51924	108741
1975	43324	894	44218	98984
1976	66123	3671	69794	128682
1977	72541	4282	76823	116995
1978	34790	6618	41408	73327
1979	26830	3237	30067	51059

Value
($1,000)

Year	Peninsula	Eastern Aleutians	Western Alaska	Alaska
1969	123	0	123	1909
1970	212	0	212	2980
1971	253	0	253	3909
1972	838	4	842	4493
1973	2874	33	2907	9341
1974	3694	460	4154	11091
1975	3466	63	3529	7904
1976	5612	312	5924	11572
1977	8621	514	9135	20640
1978	5740	1092	6832	12099
1979	4710	568	5279	8964

Sources: CFEC Gross Earnings Files and ADF&G Catch Reports.

978 nd 1979 data are pre iminary.

Table 3.1.156
Shrimp Management Area Harvest as a Percentage of the Western Alaska Harvest
1969-1979

Percentage by Weight

Year	Peninsula	Eastern Aleutians	Western Alaska
1969	100.0	0	100.0
1970	100.0	0	100.0
1971	100.0	0	100.0
1972	99.5	0.5	100.0
1973	98.9	1.1	100.0
1974	88.9	11.1	100.0
1975	98.0	2.0	100.0
1976	94.7	5.3	100.0
1977	94.4	5.6	100.0
1978	84.0	16.0	100.0
1979	89.2	10.8	100.0

Percentage by Value

Year	Peninsula	Eastern Aleutians	Western Alaska
1969	100.0	0	100.0
1970	100.0	0	100.0
1971	100.0	0	100.0
1972	99.5	0.5	100.0
1973	98.9	1.1	100.0
1974	88.9	11.1	100.0
1975	98.2	1.8	100.0
1976	94.7	5.3	100.0
1977	94.4	5.6	100.0
1978	84.0	16.0	100.0
1979	89.2	10.8	100.0

Sources: CFEC Gross Earnings Files and ADF&G Catch Reports.

1978 and 1979 data are preliminary.

Table 3.1.157
Shrimp Management Area Harvest as a Percentage of the Alaska Harvest
1969-1979

Percentage by Weight

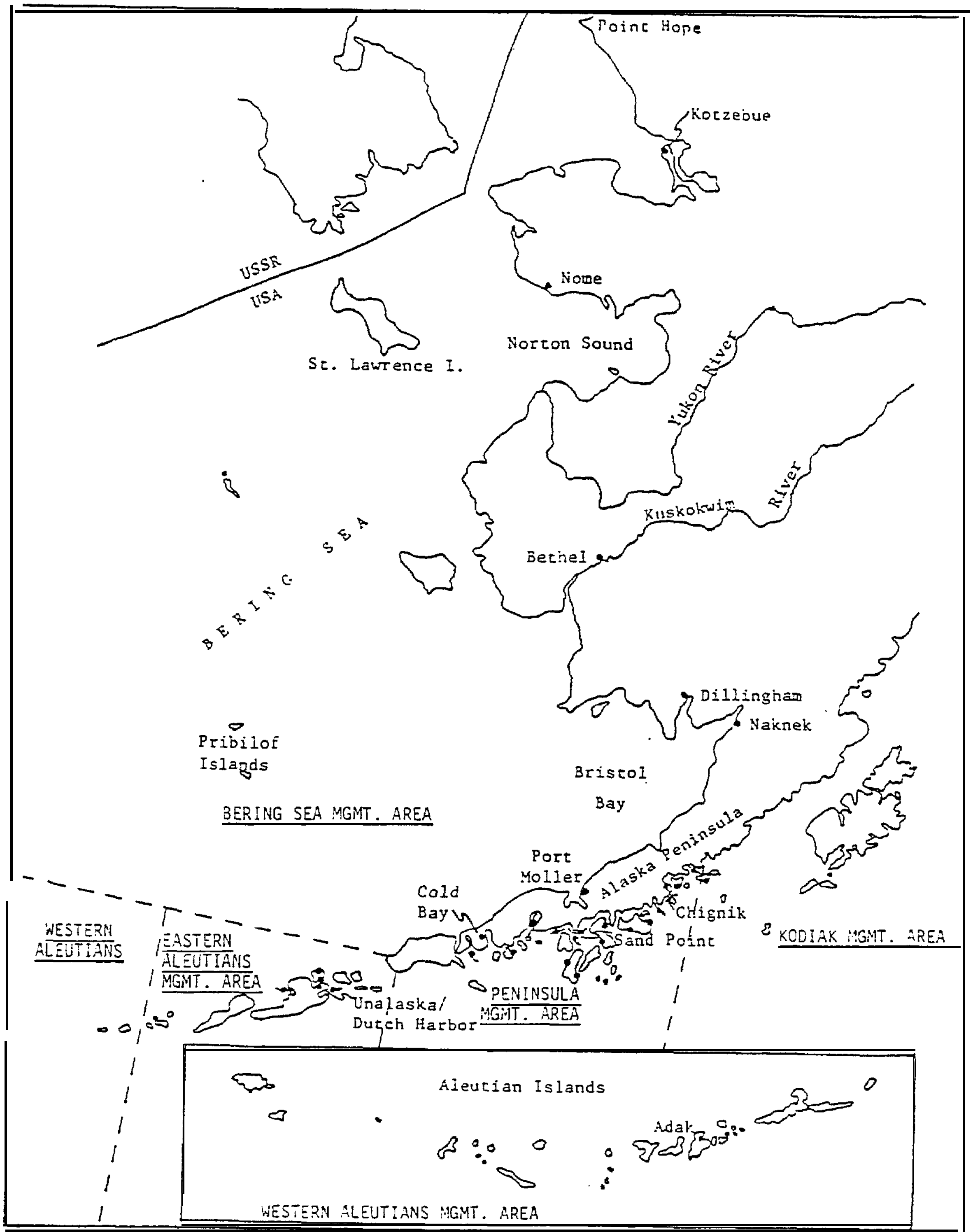
Year	Peninsula	Eastern Aleutians	Western Alaska	Alaska
1969	6.4	0	6.4	100.0
1970	7.1	0	7*1	100.0
]971	6.7	0	6*7	100.0
]9-?2	22.2	0.1	22.3	100.0
1973	32.8	0.4	33.2	100.0
1974	42.5	5.3	47.-1	100.0
1975	43.8	0.9	44.7	100.0
1976	51.4	2.9	54.2	100.0
1977	62.0	3.7	65.7	100.0
1978	47.4	9.0	56.5	100.0
1979	5?*5	6.3	58.9	100.0

Percentage by Value

Year	Peninsula	Eastern Aleutians	Western Alaska	Alaska
1969	6.4	0	6.4	100.0
1970	7.1	0	7.1	100.0
1971	6.5	0	6.5	100.0
1972	18.7	0.1	18.7	100.0
]973	30.8	0.4	31.1	10(-).0
1974	33.3	4*1	37.5	100.0
1975	43.9	0.8	44.6	100.(-)
1976	48.5	2.7	51*?	100.0
1977	41.8	2.5	44.3	100.0
1978	47.4	9.0	56.5	100.0
1979	52.5	6.3	58.9	100.0

Sources: CFEC Gross Earnings Files and ADF&G Catch Reports.

1978 and 1979 data are preliminary.



Major Fishing Areas
ADF&G Management Area Boundaries

Figure 3.7: Major Shrimp Fishing Areas, Western Alaska

Source: Alaska Department of Fish and Game, Alaska's Fisheries Atlas, 1978.

$0.3 million to $11.4 million and averaged $4.6 million (see Table 3.1.158). The harvest weights and real values have increased dramatically from their levels of the early 1970s, therefore the average harvest figures for the past five years are perhaps more indicative of the potential of the fishery. The average annual weight and real value for 1975 through 1979 are 22,100 metric tons (48.7 million pounds) and $7.3 million.

The boats of the Peninsula shrimp fleet range in length from 20.1 meters (66 feet) to over 29.0 meters (95 feet). Typically they are about 22.9 meters (75 feet) and have a crew of three, including the skipper. These boats primarily operate out of and land shrimp in Kodiak. Kodiak is the home port of many of the boats and crews. Other home ports include Alaska Peninsula communities, other Alaska communities, and non-Alaskan communities predominately in Oregon and Washington.

Until recently, harvesting activity occurred throughout the entire year. In 1979, harvesting activity occurred from June through November, with over 75 percent of the harvest being taken in June and July. The seasonality of the Peninsula shrimp fishery is summarized in Tables 3.1.159 through 3.1.162. During the last three seasons (1977-1979) the average boat participated in the fishery during 3.4 calendar months.

Eastern Aleutians

The Eastern Aleutians Management Area shrimp fishery has existed since

Table 3.1.158

Harvesting Activity
Peninsula Trawl Shrimp Fishery
1969-1979

Year	Catch: Weight: Pounds (millions)	Catch: Weight: Metric Tons	Catch: Value (millions): Nominal	Catch: Value (millions): Real[1]	Exvessel Price $/Pound): Nominal	Exvessel Price $/Pound): Real	Number of: Boat Months	Number of: Fisherman Months	Catch per Boat Month: Weight: Pounds (1,000)	Catch per Boat Month: Value 1,000): Nominal	Catch per Boat Month: Value 1,000): Real
1969	3.1	1393	0.1	0.3	0.04	0.09	14	42	219.4	R.8	19.2
1970	5.3	2400	0.2	0.4	0.04	0.08	28	84	188.9	7.6	15.6
1971	6.3	2869	0.3	0.5	0.04	0.08	34	102	186.0	7.4	14.7
1972	18.6	8443	0.8	1.6	0.05	0.09	84	752	221.6	10.0	19.1
1973	39.4	17857	2.9	5.2	0.07	()*13	136	408	289.5	21.1	38.1
1974	46.2	20945	3.7	6.0	0.08	0.13	161	4P3	286.8	22.9	37.3
1975	43.3	19652	3.5	5.2	0.08	0.12	239	717	181.3	14.5	21.6
1976	66.1	29993	5.6	7.9	0.08	0.]2	259	777	255.3	21.7	30.5
1977	72.5	'329[)4	8.6	11.4	0.12	0.16	208	624	348.8	41*4	54.8
1978	34.8	15781	5.7	'/.1	0.17	0.20	99	297	351.4	58.0	71.2
1979	26.8	12170	4.7	5.2	0.18	0.19	99	297	271.0	47.6	52.6

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game reports.

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

The 1978 and 1979 values are preliminary estimates.

Table 3.1.159
Peninsula Shrimp Fishery
Number of Boats and Catch by Month
1969-1979

Number of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1969	1	1	1	0	0	0	1	2	2	2	2	2
1970	2	2	2	2	0	2	3	3	3	3	3	3
1971	3	3	3	3	2	2	3	3	3	3	3	3
1972	4	4	4	2	7	7	7	10	16	7	8	8
1973	7	7	0	8	12	26	26	11	8	9	10	12
1974	16	12	0	11	14	18	19	18	15	12	12	14
1975	15	16	9	10	5	20	41	17	15	65	14	12
1976	17	13	0	14	31	47	54	55	7	4	6	6
1977	7	17	2	0	24	35	35	39	13	13	18	5
1978	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0

Catch (1,000 Pounds)

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1969	-1	-1	-1	0	0	0	-1	-1	-1	-1	-1	-1
1970	-1	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	-1
1971	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
1972	412	758	759	-1	878	1563	2025	3000	4031	1403	1723	1542
1973	1599	1191	0	1221	3798	5879	8950	3867	3247	2950	3370	3295
1974	3549	2766	0	1291	3816	6181	8139	6965	4794	3864	1807	3003
1975	3083	2256	1440	659	-1	3095	11387	5296	4015	2987	3602	1788
1976	3652	3995	0	1773	6302	14389	17764	11258	2114	-1	1045	1068
1977	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.160
Peninsula Shrimp Fishery
Number of Boats and Catch by Month as a Percentage of Annual Activity
1969-1979

Percentage of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	[illegible]	[illegible]	50.0	0	0	0	50.0	100.0	100.0	100.0	100.0	100.0	100.0
1970	50.0	[illegible]	50.0	50.0	0	50.0	75.0	75.0	75.0	75.0	75.0	75.0	100.0
1971	60.0	[illegible]	60.0	50.0	40.0	40.0	60.0	60.0	60.0	60.0	60.0	60.0	100.0
1972	17.4	17.4	17.4	8.7	30.4	30.4	30.4	43.5	69.6	30.4	34.8	34.8	100.0
1973	20.6	[illegible]	0	23.5	35.3	76.5	76.5	32.4	23.5	26.5	29.4	35.3	100.0
1974	33.3	[illegible]	0	22.9	29.2	37.5	39.6	37.5	31.3	25.0	25.0	29.2	100.0
1975	26.3	28.1	[illegible]	17.5	8.8	35.1	71.9	29.8	26.3	114.0	24.6	21.1	100.0
1976	24.3	25.7	0	20.0	44.3	67.1	77.1	78.6	10.0	5.7	8.6	8.6	100.0
1977	17.9	43.6	5.1	0	61.5	89.7	89.7	100.0	33.3	33.3	46.2	12.8	100.0
1978	0	0	0	0	0	0	0	0	0	0	0	0	100.0
[illegible]						0	0	0	0	0	0	0	100.0

Percentage of Catch

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969		[illegible]	0	0	0	0	0	0	0	0	0	0	0
1970	[illegible]	[illegible]	-0.0	-0.0	0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	100.0
1971	-0.0	[illegible]	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	100.0
1972	[illegible]	[illegible]	[illegible]	-0.0	4.7	8.4	10.9	16.1	21.7	7.5	9.3	8.3	100.0
1973	4.1	[illegible]	[illegible]	3.1	9.6	14.9	22.7	9.8	8.2	7.5	8.6	8.4	100.0
1974	7.7	[illegible]	0	2.9	9.3	13.4	17.6	15.1	10.4	8.4	3.9	6.5	100.0
1975	7.1	[illegible]	[illegible]	1.5	-0.0	7.1	26.3	12.2	9.3	6.9	8.3	4.1	100.0
1976	[illegible]	[illegible]	0	[illegible]	9.5	21.8	26.9	17.0	3.2	-0.0	1.6	1.6	100.0
1977	0	0	0	0	0	0	0	0	0	0	0	0	100.0
[illegible]		0	[illegible]	0	0	0		0	0	0	0	0	0
[illegible]	[illegible]		0		[illegible]	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.161
Peninsula Shrimp Fishery
Number of Fishermen by Month
1969-1979

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	3	3	3	0	0	0	3	6	6	6	6	6	42
1970	6	6	6	6	0	6	9	9	9	9	9	9	84
1971	9	9	9	9	6	6	9	9	9	9	9	9	102
1972	12	12	12	6	21	21	21	30	48	21	24	24	252
1973	21	21	0	24	36	78	78	33	24	27	30	36	408
1974	48	36	0	33	42	54	57	54	45	36	36	42	483
1975	45	48	27	30	15	60	123	51	45	195	42	36	717
1976	51	54	0	42	93	141	162	165	21	12	18	18	777
1977	21	51	6	0	72	105	105	117	39	39	54	15	624
1978	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Table 3.1.162
Peninsula Shrimp Fishery
Percent of Fisherman Man Months by Month
969-19 9

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
969	7.1	7.1	7.1	0	0	0	7.	4.3	4.3	4.3	14.3	14.3	00.0
97	7.	7.	7.1	7.		7.	0.7	0.7	10.7	0.7	10.7	10.7	100.0
[illegible]	.	8.8	8.8	8.[illegible]	5.9	5.9	8.8	8.8	8.8	8.8	8.8	8.8	0[illegible] 0
72	4.[illegible]	1.8	4.8	2.4	8.3	8.3	8.3	11.[illegible]	19.0	8.3	9.5	9.5	00.0
973	5.1	5.	[illegible]	5.9	8.8	19.1	9.1	8.	5.9	6.6	7.4	8.8	00.0
4	.	7.5	[illegible]	6.8	8.7	.2	.8	.2	9.3	7.5	7.5	8.7	100.0
975	[illegible]	.7	3.8	4.2	2.1	8.4	17.2	7.1	6.3	27.2	5.9	5.0	00.0
976	[illegible]	6.9		5.4	2.0	18.1	2 .8	21.2	2.7	.5	2.3	2.3	100.0
77	3.4	.2	.9	0	.[illegible]	6.8	6.8	8.8	6.3	6.3	8.7	2.4	[illegible]
978	0	0	0	0	0	0	0	0	0	0	0	0	0
979	0	0	0	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

1972. The harvests of 1974 through 1979 were substantially greater than those of 1972 and 1973, therefore, the summary of harvests which follows is for the latter period. The annual harvest weight ranged from 406 metric tons (0.9 million pounds) to 3,002 metric tons (6.6 million pounds) between 1974 and 1979 and averaged 1,847 metric tons (4.1 million pounds). The annual real harvest value ranged from $0.1 million to $1.3 million and averaged $0.7 million (see Table 3.1.163).

The boats of the Eastern Aleutians Management Area shrimp fishery range in length from 17.1 meters (56 feet) to over 29.0 meters (95 feet). Typically, they are 22.9 meters (75 feet) and have a crew of three, including the skipper. This fleet primarily operates out of and lands shrimp in Kodiak. Kodiak is the home port of many of the boats and crews; other home ports include Alaska Peninsula communities, other Alaska communities, and non-Alaskan communities, principally in Oregon and Washington.

Historically, harvesting activity has occurred throughout most of the year. The 1979 season included all but October, with over 36 percent of the harvest being taken in July and August. The seasonality of the fishery is summarized in Tables 3.1.164 through 3.1.167. During the past three seasons (1977-1979) the average boat participated in the fishery during 5.9 calendar months per year.

Table 3.1.163

Harvesting Activity
Eastern Aleutians Trawl Shrimp Fishery
1969-1979

Year	Catch: Weight: Pounds (millions)	Catch: Weight: Metric Tons	Catch: Value (millions)[1]: Nominal	Catch: Value (millions)[1]: Real	Exvessel Price $/Pound: Nominal	Exvessel Price $/Pound: Real	Number of Boat Months	Number of Fisherman -Months	Catch per Boat Month: Weight: Pounds (1,000)	Catch per Boat Month: Value ($1,000): Nominal	Catch per Boat Month: Value ($1,000): Real
1969	0	0	0	0	0	0	n	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0
1972	0.1	43	0.0	0.0	0.05	0.09	4	12	23.7	1.1	2.1
1973	0.5	207	0.0	0.1	0.07	0.13	1	3	456.0	33.3	60.0
1974	5.7	2608	0.5	0.7	0.08	0.13	2?	66	261.3	20.9	34.0
1975	0.9	406	0.1	0.1	[illegible]	0.10	8	24	111.8	-7.9	11.7
1976	3.7	1665	0.3	[illegible]	0.08	0.12	22	66	166.9	14.2	20.0
1977	4.3	1942	0.5	0.7	0.12	0.16	21	63	203.9	?4.5	3?.4
1978	6.6	3002	1.1	1.3	0.17	0.20	3?	96	206.8	34.1	41.9
1979	3.2	1468	0.6	[illegible]	0.18	0.19	27	81	119.9	21.0	23.3

Sources: This table was generated from data contained in (1) Commercial Fisheries Entry Commission Gross Earnings Files, and (2) Alaska Department of Fish and Game reports.

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

The 1978 and 1979 values are preliminary estimates.

Table 3.1.164

Eastern Aleutians Shrimp Fishery
Number of Boats and Catch by Month
1969-1979

Number of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	1	1	0	2	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	1	0	0
1974	1	2	6	7	3	2	0	0	0	0	0	0
1975	0	1	0	0	0	0	0	0	0	0	3	4
1976	5	7	4	4	2	0	0	0	0	0	0	0
1977	0	3	4	4	4	1	0	1	0	0	1	3
1978	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0

Catch (1,000 Pounds)

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	-1	-1	0	-1	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	-1	0	0
1974	-1	-1	1429	1347	-1	-1	0	0	0	0	0	0
1975	0	-0	0	0	0	0	0	0	0	0	-0	652
1976	696	822	1675	167	-0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979,

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.165

Eastern Aleutians Shrimp Fishery
Number of Boats and Catch by Month as a Percentage of Annual Activity
1969-1979

Percentage of Boats

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	50.0	50.0	0	100.0	0	0	0	0	0	0	0	100.0
1973	0	0	0	0	0	0	0	0	0	100.0	0	0	100.0
1974	28.6	28.6	85.7	100.0	42.9	28.6	0	0	0	0	0	0	100.0
1975	0	25.0	0	0	0	0	0	0	0	0	75.0	100.0	100.0
1976	62.5	87.5	50.0	50.0	25.0	0	0	0	0	0	0	0	100.0
1977	0	75.0	100.0	100.0	100.0	25.0	0	25.0	0	0	25.0	75.0	100.0
1978	0	0	0	0	0	0	0	0	0	0	0	0	100.0
1979	0	0	0	0	0	0	0	0	0	0	0	0	100.0

Percentage of Catch

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	-0.0	-0.0	24.9	23.4	-0.0	-0.0	0	0	0	0	0	0	100.0
1975	0	-0.0	0	0	0	0	0	0	0	0	-0.0	72.9	100.0
1976	19.0	22.4	45.6	4.5	-0.0	0	0	0	0	0	0	0	100.0
1977	0	0	0	0	0	0	0	0	0	0	0	0	100.0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Note: A minus sign indicates months in which the catch is confidential because fewer than four boats participated in the fishery.

Table 3.1.166

Eastern Aleutians Shrimp Fishery
Number of Fishermen by Month
1969-1979

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	3	3	0	6	0	0	0	0	0	0	0	12
1973	0	0	0	0	0	0	0	0	0	3	0	0	3
1974	[illegible]	6	18	21	0	6	0	0	0	0	0	0	66
1975	0	3	0	0	0	0	0	0	0	0	9	12	[illegible]
1976	15	21	12	12	6	0	0	0	0	0	0	0	66
1977	0	9	12	12	12	3	0	3	0	0	3	9	63
1978	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

Table 3.1.167

Eastern Aleutians Shrimp Fishery
Percent of Fisherman Man Months by Month
1969-1979

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	25.0	25.0	0	50.0	0	0	0	0	0	0	0	100.0
1973	0	0	0	0	0	0	0	0	0	100.0	0	0	100.0
1974	9.1	9.1	27.3	31.8	13.6	9.1	0	0	0	0	0	0	100.0
1975	0	12.5	0	0	0	0	0	0	0	0	37.5	50.0	100.0
1976	22.7	31.8	18.2	18.2	9.1	0	0	0	0	0	0	0	100.0
1977	0	14.3	19.0	19.0	19.0	4.8	0	4.8	0	0	4.8	14.3	100.0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0

Sources: CFEC Gross Earnings Files and ADF&G Western Alaska Monthly Shellfish Reports for 1977-1979.

DOMESTIC GROUNDFISH

The domestic groundfish fishery of Western Alaska is similar to that of the rest of Alaska. The similarities are as follow: it is just beginning to develop, it has not developed to the stage that it is known with any certainty how rapidly it will replace the foreign fishery which is extensive and well-developed, boats associated with other fisheries have participated in the groundfish fishery intermittently on a casual basis, and the characteristics and levels of effort of past participants are not thought to be indicative of those of future participants, Due to the last similarity, the historical characteristics and trends of this fishery are not useful in predicting future trends and are, therefore, not considered in much detail. The useful characteristics of the fishery, as it exists today, are the extent to which it underutilizes the groundfish resources of Western Alaska and its rapid rate of growth in recent years. Both characteristics are depicted by the harvest and abundance data presented in Table 3.1.168.

LOCAL HARVESTING EFFORT

In the preceding discussions of the domestic commercial fisheries of Western Alaska it was noted whether harvesting activity is dominated by local *or* non-local fishermen and boats. This section provides quantitative measures of local harvesting effort. The measures, which are presented by census division, are the number of commercial fisherman by community, the number of year permit owners by community, and the

Table 3.1.168

Western Alaska Groundfish,
Domestic Catch and Resource Abundance

	Pounds			
	Harvest			ABC[1]
	1976	1977	1978	
Pollock	0	96,339	1,133,594	2,425 million
Sablefish	0	4,322	808	11 million
Cod	369,713	497,228	1,392,076	129 million
Other	86,193	239,834	430,605	872 million
Total	455,906	837,723	2,957,083	3,437 million

Sources: The harvest statistics were provided by the ADF&G, the ABC statistics are as reported in, Fishery Mangement Plan For the Groundfish Fishery in the Bering Sea/Aleutian Island Area, 1979.

[1] Allowable Biological Catch, a basic measure of resource abundance.

gross earnings of fishermen by census division. These measures are presented in Tables 3.1.169 through 3.1.183.

FOREIGN TANNER CRAB

The foreign Tanner crab fishery in Western Alaska has been very active, but as the capacity and interest of the domestic fishery have increased, the resources available to the foreign fishery have been reduced. Since it appears that the foreign Tanner crab fishery will be completely displaced by the domestic fishery in the very near future, the following description of the foreign fishery is brief.

Both Japan and the Soviet Union have participated in the Western Alaska Tanner crab fishery. The largest annual Japanese harvest occurred in 1970, it totaled 19,885 metric tons (43.8 million pounds). The largest Soviet harvest occurred in 1969, it totaled 6,825 metric tons (15.0 million pounds). The last Soviet harvest occurred in 1971 (see Table 3.1.184). The Japanese allocation for 1980 is 7,500 metric tons (16.5 million pounds) and it is limited to C. opilio. The Japanese fleet is limited to the Bering Sea north of 58°N latitude. The nature of the Japanese fleet, as presented in the 1978 Tanner Crab Management Plan, is summarized in Table 3.1.185.

FOREIGN GROUNDFISH FISHERY

The annual groundfish harvest in Western Alaska ranged from 1,051,100 metric tons (2,317 million pounds) to 2,363,900 metric tons (4,209

Table 3.1.169

Number of Commercial Fishermen, Alaska Peninsula Area, 1969-1976

Community	1969	1970	1971	1972	1973	1974	1975	1976
Chignik	28	34	29	23	21	37	39	40
Chignik Lagoon	39	47	49	55	48	51	44	38
Chignik Lake	3	1	2	5	19	12	23	30
Cold Bay	1	4	2	--	1	--	--	2
King Cove	61	67	72	78	80	61	63	75
Perryville	21	21	24	22	23	20	18	22
Port Heiden	2	4	8	7	6	7	7	15
Port Moller	8	5	1	4	2	6	5	6
Sand Point	77	91	102	102	116	89	89	118

Source: Commercial Fisheries Entry Commission Data Files.

Note: This table is based on the number of fishermen who gave each community as a home address.

Table 3.1.170

Number of Commercial Fishing Permits, Alaska Peninsula Area, 1978

	Chignik	Chignik Lagoon[1]	Chignik Lake[2]	Cold Bay	King Cove[3]	Perryville	Port Heiden	Port Moller	Sand Point[4]
# of Permit Holders	10	15	8	2	55	9	27	23	112
Salmon Purse Seine Chignik Area	9	14	8			9			1
Salmon Purse Seine Peninsula-Aleutians Area				1	38			3	59
Salmon Drift Gill Net Peninsula-Aleutians Area				2	40			17	33
Salmon Set Gill Net Peninsula-Aleutians Area				1	13		11	19	45
Salmon Drift Gill Net Bristol Bay Area							14		1
Salmon Set Gill Net Bristol Bay Area							4		1
King Crab Pots, Vessel to 50′ Peninsula Area			1		7				31
King Crab Pots, Vessel over 50′ Peninsula Area					9				13
King Crab Pots, Vessel over 50′ Bering Sea					6				13
King Crab Pots, Vessel over 50′ Dutch Harbor Area					4				1

Continued on next page

Table 3.1.170 (Continued)

	Chignik	Chignik Lagoon[1]	Chignik Lake[2]	Cold Bay	King Cove[3]	Perryville	Port Heiden	Port Moller	Sand Point[4]
Tanner Crab Pots, Vessel to 50′ Statewide	2				11				32
Tanner Crab Pots, Vessel over 50′ Statewide					13				19
Bottomfish Long Line Statewide					1				3
Bottomfish Otter Trawl Statewide					2				3
Halibut Long Line, Vessel < 5 Tons Statewide					2				20
Halibut Long Line, Vessel ≥ 5 Tons Statewide	3	5	2		7				19
Shrimp Otter Trawl, Statewide	1								4

[1]One king crab, pots, vessels to 50 feet, Kodiak area permit held.
[2]One shrimp, beam trawl, statewide permit held.
[3]One king crab, pots, vessel over 50 feet, Adak area permit held.
[4]One herring spawn on kelp, unspecified gear, statewide permit held.
One bottomfish, unspecified gear, statewide permit held.
One king crab, pots, vessels to 90 feet, Dutch Harbor area permit held.

Source: Commercial Fisheries Entry Commission Data Files.

Table 3.1.171

Number of Commercial Fishermen, Aleutian Islands Area, 1969-1976

Community	Year							
	1969	1970	1971	1972	1973	1974	1975	1976
Adak	6	8	8	1 2	7		1	3
Akutan	9	3 3	3	4	4	2	1	0
Atka	10	10	9	7	10	6	11	9
Dutch Harbor	7	6	7	7	9	15	28	31
False Pass	10	7	17	15	19	16	?4	17
Unalaska	42	69	66	64	68	57	66	65

Source: Commercial Fisheries Entry Commission Data Files.

Note: This table is based on the number of fishermen who gave each community as a home address.

Table 3.1.172

Number of Commercial Fishing Permits, Aleutian Islands Area, 1978

	Adak[1]	Akutan[2]	Atka	Dutch Harbor[3]	False Pass	Unalaska[4]
# of Permit Holders 3"		10	a	21	12	52
Salmon Purse Seine Kodiak Area			4			
Salmon Purse Seine Peninsula-Aleutian Area					8	6
Salmon Drift Gill Net Peninsula-Aleutian Area					11	2
Salmon Set Gill Net Peninsula-Aleutian Area					8	
King Crab Pots, Vessel to 50' Dutch Harbor Area		2		1		13
King Crab Pots, Vessel over 50' Dutch Harbor Area		4		5		10
King Crab Pots, Vessel over 50' Bering Sea Area		2		7		17
Tanner Crab Pots, Vessel to 50' Statewide		1		1		8
Tanner Crab Pots, Vessel over 50' Statewide		4		8		20
Halibut Long Line, Vessel < 5 Tons Statewide	3	1		2		5
Halibut Long Line, Vessel ≥ 5 Tons Statewide			3	1	6	6

[1]One halibut, hand troll, statewide permit held.
One king crab, pots, vessel to 50 ft., Adak area permit held.

[2]One king crab, pots, vessel over 50 ft., Peninsula area permit held.
One king crab, pots, vessel over 50 ft., Adak area permit held.

[3]One king crab, pots, vessel over 50 ft., Peninsula area permit held.
One shrimp, otter trawl, statewide permit held.
One shrimp, pots, vessel to 50 ft., statewide permit held.
One dungeness crab, pots, vessel to 50 ft., statewide permit held.
One black cod, long line, vessel ≥ 5 tons, statewide permit held.

Footnotes continued on next page...

Table 3.1.172 (Continued)

[4]One king crab, unspecified gear, Norton Sound area permit held.
One king crab, pots, vessel over 50 feet, Peninsula area permit held.
One king crab, pots, vessel over 50 feet, Adak area permit held.
One king crab, pots vessel to 50 feet, Bering Sea area permit held.
One king crab, pots, vessel to 50 feet, Kodiak area permit held.
One bottomfish, otter trawl, statewide permit held.
One salmon, drift gill net, Bristol Bay area permit held.
One shrimp, pots, vessel to 50 feet, statewide permit held.
One dungeness crab, pots, vessel to 50 feet, statewide permit held.

Source: Commercial Fisheries Entry Commission Data Files.

Table 3.1.173

Number of Commercial Fishermen, Bristol Bay Area, 1969-1976

Community	1969	1970	1971	1972	1973	1974	1975	1976
Alaknagik	35	43	45	29	5	30	35	57
Clarks Point	30	29	33	30	2	26	27	33
Dillingham	124	126	137	100	38	80	113	200
Egigik	26	40	36	19	14	10	17	22
Ekuk	4	2	--	5	--	1	1	2
E kwo k	9	11	10	9	6	9	6	12
Igiugig	2	3	2	5	2	2	5	6
11 iamna	19	30	30	14	2	3	22	37
King Salmon	13	14	13	4	3	13	14	15
Kokhanok	5	5	3	6	2	5	3	7
Koliganek	20	23	25	16	2	11	16	19
Levelock	7	17	15	11	5	14	12	21
Manokatak	10	1	19	15	3	10	2	52
Naknek	47	66	67	56	13	44	56	64
New Stuyahok	32	29	32	14	2	9	20	38
Nondalton	27	29	28	12	3	4	7	12
Pedro Bay	9	10	9	8	3	2	4	7
Pilot Point	7	10	16	10	5	7	11	13
South Naknek	24	28	17	17	17	6	12	23
Togiak	28	29	41	65	6	44	70	86
Tununak	12	10	24	6	--	--	1	3
Ugashik	4	5	2	8	2	4	3	1

Source: Commercial Fisheries Entry Commission Data Files.

Note: This table is based on the number of fishermen who gave each community as a home address.

Table 3.1.174

Number of Commercial Fishing Permits, Bristol Bay Area, 1978

Community	# of Permit Holders	Number of Permits: Salmon Drift Gill Net Bristol Bay Area	Salmon Set Gill Net Bristol Bay Area	Herring Spawn on Kelp Unspecified Gear Statewide	Herring Purse Seine Westward Area	Herring Drift Gill Net Westward Area	Herring Set Gill Net Westward Area
Alaknagik	73	39	28	24	4	6	6
Clarks Point	34	17		4		2	4
Dillingham[1]	392	218	1;:	84	17	65	14
Egigik	66	36	35			1	
Ekuk	6	1	5				
Ekwok	17	17		2		2	1
Igiugig	3	1		2			
Iliamna[2]	57	33	26			1	
King Salmon[3]	61	21	26	19		6	2
Kokhanok	6	4	2				
Koliganek	21	15	5	1			
Levelock	33	14	8	16		16	16
Manokatak	136	43	59	66		13	12
Naknek	198	59	86	101		63	43
New Stuyahok	42	39	2	1		1	
Nondalton	31	12	19				
Pedro Bay	4		4	1			
Pilot Point	32	20	17				
South Naknek	61	14	49	1		2	2
Togiak	210	102	49	116		29	11
Tununak	11	9	2				
Ugashik	7	7	5				

[1]Two herring, beach seine, westward area permits held.
Two halibut, long line, statewide permits held.
[2]One halibut, long line, statewide permit held.
One salmon, set gill net, lower Yukon area permit held.
[3]Two salmon, set gill net, Peninsula-Aleutians area permits held.
One halibut, long line, statewide permit held.

Source: Commercial Fisheries Entry Commission Data Files.

Table 3.1.175

Number of Commercial Fishermen, Kuskokwim Area, 1969-1976

Community	Year 1969	1970	1971	1972	1973	1974	1975	1976
Akiachak	7	7	10	4	14	19	25	34
Akiak	4	4	4	5	5	15	8	13
Aniak	2	1	7	1	1	3	2	5
Atmautlauk	--	3	3	2	3	4	5	7
Bethel	51	66	81	81	73	91	85	165
Chefornak	5	6	6	6	--	--	6	7
Eek	12	17	11	13	8	21	9	21
Goodnews Bay	15	14	5	11	15	23	15	24
Kalskag	1	--	1	--	--	2	--	3
Kasigluk	12	12	6	6	12	9	7	20
Kipnuk	10	14	13	13	7	8	18	19
Kongiganak	4	3	3	4	6	13	3	6
Kwethluk	8	9	5	5	26	28	25	33
Kwigillingok	6	6	10	7	2	8	7	8
Napakiak	7	9	8	5	7	8	6	10
Napaskiak	7	6	5	2	1	3	5	5
Newtok	3	7	2	3	2	1	7	10
Nightmute	4	7	1	3	--	--	4	2
Nunapitchuk	15	14	12	7	10	20	9	20
Oscarville	--	--	--	--	1	--	1	--
Platinum	3	1	3	2	1	1	1	4
Quinhagak	16	12	11	23	18	17	12	29
Toksook Bay	17	17	18	10	--	--	12	24
Tuluksak	--	2	2	--	1	11	5	2
Tuntutuliak	7	6	4	12	15	17	12	18

Source: Commercial Fisheries Entry Commission Data Files.

Note: This table is based on the number of fishermen who gave each community as a home address.

Table 3.1.176

Number of Commercial Fishing Permits, Kuskokwim Area, 1978

Community	# of Permit Holders	Number of Permits: Salmon Set Gill Net Kuskokwim Area	Salmon Drift Gill Net Bristol Bay Area	Salmon Set Gill Net Bristol Bay Area	Freshwater Fish Set Gill Net Statewide
Akiachak	52	50	2		
Akiak	26	25	1		2
Aniak[1]	9	7		1	
Atmautlauk	29	29			
Bethel[2]	215	199	12	1	8
Chefornak	8	3	7		
Eek	46	42	9		
Goodnews Bay	40	33	8	1	
Kalskag	4	4			
Kasigluk[3]	42	42			
Kipnuk	24	12	13		
Kongiganak	21				
Kwethluk	76	75	1		4
Kwigillingok	21	18	5		
Napakiak	55	55	1		
Napaskiak[4]	28	26	1		
Newtok	7		7		
Nightmute	5		5		
Nunapitchuk	46	43	3		
Oscarville	7	7			
Platinum[5]	12	7	6		
Quinhagak[6]	95	90	7		
Tooksook Bay	14		14		
Tuluksak	24	24			
Tuntutuliak	58	57			7

[1] One salmon, set gill net, lower Yukon area permit held.
[2] One dungeness crab, pots, vessel 50 ft. or less, statewide permit held.
Four salmon, set gill net, Cook Inlet area permits held.
One halibut, long line, statewide permit held.
Two salmon, set gill net, lower Yukon area permits held.

Footnotes continued on following ------

Table 3.1.176 (Continued)

[3]One freshwater fish, drift gill net, statewide permit held.
[4]One freshwater fish, drift gill net, statewide permit held.
[5]One herring, beach seine, westward area permit held.
One herring, drift gill net, westward area permit held.
One herring, set gill net, westward area permit held.
[6]Three herring, set gill net, westward area permits held.

Source: Commercial Fisheries Entry Commission Data Files.

Table 3.1.177

Number of Commercial Fishermen, Lower Yukon Area, 1969-1976

Community	1969	1970	1971	1972	1973	1974	1975	1976	
	Year								
Alakanuk	3	3	5	1	8	12	9	9	
Emmonak	5	9	10	19	16	8	14	14	
Fortuna Ledge	8	2	2	2	4	4	7	1	2
Holy Cross	8	6	6	4	8	9	12	17	
Kotlik	4	10	7	2	4	6	4	5	
Marshall	--	--	--	--	--	1	1	8	
Mountain Village	22	19	16	27	31	32	34	47	
Pilot Station	9	12	5	5	7	6	6	1	3
Pitkas Point	?	2	2	--	7	4	7	9	
Russian Mission	3	2	2	1	2	3	2	7	
Scammon Bay	--	1	--	1	--	1	3	9	
Sheldon Point	1	1	--	--	2	1	--	--	
St. Marys	7	6	5	15	10	13	9	13	

Source: Commercial Fisheries Entry Commission Data Files.

Note: This table is based on the number of fishermen who gave each community as a home address.

Table 3.1.178

Number of Commercial Fishing Permits,
Lower Yukon Area, 1978

Community	# of Permit Holders	Number of Permits Salmon Set Gill Net Lower Yukon Area
Alakanuk	99	
Emmonak	105	1:;
Fortuna Ledge	34	34
Holy Cross	14	14
Kotlik	82	82
Marshall	19	19
Mountain Village[1]	112	110
Pilot Station	48	48
Pitkas Point	15	15
Russian Mission[2]	19	19
Scammon Bay	41	41
Sheldon Point	24	24
St. Marys[3]	63	61

[1] One salmon, set gill net, Kotzebue area permit held.
One salmon, set gill net, Norton Sound area permit held.
[2] One herring, set gill net, westward area permit held.
[3] One freshwater fish, set gill net, statewide permit held.
One freshwater fish, long line, statewide permit held.

Source: Commercial Fisheries Entry Commission Data Files,

Table 3.1.179

Number of Commercial Fishermen, Norton Sound Area, 1969-1976

Community	Year							
	1969	1970	1971	1972	1973	1974	1975	1976
Council	--	--	--	--	--	--	3	3
Elim	1	4	2	9	3	5	1 2	9
Golovin	7	2	4	4	8	14	5	17
Nome	7	7	6	19	11	15	24	24
Shaktoolik	--	3	4	1 0	2	1	2	6
St. Michael	2	1	--	--	1	1	3	--
Stebbens	--	--	--	--	--	--	--	--
Unalakleet	18	26	21	20	26	33	33	51
White Mountain	1	--	--	1	1	3	4	3

Source: Commercial Fisheries Entry Commission Data Files.

Note: This table is based on the number of fishermen who gave each community as a home address.

Table 3.1.180

Number of Commercial Fishing Permits, Norton Sound Area, 1978

		Number of Permits					
Community	# of Permit Holders	Salmon Set Gill Net Norton Sound Area	"Other" Species Other Gear Statewide	King Crab Unspecified Gear Norton Sound Area	Herring Spawn on Kelp Unspecified Gear Statewide	Salmon Set Gill Net Lower Yukon River Area	Herring Set Gill Net Westward Area
Council	1	1					
Elim[1]	47	45	16				
Golovin	17	17					
Nome[2]	136	23		113		1	1
Shaktoolik[3]	35	29	5	1	13		1
St. Michael	19		10		9	1	
Stebbins	8					8	
Unalakleet[4]	92	58		13	15	16	10
White Mountain	3	3					

[1] One king crab, unspecified gear, Norton Sound area permit held.
One herring, beach seine, westward area permit held.

[2] One unspecified species, set gill net, statewide permit held.
One freshwater fish, set gill net, statewide permit held.
One salmon, hand troll, statewide permit held.
One salmon, set gill net, Kotzebue area permit held.
One king crab, unspecified gear, Bering Sea permit held.
One salmon, drift gill net, Bristol Bay area permit held.
One king crab, pot gear, vessel over 50 ft., Cook Inlet area permit held.
One halibut, long line, statewide permit held.

[3] One herring, beach seine, westward area permit held.
Three salmon, set gill net, lower Yukon River area permits held.

[4] Three herring, beach seine, westward area permits held.
Four salmon, drift gill net, Bristol Bay area permits held.
One unspecified species, beach seine, statewide permit held.

Source: Commercial Fisheries Entry Commission Data Files.

Table 3.1.181

Number of Commercial Fishermen, Kotzebue Area, 1969-1976

Community	1969	1970	1971	1972	1973	1974	1975	1976
	Year							
Ambler	--	--	2	2	2	7	7	8
Buckland	--	--	--	--	--	3	2	2
Deering	--	--	--	1	--	10	15	1
Kivalina	--	3	4	3	8	8	7	5
Kotzebue	29	76	92	119	116	203	189	224
Noatak	--	3	4	7	2	7	13	15
Noorvik	1	2	2	-	-	4	7	16	13
Selawik	1	--	--	2	3	7	10	7

Source: Commercial Fisheries Entry Commission Data Files.

Note: This table is based on the number of fishermen who gave each community as a home address.

Table 3.1.182

Number of Commercial Fishing Permits, Kotzebue Area, 1978

Community	= of Permit Holders	Number of Permits: Salmon Set Gill Net Kotzebue Area	Number of Permits: Freshwater Fish Set Gill Net Statewide
Ambler	6	6	
Buckland	1	1	
Deering	8	8	
Kivalina[1]	10	10	
Kotzebue[2]	194	188	13
Noatak	15	15	
Noorvik	7	7	
Selawik	6	6	

[1] One freshwater, statewide permit held.

[2] One salmon, drift gill net, Bristol Bay area permit held.

Source: Commercial Fisheries Entry Commission Data Files.

Table 3.1.183

Fishermen's Gross Earnings by Census Division
1969 - 1976
(Mil lions)

	1969	1970	1971	1972	1973	1974	1975	1976
Aleutian Islands	$ 3.9	$ 5*5	$5.0	$4.6	$9.7	$ 8.0	$ 7.0	S14.8
Bethel	0.8	1.1	0.9	0.6	1.0	1.2	1.1	2.3
Bristol Bay	2.5	5.1	4.4	1.5	2.1	3.0	2.7	7.7
Bristol Bay Borough	0.6	1.3	0.7	0.2	0.2	0.7	0.5	0.9
Kobuk	0.1	0.3	0.2	0.3	0.9	1.6	1.3	0.4
Kuskokwim[1]	0.0	0.0	0.0	0.0	0+0	0.1	0.0	0.0
Nome	0.1	0.2	0.2	0.1	0.4	0.5	0.5	0.5
Upper Yukon[1]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Wade Hampton	0.7	1.0	2.0	1.5	2.1	2.7	2.4	3.5
Yukon/Koyukuk[1]	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.1

Source: Commercial Fisheries Entry Commission, Distribution of Incomes from Alaska Fisheries, 1978.

[1] During the years for which gross earnings of .$0.0 million are reported, the average *gross* earnings were $38,000, $6,000, and $33,000 respectively for the Kuskokwim, Upper Yukon, and Yukon/Koyukuk Census Divisions.

Table 3.1.184

Foreign Tanner Crab Harvest in
Western Alaska 1965-1977

Year	Japan Millions of Pounds	Japan Metric tons	Soviet Union Millions of Pounds	Soviet Union Metric tons	Total Millions of Pounds	Total Metric tons
1965	2.5	1,125	1.6	727	4.1	1,852
1966	3.6	1,628	1.6	727	5.2	2,355
1967	20.8	9,412	8.2	3,705	28.9	13,118
1968	28.9	13,096	8.4	3,815	37.3	16,911
1969	42.4	19,229	15.0	6,824	57.4	26,054
1970	43.8	19,884	13.8	6,257	57.6	26,142
1971	37.9	17,205	10.1	4,595	48.1	21,801
1972	37.6	17,045	0.0	0	37.6	17,045
1973	33.6	15,242	0.0	0	33.6	15,242
1974	33.7	15,288	0.0	0	33.7	15,288
1975	22.2	10,087	0.0	0	22.2	10,087
1976	23.2	10,541	0.0	0	23.2	10,541
1977	27.6	12,502	0.0	0	27.6	12,502

Source: Market Structure of the Alaska Seafood Processing Industry Vol. I Shellfish. F. L. Orth, J. A. Richardson and S. M. Pidde, University of Alaska, Sea Grant Report 78-10, 1979

Table 3.1.185

Number of Japanese Tanner Crab
Fishing Vessels, 1975-1977

	1975	1976	1977
Landbased Vessels	28	31	11
Motherships	2	2	2
Catcher Boats	12	12	12

Source: NPFMC, Fishery Management Plan for the Commercial Tanner Crab Fishery Off the Coast of Alaska, 1978

The sizes of the landbased vessels, motherships, and catcher boats are 209-454 metric tons, 6,800 metric tons, and 91 metric tons, respectively. A typical domestic Tanner crab boat is 28.5 meters (95 feet) and 127 metric tons.

million pounds) between 1968 and 1978. Over 300 vessel: have participated in this fishery in recent years. The vessels inc ude: mothership of 5,000 to 27,000 metric tons, 300-ton class trawlers, independent factory trawlers larger than 500 metric tons, 3,000 to 5,000 metric ton trawlers, 200 to 2,500 metric ton longline-gillnet vessels, refrigerated transports, Danish seiners of 100 to 150 gross tons, and pair trawlers of ?00 to 185 metric tons. More complete harvest and vessel activity data are presented in Tables 3.1.186 through 3.1.189, which are taken from the North Pacific Fishery Management Council Groundfish Plan for 1979. The location of the principal fishing grounds are depicted in Figure 3.8.

In addition to harvesting large quantities of the species targeted on, the foreign groundfish fleets also harvest large quantities of non-targeted species. Halibut, herring, crab, and salmon are among the incidental catch. It has been estimated that the annual incidental halibut catch by foreign trawlers operating in the Bering Sea ranged from 52 metric tons (0.1 million pounds) to 11 ,519 metric tons (25.4 million pounds) between 1954 and 1974 (see Table 3.1.190). It is believed that the incidental catch has been reduced since 1974 due to reduced fishing effort and time/area closures, designed to protect halibut (NPFMC, 1979, p. 5-29).

Japan and the Soviet Union have been the historic participants in the directed distant water herring fishery conducted primarily northeast of the Pribilof Islands. Due, however, to time/area restrictions and catch quotas, the herring caught by the foreign fleet is now incidental to the

Table 3.1. 186. All-nation catches in the Bering Sea/Aleutian Region, by major species groups, for the last 10 years of record (1000's mt)1/.

Species/	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978 2/
Pollock	702	863	1,257	1,744	1,875	1,759	1,588	1,357	1,238	888.2	921.3
Pacific cod	63.7	53.3	74.6	50.5	47.0	58.6	67.0	55.1	57.8	36,5	31.3
Pacific ocean perch	76.4	53.3	76.8	31.6	38.9	15.5	36.5	25.2	32,6	10.8	7.4
Sablefish	20.5	20.4	13.8	18.0	19.0	10.6	7.7	5.0	8.2	4.6	1.6
Halibut	7.1	6.3	7.7	8.6	5.9	4.3	2.2	1.6	1.2	0.6	4/
Flounders	149.9	236.2	234.9	323.4	237.7	207.1	196.3	200.4	187.2	121.9	208.3
Atka mackerel	3/	3/	1.0	3/	4.7	1.7	1.4	13.3	20.7	21.0	22.4
Others	31.5	14.4	25.9	41.5	134.7	62.3	79.9	61.9	45,6	57.3	73.9
All species	1,051.1	1,247.1	1,691.7	2,216.6	2,362.9	2,119.1	1,979.0	1,719.5	1,591.3	1,140.9	1,272.2

1/ Values in this table may differ slightly from those used elsewhere in this document because of differences in apportioning between species not clearly listed in foreign statistical reports or differences in treating estimates based on U.S. surveillance when catches were not reported.

2/ Preliminary.

3/ Catch, if any, included under "Others".

4/ Unknown at this time

Source: North Pacific Fishery Management Council, Fishery Management Plan for the Groundfish Fishery in the Bering Sea/Aleutian Island Area, 1979.

Table 3.1.187

Number of fleets in the Japanese mothership fishery and number of vessels in Japanese North Pacific trawl and longline-gillnet fisheries and landbased trawl fishery (data from Forrester et al. 1974; Yamaguchi 1974, 1975; Sasaki 1977).

	Number of mothership fleets					Number of independent vessels		
Year	Freezing fleet 1/ for flounders only)	Freezing fleet 2/ (including other than flounders)	Meal and mince-fleet 3/	Long-line-gill-net fleet 4/	Total	North Pacific trawl fishery 5/	North Pacific longline-gillnet fishery 6/	Land-based trawl fishery
1954	2	—	—		2	2	—	—
1955	2		—		2	3	—	—
1956	4	—	—		4	1		—
1957	4		—	—	4	—	—	—
1958	2	—	1	1	4	--	—	—
1959	4	—	1	1	6	2	—	—
1960	3	1	5	4	13	--	—	—
1961	—	13	5	14	32	3		54
1962	—	U	5	5	21	2	—	70
1963	—	10	2	5	17,	2		93
1964	—	6	4	2	12	2	—	103
1965	—	6	4	2	12	2	—	126
1966	—	8	4	1	13	2	—	172
1967	—	7	5	2	14	42	22	173
1968	—	6	5	1	12	42	22	184
1969	—	5	S	1	11	42	21	182
1970	—	3	6	1	10	42	22	182
1971	—	5	6	1	12	42	22	182
1972	—	4	6	8/	10	42	22	182
1973	—	4	6	--	10	42	26	182
1974	--	4	6		10	42	30	182.
1975	--	3	5	—	8	35	27	182
1976	—	3	5	—	8	54	32	182

1/ Flounder fleet: The fleets, each composed of a mothership of 7,000-9,000 tons, equipped with freezing facilities and having several 300—ton class trawlers attached to it, caught mainly yellowfin sole for freezing off Bristol Bay.

2/ Freezing fleet: The fleets, each composed of a mothership of 5,000-10,000 tons with freezing equipment, accompanied by trawlers as well as Danish seiners, which also fished longlines and gillnets, caught halibut, blackcod, herring, Pacific ocean perch, etc. These fleets operated along the continental slope between Unimak Pass and Cape Navarin, in the Gulf of Olyutorskii, and in Aleutian waters.

Source: North Pacific Fishery Management Council, Fishery Management Plan for the Groundfish Fishery in the Bering Sea/Aleutian Island Area, 1979.

Table 3.1.188

Monthly range in number of" USSR vessels operating in the eastern Bering Sea and Aleutian Islands in 1966-77 (Office of Enforcement and Surveillance 1967-70; Enforcement and Surveillance Division 1971 and 1973; Law Enforcement Division 1974, 1975, and 1977).

Year	Range in monthly number: Factory ships 1/	Factory stern trawlers	Other trawlers	Support 2/	Total	Month of maximum number
Eastern Bering Sea						
1966	0-14	0-15	0-40	0-3	0-72	Ear.
1967	0-15	0-12	0-60	0-3	0-90	Feb. - Mar.
1968	0-13	0-25	2-60	0-2	2-99	Feb.
1969	0-8	0-50	6-67	1-23	7-147	Feb.
1970	0-7	0-52	8-92	0-22	9-173	Feb.
1971	0-8	0-65	5-87	0-21	6-171	Feb.
1972	0-8	0-39	1-89	0-21	3-155	Feb.
1973	0-6	1-27	6-60	0-6	7-82	Feb.
1974	0-5	4-30	6-51	1-10	14-79	Feb. and Apr.
1975	0-4	4-13	5-36	1-7	13-51	June
1976	0-5	2-30	7-48	0-6	13-86	Apr.
Aleutian Islands						
1966	0-3	0-10	0-10	0-1	0-24	Aug.
1967	0-6	0-12	0-21	0-3	0-42	June
1968	0-4	0-14	0-23	0-1	7-28	Mar.
1969	0	0-7	0-13	0-1	3-14	Jan. and Dec.
1970	0	0-5	0-14	0-1	1-15	Jan .
1971	0	0-6	2-15	0-1	6-17	May
1972	0-1	0-5	3-19	0-1	4-21	Dec.
1973	o	0-4	6-17	0-3	6-20	Apr.
1974	0	0-2	0-19	0-5	0-24	Mar.
1975	0-1	0-30	0-1o	0-4	2-33	Sept.
1976	0	0-27	0-4	0-5	0-32	May

1/ Including all processing and refrigerated transport vessels.

2/ including tankers, tugs, cargo, and repair ships.

Source: North Pacific Fishery Management Council , Fishery Management 'Ian 'or the Groundfish Fishery in the Bering Sea/Aleutian Island Area, 1979.

Table 3.1.189'

Number of vessels operating in the Korean groundfish fishery in the eastern Bering Sea, Aleutian Islands, and Gulf of Alaska, 1968-74 (Office of Enforcement and Surveillance 1969, 1970; Enforcement and Surveillance Division 1971, 1973; Law Enforcement Division 1974, 1975, and 1977).

Year	Pair trawlers	Stem trawlers	Long-liners	Danish seiners	Factory ships	Processors and/or transport vessels	Total
1968	6	1	0	0	0	2	9
1969	7	4	0	0	1	3	15
1970	11	2	0	0	2	2	17
1971	10	3	0	0	1	3	17
1972	0	6	0	0	0	0	6
1973	8	10	I	0	3	0	22
1974	22	5	8	1	2	3	41
1975	0	13	9	1	0	0	23
1976	29	16	12	0	1	0	58

Source: North Pacific Fishery Management Council, Fishery Management Plan for the Groundfish Fishery in the Bering Sea/Aleutian Island Area, 1979.

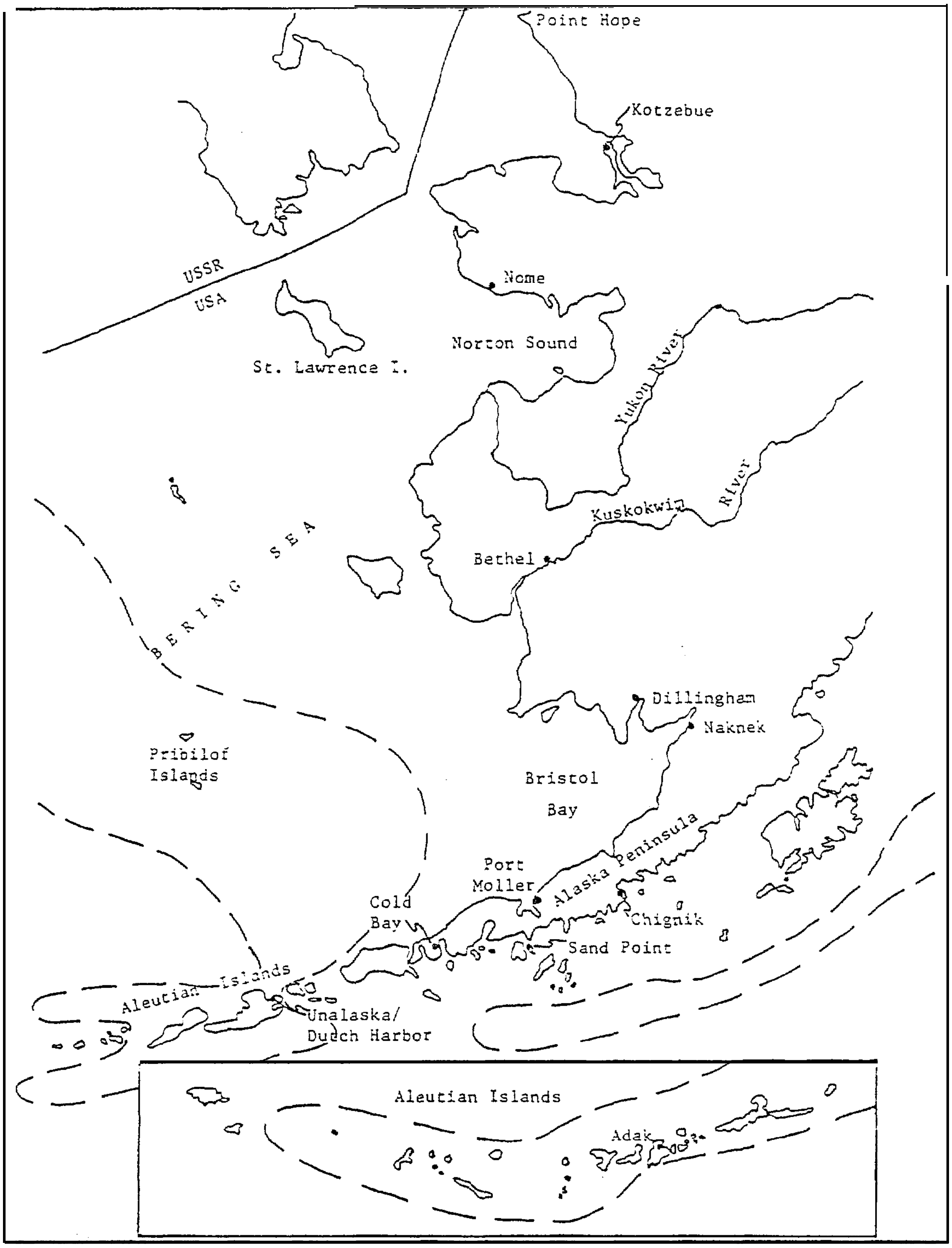


Figure 3.8: Foreign Groundfish Fishing Areas in the Bering Sea/Aleutian Islands Area.

Source: North Pacific Fishery Management Council, Fishery Management Plan for the Groundfish Fishery in the Bering Sea/Aleutian islands Area, 1979.

Table 3.1.190

Summary of the estimated halibut catch (m.t.) by Foreign Trawlers in the Bering Sea and the Northeast Pacific, 1954-1974

	Bering Sea			
	Japan			
Year	Mothership-Independent Fleet	Land-Based Fleet	U.S.S.R.	Total
1954	52			52
1955	42			42
1956	102			102
1957	102			102
1958	168			168
1959	520		374	894
1960	1,590		576	2,166
1961	2,303		926	3,229
1962	1,420	112	837	2,369
1963	125	659	555	1,339
1964	412	1,278	476	2,166
1965	440	1,386	540	2,366
1966	693	2,533	600	3,826
1967	1,341	5,301	738	7,380
1968	1,765	3,582	592	5,939
1969	2,176	3,594	972	6,742
1970	2,759	5,677	957	9,393
1971	3,484	5,728	2,307	11,519
1972	3,259	3,678	2,178	9,115
1973	2,567	2,489	1,937	7,043
1974	1,807	1,581	2,458	5,846

Source: IPHC Scientific Report No. 60, The Incidental Catch of Halibut by Foreign Trawlers.

winter pol lock trawl fishery (NPFMC, August 1979, p. ii). The harvesting activity for the foreign herring fishery (both directed and incidental) is summarized in Tables 3.1.191 through 3.1.193.

King crab and Tanner crab are also incidental catch of the foreign groundfish fleet. Estimates of the incidental crab catch by the foreign trawl fishery *in* the Bering Sea are presented in Table 3.1.194, Incidental catch of salmon also occurs. The 1977 incidental catch is estimated to have been 191 metric tons (421,000 pounds), of which over 90 percent were king salmon (NPFMC, November, 1979, p. 8-8).

PROCESSING

The onshore components of the Western Alaska commercial fishing industry are discussed in this section by census division, and the nature of the markets for seafood products and the organization of the industry are discussed for the area as a 'whole. The onshore components considered are processing activity and commercial fishing industry use of community infrastructure. The census divisions of Western Alaska are depicted in Figure 3.9 and the onshore centers of industry activity are depicted in Figure 3.10.

ALEUTIAN ISLANDS CENSUS DIVISION

Communities within the Aleutian Islands Census Division serve as the principal bases of operation for the harvesting activities of both the

Table 3.1.191

Comparison of catch quotas and reported catches in metric tons by calendar year for foreign fisheries in the eastern Bering Sea, 1973-1979.

	1973	1974	1975	1976	1977	1978	1979
Japanese Trawl							
Quota	33,000	33,000	15,000	15,000	5,800	2,580	2,413
Catch	385	2,298	1,078	3,760	5,041	2,320	
Japanese Gillnet							
Quota	4,600	4,600	3,000	3,000	1/	1/	1/
Catch	1,878	3,337	736	2,668	551	2/	198
USSR Trawl							
Quota	3/	3/	30,000	30,000	13,600	6,060	5,657
Catch	34,361	19,800	14,201	16,812	13,145	6,663	
ROK							
Quota						20	450
Catch						19	
Taiwan							
Quota						10	25
Catch						0	
Poland							
Quota							125
Catch							
Combined Fisheries							
Quota	3/		2/48,000	48,000	19,400	8,670	8,670
Catch	36,274	25,435	16,015	23,240	18,737	8,983	198

1/ Combined with trawl fishing
2/ No effort
3/ Quotas not established

Source: North Pacific Fishery Management Council, Bering-Chukchi Sea Herring, Draft Fishery Management Plan, 1979.

Table 3.1.192

Total catch, directed catch, incidental catch and percentage of incidental catch of herring in the Japanese trawl fishery, 1967-75,

Year (Jul-Jun)	Total trawl catch (ret)	Directed catch 1/	Incidental catch (ret)	Incidental Total (%)
1967-68	9,486	9,209	277	3.0
1968-69	50,857	46,392	4,465	9.0
1969-70	23,901	22,861	1,040	4.0
1970-71	24,236	24,125	111	0.5
1971-72	13,143	12,970	173	1.0
1972-73	346	70	276	80.0
1973-74	219	10	209	95.0
1974-75	2,663	292	2,371	89.0

1/ Directed catches are those in which herring accounted for 30% *or* more in the monthly catches in 1/2° x 10 statistical areas.

Source: North Pacific Fishery Management Council , Bering-Chukchi Sea Herring, Draft Fishery Management Plan, 1979.

Table 3.1.193

Number of vessels in the. Soviet and Japanese eastern' Bering Sea herring fleet by month, 1964-1976. '

Nation	Fishing year	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
U.S.S.R.									
	1964-65		30	120	120				
	1965-66		1/	15	15				
	1966-67		1	6	6				
	1967-68		1	14	31	30			
	1968-69		30	45	70	70	30		
	1969-70	6	80	81	105	1/	1/		
	1970-71	12	82	117	100	50	40		
	1971-72	29	50	90	80	60	1/		
	1972-73		25	65	66	40	40		
	1973-74	12	45	63	78	50			
	1974-75		45	50	45				
	1975-76 2/				30	39	39		
Japan									
	1966-67							1	1
	1967-68							17	17
	1968-69	14	14	14	14	14	14	24	42
	1969-70	6	1/	25	13		1	12	14
	1970-71	3	3	20	10			15	10
	1971-72	10	31	12	12	7	16	3	15
	1972-73		12	12			1/	13	15
	1973-74	4	4	12	12	12		8	11

1/ Vessels present but number unknown.

2/ Fleet also fishing for pollock.

3/ All trawlers Nov-March; both trawlers and gillnetters during April; predomina gillnetters during May and June.

Sources: NMFS Law Enforcement and Surveillance Division Foreign Fisheries Activities Reports, 1964-1975.
INPFC Annual Reports, 1965-1977.

Source: North Pacific Fishery Management Council, Bering-Chukchi Sea Herring, Draft Fishery Management Plan, 1979.

Table 3.1.194

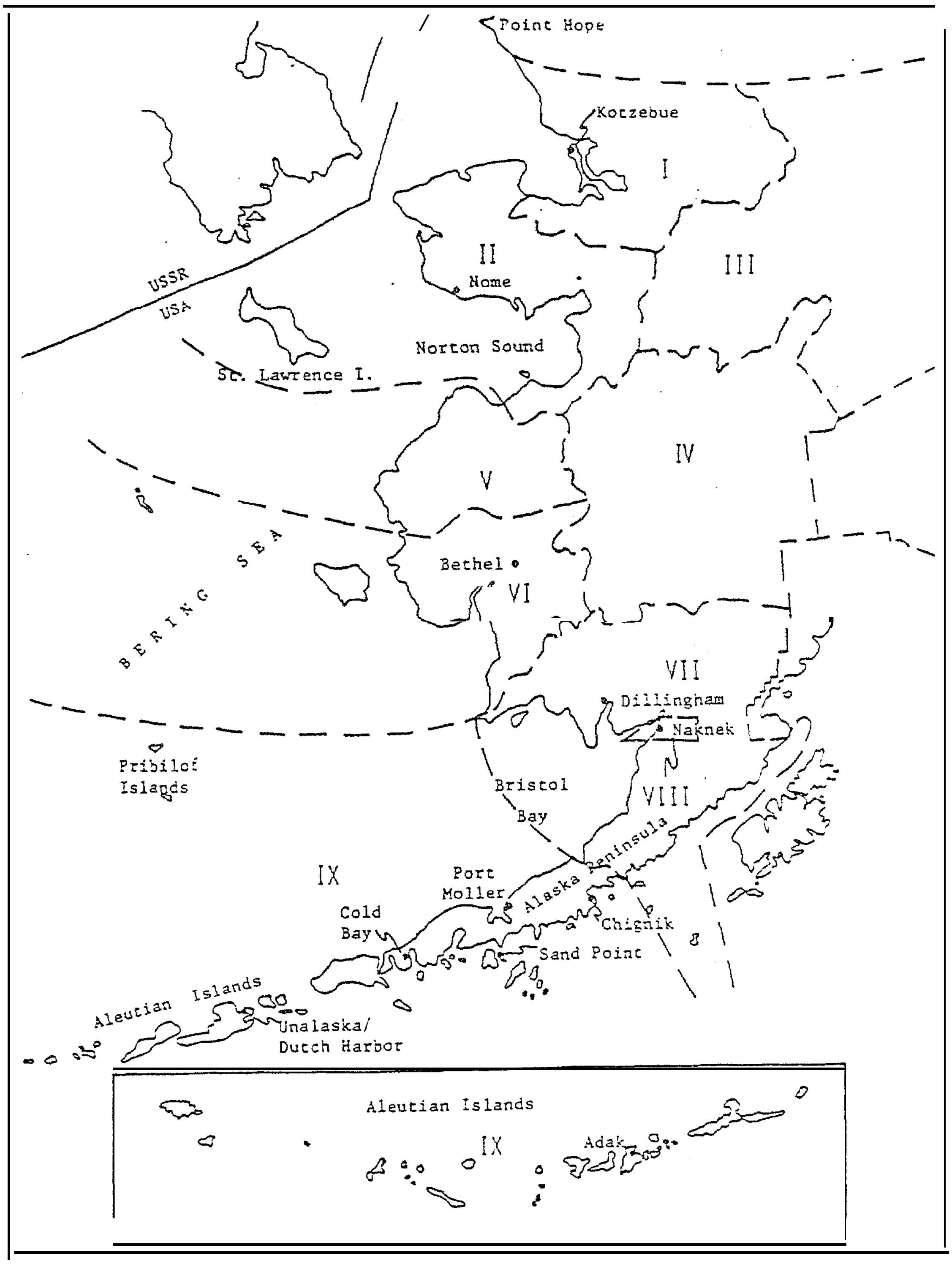
Estimated Incidental King and Tanner
Crab Catch by the Foreign Trawl Fleet
in the Bering Sea, 1973-1977

Year	King Crab Number of Crabs	King Crab Millions of Pounds	Tanner Crab Number of Crabs	Tanner Crab Millions of Pounds
1973	465,600	1.2	112,000,000	81.5
1974	489,900	1.2	155,000,000	112.8
1975	155,900	0.4	60,000,000	43.7
1976[1]	?	?	26,000,000	18.9
1977[2]	297,300	0.7	9,600,000	7.0
1977	595,800	1.5	17,500,000	12.7

Source: NPFMC, Fishery Management Plan for the Groundfish Fishery in the Bering Sea/Aleutian Island Area, November 1979

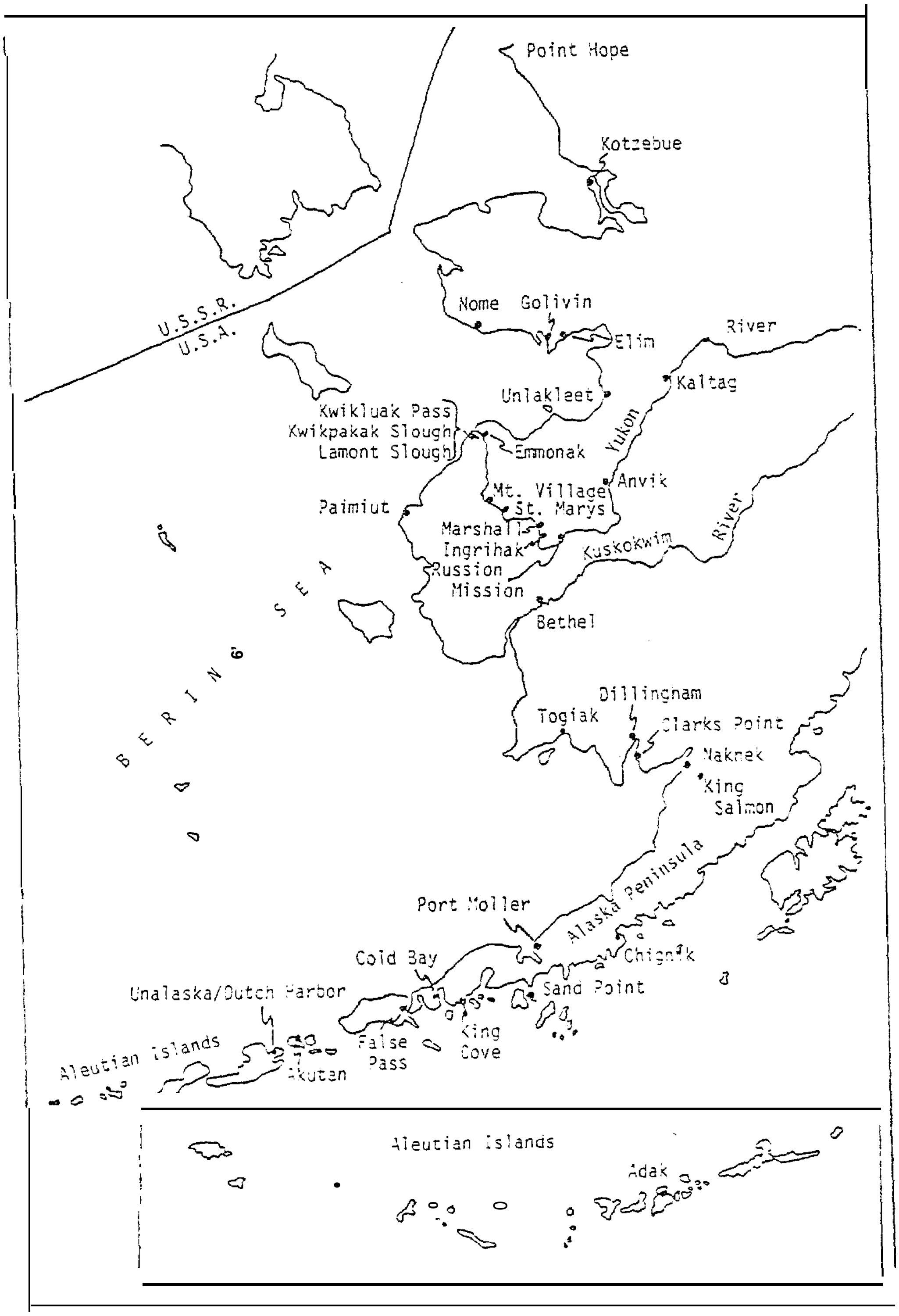
[1] The estimates of incidental catch of 1973 through 1977 are based on data collected by U.S. observers who were aboard Japanese independent trawlers (large trawlers) and groundfish motherships.

[2] The second estimate for 1977 also includes U.S. observer data for the Japanese landbased dragnet (small trawlers) fleet and the Soviet and Korean trawl fleets.



I Kobuk	IV Kuskokwim	VII Bristol Bay
II Nome	V Wade Hampton	VIII Bristol Bay Borough
III Yukon- Koyukuk	VI Bethel	IX Aleutian Islands

Figure 3.9: Alaska Census *Divisions*



F gure 3. : Onshore Centers of rcia shing Industry Activity in Western Alaska

Figure 3.10 (continued)

Alaska Peninsula Area Fish Processors:

Chignik	1 processor, permanent onshore facility, salmon; several mobile processing ships operate in the area, salmon;
King Cove	1 processor, permanent shorebased facility, species processed unknown;
Port Moller	1 processor, permanent onshore facility, salmon freezing; several mobile processing ships operate in the area, salmon;
Sand Point	1 processor, permanent *onshore* facility, salmon and shellfish.

Aleutian Island Area Fish Processors:

Adak	1 processor, permanent onshore facility, shellfish;
Akutan	5 processors, semi -permanent processing ships, shellfish;
Unalaska/ Dutch Harbor	17 processors, 4 onshore and 13 permanent processing ships, shellfish;
False Pass	1 processor, permanent onshore facility, salmon and shellfish.

Bristol Bay Area Fish Processors:

Clarks Point	1 processor, permanent onshore facility, salmon;
Dillingham	at least 2 processors, permanent onshore facilities, salmon; approximately 6 mobile processing ships operate in area; salmon; approximately 20 buyers purchase salmon over the city dock.
King Salmon	at least 2 large icing operations, salmon; several buyers, salmon; King Salmon airport is fly out point for much Naknek-landed
Naknek	9 processors, permanent facilities, (5 onshore, 4 floaters) salmon; approximately 20 mobile processing ships operate in the area. salmon; approximately 45 buyers purchase salmon;
Togiak	2 processors, permanent onshore facilities, salmon and herring; several mobile processing ships operate in the area, salmon and herring.

*

Figure 3.10 (continued)

Kuskokwim Area Fish Processors:

Bethel	3 processors, permanent facilities, salmon; numerous mobile processing ships operate in Kuskokwim River below Bethel to Kuskokwim Bay, salmon.

Lower Yukon Area Fish Processors:

Approximately 16 buyers and mobile processing ships work at the following locations processing salmon:

Anvik	Kwikpakak Slough
Black River	Lament Slough
Emmonak	Marshall
Hess Creek	Mountain Village
Ingrihak	Saint Marys
Kaltag	Paimiut
Kwikluak Pass	Russian Mission

Norton Sound Area Fish Processors:

Elim	1 buyer, salmon, flown out in round
Golovin	1 processor, permanent facility, freezes salmon
Nome	4 buyers, salmon, flown outin round
Unalakleet	1 buyer, salmon, flown out in round

Kotzebue Area Fish Processors

Kotzebue	4 buyers, salmon, flown out in round

shellfish fisheries in the Peninsula, Eastern Aleutians, Western Aleutians, and Bering Sea Management Areas arid the finfish fisheries of the Chignik, Peninsula, Eastern Aleutians, Western Aleutians, and Bering Sea Management Areas. The communities are also the sites of much of the processing activity which results from the harvests in the aforementioned management areas.

Processing Activities

Processing facilities for various species of fish are located throughout the Aleutian Islands Census Division. Generally, the plants are more apt to specialize *in* shellfish processing as the location becomes more westerly. Processing plants along the Peninsula often *process* salmon and shellfish, while plants as far west as Unalaska/Dutch Harbor usually process only crab.

Processing plants are located along the Peninsula at Chignik, Sand Point, Squaw Harbor, King Cove, False Pass, and Port Moller. Facilities at these locations are often supplemented by processing ships, each of which may operate at a number of locations during the year. Shore-based facilities provide a mixture of canning and freezing capabilities; some specialize in shrimp, crab, or salmon, while others process a variety of species. Floating processing facilities a' most always freeze their product and are relied *on most* heavily dur' ng the relatively short and intense salmon harvest.

Unalaska/Dutch Harbor is the center of Western Alaska's shellfish fishery. Little salmon *or* other finfish is caught or processed in the immediate area, The number of processing plants located at Unalaska/ Dutch Harbor has increased rapidly due to the use of processing ships, or "floaters". Only four land-based processing facilities operate in the community, but there are more than 12 permanently moored floaters which are utilized during the king crab and Tanner crab seasons.

Akutan, which is just northeast of Unalaska, has also become a pro-*cessing* center for western Alaska shellfish. Reportedly due to over-crowding around Unalaska, approximately five floaters operate in Akutan Bay and two or three more are expected to locate there soon. Adak , which is considerably west of Unalaska, is the site of the most westerly shellfish processing plant.

Processing activity in the Aleutian Islands Census Division is seasonal for most plants, with their operating schedules dependent upon the species processed. Due to the sparce population of the area , local residents are general ly not relied upon to provide a substantial portion of the plants' labor requirements. Rather, entire crews are usually recruited from other areas of Alaska and from the "Lower 48", and housed in dormitories at the plants during the processingseasons. Many workers are college students seeking temporary employment and immigrants 'who are recruited from the Seattle area.

Manufacturing employment. and wage statistics for the Aleutian Island Census Division are summarized in Tables 3.2.1 through 3.2.3. Within this area, manufacturing is almost exclusively fish processing; and fish processing employment including warehousing and wholesaling employment is principally included in manufacturing; therefore, the manufacturing data closely approximates the data for fish processing. *Department* of labor statistics indicate that broadly defined processing employment ranged between 101 and 105 percent of manufacturing employment from 1975 through 1978. The seasonality of processing employment within an individual community or region can be substantially greater than that for the census division as a whole since, as was mentioned above, there is a tendency for the processing activity within a community or area to be *concentrated on* a few species *or* species groups.

Broadly defined, the *processing* capacity of an area is its capacity both to act as a point of landing for fish and to prepare fish for transportation to other areas for further processing and marketing. The principal determinants of processing capacity include (1) the capacity of buying, icing, salting, and processing facilities and (2) the capacity of the transportation system which links an area with areas in which further processing and marketing occur, The dominant characteristics of processing capacity are that it is difficult to measure and it is seldom measured in a meaningful way because it is a complex concept; and it can change rapidly. For example, using actual production as a lower limit measure of capacity, Western Alaska king crab processing capacity increased at *an* annual rate of 21 percent from 1972 through 1976,

Table 3.2.1
Aleutian island Division
Quarterly Manufacturing Employment and Wages
1970-1978

	Man Months Quarter					Wages Quarter ($1>000)				
Year	1st	2nd	3r'd	4th	Annual	1st	2nd	3rd	4th	Annual
1970	1271.0	1045.0	2167.0	1231.0	5714.0	605.0	694.0	1996.0	889.0	4184.0
1971	1549.0	1420.0	2522.0	2397.0	7888.0	664.0	834.0	2544.0	1661.0	5703.0
I972	1335.0	1345.0	2394.0	2241.0	7315.0	764.0	755.0	2028.0	1440.0	4987.0
1973	1253.0	1349.0	2524.0	2967.0	8093.0	700.0	861.0	2242.0	1750.0	5553.0
1974	2067.0	2443.0	3104.0	2599.0	10213.0	1195.0	2044.0	3081.0	2810.0	9130.0
1975	1435.0	1562.0	2327.0	3651.0	8975.0	1076.0	1307.0	2420.0	3647.0	8450.0
1976	2067.0	2940.0	2841.0	3793.0	11641.0	1847.0	3654.0	4573.0	4295.0	14369.0
1977	2241.0	3592.0	3074.0	4545.0	13452.0	2455.0	4240.0	4815.0	5347.0	16857.0
1978	3765.0	5340.0	4947.0	5395.0	19455.0	3996.0	5754.0	7679.0	6097.0	23526.0

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

Note: The number to the right of the decimal point indicates the number of months or quarters data are not available due to confidentiality requirements.

Quarterly and annual employment data are the summation of monthly employment data which are based on the number of people employed by individual firms during a specific pay period each month.

Table 3.2.2
A eutian Island Division
Monthly Manufacturing Employment
1970-1978

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1970	553.0	466.0	252.0	226.0	331.0	488.0	820.0	919.0	428.0	371.0	420.0	440.0
1971	550.0	597.0	393.0	365.0	449.0	606.0	912.0	996.0	614.0	666.0	958.0	773.0
1972	4 7.0	470.0	448.0	344.0	475.0	526.0	995.0	831.0	568.0	742.0	846.0	653.0
1973	428.0	4[illegible].0	371.0	363.0	391.0	595.0	863.0	992.0	669.0	837.0	1082.0	1048.0
1974	627.0	700.0	740.0	711.0	824.0	908.0	983.0	1113.0	1008.0	982.0	964.0	653.0
1975	591.0	477.0	427.0	512.0	505.0	485.0	716.0	[illegible] 3.0	798.0	1334.0	1287.0	1030.0
1976	5 6.0	748.0	803.0	887.0	1063.0	990.0	919.0	[illegible]49.0	973.0	1169.0	1317.0	1307.0
1977	572.0	[illegible]46.0	023.0	973.0	1150.0	1469.0	843.0	942.0	1289.0	1635.0	1568.0	1342.0
1978	97	245.	557.0	1906.0	823.0	1619.0	1392.0	1723.0	1832.0	2234.0	1894.0	1267.0

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

Note: The number to the right of the decimal point indicates the number of months data are not available due to confidentiality requirements.

Table 3.2.3
Aleutian Islands Census Division
Number of Reporting Units in Manufacturing by Quarter
1970-1978

Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1970	18	17	18	17
1971	16	16	15	20
1972	19	18	20	19
1973	19	19	20	23
1974	22	21	24	24
1975	22	21	19	19
1976	19	19	19	19
1977	20	17	19	19
1978	18	19	20	18

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

Tanner crab processing capacity increased at an annual rate of 150 percent, and the combined processing capacity for king and Tanner crab increased at an annual rate of 30 percent (ADF&G Statistical Leaflet No. 29).

Processing capacity is primarily important because it can constrain harvesting activity in an area; harvest levels therefore provide a usefullower limit measure of capacity. That is, if a particular harvest level is landed in an area and prepared for transportation to other areas for further processing and marketing, the processing capacity of the area is at least equal to that harvest level. Using recent harvest levels as measures of processing capacity, the Aleutian Islands Census Division processing capacities are as follows: salmon 29,300 metric tons (64.6 million pounds), king crab 62,200 metric tons {137.2 million pounds), and Tanner crab 39,600 metric tons (87.2 million pounds). The salmon processing capacity figure is based on the Chignik and Peninsula harvests in 1979. The crab processing capacity figures are based on the total Western Alaska crab harvests in 1979 because they are principally processed in the Aleutian Islands Census Division. Capacity figures for halibut and shrimp are not included because the halibut and shrimp harvested in waters adjacent to the Aleutian Islands Census Division are primarily landed and processed in Kodiak.

Community Infrastructure

The infrastructure of the communities of the Aleutian Islands Census Divison and the use made of it by the commercial fishing industry are discussed in this section.

Electricity.

Electricity in the Alaska Aleutian Islands Census Division is generated by diesel-powered equipment operated by communities or individual consumers. Due to the small population and remoteness of the area, fish processing firms are usually self-sufficient for their electricity needs. Small communities generally cannot afford to maintain adequate generating capacity to fulfill the needs of fish processing firms which often operate seasonally.

Unalaska/Dutch Harbor is the center of the area's population and industry. The city generates only 600 KW of electricity out of an estimated community load of 15,000 KW when the fish processing plants are operating at high levels. Due to the apparent permanence of the processing industry and the good probability of growth, the city is attempting to have two hydroelectric plants constructed which could accommodate the needs of present electricity consumers and provide more attractive amenities to potential businesses. Construction of the hydroelectric facilities could occur within five years, but no definite timetable is available.

Water.

Communities located in the Alaska Peninsula-Aleutian Islands area generally are quite small and do not have sophisticated water systems. With the exception of the fish processing boom in Unalaska, there has not been a need to develop facilities to accommodate the needs of many people and commercial users.

Unalaska and Sand Point are two of the area's major communities. The City of Sand Point utilizes a reservoir to accumulate enough runoff for its water needs. Unalaska operates a military woodstave system, which is a type of dam and reservoir, and can provide about 18,900 liters (5,000 gal 1 ens) of water per minute except during extraordinary 1 y cold weather when the runoff is reduced by freezing. Unalaska has recently become one of the nation's largest fish processing centers, and city officials report that continued growth will require expansion of the water system.

The area receives a rather large amount of precipitation throughout much of the year, which could be utilized to develop large capacity water systems for commercial users if necessary.

Port Facilities.

Several ports are located in the Alaska Peninsula-Aleutian Islands area. Those of primary importance are at Unalaska/Dutch Harbor, Sand Point, and Cold Bay. Until the recent fish processing boom at Unalaska/Dutch

Harbor, there has been little reason to fully develop the port facilities at these locations. Also, Cold Bay and Sand Point reportedly face water depth limitations which could force larger vessels to coordinate their arrivals and departures with the tide.

Due almost solely to the rapid growth of the seafood processing industry at Unalaska/Dutch Harbor, the local port is undergoing significant upgrading. American President Lines (APL), a major freight hauling firm, is currently constructing a 122 meter (400-foot) dock, cold storage facilities, and other related port facilities, with the estimated value of the project being $27 million. Ocean-going freighters and barges will be able to call at the port with no difficulty, facilitating direct shipment of processed seafood to the large Japanese market. In 1979, approximately 15,000 metric tons of processed seafood were shipped directly from Unalaska/Dutch Harbor to Japan. Japanese tramp steamers hauled 12,000 metric tons, or 80 percent, of that amount. It is expected that American firms such as APL and Sealand will largely displace the Japanese haulers within a few years, and that proper coordination of the American ships' arrivals and departures will prevent serious congestion of the port.

Small Boat Harbor.

Communities located in the Alaska Peninsula-Aleutian Island area generally do not maintain small boat harbors. Commercial fishing boats in the area range from skiffs of only about 6.1 meters (20 feet) long up to vessels of around 61 meters (200 feet) long. Vessels usually tie up at processing firms' docks, city docks, and at any other suitable places which can be found. Smaller boats can often be removed from the water during periods of non-use.

The City of Sand Point maintains a state-constructed small boat harbor which is the most complete facility in the Alaska Peninsula-Aleutian Island area. Stalls ranging from 9.1 meters (30 feet) to 18.9 meters (62 feet) in length are provided, and a 141.5 meter (464-foot) finger float offers moorage for larger vessels.

Both Unalaska and Sand Point intend to construct harbor facilities. Construction of the small boat harbor at Unalaska designed to accommodate all sizes of fishing vessels operating in the area may begin in 1980. Any new small boat facilities at Sand Point may be incorporated into a port project; however, a timetable and further details are not known.

BRISTOL BAY - BRISTOL BAY BOROUGH CENSUS DIVISIONS

Communities within the Bristol Bay Census Divisons are the principal bases of operations for harvesting and processing activities associated with the salmon and herring fisheries in the Bristol Bay Management Area.

Processing Activity

Dillingham and Naknek are considered centers of the Bristol Bay commercial salmon industry. Most fishing is based out of these towns and other smaller surrounding communities, and processing activities are also centered in these areas. Most of the Bristol Bay salmon harvest is either frozen or canned locally. When local processing capacity is inadequate, fish are flown to other areas for processing; this greatly increases the overall capability to process Bristol Bay salmon. Shore-based plants, which have provided most of the area's canning capacity, are being converted from canneries to freezing plants. Processing ships, referred to as "floaters", are becoming increasingly prevalent; they usually freeze their product.

Only two processing facilities actually operated in Dillingham in 1979, but several other processors including six floaters operated in the surrounding Nushagak Bay vicinity. Dillingham city officials reported that over 20 firms received fish at the Dillingham city dock during the 1979 salmon season. The buyers who are not associated with local processing facilities primarily buy fish which are flown to other areas for processing.

Persons familiar with the local commercial fisheries indicated that approximately 45 buyers were active in the Naknek area for the 1979 salmon season. Nine onshore plants and 20 floaters accounted for many of the buyers; buyers who fly fish to other areas comprise the bulk of the remainder. Most shore-based processing facilities still can their product, though a definite conversion to freezing is occurring.

The City of King Salmon, though several miles inland, serves as an important link in the fly-out processing operations. King Salmon is connected to Naknek by road, and provides an adequately large airport to allow efficient air transport of salmon. Due to the strategic role of King Salmon, several buyers and chilling operations are located there.

Two onshore plants, several floaters, and over 20 buyers operate in the vicinity of Togiak, along Bristol Bay's northern coast. Their efforts are directed primarily at canning, freezing, and flying out fresh salmon and salting or freezing herring. Bristol Bay's herring fishing is concentrated near Togiak. Five processors and 27 buyers participated in the 1980 herring fishery (ADF&G, July 1980). Only superficial processing of herring consisting of salting or freezing occurs in the local area before the herring is shipped to the Orient or Kodiak for further processing.

Fish processing firms and buyers that operate in the Bristol Bay area are quite dependent upon imported labor. Often, entire crews will be recruited from other areas of Alaska and the Seattle area. The processing sector work is usually very intensive and lasts for only one to two months, and therefore is not very attractive to most permanent residents of the area. Of the local residents who do accept processing jobs, many are students, housewives, and others who do not desire permanent employment.

Manufacturing employment and wage statistics for the Bristol Bay Census Divisions are summarized in Tables 3.2.4 through 3.2.9. It should be

Table 3.2.4
Bristol Bay Division
Quarterly Manufacturing Employment and Wages
1970-1978

Year	Man Months Quarter 1st	2nd	3rd	4th	Annual	Wages Quarter ($1,000) 1st	2nd	3rd	4th	Annual
1970	344.0	2319.0	4992.0	0.3	7655.3	209.0	1451.0	6808.0	0.1	8468.1
1971	97.0	2435.0	4648.0	0.3	7180.3	36.0	1349.0	5530.0	0.1	6915.1
1972	218.0	1558.0	2734.0	320.0	4830.0	95.0	927.0	2895.0	242.0	4159.0
1973	542.0	1290.0	2856.0	660.0	5348.0	224.0	815.0	2466.0	389.0	3894.0
1974	259.0	513.0	1679.0	374.0	2824.0	146.0	374.0	1642.0	350.0	2512.0
1975	40.0	267.0	750.0	104.0	1161.0	19.0	306.0	982.0	122.0	1429.0
1976	29.0	263.0	1043.0	146.0	1481.0	14.0	329.0	2085.0	228.0	2656.0
1977	64.0	298.0	1047.0	163.0	1572.0	44.0	401.0	2663.0	185.0	3293.0
1978	42.0	305.0	1512.0	0.3	1859.3	21.0	255.0	4040.0	0.1	4316.1

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

Note: The number to the right of the decimal point indicates the number of months or quarters data are not available due to confidentiality requirements.

Quarterly and annual employment data are the summation of monthly employment data which are based on the number of people employed by individual firms during a specific pay period each month.

Table 3.2.5
Bristol Bay Division
Monthly Manufacturing Employment
1970-1978

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1970	107.0	113.0	124.0	267.0	581.0	1471.0	3319.0	1262.0	411.0	0.1	0.1	0.1
1971	35.0	32.0	30.0	88.0	526.0	1821.0	3102.0	1011.0	535.0	0.1	0.1	0.1
1972	134.0	46.0	38.0	63.0	390.0	1105.0	1835.0	598.0	301.0	162.0	118.0	40.0
1973	186.0	194.0	162.0	175.0	423.0	692.0	1446.0	802.0	608.0	250.0	219.0	191.0
1974	125.0	73.0	61.0	85.0	133.0	295.0	729.0	657.0	292.0	151.0	139.0	84.0
1975	13.0	13.0	14.0	22.0	61.0	184.0	371.0	240.0	139.0	42.0	35.0	27.0
1976	10.0	10.0	9.0	16.0	62.0	185.0	549.0	390.0	104.0	79.0	42.0	25.0
1977	33.0	16.0	15.0	21.0	101.0	176.0	435.0	457.0	155.0	132.0	18.0	13.0
1978	12.0	16.0	14.0	14.0	70.0	221.0	747.0	561.0	204.0	0.1	0.1	0.1

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

Note: The number to the right of the decimal point indicates the number of months data are not available due to confidentiality requirements.

Table 3.2.6
Bristol Bay Census Division
Number of Reporting Units in Manufacturing by Quarter
1970-1978

Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1970	18	20	22	22
1971	20	20	20	21
1972	21	21	21	19
1973	20	21	23	22
1974	23	22	21	21
1975	13	14	14	12
1976	9	13	13	14
1977	13	12	13	12
1978	13	11	12	12

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

Table 3.2.7
Bristol Bay Borough Division
Quarterly Manufacturing Employment and Wages
1970-1978

Year	Man Months Quarter 1st	2nd	3rd	4th	Annual	Wages Quarter ($1,000) 1st	2nd	3rd	4th	Annual
1970	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	78.0	338.0	1397.0	515.0	2328.0	44.(-)	225.0	1911.0	517.0	2697.0
1976	60.0	450.0	1368.0	98.0	1976.0	30.0	525.0	1902.0	64.0	2521.0
1977	41.0	34[illegible].0	1094.0	122.0	1593.0	28.0	422.0	1933.0	35.0	2418.0
1978	37.0	506.0	1842.0	56.0	2441.0	23.0	684.0	2938.0	76.0	3721.0

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

Note: The number to the right of the decimal point indicates the number of months or quarters data are not available due to confidentiality requirements.

Quarterly and annual employment data are the summation of monthly employment data which are based on the number of people employed by individual firms during a specific pay period each month.

Table 3.2.8
Bristol Bay Borough Division
Monthly **Manufacturing** Employment
1970-1978

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0
1975	21.0	25.0	32.0	30.0	114.0	194.0	851.0	456.0	90.0	201.0	177.0	137.0
1976	17.0	[illegible]	28.0	12.0	67.0	371.0	792.0	401.0	175.0	45.0	27.0	26.0
1977	12.0	14.0	15.0	23.0	62.0	261.0	617.0	301.0	166.0	33.0	49.0	40.0
1978	11.0	13.0	13.0	20.0	80.0	406.0	7?4.0	889.0	229.0	19.0	13.0	24.0

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

Note: The number to the right of the decimal point indicates the number of months data are not available due to confidentiality requirements.

Table 3.2.9
Bristol Bay Borough Census Division
Number of Reporting Units in Manufacturing by Quarter
1970-1978

Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1970	0	0	0	0
1971	0	0	0	0
1972	0	0	0	0
1973	0	0	0	0
1974	0	0	0	0
1975	10	9	8	8
1976	11	6	6	6
1977	6	6	6	6
1978	6	6	7	5

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

noted that prior to 1975, the Bristol Bay Borough Census Division was included in the Bristol Bay Division. Within these areas manufacturing is almost exclusively dominated by fish processing and processing employment including warehousing and wholesaling employment is primarily included in the manufacturing statistics. Therefore, manufacturing data closely approximate fish processing data. Department of Labor statistics indicate that broadly defined processing employment ranged between 100 and 127 percent of manufacturing employment from 1975 through 1978 in the Bristol Bay Census Division and between 88 and 106 percent in the Bristol Bay Borough Census Division. The extreme seasonality of processing employment in Bristol Bay is well documented by that data presented in the aforementioned tables.

The 1979 salmon and 1980 herring harvests in Bristol Bay indicate that the area's processing capacity is in excess of 59,000 metric tons (130 million pounds) of salmon and 18,000 metric 'tons (40 million pounds) of herring. The use of harvest levels as measures of processing capacity is discussed in a previous section. It should be noted that due to the extensive use of floaters, tenders, and cargo aircraft the processing capacity of the Bristol Bay area can change very rapidly. The 1976 herring processing capacity was less than 1 percent of what it is in 1980.

Community Infrastructure

The infrastructure of the communities of the Bristol Bay Census Division and the use made of it by the commercial fishing industry are discussed in this section.

Electricity.

Communities in the Bristol Bay area generate their electricity with diesel-powered equipment. Each village or town generates only for its own use, as distribution of relatively small amounts of electricity over long distances is uneconomical. Villages usually do not maintain large reserve generating capacities capable of accommodating new large commercial electricity consumers.

The City of Dillingham is the population center of the Bristol Bay area, and serves as the area's commercial hub. Nushagak Electric Cooperative, Inc., provides electricity for the community. Five diesel-powered generators of various sizes between 300 and 10CIO KW are operated by the co-op and create a total load capacity of 2900 KW. During most of the year, a combination of two units can accommodate the community's electricity needs. Peak electricity consumption occurs during the summer, with a load of around 1600 KW in July being 1979's maximum.

Fish processing accounts for a large portion of Dillingham's electricity consumption during the summer. Many processors operate in the Bristol Bay area, but only two sizable operations, a freezing facility and a cannery, purchase their electricity from the co-op. Even so, fish processing consumes nearly one third of the co-op's production during the salmon fishing season. In July, 1979, processors used 190,840 KWH of the total 623,857 KWH consumed by the community.

It is expected that Nushagak Electric Co-op will be called upon to provide an increasing amount of power throughout the future. Fifty new HUD houses will soon be constructed, and fish processing will require more electricity as freezing continues to replace canning. The co-op is attempting to obtain a new unit of at least 1000 KW to accommodate the anticipated demand and will be able to retire some older equipment if successful. The addition of a new unit should provide adequate generating capacity to accommodate the community's growing demand for electricity for several years.

Water.

The City of Dillingham has the largest population of any community in the Bristol Bay area, and maintains a central water system with piped distribution to consumers. A well serves as the water source, and a 310,000 liter (82,000 gallon) elevated tank is utilized for storage. During periods of peak water consumption which occurs during summer fish processing, about 322,000 liters (85,000 gallons) are used each day. This obviously stresses the city's water storage capacity and surpasses its ability to allow unrestricted consumption. At times during the 1979 summer fish processing season, tenders and offshore processors were restricted to 7,500 liters (2,000 gallons) of water per trip to replenish their supplies. Under unrestricted use, these consumers would often obtain up to 56,775 liters (15,000 gallons) per trip.

Construction is already underway on a pad for a new 1.9 million liter (500,000 gal ion) tank which should be ready for use during the 1980 fish processing season. Also, the city has a second well that will be put into service. It is believed that the additional pumping and storage capacities will be ample to allow totally unlimited water consumption for fish processing, and that additional large consumers of water could be accommodated by the system without limiting anyone else's consumption patterns. Dillingham's water system could probably fulfill the needs of additional large industrial users if the needs of major consumers are properly coordinated.

Pent Facilities.

As Bristol Bay's center of commerce, Dillingham also offers the area's major port. Due to the shallow water of the area, the port is a "port tide port", which means the dock can only be reached by vessel during certain phases of the tides when water depth is adequate. Not only is the water depth insufficient much of the time for vessel movement, but the water line is nearly 4.6 meters (15 feet) from the dock at low tide. Vessels that do not leave the dock when the tide recedes are left beached until the next high tide period. Dillingham experiences about a 7.32 meter (24 foot) tide, and it is necessary for all vessels to work with it. Even deliveries of fish to local processors by tenders or small fishing boats must be coordinated with the tide.

Though the tide situation greatly complicates shipping to and from Dillingham, large barges can reach the dock. This eliminates the need for expensive lightening by smaller barges from large barges anchored several miles offshore. However, the barges seldom stay at the dock to be grounded during low tides because of potential structural damage to the vessels. It is not uncommon for the same barge to require several trips to and from the port to complete cargo transfers. This becomes extremely time consuming, and greatly slows cargo movement.

The port usually receives around 16 barges each year, and has a shipping season extending from late April through late September if the weather is favorable. Inclement conditions often shorten the shipping season, and a later opening date is not unusual.

A single barge can and usually does tie up the entire dock, and coupled to the inconvenience of working with the tide, barges can be idle for quite some time awaiting use of the dock. Also, the staging area is quite small. The city is attempting to put together a major project to improve the port facilities, but many major concerns remain in question. The State of Alaska has already committed $1 million to improving the port, and the city will contribute $100,000. Currently, city officials are attempting to secure $3 million of additional state funding so that an entirely new port can be constructed. Most desirable would be a pier extending 122 meters (400 feet) from shore so that the dock could be used during low tide. But an improved port tide port is a more conservative, and probably more realistic, expectation of what may actually be constructed.

Small Boat Harbor.

The City of Dillingham maintains a small boat harbor whichis operational from May through September. The predominate users of the harbor are salmon gill net boats, which range up to a 9.8 meters (32 foot) maximum length legally allowed for Bristol Bay salmon fishing. Around 235 vessels are sometimes crowded into the harbor during the peak of salmon fishing activity, which reportedly requires that boats be stacked 18 across. The harbor has floating piers which allow more stacking than stalls would, and ultimately more vessels may be crowded into the harbor.

Canneries and processing firms have long provided moorage at their sites for many of the area's fishermen, and during the offseason cannery land has been used for out-of-water storage. This practice is still common and explains how hundreds of local fishermen who do not have access to the harbor care for their vessels. Some private landholders in the area are also offering moorage and on-land storage, and it appears that the use of private facilities will grow in popularity.

The Dillingham small boat harbor requires almost constant dredging from May through September to maintain an adequate depth. This has resulted in high operating costs for the harbor, and may complicate any attempt to enlarge the present harbor or construct a new harbor.

BETHEL, WADE HAMPTON, AND KUSKOKWIM CENSUS DIVISIONS

Communities in the Bethel, Wade Hampton, and Kuskokwim Census Divisions are the principal bases of the harvesting and processing activities associated with the salmon and herring fisheries of the Kuskokwim and Lower Yukon Management Areas.

Processing Activity

The commercial salmon fisheries located near the mouths of the Yukon and Kuskokwim Rivers and the herring fisheries located near Goodnews Bay, Security Cove, and Cape Romanzof are served by over 20 buyers and processors. Probably due largely to the scarcity of large airports in the area which would facilitate flying fresh fish to plants in other areas, most locally- caught fish are processed in the area. Processing ships, referred to as floaters, are common throughout the area and usually freeze their entire output. However, a few canning facilities still operate, and there are some salting operations. As is true in Bristol Bay, primarily superficial processing occurs to herring before it leaves the area.

Processors and buyers are scattered throughout the Yukon coastal area. Some of the locations are Emmonak, Black River, Lament Slough, Kwikpakak Slough, and Kwikluak Pass near Alakanuk. At least six or seven buyers are usually operating in these coastal locations, and many other buyers can be reached by traveling up river. It is estimated by persons familiar with the coastal Yukon commercial fishery that around 75 percent of the catch is processed locally, and the remainder is flown out for processing elsewhere.

The Kuskokwim salmon fishery is more concentrated than that of the Yukon, and occurs primarily in the wide Kuskokwim River mouth below Bethel. The processors which operate in the area freeze most of their product. Three permanent structures are located in town and about five floaters operate between Bethel and Kuskokwim Bay. Bethel is linked to Anchorage through regular commercial air service, and is therefore able to fly fresh salmon to Anchorage and other locations for processing. This tends to give the Kuskokwim fishery more flexibility in processing capacity than exists near the Yukon fishery.

Local residents are not able to fulfill all of the processors' labor needs. Processing employment provides a cash income for local people who choose to work when not engaged in other activities, but imported labor from other areas of Alaska and the Seattle area is essential for the operations of many facilities.

Manufacturing employment and wage statistics for the Bethel, Kuskokwim, and Wade Hampton Census Division are summarized in Tables 3.2.10 through 3.2.18. Unfortunately, there were frequently fewer than four reporting units in each census division and the data are confidential. Data provided by the Alaska Department of Labor indicate that average monthly fish processing, warehousing and wholesaling employment for the Kuskokwim and Wade Hampton Census Divisions ranged from 58 in 1975 to 97 in 1979

Table 3.2 0
Bethel Division
Quarterly Manufacturing Employment and Wages
1970-1978

Year	Man Months Quarter 1st	2nd	3rd	4th	Annual	Wages Quarter ($1,000) 1st	2nd	3rd	4th	Annual
1970	0.3	4[illegible]	453.0	161.0	1059.3	0.1	130.0	129.0	24.0	283.1
1971	0.3	0.3	0.7	70.0	170.9	[illegible] 1	0.1	0.1	19.0	19.3
1972	04.0	46.0	0.3	0.3	250.6	20.0	24.0	0.1	0.1	44.2
1973	0.3	[illegible]88.0	323.	0.3	6 .6	0.	68.0	124.0	0.1	192.2
1974	0.3	222.0	0.3	46.0	268.6	0.	68.0	0.1	30.0	98.2
1975	0.3	0.3	[illegible]	[illegible] 3	1.2	0.	0.1	0.1	0.1	0.4
1976	18.0	[illegible].3	0.3	-.3	18.9	5.0	0.1	0.1	0.1	5.3
1977	0.3	1[illegible]0	545.0	0.3	651.6	0.1	89.0	507.0	0.1	596.2
1978	22.0	1[illegible]2 0	538.0	51.0	763.0	8 0	03.0	243.0	94.0	448.0

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

Note: The number to the right of the decimal point indicates the number of months or quarters data are not available due to confidentiality requirements.

Quarterly and annual employment data are the summation of monthly employment data which are based on the number of people employed by individual firms during a specific pay period each month.

able 3.2.
Bethe D vision
Monthly Manufacturing Employment
1970-1978

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1970	0.1	0.1	0.1	9.0	20.0	416.0	50.0	243.0	160.0	70.0	67.0	24.0
1971	0.1	0.1	0.1	0.1	0.1	[illegible] 1	0.1	0.1	0.1	48.0	62.0	60.0
1972	37.0	36.0	31.0	20.0	26.0	00.0	0.1	0.1	0.1	0.1	0.1	0.1
1973	0.1	0.1	0.1	24.0	33.0	231.0	163.0	114.0	46.0	0.1	0.1	0.1
1974	0.1	0.1	0.1	23.0	4.0	65.0	0.	0.1	0.1	19.0	14.0	13.0
1975	0.1	0.1	0.1	0.1	0.1	[illegible]	[illegible] 1	0.1	0.1	0.1	0.1	0.1
1976	4.0	5.0	9.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1977	0.1	0.1	0.1	11.0	5.0	90.0	279.0	230.0	36.0	0.1	0.1	0.1
1978	7.0	6.0	9.0	12.0	8.0	22.0	260.0	237.0	41.0	36.0	8.0	7.0

Source: Alaska Department of Labor, Statistical Quarterly, 1970- 978.

Note: The number to the right of the decimal poin ndicates the number of months data are not available due to confidentiality requirements.

Table 3.2.12
Bethel Census Division
Number of Reporting Units in Manufacturing by Quarter
1970-1978

Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1970	4	6	5	5
1971	5	5	5	5
1972	4	4	4	4
1973	4	5	5	5
1974	4	5	5	5
1975	4	5	4	4
1976	4	4	4	4
1977	4	5	5	5
1978	5	5	5	7

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

Table 3.2.13
Wade Hampton Division
Quarterly Manufacturing Employment and Wages
1970-1978″

Year	Man Months Quarter 1st	2nd	3rd	4th	Annual	Wages Quarter ($1,000) 1st	2nd	3rd	4th	Annual
1970	0.3	0.3	0.3	284.0	284.9	(I.l	0*1	0.1	153.0	153.3
1971	0.3	0.3	0.3	0.3	1.2	0.1	0.1	O*1	0.1	0.4
1972	0.3	0.3	832.0	0.3	832.9	0.1	0.1	543.0	0.1	543.3
1973	0.3	104.0	983.0	0.3	1087.6	0.1	40.0	494.0	0.1	534.2
1974	0.3	0.3	931.0	121.0	1052.6	0.1	0.1	541.0	152.0	693.2
1975	62.0	50.0	470.0	0.3	582.3	44.0	15.0	375.0	0.1	434.1
1976	13.0	20.0	0.3	50.0	83.3	24.0	25.0	0.1	59.0	108.1
1977	108.0	0.3	730.0	105.0	943.3	152.0	0.1	467.0	148.0	767.1
1978	0.3	313.0	578.0	129.0	1020.3	0.1	225.0	389.0	198.0	812.1

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

Note: The number to the right of the decimal point indicates the number of months or quarters data are not available due to confidentiality requirements.

Quarterly and annual employment data are the summation of monthly employment data which are based on the number of people employed by individual firms during a specific pay period each month.

Table 3.2.14
Wade Hampton Division
Monthly Manufacturing Employment
1970-1978

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1970	.	.	0.1	.	0.1	0.1	0.1	0.1	0.1	111.0	79.0	94.0
1971	0.1	0.1	0.1	0.	0.1	0.1	0.1	0.1	0.	0.1	0.1	0.
1972	0.	0.	0.1	0.1	0.1	0.1	419.0	242.0	171.0	0.1	0.1	0.1
1973	0.	0.	0.1	1 .0	31.0	54.0	444.0	330.0	209.0	0.1	0.1	0.1
1974	.	0.	0.1	0.	0.1	0.1	506.0	362.0	63.0	50.0	37.0	34.0
1975	23.0	6.0	23.0	9.0	17.0	24.0	145.0	185.0	140.0	0.1	0.1	0.1
1976	5.0	4.	4.0	7.0	5.0	8.0	0.1	0.1	0.1	20.0	15.0	15.0
1977	42.0	34.0	32.0	0.	0.	0.1	267.0	252.0	211.0	36.0	35.0	34.0
1978	0.	.	0.1	60.0	69.0	184.0	155.0	167.0	256.0	52.0	45.0	32.0

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

Note: The number to the right of the decimal point indicates the number of months data are not available due to confidentiality requirements.

Table 3.2.15
Wade Hampton Census Division
Number of Reporting Units in Manufacturing by Quarter
1970-1978

Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1970	6	5	6	6
1971	5	5	5	5
1972	6	6	6	6
1973	6	7	7	7
1974	7	7	7	8
1975	7	7	7	7
1976	6	5	6	6
1977	5	6	6	6
1978	5	5	5	5

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

Table 3.2.16
Kuskokwim Division
Quarterly Manufacturing Employment and Wages
1970-1978

	Man Months					Wages ($1,000)				
	Quarter					Quarter				
Year	1st	2nd	3rd	4th	Annual	1st	2nd	3rd	4th	Annual
1970	0.3	0.3	0.3	0.3	1.2	0.1	0.1	0.1	0.1	0.4
1971	0.3	0.3	0.3	0.3	1.2	0.1	n.]	0.1	0.1	0.4
1972	0.3	0.3	0.3	0.3	1.2	0.1	0.1	0.1	0.1	(7*4
1973	0.3	0.3	0.3	0.3	1.2	0.1	0.1	0.1	0.1	(-).4
1974	0.3	0.3	0.3	0.-3	1.2	0.1	0.1	0.1	0.1	0.4
1975	0*3	0.3	(1.-3	0.3	1.?	0.1	0.1	0.1	0.1	0.4
1976	0.3	0.3	0.3	0.3	1.2	0.1	0.1	0.1	0.1	0.4
1977	0.3	0.3	0.3	0.3	1.2	0.1	0.1	0.1	0.1	0.4
1978	0.3	0.3	0.3	0.3	1.2	(-).1	[I*1	0.1	0.1	0.4

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

Note: The number to the right of the decimal point indicates the number of months or quarters data are not available due to confidentiality requirements.

Quarterly and annual employment data are the summation of monthly employment data which are based on the number of people employed by individual firms during a specific pay period each month.

Table 3.2.17
Kuskokwim Division
Monthly Manufacturing Employment
1970-1978

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1970	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1971	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1972	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1973	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1974	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1975	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1976	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1977	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1978	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Source; Alaska Department. of Labor, Statistical Quarterly, 1970-1978

Note: The number to the right of the decimal point indicates the number of months data are not available due to confidentiality requirements.

Table 3.2.18
Kuskokwim Census Division
Number of Reporting Units in Manufacturing by Quarter
1970-1978

Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1970	1	1	1	1
1971	1	1	1	1
1972	1	1	1	1
1973	1	1	1	1
1974	1	1	1	1
1975	1	1	1	1
1976	2	2	2	2
1977	2	2	2	2
1978	2	2	2	2

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

and averaged 84; for the Bethel Census Division employment ranged from 56 to 100 between 1975 and 1978 and averaged 78. The broadly defined Kuskokwim and Wade Hampton processing employment was 111 and 118 percent of Wade Hampton manufacturing employment in 1977 and 1978 respectively; and the broadly defined Bethel processing employment was 98 percent of manufacturing employment in 1978. For the years data are available, processing employment is demonstrated to be highly seasonal. This is, of course, to be expected since the plants process almost exclusively salmon and herring which are harvested during the late spring and summer.

Recent harvests in the Kuskokwim and Lower Yukon Management Areas indicate that the Bethel, Wade Hampton, and Kuskokwim areas are able to land and prepare for transportation for further processing and marketing over 5,443 metric tons (12 million pounds) of salmon and 1,572 metric tons (3.5 million pounds) of herring. The use of harvest levels as a measure of processing capacity is discussed in a previous section. It should be noted that processing capacity can change rapidly in this area due to the extensive use of floating processors and tenders and due to the airlift capability that exists.

Community Infrastructure

The infrastructure of the communities of the Bethel, Wade Hampton, and Kuskokwim Census Divisions and the use made of it by the commercial fishing industry are discussed in this section.

Electricity.

Each community in the Kuskokwim-Lower Yukon area generates its own electricity with diesel-powered equipment. The population of the area is too sparce and villages and cities are too distant from one another to efficiently distribute electricity from a central generating facility. With the exception of area population centers, communities generally do not maintain large reserve generation capacities which could be available to new large commercial electricity consumers. Diesel-powered generation has resulted in extremely high electricity prices, but it has the advantage of allowing rapid alteration or expansion of a system's capacity. If necessary, new units can be operational within only a few months, or sometimes weeks, of the decision to obtain them.

The City of Bethel is the area's population center and the hub of fishing operations. The city adequately handles the electricity demands of local processors and utilizes about 60 percent of its generating capacity to do so. The fish processing industry is rapidly adopting the electricity-intensive practice of freezing rather than canning salmon. As this trend grows along Alaska's west coast, increasing electricity consumption by firms operating in Bethel may result.

Water.

Municipal water systems with distribution mains to individual residences and other buildings are generally not found in remote Alaska villages.

The villages have adequate water sources, but usually rely upon individuals to procure their own supplies.

The City of Bethel maintains a water system that serves most of the community's residents. About 100 homes have piped water which is obtained from a single well capable of providing 1,324 liters (350 gallons) per minute. The city provides water delivery to the remainder of the city's residences. The well provides ample water to meet the city's residential needs. Obtaining laborers at various times of the year to deliver water to individual homes poses the major operation problem. There are currently plans to extend piped water to commercial buildings, but no further expansion of the system is expected within the near future.

Fish processing does not particularly stress the water system's capacity. Most fish which are landed in Bethel are flown out fresh after very minimal preparation. Ground water in the area is abundant enough to allow additional wells to accommodate increased industrial consumption.

Port Facilities.

The City of Bethel offers the only port in the Kuskokwim-Lower Yukon area. The city is located along the Kuskokwim River about 81 kilometers (50 miles) upriver from its mouth. The Bethel port is the farthest north facility a˙ong Alaska]s west coast that can accommodate fairly deep draft vesse˙s with water depth at dock side of 12.2 meters (40 feet). However, the water depth near the mouth of the river is

6.4 meters (21 feet), which effectively prohibits the utilization of the port's ample draft.

Four shipping companies currently serve Bethel, and each firm usually sends three to five barges to the community each year. The shipping season typically runs from the end of May through the end of September. The dock is 122 meters (400 feet) long, and can accommodate only one barge at anytime. This often causes delays as barges lie idle awaiting use of the dock. The problem is amplified as smaller barges must also obtain dock space to load cargo for distribution to villages throughout the area.

The City of Bethel has a $500,000 grant to expand the port's staging area, but city officials indicate that extensive expansion of the actual docking facilities is necessary to greatly increase efficiency of cargo handling. The ability to unload two large barges at once, while simultaneously loading smaller village-bound barges would largely eliminate the bottleneck which requires barges to wait for dock space. But at this time, such expansion is not planned at the port. Without substantial expansion, it is felt that use of the port by additional users would substantially increase the current congestion. City officials believe that the land required for port expansion could be obtained at reasonable cost because of the benefits of an improved port to all parties concerned.

Small Boat Harbor.

There are no small boat harbors in the Kuskokwim-Lower Yukon area. Most boats used by area residents are skiffs and generally do not exceed 7.3 meters (24 feet) in length. Therefore, the vessels can be beached when not in use, and are easily transported on land when removed from the water for winter storage.

The City of Bethel is the area's major population center, and is conducting a feasibility study for a small boat harbor. City officials have indicated that a capacity of around 1,000 vessels is being considered, and that an even larger capacity could be fully utilized. A variety of stall sizes is envisioned if the project materializes. However, it must be emphasized that the smaller vessels used in the Kuskokwim-Lower Yukon area are not comparable with the larger vessels of communities such as Kodiak, and that harbor capacity based solely upon number of stalls can be misleading.

Land suitable for development is a relatively scarce commodity in Bethel, but the local native corporation has agreed to provide a site for the harbor if the project reaches construction. Based upon the experiences of other Alaska communities involved with small boat harbor projects, several years will probably lapse before all of the required studies are completed, funding is arranged, and construction actually begins.

YUKON - KOYUKUK CENSUS DIVISION

The commercial fishing industry activities associated with the Upper Yukon Management Area occur in or adjacent to communities within the Yukon - Koyukuk Census Division.

Processing Activity

Commercial fishing along the upper Yukon River generally consists of harvesting salmon with set gill nets and fish wheels. The upper Yukon River fishery extends inland from near the village of Anvik; however, the section from Anvik to Ramparts experiences the heaviest fishing activity. Salmon are also taken commercially further upriver from Ramparts, but fewer fishermen participate and in less concentration.

The residents of nearly every village along the Yukon River are active in commerical salmon fishing. Fishing effort is not particularly concentrated *in* certain locations along the river beyond that caused by residents fishing in the vicinities of their villages. There is not an influx of nonlocal people into communities to fish during the summers. Rather, almost all limited entry permits are held by residents of the general area. Several limited entry salmon fishing permits for the vicinity of the Trans-Alaska Pipeline bridge over the Yukon River have been purchased by residents of Fairbanks and other Alaska cities, but there is no indication of this practice spreading to other areas along the river.

The majority of fish harvested in the area is transported by air to other areas such as Anchorage for processing. Much of the fish is assembled at Galena for icing prior to being flown out; salmon is tendered to Galena from as far away as Ruby and Nulato. Other villages are mainly dependent upon air transport of their fish from local air-fields, and icing is usually the extent of preparation.

Several relatively small processing firms operate in the region and process a significant portion of the upper Yukon's salmon harvest when their production is considered collectively. Most of the firms con-centrate on fresh frozen salmon and a very limited canning capacity is reported. Salmon roe is packaged by the firms, usually under the direction of an imported technician.

Communities reported to have fish processing facilities include Tanana, Manley Hot Springs, Anvik, and Grayling. The firms generally are not associated with major fish processing companies, are owned by Alaska residents, and employ local people with the exception of positions requiring specialized skills.

As is indicated by the manufacturing employment and wage data summarized in Tables 3.2.19 through 3.2.21, there have been so few reporting units that the data are confidential. The small number of reporting units together with the small size of the reporting units indicate that manufacturing and fish processing employment is minimal. The employment is also known to be highly seasona? due to the seasonality of harvesting activities.

Table 3.2.19
Yukon-Koyukuk Division
Quarterly Manufacturing Employment and Wages
1970-1978

Year	Man Months Quarter 1st	2nd	3rd	4th	Annual	Wages Quarter ($1,000) 1st	2nd	3rd	4th	Annual
1970	0.3	0	0	0	0.3	0.1	0	0	0	0.1
1971	0	0.3	0.3	0.3	0.9	0	0.1	0.1	0.1	0.3
1972	0.3	0	0	0	0.3	0.1	0	0	0	0.1
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0.3	0.3	0.3	0.9	0	0.1	0.1	0.1	0.3
1976	0.3	0.3	0.3	0.3	1.2	0.1	0.1	0.1	0.1	0.4
1977	0.3	0.3	0.3	0.3	1.2	0.1	0.1	0.1	0.1	0.4
1978	0.3	0.3	0.3	0.3	1.2	0.1	0.1	0.1	0.1	0.4

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

Note: The number to the right of the decimal point indicates the number of months or quarters data are not available due to confidentiality requirements.

Quarterly and annual employment data are the summation of monthly employment data which are based on the number of people employed by individual firms during a specific pay period each month.

Table 3.2.20
Yukon-Koyukuk Division
Monthly Manufacturing Employment
1970-1978

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1970	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0
1971	0	0	0	0.1	0.	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1972	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1976	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1977	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1.
1978	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

Note : The number to the right of the decimal point indicates the number of months data are not available due to confidentiality requirements.

Table 3.2.21
Yukon-Koyukuk Census Division
Number of Reporting Units in Manufacturing by Quarter
1970-1978

Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1970	1	0	0	0
1971	0	1	1	
1972	5	0	0	0
1973	0	0	0	0
1974	0	0	0	0
1975	0	2	1	
1976	2	2	2	2
1977	2	2	1	
1978	1	1	1	1

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

Recent harvests indicate that the processing capacity of the area is over 750 metric tons (1.7 million pounds) of salmon. However, since unprocessed fish can be flown out of the area, processing capacity can change rapidly.

Community Infrastructure

The infrastructure of the communities of the Yukon and Koyukuk Census Division and the use made of it by the commercial fishing industry are discussed in this section.

Electricity.

Electricity along the upper Yukon River is generated with diesel-powered generators maintained by each community. Distribution systems do not extend beyond the village or town sites being served, nor is the generating capacity usually great enough to serve a larger area. Due to the area’s sparce population and distance between villages, a costly centralized generating facility and the appropriate distribution network are not likely to replace the individual generators within the foreseeable future. Consumers requiring more electricity than the local generators can provide or lying outside their service areas, must be prepared to assist in upgrading the local equipment or install private generating equipment.

Water.

Water availability is not a problem for villages along the upper Yukon River. However, most communities do not maintain centralized freshwater systems that serve individual homes and businesses. Rather, procurement of water is often left to the individual consumers. Any new water consumers in the region should be prepared to privately furnish and maintain equipment necessary for an adequate water supply.

Small Boat Harbors.

Communities along the Upper Yukon River do not maintain small boat harbors. Open skiffs are generally used for commercial fishing and are also used for hunting and general transportation. They are usually not much beyond 6.1 meters (20 feet) in length, and can be beached or entirely removed from the water when not in use.

Port Facilities.

Villages located along the Upper Yukon River receive barge service during the summer months. The barges that navigate the Yukon River are quite versatile; they are often able to serve villages that maintain no dock facilities. Any dock facilities maintained in the area are intended for barge use and are not accessible by deep draft vessels.

NOME CENSUS DIVISION

Communities in the Nome Census Division are closely associated with the salmon, winter king crab, and set gill net herring fisheries of the Norton Sound Management Area.

Processing Activity

The commercial salmon fishery in the Nome area extends around much of Norton Sound. Therefore, the fishery is not centered near any particular community nor is the processing *sector* concentrated at any one location. Several fish buyers operate stations around Norton Sound and have the salmon they purchase transported to other areas of Alaska for processing. In most instances these buyers represent large fish processing firms that are prominent within the industry. Norton Sound salmon are usually processed at facilities in Anchorage or on the Kenai Peninsula.

Some of the common fish buying locations in Norton Sound are at Nome, Golovin, Elim, Unalakleet, and St. Michael. The salmon are usually chilled in ice and may undergo various stages of cleaning before being flown to a processing plant in Central Alaska. If the fish are to be processed soon after they are purchased, chilling is sometimes not required. At Golovin, a local co-op operates a freezing facility. This allows the firm to hold its fish in the fully-processed state and sell them at a later time. Also, a freezer ship is used to transport the product, avoiding costly air transport.

The number and close proximity of buyers appears to provide a reasonably competitive fish market in the area, and a number of processing jobs are created which provide a source of cash income for local residents. In most instances, local persons are able to fill the labor needs of the buyers, and few positions are occupied by nonlocals.

King crab has been taken through the ice in Norton Sound near Nome in recent years. The crab is steamed and frozen in Nome by a local firm, and the product is then flown to Anchorage where it is often sold in local markets. Roe herring is another relatively new fishery for the area. Prior to 1980, a transient processing ship bought all local harvests. In 1980, there were buyers from eight companies, seven processing vessels, six tenders, and one land based buying operation participating in the Norton Sound herring fishery. Local processing employment resulting from the herring fishery is minimal due to the extensive use of processing vessels and tenders.

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Manufacturing employment and wage data for the Nome Census Division are summarized in Tables 3.2.22 through 3.2.24. Due, however, to the small number of reporting units, data for many quarters are confidential and data for fish processing alone are not available. Significant seasonality in processing employment is known to exist since onshore processing is limited almost exclusively to salmon.

Recent harvest levels indicate that over 1,100 metric tons (2.4 million pounds) of salmon and 2,200 metric tons (4.9 million pounds) of herring can be landed and prepared for transportation for further processing

Table 3 2.22
Nome D vision
Quarter y Manufacturing Emp oyment and
970-1978

Year	Man Months Quarter 1st	2nd	3rd	4th	Annual	Wages Quarter ($1,000) 1st	2nd	3rd	4th	Annual
1970	68.0	0.3	52.0	0.3	120.6	14.0	0.1	13.0	0.1	27.2
1971	[illegible]	0.3	0.3	0.3	53.9	5.0	0.	[illegible]	[illegible] 1	15.3
1972	0.3	0.3	.3	.3	1.2	0.1	0.1	0.1	0.	0.4
1973	0.3	0.3	0.3	0.3	1.2	0.1	0.1	0.1	0.1	0.4
1974	0.3	0.3	0.3	0.3	.2	0.1	0.1	0.1	0.1	0.4
1975	15.0	0.3	0.3	29.0	44.6	7.0	0.1	0.1	20.0	37.2
1976	12.	.3	61.0	0.3	73.6	10.0	0.1	91.0	0.1	[illegible]1.2
1977	31.0	0.3	0.3	21.0	52.6	13.0	0.1	0.1	17.0	30.2
1978	[illegible]	0.3	271.0	0.3	283.6	13.0	0.1	201.0	0.1	214.2

NOTE: Quarterly and annual employment data are the summation of monthly employment data which are based on the number of people employed by individual firms during a specific pay period each month.

Table 3.2.23
Nome Division
Monthly Manufacturing Employment
1970-1978

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1970	20.0	[illegible]	23.0	0.1	0.1	0.1	20.0	18.0	14.0	0.1	0.1	0.1
1971	19.0	17.0	17.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1972	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1973	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1974	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1975	5.0	5.0	5.0	0.1	0.1	0.1	0.1	0.1	0.1	12.0	11.0	6.0
1976	4.0	4.0	4*II	0.1	0.1	0.1	38.0	16.0	7.0	0.1	0.1	0.1
1977	11.0	13.0	7.0	0.1	0.1	0.1	0.1	0.1	0.1	10.0	6.0	5.0
1978	4.0	4.0	4.0	0.1	0.1	0.1	130.0	100.0	41.0	0.1	0.1	0.1

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

Note: The number to the right of the decimal point indicates the number of months data are not available due to confidentiality requirements.

Table 3.2.24
Nome Census Division
Number of Reporting Units in Manufacturing by Quarter
1970-1978

Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1970	3	4	4	4
1971	3	3	2	3
1972	3	2	2	?
1973	1	1	1	1
1974	1	1	?	2
1975	4	4	4	5
1976	4	4	5	5
1977	5	5	5	4
1978	4	4	4	4

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

and marketing. The extensive use of tenders, floating processors, and air freight allow rapid changes in capacity.

Community Infrastructure

The infrastructure of the Nome Census Division and the use made of it by the commercial fishery industry are discussed in this section.

Electricity.

Electricity generation in the Norton Sound area is derived from diesel-powered units. Rather than having a central generating station and distribution throughout the entire area, each community maintains its own generating equipment. In most instances, villages have rather modest units and do not have sufficient capacity to accommodate large commercial users.

The City of Nome's generation system presently has a nameplate capacity of 6800 KW. The peak load usually occurs for a few days during the winter, and is approximately 2800 KW. A load of around 2400 KW is more common throughout the winter, and drops to around 1400 KW for the summer months. Therefore, the city has a generating capacity nearly 2 1/2 times larger than its peak load, and from 4 to 5 times greater capacity than is necessary during low load periods. Seven units of various sizes are utilized, and the equipment is *in* fairly good maintenance. Residents of Nome and an area up to about 4.8 to 6.4 kilometers (3 to 4 miles) from the city are served by the distribution network. Due to the system's excess generating capacity, Nome could accommodate a rather substantial increase in electricity consumption before enlargement of the system would be necessary. Since diesel-powered generators are used, expansion of generating capacity can be achieved quickly. The cost of diesel-generated electricity is expected to continue to increase as petroleum prices continue to rise.

Water.

Many Norton Sound area residents live in villages, which generally do not have formal water systems with central distribution networks to individual buildings. Though water is usually plentiful, commercial firms entering such a community will find it necessary to develop a private water system capable of supplying their needs.

The City of Nome is the population center of Norton Sound, and operates a central water system that serves most of the city area. The water is obtained at Moonlight Springs, 4.8 kilometers (3 miles) away, and piped to Nome. The source utilized is capable of providing a quantity of water sufficient for a city several times larger than Nome, but storage tanks near town and a better main system would be required. Although the water does not currently require treatment, a treatment facility is available should the need arise.

About 189,000 liters (50,000 gallons) of water are consumed each day, and consumption stays fairly constant year-round. Only about 60 percent of the city is connected to the central water and sewer system. The city lacks the financial resources to complete expansion of the systems to all potential users. If funds can be obtained to complete the water distribution network, consumption would increase substantially.

Port Facilities.

The City of Nome serves as the transportation hub for the Norton Sound area. The Nome port offers only minimal facilities. Weather and water depth limit its use, but no alternative facility exists which could serve the area. Even with the limitations of the present port, there appears little likelihood that another port will be developed in the area due to the marginal amount of cargo to be handled and the remoteness of other possible sites.

The port requires almost constant dredging to maintain a high tide depth of 2.4 meters (8 feet), and 1.7 meters (5.5 feet) at zero tide. Therefore, cargo delivered to the Nome port must be "lightened". Lightening consists of anchoring a large seagoing barge several miles offshore in deep water and offloading onto small, shallow draft barges that deliver to the port. The process is very expensive and substantially increases transportation costs to Nome and surrounding communities. The small barges then make deliveries to the villages within the area that can be reached by water. Since port facilities do not exist at most villages, the barges are usually beached at high tide, are quickly unloaded during low tide, and leave with the next high tide. The smaller barges often must be loaded lightly to operate in very shallow depth; this causes further increases in transportation costs.

The length of the shipping season varies from year to year due to annual variations of the weather. However, Nome's port is normally usable from sometime in later May through the end of September. All of the area's supplies must be obtained and distributed during this time or air cargo transport must be relied upon.

Most *sea* cargo is now handled in container vans. Ocean going vessels normally carry 12.2 meter (40 foot) vans, but 6.1 meter (20 foot) vans are utilized for service to the Norton and Kotzebue Sound areas. In most instances, the smaller vans are of adequate size to accommodate specific orders, and are better suited for delivery to the villages.

Arctic Lighterage Company provides lighterage services and subsequent distribution of goods throughout the area. The management of lighterage operations in Nome believes that the company's capacity could be increased significantly within a very short time due to the strength of its parent company, which is a major competitor among long-haul shippers. Additional barges and appropriate cargo handling equipment could be diverted from other locations if the demand warranted such action.

In addition to the shallow draft and limited season of operation, the port does not offer facilities necessary for major commercial use. The adjacent staging and storage areas are relatively small and the dock itself is too small for additional major users when the lighterage

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company is active. Presently, most equipment is provided by the lighterage company, and its capacities are appropriate for present operations. Adequate moorage space, cargo handling equipment, open areas, and water depth are not available for additional industrial activities.

There are no well-developed plans for port development in Norton Sound. However, St. Michael, located along the south shore of Norton Sound, has been identified as a potential port site with adequate depth for deep-draft vessels and natural protection.

Small Boat Harbor.

There are no small boat harbors in the Norton Sound area. Most boats in the area are skiffs of under 9.2 meters (30 feet) in length and can be beached when not in use. The vessels are multi-purpose and are used for subsistence and commercial fishing, hunting, and basic transportation. The City of Nome has a protected area adjacent to its port which provides a convenient tie-up area during the summer, However, moorage floats or stalls that are usually found in harbors are not present.

A number of fishermen in Nome are expressing an interest to enter new fisheries and obtain larger vessels. Should some of these people succeed in obtaining larger fishing vessels, the absence of a small boat harbor may become a more important concern of the community.

KOBUK CENSUS DIVISION

Kotzebue, which is in the Kobuk Census Division, is the center of the commercial fishing industry activity associated with the Kotzebue Sound Management Area.

Processing Activity

Most of the Kotzebue Sound commercial salmon harvest is transported to processing facilities in other parts of Alaska. No processing activity of significant magnitude was reported to occur within the area. Typically, buying stations are set up in proximity to the fishing grounds. Some buyers operate independently and work out various schemes for marketing their purchases, but most buyers represent large fish processing companies. In nearly all instances, the fish are flown to processing plants in the Anchorage or Kenai areas for final processing. The salmon are often gutted and chilled in ice before leaving the Kotzebue area, but if air shipment is to occur *soon* enough, less cleaning *or* chilling is performed locally.

Area fishermen usually have the opportunity to sell to any of the three or four or more local fish buyers. Based upon past market prices and the expression of several local persons involved with the fishery, prices paid to local fishermen reflect an acceptable degree of competition among buyers and appear reasonable relative to salmon prices in other areas of Alaska.

Due to the limited degree of processing performed locally, the need for processing labor is not large. Most labor needs can be filled by local residents, with few positions requiring the use of nonresidents.

The limited manufacturing employment arid wage data that are available are summarized in Tables 3.2.25 through 3.2.27. Due to the small number of reporting units, employment data for manufacturing and fish processing is confidential for most reporting periods. The limited fish processing employment that does occur in the Kobuk Census Division is highly seasonal since processing is limited almost exclusively to salmon.

Recent harvests indicate that the processing capacity of the Kotzebue area is in excess of 2,400 metric tons (5.3 million pounds) of salmon. Since much of the area harvest is flown in the round for processing elsewhere, processing capacity can change rapidly.

Community Infrastructure

The infrastructure of the communities of the Kobuk Census Division and the use made of it by the commercial fishing industry are discussed in this section.

Electricity.

All electricity generated in the Kotzebue Sound area is derived from diesel-powered generators. Each community maintains its own system of generating equipment and lines for distribution. These communities

Table 3.2.25
Kobuk Division
Quarterly Manufacturing Employment and Wages
1970-1978

Year	Man Months Quarter 1st	2nd	3rd	4th	Annual	Wages Quarter ($1,000) 1st	2nd	3rd	4th	Annual
1970	0	0	0	0	0	0	0	0	0	0
1971	0	0	0.3	0	0.3	0	0	0.1	0	0.1
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0.3	0.3	0.3	0.3	1.2	0.1	0.1	0.1	0.1	0.4
1975	0.3	30.0	0.3	0.3	30.9	0.1	26.0	0.1	0.1	26.3
1976	0.3	0.3	0	0.3	0.9	0.1	0.1	0	0.1	0.3
1977	0.3	0.3	0.3	0.3	1.2	0.1	0.1	0.1	0.1	0.4
1978	[illegible]	0.3	0.3	0.3	1.2	0.1	0.1	0.1	0.1	0.4

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

Note: The number to the right of the decimal point indicates the number of months or quarters data are not available due to confidentiality requirements.

Quarterly and annual employment data are the summation of monthly employment data which are based on the number of people employed by individual firms during a specific pay period each month.

Table 3.2.26
Kobuk Division
Monthly Manufacturing Employment
1970-1978

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0.1	0.1	0.1	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0
1974	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1975	0.1	0.1	0.1	7.0	9.0	14.0	0.1	0.1	0.1	0.1	0.1	0.1
1976	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	0.1	0.1	0.1
1977	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1978	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

Note: The number to the right of the decimal point indicates the number of months data are not available due to confidentiality requirements.

Table 3.2.27
Kobuk Census Division
Number of Reporting Units in Manufacturing by Quarter
. 1970-1978

Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1970	0	0	0	0
1971	0	0	1	0
1972	0	0	0	0
1973	0	0	0	0
1974	1	1	1	1
1975	2	3	2	2
1976	2	2	0	1
1977	1	1	1	1
1978	1	1	1	2

Source: Alaska Department of Labor, Statistical Quarterly, 1970-1978.

typically do not maintain substantial amounts of excess generating capacity; therefore, major commercial users of electricity entering such communities must be prepared to provide for their own needs. This could be accomplished with the operation of private generators or by assisting a community in upgrading its system.

Electricity is quite expensive in the Kotzebue Sound area. It costs approximately .S0.34 per KWH in the City of Kotzebue, and is even more expensive in the village. Due to the dependence upon petroleum to generate electricity, prices are expected to increase. However, diesel generation does permit rapid increases in capacity with little advance planning.

Water.

Water is adequately abundant for communities in the Kotzebue Sound area. However, only the City of Kotzebue has developed a water system which includes a sizable storage capacity and distribution to individual consumers. A drainage pond on the tundra near the city serves as the main source of water, and water is pumped from a more distant lake into the pond to supplement the supply. By pumping heavily during the summer to fill the pond, enough water is stored for winter use.

The City of Kotzebue consumes about 757,000 liters (200,000 gallons) of water per day. Excepting inclement weather conditions, the present system is adequate for the present consumption level. The system was developed to serve the needs of residential users and the small busi - nesses and government buildings in town. Neither the storage capacity nor the distribution system was designed for industrial users. Any large commercial consumer of water in the Kotzebue Sound area will have to develop its own water supplies, or assist in upgrading the appropriate community's system.

Port Facilities.

The City of Kotzebue serves as the transportation center for all communi- ties in the Kotzebue Sound area. Most cargo arrives by barge during the summer and s received at the city's port for subsequent distribution. The Kotzebue port faces weather and water depth problems nearly identical to those of Nome's port, and is operated by the same shipping company in a similar manner. Kotzebue Sound experiences a shorter shipping season than Norton Sound, with the first barges usually arriving in late June and the season ending in mid-September. For greater detail of the port's facilities and operation, refer to the Norton Sound Port Facili- ties Section.

Small Boat Harbor.

Formal small boat moorage in Kotzebue Sound is limited to a small , summer-use only, harbor in the City of Kotzebue. Most boats owned by area residents are skiffs of 5.5 to 7.3 meters (18 to 24 feet) long, and the harbor can accommodate about 150 at once. Due to the relatively small boats which are used for fishing, hunting and basic transportation, extensive harbor facilities are not necessary and harbors are totally absent in the surrounding villages. The skiffs are generally powered with large outboard engines, and can be beached when floating moorage is not available.

The harbor is not used during the winter months since ice damage to the boats would be quite severe. Also, many owners prefer to store their boat close to their home so that maintenance can be performed more conveniently.

No small boat harbor construction projects are planned for the area at this time. However, plans have been formulated to construct a large workshop in Kotzebue that would provide residents a suitable place to construct new vessels or perform maintenance on their boats. Several matters remain to be settled before the project can advance, and it is uncertain whether the project will be completed.

MARKETS AND THE ORGANIZATION OF THE INDUSTRY

The market structure of an industry is in part determined by the organization of the industry. The commercial fishing industry of Western Alaska is characterized by a very large number of independent fishermen and a smaller number of processors who participate in fisheries which are distinct in terms of geography and species but which often supply fish that compete 'with one another in wholesale markets. The large number of fishermen in each fishery and the potential competition among processors both within a fishery and among fisheries tends to create a competitive market structure. However, this tendency is greatly reduced by agreements between individual fishermen and processors and by linkages among many processors.

Fishermen often have seasonal to long-term agreements to deliver their catch to specific processors at prearranged prices. Such an agreement benefits a processing plant by decreasing the uncertainty as to its supply of fish, and it benefits a fisherman by decreasing the uncertainty with respect to a market for his catch. The value of the latter benefit has often been demonstrated by the inability of a fisherman to sell his catch in the absence of such an agreement. A processor may also offer specific services to a fisherman in exchange for a delivery agreement. The services can include assistance in obtaining loans to finance capital or operating expenses, bookkeeping, moorage and storage of vessel and gear, travel arrangements, and a ready source of gear. The Bristol Bay salmon fishery provides an extreme example of agreements between individual fishermen and processors. In Bristol Bay these agreements approach those of a company town. Many local fishermen have an open account with a processor which is used to buy goods and services from the processor throughout the year. These goods and services may include boats, motors, and gear to prepare for a season; fuel and supplies to be used during the season; heating oil and other consumer goods to be used throughout the year by the fisherman's family; and bookkeeping services. The account is paid for by delivering fish. The agreement to deliver only to the processor with which a fisherman has an agreement is enforced by a processor's ability to determine which fishermen will be extended credit to prepare for the next season and which fisherman it will buy fish from. The cost of such agreements to Bristol Bay fishermen or of less comprehensive agreements to other fishermen is perhaps a lower exvessel price because the option to sell to the processor currently offering the highest price has been given up.

The linkages among processors which can tend to decrease competition within the industry include parent companies with interests in several processors, joint ownership of processors by other processors, and the existence of large processors with several plants. The complexity of the ownership linkages and the failure of the State of Alaska to rigidly enforce disclosure laws have prevented a public determination of the number of independent processing units which exist. However, it is believed that there are relatively few. The potential dependence between processors is further increased because of the large Japanese interests in the Alaska commercial fishing industry and the propensity of Japanese firms to at times act jointly in response to "administrative guidance". Administrative guidance refers to policy jointly set by the Japanese government and industry for the good of all.

Although several studies have begun to measure the interdependencies among processors and to determine both their effects and the effects of agreement between individual fishermen and processors, these issues are largely unexplored. In addition to the ownership linkages among processors there are also market generated linkages. Processors compete within and among regions for the harvesting services of fishermen or for their catch. The ability to tender or fly fish in the round to distant regions for processing and the ability of some fishermen to select their point of landing tend to decrease price differentials between areas by linking fisheries in different areas to each other. Processors also compete within and among regions for wholesale markets since the output of most Alaska processors is destined *for* similar markets. Alaska seafood products are predominately shipped to the Seattle area in preparation for shipment to domestic and foreign markets or they are shipped directly to Japan. In either case the markets are centralized enough or well enough organized that once again price differentials among processors tend to be eliminated. The tendency of the market to eliminate price differentials at the exvessel and wholesale levels and often small profit margins within the industry result in very strong linkages among fisheries and greatly reduce the ability of a processor to offer exvessel prices or wages that are not consistent with those offered elsewhere.

IV. PROJECTIONS OF THE WESTERN ALASKA COMMERCIAL FISHING INCUSTRY IN THE ABSENCE OF OCS ACTIVITY PURSUANT TO LEASE SALE NUMBER 57

This chapter contains the non-OCS case projections of the levels of activity of the Western Alaska commercial fishing industry for 1980 through 2000. The source and nature of these projections are discussed in a preceding chapter. The reader is advised that a well-defined set of assumptions is an integral part of the projections and therefore the projections cannot be meaningfully understood *or* used without first understanding their origin.

The projections for the harvesting sector, the projections for the processing sector, and a discussion of the feasibility of the projections for these two sectors are presented in three separate sections. The projections of harvesting activity are presented by species or species group and by geographic area typically defined by ADF&G management. areas. The projections of processing activity are presented by census division.

Harvesting

The commercial fishing industry of Western Alaska has been extremely productive in recent years and the projections presented in this section indicate that these fisheries are expected to become even more productive for U.S. fishermen as enhancement, rehabilitation, and management programs strengthen and stabilize the salmon fisheries; as the herring, groundfish, and Tanner crab resources off Western Alaska are more fully utilized by domestic fishermen; and as selected real exvessel prices increase. The harvest projections for the Western Alaska commercial fisheries as a whole are summarized in Table 4.1. The specifics of these projections are presented in the following sections.

SALMON

As is indicated in Chapter III, the commercial fisheries of Western Alaska are very productive in absolute terms and relative to the Alaska commercial salmon fishery as a whole. The factors which will tend to increase productivity are as follow:

- enhancement, rehabilitation, and other management programs are expected to provide additional stability to the size of salmon runs;

- dramatic decreases in foreign high seas salmon fishery interceptions of salmon from Alaska tributaries are expected to favorably affect the long-term productivity of Western Alaska salmon fisheries;

- long term market conditions are expected to increase real exvessel salmon prices.

Table 4.1

Projected Western Alaska Harvest
1980-2000

Pounds (millions)

Year	Salmon	Halibut	Herring	Groundfish	King Crab	Tanner Crab	Shrimp	Total
1980	99.1	1.7	50.0	5.4	102.5	163.8	29.6	452.0
1981	101.6	1.7	50.0	7.3	102.5	163.8	30.0	456.8
1982	104.2	1.7	50.0	10.0	102.5	163.8	30.4	462.5
1983	106.9	1.7	50.0	13.7	102.5	163.8	30.9	469.4
1984	109.7	1.7	50.0	18.9	102.5	163.8	31.4	478.0
1985	112.6	1.7	50.0	26.2	102.5	163.8	32.0	488.8
1986	115.5	1.8	50.0	36.5	102.5	163.8	32.6	502.7
1987	118.3	2.0	50.0	50.9	102.5	163.8	33.4	520.9
1988	121.2	2.2	50.0	71.3	102.5	163.8	34.2	545.2
1989	124.2	2.4	50.0	100.2	102.5	163.8	35.1	578.2
1990	127.2	2.6	50.0	141.3	102.5	163.8	36.1	623.6
1991	130.4	2.9	50.0	199.6	102.5	163.8	37.3	686.5
1992	133.7	3.2	50.0	282.6	102.5	163.8	38.6	774.5
1993	137.2	3.5	50.0	401.0	102.5	163.8	40.0	898.1
1994	140.7	3.9	50.0	570.1	102.5	163.8	41.7	1072.6
1995	144.4	4.3	50.0	811.7	102.5	163.8	43.5	1320.1
1996	148.2	4.7	50.0	1157.4	102.5	163.8	45.5	1672.1
1997	152.1	5.2	50.0	1652.4	102.5	163.8	47.8	2173.8
1998	156.2	5.7	50.0	2361.9	102.5	163.8	50.3	2890.4
1999	160.5	6.3	50.0	3379.3	102.5	163.8	53.2	3915.6
2000	164.9	6.9	50.0	4839.4	102.5	163.8	56.4	5383.9

Table 4.1 (continued)

Metric Tons

Year	Salmon	Halibut	Herring	Groundfish	King Crab	Tanner Crab	Shrimp	Total
1980	44935.1	753.0	22679.9	2439.2	46493.7	74299.2	13426.5	205026.5
1981	46070.8	753.0	2?6-79.9	3316.4	46493.7	74299.2	13595.2	207208.1
1982	47252.0	753*O	22679.9	4531.9	46493,7	74299.2	13784.2	209793.8
1983	48481.1	753.0	22679.9	6222.9	46493.7	74299.2	13995.9	212925.6
1984	49760.4	753.0	22679.9	8584.3	46493.7	74299.2	1.4232.9	216803.4
1985	51092.7	753.0	2?6-19.9	11893.0	46493.7	74299.2	14498.4	2217(-)9.8
1986	52391.6	826.2	22679.9	16543.2	46493.7	74299.2	14795.8	228029.5
1987	53656.8	906.8	?2679.9	23097.3	46493.7	74?99.2	]5128.9	236?62.6
1988	54965.2	995.6	2.?679.9	32357.9	46493.7	74299.2	15501.9	247293.3
1989	56318.3	1093.5	22679.9	45472.3	46493.7	?4299.2	15919.7	262276.6
1990	57718.3	1201.4	2?679.9	64081.8	46493.7	74299.2	16387.6	?82861.9
1991	59167.1	1320.3	22679.9	90536.6	46493.7	74299.2	16911.7	311408.5
1992	60666.9	1451.6	22679.9	128204.4	46493.7	74299.2	17498.6	351294.3
1993	62220.0	1596.4	22679.9	181914.2	46493.7	74299.2	18156.1	407359.3
1994	63828.6	1756.2	22679.9	258594.8	46493.7	74299.2	18892.3	486544.8
1995	65495.4	1932.8	22679.9	368193.6	46493.7	74299.2	19717.0	598811.4
1996	67222.8	2127.8	22679.9	524998.()	46493.7	74299.2	20640.6	758462.0
1997	69013.7	?343.3	22679.9	749540.0	46493.7	74299.2	21675.0	986044.8
1998	70871.0	2581.6	22679.9	1071337.0	46493.7	74299.2	22833.6	1311095.9
1999	72797.6	2845.1	22679.9	1532842.2	46493.7	74299.2	24131.2	1776088.8
2000	74796.9	3136.6	22679.9	?195137.?	46493.7	74299.2	25584.5	2442127.9

Table 4.1 (continued)

Nominal Value

Year	Salmon	Halibut	Herring	Groundfish	King Crab	Tanner Crab	Shrimp	Total
1980	88.7	1.3	10.0	0.7	129.3	50.9	7.0	287.8
1981	90.3	3.7	10.8	1.0	121.9	47.5	7.7	282.7
1982	99.2	4.0	11.6	1.4	134.5	49.4	8.6	308.8
1983	109.1	4.4	1?.4	2.]	131.7	54.7	9*5	324.0
1984	120.0	4.9	13.4	3.(-)	141.7	57.9	10.6	351.6
1985	132.1	5.4	14.4	4.4	142.1	63.3	11.8	373.4
1986	145.3	6.4	15.5	6.5	150.8	67.5	13.1	405.2
1987	159.8	7.7	16.7	9.5	153.5	73.3	14.6	435.2
1988	175.6	9.3	17.9	14.1	161.8	78.5	16.3	473.6
1989	193.1	11.1	19.3	21.0	166.4	85.0	18.3	514.2
1990	212.4	13.3	20.7	31.4	174.7	91.3	20.4	564.3
1991	233.6	16.0	2?.3	47..9	181.0	98.5	22.9	621.5
1992	257.0	19.0	24.0	71.1	189.9	105.9	25.8	692.8
1993	282.8	22.8	25.8	107.6	197.7	114.2	29.1	780.0
1994	311.2	27.2	27.7	163.3	?07.5	122.9	32.8	892.8
1995	342.6	32.5	29.8	248.7	217.0	132.4	37.2	1040.2
1996	377.1	38.8	32.1	379.8	228.0	142.5	42.2	1240.5
1997	415.2	46.3	34.5	581.6	239.1	153.5	48.0	1518.3
1998	457.3	55.2	3-?*.1	892.7	?51.7	165.2	54.8	1913.9
1999	503.7	65.9	39.9	1373.?	264.7	177.8	62.7	2487.9
2000	554.9	78.6	43.0	2116.7	.?79.1	191.4	71.9	3335.5

Table 4.1(continued)

Real[1] Value

Year	Salmon	Halibut	Herring	Groundfish	King Crab	Tanner Crab	Shrimp	Total
1980	88.7	1.3	10.0	0.7	129.3	50.9	7.0	287.8
1981	83.9	3.4	10.0	0.9	113.3	44.1	7.2	262.9
1982	85.8	3.5	10.0	1.2	116.3	42.7	7.4	267.0
1983	87.7	3.6	10.0	1.7	105.8	44.0	7.7	260.4
1984	89.7	3.6	10.0	2.3	105.9	43.2	7.9	262.7
1985	91.7	3.7	10.0	3.1	98.7	44.0	8.2	259.4
1986	93.9	4.2	10.0	4.2	97.4	43.6	8.5	261.7
1987	95.9	4.6	10.0	5.7	92.2	44.0	8.8	261.3
1988	98.0	5.2	10.0	7.9	90.3	43.8	9.1	264.4
1989	100.2	5.8	10.0	10.9	86.3	44.1	9.5	266.8
1990	102.5	6.4	10.0	15.2	84.3	44.0	9.9	272.3
1991	104.8	7.2	10.0	21.2	81.2	44.2	10.3	278.8
1992	107.2	7.9	10.0	29.7	79.2	44.2	10.8	288.9
1993	109.7	8.9	10.0	41.7	76.7	44.3	11.3	302.4
1994	112.2	9.8	10.0	58.9	74.8	44.3	11.8	321.8
1995	114.8	10.9	10.0	83.4	72.7	44.4	12.5	348.6
1996	117.5	12.1	10.0	118.4	71.0	44.4	13.1	386.5
1997	120.3	13.4	10.0	168.5	69.3	44.5	13.9	439.8
1998	123.2	14.9	10.0	240.4	67.8	44.5	14.8	515.5
1999	126.1	16.5	10.0	343.8	66.3	44.5	15.7	623.0
2000	129.2	18.3	10.0	492.8	65.0	44.5	16.7	776.5

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

It should be noted that the mean productivity of the fisheries over a number of years is expected to increase, not necessarily the peak year productivity. The projections of the salmon harvest for Western Alaska as a whole are presented in Table 4.2.

The projections by ADF&G management area are presented below. The method used to project the commercial salmon harvest is not area specific. It utilizes information contained in ADF&G's Alaska's Salmon Fisheries Plan, A Provisional Draft for Review and Comment, historical harvest statistics, and the opinions or best guesses of ADF&G management area finfish biologists. The use of the term "best guess" is not inappropriate because the determinants of the size of a salmon run are not sufficiently well understood or predictable to allow long-term forecasts to be made with a high degree of certainty. The methodology is as follows. ADF&G management area finfish biologists were asked to review and update the harvest objectives as stated in the 1976 Alaska Salmon Plan, to indicate which average weights to use in converting the catch objective in terms of the number of fish into objectives in terms of harvest weight, and to indicate an appropriate harvest level to use in 1980, the base year. Typically they suggested that the mean annual catch from 1969 through 1979 was an appropriate base. It is assumed that catch will increase at a constant rate from the 1980 base to the short-term objective by 1985 and will increase, again at a constant rate, from the short-term objective in 1985 to the long-term objective in 2000. If a short-term objective is equal to or less than the 1980 base, the projected annual catch for 1980 through 1985 is held constant at the 1980 level. This methodology does not provide projections which exhibit the run cycles that have been

Table 4.2

Projected Western Alaska Salmon Harvest
1980-2000

	Pounds (millions)							
Year	Chignik	Peninsula	Bristol Bay	Kuskokwim	Yukon	Norton Sound	Kotzebue	Total
1980	11.5	18.3	54.2	3.2	9.0	1.6	1.3	99.1
1981	11.7	19.1	55.1	3.2	9*5	1.6	1.3	101.6
1982	11.9	19.9	56.0	3.3	10.1	1.7	1.3	104.2
1983	12.1	20.7	57.0	3.3	IO*7	1.8	1.3	106.9
1984	12.3	21.6	57.9	3.4	11.3	1*9	1.3	109.7
1985	12.5	22.5	58.9	3.5	11.9	2*O	1.3	112.6
1986	12.8	23.5	60.0	3.5	12.3	2.0	1.3	115.5
1987	13.0	24.5	61.2	3.6	12.6	2.0	1.3	118.3
1988	13.3	25.6	62.4	3.7	12.9	2.0	1*3	121.2
1989	13.5	26.8	63.6	3.8	13*1	2.0	1.3	124.2
1990	13.8	28.0	64.9	3.8	13.4	2*O	1.3	127.2
1991	14.0	29.3	66.2	3.9	13.7	2*O	1.3	130.4
1992	14.3	30.6	67.5	4.(-)	14.0	2.0	1.3	133.7
1993	14.6	32.1	68.8	4.1	14.3	?.0	1.3	137.2
1994	14.9	33.6	70.1	4.2	14.6	2*O	1.3	140.7
1995	15.1	35.1	71.5	4.2	15.0	2*1	1.3	144.4
1996	15.4	36.8	72.9	4.3	15.3	2*1	1.3	148.2
1997	15.8	38.6	74.4	4*4	15.6	2.1	1.3	152.1
1998	16.1	40.4	75.9	4.5	16.0	2.1	1.3	156.2
1999	16.4	42.4	77.4	4.6	16.3	2.1	1.3	160.5
2000	16.7	44.4	78.9	4.7	16.7	2*1	1.3	164.9

Tab'e 4.2 continued

Year	Chignik	Peninsula	Bristol Bay	Kuskokwim	Yukon	Norton Sound	Kotzebue	Total
	Metric Tons							
1980	5200.3	8299.9	24604.0	1431.8	4093.7	706.7	598.7	44935.1
1981	5292.9	8644.5	25007.5	1459.5	4327.3	740.3	598.7	46070.8
1982	5387.9	9007.2	25418.5	1487.9	4575.5	776.2	598.7	47252.0
1983	5485.3	9389.2	25837.2	1516.9	4839.2	814.5	598.7	48481.1
1984	5585.2	9791.5	26263.6	1546.6	5119.6	855.3	598.7	49760.4
1985	5687.6	10215.3	26697.8	1576.9	5417.6	898.7	598.7	51092.7
1986	5792.7	10661.7	27236.6	1607.9	5585.5	908.4	598.7	52391.6
1987	5900.5	11132.0	27767.3	1639.7	5707.8	910.8	598.7	53656.8
1988	6011.0	11627.7	28309.5	1672.1	5832.9	913.2	598.7	54965.2
1989	6124.5	12150.0	28863.3	1705.4	5960.8	915.6	598.7	56318.3
1990	6240.9	12700.6	29429.1	1739.3	6091.6	918.0	598.7	57718.3
1991	6360.4	13281.0	30007.1	1774.1	6225.4	920.4	598.7	59167.1
1992	6483.0	13892.9	30597.6	1809.6	6362.2	922.9	598.7	60666.9
1993	6609.0	14538.1	31200.8	1846.0	6502.1	925.3	598.7	62220.0
1994	6738.2	15218.6	31817.1	1883.2	6645.1	927.7	598.7	63828.6
1995	6871.0	15936.2	32446.6	1921.2	6791.4	930.2	598.7	65495.4
1996	7007.3	16693.2	33089.7	1960.2	6941.0	932.7	598.7	67222.8
1997	7147.3	17491.7	33746.7	2000.0	7094.0	935.2	598.7	69013.7
1998	7291.2	18334.2	34417.9	2040.8	7250.5	937.6	598.7	70871.0
1999	7438.9	19223.2	35103.6	2082.5	7410.5	940.1	598.7	72797.6
2000	7590.8	20161.3	35804.0	2125.2	7574.2	942.7	598.7	74796.9

Table 4.2 (continued)

Year	Nominal Value (millions) Chignik	Peninsula	Bristol Bay	Kuskokwim	Yukon	Norton Sound	Kotzebue	Total
1980	10.9	12.5	55.5	2.3	6.0	0.5	1.0	88.7
1981	10.9	13.2	55.2	2.5	6.8	0.6	1.1	90.3
1982	11.9	14.8	60.4	2.7	7.6	0.7	1.1	99.2
1983	13.0	16.5	66.1	2.9	8.6	0.8	1.2	109.1
1984	14.2	18.5	7?.4	3.1	9*6	().9	1.3	120.0
1985	15.6	20.7	79.2	3*4	10.9	1.0	1.4	132.1
1986	17.(1	23.2	87.0	3.7	11.9	1.1	1.5	145.3
1987	18.6	25.9	95.4	4.0	13.0	1.2	1.7	159.8
1988	20.3	29.1	104.7	4.3	14.2	1.3	1.8	175.6
1989	22.2	3?.6	114.9	4.6	15.6	1.4	1*9	193.1
1990	?4.2	36.5	126.1	5.0	17.0	1*5	2.1	212.4
1991	26.4	40.9	138.4	5.5	18.6	1.6	2.2	233.6
1992	28.9	45.9	151.9	6.0	20.3	1*7	2.4	257.0
1993	31.5	51.5	1,66.7	6.5	22.3	1.8	2.6	282.8
1994	34.4	57.7	182.9	7.1	24.4	2*O	2.7	311.2
1995	37.6	64.8	200.7	7.7	26.7	2.1	3.0	342.6
1996	41.1	72.7	220.3	8.4	29*?	?.3	3.2	377.1
1997	44.9	81.7	241.7	9.1	32.0	?*4	3*4	415.2
1998	49.0	91.7	265.3	9.9	35.0	2.6	3.7	457*3
1999	53.6	103.0	291.1	10.8	38.4	2.8	3.9	503.7
2000	58.5	115.9	319.4	11.8	42.1	3.1	4.2	554.9

Table 4.2 (continued)

Year	Real' Value (millions)							
	Chignik	Peninsula	Bristol Bay	Kuskokwim	Yukon	Norton Sound	Kotzebue	Total
1980	10.9	12.5	55.5	2.3	6.0	0.5	1.0	88.7
1981	10.1	12.3	51.3	2.3	6.3	0.6	1.0	83.9
1982	10.3	12.8	52.2	2.3	6.6	0.6	100	05.8
1983	10.5	13.3	53.1	2.3	6.9	006	1.0	87.7
1984	10.6	13.8	54.1	2.3	7.2	(3.7	1.0	89.7
1985	10.8	14.4	55.0	2.3	7.5	O*7	1.0	91.7
1986	11.0	15.0	56.2	2.4	7.7	0.7	1.0	93.9
1987	11.1	15.6	57.3	2.4	7.8	0.7	1*O	95.9
1988	11.3	16.2	58.5	2.4	8.0	0.7	1.0	98.0
1989	11.5	16.9	59.7	2.4	8.1	0.7	1.0	100.2
1990	11.7	17.6	60.9	2.4	8.2	0.7	1.0	102.5
1991	11.9	18.4	6?.1	2.5	8.3	O*7	1.0	104.8
1992	12.0	19.1	63.4	2.5	8.5	0.7	1.0	107.2
1993	12.2	20.0	64.6	2.5	8.6	0.7	1.0	109.7
1994	12.4	?0.8	65.9	2.5	8.8	0.7	1.0	112.2
1995	12.6	21.7	67.3	2.6	8.9	0.7	1.0	114.8
1996	12.8	22.7	68.6	2.6	9.1	0.7	1.0	117.5
1997	13.0	23.7	-r 0.0	2.6	9.3	0.7	1.0	120.3
1998	13.2	24.7	71.4	2.7	9.4	0.7	1.0	123.2
1999	13.4	25.8	72.9	?.7	9.6	0.7	1.0	126.1
2000	13.6	27.0	74.4	2.8	9.8	0.7	1.0	129.2

'The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

and will no doubt continue to be, although perhaps to a lesser degree, characteristic of salmon fisheries. The reasons for and the results of not attempting to project cycles are discussed in Chapter II. The numerical bases for the projections by species by management area are summarized in Appendix A.

Chignik

The annual Chignik Management Area commercial salmon harvest is projected to increase from 5,200 metric tons (11.5 million pounds) in 1980 to 7,591 metric tons (16.7 million pounds) in 2000, and the real value of the harvest is projected to increase from $10.9 million to $13.6 million (see Table 4.3). This represents a 46 percent increase in harvest weight and a 25 percent increase in real harvest value; a 14.4 percent projected decrease in the real exvessel price explains the less rapid increase in harvest value (see Table 4.4). The projected annual rates of change in harvesting va ue are presented in Table 4.5, and projections of catch by species appear in Tables 4.6 through 4.9. The harvest weight projected for 2000 s less than the record harvest of 1979 because the 1979 harvest level is not expected to be sustainable.

Peninsula

The annual Peninsula Management Area salmon harvest weight is expected to increase from 8,300 metric tons (18.3 million pounds) in 1980 to 20,161 metric tons (44.4 million pounds) in 2000, and the real harvest value is expected to increase from $12.5 million to $27.0 million (see

Table 4.3
Chignik Salmon Fishery
Projected Harvesting Activity
1980-2000

	Catch				Exvessel Price		Number of		Catch per Boat Month		
	Weight		Value (millions)[1]		($/Pound)				Weight	Value ($1,000)	
Year	Pounds (millions)	Metric Tons	Nominal	Real[1]	Nominal	Real	Boat Months	Fisherman Months	Pounds (1,000)	Nominal	Real
1980	11.5	5200	10.9	10.9	0.95	0.95	270	1350	42.5	40.4	40.4
1981	11.7	5293	10.9	10.1	0.94	0.87	270	1350	43.2	40.4	37.6
1982	11.9	5388	11.9	10.3	1.00	0.87	.?70	1350	44.0	44.2	38.2
1983	12.1	5485	13.0	1(").5	1.08	0.87	270	1350	44.8	48.3	38.8
1984	12.3	5585	14.2	10.6	1.16	0.86	270	1350	45.6	52.7	39.4
1985	12.5	5688	15.6	10.8	1.24	0.86	270	1350	46.4	57.6	40.0
1986	12.8	5793	17.0	11.0	1.33	0.86	270	1350	47.3	62.9	40.6
1987	13.0	5900	18.6	11.1	1.43	0.86	270	1350	48.2	68.8	41.3
1988	13.3	6011	20.3	11.3	1.53	0.85	270	1350	49.1	75.1	41.9
1989	13.5	6124	22.2	11.5	1.64	0.85	270	1350	50.0	82.0	42.6
1990	13.8	6241	24.2	11.7	1.76	0.85	27o	1350	51.0	89.6	43.2
1991	14*()	6360	26.4	11.9	1.88	0.85	270	1350	51*9	97.9	43.9
1992	14.3	6483	28.9	12.0	2.02	0.84	270	1350	52.9	106.9	44.6
1993	14.6	6609	31.5	1?.2	2.16	0.84	?70	1350	54.0	116.8	45.3
1994	14.9	6738	34.4	12.4	2.32	0.84	270	1350	55,0	1?7.6	46.0
1995	15.1	6871	37.6	12.6	2.48	0.83	27(3	1350	56.1	139.3	46.7
1996	15.4	7007	41.1	12.8	2.66	0.83	.?70	1350	57.2	152.2	4?.4
1997	15.8	7147	44.9	13.0	2.85	0.83	270	1350	58.4	166.3	48.2
1998	16.1	7291	49.0	13.2	3.05	0.82	270	1350	59.5	181.6	48.9
1999	16.4	7439	53.6	13.4	3.27	0.82	270	1350	60.7	198.4	49.7
2000	16.7	7591	58.5	13.6	3.50	0.81	270	1350	62.0	216.8	50.5

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.4
Chignik Salmon Fishery
Harvesting Activity Projected Percentage Change from 1980
1980-2000

	Percentage Change								
	Catch			Exvessel Price		Number of Boat Months	Catch per Boat Month		
		Value						Value	
Year	Weight	Nominal	Real[1]	Nominal	Real		Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	o
1981	1.8	0.1	-7.0	-1.7	-8.6	0	1.8	0.1	-7.0
1982	3.6	9.4	-5.5	5.5	-8.8	0	3.6	9.4	-5.5
1983	5.5	19.5	-4*O	13.3	-9.0	0	5.5	19.5	-4.0
1984	7.4	30.6	-7.5	21.6	-9.2	0	7.4	30.6	-2.5
1985	9.4	42.6	-0.9	30.4	-9.4	0	9.4	42.6	-().9
1986	11.4	55.8	0.6	39.9	-9.7	0	11.4	55.8	0.6
1987	13.5	70.2	2.2	50.0	-9.9	0	13.5	70.2	2*2
1988	15.6	86.0	3.8	60.9	-10.2	0	15.6	86.0	3.8
1989	17.8	103.1	5.4	72.5	-10.5	0	17.8	103.1	5.4
1990	20.0	121.9	7.1	84.9	-10.8	0	20.0	121.9	7.1
1991	.??.3	142.3	8.7	98.1	-11*1	0	22.3	142.3	8.7
1992	24.7	164.7	10.4	112.3	-11.4	0	24.7	164.7	10.4
1993	27.1	189.1	12.1	1,27.5	-11.8	0	27.1	189.1	1?.1
1994	29.6	215.8	13.9	143.7	-12.1	0	29.6	215.8	13.9
1995	32.1	245.0	15.6	161.1	-12.5	0	32.1	245*(3	15.6
1996	34.7	276.9	17.4	179.7	-12.9	0	34.7	276.9	17.4
1997	37.4	311.7	19.3	199.5	-13.2	0	37.4	311.7	19.3
1998	40.2	349.7	?1.1	220.8	-13.6	0	40.2	349.7	21.1
1999	43.0	391.3	23.0	243.5	-14.0	0	43.0	391.3	23.0
2000	46.0	436.8	25.0	267.7	-14.4	n	46.0	436.8	25.0

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.5
Chignik Salmon Fishery
Harvesting Activity Projected Annual Rate of Change
1980-2000

	Percentage Change								
	Catch						Catch per Boat Month		
		Value		Exvessel Price		Number of		Value	
Year	Weight	Nominal	Real[1]	Nominal	Real	Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	1.8	0.1	-7.0	-1.7	-8.6	0	1.8	0.1	-7.0
1982	1.8	9.3	1.6	7.4	-0.2	0	1.8	9.3	1.6
1983	1.8	9.3	1.6	7.3	-0.2	0	1.8	9.3	1.6
1984	1.8	9.3	1.6	7.3	-0.2	0	1.8	9.3	1.6
1985	1.8	9.3	1.6	7.3	-0.3	0	1.8	9.3	1.6
1986	1.8	9.2	1.6	7.3	-0.3	0	1.8	9.2	1.6
1987	1.9	9.2	1.6	7.2	-0.3	0	1.9	9.2	1.6
1988	1.9	9.2	1.6	7.2	-0.3	0	1.9	9.2	1.6
1989	1.9	9.2	1.6	7.2	-0.3	0	1.9	9.2	1.6
1990	1.9	9.2	1.6	7.2	-0.3	0	1.9	9.2	1.6
1991	1.9	9.2	1.6	7.2	-0.4	0	1.9	9.2	1.6
1992	1.9	9.2	1.6	7.2	-0.4	0	1.9	9.2	1.6
1993	1.9	9.2	1.6	7.1	-0.4	0	1.9	9.2	1.6
1994	2.0	9.2	1.6	7.1	-0.4	0	2.0	9.2	1.6
1995	2.0	9.2	1.6	7.1	-0.4	0	2.0	9.2	1.6
1996	2.0	9.2	1.6	7.1	-0.4	0	2.0	9.2	1.6
1997	2.0	9.2	1.6	7.1	-0.4	0	2.0	9.2	1.6
1998	2.0	9.2	1.6	7.1	-0.4	0	2.0	9.2	1.6
1999	2.0	9.2	1.6	7.1	-0.4	0	2.0	9.2	1.6
2000	2.0	9.3	1.6	7.1	-0.5	0	2.0	9.3	1.6

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.6
Chignik Salmon Fishery
Projected Harvest by Species
1980-2000

(1,000 Fish)

Year	Kings	Reds	Pinks	Silvers	Chums
1980	2	1000	720	25	135
1981	2	1013	746	26	135
1982	2	1026	774	26	135
1983	2	1040	802	27	135
1984	2	1054	832	28	135
1985	2	1067	862	29	135
1986	2	1081	894	30	135
1987	2	1096	92?	31	135
1988	2	1110	961	32	135
1989	2	1124	996	32	135
1990	2	1139	1032	33	135
1991	2	1154	1070	34	135
1992	2	1169	1110	35	135
1993	2	1185	1150	36	135
1994	2	1200	1193	30	135
1995	2	1216	1236	39	135
1996	2	1232	1282	40	135
1997	2	1248	1329	41	135
1998	2	1264	1377	42	135
1999	2	1281	1428	43	135
2000	2	1298	1480	45	135

Table 4.7
Chignik Salmon Fishery
Projected Harvest Weight by Species
1980-2000

Year	Pounds (1,000)					Metric Tons				
	Kings	Reds	Pinks	Silvers	Chums	Kings	Reds	Pinks	Silvers	Chums
1980	42	7500	2736	188	999	19	3402	1241	85	453
1981	42	7598	2836	193	999	19	3447	1287	88	453
1982	42	7698	2940	199	999	19	3492	1334	90	453
1983	42	7799	3048	205	999	19	3538	1383	93	453
1984	42	7901	3160	211	999	19	3584	1433	95	453
1985	42	8005	3276	217	999	19	3631	1486	98	453
1986	42	8110	3396	223	999	19	3679	1541	101	453
1987	42	8216	3521	230	999	19	3727	1597	104	453
1988	42	8324	3650	236	999	19	3776	1656	107	453
1989	42	8433	3784	243	999	19	3825	1717	110	453
1990	42	8544	3923	250	999	19	3876	1780	114	453
1991	42	8656	4067	258	999	19	3926	1845	117	453
1992	42	8770	4216	265	999	19	3978	1913	120	453
1993	42	8885	4371	273	999	19	4030	1983	124	453
1994	42	9001	4532	281	999	19	4083	2056	128	453
1995	42	9119	4698	290	999	19	4137	2131	131	453
1996	42	9239	4870	298	999	19	4191	2209	135	453
1997	42	9360	5049	307	999	19	4246	2290	139	453
1998	42	9483	5234	316	999	19	4301	2374	143	453
1999	42	9607	5426	325	999	19	4358	2461	147	453
2000	42	9733	5626	335	999	19	4415	2552	152	453

Table 4.8

Chignik Salmon Fishery
Projected Harvest Value by Species
1980-2000

	Nominal Value ($1,000)					Real Value[1] ($1,000)				
Year	Kings	Reds	Pinks	Silvers	Chums	Kings	Reds	Pinks	Silvers	Chums
1980	58	9000	985	173	689	58	9000	905	173	689
1981	63	8817	1101	188	744	58	8197	1024	175	692
1982	66	9628	12?7	205	800	57	8322	1060	177	691
1983	69	10512	1366	224	860	55	8448	1098	180	691
1984	73	114”14	1572	244	925	54	8573	1137	183	691
1985	77	12522	1695	267	995	53	8698	11”77	185	691
1986	81	13663	1888	?92	1070	5?	8823	1219	188	691
1987	85	14905	Z104	319	1151	51	8949	1263	192	691
1988	90	16258	2344	350	1237	50	9075	1308	195	691
1989	95	17731	2611	383	1330	49	9202	1355	199	690
1990	101	19335	2909	420	1430	49	9329	1404	203	690
1991	107	21082	3241	461	1538	48	9457	1454	207	690
1992	113	22984	3611	505	1654	47	9585	1506	211	690
1993	120	25055	4024	555	1778	47	9715	1560	215	689
1994	1?7	27310	4484	610	1911	46	9845	1616	220	689
1995	135	29766	49Q6	670	2055	45	9976	1674	225	689
1996	144	32440	5567	737	2209	45	10108	1735	230	688
1997	153	35352	6204	Fill	2375	44	10241	1797	235	688
1998	163	38522	6913	892	2554	44	10375	1862	240	6n8
1999	174	41975	7703	982	2“?45	43	10511	1929	246	687
2000	185	4’5-7”35	8585	1081	2951	43	10647	1998	257	687

[1]The real values are in terms of 1980 dollars.

Table 4.9
Chignik Salmon Fishery
Projected Exvessel Prices by Species
1980-2000

Year	Nominal Price ($/Pound) Kings	Reds	Pinks	Silvers	Chums	Real Price[1] ($/Pound) Kings	Reds	Pinks	Silvers	Chums
1980	1.39	1.20	0.36	0.92	0.69	1.39	1.20	0.36	0.92	0.69
1981	1.49	1.16	0.39	0.98	0.74	1.38	1.08	0.36	0.91	0.69
1982	1.56	1.25	0.42	1.03	0.80	1.35	1.08	0.36	0.89	0.69
1983	1.64	1.35	0.45	1.09	0.86	1.32	1.08	0.36	0.88	0.69
1984	1.73	1.45	0.48	1.16	0.93	1.29	1.08	0.36	0.87	0.69
1985	1.82	1.56	0.52	1.23	1.00	1.27	1.09	0.36	0.86	0.69
1986	1.92	1.68	0.56	1.31	1.07	1.24	1.09	0.36	0.84	0.69
1987	2.03	1.81	0.60	1.39	1.15	1.22	1.09	0.36	0.83	0.69
1988	2.14	1.95	0.64	1.48	1.24	1.20	1.09	0.36	0.83	0.69
1989	2.27	2.10	0.69	1.57	1.33	1.18	1.09	0.36	0.82	0.69
1990	2.40	2.26	0.74	1.68	1.43	1.16	1.09	0.36	0.81	0.69
1991	2.54	2.44	0.80	1.79	1.54	1.14	1.09	0.36	0.80	0.69
1992	2.69	2.62	0.86	1.90	1.66	1.12	1.09	0.36	0.79	0.69
1993	2.86	2.82	0.92	2.03	1.78	1.11	1.09	0.36	0.79	0.69
1994	3.03	3.03	0.99	2.17	1.91	1.09	1.09	0.36	0.78	0.69
1995	3.22	3.26	1.06	2.31	2.06	1.08	1.09	0.36	0.78	0.69
1996	3.43	3.51	1.14	2.47	2.21	1.07	1.09	0.36	0.77	0.69
1997	3.65	3.78	1.23	2.64	2.38	1.06	1.09	0.36	0.77	0.69
1998	3.88	4.06	1.32	2.82	2.56	1.05	1.09	0.36	0.76	0.69
1999	4.13	4.37	1.42	3.02	2.75	1.03	1.09	0.36	0.76	0.69
2000	4.40	4.70	1.53	3.23	2.95	1.03	1.09	0.36	0.75	0.69

[1]The real values are in terms of 1980 dollars.

Table 4.10). The corresponding percentage increases are 143 percent and 116 percent respectively (see Table 4.11). The projected annual rates of change in harvesting activity are summarized in Table 4.12, and the projections by species are presented in Tables 4.13 through 4.16. The harvest weight for 2000 is not expected to equal the record harvest of 1979 because such a high level of harvest is not thought to be sustainable.

Bristol Bay

The Bristol Bay Management Area salmon fishery is expected to continue to dominate the salmon fishery of Western Alaska and remain one of Alaska's leading salmon fisheries. The annual harvest weight is projected to increase from 24,604 metric tons (54.2 million pounds) in 1980 to 35,804 metric tons (78.9 million pounds) in 2000, and the real harvest value is expected to increase from $55.5 million to $74.4 million (see Table 4.17). The projections for 1980 do not reflect the fact that the actual 1980 harvest is generally expected to be a peak year harvest; rather it reflects the mean harvest expected during the early 1980s. The projected increases in harvest weight and real harvest value are 45.5 percent and 34.0 percent respectively (see Table 4.18). The projected annual rates of change in harvesting activity are summarized in Table 4.19, and harvest projections by species are presented in Tables 4.20 through 4.23. The harvest weight for 2000 is not expected to approach the record harvests of 1978 through 1980 because it is not believed that such harvests are sustainable.

Table 4.10
Peninsula Salmon Fishery
Projected Harvesting Activity
1980-2000

Year	Catch: Weight: Pounds (millions)	Catch: Weight: Metric	Catch: Value (millions)[1]: Nominal	Catch: Value (millions)[1]: Real	Exvessel Price ($/Pound): Nominal	Exvessel Price ($/Pound): Real	Number of Boat Months	Number of Fisherman Months	Catch per Boat Month: Weight Pounds (1,000)	Catch per Boat Month: Value ($1,000): Nominal	Catch per Boat Month: Value ($1,000): Real
1980	in.3	8300	12.5	12.5	0.68	0.68	660	1760	27.7	18.9	18.9
1981	19.1	8644	13.2	12.3	0.69	0.64	660	1760	28.9	20.0	18.6
1982	19.9	9007	14.8	12.8	0.74	0.64	660	1760	30.1	22.4	19.3
1983	20.?	9389	16.5	13.3	0.80	0.64	66(-I	1760	31.4	25.0	20.1
1984	21.6	9792	18.5	13.8	0.86	0.64	660	1760	32.7	28.0	20.9
1985	22.5	10215	?0.7	14.4	0.92	0.64	660	1760	34.1	31.4	21.8
1986	23.5	10662	23.2	15.0	0.99	0.64	660	1760	35.6	35.1	22.7
1987	24.5	11132	25.9	15.6	1.06	0.63	66(7	1760	37.2	39.3	23.6
1988	?5.6	11628	29.1	16.2	1.13	0.63	660	1760	38.8	44.0	24.6
1989	26.8	12150	32.6	16.9	1.22	0.63	660	1760	40.6	49.3	25.6
1990	28.0	12701	36.5	17.6	1.30	0.63	660	1760	42.4	55.3	?6.7
1991	29.3	13281	40.9	18.4	1[illegible]40	0.63	660	1760	44.4	62.0	27.8
1992	30.6	13893	45.9	1401	1.50	0.62	660	1760	46.4	69.5	29.0
1993	32.1	14538	51.5	20.0	1.61	0.62	660	1760	48.6	78. o	30.2
1994	33.6	15219	57.7	20.8	1.72	0.62	660	1760	50.8	87.5	31.5
1995	35.1	15936	64.8	21.7	1.84	0.62	660	1760	53.2	98.2	32.9
1996	36.8	16693	72.7	2?.7	1.98	0.62	660	1760	55.8	110.2	34.3
1997	38.6	1749?	81.7	23.”7	2.12	0.61	660	1760	58.4	123.7	35.8
1998	40.4	18334	91.7	24.7	2.27	0.61	660	1760	61.2	139.0	37.4
1999	42.4	19223	103.0	25.8	7.43	0.61	660	1760	64.2	156.1	39.1
2000	44.4	20161	115.8	27.0	2.6(1	0.61	660	1760	67.3	175.4	40.8

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the baseperiod.

Table 4.11
Peninsula Salmon Fishery
Harvesting Activity Projected Percentage-Change from 1980
1980-2000

Year	Catch: Weight	Catch: Value Nominal	Catch: Value Real[1]	Exvessel Price: Nominal	Exvessel Price: Real	Number of Boat Months	Catch per Boat Month: Weight	Catch per Boat Month: Value Nominal	Catch per Boat Month: Value Real
1980	0	0	0	0	0	0	0	0	o
1981	4.2	5.8	-1.6	1.6	-5.5	0	4.2	5.8	-1.6
1982	8.5	18.4	2.3	9.1	-5.7	0	8.5	18.4	2.3
1983	13.1	32.4	6.4	17.1	-5.9	0	13.1	32.4	6.4
1984	18.0	48.?	10.7	25.6	-15.2	0	18.0	48.2	10.7
1985	23.1	65.9	15.2	34.8	-6.4	0	23.1	65.9	15.2
1986	28.5	85.7	19.9	44.6	-6.6	0	28.5	85.7	19.9
1987	34.1	108.0	24.9	55.1	-6.9	0	34.1	108.0	24.9
1988	40.1	133.0	30.0	66.3	-7.2	0	40.1	133.0	30.0
1989	46.4	161.0	35.5	78.3	-7.5	0	46.4	161.0	35.5
1990	53.0	192.5	41.2	91.2	-7.8	0	53.0	192.5	41.2
1991	60.0	228.0	47.1	105.0	-0.1	0	60.0	228.(’I	47.1
1992	67.4	267.8	53.4	119.7	-8.4	0	67.4	267.8	53*4
1993	75.2	312.5	59.9	135.5	-8*7	0	75.2	312.5	59*9
1994	83.4	362.8	66.8	152.4	-9.0	0	83.4	362.8	6 6 . 8
1995	92.0	419.3	74.1	170.5	-9.3	0	92*O	419.3	74.1
1996	101.1	483.0	81.6	189.8	-9.7	0	10I..1	483.0	81.6
1997	110.7	554.5	89.6	210.6	-10.0	0	110.7	554.5	89.6
1998	120.’)	635.1	98.0	232.8	-10.4	0	120.9	635.1	98.0
1999	131.6	725.8	106.8	?56.5	-10.7	0	131.6	725.8	106.8
2000	142.9	827.9	116.0	282.0	-11.1	0	142.9	827.9	116.0

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.12
Peninsula Salmon Fishery
Harvesting Activity Projected Annual Rate of Change
1980-2000

	Percentage Change								
	Catch			Exvessel Price			Catch per Boat Month		
		Value						Value	
Year	Weight	Nominal	Real[1]	Nomina 1	Real	Number of Boat Months	W	Nominal	Real
1980	0	0	d	0	0	0	0	0	0
1981	4.2	5.8	-1.6	1.6	-5.5	n	4.2	5.8	-1.6
1982	4.2	11.9	4.0	7.3	-0.2	0	4.2	11.9	4.0
1983	4.2	11.9	4.0	7.3	-0.2	0	4.2	11.9	4.0
1984	4.3	11.9	4.(-)	7.3	-0.?	0	4.3	11.9	4.0
1985	4.3	11.9	4.1	7.3	-0.3	0	4.3	11.9	4.1
1986	4.4	12.0	4.1	7.3	-0.3	0	4.4	12.(-I	4.1
1987	4.4	12.0	4.1	7.3	-0.3	0	4.4	12*O	4.1
1988	4.5	12*O	4.1	7.2	-0.3	0	4.5	12.0	4.1
1989	4.5	12.0	4.2	7.2	-0.3	0	4.5	12.0	4.2
1990	4.5	12.1	4.2	?.2	-0.3	0	4.5	12*1	4.2
1991	4.6	12*1	4.2	7.2	-0.3	0	4.6	12.1	4.?
1992	4.6	12.1	4.3	7.2	-0.3	0	4.6	12.1	4.3
1993	4.6	12.2	4.3	7.2	-0.3	0	4*6	12*2	4.3
1994	4.7	12.2	4.3	7.2	-0.4	n	4.7	12*2	4 . 3
1995	4.7	12.?	4.3	7.2	-0.4	0	4.7	12.2	4.3
1996	4.7	1?.3	4.4	7.2	-0.4	0	4.7	12.3	4.4
1997	4.8	12.3	4.4	7.2	-0.4	0	4.0	12.3	4.4
1998	4.8	12.3	4.4	7.1	-0.4	0	4.8	12.3	4.4
1999	4.8	1?.3	4.4	7.1	-0.4	0	4.8	12.3	4.4
2000	4.9	1?.4	4.5	7.1	-0.4	0	4.9	12.4	4.5

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.13
Peninsula Salmon Fishery
Projected Harvest by Species
1980-2000

(1 ,000 Fish)

Year	Kings	Reds	Pinks	Silvers	Chums
1980	5	1000	2000	70	570
1981	5	1039	2121	75	573
1982	6	1080	2249	80	575
1983	6	1123	2385	86	578
1984	b	1167	2529	92	581
1985	7	1213	2682	90	583
1986	7	1261	2844	105	586
1987	7	1311	3016	113	589
1988	8	1363	3198	120	591
1989	8	1416	3392	129	594
1990	9	1472	3597	138	597
1991	9	1530	3814	148	600
1992	9	1590	4045	158	602
1993	10	1653	4289	169	605
1994	11	1718	4549	181	608
1995	11	1786	4824	194	611
1996	12	1856	5115	207	613
1997	12	1930	5424	222	616
1998	13	2006	5752	237	619
1999	14	2085	6100	254	622
2000	15	2167	6469	272	625

Table 4.14
Peninsula Salmon Fishery
Projected Harvest Weight by Species
1980-2000

	Pounds (1,000)					Metric Tons				
Year	Kings	Reds	Pinks	Silvers	Chums	Kings	Reds	Pinks	Silvers	Chums
1980	90	6100	7600	518	3990	41	2767	3447	235	1810
1981	95	6340	8059	554	4008	43	2876	3656	251	1818
1982	100	6590	8547	593	4027	45	2989	3877	269	1827
1983	106	6050	9063	635	4045	48	3107	4111	288	1835
1984	111	7120	9611	679	40154	51	3230	4360	308	1843
1985	118	7401	10192	727	4083	53	3357	4623	330	1852
1986	124	7693	10808	778	4102	56	3489	4903	353	1860
1987	131	7996	11461	833	4120	59	3627	5199	378	1869
1988	138	8311	12154	891	4139	63	3770	5513	404	1878
1989	146	8639	12889	954	4158	66	3919	5846	433	1886
1990	154	8980	13668	1021	4178	70	4073	6200	463	1895
1991	162	9334	14494	1093	4197	74	4234	6575	496	1904
1992	171	9701	15370	1169	4216	78	4401	6972	530	1912
1993	180	10084	16300	1251	4236	82	4574	7393	568	1921
1994	190	10481	17285	1339	4255	86	4754	7840	607	1930
1995	201	10895	18330	1433	4275	91	4942	8314	650	1939
1996	212	11324	19438	1534	4294	96	5137	8817	696	1948
1997	223	11771	20613	1641	4314	101	5339	9350	745	1957
1998	236	12235	21859	1757	4334	107	5550	9915	797	1966
1999	249	12717	23180	1880	4354	113	5768	10514	853	1975
2000	262	13218	24581	2012	4374	119	5996	11150	913	1984

Table 4.15
Peninsula Salmon Fishery
Projected Harvest Value by Species
1980-2000

Year	Nominal Value ($1,000)					Real Value[1] ($1,000)				
	Kings	Reds	Pinks	Silvers	Chums	Kings	Reds	Pinks	Silvers	Chums
1980	90	6710	2964	518	2195	90	6710	2964	518	2195
1981	102	6744	3390	588	2379	95	6270	3152	547	2212
1982	113	7556	3862	666	2570	97	6531	3338	576	2222
1983	125	8464	4400	755	2777	100	6802	3536	607	2232
1984	139	9478	5013	857	3000	104	7082	3746	640	2242
1985	154	10612	5713	974	3241	107	7372	3968	676	2252
1986	172	11880	6510	1107	3502	111	7672	4204	715	2261
1987	191	13297	7418	1259	3783	115	7983	4454	756	2271
1988	213	14880	8453	1433	4086	119	8306	4719	800	2281
1989	238	16650	9634	1632	4414	123	8641	5000	847	2291
1990	265	18627	10979	1860	4768	128	8988	5297	897	2300
1991	296	20837	12513	2121	5150	133	9347	5613	951	2310
1992	331	23307	14262	2420	5563	138	9720	5948	1009	2320
1993	371	26067	16255	2763	6008	144	10107	6303	1071	2330
1994	415	29151	18527	3155	6490	150	10509	6679	1137	2339
1995	466	32597	21118	3605	7009	156	10925	7078	1208	2349
1996	522	36448	24071	4122	7570	163	11357	7500	1284	2359
1997	586	40751	27437	4714	8176	170	11805	7948	1365	2369
1998	658	45559	31274	5393	8831	177	12270	8423	1452	2378
1999	739	50931	35649	6172	9537	185	12753	8927	1545	2388
2000	831	56934	40636	7066	10300	193	13254	9460	1645	2398

The real values are in terms of 1980 dollars.

Table 4.16
Peninsula Salmon Fishery
Projected Exvessel Prices by Species
1980-2000

Year	Nominal Price ($/Pound)					Real Price[1] ($/Pound)				
	Kings	Reds	Pinks	Silvers	Chums	Kings	Reds	Pinks	Silvers	Chums
1980	1.00	1.10	0.39	1.00	0.55	1.00	1.10	0.39	1.00	0.55
1981	1.07	1.06	0.42	1.06	0.59	1.00	0.99	0.39	0.99	0.55
1982	1.12	1.15	0.45	1.12	0.64	0.97	0.99	0.39	0.97	0.55
1983	1.18	1.24	0.49	1.19	0.69	0.95	0.99	0.39	0.96	0.55
1984	1.24	1.33	0.52	1.26	0.74	0.93	0.99	0.39	0.94	0.55
1985	1.31	1.43	0.56	1.34	0.79	0.91	1.00	0.39	0.93	0.55
1986	1.38	1.54	0.60	1.42	0.85	0.89	1.00	0.39	0.92	0.55
1987	1.46	1.66	0.65	1.51	0.92	0.88	1.00	0.39	0.91	0.55
1988	1.54	1.79	0.70	1.61	0.99	0.86	1.00	0.39	0.90	0.55
1989	1.63	1.93	0.75	1.71	1.06	0.85	1.00	0.39	0.89	0.55
1990	1.73	2.07	0.80	1.82	1.14	0.83	1.00	0.39	0.88	0.55
1991	1.83	2.23	0.86	1.94	1.23	0.82	1.00	0.39	0.87	0.55
1992	1.94	2.40	0.93	2.07	1.32	0.81	1.00	0.39	0.86	0.55
1993	2.06	2.58	1.00	2.21	1.42	0.80	1.00	0.39	0.86	0.55
1994	2.18	2.78	1.07	2.36	1.53	0.79	1.00	0.39	0.85	0.55
1995	2.32	2.99	1.15	2.52	1.64	0.78	1.00	0.39	0.84	0.55
1996	2.47	3.22	1.24	2.69	1.76	0.77	1.00	0.39	0.84	0.55
1997	2.62	3.46	1.33	2.87	1.90	0.76	1.00	0.39	0.83	0.55
1998	2.79	3.72	1.43	3.07	2.04	0.75	1.00	0.39	0.83	0.55
1999	2.97	4.00	1.54	3.28	2.19	0.74	1.00	0.39	0.82	0.55
2000	3.17	4.31	1.65	3.51	2.35	0.74	1.00	0.38	0.82	0.55

[1]The real values are in terms of 1980 dollars.

Table 4.17

Bristol Bay Salmon Fishery

Projected Harvesting Activity

1980-2000

Year	Catch: Weight: Pounds (millions)	Catch: Weight: Metric Tons	Catch: Value (millions): Nominal	Catch: Value (millions): Real	Exvessel Price /Pound: Nominal	Exvessel Price /Pound: Real[1]	Number of: Boat Months	Number of: Fisherman Months	Catch per Boat Month: Weight: Pounds (1,000)	Catch per Boat Month: Value ($1,000): Nominal	Catch per Boat Month: Value ($1,000): Real
1980	54.2	24604	55.5	55.5	1.0?	1.02	3150	8640	17.2	17.6	17.6
1981	55.1	25008	55.?	51*3	1.00	0.93	3150	8640	17.5	17.5	16.3
1982	56.0	25419	60.4	52.2	1.08	0.93	3150	8640	17.8	19.2	16.6
1983	57.0	25837	66.1	53.1	1.16	0.93	3150	8640	18.1	21.0	16.9
1984	57.9	26264	72.4	54.1	1.25	0.93	3150	8640	18.4	23.0	17.2
1985	58.9	26698	79.2	55.0	1.35	0.93	3150	8640	18.7	25.1	17.5
1986	60.0	27237	87.0	56.2	1.45	0.94	3150	8640	19.1	27.6	17.8
1987	6].?	27767	95.4	57.3	1.56	0.94	3150	8640	19.4	3(-).3	18.2
1988	62.4	28309	104.7	58.5	1.68	0.94	3150	8640	19.8	33.3	18.6
1989	63.6	28863	114.9	59.7	1.81	0.94	3150	8640	20.2	36.5	18.9
1990	64.9	.?9429	1.76.1	60.9	1.94	0.94	3150	8640	20.6	40.0	19.3
1991	66.2	30007	138.4	62.1	2.09	O*Q4	3150	8640	21.0	43.9	19.7
1992	67.5	30598	151.9	63.4	2.25	0.94	3150	8640	21.4	48.2	20.1
1993	68.8	31201	166.7	64.6	.?.42	0.94	3150	8640	21.8	52.9	20.5
1994	70.1	31817	182.9	65.9	“2.61	0.94	3150	8640	22.3	58.1	20.9
1995	71.5	3?447	200.7	67.3	2.81	(-).94	3150	8640	22.7	63.-?	21.4
1996	72.9	33090	220.3	68.6	3.02	0.94	-315(-)	8640	23.2	69.9	21.8
1997	74.4	33747	?41.7	70.0	3.25	0.94	3150	8640	23.6	76.7	22.2
1998	75.9	34418	265.3	71.4	3.50	0.94	3150	8640	24.1	84.2	?2.7
1999	77.4	35104	291.1	72.9	3.76	0.94	3150	8640	24.6	92.4	23.1
2000	78.9	35804	319.4	74.4	4.05	().94	3150	8640	25.1	101.4	23.6

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.18
Bristol Bay Salmon Fishery
Harvesting Activity Projected Percentage Change from 1980
1980-2000

	Percentage Change								
	Catch			Exvessel Price			Catch per Boat Month		
		Value						Value	
Year	Weight	Nominal	Real[1]	Nominal	Real	Number of Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	1.6	-0.5	-7.5	-2.1	-9.0	0	1.6	-0.5	-7.5
1982	3.3	8.9	-5.9	5.4	-8.9	0	3.3	8.9	-5.9
1983	5.0	19.2	-4.2	13.5	-8.8	0	5.0	19.2	-4.2
1984	6.7	30.4	-2.6	22.2	-8.7	0	6.7	30.4	-2.6
1985	8.5	42.7	-0.9	31.5	-8.6	0	8.5	42.7	-0.9
1986	10.7	56.8	1.2	41.6	-8.6	0	10.7	56.8	1.2
1987	12.9	72.0	3.3	52.4	-8.5	0	12.9	72.0	3.3
1988	15.1	88.8	5.4	64.1	-8.4	0	15.1	88.8	5.4
1989	17.3	107.2	7.5	76.6	-8.3	0	17.3	107.2	7.5
1990	19.6	127.4	9.7	90.1	-8.3	0	19.6	127.4	9.7
1991	22.0	149.5	11.9	104.6	-8.2	0	22.0	149.5	11.9
1992	24.4	173.8	14.2	120.2	-8.2	0	24.4	173.8	14.2
1993	26.8	200.5	16.5	137.0	-8.1	0	26.8	200.5	16.5
1994	29.3	229.7	18.9	155.0	-8.1	0	29.3	229.7	18.9
1995	31.9	261.8	21.3	174.4	-8.0	0	31.9	261.8	21.3
1996	34.5	297.1	23.7	195.2	-8.0	0	34.5	297.1	23.7
1997	37.2	335.7	26.2	217.7	-8.0	0	37.2	335.7	26.2
1998	39.9	378.1	28.8	241.8	-7.9	0	39.9	378.1	28.8
1999	42.7	424.7	31.4	267.7	-7.9	0	42.7	424.7	31.4
2000	45.5	475.7	34.0	295.6	-7.9	0	45.5	475.7	34.0

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.19
Bristol Bay Salmon Fishery
Harvesting Activity Projected Annual Rate of Change
1980-2000

Year	Catch Weight	Catch Value Nominal	Catch Value Real[1]	Exvessel Price Nominal	Exvessel Price Real	Number of Boat Months	Catch per Boat Month Weight	Catch per Boat Month Value Nominal	Catch per Boat Month Value Real
	Percentage Change								
1980	0	0	0	0	0	0	0	0	0
1981	1.6	-0.5	-7.5	-2.1	-9.0	0	1.6	-0.5	-7.5
1982	1.6	9.5	1.8	7.7	0.1	0	1.6	9.5	1.8
1983	1.6	9.4	1.8	7.7	0.1	0	1.6	9.4	1.8
1984	1.7	9.4	1.7	7.7	0.1	0	1.7	9.4	1.7
1985	1.7	9.4	1.7	7.7	0.1	0	1.7	9.4	1.7
1986	2.0	9.8	2.1	7.7	0.1	0	2.0	9.8	2.1
1987	1.9	9.7	2.0	7.7	0.1	0	1.9	9.7	2.0
1988	2.0	9.7	2.0	7.6	0.1	0	2.0	9.7	2.0
1989	2.0	9.7	2.0	7.6	0.1	0	2.0	9.7	2.0
1990	2.0	9.7	2.0	7.6	0.1	0	2.0	9.7	2.0
1991	2.0	9.7	2.0	7.6	0.1	0	2.0	9.7	2.0
1992	2.0	9.7	2.0	7.6	0.1	0	2.0	9.7	2.0
1993	2.0	9.7	2.0	7.6	0.1	0	2.0	9.7	2.0
1994	2.0	9.7	2.0	7.6	0.0	0	2.0	9.7	2.0
1995	2.0	9.7	2.0	7.6	0.0	0	2.0	9.7	2.0
1996	2.0	9.7	2.0	7.6	0.0	0	2.0	9.7	2.0
1997	2.0	9.7	2.0	7.6	0.0	0	2.0	9.7	2.0
1998	2.0	9.7	2.0	7.6	0.0	0	2.0	9.7	2.0
1999	2.0	9.7	2.0	7.6	0.0	0	2.0	9.7	2.0
2000	2.0	9.7	2.0	7.6	0.0	0	2.0	9.7	2.0

[1] The real values and prices were calculated using the U.S CPI; 98[illegible] is the base period.

Table 4.20
Bristol Bay Salmon Fishery
Projected Harvest by Species
1980-2000

(1,000 Fish)

Year	Kings	Reds	Pinks	Silvers	Chums
1980	100	8200	700	70	585
1981	100	8353	712	71	585
1982	100	8508	725	72	585
1983	100	8667	738	73	585
1984	100	8828	751	74	585
1985	100	8992	765	75	585
1986	100	9197	778	75	586
1987	100	9399	792	76	587
1988	100	9604	806	77	588
1989	100	9815	821	78	589
1990	100	10030	835	79	590
1991	100	10249	850	80	591
1992	100	10474	865	81	592
1993	100	10703	881	82	593
1994	100	10938	897	83	594
1995	100	11177	913	84	595
1996	100	11422	929	85	596
1997	100	11672	945	87	597
199$	100	11928	962	88	598
1999	100	12189	979	89	599
?000	100	12456	997	9(-I	600

Table 4.21
Bristol Bay Salmon Fishery
Projected Harvest Weight by Species
1980-2000

Year	Pounds (1,000) Kings	Pounds (1,000) Reds	Pounds (1,000) Pinks	Pounds (1,000) Silvers	Pounds (1,000) Chums	Metric Tons Kings	Metric Tons Reds	Metric Tons Pinks	Metric Tons Silvers	Metric Tons Chums
1980	2100	45100	2450	497	4095	953	20457	1111	225	1857
1981	2100	45940	2494	503	4095	953	20838	1131	228	1857
1982	2100	46795	2538	510	4095	953	21226	1151	231	1857
1983	21(-)0	47666	2583	516	4095	953	21621	1172	234	1857
1984	2100	48554	2630	522	4095	953	22024	1193	237	1857
1985	2100	49458	2676	529	4095	953	22434	1214	240	1857
1986	2100	50584	27?4	536	4102	953	22945	1236	243	1861
1987	2100	51692	2773	542	4109	953	23447	1258	246	1$64
1988	2100	52824	2822	549	4116	953	23961	1280	249	1867
1989	2100	53981	2872	556	4123	953	24486	1303	252	1870
1990	210(-)	55163	2924	563	4130	953	25022	1326	255	1873
1991	2100	56371	2976	570	4137	953	255?0	1350	259	1876
1992	2100	57606	3029	577	4144	953	26130	1374	26?	1880
1993	2100	58867	3083	585	4151	953	26702	1398	265	1883
1994	2100	60156	3138	592	4158	953	27287	1423	269	1886
1995	2100	61474	3194	599	4165	953	27884	1449	272	1889
1996	2100	62820	3251	607	4172	953	28495	1475	275	1892
1997	2100	64196	3309	615	4179	953	29119	1501	279	1895
1998	2100	65602	3368	622	4186	953	29757	1528	282	1899
1999	2100	67039	3428	630	4193	953	30408	1555	286	1902
2000	2100	68507	3489	638	4200	953	31074	1583	289	1905

Table 4.22
Bristol Bay Salmon Fishery
Projected HarvestValue by Species
1980-2000

Year	Nominal Value ($1,000) Kings	Reds	Pinks	Silvers	Chums	Real Value[1] ($1,000) Kings	Reds	Pinks	Silvers	Chums
1980	2310	49610	809	497	2252	2310	49610	809	497	2252
1981	2474	48863	888	534	2430	2301	45429	825	496	2260
1982	2599	53651	970	572	2614	2246	46374	839	495	2259
1983	2732	58893	106 I	614	2811	2196	47327	853	493	2?59
1984	2876	64633	1161	659	3023	?148	48289	867	492	2259
1985	3029	70918	1269	708	32’51	2104	49261	882	492	2258
1986	3195	78117	1388	762	3502	2063	50448	897	492	2262
1987	3372	85959	1518	820	3772	20?5	51610	912	492	2265
1988	3563	94573	1661	883	4063	1989	52791	927	493	2268
1989	3768	104036	1817	951	4376	1955	53992	943	494	2271
1990	3987	114431	1987	1026	4713	1924	55212	959	495	2274
1991	4224	125850	2174	1107	5076	1895	56454	975	497	2?77
1992	4477	138393	2378	1195	5467	1$67	57717	992	498	2280
1993	4750	152171	2602	1291	5888	1842	59003	1009	500	2283
1994	5043	167306	2846	1395	6341	1818	60312	1026	503	2286
1995	5358	183931	3114	1508	6829	1 “196	61644	1044	505	2289
1996	5696	202193	3406	1631	7354	1775	63002	1061	508	2291
1997	6059	222252	3727	1765	7920	1755	64385	1080	511	2294
1998	6449	244286	4077	1910	8529	1737	65794	1098	514	2297
1999	6868	268489	4461	2069	9184	17?(-)	67?30	1117	518	2300
2000	7319	295074	4881	2241	9890	1704	68694	1136	522	2302

[1] The real values are in terms of 1980 dollars.

Table 4.23

Bristol Bay Salmon Fishery
Projected Exvessel Prices by Species
1980-2000

Year	Nominal Price ($/Pound) Kings	Reds	Pinks	Silvers	Chums	Real Price[1] ($/Pound) Kings	Reds	Pinks	Silvers	Chums
1980	1.10	1*1O	0.33	1.00	0.55	1.10	1*1O	0.33	1.00	0.55
1981	1.18	1 o b	0.36	1.06	0.59	1.10	0.99	0.33	0.99	0.55
1982	1.24	1.15	0.38	1.12	0.64	1.07	0.99	0.33	0.97	0.55
1983	1.30	1.24	0.41	1.19	0.69	1.05	O*99	0.33	0.96	0.55
1984	1.37	1"33	0.44	1.26	(-).74	1.02	0.99	0.33	0.94	0.55
1985	1.44	1.43	0.47	1.34	0.79	1.00	1.00	0.33	(-).93	0.55
1986	1.52	1.54	0.51	1.42	0.85	0.98	1.00	0.33	0.92	0.55
1987	1.61	1.66	0.55	1.51	0.92	0.96	1.00	0.33	0.91	0.55
1988	1.70	1.79	0.59	1.61	0.99	0.95	1.00	0.33	0.90	0.55
1989	1.79	1.93	0.63	1.71	1.06	0.93	1.00	0.33	0.89	0.55
1990	1.90	.?.07	0.68	1.82	1.14	0.92	1.00	0.33	0.88	0.55
1991	2.01	?.23	0.73	1.94	1.23	0.90	1.00	0.33	0.87	0.55
1992	2.13	2.40	0.79	2.07	1.32	0.89	1.00	0.33	0.86	0.55
1993	2.26	2.58	0.84	2.21	1.42	0.88	1.00	0.33	0.86	0.55
1994	?.40	2.78	0.91	2.36	1.53	0.87	1.00	I-).33	0.85	0.55
1995	2.55	2.99	0.97	2.52	1.64	0.86	1.00	0.33	0.84	0.55
1996	2.71	3.22	1.05	2.69	1.76	0.85	1.00	0.33	0.84	0.55
1997	2.89	3.46	1.13	2.87	1.90	().84	1.00	0.33	0.83	0.55
1998	3.07	3.72	1.21	"3.07	2.04	0.83	1.00	0.33	0.83	0.55
1999	3.27	4.00	1.30	3.28	2.19	0.82	1.00	0.33	0.82	0.55
2000	3.49	4.31	1.40	3.51	2.35	0.81	1.00	O*33	0.82	0.55

[1] The real values are in terms of 1980 dollars.

Kuskokwim

The annual salmon harvest in the Kuskokwim Management Area is projected to increase from 1,432 metric tons (3.2 million pounds) in 1980 to 2,125 metric tons (4.7 million pounds) in 2000, and its real value is projected to increase from $2.3 million to $2.8 million (see Table 4.24). This represents a 48 percent increase in harvest weight and a 21 percent increase in real harvest value (see Table 4 25), The corresponding projected annual rates of change are summar zed in Table 4.26 and the harvest projections by species are presented in Tables 4.27 through 4.30. The projected harvest for 2000 exceeds the 1978 harvest and approaches the record 1979 harvest.

Yukon

The annual commercial salmon harvest in the Yukon Management Area is expected to increase from 4,903 metric tons (9. 0 mill ion pounds) in 1980 to 7,574 metric tons (16.7 million pounds) in 2000, and its real value is expected to increase from $6.0 million to $9.8 million (see Table 4.31). This represents an 85 percent increase in harvest 'weight and a 63 percent increase in real harvest value (see Table 4.32). Table 4.33 contains projections of the annual rate of change in harvesting activity and Tables 4.34 through 4.37 contain harvest projections by species. The projected harvest weight for 2000 is approximately 50 percent greater than the 1978 or 1979 harvests which are substantially greater than the mean annual harvest from 1969 through 1979.

Table 4.24
Kuskokwim Salmon Fishery
Projected Harvesting Activity
1980-2000

	Catch								Catch per Boat Month		
	Weight		Value (millions)[1]		Exvessel Price ($/Pound)		Number of		Weight	Value ($1,000)	
Year	Pounds millions)	Metric Tons	Nominal	Real	Nominal	Real	Boat Months	Fisherman Months	Pounds (1,000)	Nominal	Real
1980	3.2	1432	2.3	2.3	0.72	0.72	2025	2025	1.6	1.1	1.1
1981	3.2	1460	2.5	2.3	0.77	0.72	2025	2025	1.6	1.2	1.1
1982	3.3	1488	2.7	2.3	0.82	0.70	2025	2025	1.6	1.3	1.1
1983	3.3	1517	2.9	2.3	0.86	0.69	2025	2025	1.7	1.4	1.1
1984	3.4	1547	3.1	2.3	0.91	0.68	2025	2025	1.7	1.5	1.2
1985	3.5	1577	3.4	2.3	0.97	0.67	2025	2025	1.7	1.7	1.2
1986	3.5	1608	3.7	2.4	1.03	0.66	2025	2025	1.8	1.8	1.2
1987	3.6	1640	4.0	2.4	1.09	0.66	2025	2025	1.8	2.0	1.2
1988	3.7	1672	4.3	2.4	1.16	0.65	2025	2025	1.8	2.1	1.2
1989	3.8	1705	4.6	2.4	1.24	0.64	2025	2025	1.9	2.3	1.2
1990	3.8	1739	5.0	2.4	1.32	0.63	2025	2025	1.9	2.5	1.2
1991	3.9	1774	5.5	2.5	1.40	0.63	2025	2025	1.9	2.7	1.2
1992	4.0	1810	6.0	2.5	1.49	0.62	2025	2025	2.0	2.9	1.2
1993	4.1	1846	6.5	2.5	1.59	0.62	2025	2025	2.0	3.2	1.2
1994	4.2	1883	7.1	2.5	1.70	0.61	2025	2025	2.1	3.5	1.3
1995	4.2	1921	7.7	2.6	1.81	0.61	2025	2025	2.1	3.8	1.3
1996	4.3	1960	8.4	2.6	1.94	0.60	2025	2025	2.1	4.1	1.3
1997	4.4	2000	9.1	2.6	2.07	0.60	2025	2025	2.2	4.5	1.3
1998	4.5	2041	9.9	2.7	2.21	0.59	2025	2025	2.2	4.9	1.3
1999	4.6	2083	10.8	2.7	2.36	0.59	2025	2025	2.3	5.4	1.3
2000	4.7	2125	11.8	2.8	2.53	0.59	2025	2025	2.3	5.8	1.4

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.25

Kuskokwim Salmon Fishery

Harvesting Activity Projected Percentage Change from 1980

1980-2000

	Percentage Change								
	Catch						Catch per Boat Month		
		Value		Exvessel Price				Value	
Year	Weight	Nominal	Rear'	Nominal	Real	Number of Boat Months	Weight	Nominal	Real[1]
1980	0	0	H	()	0	0	0	0	0
1981	1.9	8.6	1.0	6.6	-0.9	0	1.9	8.6	1.0
1982	3.9	17.2	1.3	12.7	-2.6	r-)	3.9	17.2	1.3
1983	5.9	26.5	1.6	19.4	-4.1	0	5.9	26.5	1.6
1984	8.0	36.6	?.1	26.5	-5.5	0	8.0	36.6	2.1
1985	10.1	4-?.7’	2.6	34.1	-6.8	0	10.1	47.7	2.6
1986	12.3	59.9	3.2	42.4	-8.1	0	12.3	59,9	3.?
1987	14.5	73.2	4.0	51.2	-9.2	0	14.5	73.2	4.0
1988	16.8	87.7	4.8	60.7	-10.3	0	16.8	87.7	4.8
1989	19.1	103.6	5.7	70.9	-11.3	0	19.1	103.6	5*7
1990	21.5	121.0	6.6	81.9	-12.2	0	21.5	121.0	6.6
1991	23.9	140”1	7.7	93.7	-13.1	0	23.9	140.1	7.7
1992	26.4	160.9	8.8	106.5	-13.9	0	26.4	160.9	8.8
1993	28.9	183.8	10.0	120.1	-14.7	0	28.9	183.8	10.0
1994	31.5	208.8	11.3	134.8	--15.4	0	31.5	208.8	11.3
1995	34.2	236.?	12.7	150.6	-16.0	n	34.2	236.?	12.7
1996	36.9	266.3	14.1	167.5	-16.6	0	36.9	266.3	14.1
1997	39.7	?’)’). ?	15.6	185.8	-17.2	0	39.7	299.2	15.6
1998	42.5	335.3	17.2	205.4	-17.7	0	42.5	335.3	17.2
1999	45.5	374.9	18.9	226.5	-18.3	0	45.5	374.9	18.9
2000	48.4	418.2	20.6	249.1	-18.7	0	48.4	418.2	20.6

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.26
Kuskokwim Salmon Fishery
Harvesting Activity Projected Annual Rate of Change
1980-2000

Percentage Change

Year	Catch			Exvessel Price		Number of Boat Months	Catch per Boat Month		
	Weight	Value						Value	
		Nominal	Real[1]	Nominal	Real		Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	1.9	8.6	1.0	6.6	-0.9	0	1.9	8.6	1.0
1982	1.9	7.8	0.3	5.8	-1.7	0	1.9	7.8	0.3
1983	1.9	7.9	0.3	5.9	-1.6	0	1.9	7.9	0.3
1984	2.0	8.0	0.4	6.0	-1.5	0	2.0	8.0	0.4
1985	2.0	8.1	0.5	6.1	-1.4	0	2.0	8.1	0.5
1986	2.0	8.2	0.6	6.1	-1.3	0	2.0	8.2	0.6
1987	2.0	8.3	0.7	6.2	-1.3	0	2.0	8.3	0.7
1988	2.0	8.4	0.8	6.3	-1.2	0	2.0	8.4	0.8
1989	2.0	8.5	0.9	6.4	-1.1	0	2.0	8.5	0.9
1990	2.0	8.6	0.9	6.4	-1.0	0	2.0	8.6	0.9
1991	2.0	8.6	1.0	6.5	-1.0	0	2.0	8.6	1.0
1992	2.0	8.7	1.1	6.6	-0.9	0	2.0	8.7	1.1
1993	2.0	8.8	1.1	6.6	-0.9	0	2.0	8.8	1.1
1994	2.0	8.8	1.2	6.7	-0.8	0	2.0	8.8	1.1
1995	2.0	8.9	1.2	6.7	-0.8	0	2.0	8.8	1.2
1996	2.0	8.9	1.3	6.8	-0.7	0	2.0	8.9	1.2
1997	2.0	9.0	1.3	6.8	-0.7	0	2.0	8.9	1.3
1998	2.0	9.0	1.4	6.9	-0.7	0	2.0	9.0	1.3
1999	2.0	9.1	1.4	6.9	-0.6	0	2.0	9.0	1.4
2000	2.1	9.1	1.5	6.9	-0.6	0	2.0	9.1	1.4
						0	2.1	9.1	1.5

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.27
Kuskokwim Salmon Fishery
Projected Harvest by Species
1980-2000

(1,000 Fish)

Year	Kings	Reds	Pinks	Silvers	Chums
1980	50	15	15	140	180
1981	50	15	15	144	184
1982	51	16	16	148	188
1983	51	16	16	153	192
1984	52	17	17	157	196
1985	52	17	17	162	200
1986	53	17	17	166	204
1987	53	18	18	171	208
1988	54	18	18	176	213
1989	54	19	19	181	217
1990	55	19	19	186	222
1991	55	20	20	192	227
1992	56	20	20	197	232
1993	56	21	21	203	236
1994	57	21	21	209	241
1995	57	22	22	215	247
1996	58	22	22	221	252
1997	58	23	23	228	257
1998	59	24	24	234	263
1999	59	24	24	241	268
2000	60	25	25	248	274

Table 4.28
Kuskokwim Salmon Fishery
Projected Harvest Weight by Species
1980-2000

Year	Pounds (1,000)					Metric Tons				
	Kings	Reds	Pinks	Silvers	Chums	Kings	Reds	Pinks	Silvers	Churns
1980	1050	98	45	812	1152	476	44	20	368	523
1981	1060	100	46	836	1176	481	45	21	379	534
1982	1069	103	47	860	1201	485	47	21	390	545
1983	1079	105	49	885	1227	489	48	22	401	556
1984	1089	108	50	910	1253	494	49	23	413	568
1985	1099	111	51	937	1279	498	50	23	425	580
1986	1109	113	52	964	1306	503	51	24	43?	593
1987	1119	116	54	992	1334	508	53	24	450	605
1988	1129	119	55	1021	1362	512	54	25	463	618
1989	1139	122	56	1050	1391	517	55	26	476	631
1990	1150	125	58	1081	1421	522	57	26	490	644
1991	1160	129	59	1112	1451	526	58	27	504	658
1992	1171	132	61	1144	1482	531	60	28	519	672
1993	1181	135	t52	1177	1513	536	61	28	534	686
1994	1192	139	64	1211’	1545	541	63	29	550	701
1995	1203	142	66	1247	1578	546	65	30	565	716
1996	1214	146	67	1283	1611	551	66	31	582	731
1997	1225	150	69	1320	1645	556	68	31	599	746
1998	1236	154	71	1358	1680	561	70	32	616	762
1999	1248	157	73	1398	1716	566	71	33	634	778
2000”	1254	161	75	1438	1752	571	73	34	652	795

Table 4.29
Kuskokwim Salmon Fishery
Projected Harvest Value by Species
1980-2000

Year	Nominal Value ($1,000) Kings	Reds	Pinks	Silvers	Chums	Real Value[1] ($1,000) Kings	Reds	Pinks	Silvers	Chums
1980	1050	59	7	650	518	1050	59	7	650	518
1981	1135	58	7	709	571	1055	54	7	659	531
1982	1203	64	8	772	627	1040	55	7	668	542
1983	1276	71	9	842	689	1026	57	7	677	554
1984	1355	78	10	919	757	1013	59	7	686	565
1985	1441	87	11	1003	831	1001	60	8	697	577
1986	1533	96	12	1097	913	990	62	8	708	589
1987	1633	106	13	1199	1002	981	63	8	720	602
1988	1741	117	15	1312	1100	972	65	8	733	614
1989	1858	129	16	1437	1208	964	67	8	746	627
1990	1985	142	18	1575	1327	958	68	9	760	640
1991	2121	157	20	1727	1457	952	70	9	775	653
1992	2269	173	22	1894	1599	946	72	9	790	667
1993	2429	191	24	2079	1756	942	74	9	806	681
1994	2603	211	26	2283	1928	938	76	10	823	695
1995	2790	232	29	2509	2117	935	78	10	841	709
1996	2993	256	32	2758	2324	933	80	10	859	724
1997	3213	283	35	3032	2551	931	82	10	878	739
1998	3452	312	39	3336	2801	930	84	11	898	754
1999	3710	344	43	3671	3075	929	86	11	919	770
2000	3989	379	47	4041	3376	929	88	11	941	786

[1]The real values are in terms of 1980 dollars.

Table 4.30

Kuskokwim Salmon Fishery
Projected Exvessel Prices by Species
1980-2000

Year	Nominal Price ($/Pound) Kings	Reds	Pinks	Silvers	Chums	Real Price[1] ($/Pound) Kings	Reds	Pinks	Silvers	Chums
1980	1.00	0.60	0.15	0.80	0.45	1.00	0.60	0.15	0.80	0.45
1981	1.0"7	0.58	0.16	0.85	0.49	1.00	0.54	0.15	0.79	0.45
1982	1.12	0.63	0.17	0.90	0.52	0.97	0.54	0.15	0.78	0.45
1983	1.18	0.67	0.19	0.95	0.56	0.95	0.54	0.15	0.76	0.45
1984	1.24	0.73	0.20	1.01	0.60	0.93	0.54	0.15	0.75	O*45
1985	1.31	0.78	0.22	1.07	0.65	0.91	0.54	0.15	0.74	0.45
1986	1.38	0.84	0.23	1.14	0.70	0.89	0.54	0.15	(-).73	0.45
1987	1.46	0.91	0.25	1.21	0.75	0.88	0.54	0.15	0.73	0.45
1988	1.54	0.98	0.27	1.29	0.81	0.86	0.55	0.15	0.72	0.45
1989	1.63	1.05	0.29	1*3-7	0.87	0.85	0.55	0.15	0.71	0.45
1990	1.73	1.13	0.31	1.46	0.93	0.83	0.55	0.15	0.70	0.45
1991	1.83	1.22	0.33	1.55	1.00	0.82	0.55	0.15	0.70	0.45
1992	1.94	1.31	0.36	1.66	1.08	0.81	0.55	0.15	0.69	0.45
1993	2.06	1.41	0.38	1.77	1.16	0.80	0.55	0.15	0.68	(-)*45
1994	2.18	1.52	0.41	1.88	1.25	0.79	0.55	0.15	0.68	0.45
1995	?.32	1.63	0.44	2.01	1.34	0.78	0.55	0.15	0.67	0.45
1996	2.47	1.76	0.48	2.15	1.44	0.77	0.55	0.15	0.67	0.45
1997	2.62	1.89	0.51	2.30	1.55	0.76	0.55	0.15	0.67	().45
1998	2.79	2.03	0.55	?.46	1.67	0.75	0.55	0.15	0.66	0.45
1999	2.97	2.18	0.59	?.63	1.79	0.74	0.55	0.15	0.66	0.45
2000	3.17	2.35	0.64	2.81	1.93	0.74	0.55	0.15	0.65	0.45

[1]The real values are in terms of 1980 dollars.

Table 4.31
Yukon Salmon Fishery
Projected Harvesting Activity
1980-2000

Year	Catch: Weight: Pounds (millions)	Catch: Weight: Metric Tons	Catch: Value (millions): Nominal	Catch: Value (millions): Real[1]	Exvessel Price ($/Pound): Nominal	Exvessel Price ($/Pound): Real	Number of: Boat Months	Number of: Fisherman Months	Catch per Boat Month: Weight: Pounds (1,000)	Catch per Boat Month: Value ($1,000): Nominal	Catch per Boat Month: Value ($1,000): Real
1980	9.0	4094	6.0	6.0	0.67	0.67	1755	1755	5.1	3.4	3.4
1981	9.5	4327	6.8	6.3	0.71	0.66	1755	1755	5.4	3.9	3.6
1982	10.1	4575	7.6	6.6	0.76	0.65	1755	1755	5.7	4.3	3.8
1983	10.7	4839	8.6	6.9	0.80	0.65	1755	1755	6.1	4.9	3.9
1984	11.3	5120	9.6	7.2	0.85	0.64	1755	1755	6.4	5.5	4.1
1985	11.9	5418	10.9	7.5	0.91	0.63	1755	1755	6.8	6.2	4.3
1986	12.3	5585	11.9	7.7	0.97	0.63	1755	1755	7.0	6.8	4.4
1987	12.6	5708	13.0	7.8	1.04	0.62	1755	1755	7.2	7.4	4.5
1988	12.9	5833	14.2	8.0	1.11	0.62	1755	1755	7.3	8.1	4.5
1989	13.1	5961	15.6	8.1	1.18	0.61	1755	1755	7.5	8.9	4.6
1990	13.4	6092	17.0	8.2	1.27	0.61	1755	1755	7.7	9.7	4.7
1991	13.7	6225	18.6	8.3	1.36	0.61	1755	1755	7.8	10.6	4.8
1992	14.0	6362	20.3	8.5	1.45	0.60	1755	1755	8.0	11.6	4.8
1993	14.3	6502	22.3	8.6	1.55	0.60	1755	1755	8.2	12.7	4.9
1994	14.6	6645	24.4	8.8	1.66	0.60	1755	1755	8.3	13.9	5.0
1995	15.0	6791	26.7	8.9	1.78	0.60	1755	1755	8.5	15.2	5.1
1996	15.3	6941	29.2	9.1	1.91	0.59	1755	1755	8.7	16.6	5.2
1997	15.6	7094	32.0	9.3	2.05	0.59	1755	1755	8.9	18.2	5.3
1998	16.0	7250	35.0	9.4	2.19	0.59	1755	1755	9.1	20.0	5.4
1999	16.3	7411	38.4	9.6	2.35	0.59	1755	1755	9.3	21.9	5.5
2000	16.7	7574	42.1	9.8	2.52	0.59	1755	1755	9.5	24.0	5.6

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.32
Yukon Salmon Fishery
Harvesting Activity Projected Percentage Change from 1980
1980-2000

	Percentage Change											
	Catch							Catch per Boat Month				
		Value		Exvessel Price					Value			
Year	Weight	Nominal	Real[1]	Nominal	Real	Number of Boat Months	Weight	Nominal	Real			
1980	0	0	0	0	0	()	0	0	0			
1981	5.7	1 -3..?	5.2	7.1	-0.5	0	5.7	13. ?	5.2			
1982	11.8	27.0	9.8	13.7	-1.8	0	11.8	27.0	9.8			
1983	18.2	42 .-f	14.7	?0.7	-3. n	0	18.2	42*7	14.7			
1984	25.1	60.6	20.0	28.4	-4.1	0	25.1	60.6	20.0			
1985	3?.3	80.8	25.6	36.6	-5.1	0	32.3	80.8	?5.6			
1986	36.4	98.9	28.5	45.8	-5.8	0	36.4	98.9	28.5			
1987	39.4	117.2	30.4	55.8	-6.5	0	39.4	117.2	30.4			
1988	4?.5	137.3	32.4	66.5	-7.0	0	42.5	137.3	32.4			
1989	45.6	159.3	34.5	78.1	-7.6	0	45.6	159.3	34,5			
1990	48.8	183.4	36.7	90.4	-8.1	0	48.8	1 [13.4	36.7			
1991	52.1	209.9	39.0	103.8	-8.6	0	52.1	209.9	39.0			
1992	55.4	238.9	41*4	118.1	-9.0	0	55*4	238.9	41.4			
1993	58.8	270.8	43.8	133.5	-9.5	0	58.8	270.8	43.8			
1994	62.3	305.9	46.3	150.0	-9.9	0	62.3	305.9	4 6 . 3			
1995	65.9	344.3	48.9	167.8	-10.2	()	65.9	344.3	48.9			
1996	69.6	386.5	51.6	186.9	-10.6	0	69.6	386.5	51.6			
1997	-13.3	4:32.8	54.4	207.5	-10.9	0	73.3	432.8	54.4			
1998	77.1	483.7	57.2	229.6	-11.2	0	77.1	483.7	57.2			
1999	81.0	539.6	60.1	253.3	-11.5	0	81.0	539.6	60.1			
2000	f?5.0	600.9	63.2	278.8	-11.8	0	85.0	600.9	63.2			

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.33
Yukon Salmon Fishery
Harvesting Activity Projected Annual Rate of Change
1980-2000

	Percentage Change								
	Catch			Exvessel Price		Number of Boat	Catch per Boat Month		
		Value						Value	
Year	Weight	Nominal	Real[1]	Nominal	Real		Weights	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	5.-r	13.2	5..?	7.1	-0.5	0	5.-?	13.2	5.2
1982	5.7	12.2	4.3	6.1	-1.3	[illegible]	5.-7	12.2	4.3
1983	5.8	12.4	4.5	6.2	-1.2	0	5.8	12.4	4.5
1984	5.8	12.5	4.6	6.3	-1.1	0	5.8	12.5	4.6
1985	5.8	12.6	4.7	6.4	-1*1	0	5.8	12.6	4.7
1986	3.1	10.0	2.3	6.“7	-0.8	0	3.1	1 (-).0	2.3
1987	2.2	9.2	1.5	6.8	-O.-1	0	2.2	9.2	1.5
1988	2.2	9.2	1.6	6.9	-0.6	0	2.2	9.2	1.6
1989	2.2	9.3	1.6	6.9	-0.6	n	2.2	9.3	1.6
1990	2.2	9.3	1.6	7.()	-0.6	0	2.2	9.3	1.6
1991	2.2	9.3	1.7	7.0	-().5	0	2.2	9.3	1.7
1992	2.2	9.4	1.-7	7.0	-0.5	0	2.2	9.4	1.7
1993	i?.?	9.4	1.7	7.1	-0.5	0	2.2	9.4	1.7
1994	2.?	9.4	1.8	7.1	-0.4	0	7.2	9.4	1.8
1995	2.2	9.5	1.8	7.1	-0.4	0	2.2	9.5	1.8
1996	2.2	9.5	1.8	-7.1	-0.4	0	2.2	9.5	1.8
1997	2.2	9.5	1.8	7.2	-0.4	0	2.2	9.5	1.8
1998	2.2	9.5	1.8	‘7.2	-0.4	0	2.2	9.5	1.8
1999	2.2	9.6	1.’)	7..2	-0.3	0	2.2	9.6	1*9
2000	2.2	9.6	1.9	7.2	-0.3	0	2.2	9.6	1.9

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.34
Yukon Salmon Fishery
Projected Harvest by Species
1980-2000

(1,000 Fish)

Year	Kings	Reds	Pinks	Silvers	Chums
1980	95	0	0	20	1000
1981	98	0	0	20	1067
1982	101	0	0	20	1139
1983	104	0	0	20	1216
1984	107	0	0	20	1298
1985	110	0	0	20	1385
1986	112	0	0	20	1433
1987	114	0	0	20	1467
1988	115	0	0	20	1502
1989	117	0	0	20	1538
1990	119	0	0	20	1575
1991	121	0	0	20	1612
1992	123	0	0	20	1650
1993	125	0	0	20	1690
1994	127	0	0	20	1730
1995	129	0	0	20	1771
1996	131	0	0	20	1813
1997	133	0	0	20	1856
1998	135	0	0	20	1900
1999	138	0	0	20	1945
2000	140	0	0	20	1992

Table 4.35

Yukon Salmon Fishery
Projected Harvest Weight by Species
1980-2000

	Pounds (1,000)					Metric Tons				
Year	Kings	Reds	Pinks	Silvers	Chums	Kings	Reds	Pinks	Silvers	Chum
1980	2185	0	0	140	6700	991	0	0	64	3039
1981	2249	0	0	140	7151	1020	0	0	64	3244
1982	2315	0	0	140	7632	1050	0	0	64	3462
1983	2383	0	0	140	8146	1081	0	0	64	3695
1984	2453	0	0	140	8694	1113	0	0	64	3944
1985	2525	0	0	140	9279	1145	0	0	64	4209
1986	2571	0	0	140	9603	1166	0	0	64	4356
1987	2612	0	0	140	9831	1185	0	0	64	4459
1988	2654	0	0	140	10065	1204	0	0	64	4566
1989	2697	0	0	140	10304	1223	0	0	64	4674
1990	2740	0	0	140	10550	1243	0	0	64	4785
1991	2784	0	0	140	10800	1263	0	0	64	4899
1992	2829	0	0	140	11057	1283	0	0	64	5016
1993	2874	0	0	140	11320	1304	0	0	64	5135
1994	2921	0	0	140	11589	1325	0	0	64	5257
1995	2967	0	0	140	11865	1346	0	0	64	5382
1996	3015	0	0	140	12147	1368	0	0	64	5510
1997	3064	0	0	140	12436	1390	0	0	64	5641
1998	3113	0	0	140	12732	1412	0	0	64	5775
1999	3163	0	0	140	13034	1435	0	0	64	5912
2000	3214	0	0	140	13344	1458	0	0	64	6053

Table 4.36
Yukon Salmon Fishery
Projected Harvest Value by Species
1980-2000

Year	Nominal Value ($1,000) Kings	Reds	Pinks	Silvers	Chum	Real Value[1] ($1,000) Kings	Reds	Pinks	Silvers	Chums
1980	2185	0	0	133	3685	2185	0	0	133	3685
1981	2409	0	0	141	4244	2240	0	0	131	3946
1982	2604	0	0	149	4872	2251	0	0	129	4211
1983	2818	0	0	158	5592	2265	0	0	127	4494
1984	3053	0	0	168	6418	2281	0	0	125	4795
1985	3311	0	0	178	7367	2300	0	0	124	5117
1986	3555	0	0	189	8198	2296	0	0	1?2	5295
1987	3813	0	0	201	9026	2289	0	0	121	5419
1988	4093	0	0	214	9936	2285	0	0	119	5546
1989	4398	0	0	228	10937	2283	0	0	118	5676
1990	4730	0	0	242	12040	2282	0	0	117	5809
1991	5090	0	0	258	132'53	2284	0	0	116	5945
1992	5483	0	0	275	14588	2287	0	0	115	6084
1993	5910	0	0	294	16058	2292	0	0	114	6226
1994	6376	0	0	313	17675	2?98	0	(-r	113	6372
1995	6882	0	0	335	19454	?307	0	0	112	65?0
1996	7434	0	0	357	21413	2317	0	0	111	6672
1997	8036	0	0	382	23568	2328	0	0	111	6828
1998	8691	0	0	408	.?5')40	2341	0	(-r	110	6987
1999	9405	0	0	437	28551	2355	0	0	109	7149
2000	10183	0	0	467	31424	2371	0	0	109	7315

[1]The real values are in term of 1980 dollars.

Table 4.37
Salmon Fishery
Projected Exvessel Prices by Species
1980-2000

Year	Nominal Price ($/Pound)					Real Price[1] ($/Pound)				
	Kings	Reds	Pinks	Silvers	Chums	Kings	Reds	Pinks	Silvers	Chums
1980	1.00	0	0	0.95	0.55	1.00	0	0	0.95	0.55
1981	1.07	0	0	1.01	0.59	1.00	0	0	0.94	0.55
1982	1.12	0	0	1.07	0.64	0.97	0	0	0.92	0.55
1983	1.18	0	0	1.13	0.69	0.95	0	0	0.91	0.55
1984	1.24	0	0	1.20	0.74	0.93	0	0	0.90	0.55
1985	1.31	0	0	1.27	0.79	0.91	0	0	0.88	0.55
1986	1.38	0	0	1.35	0.85	0.89	0	0	0.87	0.55
1987	1.46	0	0	1.44	0.92	0.88	0	0	0.86	0.55
1988	1.54	0	0	1.53	0.99	0.86	0	0	0.85	0.55
1989	1.63	0	0	1.63	1.06	0.85	0	0	0.84	0.55
1990	1.73	0	0	1.73	1.14	0.83	0	0	0.84	0.55
1991	1.83	0	0	1.84	1.23	0.82	0	0	0.83	0.55
1992	1.94	0	0	1.97	1.32	0.81	0	0	0.82	0.55
1993	2.06	0	0	2.10	1.42	0.80	0	0	0.81	0.55
1994	2.18	0	0	2.24	1.53	0.79	0	0	0.81	0.55
1995	2.32	0	0	2.39	1.64	0.78	0	0	0.80	0.55
1996	2.47	0	0	2.55	1.76	0.77	0	0	0.80	0.55
1997	2.62	0	0	2.73	1.90	0.76	0	0	0.79	0.55
1998	2.79	0	0	2.92	2.04	0.75	0	0	0.79	0.55
1999	2.97	0	0	3.12	2.19	0.74	0	0	0.78	0.55
2000	3.17	0	0	3.34	2.35	0.74	0	0	0.78	0.55

[1] The real values are in terms of 1980 dollars.

Norton Sound

The annual harvest weight for the Norton Sound Management Area commercial salmon fishery is projected to increase from 707 metric tons (1.6 million pounds) in 1980 to 943 metric tons (2.1 million pounds) by 2000; and the real harvest value is projected to increase from S0.5 million to S0.7 million (see Table 4.38). The corresponding percentage increases are 33 percent and 30 percent respectively (see Table 4.39). Table 4.40 contains projections of the annual rate of change in harvesting activity and Tables 4.41 through 4.44 present harvest projections by species. The projected harvest weight for 2000 exceeds the 1979 harvest but is approximately 18 percent below the record harvest of 1978.

Kotzebue Sound

Kotzebue Sound is at the extreme of the habitat range of salmon and has therefore not had a large commercial salmon fishery. The annual commercial salmon harvest weight is projected to remain constant throughout the forecast period at approximately 600 metric tons (1.3 million pounds); and the annual harvest value is projected to remain at S1.0 million due to constant real exvessel prices (see Table 4.45). Projections of cumulative and annual rates of change in harvesting activity are presented in Tables 4.46 and 4.47, and harvest projections by species are summarized in Tables 4.48 through 4,51. The latter set of tables indicates that Kotzebue Sound is expected to remain exclusively a chum salmon fishery. The potential contribution of the proposed salmon hatchery is not included in the harvest projections because there is substantial uncertainty

Table 4.38
Norton Sound Salmon Fishery
Projected Harvesting Activity
19[10-2000"

Year	Catch: Weight (million) Pounds	Catch: Weight Metric Tons	Catch: Value (million $) Nominal	Catch: Value (million $) Real[1]	Exvessel Price ($/Pound) Nominal	Exvessel Price ($/Pound) Real	Number of Boat Months	Number of Fisherman Months	Catch per Boat Month: Weight Pounds (1,000)	Catch per Boat Month: Value ($1,000) Nominal	Catch per Boat Month: Value ($1,000) Real
1980	1.6	707	0.5	0.'5	0.35	0.35	450	450	3.5	1.2	1.?
1981	1.6	740	0.6	0.6	0.38	0.35	450	450	3.6	1.4	1.3
1982	1.7	776	0.'r	0.6	0.41	0.35	45 (-)	450	3.8	1.5	1.3
1983	1.8	814	0.8	0.6	0.44	0.35	450	450	4.0	1.7	1.4
1984	1.9	855	0.9	0*-r	0.4-7	0.35	450	450	4.2	2.0	1.5
1985	2.0	899	1.0	0.7	0.50	0.35	450	450	4.4	2.2	1.5
1986	2.0	908	1.1	0."r	0.54	0.35	450	450	4.5	2.4	1.6
1987	2.0	911	1.2	0.7	0.58	0.35	450	450	4.5	2.6	1.6
1988	2.0	913	1.-3	0.7	0.62	0.35	450	450	4.5	2.8	1.6
1989	2.0	916	1.4	0.7	0.67	0.35	450	450	4.5	3.0	1.6
1990	2.0	918	1.5	0.7	0.72	0.35	450	450	4*5	3.2	1.6
1991	2.0	920	1.6	0."r	0."?-?	0.35	450	450	4.5	3.5	1.6
1992	2.0	923	1.7	r-).-7	0.83	0.35	450	450	4.5	3.8	1.6
1993	2.0	925	1.8	n."r	0.89	0.35	450	450	4.5	4.0	1.6
1994	2.0	928	2.0	0.7	0.96	0.35	450	450	4.5	4.4	1.6
1995	2.1	930	2.1	0."r	1.03	0.34	45 (-)	450	4.6	4.7	1.6
1996	2.1	933	?.3	0.7	1.11	0.34	450	450	4.6	5.0	1.6
1997	2.1	935	2.4	0."7	1.19	0.34	450	450	4.6	5.4	1.6
1998	2.1	938	2.6	0.7	1.28	0.34	450	450	4.6	5.9	1.6
1999	2.1	940	2.8	0.7	1.37	0.34	450	450	4.6	6.3	If)
2000	2.1	943	3.1	0.7	1.4-/	().54	450	450	4.6	6.8	1.6

[1]The real values and prices were calculated using the U.S CPI; 1980 is the base period.

Table 4.39

Norton Sound Salmon Fishery

Harvesting Activity Projected Percentage Change from 1980

1980-2000

	Percentage Change								
	Catch						Catch per Boat Month		
		Value		Exvessel Price				Value	
Year	Weight	Nominal	Real'	Nominal	Real	Number of Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	4.8	12.9	5.0	7.8	0.2	0	4.8	12.9	5.0
1982	9.8	27.0	9.8	15.6	-0.1	0	9.8	27.0	9.8
1983	15.3	43.0	14.9	24.1	-0.3	0	15.3	43.0	14.9
1984	21.0	[illegible]	20.4	33.2	-0.5	0	21.0	61.2	20.4
1985	27.2	81.8	26.3	43.0	[illegible]	[illegible]	27.2	81.8	26.3
1986	28.6	97.3	27.4	53.5	-0.9	0	28.6	97.3	27.4
1987	28.9	112.5	27.6	64.8	-1.0	0	28.9	112.5	27.6
1988	29.2	128.7	27.7	[illegible]	-1.2	0	29.2	128.7	27.7
1989	29.6	146.3	27.8	90.1	-1.3	0	29.6	146.3	27.8
1990	29.9	165.2	28.0	104.2	-1.5	0	29.9	165.2	28.0
1991	30.3	185.6	28.1	119.3	-1.6	0	30.3	185.6	28.1
1992	30.6	207.6	28.3	135.6	-1.8	0	30.6	207.6	28.3
1993	30.9	231.3	28.5	153.0	-1.9	0	30.9	231.3	28.5
1994	31.3	256.9	28.7	171.8	-2.0	0	31.3	256.9	28.7
1995	31.6	284.4	28.8	192.1	-2.1	0	31.6	284.4	28.8
1996	32.0	314.1	29.0	213.8	[illegible]	0	32.0	314.1	29.0
1997	32.3	346.2	29.2	237.1	-2.3	0	32.3	[illegible]	29.2
1998	32.7	380.7	29.5	262.3	-2.4	0	32.7	380.7	29.5
1999	33.0	417.9	29.7	289.3	-2.5	0	33.0	417.9	29.7
2000	33.4	458.0	29.9	[illegible]	-2.6	0	33.4	458.0	29.9

'The real values and prices were calculated using the U.S. CPI: 1980 is the base period.

Table 4.40
Norton Sound Salmon Fishery
Harvesting Activity Projected Annual Rate of Change
19[10-2000

	Percentage Change							Catch per Boat Month		
	Catch									
		Value		Exvessel Price		Number of			Value	
Year	Weight	Nominal	Real[1]	Nominal	Real	Boat Months	Weight	Nominal	Real
1980	()	0	0	0	0	0	0	0	0
1981	4.8	12.9	5.0	7.8	0.2	0	4.8	12.9	5.0
1982	4.8	12.5	4.6	"7.3	-0.3	n	4.8	1?.5	4.6
1983	4.9	12.6	4.7	7.3	-o ..?	()	4.9	12.6	4.7
1984	5.0	12.7	4.8	-7.3	-0.2	0	5.(I	12.7	4.8
1985	5*1	12.8	4*9	7.4	-0. ?	0	5*1	12.8	4.9
1986	1.1	8.5	0.9	7.4	-0.2	0	1*1	8.5	[).9
1987	0.3	7.7	().1	7.4	-0.2	0	0.3	7.7	()*1
1988	O*3	7.7	0.1	7•4	-0.2	0	O*3	7'.7	0.1
1989	0.3	7.-7	0.1	7.4	-0.2	0	0.3	-7.-7	(3.1
1990	()*-3	7.7	0.1	7*I,	-0.1	0	()*3	7.7	0.1
1991	0.3	-7.?	0.1	7.4	-(). 1	n	O*3	7.-r	0.1
1992	0*3	"r.-?	0.1	7.4	-O*1	0	0.3	-7.7	0.1
1993	()•3	7.7	0.1	7.4	-0.1	o	0.3	7.7	0.1
1994	0.3	7.7	0.1	7.4	-0.1	0	0.3	7.7	O* I
1995	0.3	7.7	0.1	7.4	-0.1	0	0.3	7.7	0.1
1996	0.3	-r."r	().?	-r.4	-0.1	0	0.3	7*7	().2
1997	0.3	7.7	0.2	7*1+	-0.1	n	0.3	7*7	0.2
1998	0.3	7.7	0.2	7.4	-0.1	0	0.3	7.7	0.2
1999	0.3	7.7	0.2	7.5	-0.1	0	0.3	7.7	0.2
2000	0.3	7.7	0•2	7.5	-()* 1	o	0.3	7.7	O*2

[1] The real values and prices were calculated using the U.S. CP1; 1980 is the base period.

Table 4.41

Norton Sound Salmon Fishery
Projected Harvest by Species
1980-2000

(1,000 Fish)

Year	Kings	Reds	Pinks	Silvers	chums
1980	4	0	100	7	165
1981	4	0	100	7	176
1982	4	0	100	7	188
1983	4	0	100	7	200
1984	4	0	100	7	213
1985	4	0	100	7	228
1986	4	0	100	7	231
1987	4	0	100	7	231
1988	4	0	100	7	232
1989	4	0	100	7	233
1990	4	0	100	7	233
1991	5	0	100	7	234
1992	5	0	100	7	235
1993	5	0	100	7	235
1994	5	0	100	7	236
1995	5	0	100	7	237
1996	5	0	100	7	237
1997	5	0	100	7	238
1998	5	0	100	7	239
1999	5	0	100	7	239
2000	5	0	100	7	240

Table 4.42
Norton Sound Salmon Fishery
Projected Harvest Weight by Species
1 980-2000

Year	Pounds (1,000) Kings	Reds	Pinks	Silvers	Chums	Metric Tons Kings	Reds	Pinks	Silvers	Chums
1980	72	0	330	50	1106	33	0	150	23	501
1981	73	0	330	50	1179	33	0	150	23	535
1982	7f,	0	330	50	1257	33	0	150	23	570
1983	74	0	330	50	1341	34	0	150	23	608
1984	75	0	330	50	1430	34	0	150	23	649
1985	76	0	330	50	1525	35	0	150	23	692
1986	77	0	330	50	1545	35	0	150	23	701
1987	78	0	330	50	1550	35	0	150	23	703
1988	79	0	330	50	1554	36	0	150	23	705
1989	80	0	330	50	1559	36	0	150	23	70“7
19'30	80	0	330	50	1563	36	0	150	23	709
1991	81	0	330	50	1567	37	0	150	23	711
1992	82	0	330	50	1572	37	0	150	23	-713
1993	83	0	330	50	1576	38	0	150	23	715
1994	84	0	330	50	1581	38	0	150	23	717
1995	85	0	330	50	1585	39	0	150	23	719
1996	86	0	330	50	1590	39	()	150	23	721
1997	87	0	330	50	1594	39	0	150	23	723
1998	88	0	330	50	1599	40	0	150	23	725
1999	89	0	330	50	1603	40	0	150	23	7?7
2000	90	()	330	50	1608	41	0	150	?3	729

Table 4.43
Norton Sound Salmon Fishery
Projected Harvest Value by Species
1980-2000

Year	Nominal Value ($1,000)					Real Value[1] ($1,000)				
	Kings	Reds	Pinks	Silvers	Chums	Kings	Reds	Pinks	Silvers	Chums
1980	54	0	82	25	387	54	0	82	25	387
1981	58	0	89	27	445	54	0	83	25	414
1982	62	0	96	28	511	54	0	83	24	441
1983	66	0	103	30	586	53	0	83	24	471
1984	70	0	110	32	672	53	0	82	24	502
1985	75	0	119	34	770	52	0	82	23	535
1986	80	0	127	36	840	52	0	82	23	542
1987	85	0	137	38	905	51	0	82	23	544
1988	91	0	147	41	976	51	0	82	23	545
1989	97	0	158	43	1053	51	0	82	22	546
1990	104	0	170	46	1135	50	0	82	22	548
1991	112	0	183	49	1224	50	0	82	22	549
1992	120	0	196	52	1320	50	0	82	22	550
1993	128	0	211	56	1423	50	0	82	22	552
1994	138	0	227	59	1534	50	0	82	21	553
1995	148	0	244	63	1654	50	0	82	21	554
1996	159	0	262	68	1783	50	0	82	21	556
1997	171	0	282	72	1923	50	0	82	21	557
1998	184	0	303	77	2073	50	0	82	21	558
1999	198	0	325	83	2235	50	0	81	21	560
2000	214	0	350	89	2410	50	0	81	21	561

[1]The real values are in terms of 1980 dollars.

Table 4.44
Norton Sound Salmon Fishery
Projected Exvessel Prices by Species
1980-2000

Year	Nominal Price ($/Pound) Kings	Reds	Pinks	Silvers	Chums	Real Price[1] ($/Pound) Kings	Reds	Pinks	Silvers	Chums
1980	0.75	0	0.25	0.50	0.35	0.75	0	0.25	0.50	0.35
1981	0.80	0	0.27	0.53	0.38	0.75	0	0.25	0.49	0.35
1982	0.84	0	0.29	0.56	0.41	0.73	0	0.25	0.49	0.35
1983	0.89	0	0.31	0.59	0.44	0.71	0	0.25	0.48	0.35
1984	0.93	0	0.33	0.63	0.47	0.70	0	0.25	0.47	0.35
1985	0.98	0	0.36	0.67	0.51	0.68	0	0.25	0.47	0.35
1986	1.04	0	0.39	0.7[illegible]	0.54	0.67	0	0.25	0.46	0.35
1987	1.09	0	0.41	0.76	0.58	0.66	0	0.25	0.45	0.35
1988	1.16	0	0.45	0.80	0.63	0.65	0	0.25	0.45	0.35
1989	1.22	0	0.48	0.86	0.68	0.63	0	0.25	0.44	0.35
1990	1.29	0	0.51	0.91	0.73	0.62	0	0.25	0.44	0.35
1991	1.37	0	0.55	0.97	0.78	0.62	0	0.25	0.44	0.35
1992	1.45	0	0.59	1.03	0.84	0.61	0	0.25	0.43	0.35
1993	1.54	0	0.64	1.10	0.90	0.60	0	0.25	0.43	0.35
1994	1.64	0	0.69	1.18	0.97	0.59	0	0.25	0.42	0.35
1995	1.74	0	0.74	1.26	1.04	0.58	0	0.25	0.42	0.35
1996	1.85	0	0.79	1.34	1.12	0.58	0	0.25	0.42	0.35
1997	1.97	0	0.85	1.44	1.21	0.57	0	0.25	0.42	0.35
1998	2.09	0	0.92	1.53	1.30	0.56	0	0.25	0.41	0.35
1999	2.23	0	0.99	1.64	1.39	0.56	0	0.25	0.41	0.35
2000	2.38	0	1.06	1.76	1.50	0.55	0	0.25	0.41	0.35

[1] The real values are in terms of 1980 dollars.

Table 4.45
Kotzebue Sound Salmon Fishery
Projected Harvesting Activity
1980-2000

	Catch				Exvessel Price		Number of		Catch per Boat Month		
	Weight		Value		($/Pound)		Boat	Fisherman	Weight	Value ($1,000)	
Year	Pounds (millions)	Metric Tons	(millions) Nominal	Real[1]	Nominal	Real	Months	Months	Pounds (1,000)	Nominal	Real
1980	1.3	599	1.0	1.0	0.75	0.75	425	425	3.1	2.3	2.3
1981	1.3	599	1.1	1.0	0.81	0.75	425	425	3.1	2.5	2.3
1982	1.3	599	1.1	1.0	0.87	0.75	425	425	3.1	2.7	2.3
1983	1.3	599	1.2	1.0	0.94	0.75	425	425	3.1	2.9	2.3
1984	1.3	599	1.3	1.0	1.01	0.75	425	425	3.1	3.1	2.3
1985	1.3	599	1.4	1.0	1.08	0.75	425	425	3.1	3.4	2.3
1986	1.3	599	1.5	1.0	1.16	0.75	425	425	3.1	3.6	2.3
1987	1.3	599	1.7	1.0	1.25	0.75	425	425	3.1	3.9	2.3
1988	1.3	599	1.8	1.0	1.35	0.75	425	425	3.1	4.2	2.3
1989	1.3	599	1.9	1.0	1.45	0.75	425	425	3.1	4.5	2.3
1990	1.3	599	2.1	1.0	1.56	0.75	425	425	3.1	4.8	2.3
1991	1.3	599	2.2	1.0	1.67	0.75	425	425	3.1	5.2	2.3
1992	1.3	599	2.4	1.0	1.80	0.75	425	425	3.1	5.6	2.3
1993	1.3	599	2.6	1.0	1.93	0.75	425	425	3.1	6.0	2.3
1994	1.3	599	2.7	1.0	2.08	0.75	425	425	3.1	6.5	2.3
1995	1.3	599	3.0	1.0	2.24	0.75	425	425	3.1	6.9	2.3
1996	1.3	599	3.2	1.0	2.40	0.75	425	425	3.1	7.5	2.3
1997	1.3	599	3.4	1.0	2.58	0.75	425	425	3.1	8.0	2.3
1998	1.3	599	3.7	1.0	2.78	0.75	425	425	3.1	8.6	2.3
1999	1.3	599	3.9	1.0	2.99	0.75	425	425	3.1	9.3	2.3
2000	1.3	599	4.2	1.0	3.21	0.75	425	425	3.1	10.0	2.3

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.46
Kotzebue Sound Salmon Fishery
Harvesting Activity Projected Percentage Change from 1980
1980-2000

	Percentage Change								
	Catch						Catch per Boat Month		
		Value		Exvessel Price		Number of		Value	
Year	Weight	Nominal	Real	Nominal	Real	Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	0	7.9	0.3	7.9	0.3	0	0	7.9	0.3
1982	0	16.1	0.3	16.1	0.3	0	0	16.1	0.3
1983	0	24.8	0.3	24.8	0.3	0	0	24.8	0.3
1984	0	34.2	0.3	34.2	0.3	0	0	34.2	0.3
1985	0	44.3	0.3	44.3	0.3	0	0	44.3	0.3
1986	0	55.2	0.2	55.2	0.2	0	0	55.2	0.2
1987	0	66.9	0.2	66.9	0.2	0	0	66.9	0.2
1988	0	79.5	0.2	79.5	0.2	0	0	79.5	0.2
1989	0	93.0	0.2	93.0	0.2	0	0	93.0	0.2
1990	0	107.5	0.1	107.5	0.1	0	0	107.5	0.1
1991	0	123.1	0.1	123.1	0.1	0	0	123.1	0.1
1992	0	139.9	0.0	139.9	0.0	0	0	139.9	0.0
1993	0	157.9	0.0	157.9	0.0	0	0	157.9	0.0
1994	0	177.3	-0.0	177.3	-0.0	0	0	177.3	-0.0
1995	0	198.1	-0.1	198.1	-0.1	0	0	198.1	-0.1
1996	0	220.5	-0.1	220.5	-0.1	0	0	220.5	-0.1
1997	0	244.6	-0.2	244.6	-0.2	0	0	244.6	-0.2
1998	0	270.5	-0.2	270.5	-0.2	0	0	270.5	-0.2
1999	0	298.3	-0.3	298.3	-0.3	0	0	298.3	-0.3
2000	0	328.2	-0.3	328.2	-0.3	0	0	328.2	-0.3

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.47
Kotzebue Sound Salmon Fishery
Harvesting Activity Projected Annual Rate of Change
1980-2000

	Percentage Change								
	Catch						Catch per Boat Month		
		Value		Exvessel Price				Value	
Year	Weight	Nominal	Real[1]	Nominal	Real	Number of Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	0	7.9	0.3	7.9	0.3	0	0	7.9	0.3
1982	0	7.6	-0.0	7.6	-0.0	0	0	7.6	-0.0
1983	0	7.5	-0.0	7.5	-0.0	0	0	7.5	-0.0
1984	0	7.5	-0.0	7.5	-0.0	0	0	7.5	-0.0
1985	0	7.5	-0.0	7.5	-0.0	0	0	7.5	-0.0
1986	0	7.5	-0.0	7.5	-0.0	0	0	7.5	-0.0
1987	0	7.5	-0.0	7.5	-0.0	0	0	7.5	-0.0
1988	0	7.5	-0.0	7.5	-0.0	0	0	7.5	-0.0
1989	0	7.5	-0.0	7.5	-0.0	0	0	7.5	-0.0
1990	0	7.5	-0.0	7.5	-0.0	0	0	7.5	-0.0
1991	0	7.5	-0.0	7.5	-0.0	0	0	7.5	-0.0
1992	0	7.5	-0.0	7.5	-0.0	0	0	7.5	-0.0
1993	0	7.5	-0.0	7.5	-0.0	0	0	7.5	-0.0
1994	0	7.5	-0.0	7.5	-0.0	0	0	7.5	-0.0
1995	0	7.5	-0.0	7.5	-0.0	0	0	7.5	-0.0
1996	0	7.5	-0.0	7.5	-0.0	0	0	7.5	-0.0
1997	0	7.5	-0.0	7.5	-0.0	0	0	7.5	-0.0
1998	0	7.5	-0.0	7.5	-0.0	0	0	7.5	-0.0
1999	0	7.5	-0.0	7.5	-0.0	0	0	7.5	-0.0
2000	0	7.5	-0.1	7.5	-0.1	0	0	7.5	-0.1

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.48
Kotzebue Sound Salmor Fis ery
Projec ed Harvest by Spec es
1980-2000

(1,000 sh

Year	Kings	Reds	Pinks	Silvers	Chums
1980	0	0	0	0	150
1981	0	0	0	0	150
1982	0	0	0	0	150
1983	0	0	0	0	150
1984	0	0	0	0	150
1985	0	0	0	0	150
1986	0	0	0	0	150
1987	0	0	0	0	150
1988	0	0	0	0	150
1989	0	0	0	0	150
1990	0	0	0	0	150
1991	0	0	0	0	150
1992	0	0	0	0	150
1993	0	0	0	0	150
1994	0	0	0	0	150
1995	0	0	0	0	150
1996	0	0	0	0	150
1997	0	0	0	0	150
1998	0	0	0	0	150
1999	0	0	0	0	150
2000	0	0	0	0	150

Table 4.49
Kotzebue Sound Salmon Fishery
Projected Harvest Weight by Species
1980-2000

Year	Pounds (1,000) Kings	Reds	Pinks	Silvers	Chums	Metric Tons Kings	Reds	Pinks	Silvers	Chums
1980	0	0	0	0	1320	0	0	0	0	599
1981	0	0	0	0	1320	0	0	0	0	599
1982	0	0	0	0	1320	0	0	0	0	599
1983	0	0	0	0	1320	0	0	0	0	599
1984	0	0	0	0	1320	0	0	0	0	599
1985	0	0	0	0	1320	0	0	0	0	599
1986	0	0	0	0	1320	0	0	0	0	599
1987	0	0	0	0	1320	0	0	0	0	599
1988	0	0	0	0	1320	0	0	0	0	599
1989	0	0	0	0	1320	0	0	0	0	599
1990	0	0	0	0	1320	0	0	0	0	599
1991	0	0	0	0	1320	0	0	0	0	599
1992	0	0	0	0	1320	0	0	0	0	599
1993	0	0	0	0	1320	0	0	0	0	599
1994	0	0	0	0	1320	0	0	0	0	599
1995	0	0	0	0	1320	0	0	0	0	599
1996	0	0	0	0	1320	0	0	0	0	599
1997	0	0	0	0	1320	0	0	0	0	599
1998	0	0	0	0	1320	0	0	0	0	599
1999	0	0	0	0	1320	0	0	0	0	599
2000	0	0	0	0	1320	0	0	0	0	599

Table 4.50
Kotzebue Sound Salmon Fishery
Projected Harvest Value by Species
1980-2000

Year	Nominal Value ($1,000) Kings	Reds	Pinks	Silvers	Chums	Real Value[1] ($1,000) Kings	Reds	Pinks	Silvers	Chums
1980	0	0	0	0	990	0	0	0	0	990
1981	0	0	0	0	1068	0	0	0	0	993
1982	0	0	0	0	1149	0	0	0	0	993
1983	0	0	0	0	1236	0	0	0	0	993
1984	0	0	0	0	1329	0	0	0	0	993
1985	0	0	0	0	1429	0	0	0	0	993
1986	0	0	0	0	1537	0	0	0	0	992
1987	0	0	0	0	1652	0	0	0	0	992
1988	0	0	0	0	1777	0	0	0	0	992
1989	0	0	0	0	1911	0	0	0	0	992
1990	0	0	0	0	2054	0	0	0	0	991
1991	0	0	0	0	2209	0	0	0	0	991
1992	0	0	0	0	2375	0	0	0	0	990
1993	0	0	0	0	2553	0	0	0	0	990
1994	0	0	0	0	2745	0	0	0	0	990
1995	0	0	0	0	2951	0	0	0	0	989
1996	0	0	0	0	3173	0	0	0	0	989
1997	0	0	0	0	3411	0	0	0	0	988
1998	0	0	0	0	3668	0	0	0	0	988
1999	0	0	0	0	3943	0	0	0	0	987
2000	0	0	0	0	4239	0	0	0	0	987

[1]The real values are terms of 1980 dollars.

Table 4.5
Kotzebue Sound Salmon Fishery
Projected Exvessel Prices by Species
1980-2000

Year	Nominal Price ($/Pound)					Real Price[1] ($/Pound)				
	Kings	Reds	Pinks	Silvers	Chums	Kings	Reds	Pinks	Silvers	Chums
1980	0	0	0	0	0.75	0	0	0	0	0.75
1981	0	0	0	0	0.81	0	0	0	0	0.75
1982	0	0	0	0	0.87	0	0	0	0	0.75
1983	0	0	0	0	0.94	0	0	0	0	0.75
1984	0	0	0	0	1.01	0	0	0	0	0.75
1985	0	0	0	0	1.08	0	0	0	0	0.75
1986	0	0	0	0	1.16	0	0	0	0	0.75
1987	0	0	0	0	1.25	0	0	0	0	0.75
1988	0	0	0	0	1.35	0	0	0	0	0.75
1989	0	0	0	0	1.45	0	0	0	0	0.75
1990	0	0	0	0	1.56	0	0	0	0	0.75
1991	0	0	0	0	1.67	0	0	0	0	0.75
1992	0	0	0	0	1.80	0	0	0	0	0.75
1993	0	0	0	0	1.93	0	0	0	0	0.75
1994	0	0	0	0	2.08	0	0	0	0	0.75
1995	0	0	0	0	2.24	0	0	0	0	0.75
1996	0	0	0	0	2.40	0	0	0	0	0.75
1997	0	0	[illegible]	0	2.58	0	0	0	0	0.75
1998	0	0	0	0	2.78	0	0	0	0	0.75
1999	0	0	0	0	2.99	0	0	0	0	0.75
2000	0	0	0	0	3.21	0	0	0	0	0.75

[1]The real values are in terms of 1980 dollars.

whether a hatchery can effectively operate in such an extreme habitat. If the hatchery s successful, it could add 400 to 4,000 metric tons (0.88 to 8.8 mi ion pounds) to the annual harvest weight and $0.7 to $6.6 million to he annual real harvest value by the late 1980s. Another factor which can have a large effect on the commercial harvest is the subsistence harvest. State law requires that Subsistence needs be met first; therefore, a. decrease in subsistence catch would allow an increase in commercial harvest. It has been suggested that subsistence catch will decrease as subsistence fishermen become more involved with a cash economy, but it is difficult to predict how subsistence catch w ll change. These comments are also of particular relevance in the Kuskokw m, Yukon, and Norton Sound Management Areas.

HALIBUT

The Western Alaska halibut fishery is expected to become increasingly productive because of efforts to rebuild the halibut stocks in the Gulf of Alaska and the Bering Sea. These efforts included programs to reduce the incidental catch of juvenile halibut by trawlers and to reduce directed fishing pressure by imposing lower quotas. These efforts are expected to result in increased annual harvest weight from 1985 through 2000. The annual harvest weight for the Western Alaska halibut fishery is projected to increase from 753 metric tons (1.7 million pounds) in 1980 to 3,137 metric tons (6.9 million pounds) in 2000, and the annual real harvest value is projected to increase from $1.3 million to $18.3 million (see Table 4.52).

Table 4.52

Projected Western Alaska Halibut Harvest
1980-2000

Pounds (millions)

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Total
1980	0.9	0.1	0.2	0.5	1.7
1981	0.9	0.1	0.2	0.5	1.7
1982	0.9	0.1	0.2	0.5	1.7
1983	0.9	0.1	0.2	0.5	1.7
1984	0.9	0.1	0.2	0.5	1.7
1985	0.9	0.1	0.2	0.5	1.7
1986	0.9	0.1	0.3	0.6	1.8
1987	1.0	0.1	0.3	0.6	2.0
1988	1.1	0.1	0.3	0.7	2.2
1989	1.2	0.1	0.3	0.8	2.4
1990	1.3	0.1	0.4	0.9	2.6
1991	1.4	0.1	0.4	1.0	2.9
1992	1.5	0.1	0.4	1.2	3.2
1993	1.7	0.1	0.5	1.3	3.5
1994	1.8	0.1	0.5	1.5	3.9
1995	1.9	0.1	0.5	1.7	4.3
1996	2.1	0.1	0.6	1.9	4.7
1997	2.3	0.1	0.6	2.1	5.2
1998	2.5	0.2	0.7	2.4	5.7
1999	2.7	0.2	0.7	2.7	6.3
2000	2.9	0.2	0.8	3.0	6.9

Table 4.52 (continued

Metric Tons

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Total
1980	391.9	25.4	108.9	226.8	753.0
1981	391.9	25.4	108.9	226.8	753.0
1982	391.9	25.4	108.9	226.8	753.0
1983	391.9	25.4	08.9	226.8	753.0
1984	391.9	25.4	108.9	226.8	753.0
1985	391.9	25.4	108.9	226.8	753.0
1986	425.0	27.5	118.1	255.6	826.2
1987	460.9	29.9	128.0	288.0	906.8
1988	499.8	32.4	138.8	324.5	995.6
1989	542.1	35.1	150.6	365.7	1093.5
1990	587.9	38.1	163.3	412.1	1201.4
1991	637.5	4 .3	77.	464.4	1320.3
1992	691.4	44.8	92.0	523.3	1451.6
1993	749.8	48.6	208.3	589.7	1596.4
1994	813.1	52.7	225.9	664.6	1756.2
1995	881.8	57.2	244.9	748.9	1932.8
1996	956.3	62.0	265.6	843.9	2127.8
1997	1037.1	67.2	288.1	951.0	2343.3
1998	1124.7	72.9	312.4	1071.6	2581.6
1999	1219.7	79.1	338.8	1207.6	2845.1
2000	1322.7	85.7	367.4	360.8	3136.6

Table 4.52 (continued)

Nominal Value mil ions

Year	Peninsula	Eastern Aleut ans	Western Aleutians	Bering Sea	Total
1980	0.7	0.0	0.2	0.4	1.3
1981	1.9	0.1	0.5	1.1	3.7
1982	2.1	0.1	0.6	1.2	4.0
1983	2.3	0.2	0.6	1.3	4.4
1984	2.5	0.2	0.7	1.5	4.9
1985	2.8	0.2	0.8	1.6	5.4
1986	3.3	0.2	0.9	2.0	6.4
1987	3.9	0.3	1.1	2.5	7.7
1988	4.7	0.3	1.3	3.0	9.3
1989	5.5	0.4	1.5	3.7	11.1
1990	6.5	0.4	1.8	4.6	13.3
1991	7.7	0.5	2.1	5.6	16.0
1992	9.1	0.6	2.5	6.9	19.0
1993	10.7	0.7	3.0	8.4	22.8
1994	12.6	0.8	3.5	10.3	27.2
1995	14.8	1.0	4.1	12.6	32.5
1996	17.4	1.1	4.8	15.4	38.8
1997	20.5	1.3	5.7	18.8	46.3
1998	24.1	1.6	6.7	22.9	55.2
1999	28.2	1.8	7.8	28.0	65.9
2000	33.1	2.1	9.2	34.1	78.6

Table 4.52 (continued)

Real Value[1] (millions)

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Total
1980	0.7	0.0	0.2	0.4	1.3
1981	1.8	0.1	0.5	1.0	3.4
1982	1.8	0.1	0.5	1.1	3.5
1983	1.9	0.1	0.5	1.1	3.6
1984	1.9	0.1	0.5	1.1	3.6
1985	1.9	0.1	0.5	1.1	3.7
1986	2.1	0.1	0.6	1.3	4.2
1987	2.4	0.2	0.7	1.5	4.6
1988	2.6	0.2	0.7	1.7	5.2
1989	2.9	0.2	0.8	1.9	5.8
1990	3.1	0.2	0.9	2.2	6.4
1991	3.5	0.2	1.0	2.5	7.2
1992	3.8	0.2	1.1	2.9	7.9
1993	4.2	0.3	1.2	3.3	8.8
1994	4.5	0.3	1.3	3.7	9.8
1995	5.0	0.3	1.4	4.2	10.9
1996	5.4	0.4	1.5	4.8	12.1
1997	5.9	0.4	1.6	5.4	13.4
1998	6.5	0.4	1.8	6.2	14.9
1999	7.1	0.5	2.0	7.0	16.5
2000	7.7	0.5	2.1	7.9	18.3

[1]Real Values are calculated using the U.S. CPI; 1980 is the base year.

The following method is used to project annual harvest weight. The 1980 through 1985 annual harvests for IPHC Area 3 and Area 4 are set equal to the allowable biological catch (ABC) as reported in the NPFMC Summary Fishery Management Plan for Halibut Off the Coast of Alaska. The harvests for 1986 through 2000 are increased from the 1980-1985 level at the constant rate of growth which generates a 2000 harvest equal to the estimate of maximum sustainable yield presented in the Management Plan. The harvest projections for Area 3 are allocated to the Chirikof, Shumagin, and Aleutian districts and to the Peninsula, Eastern Aleutian, and Western Aleutian Management Areas on the basis of each area's contribution to Area 3 catch from 1969 through 1979. The numerical basis of these projections is presented in Appendix A.

Peninsula

The annual harvest weight for the Peninsula Management Area halibut is projected to remain at 392 metric tons (0.9 million pounds) from 1980 through 1985 and to increase to 1,323 metric tons (2.9 million pounds) by 2000, and the real harvest value is projected to increase from $0.7 million to $7.7 million (see Table 4.53). This represents a 238 percent increase in annual harvest weight and a 1,015 percent increase in annual real harvest value (see Table 4.54). The corresponding annual rates of change in harvesting activity are summarized in Table 4.55. The large increase in the exvessel price in 1981 represents a return to the long-run price trend for halibut which was substantially deviated from in

Table 4.53

Peninsula Halibut Fishery
Projected Harvesting Activity
1980-2000

Year	Catch: Weight: Pounds (millions)	Catch: Weight: Metric Tons	Catch: Value (millions): Nominal	Catch: Value (millions): Real[1]	Exvessel Price ($/Pound): Nominal	Exvessel Price ($/Pound): Real	Number of: Boat Months	Number of: Fisherman Months	Catch per Boat Month: Weight: Pounds (1,000)	Catch per Boat Month: Value ($1,000): Nominal	Catch per Boat Month: Value ($1,000): Real
1980	[illegible].9	392	0.7	0.7	0.80	0.80	210	1050	4.1	3.3	3.3
1981	[illegible].9	392	1.9	1.8	2.20	2.05	210	1050	4.1	9.1	8.4
1982	[illegible].9	392	2.1	1.8	2.43	2.10	210	1050	4.1	10.0	8.6
1983	[illegible].9	392	2.3	1.9	2.68	2.15	210	1050	4.1	11.0	8.9
1984	0.9	392	2.5	1.9	2.94	2.20	210	1050	4.1	12.1	9.0
1985	0.9	392	2.8	1.9	3.23	2.24	210	1050	4.1	13.3	9.2
1986	0.9	425	3.3	2.1	3.54	2.29	210	1050	4.5	15.8	10.2
1987	1.0	461	3.9	2.4	3.87	2.32	210	1050	4.8	18.7	11.2
1988	1.1	500	4.7	2.6	4.23	2.36	210	1050	5.2	22.2	12.4
1989	[illegible]	542	5.5	2.9	4.62	2.40	210	1050	5.7	26.3	13.6
1990	[illegible]	588	6.5	3.1	5.03	2.43	210	1050	6.2	31.0	15.0
1991	[illegible]	638	7.7	3.5	5.48	2.46	210	1050	6.7	36.7	16.5
1992	1.5	691	9.1	3.8	5.95	2.48	210	1050	7.3	43.2	18.0
1993	1.7	750	10.7	4.2	6.48	2.51	210	1050	7.9	51.0	19.8
1994	1.8	813	12.6	4.5	7.03	2.53	210	1050	8.5	60.0	21.6
1995	1.9	882	14.8	5.0	7.63	2.56	210	1050	9.3	70.6	23.7
1996	2.1	956	17.4	5.4	8.27	2.58	210	1050	10.0	83.0	25.9
1997	2.3	1037	20.5	5.9	8.96	2.60	210	1050	10.9	97.5	28.3
1998	2.5	1125	24.1	6.5	9.70	2.61	210	1050	11.8	114.5	30.8
1999	2.7	1220	28.2	7.1	10.50	2.63	210	1050	12.8	134.4	33.7
2000	2.9	1323	33.1	7.7	11.36	2.64	210	1050	13.9	157.7	36.7

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.54

Peninsula Halibut Fishery Harvesting Activity
Projected Percentage Change from 1980
1980-2000

	Percentage Change								
	Catch						Catch per Boat Month		
		Value		Exvessel Price				Value	
Year	Weight	Nominal	Real[1]	Nominal	Real	Number of Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	0	175.0	155.7	175.0	155.7	0	0	175.0	155.7
1982	0	203.9	162.6	203.8	162.6	0	0	203.8	162.6
1983	0	235.0	169.2	235.0	169.2	0	0	235.0	169.2
1984	0	267.5	174.6	267.5	174.6	0	0	267.5	174.6
1985	0	303.8	180.5	303.8	180.5	0	0	303.8	180.5
1986	8.4	379.9	209.9	342.5	185.8	0	8.4	379.9	209.9
1987	17.6	468.9	241.6	383.8	190.4	0	17.6	468.9	241.6
1988	27.5	574.4	276.4	428.8	195.2	0	27.5	574.4	276.4
1989	38.3	698.8	314.5	477.5	199.7	0	38.3	698.8	314.5
1990	50.0	843.1	355.1	528.8	203.4	0	50.0	843.1	355.1
1991	62.7	1014.3	399.9	585.0	207.3	0	62.7	1014.3	399.9
1992	76.4	1212.1	447.2	643.8	210.2	0	76.4	1212.1	447.2
1993	91.3	1449.6	500.9	710.0	214.1	0	91.3	1449.6	500.9
1994	107.5	1723.2	557.2	778.8	216.8	0	107.5	1723.2	557.2
1995	125.0	2045.9	619.2	853.8	219.6	0	125.0	2045.9	619.2
1996	144.0	2422.4	686.0	933.8	222.1	0	144.0	2422.4	686.0
1997	164.6	2863.7	758.6	1020.0	224.5	0	164.6	2863.7	758.6
1998	187.0	3379.5	837.1	1112.5	226.6	0	187.0	3379.5	837.1
1999	211.2	3984.7	922.8	1212.5	228.7	0	211.2	3984.7	922.8
2000	237.5	4692.5	015.7	1320.0	230.6	0	237.5	4692.5	1015.7

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.55

Peninsula Halibut Fishery Harvesting Activity
Projected Annual Rate of Change
1980-2000

	Percentage Change								
	Catch						Catch per Boat Month		
		Value		Exvesse	Price			Value	
Year	Weight	Nominal	Real[1]	Nominal	Real	Number of Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	0	75.0	155.7	175.0	155.7	0	0	175.0	155.7
1982	0	10.5	2.7	10.5	2.7	0	0	10.5	2.7
1983	0	10.3	2.5	10.3	2.5	0	0	10.3	2.5
1984	0	9.7	2.0	9.7	2.0	0	0	9.7	2.0
1985	0	9.9	2.1	9.9	2.1	0	0	9.9	2.1
1986	8.4	18.9	10.5	9.6	1.9	0	8.4	18.9	10.5
1987	8.4	18.6	10.2	9.3	1.6	0	8.4	18.6	10.2
1988	8.4	18.5	10.2	9.3	1.6	0	8.4	18.5	10.2
1989	8.4	18.4	10.1	9.2	1.5	0	8.4	18.4	10.1
1990	8.4	18.1	9.8	8.9	1.2	0	8.4	8.	9.8
1991	8.4	18.1	9.8	8.9	1.3	0	8.4	18.1	9.8
1992	8.4	17.7	9.5	8.6	0.9	0	8.4	17.7	9.5
1993	8.4	18.1	9.8	8.9	1.3	0	8.4	18.1	9.8
1994	8.4	17.7	9.4	8.5	0.9	0	8.4	17.7	9.4
1995	8.4	17.7	9.4	8.5	0.9	0	8.4	17.7	9.4
1996	8.4	17.5	9.3	8.4	0.8	0	8.4	17.5	9.3
1997	8.4	1[illegible].5	9.2	8.3	0.7	0	8.4	17.5	9.2
1998	8.4	1[illegible].4	9.2	8.3	0.6	0	8.4	17.4	9.2
1999	8.4	1[illegible].4	9.1	8.2	0.6	0	8.4	17.4	9.1
2000	8.4	1[illegible].3	9.1	8.2	0.6	0	8.4	17.3	9.1

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

1980 due to large cold storage inventories and the recession which began in 1980.

Eastern Aleutian

The annual harvest weight for the Eastern Aleutian Management Area halibut fishery is projected to increase from 25 metric tons (0.1 million pounds) in 1980 through 1985 to 86 metric tons (0.2 million pounds) in 2000, and the annual real harvest value is expected to increase from $45,000 to $500,000 (see Table 4.56). The corresponding percentage increases are 238 percent and 1,015 percent (see Table 4.57). The projected annual rates of change in harvesting activity are summarized in Table 4.58.

Western Aleutian

Annual harvest weight for the Western Aleutian Management Area halibut fishery is expected to increase from 109 metric tons (0.2 million pounds) in 1980 through 1985 to 367 metric tons (0.8 million pounds) in 2000, and real harvest value is projected to increase from $0.2 million to $2.1 million (see Table 4.59). This is equivalent to a 237 percent increase in harvest weight and a 1,015 percent increase in harvest value (see Table 4.60). The corresponding projected annual percentage rates of change in harvesting activity appear in Table 4.61.

Table 4.56

Eastern Aleutians Halibut Fishery
Projected Harvesting Activity
1980-2000

	Catch				Exvessel Price ($/Pound)		Number of		Catch per Boat Month		
	Weight		Value (millions)						Weight	Value ($1,000)	
Year	Pounds (millions)	Metric Tons	Nominal	Real[1]	Nominal	Real	Boat Months	Fisherman Months	Pounds (1,000)	Nominal	Real
1980	0.1	25	0.0	0.0	0.80	0.80	30	150	1.9	1.5	1.5
1981	0.1	25	0.1	0.1	2.20	2.05	30	150	1.9	4.1	3.8
1982	0.1	25	0.1	0.1	2.43	2.10	30	150	1.9	4.5	3.9
1983	0.1	25	0.2	0.1	2.68	2.15	30	150	1.9	5.0	4.0
1984	0.1	25	0.2	0.1	2.94	2.20	30	150	1.9	5.5	4.1
1985	0.1	25	0.2	0.1	3.23	2.24	30	150	1.9	6.0	4.2
1986	0.1	28	0.2	0.1	3.54	2.29	30	150	2.0	7.2	4.6
1987	0.1	30	0.3	0.2	3.87	2.32	30	150	2.2	8.5	5.1
1988	0.1	32	0.3	0.2	4.23	2.36	30	150	2.4	10.1	5.6
1989	0.1	35	0.4	0.2	4.62	2.40	30	150	2.6	11.9	6.2
1990	0.1	38	0.4	0.2	5.03	2.43	30	150	2.8	14.1	6.8
1991	0.1	41	0.5	0.2	5.48	2.46	30	150	3.0	16.6	7.5
1992	0.1	45	0.6	0.2	5.95	2.48	30	150	3.3	19.6	8.2
1993	0.1	49	0.7	0.3	6.48	2.51	30	150	3.6	23.1	9.0
1994	0.1	53	0.8	0.3	7.03	2.53	30	150	3.9	27.2	9.8
1995	0.1	57	1.0	0.3	7.63	2.56	30	150	4.2	32.0	10.7
1996	0.1	62	1.1	0.4	8.27	2.58	30	150	4.6	37.7	11.7
1997	0.1	67	1.3	0.4	8.96	2.60	30	150	4.9	44.3	12.8
1998	0.2	73	1.6	0.4	9.70	2.61	30	150	5.4	52.0	14.0
1999	0.2	79	1.8	0.5	10.50	2.63	30	150	5.8	61.0	15.3
2000	0.2	86	2.1	0.5	11.36	2.64	30	150	6.3	71.6	16.7

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.57

Eastern Aleutian Halibut Fishery Harvesting Activity
Projected Percentage Change from 1980
1980-2000

	Percentage Change								
	Catch						Catch per Boat Month		
		Value		Exvessel Price				Value	
Year	Weight	Nominal	Real[1]	Nominal	Real	Number of Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	0	175.0	155.7	175.0	155.7	0	0	175.0	155.7
1982	0	203.8	162.6	203.8	162.6	0	0	203.8	162.6
1983	0	235.0	169.2	235.0	169.2	0	0	235.0	169.2
1984	0	267.5	174.6	267.5	174.6	0	0	267.5	174.6
1985	0	303.8	180.5	303.8	180.5	0	0	303.8	180.5
1986	8.4	379.9	209.9	342.5	185.8	0	8.4	379.9	209.9
1987	17.6	468.9	241.6	383.8	190.4	0	17.6	468.9	241.6
1988	27.5	574.4	276.4	428.8	195.2		27.5	574.4	276.4
1989	38.3	698.8	314.5	477.5	199.7	0	38.3	698.8	314.5
1990	50.0	843.1	355.1	528.8	203.4	0	50.0	843.1	355.1
1991	62.7	1014.3	399.9	585.0	207.3	0	62.7	10 4.3	399.9
1992	76.4	1212.1	447.2	643.8	210.2	0	76.4	1212.1	447.2
1993	91.3	1449.6	500.9	710.0	214.1	0	91.3	1449.6	500.9
1994	107.5	1723.2	557.2	778.8	216.8	0	107.5	1723.2	557.2
1995	125.0	2045.9	619.2	853.8	219.6	0	125.0	2045.9	619.2
1996	144.0	2422.4	686.0	933.8	222.1	0	144.0	2422.4	686.0
1997	164.6	2863.7	758.6	1020.0	224.5	0	164.6	2863.7	758.6
1998	187.0	3379.5	837.1	1112.5	226.6	0	187.0	3379.5	837.1
1999	211.2	3984.7	922.8	1212.5	228.7	0	211.2	3984.7	922.8
2000	237.5	4692.5	1015.7	1320.0	230.6	0	237.5	4692.5	1015.7

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

able 4.58

Easte n Aleutian Halibut Fishery Harvesting Act vity
Projected Annual Rate of Change
1980-2000

	Percentage Change								
	Catch			Exvessel Price			Catch per Boat Month		
		Value						Value	
Year	Weight	Nomin l	Real[1]	Nominal	Real	Number of Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	0	175.0	55.7	175.0	155.7	0	0	75.0	155.7
1982	0	10.5	2.7	10.5	2.7	0	0	10.5	2.7
1983	0	10.3	2.5	10.3	2.5	0	0	10.3	2.5
1984	0	9.7	2.0	9.7	2.0	0	0	9.7	2.0
1985	0	9.9	2.1	9.9	2.1	0	0	9.9	2.1
1986	8.4	18.9	10.5	9.6	1.9	0	8.4	18.9	10.5
1987	8.4	18.6	10.2	9.3	1.6	0	8.4	18.6	10.2
1988	8.4	18.5	10.2	9.3	1.6	0	8.4	18.5	10.2
1989	8.4	18.4	10.1	9.2	1.5	0	8.4	18.4	10.1
1990	8.4	18.1	9.8	8.9	1.2	0	8.4	18.1	9.8
1991	8.4	18.1	9.8	8.9	1.3	0	8.4	18.1	9.8
1992	8.4	17.7	9.5	8.6	0.9	0	8.4	17.7	9.5
1993	8.4	18.1	9.8	8.9	1.3	0	8.4	18.1	9.8
1994	8.4	17.7	9.4	8.5	0.9	0	8.4	17.7	9.4
1995	8.4	17.7	9.4	8.5	0.9	0	8.4	17.7	9.4
1996	8.4	17.5	9.3	8.4	0.8	0	8.4	17.5	9.3
1997	8.4	17.5	9.2	8.3	0.7	0	8.4	17.5	9.2
1998	8.4	17.4	9.2	8.3	0.6	0	8.4	17.4	9.2
1999	8.4	17.4	9.1	8.2	0.6	0	8.4	17.4	9.1
2000	8.4	17.3	9.1	8.2	0.6	0	8.4	17.3	9.1

[1] The real values and prices were calculated using the U.S. CPI; 980 is the base period.

Table 4 59

Bering Sea Halibut Fishery
Projected Harvesting Activity
1980-2000

	Catch								Catch per Boat Month		
	Weight		Value (millions)[1]		Exvessel Price ($/Pound)		Number of		Weight	Value ($1,000)	
Year	Pounds (millions)	Metric Tons	Nominal	Real	Nominal	Real	Boat Months	Fisherman Months	Pounds (1,000)	Nominal	Real
1980	0.5	227	0.4	0.4	0.80	0.80	75	375	6.7	5.3	5.3
1981	0.5	227	1.1	1.0	2.20	2.05	75	375	6.7	14.7	13.6
1982	0.5	227	1.2	1.1	2.43	2.10	75	375	6.7	16.2	14.0
1983	0.5	227	1.3	1.1	2.68	2.15	75	375	6.7	17.9	14.4
1984	0.5	227	1.5	1.1	2.94	2.20	75	375	6.7	19.6	14.6
1985	0.5	227	1.6	1.1	3.23	2.24	75	375	6.7	21.5	15.0
1986	0.6	256	2.0	1.3	3.54	2.29	75	375	7.5	26.6	17.2
1987	0.6	288	2.5	1.5	3.87	2.32	75	375	8.5	32.8	19.7
1988	0.7	325	3.0	1.7	4.23	2.36	75	375	9.5	40.4	22.5
1989	0.8	366	3.7	1.9	4.62	2.40	75	375	10.8	49.7	25.8
1990	0.9	412	4.6	2.2	5.03	2.43	75	375	12.1	60.9	29.4
1991	1.0	464	5.6	2.5	5.48	2.46	75	375	13.7	74.8	33.6
1992	1.2	523	6.9	2.9	5.95	2.48	75	375	15.4	91.5	38.2
1993	1.3	590	8.4	3.3	6.48	2.51	75	375	17.3	112.3	43.6
1994	1.5	665	10.3	3.7	7.03	2.53	75	375	19.5	137.3	49.5
1995	1.7	749	12.6	4.2	7.63	2.56	75	375	22.0	168.0	56.3
1996	1.9	844	15.4	4.8	8.27	2.58	75	375	24.8	205.1	63.9
1997	2.1	951	18.8	5.4	8.96	2.60	75	375	28.0	250.5	72.6
1998	2.4	1072	22.9	6.2	9.70	2.61	75	375	31.5	305.5	82.3
1999	2.7	1208	28.0	7.0	10.50	2.63	75	375	35.5	372.7	93.3
2000	3.0	1361	34.	7.9	11.36	2.64	75	375	40.0	454.4	105.8

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Iable 4 60

Ber ng Sea lalibut I shery Harvesting Activity
'rojectec Percentage Change from 980
1980-2000

				'ercentage Change					
	Catcl						Catch per Boat Month		
		Value		Exvesse	Price			Value	
Year	Weight	Nominal	Real[1]	Nominal	Real	Number of Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	0	175.0	155.7	175.0	155.7	0	0	175.0	155.7
1982	0	203.8	162.6	203.8	162.6	0	0	203.8	162.6
1983	0	235.0	169.2	235.0	169.2	0	0	235.0	169.2
1984	0	267.5	174.6	267.5	174.6	0	0	267.5	174.6
1985	0	303.8	180.5	303.8	180.5	0	0	303.8	180.5
1986	12.7	398.6	222.0	342.5	185.8	0	12.7	398.6	222.0
1987	27.0	514.3	268.8	383.8	190.4	0	27.0	514.3	268.8
1988	43.1	656.6	322.4	428.8	195.2	0	43.1	656.6	322.4
1989	61.3	831.2	383.3	477.5	199.7	0	61.3	831.2	383.3
1990	81.7	1042.5	451.3	528.8	203.4	0	81.7	1042.5	451.3
1991	104.8	1302.7	529.2	585.0	207.3	0	104.8	1302.7	529.2
1992	130.7	1616.2	615.7	643.8	210.2	0	130.7	1616.2	615.7
1993	160.0	2006.2	716.7	710.0	214.1	0	160.0	2006.2	716.7
1994	193.0	2474.9	828.2	778.8	216.8	0	193.0	2474.9	828.2
1995	230.2	3049.2	955.5	853.8	219.6	0	230.2	3049.2	955.5
1996	272.1	3746.4	1098.5	933.8	222.1	0	272.1	3746.4	1098.5
1997	319.3	4596.1	1260.4	1020.0	224.5	0	319.3	4596.1	1260.4
1998	372.5	5629.0	1443.0	1112.5	226.6	0	372.5	5629.0	1443.0
1999	432.4	6888.3	1649.9	1212.5	228.7	0	432.4	6888.3	1649.9
2000	500.0	8420.0	1883.5	1320.0	230.6	0	500.0	8420.0	1883.5

[1] he rea va ues and rices were ca culated using the U.S. CP ; 1980 is the base period.

ab e 4.61

Bering Sea Halibut Fishery Harvesting Act v ty
Projected Annual Rate of Change
1980-2000

	Percentage Change								
	Catch						Catch per Boat Month		
		Value		Exvessel Price		Number of		Value	
Year	Weight	Nominal	Real[1]	Nominal	Real	Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	0	175.0	55.7	175.0	55.7	0	0	175.0	155.7
1982	0	10.5	2.7	10.5	2.7	0	0	10.5	2.7
1983	0	10.3	2.5	10.3	2.5	0	0	10.3	2.5
1984	0	9.7	2.0	9.7	2.0	0	0	9.7	2.0
1985	0	9.9	2.1	9.9	2.1	0	0	9.9	2.1
1986	12.7	23.5	14.8	9.6	1.9	0	12.7	23.5	14.8
1987	12.7	23.2	14.5	9.3	1.6	0	12.7	23.2	14.5
1988	12.7	23.2	14.5	9.3	1.6	0	12.7	23.2	14.5
1989	12.7	23.1	14.4	9.2	1.5	0	12.7	23.1	14.4
1990	12.7	22.7	14.1	8.9	1.2	0	12.7	22.7	14.1
1991	12.7	22.8	14.1	8.9	1.3	0	12.7	22.8	14.1
1992	12.7	22.4	13.8	8.6	0.9	0	12.7	22.4	13.8
1993	12.7	22.7	14.1	8.9	1.3	0	12.7	22.7	14.1
1994	12.7	22.3	13.7	8.5	0.9	0	12.7	22.3	13.7
1995	12.7	22.3	13.7	8.5	0.9	0	12.7	22.3	13.7
1996	12.7	22.1	13.6	8.4	0.8	0	12.7	22.1	13.6
1997	12.7	22.1	13.5	8.3	0.7	0	12.7	22.1	13.5
1998	12.7	22.0	13.4	8.3	0.6	0	12.7	22.0	13.4
1999	12.7	22.0	13.4	8.2	0.6	0	12.7	22.0	13.4
2000	12.7	21.9	13.3	8.2	0.6	0	12.7	21.9	13.3

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Bering Sea

The Bering Sea Management Area halibut fishery is expected to grow more rapidly than the fisheries in Area 3. Annual harvest weight s projected to increase from 227 metric tons (0.5 million pounds) n 1980 through 1985 to 1,361 metric tons (3.0 million pounds) in 2000, and real harvest value is projected to increase from $0.4 million to $7.9 million (see Table 4.62). This represents a 500 percent increase in harvest weight and a 1,883 percent increase in real harvest value (see Table 4.63). Table 4.64 contains the corresponding annual rates of change in harvesting activity.

HERRING

The level of harvesting activity of the Western Alaska herr ng fishery has changed rapidly in recent years. For example, between 976 and 1980 the number of boats participating in the fishery increased from less than 50 to more than 600 and annual harvest weight increased from 142 metric tons (0.3 million pounds) to approximately 21,500 metric tons (47.4 million pounds). The rapid changes have not all been increases; in 1980 exvessel roe herring prices ranged from $150 to $400 per metric tons whereas in 1979 they had ranged from $600 to $1,000. The level of harvesting activity has changed rapidly and is expected to continue to change rapidly because its two principle determinants, resource abundance and exvessel prices, are subject to rapid changes.

Table 4.62

Western Aleutians Halibut Fishery
Projected Harvesting Activity
1980-2000

Year	Catch: Weight: Pounds (millions)	Catch: Weight: Metric Tons	Catch: Value (millions): Nominal	Catch: Value (millions): Real[1]	Exvessel Price ($/Pound): Nominal	Exvessel Price ($/Pound): Real	Number of: Boat Months	Number of: Fisherman Months	Catch per Boat Months: Weight: Pounds (1,000)	Catch per Boat Months: Value ($1,000): Nominal	Catch per Boat Months: Value ($1,000): Real
1980	.2	109	0.2	0.2	0.80	0.80	15	75	16.0	12.8	12.8
1981	0.2	109	0.5	0.5	2.20	2.05	15	75	16.0	35.2	32.7
1982	0.2	109	0.6	0.5	2.43	2.10	15	75	16.0	38.9	33.6
1983	0.2	109	0.6	0.5	2.68	2.15	15	75	16.0	42.9	34.5
1984	0.2	109	0.7	0.5	2.94	2.20	15	75	16.0	47.0	35.1
1985	0.2		0.8	0.5	3.23	2.24	15	75	16.0	51.7	35.9
1986	0.3	118	0.9	0.6	3.54	2.29	15	75	17.4	61.4	39.7
1987	0.3	128	1.1	0.7	3.87	2.32	15	75	18.8	72.8	43.7
1988	0.3	139	1.3	0.7	4.23	2.36	15	75	20.4	86.3	48.2
1989	0.3	151	1.5	0.8	4.62	2.40	15	75	22.1	102.2	53.1
1990	0.4	163	1.8	0.9	5.03	2.43	15	75	24.0	120.7	58.2
1991	0.4	177	2.1	1.0	5.48	2.46	15	75	26.0	142.6	64.0
1992	.4	192	2.5	1.1	5.95	2.48	15	75	28.2	167.9	70.0
1993	.5	208	3.0	1.2	6.48	2.51	15	75	30.6	198.4	76.9
1994	.5	226	3.5	1.3	7.03	2.53	15	75	33.2	233.4	84.1
1995	.5	245	4.1	1.4	7.63	2.56	15	75	36.0	274.7	92.1
1996	.6	266	4.8	1.5	8.27	2.58	15	75	39.0	322.9	100.6
1997	.6	288	5.7	1.6	8.96	2.60	15	75	42.3	379.4	109.9
1998	.7	312	6.7	1.8	9.70	2.61	15	75	45.9	445.4	120.0
1999	0.7	339	7.8	2.0	10.50	2.63	15	75	49.8	522.8	130.9
2000	0.8	6	9.2	2.1	11.36	2.64	15	75	54.0	613.4	142.8

[1] The rea va ues and pri e were calculated using the U.S. CPI; 1980 is the base period.

Table 4.63

Western Aleutians Halibut Fishery Harvesting Activity
Projected Percentage Change from 1980
1980-2000

Year	Catch Weight	Catch Value Nominal	Catch Value Real[1]	Exvessel Price Nominal	Exvessel Price Real	Number of Boat Months	Catch per Boat Month Weight	Catch per Boat Month Value Nominal	Catch per Boat Month Value Real
1980	0	0	0	0	0	0	0	0	0
1981	0	175.0	155.7	175.0	155.7	0	0	175.0	155.7
1982	0	203.8	162.6	203.8	162.6	0	0	203.8	162.6
1983	0	235.0	169.2	235.0	169.2	0	0	235.0	169.2
1984	0	267.5	174.6	267.5	174.6	0	0	267.5	174.6
1985	0	303.8	180.5	303.8	180.5	0	0	303.8	180.5
1986	8.4	379.9	209.9	342.5	185.8	0	8.4	379.9	209.9
1987	17.6	468.9	241.6	383.8	190.4	0	17.6	468.9	241.6
1988	27.5	574.4	276.4	428.8	195.2	0	27.5	574.4	276.4
1989	38.3	698.8	314.5	477.5	199.7	0	38.3	698.8	314.5
1990	50.0	843.1	355.1	528.8	203.4	0	50.0	843.1	355.1
1991	62.7	1014.3	399.9	585.0	207.3	0	62.7	1014.3	399.9
1992	76.4	1212.1	447.2	643.8	210.2	0	76.4	1212.1	447.2
1993	91.3	1449.6	500.9	710.0	214.1	0	91.3	1449.6	500.9
1994	107.5	1723.2	557.2	778.8	216.8	0	107.5	1723.2	557.2
1995	125.0	2045.9	619.2	853.8	219.6	0	125.0	2045.9	619.2
1996	144.0	2422.4	686.0	933.8	222.1	0	144.0	2422.4	686.0
1997	164.6	2863.7	758.6	1020.0	224.5	0	164.6	2863.7	758.6
1998	187.0	3379.5	837.1	1112.5	226.6	0	187.0	3379.5	837.1
1999	211.2	3984.7	922.8	1212.5	228.7	0	211.2	3984.7	922.8
2000	237.5	4692.5	1015.7	1320.0	230.6	0	237.5	4692.5	1015.7

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.64

Western Aleutians Halibut Fishery Harvesting Activity
Projected Annual Rate of Change
1980-2000

Year	Percentage Change: Catch: Weight	Catch: Value: Nominal	Catch: Value: Real[1]	Exvessel Price: Nominal	Exvessel Price: Real	Number of Boat Months	Catch per Boat Month: Weight	Catch per Boat Month: Value: Nominal	Catch per Boat Month: Value: Real
1980	0	0	0	0	0	0	0	0	0
1981	0	175.0	55.7	75.0	155.7	0	0	175.0	155.7
1982	0	10.5	2.7	10.5	2.7	0	0	10.5	2.7
1983	0	10.3	2.5	10.3	2.5	0	0	10.3	2.5
1984	0	9.7	2.0	9.7	2.0	0	0	9.7	2.0
1985	0	9.9	2.1	9.9	2.1	0	0	9.9	2.1
1986	8.4	18.9	10.5	9.6	1.9	0	8.4	18.9	10.5
1987	8.4	18.6	10.2	9.3	1.6	0	8.4	18.6	10.2
1988	8.4	18.5	10.2	9.3	1.6	0	8.4	18.5	10.2
1989	8.4	18.4	10.1	9.2	1.5	0	8.4	18.4	10.1
1990	8.4	18.1	9.8	8.9	1.2	0	8.4	18.1	9.8
1991	8.4	18.1	9.8	8.9	1.3	0	8.4	18.1	9.8
1992	8.4	17.7	9.5	8.6	0.9	0	8.4	17.7	9.5
1993	8.4	18.1	9.8	8.9	1.3	0	8.4	18.1	9.8
1994	8.4	17.7	9.4	8.5	0.9	0	8.4	17.7	9.4
1995	8.4	17.7	9.4	8.5	0.9	0	8.4	17.7	9.4
1996	8.4	17.5	9.3	8.4	0.8	0	8.4	17.5	9.3
1997	8.4	17.5	9.2	8.3	0.7	0	8.4	17.5	9.2
1998	8.4	17.4	9.2	8.3	0.6	0	8.4	17.4	9.2
1999	8.4	17.4	9.1	8.2	0.6	0	8.4	17.4	9.1
2000	8.4	17.3	9.1	8.2	0.6	0	8.4	17.3	9.1

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Although stock abundance is very difficult to measure, large fluctuations in resource abundance appear to be characteristic of herring fisheries. For example, ADF&G summaries of the 1978, 1979, and 1980 herring fisheries of Western Alaska indicate that the herring biomass was 187,000 to 235,000 metric tons in 1978, 260,000 to 640,000 metric tons in 1979, and 83,000 to 174,000 metric tons in 1980. Just as rapid changes in resource abundance were in part responsible for the rapid changes in annual harvests which occurred during the late 1970s, rapid changes in resource abundance from 1980 through 2000 are expected to be partically responsible for the rapid changes in annual harvests that will characterize the fishery through 2000.

The factors which explain the rapid changes in exvessel prices which have occurred and which are expected to occur include the rapid changes in resource abundance and the resulting changes in annual harvests, what was apparently a highly inelastic demand for herring roe, and the timing of the Western Alaska fisheries relative to other herring fisheries and the consumption of herring roe. The last factor has and will continue to make Western Alaska herring prices more volatile than those of other areas because the Western Alaska fisheries are the last to occur prior to the period of concentrated retail marketing and consumption. Therefore if harvests elsewhere have been adequate there is little interest in Western Alaska and exvessel prices tend to be lower than those for earlier fisheries, but if there have been poor harvests elsewhere the Western Alaska fisheries offer the last chance to obtain adequate roe and Western Alaska prices tend to be exceptionally high.

The abrupt price declines which occurred in 1980 are explained by the previous factors and the unsustainably high prices of 1979. It appears that the very high 1979 exvessel prices resulted in retail prices which met with severe consumer resistance, that is, consumers were not willing to buy much roe at the high retail prices. As a result there were exceptionally large inventories of roe before the 1980 fishing season began. The large inventories have depressed exvessel prices in 1980, and the consumer resistance to the 1979 retail prices suggests that even once the inventories are eliminated, exvessel prices will remain below the 1979 levels.

During the next twenty years real exvessel prices are expected to fluctuate between $200 and $1,000 per metric ton and perhaps typically be $440 per metric ton. The development, depletion, and recovery of herring stocks throughout the world and the timing of the Western Alaska fisheries will tend to generate rapid fluctuations in exvessel prices. The fluctuations in exvessel prices and local resource abundance will cause flucutuations in annual harvests. The information that is necessary to accurately predict annual harvests does not exist. The harvest projections are therefore based on recent assessments of resource abundance and the knowledge that both resource abundance and the proportion of the resources exploited can change rapidly. Annual harvest weight is expected to fluctuate between 2,500 metric tons, the record harvest prior to 1973, and 40,000 metric tons, the maximum sustainable yield for the commercial fishery (NPFMC, 1979). An annual harvest of 22,700 metric tons (50 million pounds) will perhaps be a typical harvest;

the record harvest of 1980 was approximately 21,600 metric tons (48 million pounds) excluding 2,500 metric tons of wastage. The proportion of total annual harvest taken in each area is not expected to be any more stable than total harvest. In 1980 the proportions were as follow: Bristol Bay, 82.4 percent; Security Cove, 2.3 percent; Goodnews Bay, 1.9 percent; Cape Romanzof 2.6 percent; and Norton Sound. 10.3 percent. To allow for the fluctuations in harvest proportions that will occur between 1980 and 2000, it may be appropriate to assign percentages of one half the 1980 values and assign 50 percent of the harvest to unspecified areas which would include the aforementioned areas and as of yet unexploited areas such as Kotzebue Sound.

There is perhaps almost as much uncertainty associated with the numbers of boats and fishermen which take the harvest as with the size and value of the harvest. There is substantial local interest in limiting the participation of purse seiners in order to enhance the opportunities of local fishermen to profitably participate in the herring fisheries of Western Alaska. Limiting purse seiners would allow increased local participation for the following reasons: with the exception of Bristol Bay, the purse seiners have been almost exclusively non-local boats; purse seiners have been highly productive and have therefore greatly reduced the harvest available to gill net boats; local fishermen can more readily participate in the gill net fishery than in the purse seine fishery because the relatively inexpensive [illegible] fishermen use in local salmon fisheries can be used in a gill net herring fishery; and a gill net fishery may not be lucrative enough to attract non-local fishermen for whom transportation, onsite, and opportunity costs may be higher. During the past year, the Alaska Board of Fisheries limited the use of purse seiners to the Bristol Bay area and set regulations which will tend to increase the proportion of the Bristol Bay harvest taken by gill net boats. The actions of the Board of Fisheries are in accordance with its policy to assure an equitable distribution of fishery resources. In the absence of such regulations, a relatively small number of purse seiners could take much of the total harvest. The limits on purse seiners are to be reexamined in terms of the ability of the gill net fisheries to fully utilize the herring stocks. A preliminary ADF&G report on the 1980 Western Alaska Herring Fishery indicates that the gill net fisheries currently have this ability; therefore, the expectation is that the limitations on purse seiners will remain in effect.

It should be noted that the Bristol Bay purse seine fishery is not completely non-local nor are the gill net fisheries completely local. The Bristol Bay purse seine fleet includes 9.8 meter (32 foot) Bristol Bay salmon boats, some of which are operated by local residents, as well as a larger purse seiners from elsewhere in Alaska. The gill net fleets in the Arctic-Yukon-Kuskokwim (A-Y-K) area include A-Y-K boats as well as boats from Bristol Bay and elsewhere in Alaska. For example, approximately 120 gill net boat particpated in the Security Cove fishery, most of which had previously participated in the Bristol Bay fishery, and 20 to 30 of which were local boats. A number of large gill net boats from the Security Cove fishery participated in the Goodnews Bay fishery during a two day closure in Security Cove; during the remainder of the season, only local boats were active. A total of 58 gill net boats participated in the Cape Romanzof fishery, of which 45 local boats took 40 percent of the harvest. In Norton Sound approximately 70 percent of the fishermen who made landings were residents of the Norton Sound area and about 50 percent of the total harvest was taken by these local fishermen.

The projections of harvesting activity for the Western Alaska roe herring fisheries presented in Table 4.65 are based on the preceding information; they are thought to depict typical levels of activity that will occur during the next twenty years. The annual deviations from these norms are expected to be sustantial since the herring fisheries are expected to be relatively unstable.

In addition to the roe herring fisheries of Western Alaska there have been and there are expected to continue to be relatively minor herring roe on kelp fisheries. The roe on kelp fisheries have been relatively stab e since 1976 with harvests ranging from 100 to 200 metric tons. In 1980 roe on kelp fisheries occurred in Bristol Bay and Norton Sound. Approximately 30 fishermen harvested 36 metric tons valued at $95,000 during the 1980 Bristol Bay fishery, and 20 fishermen harvested 22 metric tons valued at $73,000 during the 1980 Norton Sound fishery. The 1980 harvesting activity is expected to be typical of that which will occur from 1981 to 2000; however, large fluctuations in harvesting activity are expected in these predominately local fisheries.

Table 65

Western Alaska Roe Herring Fisheries Projected
Typical Annual Harvesting Activity

Fishery	Catch: Weight Million Dollars	Catch: Weight Metric Tons	Catch: Real Value Million Dollars	Number of: Boats[1]	Number of: Fishermen	Catch per Boat: Metric Tons	Catch per Boat: Real Value Dollars
Bristol Bay Purse Seine	34.6	5,700	6.9	140	700	112.1	49,300
Bristol Bay Gill Net	6.6	3,000	1.3	363	1,089	8.3	3,600
Security Cove Gill Net	.4	640	0.3	111	333	5.8	2,700
Goodnews Bay Gill Net	.0	430	0.2	44	132	9.8	4,500
Cape Romanzof Gill Net	.3	590	0.3	54	162	10.9	5,600
Norton Sound Gill Net	5.1	2.340	1.0	289	600	8.1	3,500
Total	50.0	22,700	10.0				

[1] These projections are based on preliminary ADF&G estimates of the number of boats in each 1980 fishery.

Offshore foreign herring fisheries were active in Western Alaska from the late 1960s through the late 1970s, and it has been suggested that a domestic offshore fishery may develop in addition to the near shore fisheries discussed above. It is not known when such a fishery may develop or how large it may become. In 1980, ADF&G measures of resource abundance indicated that herring stocks were not available for an offshore fishery. Due to the great uncertainty associated with this fishery and the large fluctuations in the near shore fishery that are expected, separate projections for the offshore fishery are not presented in this report.

KING CRAB

The king crab fisheries of Western Alaska are expected to remain extremely productive and to dominate the Alaska king crab fishery. The annual harvest weight is expected to equal 46,494 metric tons (102 million pounds) throughout the forecast period; however, due to steadily decreasing real exvessel prices, real harvest value is projected to decrease from $129 million in 1980 to $66 million in 2000 (see Table 4.66). The projections of annual harvest weight reflect the best current guesses of the Westward Region ADF&G shellfish biologist, as based on historical harvest data and short-term trends. If a range of probable harvests was given, the mean value is used. For example, it is believed that the annual Bering Sea king crab harvest may range from 22,680 metric tons (50 million pounds) to 54,430 metric tons (120 million pounds) and the projection is set equal to 38,555 metric tons (85 million able : 66

Projected Western Alaska King Crab Harvest
980-2000

Pounds (millions

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Total
1980	5.5	10.0	2.0	85.0	102.5
1981	5.5	10.0	2.0	85.0	102.5
1982	5.5	10.0	2.0	85.0	102.5
1983	5.5	10.0	2.0	85.0	102.5
1984	5.5	10.0	2.0	85.0	102.5
1985	5.5	10.0	2.0	85.0	102.5
1986	5.5	10.0	2.0	85.0	102.5
1987	5.5	10.0	2.0	85.0	102.5
1988	5.5	10.0	2.0	85.0	102.5
1989	5.5	10.0	2.0	85.0	102.5
1990	5.5	10.0	2.0	85.0	102.5
1991	5.5	10.0	2.0	85.0	102.5
1992	5.5	10.0	2.0	85.0	102.5
1993	5.5	10.0	2.0	85.0	102.5
1994	5.5	10.0	2.0	85.0	102.5
1995	5.5	10.0	2.0	85.0	102.5
1996	5.5	10.0	2.0	85.0	102.5
1997	5.5	10.0	2.0	85.0	102.5
1998	5.5	10.0	2.0	85.0	102.5
1999	5.5	10.0	2.0	85.0	102.5
2000	5.5	10.0	2.0	85.0	102.5

Table 4.66 (continued)

Metric Tons

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Total
1980	2494.8	4536.0	907.2	38555.7	46493.7
1981	2494.8	45”36.(3	907.2	38555*7	46493,7
1982	2494.8	4536.0	907.2	30555.7	46493.7
1983	2494.8	4536.0	907.2	38555.7	46493.7
1984	2494.8	4536.0	9(37.2	30555.7	46493.7
1985	2494.8	4536.0	907.2	38555.7	46493,7
1986	2494.8	4536.0	907.2	30555.7	46493,7
1987	2494.8	4536.0	907.2	30555.7	46493.7
1988	2494.8	4536.0	907.2	38555.7	46493.7
1989	2494.8	4536.0	907.2	38555.7	46493,7
1990	2494.8	4536.0	907.2	38555.7	46493.7
1991	2494.8	4536.0	907.2	38555.7	46493.7
1992	2494.8	4536.0	907.2	38555.7	46493.7
1993	2494.8	4536*()	907.2	38555.7	46493.7
1994	2494.8	4536.0	907.2	38555*7	46493.7
1995	2494.8	4536.0	9(-)7.2	38555.7	46493.7
1996	2494.8	4536.()	907.2	38555.7	46493.7
1997	2494.8	4536.0	907.2	38555.7	46493.7
1998	2494.8	4536.0	907.2	38555.7	46493.7
1999	2494.8	4536.(-)	907.2	38555.7	46493.7
2000	2494.8	4536.0	907.2	38555.7	46493.7

Table 4.66 (continued)

Nominal Value (millions)

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Total
1980	6.9	12.6	2.5	107.2	129,3
1981	6.5	11.9	2.4	101.1	121.9
1982	7.2	13.1	2.6	111.6	134.5
1983	7.1	12.8	2.6	109.2	131.7
1984	7.6	13.8	.2.$	117.5	141.7
1985	7.6	13.9	2.8	117.8	142.1
1986	8.1	14.7	2.9	125.1	150.8
1987	8.2	15.0	3.0	127.3	153.5
1988	8.7	15.8	3.2	134.2	161.8
1989	8.9	16.2	3.2	138.0	166.4
1990	9.4	17.0	3.4	144.9	174.7
1991	9.7	17.7	3.5	150.1	181.0
1992	10.2	18.5	3.7	157.5	189.9
1993	10.6	19.3 ,	3.9	164.0	197.7
1994	11.1	20.2	4.0	172.1	207.5
1995	11.6	?1.2	4.2	179.9	217.0
1996	12.2	22.2	4.4	189.1	228.0
1997	12.8	?3.3	4.7	198.3	239.1
1998	13.5	24.6	4.9	208.7	251.7
1999	14.,?	25.8	5.2	219.5	264.7
2000	15.0	?7.2	5.4	231.4	279.1

Table 4.66 (continued)

Real Value[1] (millions)

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Total
1980	6.9	12.6	2.5	107.2	1?9.3
1981	6.1	11.1	2.2	94.0	113.3
1982	6.2	11*3	2.3	96.4	116.3
1983	5.7	10.3	2.1	87.7	105.8
1984	5.?	IO*3	2.1	87.8	105.9
1985	5.3	9.6	1.9	81.8	98.7
1986	5.2	9.5	1.9	80.8	97.4
1987	4.9	9.0	1.8	76.4	92.2
1988	4.8	8.8	1.8	74”9	90.3
1989	4.6	8.4	1.7	71.6	86.3
1990	4.5	8.2	1.6	69.9	84.3
1991	4.4	7.9	1.6	67.3	81.2
1992	4.2	7.7	1*5	65.7	79.2
1993	4.1	7.5	1.5	63.6	76.7
1994	4.0	7.3	1.5	6?,0	74.8
1995	3.5	7.1	1.4	60.3	72.7
1996	3.8	6.9	1.4	58.9	71.0
1997	3.7	6.8	1.4	57.4	69.3
1998	3.6	6.6	1.3	56.2	67.8
1999	3.6	6.5	1.3	55.0	66.3
2000	3.5	6.3	1.3	53.9	65.0

[1] Real values are calculated using the U.S. CPI; 1980 is the base year.

pounds). This example also demonstrates the size of error in the point estimates that is not unexpected.

Peninsula

The annual harvest weight for the Peninsula king crab fishery is expected to average 2,495 metric tons (5.5 million pounds) from 1980 through 2000, and the annual real harvest value is expected to decrease from $6.9 million in 1980 to $3.5 million in 2000 (see Table 4.67). This represents a 50 percent decrease in real harvest value (see Table 4.68). The corresponding annual rates of change in harvesting activity are presented in Table 4.69. The projected mean annual harvest weight exceeds the mean catch for either 1969 through 1979 or 1975 through 1979 but is approximately equal to the 1969 or 1973 catch.

Eastern Aleutians

The annual king crab harvest in the Eastern Aleutians Management Area is expected to average 4,536 metric tons (10 million pounds) between 1980 and 2000; and the annual real harvest value is projected to decrease from $12.6 million in 1980 to $6.3 million in 2000 (see Table 4.70). The 50 percent decrease in real value is due to the projected decrease in the real exvessel price (see Table 4.71). The projected annual percentage changes in harvesting activity appear in Table 4.72. The projected annual harvest weight is approximately equal to the mean annual catch for both 1969 through 1979 and 1975 through 1979.

Table 4.67
Peninsula King Crab Fishery
Projected Harvesting Activity
1980-2000

	Catch				Exvessel Price		Number of		Catch per Boat Month		
	Weight		Value		($/Pound)				Weight	Value	
	Pounds	Metric	(millions)[1]				Boat	Fisherman	Pounds	($1,000)	
Year	(millions)	Tons	Nominal	Real	Nominal	Real	Months	Months	(1,000)	Nominal	Real
1980	5.5	?495	6.9	6.9	1.26	1.26	128	513	42.9	54*1	54.1
1981	5.5	2495	6.5	6.1	1.19	1.11	133	533	4103	49.1	45.6
1982	5.5	2495	7.2	6.2	1*31	1.13	132	529	41.6	54.6	47.2
1983	5.5	?495	7.1	5.7	1.28	1.03	136	544	40.4	51.9	41.7
1984	5.5	2495	7.6	5.7	1.38	1.03	136	544	40.4	55.9	41.8
1985	5.5	2495	7.6	5.3	1.39	0.96	139	556	39.6	54.9	38.1
1986	5.5	2495	8.1	5.2	1.47	0.95	139	558	39.4	58.0	37.5
1987	5.5	2495	8.2	4*9	1.50	(-).90	142	567	38.8	58.1	34*9
1988	5.5	2495	8.7	4.8	1.58	0.88	143	570	38.6	60.9	34.0
1989	5.5	2495	8.9	4*6	1.62	0.84	145	578	38.1	61.8	32.1
1990	5.5	2495	9.4	4.5	1.70	0.82	146	582	37.8	64.4	31.1
1991	5.5	?495	9.7	4*4	1.77	0.79	147	5P9	37*4	66.0	29.6
1992	5.5	2495	10.2	4.2	1.85	0.77	148	593	37.1	68.7	28.7
1993	5.5	7495	10.6	4*1	1.,93	0.75	150	599	36.7	70.9	27.5
1994	5.5	2495	11.1	4.0	2.(-)2	0.73	151	603	36.5	73.8	26.6
1995	5.5	2495	11.6	3.9	2.12	0.71	152	608	36.2	76.5	25*7
1996	5.5	2495	12. ?	3.8	2.22	0.69	153	6]3	35*9	79.9	24.9
1997	5.5	2495	12.8	3*7	2.33	0.68	154	617	35.6	83.2	24.1
1998	5.5	2495	13.5	3.6	2.46	0.66	155	621	35.4	87.0	23.4
1999	5.5	2495	14.2	3.6	2.58	0.65	156	625	35.2	90,9	22.7
2000	5.5	2495	15.0	3.5	2.72	0.63	157	629	35.0	95.2	22.2

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.68

Peninsula King Crab Fishery Harvesting Activity
Projected Percentage Change from 1980
1980-2000

	Percentage Change								
	Catch						Catch per Boat Month		
		Value[1]		Exvessel Price				Value	
Year	Weight	Nominal	Real	Nominal	Real	Number of Boat Months	Weight	Nominal	Real
1980	0	o	0	0	()	n	0	0	0
1981	0	-5.7	-12.3	-5.7	-12.3	4.0	-3.8	-9.3	-15.7
1982	0	4.1	-10.0	4.1	-10.0	3.2	-3.1	0.8	-12.8
1983	0	1.9	-18.1	1.9	-18.1	6.1	-5.8	-4.0	-22.9
1984	0	9.7	-18.1	9.7	-18.1	6.1	-5.8	3.3	-22.8
1985	0	9*9	-23.7	9.9	-23.7	8.3	-7*7	1.4	-29.5
1986	0	16.7	-24.7	16.7	-24.7	8.8	-8.1	7.3	-30.7
1987	0	18.8	-28.7	18.8	-28.7	10.6	-9.6	7.4	-35*5
1988	0	25.1	-30.1	25.1	-30.1	11.2	-10.1	12.5	-37.2
1989	0	28.7	-33.2	28.7	-33.2	12.7	-11.3	14.2	-40.8
1990	0	35.2	-34.8	35.2	-34.8	13.5	-11.9	19.0	-42.6
1991	0	40*(-1	-37.2	40.0	-37.2	14.8	-12.9	21.9	-45.3
1992	0	46.9	-38.7	46.9	-38.7	15.7	-13.5	27.0	-47.0
1993	0	52.9	-40.7	52.9	-40.7	16.8	-14.4	31.0	-49.2
1994	0	60.5	-4?.1	60.5	-42.1	17.6	-15.0	36.5	-50.8
1995	0	67.8	-43.8	67.8	-43.8	18.6	-15.7	41.5	-52.6
1996	0	76.4	-45.0	76.4	-45.0	19.5	-16.3	47.6	-54.0
1997	0	85.0	-46.4	85.0	-46.4	20.4	-16.9	53.7	-55.5
1998	()	94.7	-47.6	94.7	-47*6	21.1	-17.5	60.7	-56.7
1999	0	104.8	-48.7	104.8	-48.7	21.9	-18.0	67.9	-58.0
2000	f)	115.9	-49.7	115.9	-49.7	22.7	-18.5	76.0	-59.0

[1] The realvalues and prices were calculated using the U.S.CPI; 1980 is the base period.

Table 4.69

Peninsula King Crab Fishery Harvesting Activity
Projected Annual Rate of Change
1980-2000

	Percentage Change								
	Catch			Exvessel Price		Number of	Catch per Boat Month		
		Value						Value	
Year	Weight	Nominal	Real[1]	Nominal	Real	Boat Months	Weight	Nominal	Real
1980	0	()	n	0	0	0	0	0	0
1981	0	-5.7	-12.3	-5.7	-12.3	4.0	-3.8	-9.3	-15.7
1982	()	10"4	2.6	10.4	?.6	-0.8	0.8	11.2	3.4
1983	0	-2.1	-9.0	-2.1	-9.0	2.0	-2.8	-4.8	-11.5
1984	0	7.7	0.1	7*7	0.1	-0.0	0.0	7.7	0.1
1985	0	0.2	-6.8	0.2	-6.8	2.1	-2.1	-1.8	-0.7
1986	0	6.2	-1.3	6*2	-1.3	0.4	-0.4	5.7	-1.7
1987	0	1.8	-5.4	1.8	-5.4	1.7	-1.6	0*1	-6.9
1988	n	5.4	-2.0	5.4	-2.0	0.6	-0.6	4.7	-2.6
1989	0	2.8	-4.4	2.8	-4.4	"1.3	-1.3	" 1.5	-5.7
1990	0	5.0	-2.4	5.0	-2.4	0*7	-0.7	4.3	-3.0
1991	0	3.6	-3.7	3.6	-3.7	101	-1.1	2.4	-4.8
1992	0	4.9	-2.5	4.9	-2.5	0.7	-0.7	4.1	-3.2
1993	0	4.1	-3.2	4.1	--3.2	1.0	-1.0	3*1	-4.1
1994	0	5.0	-2.4	5.0	-2,4	0.7	-0.7	4.2	-3.1
1995	0	4.5	-2.8	4.5	-2.8	0.8	-0.8	3*7	-3*6
1996	0	5.1	-?.3	5.1	-2.3	0.7	-0.7	4.4	-3.0
1997	o	4.9	-2.5	4.9	-2.5	0.7	-0.7	4*1	-3.2
1998	0	5.2	-?.1	5.2	-2.1	0.6	-0.6	4.6	-2.8
1999	0	5.2	-?.?	5.2	-2.2	0.7	-0.7	4.5	-?.9
2000	0	5.4	-?.0	5.4	-2.0	0.6	-0.6	4.8	-2.6

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.70
Eastern Aleutians King Crab Fishery
Projected Harvesting Activity
1980-2000

Year	Catch: Weight: Pounds (millions)	Catch: Weight: Metric Tons	Catch: Value (millions): Nominal	Catch: Value (millions): Real[1]	Exvessel Price ($/Pound): Nominal	Exvessel Price ($/Pound): Real	Number of Boat Months	Number of Fisherman Months	Catch per Boat Month: Weight: Pounds (1,000)	Catch per Boat Month: Value ($1,000): Nominal	Catch per Boat Month: Value ($1,000): Real
1980	10.0	4536	12.6	12.6	1.26	1.26	123	492	81.3	102.5	102.5
1981	10.0	4536	11.9	11.1	1.19	1.11	123	492	81.3	96.7	89.9
1982	10.0	4536	13.1	11.3	1.31	1.13	123	492	81.3	106.7	92.2
1983	10.0	4536	12.8	10.3	1.28	1.03	123	492	81.3	104.4	83.9
1984	10.0	4536	13.8	10.3	1.38	1.03	123	492	81.3	112.4	84.0
1985	10.0	4536	13.9	9.6	1.39	0.96	123	492	81.3	112.7	78.3
1986	10.0	4536	14.7	9.5	1.47	0.95	123	492	81.3	119.6	77.3
1987	10.0	4536	15.0	9.0	1.50	0.90	123	492	81.3	121.8	73.1
1988	10.0	4536	15.8	8.8	1.58	0.88	123	492	81.3	128.3	71.6
1989	10.0	4536	16.2	8.4	1.62	0.84	123	492	81.3	132.0	68.5
1990	10.0	4536	17.0	8.2	1.70	0.82	123	492	81.3	138.6	66.9
1991	10.0	4536	17.7	7.9	1.77	0.79	123	492	81.3	143.5	64.4
1992	10.0	4536	18.5	7.7	1.85	0.77	123	492	81.3	150.6	62.8
1993	10.0	4536	19.3	7.5	1.93	0.75	123	492	81.3	156.8	60.8
1994	10.0	4536	20.2	7.3	2.02	0.73	123	492	81.3	164.6	59.3
1995	10.0	4536	21.2	7.1	2.12	0.71	123	492	81.3	172.1	57.7
1996	10.0	4536	22.2	6.9	2.22	0.69	123	492	81.3	180.8	56.3
1997	10.0	4536	23.3	6.8	2.33	0.68	123	492	81.3	189.7	54.9
1998	10.0	4536	24.6	6.6	2.46	0.66	123	492	81.3	199.6	53.8
1999	10.0	4536	25.8	6.5	2.58	0.65	123	492	81.3	210.0	52.6
2000	10.0	4536	27.2	6.3	2.72	0.63	123	492	81.3	221.4	51.5

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.71

Eastern Aleutians King Crab Fishery Harvesting Activity
Projected Percentage Change from 1980
1980-2000

	Percentage Change								
	Catch						Catch per Boat Month		
		Value		Exvessel Price				Value	
Year	Weight	Nominal	Real	Nominal	Real	Number of Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	0	-5.7	-12.3	-5.7	-12.3	0	0	-5.7	-12.3
1982	0	4.1	-10.0	4.1	-10.0	0	0	4.1	-10.0
1983	0	1.9	-18.1	1.9	-18.1	0	0	1.9	-18.1
1984	0	9.7	-18.1	9.7	-18.1	0	0	9.7	-18.1
1985	0	9.9	-23.7	9.9	-23.7	0	0	9.9	-23.7
1986	0	16.7	-24.7	16.7	-24.7	0	0	16.7	-24.7
1987	0	18.8	-28.7	18.8	-28.7	0	0	18.8	-28.7
1988	0	25.1	-30.1	25.1	-30.1	0	0	25.1	-30.1
1989	0	28.7	-33.2	28.7	-33.2	0	0	28.7	-33.2
1990	0	35.2	-34.8	35.2	-34.8	0	0	35.2	-34.8
1991	0	40.0	-37.7	40.0	-37.2	0	0	40.0	-37.2
1992	0	46.9	-38.7	46.9	-38.7	0	0	46.9	-38.7
1993	0	52.9	-40.7	52.9	-40.7	0	0	52.9	-40.7
1994	0	60.5	-42.1	60.5	-42.1	0	0	60.5	-42.1
1995	0	67.8	-43.8	67.8	-43.8	0	0	67.8	-43.8
1996	0	76.4	-45.0	76.4	-45.0	0	0	76.4	-45.0
1997	0	85.0	-46.4	85.0	-46.4	0	0	85.0	-46.4
1998	0	94.7	-47.6	94.7	-47.6	0	0	94.7	-47.6
1999	0	104.8	-48.7	104.8	-48.7	0	0	104.8	-48.7
2000	0	115.9	-49.7	115.9	-49.7	0	0	115.9	-49.7

The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.72
Eastern Aleutians King Crab Fishery Harvesting Activity
Projected Annual Rate of Change
1980-2000

	Percentage Change								
	Catch						Catch per Boat Month		
		Value		Exvessel Price				Value	
Year	Weight	Nominal	Real[1]	Nominal	Real	Number of Boat Months	Weight	Nominal	Real
1980	0	0	n	0	0	0	0	0	0
1981	0	-5.7	-12.3	-5*7	-12.3	0	0	-5.7	-12.3
1982	0	10.4	2.6	10.4	2.6	0	0	10.4	2.6
1983	0	-2.1	-9.0	-2*1	-9.0	0	0	-2.1	-9.0
1984	0	7.7	0.1	7.7	0.1	0	0	7*7	0.1
1985	0	O*2	-6.8	0.2	-6.8	0	0	0.2	-6.8
1986	0	6.2	-1.3	6.2	-1.3	0	0	6.2	-1.3
1987	0	1.8	-5.4	1.8	-5.4	0	0	1.8	-5.4
1988	n	5.4	-?.0	5.4	-2.0	0	0	5.4	-2.0
1989	0	2.8	-4*4	2*R	-4.4	0	0	2.8	-4.4
1990	0	5.0	-2.4	5.0	-2.4	0	0	5.0	-2.4
1991	0	3.6	-3.7	3.6	-3*7	0	0	3.6	-3.7
1992	0	4*9	-2.5	4.9	-2.5	0	0	4*9	-2.5
1993	n	4.1	-3.2	4.1	-3.2	0	0	4.1	-3.2
1994	0	5.0	-2.4	5.0	-2.4	0	0	5.0	- 2 . 4
1995	0	4.5	-2.8	4.5	-2.8	0	0	4*5	-2.8
1996	0	5.1	-?.3	5.1	-2.3	0	0	5.1	-2.3
1997	0	4.9	-2.5	4.9	-2.5	0	0	4.9	-2.5
1998	()	5.2	-?.1	5.2	-2.1	0	0	5.2	-2*1
1999	n	5.7	-2.2	5.2	-2.2	0	0	5.2	-2.2
2000	0	5.4	-?.0	5.4	-2.0	0	0	5.4	-2.0

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Western Aleutians

The Western Aleutians king crab fishery is expected to remain a relatively minor fishery with an annual harvest weight of 907 metric tons (2 million pounds) and annual real harvest value decreasing from $2.5 million in 1980 to $1.3 million in 2000 (see Table 4.73). Again the change in the real value is due to a projected 50 percent decrease in the real exvessel price (see Table 4.74). Table 4.75 contains projections of the annual rates of change in harvesting activity. The annual harvest weight has decreased significantly in this fishery since the early 1970s, when a high of 11,700 metric tons (25.9 million pounds) was harvested in 1971, to a low of 363 metric tons (0.8 million pounds) in 1979. The projected annual harvest weight exceeds the 1975 through 1979 mean of 680 metric tons (1.5 million pounds) but is significantly less than the 1969 through 1979 mean annual harvest of 3,810 metric tons (8.4 million pounds).

Bering Sea

The Bering Sea king crab fishery is expected to continue to dominate the Alaska king crab fishery and to remain the premier fishery in Alaska. The king crab stocks which have increased during the past five years are expected to peak in 1980 and to decline in the early 1980s. During the forecast period, annual harvest weight is expected to average 38,556 metric tons (85 million pounds), and annual real harvest value is projected to decrease from $107.2 million in 1980 to $53.9 million in 2000 (see Table 4.76). The 50 percent decrease in real value is due to the projected decrease in the real exvessel price (see Table 4.77). The projected

Table 4.73
Western Aleutians King Crab Fishery
Projected Harvesting Activity
1980-2000

	Catch				Exvessel Price		Number of		Catch per Boat Month		
	Weight		Value (millions)[1]		($/Pound)				Weight	Value ($1,000)	
Year	Pounds (millions)	Metric Tons	Nominal	Real	Nominal	Real	Boat Months	Fisherman Months	Pounds (1,000)	Nominal	Real
1980	2.0	907	2.5	2.5	1.26	1.26	37	147	54.2	68.4	68.4
1981	2.0	90”?	2.4	2.2	1.19	1.11	3'7	147	54.2	64.5	60.0
1982	2.0	907	2.6	2.3	1.31	1.13	37	147	54.2	71.2	61.5
1983	2.0	907	2.6	2.1	1.28	1.03	37	147	54.2	69.7	56.0
1984	2*O	9(-)7	2.8	2.1	1.38	1.03	37	147	54.2	75.0	56.0
1985	2.0	907	2.9	1.9	1.39	0.96	37	147	54.2	75.2	52.2
1986	2.0	907	2.9	1.9	1.47	0.95	37	147	54.2	79.0	51.5
1987	2.0	907	3.0	1.8	1.50	0.90	37	147	54.2	81.2	48.8
1988	2.0	907	3..?	1.8	1.58	0.88	37	147	54.2	85.6	47.8
1989	2.0	907	3.2	1.7	1.62	O*R4	37	147	54.2	88.0	45.7
1990	2.0	907	3.4	1.6	1.70	O*R2	37	147	54.2	92.5	44.6
1991	2.0	907	3.5	1.6	1.77	0.79	37	147	54.2	95.8	43.0
1992	2.0	907	3.7	1.5	1.85	0.77	37	147	54.2	100.5	41.9
1993	2.0	9n7	3.9	1.5	1.93	0.75	37	147	54.2	104.6	40.6
1994	2.0	907	4.0	1.5	2*O2	0.73	37	147	54.2	109.8	39.6
1995	2.0	907	4.?	1.4	2.12	0.71	37	147	54.2	114.8	38.5
1996	2.0	907	4.4	1.4	2.22	0.69	37	147	54.2	120.6	37.6
1997	2.0	907	4.7	1.4	2.33	0.68	37	147	54.2	126.5	36.7
1998	2.(-1	907	4.9	1.3	2.46	0.66	37	147	54.2	133.2	35.9
1999	2.0	907	5.?	1.3	2.58	0.65	37	147	54.2	140.1	35.1
2000	2.0	90”7	5.4	1.3	2.72	0.63	37	147	54.2	147.7	34.4

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.74
Western Aleutians King Crab Fishery Harvesting Activity
Projected Percentage Change from 1980
1980-2000

	Percentage Change								
	Catch			Exvessel Price		Number of Boat Months	Catch per Boat Month		
		Value[1]						Value	
Year	Weight	Nominal	Real	Nominal	Real		Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	0	-5.7	-12.3	-5.7	-12.3	0	0	-5.7	-12.3
1982	0	4.1	-10.0	4.1	-10.0	0	0	4.1	-10.0
1983	0	1.9	-18.1	1.9	-18.1	0	0	1.9	-18.1
1984	0	9.7	-18.1	9.7	-18.1	0	0	9.7	-18.1
1985	0	9.9	-23.7	9.9	-23.7	0	0	9.9	-23.7
1986	0	16.7	-24.7	16.7	-24.7	0	0	16.7	-24.7
1987	0	18.8	-28.7	18.8	-28.7	0	0	18.8	-28.7
1988	0	25.1	-30.1	25.1	-30.1	0	0	25.1	-30.1
1989	0	28.7	-33.2	28.7	-33.2	0	0	28.7	-33.2
1990	0	35.2	-34.8	35.2	-34.8	0	0	35.2	-34.8
1991	0	40.0	-37.2	40.0	-37.2	0	0	40.0	-37.2
1992	0	46.9	-38.7	46.9	-38.7	0	0	46.9	-38.7
1993	0	52.9	-40.7	52.9	-40.7	0	0	52.9	-40.7
1994	0	60.5	-42.1	60.5	-42.1	0	0	60.5	-42.1
1995	0	67.8	-43.8	67.8	-43.8	0	0	67.8	-43.8
1996	0	76.4	-45.0	76.4	-45.0	0	0	76.4	-45.0
1997	0	85.0	-46.4	85.0	-46.4	0	0	85.0	-46.4
1998	0	94.7	-47.6	94.7	-47.6	0	0	94.7	-47.6
1999	0	104.8	-48.7	104.8	-48.7	0	0	104.8	-48.7
2000	0	115.9	-49.7	115.9	-49.7	0	0	115.9	-49.7

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.75

Western Aleutians King Crab Fishery Harvesting Activity
Projected Annual Rate of Change
1980-2000

	Percentage Change								
	Catch			Exvessel Price		Number of Boat Months	Catch per Boat Month		
		Value						Value	
Year	Weight	Nominal	Real[1]	Nominal	Real[1]		Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	0	-5.7	-12.3	-5.7	-12.3	0	0	-5.7	-12.3
1982	o	10.4	2.6	10.4	2.6	0	0	10.4	2.6
1983	0	-2.1	-9.0	-2.1	-9.0	0	0	-2.1	-9,0
1984	0	7.7	0.1	-/.7	0.1	0	0	7.7	0.1
1985	0	0.2	-6.8	0.2	-6.8	0	0	0*2	-6.8
1986	0	6.2	-1.3	6.2	-1.3	0	0	6.2	-1.3
1987	0	1.8	-5.4	1.8	-5.4	0	0	1.8	-5.4
1988	0	5.4	-2.0	5.4	-2.0	0	0	5.4	-2.0
1989	0	2.8	-4.4	2.8	-4.4	0	0	2.8	-4.4
1990	0	5*0	-2.4	5.0	-?.4	0	0	5.0	-2.4
1991	o	3.6	-3.7	3.6	-3.7	0	0	3.6	-3.7
1992	0	4.9	-2.5	4.9	-2.5	0	0	4.9	-2.5
1993	0	4.1	-3.2	4.1	-3.2	0	0	4.1	-3.2
1994	()	5.0	-2.4	5.0	-2.4	0	0	5.0	-2.4
1995	0	4.5	-2.8	4.5	-2.8	0	0	4.5	-2.8
1996	0	5.1	-?.3	5.1	-2.3	0	0	5.1	-2.3
1997	0	4.9	-2.5	4*9	-2.5	0	0	4.9	-2.5
1998	()	5.2	-2.1	5.2	-2.1	0	0	5.2	-2.1
1999	0	5.2	-2.2	5.2	-2.2	0	0	5.2	-2.2
2000	n	5.4	-2.0	5.4	-2.0	0	0	5.4	-2.0

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.76
Bering Sea King Crab Fishery
Projected Harvesting Activity
1980-2000

	Catch				Exvessel Price ($/Pound)		Number of		Catch per Boat Month		
	Weight		Value (millions)[1]						Weight	Value $1,000)	
Year	Pounds (millions)	Metric Tons	Nominal	Real	Nominal	Real	Boat Months	Fisherman Months	Pounds (1,000)	Nominal	Real
1980	85.0	38556	1(’)’?.?	107.2	1.?6	1.26	425	1700	200.0	252,2	252.2
1981	85.0	38556	101.1	94.0	1.19	1.11	425	1700	200.0	237.8	221.1
1982	85.0	38556	111.6	96.4	1.31	1.13	425	1700	200.0	262.5	226.9
1983	85.0	38556	109.2	87.7	1.28	1.03	425	1700	200,0	256.9	206.4
1984	85.0	38556	117.5	87.8	1.38	1.03	425	1700	200.0	276.6	206.6
1985	85.0	38556	117.8	81.8	1.39	0.96	425	1700	200.0	277.2	192.5
1986	85.0	38556	125.1	80.8	1.47	0.95	425	1700	20(-).0	294,3	190.0
1987	85.0	38556	127.3	76.4	1.50	0.90	425	1700	200.0	299.5	179*R
1988	85.0	38556	134.2	74.9	1.50	0.88	425	]700	200.0	315.6	176.2
1989	85.0	38556	138.0	71.6	1.62	0.84	425	1700	200.0	324.6	168.5
1990	85.0	38556	144.9	69.9	1.70	0.82	425	1700	200.0	340.9	164.5
1991	85.0	38556	150.1	67.3	1.77	0.79	425	1700	?0(-).0	353.1	158.4
1992	85.0	38556	157.5	65.7	1.85	().77	425	1700	200.0	370.5	154.5
1993	85.0	38556	164.0	63.6	1*93	0.75	425	1700	200.0	385.8	149.6
1994	85.0	38556	172.1	62.0	2.02	().73	425	1700	200.0	404.9	146.0
1995	85.0	38556	179.9	60.3	2.12	0.71	425	17(-)0	200.0	423.3	141.9
1996	85.0	38556	189.1	58.9	2*?2	0.69	425	1700	200.0	444.8	138.6
1997	85.0	38556	198.3	57.4	2.33	0.68	425	1700	200.0	466.6	135.2
1998	85.0	38556	208.7	56.2	2.46	0.66	425	1700	200.0	491 .(-)	132.3
1999	85.0	38556	219.5	55.0	2.58	0.65	425	1700	200.0	51605	129.3
2000	85.0	38556	231.4	53.9	?.72	0.63	425	1700	200.0	544.5	126.8

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.77
Bering Sea King Crab Fishery Harvesting Activity
Projected Percentage Change from 1980
1980-2000

	Percentage Change								
	Catch						Catch per Boat Month		
		Value		Exvessel Price				Value	
Year	Weight	Nominal	Real[1]	Nominal	Real	Number of Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	0	-5.7	-12.3	-5.7	-12.3	0	0	-5.7	-12.3
1982	0	4.1	-10.0	4.1	-10.0	0	0	4.1	-10.0
1983	0	1.9	-18.1	1.9	-18.1	0	0	1.9	-18.1
1984	0	9.7	-18.1	9.7	-18.1	0	0	9.7	-18.1
1985	0	9.9	-23.7	9.9	-23.7	0	0	9.9	-23.7
1986	0	16.7	-24.7	16.7	-24.7	0	0	16.7	-24.7
1987	0	18.8	-28.7	18.8	-28.7	0	0	18.8	-28.7
1988	0	25.1	-30.1	25.1	-30.1	0	0	25.1	-30.1
1989	0	28.7	-33.2	28.7	-33.2	0	0	28.7	-33.2
1990	0	35.2	-34.8	35.2	-34.8	0	0	35.2	-34.8
1991	0	40.0	-37.2	40.0	-37.2	0	0	40.0	-37.2
1992	0	46.9	-38.7	46.9	-38.7	0	0	46.9	-38.7
1993	0	52.9	-40.7	52.9	-40.7	0	0	52.9	-40.7
1994	0	60.5	-42.1	60.5	-42.1	0	0	60.5	-42.1
1995	0	67.8	-43.8	67.8	-43.8	0	0	67.8	-43.8
1996	0	76.4	-45.0	76.4	-45.0	0	0	76.4	-45.0
1997	0	85.0	-46.4	85.0	-46.4	0	0	85.0	-46.4
1998	0	94.7	-47.6	94.7	-47.6	0	0	94.7	-47.6
1999	0	104.8	-48.7	104.8	-48.7	0	0	104.8	-48.7
2000	0	115.9	-49.7	115.9	-49.7	0	0	115.9	-49.7

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

annual rates of change in harvesting activity are reported in Table 4.78. The projected annual harvest weight is approximately equal to the mean annual harvest for 1975 through 1979 but is less than either the 1978 or 1979 harvest.

The Norton Sound king crab fisheries have been and are expected to remain a relatively insignificant part of the Bering Sea fishery. The large boat fishery which occurs during the summer is expected to have annual harvests of approximately 454-metric tons (1 million pounds) of red king crab in Norton Sound and 1,361 metric tons (3 million pounds) of blue king crab off St. Lawrence Island. The small local king crab fishery which occurs on the ice near Nome is not expected to exhibit significant growth.

TANNER CRAB

The dominance of the Western Alaska Tanner crab fisheries is expected to increase as the Japanese fishery which has been targetting on *C. opilio* is replaced by the domestic fishery in the early 1980s. The average annual harvest weight is projected to average 74,299 metric tons (164 million pounds) from 1980 through 2000; and the average annual real harvest value is projected to be approximately $44 million (see Table 4.79). The method used to project the average annual harvest weight for *C. bairdi* Tanner crab is identical to that for king crab; the projection for *C. opilio* Tanner crab is based on the NPFMC's 1980 assessment of the optimal yield for Bering Sea *C. opilio*. The annual harvest projections

Table 4.78

Bering Sea King Crab Fishery Harvesting Activity
Projected Annual Rate of Change
1980-2000

	Percentage Change								
	Catch						Catch per Boat Month		
		Value		Exvessel Price				Value	
Year	Weight	Nominal	Real[1]	Nominal	Real	Number of Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	0	-5.'?	-12.3	-5.7	-12.3	0	0	-5*7	-12.3
1982	0	10.4	2.6	10.4	2*6	0	0	10.4	2.6
1983	0	-2.1	-9.0	-2.1	-9.0	0	0	-2.1	-9.0
1984	0	7.7	0.1	7.7	0.1	0	0	7.7	0.1
1985	0	o.?	-6.8	0.2	-6.8	0	0	0.2	-6.8
1986	0	6.2	-1.3	6.2	-L*3	0	0	6.2	-1.3
1987	0	1.8	-5.4	1.8	-5.4	0	0	1.8	-5*4
1988	0	5.4	-2.0	5.4	-2.0	0	0	5.4	-2.0
1989	0	2.8	-4.4	2.8	-4*4	0	0	2.8	-4.4
1990	0	5.0	-2.4	5.0	-2.4	0	0	5.0	-2.4
1991	0	3.6	-3.7	3.6	-3.7	0	0	3.6	.-3.7
1992	0	4.9	-2.5	4.9	-2*5	0	0	4.9	-2.5
1993	0	4.1	-3.2	4.1	-3.2	0	0	4*1	-3.2
1994	0	5.0	-2.4	5.0	-2.4	0	0	5.0	-2.4
1995	0	4.5	-2.8	4.5	-2.8	0	0	4*5	-2.8
1996	0	5.1	-2.3	5.1	-2.3	0	0	5*1	-2.3
1997	0	4.9	-2.5	4.9	-2.5	0	0	4.9	-2.5
1998	0	5.?	-2.1	5.2	-2.1	0	0	5.2	-2.1
1999	0	'5.?	-2.2	5.2	-2.2	n	0	5.2	-2.?
2000	0	5.4	-2.0	5.4	-2.0	0	0	5.4	-2.0

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.79

Projected Western Alaska Tanner Crab Harvest
1980-2000

Pounds (millions)

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Total
1980	8.0	0.7	0.1	155.0	163.8
1981	8.0	0.7	0.1	155.0	163.8
1982	8.0	0.7	0.1	155.0	163.8
1983	8.0	0.7	0.1	155.0	163.8
1984	8.0	0.7	0.1	155.0	163.8
1985	8.0	0.7	0.1	155.0	163.8
1986	8.0	0.7	0.1	155.0	163.8
1987	8.0	0.7	0.1	155.0	163.8
1988	8.0	0.7	0.1	155.0	163.8
1989	8.0	0.7	0.1	155.0	163.8
1990	8.0	0.7	0.1	155.0	163.8
1991	8.0	0.7	0.1	155.0	163.8
1992	8.0	0.7	0.1	155.0	163.8
1993	8.0	0.7	0.1	155.0	163.8
1994	8.0	0.7	0.1	155.0	163.8
1995	8.0	0.7	0.1	155.0	163.8
1996	8.0	0.7	0.1	155.0	163.8
1997	8.0	0.7	0.1	155.0	163.8
1998	8.0	0.7	0.1	155.0	163.8
1999	8.0	0.7	0.1	155.0	163.8
2000	8.0	0.7	0.1	155.0	163.8

Table 4.79 (continued)

Metric Tons

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Total
1980	3628.8	317.5	45.4	70307.5	74299.2
1981	3628.8	317.5	45.4	70307.5	74?99.2
1982	3628.8	317.5	45.4	70307.5	74299.2
1983	3628.8	317.5	45*4	70307.5	74299.2
1984	3628.8	317.5	45*4	70307.5	74299.2
1985	3628.8	317.5	45.4	70307.5	74299.2
1986	3628.8	317.5	45.4	70307.5	74299.2
1987	3628.8	317.5	45*4	70307.5	74299.2
1988	3628.8	317.5	45.4	70307.5	74299.2
1989	3628.8	317.5	45.4	70307.5	74299.2
1990	3628.8	317.5	45.4	70307.5	74299.2
1991	3628.8	317.5	45.4	70307.5	74299.2
1992	3628.8	317.5	45.4	70307.5	74299.2
1993	3628.8	317.5	45.4	7(-)307.5	74?99.2
1994	3628.8	317.5	45.4	70307.5	74299.2
1995	3628.8	317.5	45*4	70307.5	74?99.2
1996	3628.8	317.5	45.4	70307.5	74299.2
1997	3628.8	317.5	45.4	70307.5	?4299.2
1998	3628.8	317.5	45.4	70307.5	74299.?
1999	3628.8	317.5	45.4	70307,5	74299.2
2000	3628.8	317.5	45.4	70307.5	74299.2

Table 4.79 (continued)

Nominal Value (millions

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Total
1980	4.4	0.4	0.1	46.0	50.9
1981	4.1	0.4	0.1	42.9	47.5
1982	4.3	0.4	0.1	44.7	49.4
1983	4.7	0.4	0.1	49.5	54.7
1984	5.0	0.4	0.1	52.4	57.9
1985	5.5	0.5	0.1	57.3	63.3
1986	5.8	0.5	0.1	61.1	67.5
1987	6.3	0.6	0.1	66.3	73.3
1988	6.8	0.6	0.1	71.1	78.5
1989	7.4	0.6	0.1	76.9	85.0
1990	7.9	0.7	0.1	82.6	91.3
1991	8.5	0.7	0.1	89.2	98.5
1992	9.2	0.8	0.1	95.9	105.9
1993	9.9	0.9	0.1	103.4	114.2
1994	10.6	0.9	0.1	111.2	122.9
1995	11.5	1.0	0.1	119.8	132.4
1996	12.3	1.1	0.2	128.9	142.5
1997	13.3	1.2	0.2	138.9	153.5
1998	14.3	1.2	0.2	149.4	165.2
1999	15.4	1.3	0.2	160.9	177.8
2000	16.5	1.4	0.2	173.2	191.4

Table 4.79 (continued)

Real Value[1] (millions)

Year	Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea	Total
1980	4.4	0.4	0.1	46.0	50.9
1981	3.8	O*3	0.0	39.9	44.1
1982	3*7	0.3	0.0	38.7	42.7
1983	3.8	0.3	0.0	39.8	44.0
1984	3.7	0.3	0.0	39.1	43.2
1985	3.8	0.3	0.0	39.8	44.0
1986	3.8	0.3	0.0	39.4	43.6
1987	3.8	0.3	0.0	39.8	44.0
1988	3.8	0.3	0.0	39.7	43.8
1989	3.8	0.3	0.0	39.9	44.1
1990	3.8	0.3	0.0	39.8	44.0
1991	3.8	0.3	0.0	40.0	44.2
1992	3.8	0.3	0.0	40.0	44.2
1993	3.8	0.3	0.0	40.1	44.3
1994	3.8	0.3	0.0	40.1	44.3
1995	3.8	0.3	0.0	40.2	44.4
1996	3.8	0.3	0.0	40.2	44.4
1997	3.8	0.3	0.0	40.2	44.5
1998	3.8	0.3	0.0	40.2	44*5
1999	3.9	0.3	0.0	40.3	44.5
2000	3.9	0.3	0.0	40.3	44.5

[1]Real values are calculated using the U.S. CPI; 1980 is the base year.

are for both species of Tanner crab. The domestic fishery did not target on C. opilio prior to 1979.

Peninsula

The Peninsula Tanner crab fishery is projected to have an average annual harvest weight of 3,629 metric tons (8 million pounds) from 1980 through 2000 and an average annual real harvest value of $3.8 million (see Table 4.80). Secular trends are not expected in harvest weight, real harvest value, or real exvessel prices (see Tables 4.81 and 4.82); however, fluctuations in these measures of harvesting activity will occur. The projected annual harvest weight equals the mean annual harvest for 1969 through 1979 and is approximately 50 percent less than the mean annual harvest for 1975 through 1979.

Eastern Aleutians

The Eastern Aleutians Tanner crab fishery is expected to remain a relatively minor fishery. The average annual harvest weight is projected to equal 318 metric tons (0.7 million pounds) from 1980 through 2000; and the average annual real harvest value is projected to be $0.3 million (see Table 4.83). The projected cumulative and annual rates of change in harvesting activity appear in Tables 4.84 and 4.85. The projected average annual harvest weight approximately equals the mean harvest for 1969 through 1979 but is less than 65 percent of the mean harvest for 1975 through 1979.

Table 4.80
Peninsula Tanner Crab Fishery
Projected Harvesting Activity
1980-2000

	Catch				Exvessel Price		Number of		Catch per Boat Month		
	Weight		Value (millions)		($/Pound]				Weight	Value ($1,000)	
Year	Pounds (millions)	Metric Tons	Nominal	Real[1]	Nominal	Real	Boat Months	Fisherman Months	Pounds (1,000)	Nominal	Real
1980	8.0	3629	4.4	4.4	(-).55	0.55	193	773	41,4	22.8	22.8
1981	8.0	3629	4.1	3.8	0.51	0.48	183	732	43.7	22.4	20.9
1982	8.0	3629	4.3	3.7	0.53	0.46	181	723	44.2	23.6	20.4
1983	8.0	3629	4.7	3.8	(-).59	0.48	183	731	43.8	25.9	20.8
1984	8.0	3629	5.0	3.7	0.63	0.47	182	726	44.1	27.6	?0.6
1985	8.0	3629	5.5	3.8	0.68	0.48	183	731	43.8	30.0	20.8
1986	8.0	3629	5.8	3.8	0.73	(-).47	182	728	43*9	32.1	20.7
1987	8.0	3629	6.3	3.8	0.79	0.48	183	731	43.8	34,7	20.8
1988	8.0	3629	6.8	3.8	0.85	0.47	183	730	43.8	37.2	20.8
1989	8.0	3629	7.4	3.8	().92	0.48	183	732	43.7	40.2	20.9
1990	8.0	3629	7.9	3.8	().99	0.48	183	731	43.8	43.2	20.8
1991	8.0	3629	8.5	3.8	1.07	0.48	183	732	43.7	46.6	20.9
1992	8.0	3629	9.2	3.8	1.15	0.48	183	732	43.7	50.1	20.9
1993	8.0	3629	9.9	3.8	1.24	0.48	183	733	43.7	53*9	20.9
1994	8.0	3629	10.6	3.8	1.33	0.48	183	733	43.7	58.0	20.9
1995	8.0	3629	11.5	3.8	1.43	0.48	183	733	43.6	62.5	20.9
1996	8.0	3629	12.3	3.8	1.54	0.48	183	733	43.6	67.2	20.9
1997	8.0	3629	13.3	3.8	1.66	0.48	183	734	43.6	72.3	21.0
1998	8.0	3629	14.3	3.8	1.79	0.48	183	734	43.6	77.8	21.0
1999	8.0	3629	15.4	3.9	1.92	0.48	184	734	43.6	83.8	21.0
2000	8.0	3629	16.5	3.9	2.07	().48	184	734	43.6	90.1	21.0

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.81

Peninsula Tanner Crab Fishery Harvesting Activity
Projected Percentage Change from 1980
1980-2000

	Percentage Change								
	Catch						Catch per Boat Month		
		Value[1]		Exvessel Price		Number of		Value	
Year	Weight	Nominal	Real	Nominal	Real	Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	0	-6.7	-13.3	-6.7	-13.3	-5.4	5.7	-1.4	-8.4
1982	0	-2.8	-16.0	-2.8	-16.0	-6.5	6.9	3.9	-10.2
1983	0	7.5	-13.6	7.5	-13.6	-5.5	5.8	13.8	-8.6
1984	0	13.8	-15.0	13.8	-15.0	-6.1	6.5	21.1	-9.5
1985	0	24.4	-13.6	24.4	-13.6	-5.5	5.8	31.6	-8.6
1986	0	32.7	-14.3	32.7	-14.3	-5.8	6.1	40.8	-9.1
1987	0	44.1	-13.5	44.1	-13.5	-5.4	5.8	52.4	-8.5
1988	0	54.4	-13.8	54.4	-13.8	-5.6	5.9	63.5	-8.7
1989	0	67.1	-13.3	67.1	-13.3	-5.4	5.7	76.5	-8.4
1990	0	79.4	-13.4	79.4	-13.4	-5.4	5.7	89.7	-8.5
1991	0	93.7	-13.1	93.7	-13.1	-5.3	5.6	104.5	-8.3
1992	0	108.2	-13.2	108.2	-13.2	-5.3	5.6	119.9	-8.3
1993	0	124.6	-12.9	124.6	-12.9	-5.2	5.5	136.9	-8.1
1994	0	141.6	-12.9	141.6	-12.9	-5.2	5.5	154.9	-8.1
1995	0	160.3	-12.8	160.3	-12.8	-5.2	5.4	174.4	-8.0
1996	0	180.1	-12.7	180.1	-12.7	-5.1	5.4	195.3	-8.0
1997	0	201.6	-12.6	201.6	-12.6	-5.1	5.4	217.8	-7.9
1998	0	224.6	-12.6	224.6	-12.6	-5.1	5.3	242.0	-7.9
1999	0	249.5	-12.5	249.5	-17.5	-5.0	5.3	268.1	-7.8
2000	0	276.1	-12.4	276.1	-12.4	-5.0	5.3	296.0	-7.8

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.82
Peninsula Tanner Crab Fishery Harvesting Activity
Projected Annual Rate of Change
1980-2000

	Percentage								
		Value		Exvessel Price			Catch per Boat Month		
								Value	
Year	Weight	Nominal	Real[1]	Nominal	Real	Number of Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	0	-6.7	-13.3	-6.7	-13.3	-5.4	5.7	-1.4	-8.4
1982	0	4.2	-3.2	4.2	-3.2	-1.2	1.2	5.4	-2.0
1983	0	10.7	2.9	10.7	2.9	1.1	-1.0	9.5	1.8
1984	0	5.8	-1.7	5.8	-1.7	-0.6	0.6	6.4	-1.1
1985	0	9.4	1.7	9.4	1.7	0.6	-0.6	8.7	1.1
1986	0	6.7	-0.8	6.7	-0.8	-0.3	0.3	7.0	-0.5
1987	0	8.6	1.0	8.6	1.0	0.4	-0.4	8.2	0.6
1988	0	7.1	-0.4	7.1	-0.4	-0.1	0.1	7.3	-0.3
1989	0	8.2	0.6	8.2	0.6	0.2	-0.2	8.0	0.4
1990	0	7.4	-0.2	7.4	-0.2	-0.1	0.1	7.4	-0.1
1991	0	8.0	0.4	8.0	0.4	0.1	-0.1	7.8	0.2
1992	0	7.5	-0.0	7.5	-0.0	-0.0	0.0	7.5	-0.0
1993	0	7.8	0.3	7.8	0.3	0.1	-0.1	7.7	0.2
1994	0	7.6	0.0	7.6	0.0	0.0	-0.0	7.6	0.0
1995	0	7.7	0.2	7.7	0.2	0.1	-0.1	7.7	0.1
1996	0	7.6	0.0	7.6	0.0	0.0	-0.0	7.6	0.0
1997	0	7.7	0.1	7.7	0.1	0.0	-0.0	7.6	0.1
1998	0	7.6	0.1	7.6	0.1	0.0	-0.0	7.6	0.0
1999	0	7.7	0.1	7.7	0.1	0.0	-0.0	7.6	0.1
2000	0	7.6	0.1	7.6	0.1	0.0	-0.0	7.6	0.0

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.83
Eastern Aleutians Tanner Crab Fishery
Projected Harvesting Activity
1980-2000

	Catch				Exvessel Price ($/Pound)		Number of		Catch per Boat Month		
	Weight		Value						Weight	Value ($1,000)	
Year	Pounds (millions)	Metric Tons	NoJ'#a'l''I!JJ11		Nominal	Real[1]	Boat Months	Fisherman Months	Pounds (1,000)	Nominal	Real
1980	0.7	318	0.4	0.4	0.55	0.55	2a	110	25.4	14.0	14.0
1981	0.7	318	0.4	0.3	0.51	0.48	24	98	28.6	14.7	13.7
1982	0.7	318	0.4	0.3	0.53	0.46	24	95	29.4	15*7	13.6
1983	0.7	318	0.4	0.3	0.59	0.48	?4	98	28.7	17.0	13.6
1984	0.7	318	0.4	0.3	0.63	0.47	24	96	29.1	18.2	13.6
1985	0.7	318	0.5	0.3	0.68	0.48	24	98	28.7	19.6	13.6
1986	().7	319	0.5	0.3	0.73	0.47	24	97	28.9	21.1	13.6
1987	0.7	318	0.6	0.3	0.79	0.48	24	98	28.7	22.7	13.6
1988	0.7	318	0.6	0.3	0.85	0.47	24	97	28.8	?4.4	13.6
1989	0.7	318	0.6	0.3	0.92	0.48	24	98	28.6	?6.3	13.7
1990	0.7	318	0.7	0.3	0.99	0.48	24	98	28.7	28.3	13.6
1991	n.7	318	().7	()*3	1.07	0.48	24	98	28.6	30.4	13.7
1992	(-).7	318	0.8	0.3	1.15	0.48	24	98	28.6	32.7	13.7
1993	0.7	318	0.9	0.3	1.24	0.48	25	98	28.5	35.2	13.7
1994	0.7	318	0.9	1-).3	1033	0.48	25	98	28.5	37.9	13.7
1995	(-).7	318	1.0	0.3	1.43	0.48	25	98	20.5	40.8	13.7
1996	(-).7	318	1.1	0.3	1.54	0.48	25	98	28.5	43*9	13.7
1997	0.7	318	1 ..?	0.3	1.66	0.48	25	98	28.4	47.2	13.7
1998	().7	318	1.2	0.3	1.79	0.48	25	98	28.4	50.8	13.7
1999	().7	318	1.3	0.3	1.92	0.48	25	99	20.4	54.6	13.7
2000	0.7	318	1.4	0.3	2.07	0.48	25	99	28.4	58.7	13.7

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.84
Eastern Aleutians Tanner Crab Fishery Harvesting Activity
Projected Percentage Change from 1980
1980-2000

	Percentage Change								
	Catch						Catch per Boat Month		
		Value		Exvessel Price				Value	
Year	Weight	Nominal	Real[1]	Nominal	Real	Number of Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	0	-6.7	-13.3	-6.7	-13.3	-11.4	12.8	5.2	-2.2
1982	0	-2.8	-16.0	-2.8	-16.0	-13.7	15.9	12.6	-2.7
1983	0	7.5	-13.6	7.5	-13.6	-11.6	13.1	21.7	-2.2
1984	0	13.8	-15.0	13.8	-15.0	-12.8	14.7	30.5	-2.5
1985	0	24.4	-13.6	24.4	-13.6	-11.6	13.1	40.8	-2.2
1986	0	32.7	-14.3	32.7	-14.3	-12.2	13.9	51.2	-2.4
1987	0	44.1	-13.5	44.1	-13.5	-11.5	13.0	62.9	-2.2
1988	0	54.4	-13.8	54.4	-13.8	-11.8	13.4	75.1	-2.3
1989	0	67.1	-13.3	67.1	-13.3	-11.4	12.8	88.5	-2.2
1990	0	79.4	-13.4	79.4	-13.4	-11.5	13.0	102.7	-2.2
1991	0	93.7	-13.1	93.7	-13.1	-11.2	12.6	118.1	-2.1
1992	0	108.2	-13.2	108.2	-13.2	-11.2	12.7	134.6	-2.2
1993	0	124.6	-12.9	124.6	-12.9	-11.1	12.4	152.5	-2.1
1994	0	141.6	-12.9	141.6	-12.9	-11.0	12.4	171.6	-2.1
1995	0	160.3	-12.8	160.3	-12.8	-10.9	12.2	192.2	-2.1
1996	0	180.1	-12.7	180.1	-12.7	-10.9	12.2	214.3	-2.1
1997	0	201.6	-12.6	201.6	-12.6	-10.8	12.1	238.1	-2.1
1998	0	224.6	-12.6	224.6	-12.6	-10.7	12.0	263.7	-2.0
1999	0	249.5	-12.5	249.5	-12.5	-10.7	11.9	291.3	-2.0
2000	0	276.1	-12.4	276.1	-12.4	-10.6	11.9	320.9	-2.0

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.85
Eastern Aleutians Tanner Crab Fishery Harvesting Activity
Projected Annual Rate of Change
1980-2000

Year	Catch: Weight	Catch: Value Nominal	Catch: Value Real[1]	Exvessel Price Nominal	Exvessel Price Real	Number of Boat Months	Catch per Boat Month: Weight	Catch per Boat Month: Value Nominal	Catch per Boat Month: Value Real
	Percentage Change								
1980	0	n	0	0	0	0	0	0	0
1981	0	-6.7	-13.3	-6.7	-13.3	-11.4	12.8	5.2	-2.2
1982	n	4.2	-3.2	4.2	-3.2	-2.6	2.7	7.0	-0.5
1983	0	10.7	2.9	10.7	2.9	2.4	-2.4	8.1	0.5
1984	0	5.8	-1.7	5.8	-1.7	-1.4	1.4	7.3	-0.3
1985	0	9.4	1..7	9.4	1.7	1*4	-1.4	709	0.3
1986	0	6.7	-0.8	6.7	-0.8	-0.7	0.7	7.4	-0.1
1987	0	8.6	1.0	8.6	1.0	0.8	-0.8	7.7	0.2
1988	0	7.1	-0.4	7.1	-0.4	-0.3	O*3	7.5	-0.1
1989	0	8.2	0.6	8.2	0.6	0.5	-0.5	7*7	0.1
1990	n	7.4	-(-).2	7.4	-(-).2	-0.1	0.1	7.5	-0.0
1991	n	8.0	0.4	8.0	0.4	O*3	-0.3	7.6	0.1
1992	0	7.5	-0.0	7.5	-0.0	-0.0	0.0	7.6	-0.0
1993	n	7.8	(3.3	7.8	0.3	0.2	-0.2	7.6	0.0
1994	n	7.6	0.0	'7.6	0.0	0.0	-0.0	7.6	0.0
1995	0	7.7	0.2	7.7	0.2	0.1	-0.1	7.6	0.0
1996	n	7.6	0.0	7.6	0.0	0.0	-0.0	7,(5	0.0
1997	n	7.7	0.1	7.7	0.1	0.1	-0.1	7.6	O*O
1998	n	7.6	0.1	7.6	0.1	0.0	-0.0	7.6	0.0
1999	0	-7,7	0.1	7.7	0.1	0.1	-0.1	7.6	0.0
2000	0	7.6	0.1	7.6	0.1	0.0	-0.0	7.6	0.0

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Western Aleutians

The Western Aleutians Tanner crab fishery has been and is expected to remain a very minor part of the Western Alaska fishery. The projected average annual harvest weight equals 45 metric tons (0.1 million pounds); and the projected average annual real harvest value is $47,000 (see Table 4.86). Neither harvest nor real exvessel prices are expected to exhibit a secular trend (see Tables 4.87 and 4.88). The projected average harvest weight equals the mean harvest weight for 1975 through 1979.

Bering Sea

The Bering Sea is the site of the dominant Tanner crab fishery in Alaska, and due to the concentration of only partially utilized C. opilio stocks, its dominance is expected to increase. The projected average annual harvest weight, including both C. bairdi and C. opilio, equals 70,308 metric tons (155 million pounds); and the average annual real harvest value is projected to be $44 million (see Tables 4.89 through 4.91). The assumption that the C. opilio stocks will be fully utilized in 1980 is not correct, but it appears that they will be fully utilized by 1981. As is true for the other Western Alaska Tanner crab fisheries, annual harvest weight and the exvessel price are expected to fluctuate over time but without exhibiting secular trends for the period as a whole. Therefore, the projections presented in the aforementioned tables are of typical levels of harvesting activity.

Table 4.86
Western Aleutians Tanner Crab Fishery
Projected Harvesting Activity
1980-2000

Year	Catch: Weight: Pounds (millions)	Catch: Weight: Metric Tons	Catch: Value (millions): Nominal	Catch: Value (millions): Real[1]	Exvessel Price ($/Pound): Nominal	Exvessel Price ($/Pound): Real	Number of: Boat Months	Number of: Fisherman Months	Catch per Boat Month: Weight: Pounds (1,000)	Catch per Boat Month: Value ($1,000): Nominal	Catch per Boat Month: Value ($1,000): Real
1980	0.1	45	0.1	0.1	0.55	0.55	8	32	12.5	6.9	6.9
1981	0.1	45	0.1	0.0	0.51	0.48	8	32	12.5	6.4	6.0
1982	0.1	45	0.1	0.0	0.53	0.46	8	32	12.5	6.7	5.8
1983	0.1	45	0.1	0.0	0.59	0.48	8	32	12.5	7.4	5.9
1984	0.1	45	0.1	0.0	0.63	0.47	8	32	12.5	7.8	5.8
1985	0.1	45	0.1	0.0	0.68	0.48	8	32	12.5	8.6	5.9
1986	0.1	45	0.1	0.0	0.73	0.47	8	32	12.5	9.1	5.9
1987	0.1	45	0.1	0.0	0.79	0.48	8	32	12.5	9.9	5.9
1988	0.1	45	0.1	0.0	0.85	0.47	8	32	12.5	10.6	5.9
1989	0.1	45	0.1	0.0	0.92	0.48	8	32	12.5	11.5	6.0
1990	0.1	45	0.1	0.0	0.99	0.48	8	32	12.5	12.3	6.0
1991	0.1	45	0.1	0.0	1.07	0.48	8	32	12.5	13.3	6.0
1992	0.1	45	0.1	0.0	1.15	0.48	8	32	12.5	14.3	6.0
1993	0.1	45	0.1	0.0	1.24	0.48	8	32	12.5	15.4	6.0
1994	0.1	45	0.1	0.0	1.33	0.48	8	32	12.5	16.6	6.0
1995	0.1	45	0.1	0.0	1.43	0.48	8	32	12.5	17.9	6.0
1996	0.1	45	0.2	0.0	1.54	0.48	8	32	12.5	19.3	6.0
1997	0.1	45	0.2	0.0	1.66	0.48	8	32	12.5	20.7	6.0
1998	0.1	45	0.2	0.0	1.79	0.48	8	32	12.5	22.3	6.0
1999	0.1	45	0.2	0.0	1.92	0.48	8	32	12.5	24.0	6.0
2000	0.1	45	0.2	0.0	2.07	0.48	8	32	12.5	25.9	6.0

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base per[illegible]

Table 4.87

Western Aleutians Tanner Crab Fishery Harvesting Activity
Projected Percentage Change from 1980

1980-2000

	Percentage Change								
	Catch						Catch per Boat Month		
		Value		Exvessel Price		Number of		Value	
Year	Weight	Nominal	Real[1]	Nominal	Real	Boat Months	Weight	Nominal	Real
1980	0	0	0	0	o	0	0	0	o
1981	0	-6.7	-13.3	-6.7	-13.3	0	0	-6.7	-13.3
1982	()	-2.8	-16.0	-2.8	-16.0	0	0	-2.8	-16.0
1983	0	7.5	-13.6	7.5	-13.6	0	0	7.5	-13.6
1984	n	13.8	-15.0	13.8	-15.0	0	0	13.8	-15.0
1985	0	24.4	-13.6	24.4	-13.6	0	0	24.4	-13.6
1986	0	32.7	-14.3	32.7	-14.3	0	0	32.7	-14.3
1987	0	44.1	-13.5	44.1	-13.5	0	0	44.1	-13.5
1988	0	54*4	-13.8	54.4	-13.8	0	0	54*4	-13.8
1989	0	67.1	-13.3	67.1	--13.3	0	0	67.1	-13.3
1990	0	79.4	-13.4	79.4	-13.4	0	0	79.4	-13.4
1991	0	93.7	-13.1	93,7	-13.1	0	0	93*7	-13.1
1992	0	108.2	-13.2	108.2	-13.2	0	0	108.2	-13.2
1993	0	124.6	-12.9	124.6	-12.9	0	0	124.6	-12.9
1994	0	141.6	-12.9	141.6	-12.9	0	0	141.6	-12.9
1995	0	160.3	-12.8	160.3	-12.8	0	0	160.3	-12.8
1996	0	180.1	-12.7	180.1	-12.7	0	0	180.1	-12.7
1997	()	201.6	-12.6	201.6	-12.6	n	0	201.6	-12.6
1998	0	224.6	-12.6	224*6	-12.6	0	o	224.6	-12.6
1999	n	249.5	-12.5	249.5	-12.5	0	0	249.5	-12.5
2000	0	276.1	-12.4	276.1	-12.4	0	0	276.1	-12.4

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period,

Table 4.88

Western Aleutians Tanner Crab Fishery Harvesting Activity
Projected Annual Rate of Change
1980-2000

	Percentage Change								
	Catch			Exvessel Price			Catch per Boat Month		
		Value[1]						Value	
Year	Weight	Nominal	Real	Nominal	Real	Number of Boat Months	Weight	Nominal	Real
1980	n	0	0	n	0	0	0	0	0
1981	0	-6.7	-13.3	-6.7	-13.3	0	0	-6.7	-13.3
1982	0	4.?	-3.2	4.2	-3.2	0	0	4.2	-3.2
1983	0	in.7	2.9	10.7	2.9	0	0	10.7	2.9
1984	0	5.8	-1.7	5.8	-1.7	0	0	5.8	-1.7
1985	0	9.4	1.7	9,4	1.7	()	0	9.4	1.7
986	0	6.7	-0.8	6.7	-0.8	0	0	6.7	-0.8
987	0	8.6	1.0	8.6	1.0	0	0	8.6	1.0
988	0	7.1	-0.4	7.1	-0.4	0	0	7.1	-(3*4
1989	0	8.?	0.6	8.2	0.6	0	0	8.?	0.6
1990	0	7.4	-0.2	7.4	-0.2	0	0	7.4	-0.2
1991	0	8.0	0.4	8.0	0.4	0	0	8.0	0.4
1992	0	7.5	-0.0	7.5	-0.0	0	0	7.5	-0.0
1993	0	7.8	0 . 3	-?.8	0.3	0	0	7.8	0.3
1994	0	7.6	0.0	7.6	0.0	n	0	7.6	0.0
1995	0	7.7	0.2	7.7	0.2	0	0	7.7	0.2
1996	0	7.6	0.0	7.6	0.0	0	0	7.6	0.0
1997	0	7.7	0.1	7.7	0.1	0	0	7*7'	0.1
1998	0	7.6	0.1	7.6	0.1	0	0	7.6	0.1
1999	0	7.7	I-)*1	7.7	().1	0	0	7.7	0.1
2000	0	7.6	0.1	7.6	0.1	0	0	7.6	0.1

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.89
Bering Sea Tanner Crab Fishery
Projected Harvesting Activity
1980-2000"

Year	Catch: Weight: Pounds (millions)	Catch: Weight: Metric Tons	Catch: Value (millions)[1]: Nominal	Catch: Value (millions)[1]: Real[1]	Exvessel Price ($/Pound): Nominal	Exvessel Price ($/Pound): Real	Number of: Boat Months	Number of: Fisherman Months	Catch per Boat Month: Weight: Pounds (1,000)	Catch per Boat Month: Value ($1,000): Nominal	Catch per Boat Month: Value ($1,000): Real
1980	155.0	70308	46.0	46.0	0.30	0.30	864	3454	179.5	53.3	53.3
1981	155.0	70308	42.9	39.9	0.28	0.?6	864	3454	179.5	49.7	46.2
1982	155.0	70308	44.7	38.7	0.29	0.25	864	3454	179.5	51.8	44.8
1983	155.0	70308	49.5	39.8	0.32	0.26	864	3454	179.5	57.3	46.1
1984	155.0	70308	52.4	39.1	0.34	0.25	864	3454	179.5	60.6	45*3
1985	155.0	70308	57.3	39.8	0.37	0.26	864	3454	179.5	66.3	46.1
1986	155.0	70308	61.1	39.4	0.39	0.25	864	3454	179.5	70.7	45.7
1987	155.0	70308	66.3	39.8	O*43	0.26	864	3454	179.5	76.8	46.1
1988	155.0	70308	71.1	39.7	0.46	0.26	864	3454	179.5	82.3	45.9
1989	155.0	70308	76.9	39.9	0.50	0.26	864	3454	179.5	89.1	46.2
1990	155.0	70308	82.6	39.8	0.53	0.26	864	3454	179.5	95*6	46.1
1991	155.0	70308	89.2	40.0	0.58	0.26	864	3454	179.5	103.3	46.3
1992	155.0	70308	95.9	40.0	0.62	0.26	864	3454	179.5	111.0	46.3
1993	155.0	70308	103.4	40.1	0.67	0.26	864	3454	179.5	119.7	46.4
1994	155.0	70308	111.2	40.1	0.72	0.26	864	3454	179.5	128.8	46.4
1995	155.0	70308	119.8	40.2	(?.77	0.26	864	3454	179.5	138.8	46.5
1996	155.0	70308	128.9	40.2	0.83	0.26	864	3454	179.5	149.3	46.5
1997	155.0	70308	138.9	40.2	0.90	0.26	864	3454	179.5	160.8	46.6
1998	155.0	70308	149.4	40.2	0.96	0.26	864	3454	179.5	173.1	46.6
1999	155.0	70308	160.9	40.3	1.04	0.?6	864	3454	179.5	186.3	46.7
2000	155.0	70308	173.2	40.3	1.12	0.?6	864	3454	179.5	200.5	46.7

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.90
Bering Sea Tanner Crab Fishery Harvesting Activity
Projected Percentage Change from 1980
1980-2000

	Percentage Change								
	Catch						Catch per Boat Month		
		Value		Exvessel Price		Number of		Value	
Year	Weight	Nominal	Real [1]	Nominal	Real	Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	0	-6.7	-13.3	-6.7	-13.3	0	0	-6.7	-13.3
1982	0	-2.8	-16.0	-2.8	-16.0	0	0	-2.8	-16.0
1983	0	7.5	-13.6	7.5	-13.6	0	0	7.5	-13.6
1984	0	13.8	-15.0	13.8	-15.0	0	0	13.8	-15.0
1985	0	24.4	-13.6	24.4	-13.6	0	0	24.4	-13.6
1986	0	32.7	-14.3	32.7	-14.3	0	0	32.7	-14.3
1987	0	44.1	-13.5	44.1	-13.5	0	0	44.1	-13.5
1988	0	54.4	-13.8	54.4	-13.8	0	0	54.4	-13.8
1989	0	67.1	-13.3	67.1	-13.3	0	0	67.1	-13.3
1990	0	79.4	-13.4	79.4	-13.4	0	0	79.4	-13.4
1991	0	93.7	-13.1	93.7	-13.1	0	0	93.7	-13.1
1992	0	108.2	-13.2	108.2	-13.2	0	0	108.2	-13.2
1993	0	124.6	-12.9	124.6	-12.9	0	0	124.6	-12.9
1994	0	141.6	-12.9	141.6	-12.9	0	0	141.6	-12.9
1995	0	160.3	-12.8	160.3	-12.8	0	0	160.3	-12.8
1996	0	180.1	-12.7	180.1	-12.7	0	0	180.1	-12.7
1997	0	201.6	-12.6	201.6	-12.6	0	0	201.6	-12.6
1998	0	224.6	-12.6	224.6	-12.6	0	0	224.6	-12.6
1999	0	249.5	-12.5	249.5	-12.5	0	0	249.5	-12.5
2000	0	276.1	-12.4	276.1	-12.4	0	0	276.1	-12.4

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.91
Bering Sea Tanner Crab Fishery Harvesting Activity
Projected Annual Rate of Change
1980-2000

	Percentage Change								
	Catch			Exvessel Price			Catch per Boat Month		
		Value						Value	
Year	Weight	Nominal	Real[1]	Nominal	Real	Number of Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	0	-6.7	-13.3	-6.7	-13.3	0	0	-6.7	-13.3
1982	0	4.2	-3.2	4.2	-3.2	0	0	4.2	-3.2
1983	0	10.7	2.9	10.7	2.9	0	0	10.7	2.9
1984	0	5.8	-1.7	5.8	-1.7	0	0	5.8	-1.7
1985	0	9.4	1.7	9.4	1.7	0	0	9.4	1.7
1986	0	6.7	-0.8	6.7	-0.8	0	0	6.7	-0.8
1987	0	8.6	1.0	8.6	1.0	0	0	8.6	1.0
1988	0	7.1	-0.4	7.1	-0.4	0	0	7.1	-0.4
1989	0	8.2	0.6	8.2	0.6	0	0	8.2	0.6
1990	0	7.4	-0.2	7.4	-0.2	0	0	7.4	-0.2
1991	0	8.0	0.4	8.0	0.4	0	0	8.0	0.4
1992	0	7.5	-0.0	7.5	-0.0	0	0	7.5	-0.0
1993	0	7.8	0.3	7.8	0.3	0	0	7.8	0.3
1994	0	7.6	0.0	7.6	0.0	0	0	7.6	0.0
1995	0	7.7	0.2	7.7	0.2	0	0	7.7	0.2
1996	0	7.6	0.0	7.6	0.0	0	0	7.6	0.0
1997	0	7.7	0.1	7.7	0.1	0	0	7.7	0.1
1998	0	7.6	0.1	7.6	0.1	0	0	7.6	0.1
1999	0	7.7	0.1	7.7	0.1	0	0	7.7	0.1
2000	0	7.6	0.1	7.6	0.1	0	0	7.6	0.1

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

The projected average annual harvest weight is approximately 245 percent greater than the mean harvest for 1975 through 1979 and approximately 100 percent greater than the record harvest of 1979. However, since over 35 percent of the 1979 harvest was taken in one month, it appears that the projected harvest levels will not be constrained by harvesting capacity.

The projected exvessel price of Tanner crab is substantially lower in the Bering Sea Management Area than elsewhere in Western Alaska because the Bering Sea harvest is expected to be dominated by C. opilio, a species of Tanner crab which has had a lower exvessel price than C. bairdi, the predominant species in the other management areas. The National Marine Fisheries Service "Fishery Market News" reported prices of $0.56 and $0.40 respectively, for C. bairdi and C. opilio landed in Kodiak in April and May of 1979, and prices of $0.555 and $0.25 during the spring of 1980. This represented a 28.6 percent price discount on C. opilio in 1979 and a 55.0 percent discount in 1980. It is not known which discount will prevail during the forecast period; however, the 55 percent discount apparently reflects a current market valuation of the two species of Tanner crab which was not significantly affected by the recent fishermen's strike. A price discount of 55 percent is used in this report. The projected exvessel Tanner crab prices are not, however, 55 percent lower for the Bering Sea because the Bering Sea harvest will include both species of Tanner crab.

SHRIMP

The Western Alaska shrimp fishery is expected to remain an important but not dominant part of the Alaska fishery. The annual harvest weight is projected to increase from 13,426 metric tons (29.6 million pounds) in 1980 to 25,5/34 metric tons (56.4 million pounds) in 2000 and therefore to partially recover from the dramatic decline of the late 1970s. Real harvest value is projected to increase from $7.0 million to $16.7 million (see Table 4.92}. The harvest weight projections are similar to those for king crab and Tanner crab in that they also reflect the best guesses of the ADF&G Westward Region shellfish biologist. However, the recent collapse of the South Peninsula shrimp stocks and insufficient information about the rate at which the stocks may recover increase the uncertainty associated with these projections.

Peninsula

The Peninsula shrimp fishery includes the Chignik Management Area in which the harvest has been relatively stable since 1975 and the South Peninsula Management Area in which the 1979 harvest was 6.7 percent of the 1977 harvest. It is not known if or how rapidly the latter fishery can be rebuilt. The projections presented below are based on the assumption that the annual South Peninsula harvest weight will increase at a constant rate from the 1979 level to 13,608 metric tons (30 million pounds) in 2000. This is less than 65 percent of the record harvest of 1977.

Table 4.92

Projected Western Alaska Shrimp Harvest
1980-2000

Weight

Year	Pounds (millions) Peninsula	Pounds (millions) Eastern Aleutians	Pounds (millions) Total	Metric Tons Peninsula	Metric Tons Eastern Aleutians	Metric Tons Total
1980	27.1	2.5	29.6	12292.5	1134.0	13426.5
1981	27.5	2.5	30.0	12461.2	1134.0	13595.2
1982	27.9	2.5	30.4	12650.2	1134.0	13784.2
1983	28.4	2.5	30.9	12861.9	1134.0	13995.9
1984	28.9	2.5	31.4	13098.9	1134.0	14232.9
1985	29.5	2.5	32.0	13364.4	1134.0	14498.4
1986	30.1	2.5	32.6	13661.8	1134.0	14795.8
1987	30.9	2.5	33.4	13994.9	1134.0	15128.9
1988	31.7	2.5	34.2	14367.9	1134.0	15501.9
1989	32.6	2.5	35.1	14785.7	1134.0	15919.7
1990	33.6	2.5	36.1	15253.6	1134.0	16387.6
1991	34.8	2.5	37.3	15777.7	1134.0	16911.7
1992	36.1	2.5	38.6	16364.7	1134.0	17498.6
1993	37.5	2.5	40.0	17022.1	1134.0	18156.1
1994	39.2	2.5	41.7	17758.3	1134.0	18892.3
1995	41.0	2.5	43.5	18583.0	1134.0	19717.0
1996	43.0	2.5	45.5	19506.6	1134.0	20640.6
1997	45.3	2.5	47.8	20541.0	1134.0	21675.0
1998	47.8	2.5	50.3	21699.6	1134.0	22833.6
1999	50.7	2.5	53.2	22997.2	1134.0	24131.2
2000	53.9	2.5	56.4	24450.5	1134.0	25584.5

Table 4.92 (continued)

Value

Year	Nominal Value (millions) Peninsula	Nominal Value (millions) Eastern Aleutians	Nominal Value (millions) Total	Real Value[1] (millions) Peninsula	Real Value[1] (millions) Eastern Aleutians	Real Value[1] (millions) Total
1980	6.4	0.6	7.0	6.4	0.6	7.0
1981	7.1	0.6	7.7	6.6	0.6	7.2
1982	7.9	0.7	8.6	6.8	0.6	7.4
1983	8.8	0.8	9.5	7.0	0.6	7.7
1984	9.8	0.8	10.6	7.3	0.6	7.9
1985	10.9	0.9	11.8	7.6	0.6	8.2
1986	12.1	1.0	13.1	7.8	0.6	8.5
1987	13.5	1.1	14.6	8.1	0.7	8.8
1988	15.1	1.2	16.3	8.5	0.7	9.1
1989	17.0	1.3	18.3	8.8	0.7	9.5
1990	19.0	1.4	20.4	9.2	0.7	9.9
1991	21.4	1.5	22.9	9.6	0.7	10.3
1992	24.1	1.7	25.8	10.1	0.7	10.8
1993	27.2	1.8	29.1	10.6	0.7	11.3
1994	30.9	2.0	32.8	11.1	0.7	11.8
1995	35.0	2.1	37.2	11.7	0.7	12.5
1996	39.9	2.3	42.2	12.4	0.7	13.1
1997	45.5	2.5	48.0	13.2	0.7	13.9
1998	52.0	2.7	54.8	14.0	0.7	14.8
1999	59.7	2.9	62.7	15.0	0.7	15.7
2000	68.7	3.2	71.9	16.0	0.7	16.7

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

The annual harvest weight for the Peninsula (Chignik/South Peninsula) shrimp fishery is projected to increase from 12,292 metric tons (27.1 million pounds) in 1980 to 24,450 metric tons (53.9 million pounds) in 2000; and real harvest value is projected to increase from $6.4 million to $16.0 million (see Table 4.93). The 99 percent increase in harvest weight is accounted for by the projected recovery of the South Peninsula fishery and the 150 percent increase in harvest value is explained by projected increases in both harvest weight and the real exvessel price (see Table 4.94). The corresponding annual rates of change in harvesting activity appear in Table 4.95. The projected harvest weight for 2000 is 10 percent greater than the mean harvest for 1975 through 1979, but it is 25 percent less than the record harvest of 1977.

Eastern Aleutians

The Eastern Aleutians shrimp fishery is a relatively small fishery. Its annual harvest weight is projected to average 1,134 metric tons (2.5 million pounds) between 1980 and 2000; and its annual real harvest value is projected to increase from $0.6 million to $0.7 million (see Table 4.96). The 25.8 percent increase in real value reflects the projected increase in the exvessel price (see Table 4.97). Table 4.98 contains projections of the annual rates of change in harvesting activity. The average projected harvest weight is approximately 70 percent of the mean harvest for 1973 through 1979.

Table 4.93
Peninsula Shrimp Fishery
Projected Harvesting Activity
1980-2000

	Catch								Catch per Boat Month		
	Weight		Value		Exvessel Price		Number of		Weight	Value	
	Pounds	Metric	Trillions)[1]		($/Pound)		Boat	Fisherman	Pounds	($1,000)	
Year	(millions)	Tons	Nominal	Real[1]	Nominal	Real	Months	Months	(1,000)	Nominal	Real
1980	27.1	12292	6.4	6.4	().24	0.24	111	333	244. o	57.6	57.6
1981	27.5	12461	7.1	6.6	0.26	0.24	112	337	244.5	63.1	58.6
1982	27.9	12650	7.9	6.8	0.28	0.24	114	342	244.9	69.3	59.9
1983	28.4	12862	8.8	7.0	0.31	0.25	116	347	245.4	75.8	60.9
1984	28.9	13099	9.8	7.3	0.34	0.25	117	352	246.0	83.1	62.1
1985	29.5	13364	10.9	7.6	0.37	0.26	119	350	246.6	91.0	63.2
1986	30.1	13662	12.1	7.8	0.40	0.26	122	365	247.2	99.4	64.2
1987	30.9	13995	13.5	8.1	0.44	0.26	124	373	248.0	108.9	65.4
1988	31.7	14368	15.1	8.5	0.48	0.27	127	382	248.8	118.9	66.4
1989	32.6	14786	17.0	8.8	0.52	0.27	131	392	249.6	129.8	67.4
1990	33.6	15254	19.0	9.2	0.57	0.27	134	403	250. b	141.8	68.4
1991	34.8	15778	21.4	9.6	0.62	0.28	138	415	251.6	154.8	69.4
1992	36.1	16365	24.1	10.1	0.67	0.28	143	428	252.8	169.1	70.5
1993	37.5	17022	27.2	10.6	().73	0.28	148	443	254.0	184.4	71.5
1994	39.2	17758	30.9	11.1	0.79	0.28	153	460	255.3	201.2	72.5
1995	41.0	18583	35.0	11.7	0.86	0.?9	160	479	256.7	219.5	73.6
1996	43.0	19507	39.9	12.4	0.93	0.29	167	500	258.3	239.4	74.6
1997	45.3	20541	45.5	13.2	1.00	0.29	174	523	259.9	261.2	75.7
1998	47.8	21700	5?. ()	14.0	1.09	0.29	183	548	261.7	284.7	76.7
1999	50.7	22997	59.7	15.0	1.18	(3.2'1	192	577	263.6	310.5	77.7
2000	53.9	24450	68.7	16.0	1.28	().30	203	609	265.5	338.6	78.8

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.94
Peninsula Shrimp Fishery Harvesting Activity
Projected Percentage Change from 1980
1980-2000

Year	Catch: Weight	Catch: Value: Nominal	Catch: Value: Real [1]	Exvessel Price: Nominal	Exvessel Price: Real	Number of Boat Months	Catch per Boat Month: Weight	Catch per Boat Month: Value: Nominal	Catch per Boat Month: Value: Real
1980	0	0	0	0	0	0	0	0	0
1981	1.4	10.8	3.0	9.3	1.6	1.2	0.2	9.5	1.8
1982	2.9	23.4	6.7	19.9	3.7	2.5	0.4	20.3	4*O
1983	4.6	37.0	10.1	30.9	5.2	4.1	0.6	31.7	5.8
1984	6.6	52.6	14.0	43.2	7.(-I	5.7	0.8	44*3	7.8
1985	8.7	70.0	18.1	56.4	8.6	7.6	1*0	58.0	9.7
1986	11.1	89.3	22.3	70.3	10.0	9.7	1.3	72.6	11.4
1987	13.8	111.8	?7.2!	86.0	11.7	12.0	1.6	89.0	13.5
1988	16.9	136.7	32.1	102.5	13.1	14.7	1.9	106.5	15.2
1989	20.3	165.0	37.5	120.3	14.3	17.6	2.3	125.4	17.0
1990	24.1	197.6	43.6	139.8	15.7	20.8	2.7	146.3	18.8
1991	28.4	?34.5	50.0	160.6	16.9	24.5	3.1	168.7	20.5
1992	33.1	277.4	57.4	183.5	18.2	28.5	3.6	193.6	22.5
1993	38.5	326.0	65.2	207.6	19.3	33.(-I	4.1	220.2	24.1
1994	44.5	382.4	73.9	233.9	20.4	38.1	4.6	249.3	25.9
1995	51.2	447.7	83.6	262.3	21.4	43.7	5.2	281.2	27.7
1996	58.7	523.3	94.2	292.8	22.4	49.9	5.8	315.7	29.5
1997	67.1	611.6	106.1	325.8	23.4	56.9	6.5	353.6	31.4
1998	76.5	713.8	119.2	361.(-I	24.2	64.6	7.2	394.3	33*1
1999	87.1	833.8	133.8	399.2	25.0	73.?	8.0	439.1	35.0
2000	98.9	974.6	150.2	440.3	25.8	82.8	8.8	487.9	36.9

All columns: Percentage Change.

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.95
Peninsula Shrimp Fishery Harvesting Activity
Projected Annual Rate of Change
1980-2000

	Change								
	Catch						Catch per Boat Month		
		Value		Exvessel Price		Number of		Value	
Year	Weight	Nominal	Real[1]	Nominal	Real	Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	1.4	10.8	3.0	9.3	1.6	1.2	0.2	9.5	1.8
1982	1.5	11.4	3.5	9.7	2.0	1.3	0.2	9.9	2.2
1983	1.7	11.0	3.2	9.2	1.5	1.5	0.2	9.4	1.7
1984	1.8	11.4	3.6	9.4	1.7	1.6	0.2	9.6	1.9
1985	2.0	11.4	3.6	9.2	1.5	1.8	0.2	9.4	1.7
1986	2.2	11.4	3.5	8.9	1.3	1.9	0.3	9.2	1.6
1987	2.4	11.9	4.0	9.2	1.5	2.1	0.3	9.5	1.8
1988	2.7	11.8	3.9	8.9	1.2	2.3	0.3	9.2	1.6
1989	2.9	11.9	4.1	8.8	1.1	2.5	0.4	9.2	1.5
1990	3.2	12.3	4.4	8.8	1.2	2.8	0.4	9.3	1.6
1991	3.4	12.4	4.5	8.7	1.0	3.0	0.4	9.1	1.4
1992	3.7	12.8	4.9	8.8	1.1	3.3	0.4	9.3	1.6
1993	4.0	12.9	4.9	8.5	0.9	3.5	0.5	9.0	1.4
1994	4.3	13.2	5.3	8.5	0.9	3.8	0.5	9.1	1.4
1995	4.6	13.5	5.6	8.5	0.9	4.1	0.6	9.1	1.4
1996	5.0	13.8	5.8	8.4	0.8	4.3	0.6	9.1	1.4
1997	5.3	14.2	6.1	8.4	0.8	4.6	0.6	9.1	1.4
1998	5.6	14.4	6.3	8.3	0.6	4.9	0.7	9.0	1.3
1999	6.0	14.7	6.7	8.3	0.7	5.2	0.7	9.0	1.4
2000	6.3	15.1	7.0	8.2	0.6	5.5	0.8	9.1	1.4

[1] he real values and prices were calculated using the U.S. CPI; 980 is the base period.

Table 4.96

Eastern Aleutians Shrimp Fishery

Projected harvesting Activity

1980-2000

	Catch				Exvessel Price		Number of		Catch per Boat Month		
	Weight		Value (millions)[1]		($/Pound)				Weight	Value ($1,000)	
Year	Pounds (millions)	Metric Tons	Nominal	Real	Nominal	Real	Boat Months	Fisherman Months	Pounds (1,000)	Nominal	Real
1980	2.5	1134	0.6	0.6	0.24	0.24	?3	68	109.8	25.9	25.9
1981	2.5	1134	0.6	0.6	0.26	0.24	23	68	109.8	28.3	26.3
1982	2.5	1134	0.7	(-).6	0.28	0.24	23	68	109.8	31.1	26.9
1983	2.5	1134	0.8	0.6	0.31	0.,25	23	68	109.8	33*9	77.3
1984	2.5	1134	0.8	0.6	0.34	0.25	23	68	109.8	37.1	27.7
1985	2.5	1134	0.9	0.6	0.37	0.26	23	68	109. H	40.5	28.2
1986	2.5	1134	1.0	0.6	0.40	0.26	23	68	109.8	44.2	28.5
1987	2.5	1134	1.1	0.7	c). 44	0.26	?3	68	109.8	48.2	28.9
1988	2.5	1134	1.?	0.7	0.48	0.27	23	68	109.8	52.5	29.3
1989	2.5	1134	1.3	0.7	0.52	0.?7	?3	68	109.8	57.1	29.6
1990	2.5	1134	1.4	0.7	0.57	0.27	23	68	109.8	62.2	30.0
1991	2.5	1134	1.5	(3.7	0.62	0.28	23	68	109.8	67.5	30.3
1992	2.5	1134	1.7	0.7	0.67	0.28	23	68	109.8	73.5	30.6
1993	2.5	1134	1.8	0.7	0.73	0.28	23	68	109.8	79.7	30.9
1994	2.5	1134	2.0	0.7	0.79	0.28	23	68	109.8	86.5	31.2
1995	2.5	1134	2.1	0.7	0.86	0.29	23	68	109.8	93.9	31.5
1996	2.5	1134	2.3	0.7	0.93	0.?9	23	68	109.8	101.8	31.7
1997	2.5	1134	2.5	0.7	1.00	0.29	23	68	109.8	110.4	32.0
1998	2.5	1134	2.7	0.7	1.09	0.29	23	68	109.8	119.5	32.?
1999	2.5	1134	2.9	0,7	1.18	0.29	23	68	109.8	129,4	32.4
2000	2.5	1134	3.2	0.7	1.28	0.30	23	68	109.8	140.0	32.6

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.97
Eastern Aleutians **Shrimp** Fishery Harvesting Activity
Projected Percentage Change from 1980
1980-2000

	Percentage Change								
	Catch						Catch per Boat Month		
		Value		Exvessel Price		Number of		Value	
Year	Weight	Nominal	Real[1]	Nominal	Real	Boat Months	Weight	Nominal	Real
1980	0	0	0	0	0	0	0	0	0
1981	0	9.3	1.6	9.3	1.6	0	0	9*3	1.6
1982	0	19.9	3.7	19.9	3.7	0	0	19.9	3.7
1983	cl	30.9	5.2	30.9	5.2	0	0	30.9	5,2
1984	n	43.2	7.0	43.2	7.0	0	0	43.2	7.0
1985	0	56.4	8.6	56.4	8.6	0	0	56.4	8.6
1986	0	70.3	10.0	70.3	10.0	0	0	70.3	10.0
1987	0	86.0	11.7	86.0	11.7	0	0	86.0	11.7
1988	0	102.5	13.1	10205	13.1	0	0	102.5	13.1
1989	0	120.3	14.3	120.3	14.3	0	0	120.3	14.3
1990	0	139.8	15.7	139.8	15.7	o	0	139.8	15.7
1991	0	160.6	16.9	160.6	16.9	0	0	160.6	16.9
1992	0	183.5	18.2	183.5	18.2	0	0	183.5	18.2
1993	0	207.6	19.3	207.6	19.3	0	0	207.6	19.3
1994	0	233.9	20.4	233.9	20.4	0	0	233.9	20.4
1995	o	262.3	21.4	262.3	21.4	0	0	262.3	21,4
1996	0	292.8	22.4	292.8	22.4	o	o	292.8	22.4
1997	()	325.8	23.4	325.8	23.4	0	0	325.8	23.4
1998	0	361.0	24.2	361.0	24.2	0	0	361.0	24,?
1999	0	399.2	25.0	399.2	25.0	o	0	399.?	25.0
2000	()	440.3	25.8	44(-).3	25.8	0	0	440.3	25.8

[1] The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.98
Eastern Aleutians Shrimp Fishery Harvesting Activity
Projected Annual Rate of Change
1980-2000

Year	Catch: Weight	Catch: Value Nominal	Catch: Value Real[1]	Exvessel Price: Nominal	Exvessel Price: Real	Number of Boat Months	Catch per Boat Month: Weight	Catch per Boat Month: Value Nominal	Catch per Boat Month: Value Real
			Percentage Change						
1980	0	0	0	0	0	0	0	0	o
1981	0	9.3	1.6	9.3	1.6	0	0	9.3	1.6
1982	0	9*7	2.0	9.7	2.0	0	0	9.7	2.0
1983	0	9.2	1.5	9.2	1.5	0	0	9.2	1.5
1984	()	9*4	1.7	9.4	1.7	0	0	9.4	1.7
1985	0	9.2	1.5	9.2	1.5	0	0	9.2	1.5
1986	0	8.9	103	8.9	1.3	0	0	8.9	1.3
1987	0	9.2	1.5	9.2	1.5	0	0	9.2	1.5
1988	0	8.9	1.2	8.9	1.2	0	0	8.9	1.2
1989	()	8.8	1.1	8.8	1.1	0	o	8.8	1.1
1990	0	8.8	1.2	8.8	1.2	0	o	8.8	1.2
1991	()	8.7	1.0	8.7	1.0	0	o	8.7	1.0
1992	0	8.8	1.1	8.8	1.1	0	0	8.8	1.1
1993	0	8.5	0.9	, 8.5	0.9	0	0	8.5	(-).9
1994	o	8.5	0.9	8.5	0.9	0	0	8.5	0.9
1995	0	8.5	0.9	8.5	0.9	0	0	8.5	0.9
1996	0	8.4	0.8	8.4	0.8	0	o	8.4	0.8
1997	0	8.4	0.8	8.4	0.8	0	0	8.4	0.8
1998	n	8.3	0.6	8.3	0.6	()	o	8.3	0.6
1999	0	8.3	0.7	8.3	0.7	0	0	8.3	0.7
2000	()	8.2	0.6	8.2	0.6	0	o	8.2	0.6

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

GROUNDFISH

As is indicated in Chapter II, there is a tremendous amount of uncertainty concerning both how rapidly the domestic groundfish fishery will develop and replace the foreign fishery and what the nature of the domestic fishery will be. The projections presented in this section are based on a set of assumptions which is defined and discussed in Chapter 11, and they are meaningful only in the context of those assumptions. The reader is therefore advised to review the relevant section of Chapter II in order to more fully understand the nature of the projections.

Western Alaska is expected to dominate the Alaska groundfish fishery because the Alaska groundfish stocks are principally located in the Bering Sea. The annual Western Alaska groundfish harvest weight is projected to increase from 2,439 metric tons in 1980 to 2.2 million metric tons in 2000; and the annual real harvest value is projected to increase from $0.7 million to $493 million (see Table 4.99). The real harvest value projections reflect the assumption that real exvessel prices will remain constant and that nominal prices will therefore increase at the same rate as the U.S. Consumer Price Index (CPI) for all goods and services. The projections of nominal exvessel prices appear in Table 4.100. Because 198(9 is used as the base year in determining real prices and values and because real prices are assumed to remain constant, the 1980 nominal prices equal the real prices used for 1980 through 2000.

Table 4.99

Projected Western Alaska Groundfish Harvest
1980-2000

Weight

Year	Pounds (millions) Chirikof/ Shumagin	Bering Sea	Total	Metric Tons Chirikof/ Shumagin	Bering Sea	Total
1980	0.7	4.7	5.4	299.1	2140.?	?439.2
1981	0.9	6.4	7.3	393.9	2922.5	3316.4
1982	1.1	8.8	10.0	521.6	4010.3	4531.9
1983	1.5	12.2	13.7	694.4	5528.5	6222.9
1984	2.0	16.9	18.9	929.7	7654.6	8584.3
1985	2.8	23.5	26.2	1251.6	10641.4	11893.0
1986	3.-?	32.7	36.5	1694.1	14849.1	16543.2
1987	5.1	45.8	50.9	2305.3	20792,0	23097.3
1988	7.0	64.4	71*3	3153.2	29204,6	32357.9
1989	9.6	90.7	100.2	4334.4	41137.9	45472.3
1990	13.2	128.1	141.3	5986.1	58095.7	64081.8
1991	18.3	181.3	199.6	8303.9	82232.8	90536.6
1992	25.5	?5701	282.6	11566.7	116637.7	128204.4
1993	35.7	365.4	401.0	16173.5	165740.7	181914.2
1994	50.0	520.1	570.1	22695.5	235899.3	258594.8
1995	70.4	741.3	811.7	31951.4	336242.2	368193.6
1996	99.5	1057*?	1157.4	45116.3	479881.7	524998.0
1997	140.8	1511.6	1652.4	63879.5	685660.5	749540.0
1998	199.9	2162.0	2361.9	90671.1	980665.9	1071337.0
1999	284.4	3094.9	3379.3	128991.8	1403850.4	153?842.2
2000	405.4	4434.()	4839.4	183889.6	2011247.6	?195137.2

Table 4.99 continued)

Value

Year	Nominal Value (millions) Chirikof/ Shumagin	Bering Sea	Total	Real Value[1] (millions) Chirikof/ Shumagin	Bering Sea	Total
1980	0.1	0.6	0.7	0.1	0.6	0.7
1981	0.1	0.9	1.0	0.1	0.8	0.9
1982	0.2	1.2	1.4	0.2	1.1	1.2
1983	0.3	1.8	2.1	0.2	1.5	1.7
1984	0.4	2.6	3.0	0.3	2.0	2.3
1985	0.5	3.9	4.4	0.4	2.7	3.1
1986	0.8	5.7	6.5	0.5	3.7	4.2
1987	1.1	8.4	9.5	0.7	5.1	5.7
1988	1.6	12.5	14.1	0.9	7.0	7.9
1989	2.3	18.7	21.0	1.2	9.7	10.9
1990	3.4	28.0	31.4	1.6	13.5	15.2
1991	5.0	42.2	47.2	2.2	18.9	21.2
1992	7.4	63.8	71.1	3.1	26.6	29.7
1993	10.9	96.7	107.6	4.2	37.5	41.7
1994	16.3	147.0	163.3	5.9	53.0	58.9
1995	24.6	224.1	248.7	8.2	75.1	83.4
1996	37.2	342.7	379.8	11.6	106.8	118.4
1997	56.5	525.1	581.6	16.4	152.1	168.5
1998	86.3	806.3	892.7	23.3	217.2	240.4
1999	132.6	1240.6	1373.2	33.2	310.7	343.8
2000	204.5	1912.3	2116.7	47.6	445.2	492.8

[1]The real values and prices were calculated using the U.S. CPI; 1980 is the base period.

Table 4.99 (continued)

Year	Pollock	Cod	Sablefish	Other	Total
	Metric Tons				
1980	1060	972	1	408	2441
1981	1521	1206	2	590	3320
1982	2184	1496	3	854	4536
1983	3135	1856	5	1234	6229
1984	4499	23(33	8	1783	8594
1985	6458	2857	13	2578	11906
1986	9271	3545	20	3727	16562
1987	13307	4398	33	5387	23125
1988	19101	5456	53	7787	32397
1989	27418	6769	85	11255	45529
1990	39357	8399	137	16270	64162
1991	56493	10420	221	23518	90652
1992	81091	12928	356	33996	128371
1993	116399	16039	573	49141	182153
1994	167082	19899	923	71033	258937
1995	23983?	24689	1485	102679	368685
1996	344258	30631	2391	148423	525703
1997	494154	38003	3049	214547	750552
1998	709316	47149	6196	310128	1072790
1999	1018164	58497	9975	448292	1534928
2000	1461490	72576	16057	648009	2198131

Table 4.100
Projected Nominal Exvessel Groundfish Prices
1980-2000

Year	Pollock	Cod	Sablefish	Other
	(Dollars/Pound)			
1980	0.07	0.19	0.65	0.15
1981	0.08	0.20	0.70	0.16
1982	0.08	0.22	0.75	0.17
1983	0.09	0.24	0.81	0.19
1984	0.09	0.25	0.87	0.20
1985	0.10	0.27	0.94	0.22
1986	0.11	0.29	1.01	0.23
1987	0.12	0.32	1.08	0.25
1988	0.13	0.34	1.16	0.27
1989	0.13	0.37	1.25	0.29
1990	0.15	0.39	1.35	0.31
1991	0.16	0.42	1.45	0.33
1992	0.17	0.46	1.56	0.36
1993	0.18	0.49	1.68	0.39
1994	0.19	0.53	1.80	0.42
1995	0.21	0.57	1.94	0.45
1996	0.22	0.61	2.09	0.48
1997	0.24	0.66	2.24	0.52
1998	0.26	0.71	2.41	0.56
1999	0.28	0.76	2.60	0.60
2000	0.30	0.82	2.79	0.64

In this report the groundfish fishery of Western Alaska is divided into two fisheries; the Bering Sea fishery defined to consist of the entire Fishery Conservation Zone (FCZ) of the Bering Sea and that portion of the North Pacific Ocean which is adjacent to the Aleutian Islands west of 170°W; and the Chirikof/Shumagin fishery defined to consist of that portion of the FCZ of the North Pacific Ocean adjacent to the Aleutian Islands or the Alaska Peninsula between 154°W and 170°W.

Chirikof/Shumagin

The annual harvest weight for the Chirikof/Shumagin groundfish fishery is projected to increase from 220 metric tons in 1980 to 184,103 metric tons in 2000; and the real harvest value is projected to increase from $0.1 million to $47.6 million (see Table 4.101). The fleet is projected to be comprised of 34 trawlers and 12 catcher/processors by 2000 and to employ 510 crewmembers who will receive $15.3 million dollars of real annual income. Tables 4.102 and 4.103 present harvest projections by species. With the exception of the exvessel price, the indexes of harvesting activity are projected to increase at an annual rate of approximately 40 percent and by 83,500 percent for the twenty-year period as a whole.

Bering Sea

The groundfish resources off the coast of Alaska are predominately located in the Bering Sea; groundfish harvesting activity is therefore expected to be concentrated in the Bering Sea. Annual harvest weight is

Table 4.101

Projected Chirikof/Shumagin Groundfish Harvesting Activity
1980-2000

Year	Catch: Weight Metric Tons	Catch: Real Value (millions)[1]	Exvessel Price ($/Pound): Nominal	Exvessel Price ($/Pound): Real	Number of: Trawlers	Number of: Processors	Number of: Trawl Fish-ermen	Number of: Catcher/ Processor Fishermen	Real Wage ($1,000): Trawler Fishermen	Real Wage ($1,000): Catcher/ Processor Fishermen
1980	220	0.10	0.21	0.21	0.04	0.02	0.24	0.40	8	9
1981	308	0.13	0.21	0.19	0.06	0.02	0.34	0.55	11	13
1982	432	0.17	0.21	0.18	0.08	0.03	0.48	0.77	16	19
1983	604	0.22	0.21	0.17	0.11	O*O4	0.67	1.08	22	26
1984	846	0.29	0.21	0.15	0.16	0.06	O*94	1.51	31	37
1985	1184	0.38	0.21	0.15	0.22	0.08	1.32	2.10	44	51
1986	1657	0.50	0.21	0.14	0.31	0.12	1.84	2.93	62	72
1987	2320	0.67	0.22	O*13	0.43	0.16	2.58	4.09	87	101
1988	3248	0.89	0,22	0.12	0.60	0.23	3.61	5.70	122	141
1989	4548	. 1.21	0.23	0.12	0.84	0.31	5*O5	7*94	172	198
1990	6367	1.64	0.24	O*12	1.18	0.44	7.07	11.07	242	277
1991	8913	2.23	0.25	0.11	1.65	0.61	9*9O	15,44	340	388
1992	12478	3.07	0.27	0.11	2.31	0.84	13.86	21.51	478	543
1993	17468	4.24	0.28	0.11	3.23	1.18	19.41	29.98	673	761
1994	24455	5.89	0.30	0.11'	4.53	1.63	27.17	41.77	947	1065
1995	34236	8.24	0.33	O*11	6.34	2.27	38*O4	58.20	1332	1491
1996	47929	11.58	0.35	0.11	8.88	3.16	53.25	81.06	1875	2087
1997	67099	16.37	0.38	0.11	12.43	4.39	74.55	112.90	263a	2921
1998	93936	23.25	0.42	0.11	17.40	6.10	104.37	157.21	3712	4088
1999	131506	33.19	0.46	0.11	24.35	8.47	146.12	218.88	5223	5719
2000	184103	47.60	0.50	0.12	34,09	11.77	204.56	304.68	7349	8000

[1] Real prices and values are in terms of 1980 dollars.

Table 4.102
Projected Chirikof/Shumagin Groundfish Harvest Weight by Species
1980-2000

Year	Pollock	Cod	Sablefish	Other	Total
	Metric Tons				
1980	81	184	0	34	299
1981	116	228	1	49	394
1982	166	283	1	71	522
1983	238	351	1	103	694
1984	342	436	2	149	930
1985	491	541	4	216	1252
1986	705	671	6	312	1694
1987	1012	832	10	451	2305
1988	1453	1032	16	652	3153
1989	2086	1281	25	943	4334
1990	2994	1589	40	1363	5986
1991	4298	1972	65	1970	8304
1992	6169	2446	104	2847	11567
1993	8855	3035	168	4116	16174
1994	12710	3766	270	5950	22696
1995	18245	4672	435	8600	31951
1996	26188	5796	700	12432	45116
1997	37591	7191	1127	17970	63880
1998	53959	8922	1814	25976	90671
1999	77454	11069	2921	37548	128992
2000	111179	13733	4702	54276	183890

Table 4.103
Projected Chirikof/Shumagin Groundfish Harvest Value by Species
1980-2000

Year	Nominal Value (millions) Pollock	Cod	Sablefish	Other	All	Real Value[1] (millions) Pollock	Cod	Sablefish	Other	All
1980	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1
1981	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1
1982	0.0	0.1	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.2
1983	0.0	0.2	0.0	0.0	0.3	0.0	0.1	0.0	0.0	0.2
1984	0.1	0.2	0.0	0.1	0.4	0.1	0.2	0.0	0.0	0.3
1985	0.1	0.3	0.0	0.1	0.5	0.1	O*2	O*O	0.1	0.4
1986	0.2	0.4	0.0	0.2	0.8	O*1	0.3	0.0	O*1	0.5
1987	0.3	0.6	0,0	0.2	1.1	0,2	0.3	0.0	0.1	0.7
1988	0.4	0.8	0.0	O*4	1.6	0.2	O*4	0.0	0.2	O*9
1989	0.6	1.0	0.1	0.6	2.3	0.3	0.5	O*O	0.3	1.2
1990	1.0	1,4	0.1	0.9	3.4	0.5	0.7	0.1	0.5	1.6
1991	1.5	1.8	0.2	1.5	5.0	0.7	0.8	0.1	O*7	2.2
1992	2.3	2.5	0.4	2.3	7.4	1.0	1.0	0.1	0.9	3.1
1993	3.5	3.3	0.6	3.5	10.9	1.4	1.3	0.2	1*4	4.2
1994	5.4	4.4	1.1	5.5	16.3	2.('J	1.6	0.4	2.0	5.9
1995	8.4	5:8	1.9	8.5	24.6	2.8	2.0	0.6	2*8	8.2
1996	13.0	7.8	3.2	13.2	37.2	4.0	2.4	1.0	4*1	11.6
1997	20.0	10.4	5.6	20.5	56.5	5.8	3.0	1.6	5.9	16.4
1998	30.9	13.9	9.7	31.9	86.3	8.3	3.7	2*6	8.6	23.3
1999	47.7	18.5	16.7	49.6	132.6	12.0	4.6	4.2	12.4	33.2
2000	73.7	24.7	28.9	77.1	204.5	17.2	5.8	6.7	17*9	47.6

[1]The real values are in terms of 1980 dollars.

projected to increase from 2,409 metric tons in 1980 to 2.0 million metric tons in 2000; annual real harvest value is projected to increase from $0.6 million to $445 million (see Table 4.104). The annual rates of growth are approximately 40 percent and the cumulative percentage growth from 1980 through 2000 is over 83,500 percent. The fishery projected for 2000 would include 373 trawlers and 124 catcher/processors, and it would employ approximately 5,500 crewmembers who would receive over $165 million of real income. Harvest projections by species are presented in Tables 4.105 and 4.106.

FOREIGN TANNER CRAB

The foreign tanner crab fishery has been limited more each year. In 1980 it is limited to a Japanese fleet targetting on *C. opilio* Tanner crab north of 58°N latitude. The general expectation is that the foreign Tanner crab fishery will be completely displaced by the domestic fishery in the early 1980s.

FOREIGN GROUNDFISH

The domestic groundfish fishery is projected to grow at a constant rate until it has completely replaced the foreign fishery by 2000. The harvesting activity of the foreign fishery is therefore projected to gradually decrease during the 1980s and to decrease quite rap· dly during the 1990s. For example, the approximate cumulative decreases in harvesting activity are 0.6 percent by 1985, 3.5 percent by 1990, 18 6 percent

Table 4.104
Projected Bering Sea Groundfish Harvesting Activity
1980-2000

Year	Catch: Weight Metric Tons	Catch: Real Value (millions)[1]	Exvessel Price ($/Pound): Nominal	Exvessel Price ($/Pound): Real	Number of: Trawlers	Number of: Catcher/ Processors	Number of: Trawl Fish- ermen	Number of: Catcher/ Processor Fishermen	Real Wage ($1 ,000): Trawler Fishermen	Real Wage ($1 ,000): Catcher/ Processor Fishermen
1980	2409	0.61	0.11	0.11	0.45	0.17	2.68	4.29	87	102
1981	3372	0.81	0.12	0.11	0.62	0.24	3*75	5.98	122	143
1982	4721	1.08	0.12	0.10	0.87	0.33	5.25	8.34	172	200
1983	6609	1.46	0.12	0.10	1.22	0.46	7.34	11.63	242	281
1984	9252	1.97	0.13	O*1O	1.71	0.64	10.28	16.22	340	393
1985	12952	2.68	0.14	0.09	2.40	0.89	14.39	22.62	479	551
1986	18132	3.67	0.14	0.09	3.36	1.24	20.15	31.53	674	772
1987	25385	5.(-)5	0.15	0.09	4.70	1.73	28.21	43,95	948	1082
1988	35537	6.98	0.16	0.09	6.58	2.40	39.49	61.25	1334	1515
1989	49751	9.70	0.17	0.09	9.21	3*35	55.28	85*35	1878	2122
1990	69649	13.52	0.18	0.09	12.90	4.65	77.39	118.92	2642	2971
1991	97506	18.93	0.20	0.09	18.06	6.47	1086.34	165.67	3718	4159
1992	136504	26.59	0.21	0.09	25.28	8.99	151.67	230.77	5231	5822
1993	191100	37*48	0.23	0.09	35*39	12.49	212.33	321.38	7361	8148
1994	267532	52.99	0.25	0.09	49.54	17.36	297.26	447.52	10358	11401
1995	374533	75.12	0.27	0.09	49.36	24.11	416.15	623.05	14575	15951
1996	524331	106.77	0.30	().09	97.10	33.48	582.59	867.28	20509	22313
1997	734041	152.11	0.32	0.09	135.93	46.49	815.61	1207.04	28858	31206
1998	10?7627	217.17	0.36	0.10	190.30	64.52	1141.82	1679.59	4(')607	43635
1999	1438635	310.65	0.39	0.10	266.42	89.52	1598.49	2336.68	57138	61002
2000	2014029	445.18	0.43	0.10	372.97	124.16	2237.82	3250.20	80400	85264

[1] Real prices and values are in terms of 1980 dollars.

Table 4.105
Projected Bering Sea Groundfish Harvest Weight by Species
1980-2000

Year	Pollock	Cod	Sablefish	Other	Total
	Metric Tons				
1980	977	788	1	374	2140
1981	1402	978	1	541	2922
1982	2013	1213	2	782	4010
1983	2890	1505	3	1130	5528
1984	4148	1867	6	1634	7655
1985	5954	2316	9	2362	10641
1986	8546	2874	14	3414	14849
1987	12268	3566	23	4936	20792
1988	17609	4424	37	7134	29205
1989	25276	5488	60	10313	41138
1990	36282	6809	97	14907	58096
1991	52080	8448	156	21548	82233
1992	?4756	10482	252	31148	116638
1993	107306	13004	405	45025	165741
1994	154029	16134	652	65084	235899
1995	2?1096I	20017	1050	940?9	336242
1996	317365	?4835	1691	135992	479882
1997	455550	30812	2722	196577	685661
1998	653904	38227	4382	284153	980666
1999	938625	47428	7054	410744	1403850
2000	1347317	58842	11355	593733	2011248

Table 4. 106
Projected Bering Sea Groundfish Value by Species
1980-2000

Year	Nominal Value (millions)					Real Value[1] (millions)				
	Pollock	cod	Sablefish	Other	All	Pollock	Cod	Sablefish	Other	All
1980	0.2	0.3	0.0	0.1	0.6	0.2	0.3	0.0	0.1	0.6
1981	0.2	Q*4	0.0	0,2	0.9	0.2	O*4	0.0	0.2	0.8
1982	0.4	0.6	0.0	0.3	1.2	0.3	0.5	O*O	O*3	1.1
1983	0.6	0.8	0.0	0.5	1.8	0.4	0.6	0.0	O*4	1.5
1984	0.9	1.0	0.0	0.7	2,6	0.6	0.8	0.0	0.5	2.0
1985	1.3	1.4	0.0	1.1	3.9	()*9	1.0	0.0	0.8	2.7
1986	2.0	1.9	0.0	1.7	5*7	1.3	1.2	0.0	1.1	3.7
1987	3.2	2.5	0.1	2.7	8.4	1.9	1.5	0.0	1.6	5.1
1988	4.9	3.3	0.1	4.2	12.5	2.7	1.9	0.1	2.4	7,0
1989	7.5	4.4	0.2	6.6	18.7	3.9	2.3	0.1	3.4	9.7
1990	11.6	5.9	0.3	10.2	28.0	5.6	2.9	0.1	4.9	13.5
1991	17.9	7.9	0.5	15.9	42.2	8.0	3*5	O*2	7.1	18.9
1992	27.7	10.5	0.9	24.7	63.8	11.5	4.4	O*4	10.3	26.6
1993	42.7	14.0	1.5	38.4	96.7	16.6	5.4	0.6	14.9	37.5
1994	65.9	18.7	2.6	59.7	147*0	23.0	6.8	0.9	21.5	53.0
1995	101.8	25.0	4.5	92.8	224.1	34.1	8.4	1.5	31.1	75.1
1996	157.2	33.4	7.8	144.3	342.7	49.0	10.4	2.4	45.0	106.8
1997	242.7	44.6	13.5	224.4	525.1	70.3	12.9	3*9	65.0	152.1
1998	374.7	59.5	23.3	348.9	806.3	100.9	16.0	6.3	94*O	217.2
1999	578.5	79.3	40.4	542.4	1240.6	144.9	19.9	10.1	135.8	310.7
2000	893.1	16-)5*9	69.9	843.4	1912.3	207.9	24.6	16.3	196.3	445.2

[1]The realvalues are in terms of 1980 dollars.

by 1995, 51 percent by 1998, and 100 percent by 2000. This suggests that the levels of foreign harvesting. activity will be maintained near current levels through the early 1990s.

Incidental catch tends to be a function of directed catch, therefore foreign incidental catch is projected to decrease very gradually until the mid 1990s. As the foreign groundfish fishery is replaced by the domestic fishery, domestic incidental catch will tend to increase; however, the domestic incidental catch is not expected to become large enough with respect to projected directed catch to significantly affect domestic landings. This expectation is in part based on the ability of a management agency, such as the NPFMC, to limit incidental catch and its propensity to do so when incidental catch significantly affects the resources available to a directed fishery.

Processing,

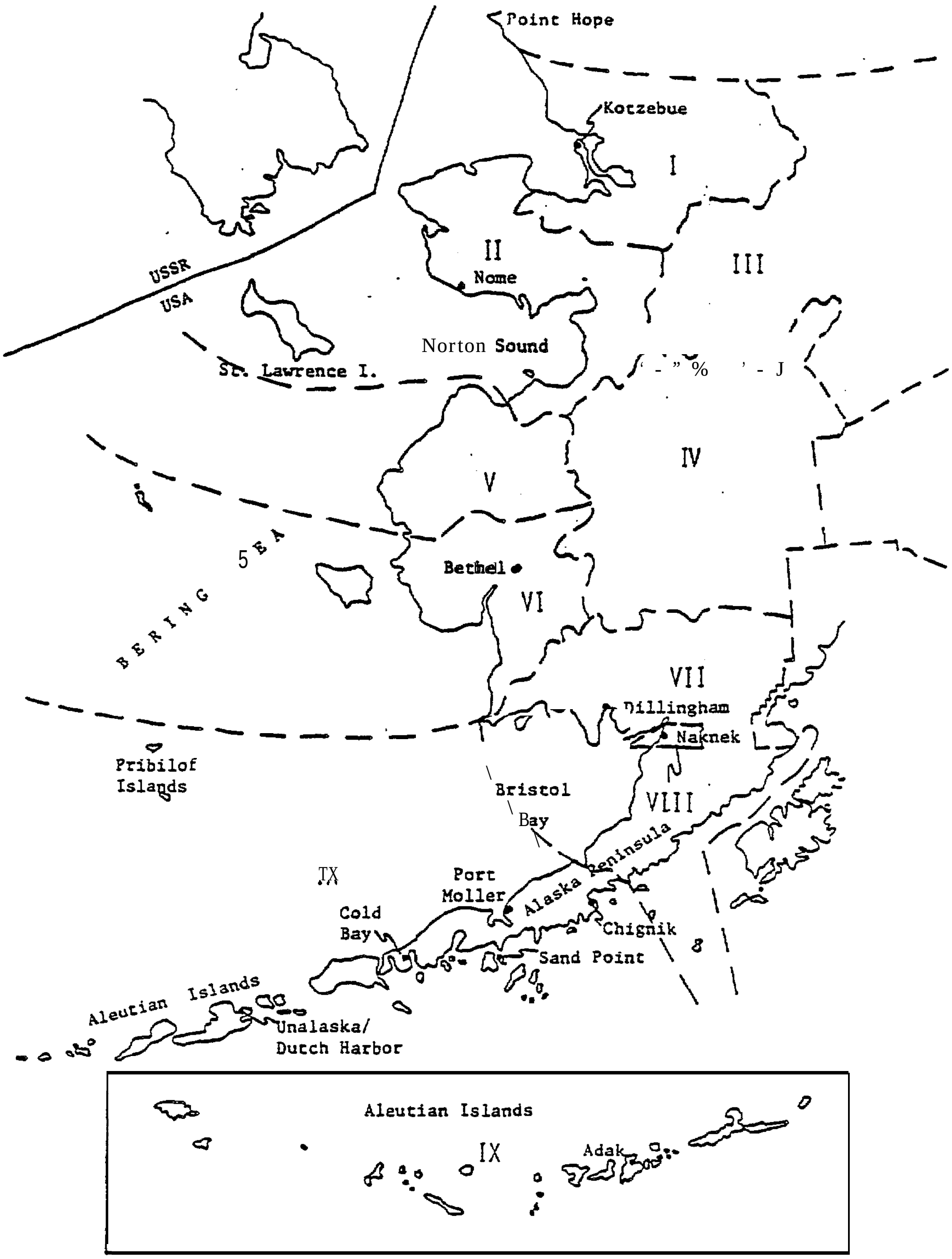
This section contains projections of seafood processing plant employment and wages by census division. The projections are based on the 1978 harvest for the adjacent management area(s), the 1978 employment and wage statistics for manufacturing, and the projected harvests for the adjacent management area(s). The 1978 statistics provided the most current measures of the relationships between harvest levels and processing employment available when the employment projections were made. Two sets of projections are presented for the traditional fisheries and a separate set of projections is presented for the groundfish industry.

The two sets of projections for the traditional fisheries are referred to as the high and low projections. The former are based on the assumption that labor requirements per unit of fish processed will not change, arid the latter are based on the assumption that per unit labor requirements decrease at an annual rate of 2 percent. Projections have not been made of processing plant water and electric power requirements because processing plants often provide their own sources of water and electric power, because the requirements are typically not expected to exceed historical levels, and because the rates of change for these inputs are expected to parallel those for labor.

A more detailed discussion of the method used to project employment and wages appears in Chapter II. The census areas of Western Alaska are depicted in Figure 4.1.

ALEUTIAN ISLANDS CENSUS DIVISION

The management areas adjacent to the Aleutian Islands Census Division consist of the Peninsula, Eastern Aleutians, Western Aleutians, and the Bering Sea shellfish management areas; the Chignik and Peninsula salmon management areas, and the Chirikof, Shumagin, Aleutian, and Bering Sea halibut and groundfish management areas. Although the harvests from these management areas are not exclusively landed and processed in the Aleutian Islands Census Division, processing activities in this census division are projected to change proportionately with the harvest from these management areas.



Census Division Boundaries

I Kobuk	IV Kuskokwim	VII Bristol Bay
II Nome	V Wade Hampton	VIII Bristol Bay Borough
III Yukon-Koyukuk	VI Bethel	IX Aleutian Islands

Figure 4.1 : Alaska Census Divisions

The high projections indicate that annual employment will increase from 1,820 man years in 1980 to 2,188 man years in 2000 and that annual real wages will increase from $30.7 million to $40.8 million in the processing sector of the traditional fisheries (see Table 4.107). The low projections call for employment to decrease from 1,748 in 1980 to 1,403 in 2000 and for real wages to decrease from $29.5 million to $26.2 million. Projections of the cumulative and annual percentage changes in projected employment and wages appear in Tables 4.108 and 4.109.

The domestic groundfish industry is also projected to generate significant employment in the Aleutian Island Census Division because the onshore processing and support activities associated with the Western Alaska groundfish harvest are expected to be concentrated in this area. The reasons for expecting this include the following: processing activity of the Aleutian and Bering Sea shellfish fisheries, which have fishing boats and fishing grounds similar to those to be utilized in the groundfish fishery, is heavily concentrated in this area; with the exception of this area, there are few deep water harbors in the general proximity of the major groundfish fishing grounds; and the State of Alaska has identified this area a one in which to concentrate its groundfish development efforts.

The projections for 2000 indicate that the Bering Sea and Chirikof/Shumagin groundfish harvests will result in 20 onshore processing plants, which will employ 8,206 individuals and pay real wages of $95 million; and they will result in a fleet of catcher/processors which will employ

Table 4. 107
Aleutian Islands Census Division
Projected Processing Plant Employment and Wages
1980-2000 ' "

Year	Total Harvest (1 ,000 Pounds)	High Projections: Man Years	High Projections: Wages Nominal	High Projections: Wages Real[1]	Low Projections: Man Years	Low Projections: Wages Nominal	Low Projections: Wages Real
1980	328563	1820	30727?88	30727288	1748	29510487	295104I37
1981	329898	1827	33351?49	31007112	1720	31389928	29183645
1982	331324	1835	36208519	31297467	1693	33397505	288(57787
1983	332848	1843	39321391	31599231	1666	35543422	28563201
1984	334477	1852	42714549	31913371	1641	37838357	28270216
1985	3362?3	1862	46415377	32240959	1617	40294373	27989199
1986	338360	1874	50494012	32608825	1594	42958437	27742382
1987	340661	1887	54955083	32995321	1573	45818676	27509774
1988	343138	1900	59838538	33402170	1553	48892441	27292004
1989	345810	1915	65189179	33831280	1534	52199017	27089765
1990	348695	1931	71(-)57359	34284766	1515	55759896	26903828
1991	351813	1948	77499[100	34764976	1498	59599079	26735043
1992	355186	1967	84580528	35274507	1483	63743430	26584347
1993	358839	1987	92371999	35816250	1468	6R223101	26452774
1994	362800	2009	100956380	36393411	1454	73071996	26341467
1995	367100	2033	110427110	37009558	1442	78328346	26251683
1996	371"/71	2059	120890640	37668655	1431	84035353	26184811
1997	376851	2087	13?468620	38375111	1422	90241941	26142376
1998	382382	2118	]45300330	39133838	1414	97003655	26126061
1999	388410	2151	15954569(-I	39950-307	1407	104383690	26137719
2000	394986	2188	175388690	40830608	1403	112454080	26179308

[1] Real values are in terms of 1980 dollars.

Table 4.108
Aleutian Islands Census Division
Processing Plant Employment and Wages
Projected Cumulative Percentage Change from 1978 Levels
1980-2000

	High Projections			Low Projections		
		Wages			Wages	
Year	Man Years	Nominal	Real	Man Years	Nominal	Real
1980	12.3	31.2	6.8	7.8	26.0	2.6
1981	12.7	42.4	7.8	6.1	34.0	1.4
1982	13.2	54.6	8.8	4.4	42.6	0.3
1983	13.7	67.9	9.8	2.8	51.7	-0.7
1984	14.3	82.4	10.9	1.2	61.5	-1.8
1985	14.9	98.2	12.0	-0.3	72.0	-2.7
1986	15.6	115.6	13.3	-1.6	83.4	-3.6
1987	16.4	134.6	14.7	-3*O	95.6	-4*4
1988	17.2	155.5	16.1	-4.2	108.7	-5.2
1989	18.2	178.3	17.6	-5.4	122.8	-5.9
1990	19.1	203.4	19.1	-6.5	138.1	-6.5
1991	20.2	230.9	20.8	-7.6	154.4	-7.1
1992	21.4	261.1	22.6	-8.5	172.1	-7.6
1993	22.6	294.4	24.5	-9.4	191.3	-8.1
1994	24.0	331.0	26.5	-10.3	212.0	-8.5
1995	25.4	371.4	28.6	-11.0	234.4	-8.8
1996	27.0	416.1	30.9	-11.7	258.8	-9.0
1997	28.8	465.5	33.4	-12.3	285.3	-9.2
1998	30.6	520.3	36.0	-12.8	314.1	-9.2
1999	32.7	581.1	38.8	-13.2	345.6	-9.2
2000	35.0	648.8	41.9	-13*5	380.1	-9*O

Table 4.109
Aleutian Islands Census Division
Processing Plant Employment and Wages
Projected Annual Percentage Change
1980-2000

	High Projections			Low Projections		
		Wages			Wages	
Year	Man Years	Nominal	Rea 1	Man Years	Nominal	Real
1980	0	0	0	0	0	0
1981	0.4	8.5	0.9	-1.6	6.4	-1.1
1982	0.4	8.6	0.9	-1.6	6.4	-1*1
1983	0.5	8.6	1,0	-1.5	6.4	-1.1
1984	0*5	8.6	1.0	-1.5	6*5	-1.0
1985	().5	8.7	1.0	-1.5	6.5	-1.0
1986	6-).6	8.8	1.1	-1*4	6.6	-0.9
1987	(-).'7	8.8	1.2	-1.3	6.7	-0.0
1988	().7	8.9	1.2	-1.3	6.7	-O*U
1989	0.8	8.9	1,3	-1.2	6.8	-0.7
1990	()*8	9.(-)	1.3	-102	6*8	-0.7
1991	0.9	9.1	1.4	-1.1	6*9	-0.6
1992	1.0	9.1	1.5	-1.1	7.0	-0.6
1993	1.0	9.2	1.5	-1.0	7.0	-0.5
1994	1.1	9.3	1.6	-0.9	7.1	-0.4
1995	1.2	9.4	1*-?	-0.8	7.2	-0.3
1996	1.3	9.5	1.8	-0.8	7.3	-0.3
1997	1.4	9.6	1.9	-0.7	7.4	-0.2
1998	1.5	9.7	2.0	-0.6	7*5	-0.1
1999	1.6	9.8	2.1	-0.5	7.6	0.0
2000	1.7	9.9	?.2	-0.3	7.7	0.2

3,554 individuals who will receive real wages of $93.3 million (see Tables 4.110 and 4.111). The Aleutian Islands Census Division resident labor force is not large enough to support this level of activity. The urban areas of Alaska and the Pacific Northwest are expected to be primary sources of labor for both onshore and offshore processing.

BRISTOL BAY CENSUS DIVISIONS

The Bristol Bay salmon and herring management areas are adjacent to the Bristol Bay and Bristol Bay Borough Census Divisions, and the harvests from these management areas are the principal determinant of processing activity in these census divisions. Processing activity in this area is almost exclusively limited to salmon and herring. The high projections indicate that employment will increase from 212 man years in 1980 to 308 man years in 2000, and that real wages will increase from $5.5 million to $8.9 million (see Table 4.112). The low projections call for employment to decrease from 203 in 1980 to 197 in 2000 and for real wages to increase from $5.3 million to $5.7 million. The projected cumulative and annual percentage changes in employment and wages are presented in Tables 4.113 and 4.114.

These projections are based on the 1978 and projected salmon harvests in Bristol Bay and on 1978 employment and wage statistics. The herring harvest for 1978 and the herring projections are not directly used because of the great uncertainty associated with the herring fishery. However, since the herring fishery was active in 1978, the projections

Table 4.110
Projected Bering Sea Groundfish Processing Activity
Inputs and Harvesting Employment
1980-2000

Year	Metric Tons of Groundfish	Number of: Processing Plants	Number of: Fillet Lines	Number of: Processing Plant Employees	Number of: Trawler Fishermen	Number of: Catch/Proc. Fishermen	Number of: Total Employees	Real Wages ($1,000)[1]: Processing Plants	Real Wages ($1,000)[1]: Trawlers	Real Wages ($1,000)[1]: Catcher/Processors	Real Wages ($1,000)[1]: Total
1980	2409	0.0	0.3	9.0	2.7	4.3	16	94	87	102	283
1981	3372	0.0	0.4	12.6	3.7	6.0	22	132	122	143	398
1982	4721	0.0	0.5	17.6	5.2	8.3	31	186	172	200	559
1983	6609	0.1	0.7	24.7	7.3	1106	44	262	242	281	785
1984	9252	0.1	1*O	34.5	10.3	16.2	61	369	340	393	1103
1985	12952	0.1	1.4	48.4	14.4	22.6	85	519	479	551	1549
1986	18132	0.2	2.0	67.7	20.1	31.5	119	731	674	772	2177
1987	25385	0.2	2.8	94.8	28.2	43.9	167	1028	948	1082	3058
1988	35537	0.3	3.9	132.7	39.5	6102	233	1447	1334	1515	4296
1989	49751	0.5	5.5	185.7	55.3	85.4	326	2036	1878	2122	6035
1990	69649	0.6	7.7	260.0	77.4	118.9	456	2865	2642	2971	8478
1991	975(-)6	().9	10.8	364.0	108.3	165.7	638	4031	3718	4159	11908
1992	136504	1.3	15.2	509.6	151.7	230.8	892	5672	5231	5822	16725
1993	191100	1.8	21.2	713.5	212.3	321.4	1247	7982	7361	8148	23491
1994	267532	2.5	29.7	998.8	297.3	447.5	1744	11231	10358	11401	32990
1995	374533	3.5	41.6	1398.3	416.2	623.1	2438	15804	14575'	15951	46330
1996	524331	4.9	58.3	1957.6	502.4	867.3	3407	22238	20509	22313	65059
1997	734041	6.8	81.6	2740.5	815.6	1207.0	4763	31291	28858	31206	91355
1998	1027627	9.5	114.2	3836.6	1141.8	1679.6	6658	44030	40607	43635	128272
1999	1438635	13.3	159.8	5371.1	1598.5	2336.7	9306	61955	57138	61002	180096
?000	2014029	18.6	223,8	7519.4	2237.8	3250.2	13007	87178	80400	85?64	252843

[1] Real values are in terms of 1980 dollars.

Table 4.111

FW.jetted Chirikof/Shumagin Groundfish Processing Activity
Inputs and Harvesting Employment
1980-2000

Year	Metric Tons of Groundfish	Number of						Real Wages ($1,000)[1]			
		Processing Plants	Fillet Lines	Processing Plant Employees	Trawler Fishermen	Catch/ Proc. Fishermen	Total Employees	Processing Plants	Trawlers	Catcher/ Processors	Total
1980	220	0.0	0.0	0.8	0.2	0.4	1	9	8	9	26
1981	\ 308	O*O	0*O	1.2	0.3	0.6	2	12	11	13	37
1982	432	0.0	0.0	1.6	0,5	0.8	3	17	16	19	51
1983	604	0.0	0.1	2.3	0.7	1.1	4	24	22	26	72
1984	846	0.0	0.1	3.2	0.9	1.5	6	34	31	37	101
1985	1184	0.0	0.1	4*4	1.3	2.1	8	47	44	51	142
1986	1657	0.0	0.2	6.2	1.8	2.9	11	67	62	72	200
1987	2320	0.0	0.3	8.7	2.6	4.1	15	94	87	101	281
1988	3248	0.0	0.4	12.1	3.6	5.7	21	132	122	141	395
1989	4548	0.0	0.5	17.0	5.1	7.9	30	186	172	198	555
1990	6367	0.1	0.7	23.8	7.1	11.1	42	262	242	277	780
1991	8913	0.1	1.0	33.3	9*9	15.4	59	368	340	388	1096
1992	12478	0.1	1.4	46.6	13.9	21.5	82	519	478	543	1540
1993	17468	0.2	1.9	65.2	19.4	30.0	115	730	673	761	2163
1994	24455	0.2	2.7	91.3	27.2	41.8	160	1027	947	1065	3039
1995	34236	0.3	3.8	127.8	38.0	58.2	224	1445	1332	1491	4268
1996	47929	0.4	5.3	178.9	53.3	81.1	313	2033	1875	2087	5995
1997	67099	0.6	7.5	250.5	74.6	112.9	438	2860	2638	2921	8419
1998	93936	().9	10.4	350.7	104.4	157.2	612	4025	3712	4088	11824
1999	131506	1.2	14.6	491.0	146.1	218.9	856	5663	5223	5719	16606
2000	184103	1.7	20.5	687.3	204.6	304,7	1197	7969	7349	8000	23319

[1] Real values are in terms of 1980 dollars.

Table 4.112
Bristol Bay Census Divisions
Projected Processing Plant Employment and Wages
1980-2000

Year	Total Harvest (1,000 Pounds)	High Projections Man Years	High Projections Wages Nominal	High Projections Wages Real[1]	Low Projections Man Years	Low Projections Wages Nominal	Low Projections Wages Real
1980	54242	212	5513614	5513614	203	5295275	5295275
1981	55132	215	6057970	5632177	202	5701712	5300960
1982	56038	219	6656294	5753484	202	6139554	5306831
1983	56961	222	7313958	5877601	201	6611239	5312886
1984	57901	226	8036866	6004593	200	7119396	5319123
1985	58858	230	8831513	6134528	199	7666862	5325541
1986	60046	234	9739513	6289738	199	8286018	5351076
1987	61216	239	10733569	6444491	199	8949089	5373080
1988	62411	243	11829541	6603309	199	9665596	5395384
1989	63632	248	13037918	6766299	199	10439870	5417987
1990	64879	253	14370271	6933573	199	11276592	5440890
1991	66154	258	15839365	7105246	198	12180826	5464093
1992	67456	263	17459284	72131435	198	13158048	5487595
1993	68785	268	1?245565	746?261	198	14214179	5511395
1994	70144	274	21215352”	7647848	198	15355623	5535494
1995	71532	279	23387561	7838323	198	16589305	5559892
1996	72950	285	25783060	8033816	198	17922715	5584589
1997	74398	290	28424880	8234463	198	19363954	5609584
1998	75878	296	31338426	844(-)400	198	20921782	5634878
1999	77389	302	34551736	8651769	198	22605672	5660470
2000	78934	308	38095746	8868716	197	24425874	5686360

[1] Real values are in terms of 1980 dollars.

Table 4.113
Bristol Bay Census Divisions
Processing Plant Employment and Wages
Projected Cumulative Percentage Change from 1978 Levels
1980-2000

Year	High Projections			Low Projections		
		Wages			Wages	
	Man Years	Nominal	Real	Man Years	Nominal	Real
1980	-40.9	-30.9	-43.8	-43.2	-33.7	-46.0
1981	-39.9	-24.1	-42.6	-43*5	-28.6	-46.0
1982	-38.9	-16.6	-41.3	-43.7	-23.1	-45.9
1983	-37.9	-8.4	-40.1	-43.9	-17.2	-45.8
1984	-36.9	(-).7	-38.8	-44* 1	-10.8	-45.8
1985	-35.9	10.6	-37.5	-44.3	.-4.0	-45.7
1986	-34.6	22.0	-35,9	-44.3	3.8	-45*4
1987	-33.3	34*4	-34.3	-44*4	12.1	-45.2
1988	-32.0	48.2	-32.7	-44.4	21.1	-45*O
1989	-30.7	63.3	-31.0	-44*5	30.8	-44.8
1990	-29.3	80.0	--29.3	-44.5	41*3	-44.5
1991	-27.9	98.4	-27.6	-44.6	52.6	-44.3
1992	-26.5	118.7	-25.8	-44.6	64.8	-44.(I
1993	-25.1	141.1	-23.9	-44.6	78.0	-43.8
1994	-23.6	165.7	-22*O	-44.7	92.3	-43.6
1995	-72.1	193.0	-20.1	-44.7	107.8	-43.3
1996	-20.5	223.0	-18.1	-44.7	124.5	-43.1
1997	-18.9	256.0	-16.0	-44.8	142.6	-42.8
1998	-17.3	292.5	-13.9	-44*8	162.1	-42.5
1999	-15.7	332.8	-11.8	-44.8	183.2	-42.3
2000	-14.0	377.2	-9.6	-44.9	206.0	-42.0

Table 4.1.4
Bristol Bay Census Divisions
Processing Plant Employment and Wages
Projected Annual Percentage Change
1980-2000

	High Projections			Low Projections		
		Wages			Wages	
Year	Man Years	Nominal	Real	Man Years	Nominal	Real
1980	0	0	0	0	0	0
1981	1.6	9.9	2.2	-0.4	7.7	0.1
1982	1.6	9.9	2.2	-0.4	7.7	0.1
1983	1.6	9.9	2.2	-0.4	7.7	0.1
1984	1.7	9.9	2.2	-0.4	7.7	0.1
1985	1.7	9.9	2.2	-0.4	7.7	0.1
1986	2.0	10.3	2.5	-0.0	8.1	0.5
1987	1.9	10.2	2.5	-0.1	8.0	0.4
1988	2.0	10.2	2.5	-0.1	8.0	0.4
1989	2.0	10.2	2.5	-0.1	8.0	0.4
1990	2.0	10.2	2.5	0.1	8.0	0.4
1991	2.0	10.2	2.5	-0.1	8.0	0.4
1992	2.0	10.2	2.5	-0.1	8.0	0.4
1993	2.0	10.2	2.5	-0.1	8.0	0.4
1994	2.0	10.2	2.5	-0.1	8.0	0.4
1995	2.0	10.2	2.5	-0.1	8.0	0.4
1996	2.0	10.2	2.5	-0.1	8.0	0.4
1997	2.0	10.2	2.5	-0.1	8.0	0.4
1998	2.0	10.2	2.5	-0.1	8.0	0.5
1999	2.0	10.3	2.5	-0.0	8.0	0.5
2000	2.0	10.3	2.5	-0.0	8.1	0.5

implicitly allow for processing activity associated with the herring fishery and assume that such activities will increase proportionately with the salmon harvest.

BETHEL CENSUS DIVISION

The Kuskokwim salmon and herring management areas are adjacent to the Bethel Census Division, and the harvest from these management areas is a principal determinant of processing activity within this census division. The high projections indicate that employment will increase from 49 man years in 1980 to 72 man years in 2000 and that real wages will increase from $0.4 million to $0.6 million (see Table 4.115). The low projections call for employment to remain at approximately 47 man years from 1980 to 2000 and for real wages to increase from $0.39 million to $0.42 million. The projected cumulative and annual percentage rates of change are presented in Tables 4.116 and 4.117. These projections are similar to the Bristol Bay projections in that they are based on the 1978 and projected salmon harvests.

WADE HAMPTON CENSUS DIVISION

The Yukon Management Area commercial salmon harvest has been a principal determinant of processing activity in the Wade Hampton Census Division. Although processing activity may result from the herring and groundfish fisheries which may develop in the areas of the Bering Sea adjacent to this census division, the nature of that activity is too speculative

Table 4.115
Bethel Census Division
Projected Processing Plant Employment and Wages
1980-2000

Year	Total Harvest (1,000 Pounds)	High Projections			Low Projections		
			Wages			Wages	
		Man Years	Nominal	Real[1]	Man Years	Nominal	Real
1980	3157	49	403150	403150	47	387185	387185
1981	3218	50	444250	413025	47	418124	388736
1982	3280	51	489569	423167	47	4S1562	390316
1983	3344	52	539542	433584	47	487704	391926
1984	3410	53	594653	444284	47	526769	393565
1985	3476	54	655431	455274	47	568996	395235
1986	3545	55	7?2463	466564	47	614645	396935
1987	3615	56	796398	478162	47	663995	398666
1988	3686	57	877951	490077	47	717350	400428
1989	3760	58	967911	502318	46	775037	402222
1990	3834	59	1067152	514895	46	837412	404046
1991	3911	60	1176636	527817	46	9(34859	405903
1992	3989	62	1297428	541095	46	977796	407792
1993	4070	63	1430702	554739	46	1056672	409713
1994	4152	64	1577758	568760	46	1141978	411667
1995	4236	65	1740029	583169	46	1234240	413655
1996	4321	67	1919099	597977	46	1334034	415675
1997	4409	68	2116719	613197	46	1441978	417730
1998	449c)	69	2334821	628839	46	1558745	419818
1999	4591	71	2575542	644917	46	1685063	421941
2000	4685	72	2841242	661443	46	1821721	424098

[1] Real values are in terms of 1980 dollars.

Table 4.116
Bethel Census Division
Processing Plant Employment and Wages
Projected Cumulative Percentage Change from 1978 Levels
1980-2000

Year	High Projections			Low Projections		
		Wages			Wages	
	Nan Years	Nominal	Real	Man Years	Nominal	Rea 1
1980	-23.8	-11.0	-27.5	-26.8	-14.5	-30.4
1981	-22.4	-1.9	-25.8	-26.9	-7.7	-30.1
1982	-20.8	8.1	-23.9	-27.0	-O*3	-29.9
1983	-19.3	19.1	-22.1	-27.1	7.7	-29.6
1984	-17,7	31.3	-20.2	-27.1	16.3	-29.3
1985	-16.1	44.7	-18.2	-27.2	25.6	-29.0
1986	-14.5	59.5	-16.1	-27.2	35.7	-28.7
1987	-12.8	75.8	-14.1	-27.3	46.6	-28.4
1988	-11.0	93.8	-11.9	-27.3	58.4	-28.0
1989	-9.3	113.7	-9*7	-27.4	71.1	-27.7
1990	-7.5	135.6	-7*5	-27,4	84.9	-27.4
1991	-5.6	159.8	-5.1	-27.4	99.8	-27.1
1992	-3.7	186.5	-2.8	-27.4	115.9	-26.7
1993	-1.8	215.9	-0,3	-27.5	133.3	-26.4
1994	0.2	248.3	2.2	-27.5	152.1	-26.0
1995	2..?	284.2	4.8	-27.5	172.5	-25.7
1996	4.3	323.7	7.5	-27.5	194.5	-25.3
1997	6.4	367.3	10.2	-27.5	218.4	-24.9
1998	8.6	415.5	13.0	-27*5	244.1	-24.6
1999	10.8	468.6	15.9	-27.5	272.0	-24.2
2000	13.1	527.3	18.9	-27.5	302.2	-23.8

Table 4.117
Bethel Census Division
Processing Plant Employment and Wages
Projected Annual Percentage Change
1980-2000

Year	High Projections: Man Years	High Projections: Wages Nominal	High Projections: Wages Real	Low Projections: Man Years	Low Projections: Wages Nominal	Low Projections: Wages Real
1980	0	0	0	0	0	0
1981	1.9	10.2	2.4	-0.1	8.0	0.4
1982	1.9	10.2	2.5	-0.1	8.0	0.4
1983	1.9	10.2	2.5	-0.1	8.0	0.4
1984	2.0	10.2	2.5	-0.1	8.0	0.4
1985	2.0	10.2	2.5	-0.1	8.0	0.4
1986	2.0	10.2	2.5	-0.1	8.0	0.4
1987	2.0	10.2	2.5	-0.1	8.0	0.4
1988	2.0	10.2	2.5	-0.1	8.0	0.4
1989	2.0	10.2	2.5	-0.1	8.0	0.4
1990	2.0	10.3	2.5	-0.0	8.0	0.5
1991	2.0	10.3	2.5	-0.0	8.1	0.5
1992	2.0	10.3	2.5	-0.0	8.1	0.5
1993	2.0	10.3	2.5	-0.0	8.1	0.5
1994	2.0	10.3	2.5	-0.0	8.1	0.5
1995	2.0	10.3	2.5	-0.0	8.1	0.5
1996	2.0	10.3	2.5	-0.0	8.1	0.5
1997	2.0	10.3	2.5	-0.0	8.1	0.5
1998	2.0	10.3	2.6	-0.0	8.1	0.5
1999	2.0	10.3	2.6	0.0	8.1	0.5
2000	2.	10.3	2.6	0.0	8.1	0.5

to be included in these projections. The projections are therefore based on the expected commercial salmon harvest.

The high projections indicate that employment will increase from 69 man years in 1980 to 128 man years in 2000, and that real wages will increase from $0.8 million to $1.6 million (see Table 4.118). The low projections call for employment to increase from 66 in 1980 to 82 in 2000 and for real wages to increase from $0.7 million to $1.0 million. Projections of the cumulative and annual percentage changes in employment and wages appear in Tables 4.119 and 4.120. It should be noted that although part of the Yukon Management Area harvest occurs in and is processed in the Yukon/Koyukuk Census Division, harvesting and processing activities within the Wade Hampton Census Division are expected to increase proportionately with the total Yukon Management Area salmon harvest.

NOME CENSUS DIVISION

The processing activity in the Nome Census Division is primarily determined by the salmon and herring harvests in the Norton Sound Management Area. The summer king crab harvest from Norton Sound is not landed in the Nome Census Division and the winter king crab fishery has resulted in minimal processing activity.

The high projections are that employment will increase from 15 man years in 1980 to 20 man years in 2000, and that real wages will increase from $151,000 to $223,000 (see Table 4.121). The low projections are that

Table 4.113
Wade Hampton Census Division
Projected Processing Plant Employment and Wages
1980-2000

Year	Total Harvest (1,000 Pounds)	High Projections: Man Years	High Projections: Wages Nominal	High Projections: Wages Real[1]	Low Projections: Man Years	Low Projections: Wages Nominal	Low Projections: Wages Real
1980	9025	69	758743	758743	66	728697	728697
1981	9540	73	866999	806061	69	816013	758658
1982	10087	77	990980	856571	71	914049	790074
1983	10669	82	1133002	910497	74	1024144	823017
1984	11287	86	1295726	968078	76	11470(39	857564
1985	11944	91	1482210	1029570	79	1286745	893796
1986	12314	94	1651927	1066/308	80	1405398	907600
1987	12583	96	1824841	1095644	80	1521457	913491
1988	12859	98	2015884	1125277	80	1647124	919433
1989	13141	100	2226960	1155727	80	1783197	925427
1990	13430	103	24601”73	1187(-)19	81	1930538	931474
1991	13724	105	2717846	1219175	81	2090094	937573
1992	14026	107	3002550	1252220	81	2262847	943726
1993	14334	110	3317123	1286179	81	2449925	949932
1994	14650	112	3664705	1321077	131	2652505	956192
1995	14972	114	4048763	1356940	01	2871876	962507
1996	15302	117	4473131	1393795	81	3109431	968876
1997	15639	120	4942044	1431671	81	3366681	975301
1998	15984	12?	5460185	1470596	82	3645263	981781
1999	16337	125	6032730	1510598	82	3946948	988317
2000	16698	128	6665397	1551709	82	4273657	994910

[1] Real values are in terms of 1980 dollars.

Table 4.119
Wade Hampton Census Division
Processing Plant Employment and Wages
Projected Cumulative Percentage Change from 1978 Levels
1980-2000

Year	High Projections			Low Projections		
		Wages			Wages	
	Man Years	Nominal	Real	Man Years	Nominal	Real
1980	-18.8	-5.2	-22.8	-22.1	-8.9	-25.9
1981	-14.2	8.4	-18.0	-19.3	2.0	-22.8
1982	-9.3	23.9	-12.8	-16.3	14.3	-19.6
1983	-4.1	41.6	-7.4	-13.3	28.0	-16.3
1984	1.5	62.0	-1.5	-10.1	43.5	-12.7
1985	7.4	85.3	4.8	-6.8	60.8	-9.1
1986	10.7	106.5	8.5	-5.8	75.7	-7.7
1987	13.2	128.1	11.5	-5*7	90.2	-7.1
1988	15.6	152.0	14.5	-5.5	105.9	-6.5
1989	18.2	178.4	17.6	-5.4	122.9	-5.8
1990	20.8	207.5	20.8	-5.2	141.3	-5,2
1991	23.4	239.7	24.0	-5.1	161.3	-4.6
1992	26.1	275.3	27.4	-4.9	182.8	-4.0
1993	28.9	314.6	30.9	-4.8	204.2	-3,3
1994	31.7	358.1	34.4	-4.6	231.6	-2.7
1995	34.6	406.1	38.1	-4.5	259.0	-2.1
1996	37.6	459.1	41.8	-4.3	288.7	-1.4
1997	40.6	517.7	45.7	-4.2	320.8	-0.8
1998	43.7	582.5	49.6	-4*0	355.6	-0.1
1999	46.9	654.1	53.7	-3*9	393.4	0.6
2000	50.2	733.2	57.9	-3.7	434.2	1.2

Table 4.120
Wade Hampton Census Division
Processing Plant Employment and Wages
Projected Annual Percentage Change
1980-2000

	High Projections			Low Projections		
		Wages			Wages	
Year	Man Years	Nominal	Real	Man Years	Nominal	Real
1980	0	0	0	0	0	0
1981	5.-?	14.3	6.2	3.6	12.0	4.1
1982	5.7	14.3	6.3	3.6	12.0	4.1
1983	5.8	14.3	6.3	3.6	12.0	4.2
1984	5.8	14.4	6.3	3."?	12.1	4.2
1985	5.8	14.4	6*4	3.7	12.1	4,2
1986	3.1	11.5	3.6	1.0	9.2	1.5
1987	2.2	10.5	2.7	0.1	8.3	0.6
1988	2.2	10.5	2.7	0.1	8.3	0.7
1989	2.2	10.5	2.7	0*1	8.3	0,7
1990	.?.2	10.5	2.7	0.2	8.3	0.7
1991	2.2	10.5	2.7	0*2	8.3	0.7
1992	2.2	10.5	2.7	0.2	8.3	0*7
1993	2.2	10.5	2.7	0.2	8.3	0.7
1994	2 . ?	10.5	2.7	0.2	8.3	0,7
1995	2.2	10.5	2.7	0.2	8.3	0.7
1996	2.2	10.5	2.7	0.2	8.3	0.7
1997	2.2	10.5	2.?	0.2	8.3	0.7
1998	?.2	10.5	2.7	0.2	8.3	0.7
1999	2.2	10.5	2.7	0.2	8.3	0.7
2000	?.2	10.5	2.7	0.2	8.3	0.7

Table 4.121
Nome Census Division
Projected Processing Plant Employment and Wages
1980-2000

		High Projections			Low Projections		
			Wages			Wages	
Year	Total Harvest (1,000 Pounds)	Man Years	Nominal	Real[1]	Man Years	Nominal	Real
1980	1558	15	151228	151228	15	145239	145239
1981	1632	16	171268	159230	15	161196	149866
1982	1711	17	194116	167787	15	179046	154762
1983	1796	18	220181	176940	16	199026	159940
1984	1885	18	249931	186731	16	221399	165414
1985	1981	19	283905	197206	17	246465	171199
1986	2003	20	310219	200338	17	263923	170440
1987	2008	20	336225	201871	16	280327	168310
1988	2013	20	364412	203417	16	297751	166206
1989	2019	20	394964	204975	16	316260	164130
1990	2024	20	428079	206546	16	335921	162080
1991	2029	20	463973	208130	15	356806	160056
1992	2035	20	502879	209727	15	378990	158059
1993	2040	20	545049	211337	15	402556	156087
1994	2045	20	590757	212960	15	427589	154140
1995	2051	20	640302	214597	14	454180	152218
1996	2056	20	694005	216247	14	482427	150321
1997	2062	20	752215	217911	14	512433	148448
1998	2067	20	815311	219588	14	54430$	146599
1999	2073	20	883704	221280	13	578168	144774
2000	2078	20	957838	222985	13	614138	142972

[1]Real values are in terms of 1980 dollars.

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employment will decrease from 15 to 13, and that real wages will decrease from $145,000 to $143,000. The corresponding cumulative and annual percentage changes appear in Tables 4.122 and 4.123. The projections of processing activity are based on the projected salmon harvests as are the projections for the Bristol Bay, Bethel, Wade Hampton, and Kobuk Census Divisions.

KOBUK CENSUS DIVISION

The Kotzebue Sound Management Area salmon harvest has been and is expected to continue to be, a major determinant of processing activity in the Kobuk Census Division. The annual salmon harvest is projected to average 600 metric tons (1.3 million pounds) between 1980 and 2000. The resulting high projections are that employment will remain stable at 6.5 man years and that real wages will increase from $64,000 to $71,000 (see Table 4.124). The low projections indicate that employment will decrease from 6 in 1980 to 4 in 2000 and that real wages will decrease from $62,000 to $45,000. Projections of the cumulative and annual rates of change in employment and wages appear in Tables 4.125 and 4.126.

The Feasibility of the Non-OCS Projections

With the exception of the groundfish industry, modest rates of growth are projected for 1980 through 2000, and for many fisheries the peak projected levels of harvesting and processing are below record levels. This suggests that for the traditional domestic fisheries the projected

Table 4.122
Nome Census Division
Processing Plant Employment and Wages
Projected Cumulative Percentage Change from 1978 Levels
1980-2000

Year	High Projections: Man Years	High Projections: Wages Nominal	High Projections: Wages Real	Low Projections: Man Years	Low Projections: Wages Nominal	Low Projections: Wages Real
1980	-36.4	-25.7	-39.5	-38.9	-28.6	-41.9
1981	-33.4	-15.8	-36.3	-37.3	-20.8	-40.1
1982	-30.2	-4.6	-32.9	-35.6	-12.0	-38.1
1983	-26.7	8.2	-29.2	-33.8	-2.2	-36.0
1984	-23.0	22.8	-25.3	-31.8	8.8	-33*I3
1985	-19.1	39.5	-21.1	-29.8	21.1	-31.5
1986	-18.3	52.4	-19.9	-30.5	29.7	-31.8
1987	-18.0	65.?	-19.3	-31.7	37.?	-32.7
1988	-17.8	79.1	-18.6	-32.9	46.3	-33.5
1989	-17.'6	94.1	-18.0	-34.0	55.4	-34.4
1990	-17.4	110.3	-17.4	-35.2	65.1	-35.2
1991	-17.2	128.0	-16.8	-36.3	75,3	-36.0
1992	-17.0	147.1	-16.1	-37s4	86.2	-36.8
1993	-16.7	167.8	-15.5	-38.5	97.8	-37.6
1994	-16.5	190.3	-14.8	-39.6	110.1	-38.4
1995	-16.3	214.6	-14.2	-40.6	123.2	-39.1
1996	-16.1	241.0	-13.5	-41.7	137.0	-39*9
1997	-15.9	269.6	-12.8	-42.7	151.8	-40.6
1998	-15.6	300.6	-12.2	-43.7	167.4	-41.4
1999	-15.4	334.2	-11*5	-44.7	184.1	-42.1
2000	-15.2	370.6	-10.8	-45.6	201.R	-42.8

Table 4.123
Nome Census Division
Processing Plant Employment and Wages
Projected Annual Percentage Change
1980-2000

Year	High Projections: Man Years	High Projections: Wages Nominal	High Projections: Wages Real	Low Projections: Man Years	Low Projections: Wages Nominal	Low Projections: Wages Real
1980	0	0	0	0	0	0
1981	4.8	13.3	5.3	2.7	11.0	3.2
1982	4.8	13.3	5.4	2.8	11.1	3.3
1983	4.9	13.4	5.5	2.8	11.2	3.3
1984	5.0	13.5	5.5	2.9	11.2	3.4
1985	5.1	13.6	5.6	3.0	11.3	3.5
1986	1.1	9.3	1.6	-0.9	7.1	-0.4
1987	0.3	8.4	0.8	-1.7	6.2	-1.3
1988	0.3	8.4	0.8	-1.7	6.2	-1.2
1989	0.3	8.4	0.8	-1.7	6.2	-1.2
1990	0.3	8.4	0.8	-1.7	6.2	-1.2
1991	0.3	8.4	0.8	-1.7	6.2	-1.2
1992	0.3	8.4	0.8	-1.7	6.2	-1.2
1993	0.3	8.4	0.8	-1.7	6.2	-1.2
1994	0.3	8.4	0.8	-1.7	6.2	-1.2
1995	0.3	8.4	0.8	-1.7	6.2	-1.2
1996	0.3	8.4	0.8	-1.7	6.2	-1.2
1997	0.3	8.4	0.8	-1.7	6.2	-1.2
1998	0.3	8.4	0.8	-1.7	6.2	-1.2
1999	0.3	8.4	0.8	-1.7	6.2	-1.2
2000	0.3	8.4	0.8	-1.7	6.2	-1.2

Table 4.124
Kobuk Census Division
Projected Processing Plant Employment and Wages
1980-2000

Year	Total Harvest (1,000 Pounds)	High Projections Man Years	High Projections Wages Nominal	High Projections Wages Real[1]	Low Projections Man Years	Low Projections Wages Nominal	Low Projections Wages Real
1980	1320	6	64067	64067	6	61530	61530
1981	1320	6	69257	64389	6	65184	60602
1982	1320	6	74867	64712	6	69055	59688
1983	1320	6	80931	65037	6	73155	58788
1984	1320	6	87486	65364	6	77499	57902
1985	1320	6	94572	65692	6	82101	57029
1986	1320	6	102233	66022	6	86976	56169
1987	1320	6	110514	66353	5	92141	55322
1988	1320	6	119465	66686	5	97612	54487
1989	1320	6	129142	67021	5	103408	53666
1990	1320	6	139603	67357	5	109548	52856
1991	1320	6	150910	67696	5	116053	52059
1992	1320	6	163134	68035	5	122945	51274
1993	1320	6	176348	68377	5	130245	50501
1994	1320	6	190632	68720	5	137979	4974(-J
1995	1320	6	206073	69065	5	146172	48990
1996	1320	6	222765	69412	4	154852	48251
1997	1320	6	240809	69761	4	164(347	47523
1998	1320	6	260315	70111	4	173788	46806
1999	1320	6	281400	70463	4	184108	46101
2000	1320	6	304194	70817	4	195040	45405

[1] Real values are in terms of 1980 dollars.

Table 4.125
Kobuk Census Division
Processing Plant Employment and Wages
Projected Cumulative Percentage Change from 1978 Levels
1980-2000

Year	High Projections: Man Years	High Projections: Wages Nominal	High Projections: Wages Real	Low Projections: Man Years	Low Projections: Wages Nominal	Low Projections: Wages Real
1980	30.7	52.7	24.3	25.5	46.7	19.4
1981	30.7	65.1	24.9	23.0	55.4	17.6
1982	30.7	78.5	25.6	20.5	64.6	15.8
1983	30.7	92.9	26.2	18.1	74.4	14.1
1984	30.7	108.5	26.8	15.8	84.7	12.4
1985	30.7	125.4	27.5	13.5	95.7	10.7
1986	30.7	143.7	28.1	1102	107.3	9.0
1987	30.7	163.4	28.8	9.0	119.6	7*3
1988	30.7	184.8	29.4	6.8	132.7	5.7
1989	30.7	207.8	30.0	4.7	146.5	4.1
1990	30.7	232.8	30.7	2.6	161.1	2*6
1991	30.7	259.7	31.4	0.5	176.6	1.0
1992	30.7	288.9	32.0	-1.5	193.1	-0.5
1993	30.7	320.4	32.7	-3.5	210.5	-2.0
1494	30.7	354.4	33*3	-5.4	228.9	-3.5
1995	30.7	391.2	34.0	-7.3	240.4	-4.9
1996	30.7	431.0	34.7	-9.2	269.1	-6.4
1997	30.7	474.0	35*4	-11.0	291.1	-7*0
1998	30.7	520.5	36.0	-12.7	314.3	-9*2
1999	30.7	570.8	36.7	-14.5	338.9	-10.5
2000	30.7	625.1	3-7.4	-16*2	364.9	-11.9

Table 4.126
Kobuk Census Division
Processing Plant Employment and Wages
Projected Annual Percentage Change
1980-2000

Year	High Projections: Man Years	High Projections: Wages Nominal	High Projections: Wages Real	Low Projections: Man Years	Low Projections: Wages Nominal	Low Projections: Wages Real
1980	0	0	0	0	0	0
1981	0	8.1	0.5	-2.0	5.9	-1.5
1982	0	8.1	0.5	-2*O	5.9	-1,5
1983	0	8.1	0.5	-2.(1	5.9	-1.5
1984	0	8.1	0.5	-2.0	5.9	-1.5
1985	0	8.1	0.5	-2.0	5.9	-1.5
1986	0	8.1	O*5	-2.0	5.9	-1.5
1987	0	8.1	0.5	-2*O	5*9	-1*5
1988	0	8.1	O*5	-2.0	5.9	-1.5
1989	0	8.1	0.5	-2.0	5.9	-1.5
1990	o	8.1	0.5	-2*O	5.9	-1.5
1991	0	8.1	0.5	-2.0	5.9	-1.5
1992	0	8.1	0.5	-2.0	5.9	-1.5
1993	0	8.1	0.5	-2.0	5*9	-1.5
1994	0	8.1	0.5	-2.0	5.9	- 1 * 5
1995	0	8.1	0.5	-2.0	5.9	-1.5
1996	0	8.1	0.5	-2.0	5*9	-1.5
1997	0	8.1	0.5	-2*O	5.9	-1.5
1998	n	8.1	0.5	-2.0	5*9	-1.5
1999	0	8.1	0.5	-2.0	5.9	-1,5
2000	0	8.1	0.5	-2*O	5.9	-1.5

levels of activity will not be constrained by the availability of harvesting or processing capacity or by the infrastructure of coastal communities. During peak harvest years in the cyclical fisheries, there has historically been inadequate capacity since it is not economically feasible to maintain sufficient processing capacity to meet peak year harvests. This situation is expected to continue to exist but perhaps to a lesser extent as fishery management programs become more successful in stabilizing annual harvests and as the ability to transport fish in the round increases.

The groundfish projections are thought to be physically possible, in part both because the groundfish industry in Western Alaska is expected to be self-sufficient with respect to water, electric power, and labor, and because most of the human and physical capital necessary for this industry is expected to be non-local. The real issue is whether the groundfish projections are economically feasible. As is mentioned in Chapter II, there is no consensus with respect to the rate at which the domestic groundfish industry will develop. The projections presented in this chapter are perhaps optimistic in that they assume that the domestic fishery will have completely replaced the foreign fishery by 2000. However, the constant rate of growth used in the projections results in the foreign fishery being replaced at very moderate rates prior to the mid-1990s; in this respect, the projections are not particularly optimistic. The rapid expansion of the king and Tanner crab fleets, which has resulted in very short king crab seasons and which will allow the domestic Tanner crab fishery to rapidly replace the foreign fishery, provides a basis for the rapid development of the domestic groundfish fishery; but market conditions have not yet been sufficiently favorable to attract many idle crabbers into the groundfish fishery. However, once they are, a tremendous increase in harvesting activity can occur in one to two years and provide a level of activity from which further growth could proceed with greater certainty. This suggests that the fishery could experience explosive growth once the market conditions are favorable. The difficulty is that it is not known when this will happen. In the absence of this information, the projections presented in this report are thought to provide a representative scenario of the development of the groundfish industry.

Factors of Change

The future development of the Western Alaska commercial fishing industry will be determined by a large number of interdependent environmental, market, and governmental factors. This section consists of a summary and brief discussion of what are thought to be the most critical factors.

ENVIRONMENTAL FACTORS

Resource abundance is a principle determinant of harvesting and processing activity. It is a binding constraint on activity and/or a principal determinant of the profitability of such activity in all commercial fisheries. The often rudimentary measures of resource abundance which are used indicate that resource abundance can change rapidly in response to fishing pressure or changes in oceanographic and biological conditions. Cyclical fluctuations with varying degrees of regularity have been observed for some species; for other species, the fluctuations appear to be somewhat random with respect to time. The potential for dramatic fluctuations is thought to be higher in an area at the extreme of a species' environment; Western Alaska includes such areas for a number of species. Typically, the more narrowly fisheries are defined the greater the fluctuations in resource abundance because the location of stocks can vary and because aggregation tends to reduce fluctuations. For example, resource abundance in the salmon fishery of Western Alaska as a whole is expected to be more stable than that in the Bristol Bay red salmon fishery.

Although it is recognized that resource abundance will fluctuate, there are reasons to believe that the total stocks of some species or the proportions of the stocks available to domestic fisheries will increase. Salmon run sizes are expected to increase as a result of enhancement and rehabilitation programs and decreased foreign high seas interceptions of Alaska salmon; and in some areas decreases in subsistence harvests may allow increases in commercial harvests. Time and area closures which have reduced the incidental harvest of halibut and restrictive quotas are expected to allow a gradual, but only partial recovery of the Western Alaska halibut stocks. For the remaining species, there do not appear to be strong justifications for expecting secular increases or decreases in resource abundance during the forecast period. However, the proportions of Tanner crab, groundfish, and herring resources available to the domestic commercial fishing industry are expected to increase.

MARKET FACTORS

The level of harvesting and processing activity and/or the profitability of such activity is determined by the prices received for the products of this activity and the prices of inputs used in conducting these activities. The former prices are determined by the supply of and demand for seafood products. The latter prices are primarily determined by exogenous factors; for example, the price of diesel fuel is not measurably affected by the Western Alaska commercial fishing industry. The demand for seafood products is similarly determined by exogenous factors such as the levels of real income and the consumer price indexes in the U.S. and in Japan and the foreign exchange rate.

Japan and the U.S. are currently the principal markets for Alaska seafood products. The Japanese demand for these products tends to be directly related to income in Japan and the exchange rate (Yen/Dollar), and it tends to be inversely related to other supplies of seafood products. The U.S. demand for seafood products appears to be pro-cyclical, that is, it reflects the cyclical patterns of the national economy. A partial explanation of this is that a large proportion of the seafood consumed in the U.S. is consumed in restaurants and expenditures at restaurants tend to be pro-cyclical. Although U.S. and Japanese demand for Alaska seafood products is expected to increase over time, cyclical increases and decreases will occur. In an attempt to increase the overall demand for these products and to decrease the magnitude of the cycles, new markets are being developed. It is not yet known how successful this attempt will be.

The joint ventures that are underway between U.S. and Soviet and between U.S. and Korean firms are examples of new markets that are being developed. In these joint ventures, U.S. groundfish trawlers are delivering fish to foreign processing ships on the fishing grounds. These direct sales are beneficial to domestic fishermen because the domestic exvessel demand for groundfish is currently not adequate to cover the higher cost of delivering fish to onshore processors. To the extent that joint ventures provide U.S. fishermen an opportunity to develop groundfish fishing skills, they will tend to promote the development of the domestic groundfish industry.

A factor which has been receiving more attention as the industry has sought to find new markets and strengthen existing ones is product quality. Quality control problems have reportedly both reduced the Japanese demand for Alaska salmon and prevented market development in Europe. The State of Alaska and the commercial fishing industry are reviewing the benefits of improved quality control for groundfish as well as for salmon; and it is anticipated that programs to improve the quality and marketability of Alaska seafood products will appear.

Market development activities are expected to provide improved markets for heavily exploited species and to provide marketing opportunities for underutilized species. For example, the surf clam resources of the Alaska Peninsula are capable of supporting six to ten boats for three to four months per year in a $5.9 million fishery (Alaska Fisherman Journal, July 1980). During the next twenty years new fisheries are expected to develop and broaden the base of the Western Alaska commercial fishing industry; the groundfish, herring, and clam fisheries are expected to be among such fishing. The underutilized fishery resources of the Bering Sea can potentially support a variety of fisheries. The development of many of these fisheries will however be dependent on marketing efforts the timing of which is not known. The development of the Tanner crab fishery provides an example of an underutilized species becoming the base of a major fishery. In 1965, Japan and the Soviet Union harvested 1,853 metric tons (4.1 million pounds) of Tanner crab in the Eastern Bering Sea (Orth 1979) and domestic fishermen did not harvest any Tanner crab (ADF&G 1979); but by 1979 a domestic harvest which exceeded 39,500 metric tons (87 million pounds) and had an exvessel value of over $40 million was taken in Western Alaska by a fleet of over 135 vessels. Just as the Tanner crab fishery of the 1970s was not foreseen in the early 1960s, the new fisheries of the late 1980s or 1990s cannot be readily identified today.

Factors which have become increasingly important with respect to the exvessel supply of fish are increasing fuel costs and increasing investments in vessels. Both have tended to decrease the return on vessels in fisheries for-which exvessel prices and stocks are relatively stable or declining. Limited entry has prevented an increase in the size of the salmon fleets but has not prevented increases in vessel investment and fishing power. Limited entry has not yet been extended to the other commercial fisheries of Western Alaska; therefore with few exceptions, fleet sizes have continued to grow. The combination of increasing fuel costs, increasing investments in vessels, and nonincreasing gross earnings will decrease the profitability of a fishery and will eventually limit entry. The absence of a large profit margin will also mean that during bad years a relatively large number of vessels may be forced out of a fishery.

GOVERNMENTAL FACTORS

There is a large number of state and federal programs that are intended to benefit commercial fisheries and fishermen. These programs assist in financing capital expenditures, provide information, assist in market development, provide ports and harbors and navigational aids and rescue services, and attempt to manage fishery resources. Such programs are expected to exist throughout the forecast period and perhaps be improved as government becomes more aware of how these programs affect commercial fisheries.

There are other government programs that are not specifically designed to benefit commercial fisheries. The water quality control programs of the Environmental Protection Agency (EPA) are included in this category. These programs benefit the commercial fishing industry by decreasing water quality degradation by other industries, but in the short-run they also appear to hinder the industry by regulating the methods seafood processing plants use to dispose of seafood waste. The industry has suggested that EPA waste disposal regulations that require the finer screening of waste before it is discharged would be so costly that a large number of processing plants would become unprofitable to operate and would be closed. Partially as the result of the political pressure of the industry, the screening requirements for processing plants in non-remote areas were temporarily revoked during 1980. The result was that non-remote plants did not have to meet the stricter screening requirements during 1980. The discharge requirements for remote areas appear not to be sufficiently stringent to disrupt the industry. The industry has submitted data to support its claim that the stricter screening requirements are not cost effective and it will no doubt continue to exert political pressure to minimize the requirements to be met by processing plants. The latter combined with the ability of Kodiak processing plants to meet the stricter screening requirements suggest that EPA regulations will not significantly affect the ability of seafood processing plants to operate in Western Alaska. A more complete discussion of governmental programs which affect the commercial fishing industry is included in Appendix B.

The prospects for development of the Western Alaska commercial fishing industry during the next twenty years are promising. The high valued species which are now heavily exploited are expected to continue to support fisheries which dominate Alaska commercial fisheries and which produce a significant portion of the total value of a?? U.S. commercial landings; and the species which have been underutilized by the domestic fishing industry provide the potential for both significant growth and an increasingly important role for Western Alaska fisheries relative to Alaska and U.S. fisheries as a whole.

V. POTENTIAL IMPACTS OF ALTERNATIVE LEVELS OF OCS DEVELOPMENT

Competition between the commercial fishing and OCS petroleum industries for labor, ocean space use, and the services provided by the infrastructures of coastal communities can impact the development of a commercial fishing industry. The objective of this chapter is to analyze the potential impacts on the commercial fishing industries of Western Alaska that may result from alternative hypothesized levels of OCS activity pursuant to Lease Sale No. 57. The method used to meet this objective is as follows:

- The characteristics of the hypothesized OCS activity and the projected impacts on the population, employment, and infrastructure of the coastal communities as presented in other studies program reports are summarized.

- Past experiences of interactions between the offshore oil and commercial fishing industries and economic analysis are used to identify potential impacts.

- The hypothesized characteristics of the development of the commercial fishing and OCS industries are compared in light of past experiences to determine the types of impacts that may occur.

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The impacts that are considered are those on:

- Catch by species by weight and value.
- Level of fishing effort (number of vessels by type, employment, and income).
- Level of processing effort (number of plants by type, employment and income).
- Local participation in harvesting and processing.
- Fish markets.
- Capacity, suitability and location of local ports, harbors, processing plants, fleets, and public services.
- Siting and public service requirements of commercial harbors and *onshore* processing plants.
- Areas of conflict in ocean and harbor space use.
- Frequency and seasonality of ocean space and harbor use.
- Conflicts between recreational and commercial fishing activities.

- Organization of the commercial fishing industry and current economic and political trends of significance to the industry.

As is noted in Chapter I, there are serious limitations on the degree to which quantitative projections of impacts can be made. For this reason, the discussion of potential impacts is typically discussed in qualitative rather than quantitative terms.

The Hypothesized Characteristics of OCS Development

In order to analyze the potential impact of OCS development, it is necessary to know what the characteristics of the OCS and commercial fishing industries and coastal communities are expected to be. The projected characteristics of the commercial fishing industries of the study area are presented in Chapter IV. The projected characteristics of OCS development and of the coastal communities as described in other SESP reports are summarized in this section and subsequent sections by OCS development scenario. The reports from which the summaries are drawn were written in preparation of the following SESP reports:

- Technical Report Number 49
  Bering-Norton
  Petroleum Development Scenarios
- Technical Report Number 50
  Bering-Norton
  Petroleum Development Scenarios
  Economic and Demographic Analysis

- Technical Report Number 52
  Bering-Norton
  Petroleum Development Scenarios
  Transportation Systems Analysis

- Technical Report Number 53
  Bering-Norton
  Petroleum Development Scenarios
  Local Socioeconomic Systems Analysis

- Technical Report Number 54
  Bering-Norton
  Petroleum Development Scenarios
  Sociocultural Systems Analysis

These reports describe the hypothesized OCS activity and project the potential impacts that alternative levels of OCS development may have on the environments in which the commercial fisheries operate. These reports, therefore, provide information which serves as a basis for the analysis of the potential impacts on the fishing industries.

The four alternative levels of OCS development to be considered will be referred to as the exploration only case and the low, mean, and high find cases. The latter three are generated from the 95 percent, mean, and 5 percent probability resource level scenarios, respectively. The low find case encompasses the OCS development that is expected to occur if the actual level of the recoverable resources is found to be no greater than that which is thought to have a 95 percent probability of existing. Similarly, the high find case encompasses the OCS development that is expected to occur if the actual level of the recoverable resources is found to equal that which is thought to have at most a 5 percent probability of existing. The mean find case is associated with a statistical mean level of recoverable resources.

With the exception of the exploration only case in which OCS activities associated with Lease Sale Number 57 are hypothesized to end after three years of unsuccessful attempts to discover commercially viable oil or gas fields, the OCS development scenarios presented in Technical Report Number 49 differ only in magnitude and in the placement of oil and gas fields. The hypotheses shared by the three scenarios are as follow:

- Commercial discoveries of oil and gas occur.
- Pipelines are used to transport oil and gas to onshore facilities at Cape Nome.
- A crude oil marine terminal with offshore berthing and a liquid natural gas (LNG) plant will be located at Cape Nome.
- The exploration phase involves aerial support and light supply transshipment provided from a service base in Nome, storage barges and freighters moored in Norton Sound, and an Aleutian Island storage and transshipment facility.
- A forward service base supporting development and production activities is constructed adjacent to the other Cape Nome facilities; and development activities are also supported by storage and accommodation barges and freighters moored in Norton Sound, and a rear support base located in the Aleutian Islands.

- The drilling season will be extended to a maximum of eight months by the use of ice-breaker support.

- Onshore petroleum development will occur as a self-contained enclave, in a fashion similar to that at Prudhoe Bay. Onshore work crews will be rotated to and from the Cape Nome facilities on a ?4 day cycle. They will live in dormitory housing provided by the oil industry while on duty. This assumption is presented in Technical Report Number 53.

The magnitude of these OCS activities as reported in Technical Report Number 49 and the resulting impacts on population, employment, and transportation systems as presented in Technical Reports Number 50, 52, and 53 are summarized below by scenario.

EXPLORATION ONLY CASE

The exploration activities are hypothesized to begin in 1983, end in 1985, and result in eight wells, two of which will be drilled with conventional rigs from summer-constructed gravel islands. The marine traffic generated by these activities is summarized in Table 5.1. The associated population and employment impacts for the Nome/Wade Hampton Census Divisions are expected to be minimal (see Table 5.2).

Table 5.1

Exploration Only Case
Marine Traffic Generated by OCS Activity
1983-2000

Year	Linehaul Vessels	Linehaul Lighters (Arrivals/Year)	Coastal Lighters	Supply Boats (Trips/Month)	Gravel Barges (Trips/Year)	Pipeline Lay and Bury Barges Number Onsite)	Oil & Tankers (Department/Year)
1983	3	50	0	24	86	0	0
1984	6	99	0	48	86	0	0
1985	2	50	0	24	0	0	0
1986	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0

Source: Peat, Marwick, Mitchell & Co. and James D. Lindsay & Associates, 1980.

NOTE: These estimates do not include 15 to 19 linehaul vessel arrivals, 143 to 184 linehaul lighter vessel arrivals, or 16 to 21 coastal lighter vessel arrivals that are expected to occur in the absence of Lease Sale No. 57.

Table 5.2
Nome/Wade Hampton Census Division
Exploration Only Case
Projected OCS Population and Employment Impacts
1980-2000

Year	Population		Employment		Increment		Percentage Increment		Annual Percentage Change				Cumulative Percentage Change			
									Population		Employment		Population		Employment	
	Without OCS	with OCS	Without OCS	With OCS	Population	Employment	Pop.	Employment	Without OCS	With OCS	Without OCS	With OCS	Without OCS	With OCS	Without OCS	With OCS
1980	11846	11846	3080	3080	0	0	0	0	0	0	0	0	0	0	0	0
1981	11776	11776	3054	3054	0	0	0	0	-0.6	-0.6	-0.8	-0.8	-0.6	-0.6	-0.8	-0.8
1982	11511	11541	2962	2962	0	0	0	0	-2.3	-2.3	-3.0	-3.0	-2.8	-2.8	-3.8	-3.8
1983	11752	11846	3034	3081	94	47	0.8	1.5	2.1	2.9	2.4	4.0	-0.8	0	-1.5	0.0
1984	12406	12634	3227	3331	198	04	1.6	3.2	5.6	6.4	6.4	8.1	4.7	6.4	4.8	8.1
1985	12525	[illegible]	3260	3318	108	58	0.9	1.8	1.0	0.2	1.0	-0.4	5.7	6.6	5.8	7.7
1986	12517	[illegible]	3259	3260	6	1	0.0	0.0	-0.1	-0.9	-0.0	-1.7	5.7	5.7	5.8	5.8
1987	12556	12559	3289	3289	3	0	0.0	0	0.3	0.3	0.9	0.9	6.0	6.0	6.8	6.8
1988	12690	12692	3356	3357	2	1	0.0	0.0	1.1	1.1	2.0	2.1	7.1	7.1	9.0	9.0
1989	12886	12889	3448	3448	2	0	0.0	0	1.5	1.5	2.7	2.7	8.8	8.8	11.9	11.9
1990	13108	13111	3545	3545	3	0	0.0	0	1.7	1.7	2.8	2.8	10.7	10.7	15.1	15.1
1991	13292	13294	3631	3631	2	0	0.0	0	1.4	1.4	2.4	2.4	12.2	12.2	17.9	17.9
1992	13494	13496	3724	3724	2	0	0.0	0	1.5	1.5	2.6	2.6	13.9	13.9	20.9	20.9
1993	13662	13664	3916	3916	2	0	0.0	0	1.4	[illegible]	2.5	2.5	15.5	15.5	23.9	23.9
1994	13909	13911	3922	3922	2	0	0.0	0	1.7	[illegible]	2.8	2.8	17.4	17.4	27.3	27.3
1995	14105	14107	4019	4019	2	0	0.0	0	1.4	[illegible]	2.5	2.5	19.1	19.1	30.5	30.5
1996	14291	14293	4118	4118	2	0	0.0	0	[illegible]	[illegible]	2.5	2.5	20.6	20.7	33.7	33.7
1997	14491	14493	4225	4225	2	0	0.0	0	[illegible]	[illegible]	2.6	2.6	22.3	22.3	37.2	37.2
1998	14707	14709	4342	4342	2	0	0.0	0	[illegible]	[illegible]	2.8	2.8	24.2	24.2	41.0	41.0
1999	[illegible]	14951	4471	4471	2	0	0.0	0	[illegible]	[illegible]	3.0	3.0	26.2	26.2	45.2	45.2
2000	15140	15142	4588	4588	2	0	0.0	0	1.3	[illegible]	2.6	2.6	27.8	27.8	49.0	49.0

Source: This table summarizes project ons presented in Technical Report Number 50

LOW FIND CASE, 95 PERCENT PROBABILITY RESOURCE SCENARIO

In the low find case, exploration activities are hypothesized to begin in 1983, end in 1988, include the drilling of 36 wells and the construction of gravel islands, and result in the discovery of two marginally commercial oil fields and one marginally commercial non-associated gas field. The oil fields are located between 34 and 58 kilometers (21 and 36 miles) southwest of Nome, and the gas field is located about 34 kilometers (21 miles) south of Nome (see Figure 5.1). The development phase activity which begins in 1987 and ends in 1990, results in the installation of a single steel platform in each of the three fields, the construction of the associated pipelines, a small marine crude oil terminal, a small LNG plant, and a forward service base. The production phase activities begin in 1990 and end in 2009. The marine traffic generated by these activities is summarized in Table 5.3, and the population and employment impacts for the Nome area and the Nome/Wade Hampton Census Divisions are summarized in Tables 5.4 and 5.5.

MEAN FIND CASE, MEAN PROBABILITY RESOURCE SCENARIOS

Mean find case exploration activities begin in 1983, end in 1989, include the drilling of 64 wells and the construction of seven gravel islands, and result in the discovery of five commercial oil fields and two commercial non-associated gas fields. The five oil fields are located in two groups of fields, one in inner Norton Sound, the second in the central Sound south of Nome, plus a single field in the outer Sound

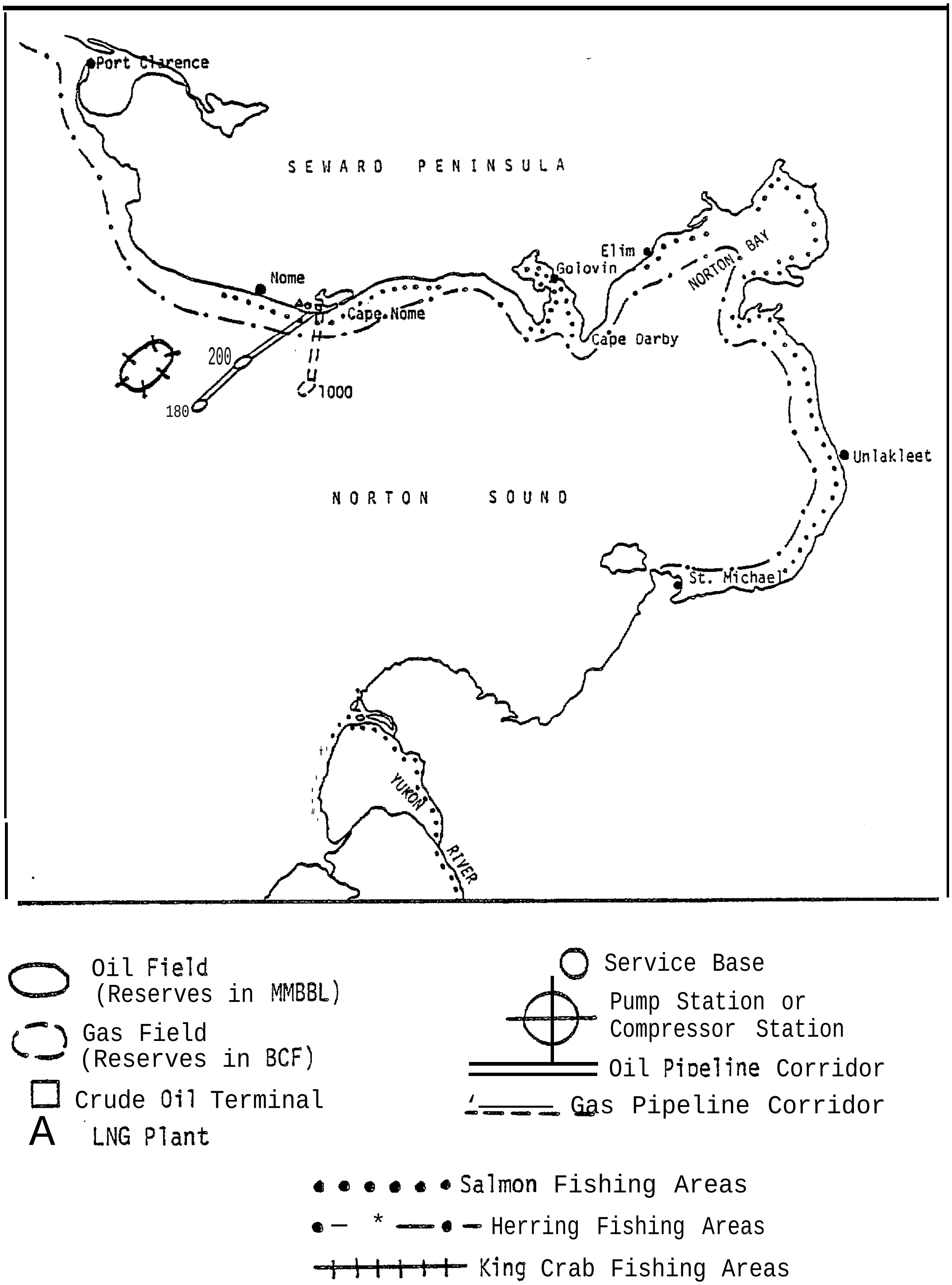


Figure 5.1: Low Find Case, Offshore OCS Structures and Fishing Grounds

Table 5.3

Low Find Case
Marine Traffic Generated by OCS Activity
1983-2000

Year	Linehaul Vessels	Linehaul Lighters (Arrivals/Year)	Coastal Lighters	Supply Boats (Trips/Month)	Gravel Barges (Trips/Year)	Pipeline Lay and Bury Barges Number Onsite)	Oil & Tankers (Department/ Year)
1983	2	136	0	24	0	0	0
1984	5	204	0	48	75	0	0
1985	5	3(-)7	1	6(3	122	0	0
1986	6	377	1	72	122	0	0
1987	19	170	1	36	122	0	0
1988	14	9	1	60	0	0	0
1989	12	12	1	138	0	3	0
1990	15	27	3	102	0	1	39
1991	15	27	1	112	0	0	77
1992	6	21	3	16?	0	0	114
1993	3	16	1	12	0	0	152
1994	3	16	2	12	0	0	148
1995	3	18	2	12	0	0	124
1996	2	17	2	12	0	0	104
1997	3	17	2	12	n	0	88
1998	2	16	2	12	0	0	76
1999	2	17	2	12	0	0	66
2000	2	16	1	12	0	0	58

Source: Peat, Marwick, Mitchell & Co. and James D. Lindsay & Associates, 1980.

NOTE : These estimates do not include 15 to 19 linehaul vessel arrivals, 143 to 184 linehaul lighter vessel arrivals, or 16 to 21 coastal lighter vessel arrivals that are expected to occur in the absence of Lease Sale No. 57.

Table 5.4
Nome/Wade Hampton Census Division
Low Find Case
Projected OCS Population and Employment Impacts
1980-2000

	Population		Employment		Increment		Percentage Increment		Annual Percentage Change				Cumulative Percentage Change			
									Population		Employment		Population		Employment	
Year	Without OCS	With OCS	Without OCS	With OCS	Population	Employment	Pop.	Employment	Without OCS	With OCS	Without OCS	With OCS	Without OCS	With OCS	Without OCS	With OCS
1980	11846	11846	3080	3080	0	0	0	0	0	0	0	0	0	0	0	0
1981	11776	11776	3054	3054	0	0	0	0	-0.6	-0.6	-0.8	-0.8	-0.6	-0.6	-0.8	-0.8
1982	11511	11511	2962	2962	0	0	0	0	-2.3	-2.3	-3.0	-3.0	-2.8	-2.9	-3.8	-3.8
1983	11752	11941	3034	3127	189	93	1.6	3.1	2.1	3.7	2.4	5.6	-0.8	0.8	-1.5	1.5
1984	12406	12700	3227	3379	294	152	2.4	4.7	5.6	6.4	6.4	8.1	4.7	7.2	4.8	9.7
1985	12525	13049	3260	3519	524	259	4.2	7.9	1.0	2.7	1.0	4.1	5.7	10.2	5.8	14.3
1986	12517	13277	3259	3636	760	377	6.1	11.6	-0.1	1.7	-0.0	3.3	5.7	12.1	5.8	18.1
1987	12556	12864	3289	3468	308	179	2.5	5.4	0.3	-3.1	0.9	-4.6	6.0	8.6	6.8	12.6
1988	12690	13389	3356	3745	699	389	5.5	11.6	1.1	4.1	2.0	8.0	7.1	13.0	9.0	21.6
1989	12886	13812	3448	4033	926	585	7.2	17.0	1.5	3.2	2.7	7.7	8.8	16.6	11.9	30.9
1990	13108	15373	3545	5103	2265	1558	17.3	43.9	1.7	11.3	2.8	26.5	10.7	29.8	15.1	65.7
1991	13292	15502	3631	5188	2210	1557	16.6	42.9	1.4	0.8	2.4	1.7	12.2	30.9	17.9	68.4
1992	13494	15211	3724	4930	1717	1206	12.7	32.4	1.5	-1.9	2.6	-5.0	13.9	28.4	20.9	60.1
1993	13682	15019	3816	4756	1337	940	9.8	24.6	1.4	-1.3	2.5	-3.5	15.5	26.8	23.9	54.4
1994	13909	15171	3922	4824	1262	902	9.1	23.0	1.7	1.0	2.8	1.4	17.4	28.1	27.3	56.6
1995	14105	15507	4019	5041	1402	1022	9.9	25.4	1.4	2.2	2.5	4.5	19.1	30.9	30.5	63.7
1996	14291	15683	4118	5145	1392	1027	9.7	24.9	1.3	1.1	2.5	2.1	20.6	32.4	33.7	67.0
1997	14491	15873	4225	5259	1382	1034	9.5	24.5	1.4	1.2	2.6	2.2	22.3	34.0	37.2	70.7
1998	14707	16079	4342	5383	1372	1041	9.3	24.0	1.5	1.3	2.8	2.4	24.2	35.7	41.0	74.8
1999	14949	16305	4471	5517	1356	1046	9.1	23.4	1.6	1.4	3.0	2.5	26.2	37.6	45.2	79.1
2000	15140	16481	4588	5638	1341	1050	8.9	22.9	1.3	1.1	2.6	2.2	27.8	39.1	49.0	83.1

Source: This ta[illegible]le [illegible] projections presented in Techn[illegible]c[illegible] Report Number 5[illegible]

Table 5.5
Nome Area Census Division
Low Find Case
Projected OCS Population and Employment Impacts
1980-2000

Year	Population Without OCS	Population With OCS	Employment Without OCS	Employment With OCS	Increment Population	Increment Employment	Percentage Increment Pop.	Percentage Increment Employment	Annual % Change Population Without OCS	Annual % Change Population With OCS	Annual % Change Employment Without OCS	Annual % Change Employment With OCS	Cumulative % Change Population Without OCS	Cumulative % Change Population With OCS	Cumulative % Change Employment Without OCS	Cumulative % Change Employment With OCS
1980	3125	3125	1094	1094	0	0	0	0	0	0	0	0	0	0	0	0
1981	3188	3188	1116	1116	0	0	0	0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
1982	3252	3252	1171	1171	0	0	0	0	2.0	2.0	4.9	4.9	4.1	4.1	7.0	7.0
1983	3317	3325	1194	1201	8	7	0.2	0.6	2.0	2.2	2.0	2.6	6.1	6.4	9.1	9.8
1984	3383	3391	218	1229	8	11	0.2	0.9	2.0	2.0	2.0	2.3	8.3	8.5	11.3	12.3
1985	3451	3464	277	1291	13	14	0.4	1.1	2.0	[illegible]	4.8	5.0	10.4	10.8	16.7	18.0
1986	3520	3537	302	1323	17	21	0.5	1.6	2.0	2.1	2.0	2.5	12.6	13.2	19.0	20.9
1987	3590	3842	328	1451	252	123	7.0	9.3	2.0	8.6	2.0	9.7	14.9	22.9	21.4	32.6
1988	3662	4188	392	1649	526	257	14.4	18.5	2.0	9.0	4.8	13.6	17.2	34.0	27.2	50.7
1989	3735	4551	419	1818	816	399	21.8	28.1	2.0	8.7	1.9	10.2	19.5	45.6	29.7	66.2
1990	3810	4655	448	1861	845	413	22.2	28.5	2.0	2.3	2.0	2.4	21.9	49.0	32.4	70.1
1991	3829	4619	493	1878	790	385	20.6	25.8	0.5	-0.8	3.1	0.9	22.5	47.9	36.5	71.7
1992	3848	4487	501	1812	639	311	16.6	20.7	0.5	-2.9	(3.5	-3.5	23.1	43.6	37.2	65.6
1993	3867	4385	508	1761	518	253	13.4	16.8	0.5	-2.3	0.5	-2.8	23.7	40.3	37.8	61.0
1994	3886	4386	1477	1721	500	244	17.9	[illegible]	0.5	0.0	-2.1	-2.3	24.4	40.4	35.0	57.3
1995	3906	4458	1484	1753	553	269	14.?	18.1	0.5	1.6	0.5	1.9	25.0	42.7	35.6	60.2
1996	3925	4478	1492	1761	553	269	14.1	18.0	0.5	0.4	0.5	0.5	25.6	43.3	36.4	61.0
1997	3945	4498	1499	1768	553	269	14.0	17.9	0.5	0.4	0.5	0.4	26.2	43.9	37.0	61.6
1998	3965	4518	1507	1776	553	269	13.9	17.9	0.5	0.4	0.5	0.5	26.9	44.6	37.8	62.3
1999	3985	4538	1514	1783	553	269	13.9	17.8	0.5	0.4	0.5	0.4	27.5	45.2	38.4	63.0
2000	4005	4558	1522	1791	553	269	13.8	17.7	0.5	0.4	0.5	0.4	28.2	45.9	39.1	63.7

Source: This table summarizes projections presented in Technical Report Number 53.

southwest of Cape Rodney. The gas fields are located close to each other about 48 kilometers (30 miles) south of Nome (see Figure 5.2).

The mean find case development phase begins in 1986 and ends in 1990. It consists of the installation of six steel platforms and two gravel islands, and the construction of pipelines, a medium-sized crude oil terminal, a LNG plant, and a forward service base. Construction of the onshore facilities at Cape Nome begins in 1986 and will be completed in 1988. The production phase begins in 1990 and continues through 2010. The marine traffic generated by OCS activities is summarized in Table 5.6, and the population and employment impacts for the Nome area and the Nome/Wade Hampton Census Divisions are presented in Tables 5.7 and 5.8.

HIGH FIND CASE, 5 PERCENT PROBABILITY RESOURCE SCENARIO

High find case exploration activities begin in 1983, end in 1988, result in 90 wells being drilled and six gravel islands being constructed, and produce seven commercial oil fields and three commercial non-associated gas fields. The fields are in three clusters located, respectively, in inner Norton Sound south of Cape Darby, central Norton Sound south of Nome, and outer Norton Sound about 64 kilometers (40 miles) southwest of Cape Rodney {see Figure 5.3).

Development phase activities which begin in 1986 and end in 1991 include the installation of 11 steel platforms and four gravel platforms, and the construction of pipelines and onshore facilities at Cape Nome. The

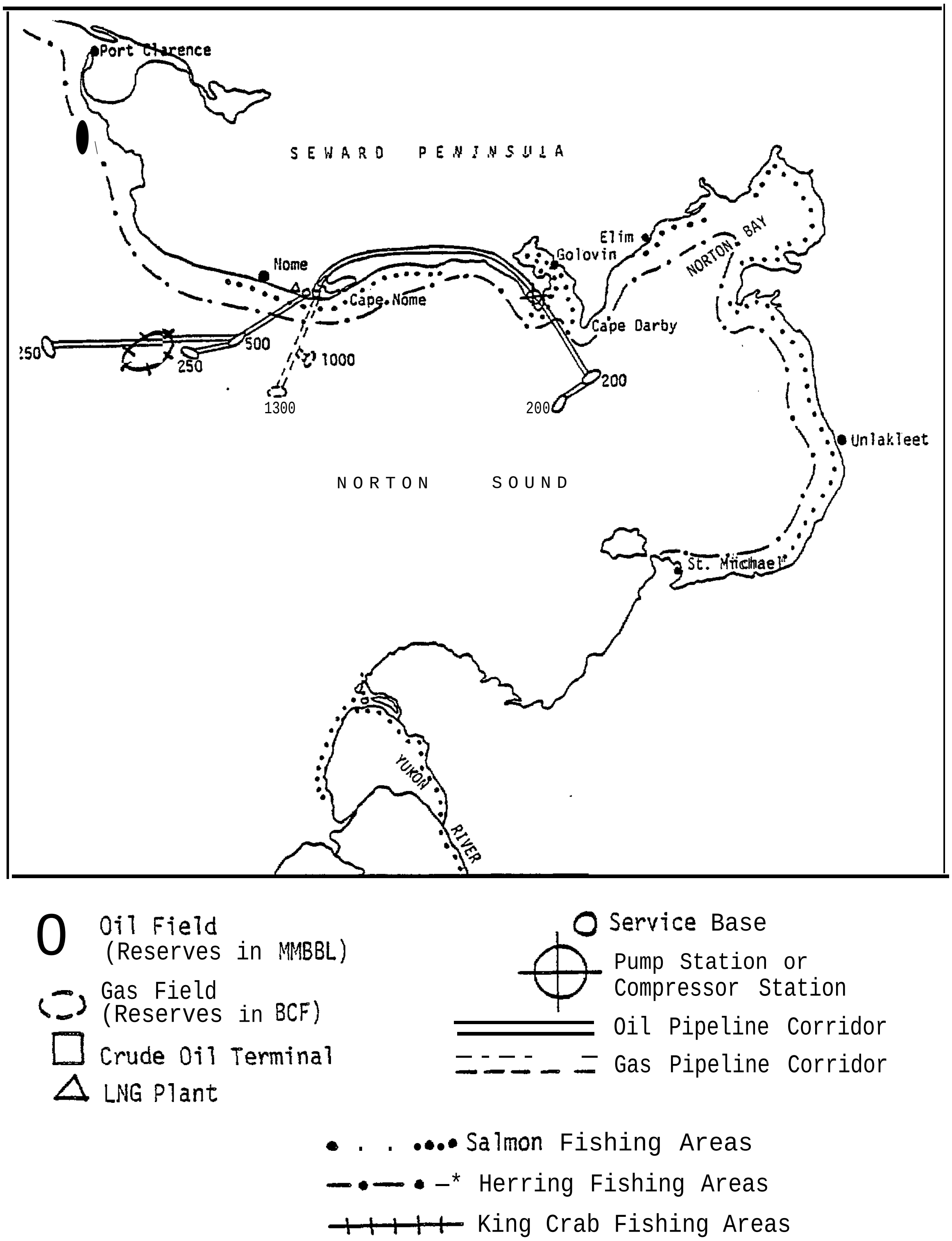


Figure 5.2: Mean Find Case, Offshore OCS Structures and Fishing Grounds

Table 5.6

Mean Find Case
Marine Traffic Generated by OCS Activity
1983-2000

Year	Linehaul Vessels	Linehaul Lighters (Arrivals/Year)	Coastal Lighters	Supply Boats (Trips/Month)	Gravel Barges (Trips/Year)	Pipeline Lay and Bury Barges Number Onsite	Oil & Tankers (Department/Year)
1983	4	204	0	36	0	0	0
1984	9	436	1	84	75	0	0
1985	10	548	1	96	122	0	0
1986	39	411	1	72	122	0	0
1987	26	279	1	72	122	0	0
1988	16	23	3	216	511	5	0
1989	21	20	2	264	778	1	26
1990	19	54	6	236	389	5	91
1991	21	64	7	252	0	1	204
1992	17	61	7	212	0	0	311
1993	9	50	5	122	0	0	370
1994	6	46	5	52	0	0	404
1995	6	45	5	32	0	0	401
1996	6	46	6	32	0	0	365
1997	6	46	5	32	0	0	314
1998	5	46	5	32	0	0	268
1999	5	46	5	32	0	0	229
2000	5	45	5	32	0	0	201

Source: Peat, Marwick, Mitchell & Co. and James D. Lindsay & Associates, 1980.

NOTE: These estimates do not include 15 to 1 linehaul vessel arrivals, 143 to 84 linehaul lighter vessel arrivals, or 16 to 21 coastal lighter vessel arrivals that are expected to occur in the absence of Lease Sale No. 57.

Table 5.7
Nome/Wade Hampton Census Division
Mean Find Case
Projected OCS Population and Employment Impacts
1980-2000

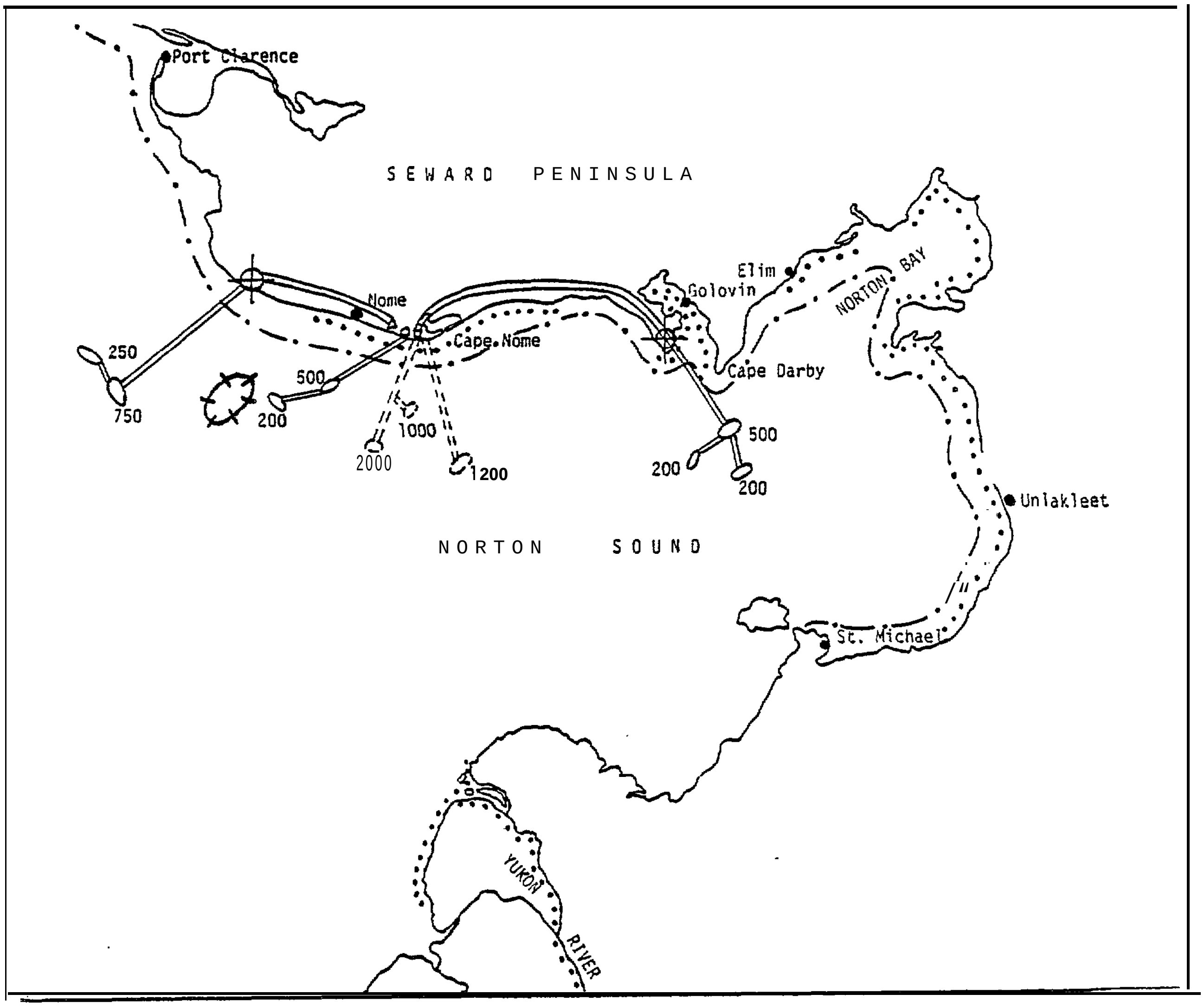
Year	Population: Without OCS	Population: With OCS	Employment: Without OCS	Employment: With OCS	Increment: Population	Increment: Employment	Percentage Increment: Pop.	Percentage Increment: Employment	Annual Percentage Change, Population: Without OCS	Annual Percentage Change, Population: With OCS	Annual Percentage Change, Employment: Without OCS	Annual Percentage Change, Employment: With OCS	Cumulative Percentage Change, Population: Without OCS	Cumulative Percentage Change, Population: With OCS	Cumulative Percentage Change, Employment: Without OCS	Cumulative Percentage Change, Employment: With OCS
1980	11846	11846	3080	3080	0	0	0	0	0	0	0	0	0	0	0	0
1981	11776	11776	3054	3054	0	0	0	0	-0.6	-0.6	-0.[illegible]	-0.8	-0.6	-0.6	-0.8	-0.8
1982	11511	11511	2962	2962	0	0	0	0	-2.3	-2.3	-3.[illegible]	-3.0	-2.8	-2.8	-3.8	-3.8
1983	11752	12041	3034	3178	289	144	2.5	4.7	2.1	4.6	2.[illegible]	7.3	-0.8	1.6	-1.5	3.2
1984	12406	13079	3227	3570	673	343	5.4	10.6	5.6	8.6	6.4	2.3	4.7	10.4	4.8	15.9
1985	12525	13573	3260	3768	1048	508	8.4	15.6	1.0	3.8	1.0	5.5	5.7	14.6	5.8	22.3
1986	12517	13459	3259	3801	942	542	7.5	16.6	-0.1	-0.8	-0.0	0.9	5.7	13.6	5.8	23.4
1987	12556	13554	3289	3983	998	694	7.9	21.1	0.3	0.7	0.9	4.8	6.0	14.4	6.8	29.3
1988	12690	14522	3356	4354	1832	998	14.4	29.7	[illegible]1	7.1	2.0	9.3	7.1	22.6	9.0	41.4
1989	12886	14420	3448	4425	1534	977	11.9	28.3	[illegible].5	-0.7	2.7	1.6	8.8	21.7	11.9	43.7
1990	13108	17582	3545	6639	4474	3094	34.1	87.3	[illegible].7	21.9	2.8	50.0	10.7	48.4	15.1	115.6
1991	13292	18601	3631	7362	5309	3731	39.9	102.8	[illegible].4	5.8	2.4	10.9	12.2	57.0	17.9	139.0
1992	13494	18511	3724	7263	5017	3539	37.2	95.0	[illegible].5	-0.5	2.6	-1.3	13.9	56.3	20.9	135.8
1993	13682	17828	3916	6743	4146	2927	30.3	76.7	[illegible].4	-3.7	2.5	-7.2	15.5	50.5	23.9	118.9
1994	13909	17638	3922	6580	3729	2658	26.8	67.8	[illegible].7	-[illegible]1	2.8	-2.4	17.4	48.9	27.3	113.6
1995	14105	17788	4019	6683	3683	2664	26.1	66.3	[illegible].4	[illegible].9	2.5	1.6	19.1	50.2	30.5	117.0
1996	14291	18047	4118	6872	3756	2754	26.3	66.9	[illegible].3	0.5	2.5	2.8	20.6	52.3	33.7	123.1
1997	14491	18275	4225	7035	3794	2810	26.1	66.5	[illegible].4	[illegible].3	2.6	2.4	22.3	54.3	37.2	12[illegible].4
1998	14707	18469	4342	7170	3762	2828	25.6	65.1	[illegible].5	[illegible].1	2.8	1.9	24.2	55.9	41.0	13[illegible].8
1999	14949	18675	4471	7313	3726	2842	24.9	63.6	[illegible].6	[illegible].1	3.0	2.0	26.2	57.6	45.2	13[illegible].4
2000	15140	18828	4588	7441	3688	2853	24.4	62.2	[illegible].3	0.8	2.6	1.8	27.8	58.9	49.0	14[illegible].6

Source: This table summarizes projections presented in Technical Report Number 50

Table 5.8
Nome Area Census Division
Mean Find Case
Projected OCS Population and Employment Impacts
1980-2000

Year	Population Without OCS	Population With OCS	Employment Without OCS	Employment With OCS	Increment Population	Increment Employment	Percentage Increment Pop.	Percentage Increment Employment	Annual Percentage Change Population Without OCS	Annual Percentage Change Population With OCS	Annual Percentage Change Employment Without OCS	Annual Percentage Change Employment With OCS	Cumulative Percentage Change Population Without OCS	Cumulative Percentage Change Population With OCS	Cumulative Percentage Change Employment Without OCS	Cumulative Percentage Change Employment With OCS
1980	3125	3125	1094	1094	0	0	0	0	0	0	0	0	0	0	0	0
1981	3188	3188	1116	116	0	0	0	0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
1982	3252	3252	1171	171	0	0	0	0	2.0	2.0	4.9	4.9	4.1	4.1	7.0	7.0
1983	3317	3330	1194	206	13	12	0.4	1.0	2.0	2.4	2.0	3.0	6.1	6.6	9.1	10.2
1984	3383	3415	1218	247	32	29	0.9	2.4	2.0	2.6	2.0	3.4	8.3	9.3	1.3	14.0
1985	3451	3485	1277	310	34	33	1.0	2.6	2.0	2.0	4.8	5.1	10.4	11.5	6.7	19.7
1986	3520	4209	1302	539	689	337	19.6	25.9	2.0	20.8	2.0	25.1	12.6	34.7	9.0	49.8
1987	3590	4553	1328	797	963	469	26.8	35.3	2.0	8.2	2.0	9.6	14.9	45.7	1.4	64.3
1988	3662	4743	1392	1921	1081	529	29.5	38.0	2.0	4.2	4.8	6.9	17.2	51.8	27.2	75.6
1989	3735	4781	1419	1932	1046	513	28.0	36.2	2.0	0.8	1.9	0.6	19.5	53.0	29.7	76.6
1990	3810	5110	1448	2084	1300	636	34.1	43.9	2.0	6.9	2.0	7.9	21.9	63.5	32.4	90.5
1991	3829	5164	1493	2144	1335	651	34.9	43.6	0.5	1.1	3.1	2.9	22.5	65.2	36.5	96.0
1992	3848	5136	1501	2129	1288	628	33.5	41.8	0.5	-0.5	0.5	-0.7	23.1	64.4	37.2	94.6
1993	3867	5102	1509	2110	1235	602	31.9	39.9	0.5	-0.7	0.5	-0.9	23.7	63.3	37.8	92.9
1994	3886	5088	1477	2062	1202	585	30.9	39.6	0.5	-0.3	-2.1	-2.3	24.4	62.8	35.0	88.5
1995	3905	5107	1484	2069	1202	585	30.8	39.4	0.5	0.4	0.5	0.3	25.0	63.4	35.6	89.1
1996	3925	5127	1492	2077	1202	585	30.6	39.2	0.5	0.4	0.5	0.4	25.6	64.1	36.4	89.9
1997	3945	5147	1499	2084	1202	585	30.5	39.0	0.5	0.4	0.5	0.3	26.2	64.7	37.0	90.5
1998	3965	5167	1507	2092	1202	585	30.3	38.8	0.5	0.4	0.5	0.4	26.9	65.3	37.8	91.2
1999	3985	5187	1514	2099	1202	585	30.2	38.6	0.5	0.4	0.5	0.3	27.5	66.0	38.4	91.9
2000	4005	5207	1522	2107	1202	585	30.0	38.4	0.5	0.4	0.5	0.4	28.2	66.6	39.1	92.6

Source: This table summarizes projections presented in Technical Report Number 53.



Oil Fields (Reserves in MMBBL)

Gas Field (Reserves in BCF)

Crude Oil Terminal

LNG Plant

Service Base

Pump Station or Compressor Station

Oil Pipeline Corridor

Gas Pipeline Corridor

Salmon Fishing Areas

Herring Fishing Areas

King Crab Fishing Areas

Figure 5.3: High Find Case, Offshore OCS Structures and Fishing Grounds

onshore facilities are a crude oil terminal, a LNG plant, and a forward service base; construction begins in 1986 and will be completed in 1988. Production phase activities begin in 1989 and continue through 2016. The marine traffic generated by OCS activities is summarized in Table 5.9, and the employment and population impacts for the Nome area and the Nome/Wade Hampton Census Divisions appear in Tables 5.10 and 5.11.

Using Past Interactions Between the Offshore Petroleum and Commercial Fishing Industries and Economic Analyses to Identify Potential Impacts

In the following sections, past experiences of interactions between the offshore petroleum and commercial fishing industries and economic analyses are used to identify the impacts that may result as these two industries compete for labor, ocean space use, and services of the infrastructures of coastal communities.

COMPETITION FOR LABOR

The commercial fishing industry is the largest private sector employer in Western Alaska, and its labor requirements are projected to increase as the traditional fisheries continue to expand and as a domestic groundfish industry develops. The question to be addressed in this section is, can the labor requirements of the commercial fishing industry be met as the OCS industry develops and becomes a major employer? The answer to this question will be determined by a number of factors including: *

Table 5.9

High Find Case
Marine Traffic Generated by OCS Activity
1983-2000

Year	Linehaul Vessels	Linehaul Lighters (Arrivals/Year)	Coastal Lighters	Supply Boats (Trips/Month)	Gravel Barges (Trips/Year)	Pipeline Lay and Bury Barges Number !!@@!-	Oil & Tankers (Department/ Year)
1983	4	204	0	36	0	0	o
1984	7	408	1	96	75	0	0
1985	11	616	2	132	75	0	0
1986	66	687	2	144	122	0	0
]987	4$	492	3	132	122	0	0
1988	27	667	4	267	572	6	o
1989	25	44	4	416	1411	7	24
1990	46	85	9	6?9	839	5	114
1991	57	105	12	509	389	6	265
1992	52	108	12	433	389	1	468
1993	35	96	10	280	0	1	635
1994	18	87	10	170	0	1	711
1995	14	85	10	100	o	0	722
1996	11	83	10	80	0	0	687
1997	10	84	9	60	0	0	617
1998	9	83	9	60	0	0	537
1999	9	82	10	60	o	0	461
2000	9	83	9	60	0	0	379

Source: Peat, Marwick, Mitchell & Co. and James D. Lindsay & Associates, 1980.

NOTE : These estimates do not include 15 to 19 linehaul vessel arrivals, 143 to 184 linehaul lighter vessel arrivals, or 16 to 21 coastal lighter vessel arrivals that are expected to occur in the absence of Lease Sale No. 57.

Table 5.10
Nome/Wade Hampton Census Division
High Find Case
ted OCS Population and Employment Impacts
1980-2000

Year	Population: Without OCS	Population: With OCS	Employment: Without OCS	Employment: With OCS	Increment: Population	Increment: Employment	Percentage Increment: Pop.	Percentage Increment: Employment	Annual Percentage Change: Population Without OCS	Annual Percentage Change: Population With OCS	Annual Percentage Change: Employment Without OCS	Annual Percentage Change: Employment With OCS	Cumulative Percentage Change: Population Without OCS	Cumulative Percentage Change: Population With OCS	Cumulative Percentage Change: Employment Without OCS	Cumulative Percentage Change: Employment With OCS
1980	11846	11846	3080	3090	0	0	0	0	0	0	0	0	0	0	0	0
1981	11776	11776	3054	3054	0	0	0	0	-0.6	-0.6	-0.8	-0.8	-0.6	-0.6	-0.8	-0.8
1982	11511	11511	2962	2962	0	0	0	0	-2.3	-2.3	-3.0	-3.0	-2.8	-2.8	-3.8	-3.8
1983	11752	12035	3034	3174	283	140	2.4	4.6	2.1	4.6	2.4	7.2	-0.8	1.6	-1.5	3.1
1984	12406	12984	3227	3523	578	296	4.7	9.2	5.6	7.9	6.4	11.0	4.7	9.6	4.8	14.4
1985	12525	13731	3260	3860	1206	600	9.6	18.4	1.0	5.8	1.0	9.[illegible]	5.7	15.9	5.8	25.3
1986	12517	14053	3259	4136	1536	877	12.3	26.9	-0.1	2.3	-0.0	7.2	5.7	18.6	5.8	34.3
1987	12556	14555	3289	4631	1999	1342	15.9	40.8	0.3	3.6	0.9	12.0	6.0	22.9	6.8	50.4
1988	12690	15398	3356	4956	2708	1600	21.3	47.7	1.1	5.8	2.0	7.0	7.1	30.0	9.0	60.9
1989	12886	16390	3448	5498	3504	2050	27.2	59.5	1.5	6.4	2.7	[illegible]	8.8	38.4	11.9	78.5
1990	13108	20123	3545	8318	7015	4773	53.5	134.6	1.7	22.8	2.8	[illegible]	10.7	69.9	15.1	170.1
1991	13292	21888	3631	9595	8596	5964	64.7	164.3	1.4	8.8	2.4	[illegible]	12.2	84.8	17.9	211.5
1992	13494	22367	3724	9921	8873	6197	65.8	166.4	1.5	2.2	2.6	[illegible]	13.9	88.8	20.9	222.1
1993	13682	21598	3816	9369	7916	5553	57.9	145.5	1.4	-3.4	2.5	-4[illegible]	15.5	82.3	23.9	204.2
1994	13909	21048	3922	8948	7139	5026	51.3	128.1	1.7	-2.5	2.8	-0[illegible]	17.4	77.7	27.3	190.5
1995	14105	21066	4019	8981	6961	4962	49.4	123.5	1.4	0.1	2.5	0[illegible]	19.1	77.8	30.5	191.6
1996	14291	21139	4118	9056	6848	4938	47.9	119.9	1.3	0.3	2.5	[illegible]	20.6	78.4	33.7	194.0
1997	14491	21349	4225	9231	6857	5006	47.3	118.5	1.4	1.0	2.6	[illegible]	22.3	80.2	37.2	199.7
1998	14707	21524	4342	9378	6817	5036	46.4	116.0	1.5	0.8	2.8	[illegible]	24.2	81.7	41.0	204.5
1999	14949	21760	4471	9572	6811	5101	45.6	114.1	1.6	1.1	3.0	[illegible]	26.2	83.7	45.2	210.8
2000	15140	21887	4588	9709	6747	5121	44.6	111.6	1.3	0.6	2.6	1.4	27.8	84.8	49.0	215.2

Source: This table summarizes projections presented in Technical Report Number 50.

Table 5.11
Nome Area Census Division
High Find Case
Projected OCS Population and Employment Impacts
1980-2000

Year	Population		Employment		Increment		Percentage Increment		Annual Percentage Change				Cumulative Percentage Change			
									Population		Employment		Population		Employment	
	Without OCS	With OCS	Without OCS	With OCS	Population	Employment	Pop.	Employment	Without OCS	With OCS	Without OCS	With OCS	Without OCS	With OCS	Without OCS	With OCS
1980	3125	3125	1094	1094	0	0	0	0	0	0	0	0	0	0	0	0
1981	3188	3188	1116	1116	0	0	0	0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
1982	3252	3252	1171	1171	0	0	0	0	2.0	2.0	4.9	4.9	4.1	4.1	7.0	7.0
1983	3317	3330	1194	1206	13	12	0.4	1.0	2.0	2.4	2.0	3.0	6.1	6.6	9.1	10.2
1984	3383	3411	1218	1243	28	25	0.8	2.1	2.0	2.4	2.0	3.1	8.3	9.2	11.3	13.6
1985	3451	3496	1277	1317	45	40	1.3	3.1	2.0	2.5	4.8	6.0	10.4	11.9	16.7	20.4
1986	3520	4563	1302	1811	1043	509	29.6	39.1	2.0	0.5	2.0	37.5	12.6	46.0	19.0	65.5
1987	3590	4934	1328	1980	1344	652	37.4	49.1	2.0	8.1	2.0	9.3	14.9	57.9	21.4	81.0
1988	3662	5025	1392	2054	1363	662	37.2	47.6	2.0	1.8	4.8	3.7	17.2	60.8	27.2	87.8
1989	3735	5202	1419	2136	1467	717	39.3	50.5	2.0	3.5	[illegible].9	4.0	19.5	66.5	29.7	95.2
1990	3810	5322	1448	2197	1512	739	39.7	51.0	2.0	2.3	2.0	2.4	21.9	70.3	32.4	99.9
1991	3829	5509	1493	2310	1680	817	43.9	54.7	0.5	3.5	3.1	5.6	22.5	76.3	36.5	111.2
1992	3848	5497	1501	2303	1649	802	42.9	53.4	0.5	-0.2	0.5	-0.3	23.1	75.9	37.2	110.5
1993	3867	5424	1508	2266	1557	758	40.3	50.3	0.5	-1.3	0.5	-1.6	23.7	73.6	37.8	107.1
1994	3886	5402	1477	2214	1516	737	39.0	49.9	0.5	-0.4	-2.1	-2.3	24.4	72.9	35.0	102.4
1995	3905	5405	1484	2214	1500	730	38.4	49.2	0.5	0.1	0.5	0	25.0	73.0	35.6	102.4
1996	3925	5423	1492	2221	1498	729	38.2	48.9	0.5	0.3	0.5	0.3	25.6	73.5	36.4	103.0
1997	3945	5445	1499	2229	1500	730	38.0	48.7	0.5	0.4	0.5	0.4	26.2	74.2	37.0	03.7
1998	3965	5465	1507	2237	1500	730	37.8	48.4	0.5	0.4	0.5	0.4	26.9	74.9	37.8	104.5
1999	3985	5487	1514	2246	1502	732	37.[illegible]	48.3	0.5	0.4	0.5	0.4	27.5	75.6	38.4	105.3
2000	4005	5507	1522	2254	1502	732	37.[illegible]	48.[illegible]	0.5	0.4	0.5	0.4	28.2	76.2	39.1	106.0

Source: Th s table summarizes projections presented in Technical Report Number 5.

- the skill requirements of both industries,
- wage differentials between the industries,
- the hiring practices of both industries,
- the sources of labor that are available to each industry,
- the effect of OCS activity on the supply of labor in each community.

Skill Requirements

Differences in skill requirements tend to limit the competition for labor between two industries; an analysis of the skill requirements of the two industries can, therefore, be used to begin to determine which types of labor the industries will compete for. Typically, the skill requirements are sufficiently different to limit competition. For example, the offshore OCS operations require highly specialized labor, and the OCS supply boats are manned by licensed officers and crews with seaman's papers. Conversely, seafood processing requires a large number of unskilled workers, and fishing boats are typically manned by individuals who are not licensed officers or do not have seaman's papers. Therefore, the offshore labor requirements of the OCS industry tend *not* to compete with either the harvesting or processing labor requirements of the fishing industry.

The OCS requirements for onshore labor, particularly for construction projects, can, however, compete directly with the labor requirements of the fishing industry since the skill requirements for many onshore jobs are minimal and can be met by many of those who are employed in the fishing industry. In terms of skill requirements, the OCS industry can also compete with the fishing industry for more skilled workers such as foremen and mechanics.

Wage Differentials

For the types of labor for which there is direct competition between the two industries, the effect of the competition on the fishing industry's ability to meet its labor requirements will be affected by the wage differential between the two industries. For example, the hourly wage in seafood processing is expected to be substantially below the hourly wage in construction; therefore, to the extent that both can utilize unskilled labor, the onshore construction projects can provide effective and, therefore, potentially adverse competition. - The shellfish fisheries of Western Alaska and the salmon and herring fisheries from Chignik to Bristol Bay often have monthly crew shares in excess of $5,000 per fisherman. In these fisheries, the equivalent of monthly wages are expected to be higher than construction wages; therefore, OCS construction labor requirements are not expected to effectively compete with harvesting labor requirements even though many fishermen are well qualified to work in construction. The salmon and herring fisheries in the Arctic-Yukon-Kuskokwim Region may have monthly crew shares of less than $1,000; however, due to the limited number of hours spent in these fisheries and the time available for other pursuits, the equivalent of an hourly wage in these fisheries is expected to be adequate to limit the ability of OCS labor requirement to effectively compete with the harvesting labor requirements of these fisheries.

Hiring Practices

The hiring practices of an industry also influence the degree to which it provides effective competition for particular types of labor. Hiring practices of the OCS industry will tend to limit the competition for labor. The industry consists of oil companies and service companies that participate in petroleum development on a global scale. As the activity of the industry begins in a new area, petroleum industry workers from other areas are brought in; therefore, the points of entry into the industry are typically not a new area of industry activity. A major exception to this hiring practice would include hiring for large onshore construction projects. For such projects, a large number of workers who are new to the industry are employed. This does not, however, mean that such workers will be hired locally. If local hiring halls of the construction unions do not exist or are not used, the large construction labor requirements may less effectively compete with the labor requirements of the fishing industry. The use of non-local hiring halls limits, but does not eliminate, access to local residents.

Hiring practices in the fishing industry will also tend to reduce the effective competition for labor between the two industries. For example, crews are typically hired in the home port of a fishing boat or its skipper; therefore, non-local boats do not draw heavily on the local labor force. The hiring of some processing plant employees also occurs in part at distant locations. For example, processing plants recruit students on college campuses in Alaska and in the Pacific Northwest and recruit non-students from the Seattle and Anchorage areas. Effective competition will also be reduced by the use of family members to crew fishing boats. Family crew members have close ties to a fishery and in many cases are too young to be employed elsewhere or have little interest in alternative employment opportunities.

Source of Labor

The source of labor and hiring practices are closely related; they both affect the effectiveness of the competition for labor generated by the OCS industry by differentiating between the labor pools from which each industry hires. The analysis presented under hiring practices is, therefore, applicable to this section. A factor which is more appropriately discussed in this section is the nature of employment in the two industries and, thus, the type of worker each attracts.

Many individuals are attracted to the fishing industry because being a fisherman results in a lifestyle that could not otherwise be enjoyed. To the extent that fishermen are tied to the non-monetary rewards of that lifestyle, they are not part of the labor pool in which other industries readily compete. This may be particularly true for native fishermen in Western Alaska, because their participation in commercial fisheries provides equipment and cash income that are required to successfully participate in subsistence fisheries (Ellana, 1980).

A distinction can be drawn between the part of the unskilled labor force utilized by fish processing plants and the part utilized by OCS onshore construction projects. Seafood processing plants have had a much higher propensity to hire women, students, minorities, and transients than have construction contractors; therefore, the major source of labor in seafood processing has not been considered part of the labor pool for construction. This is no doubt explained by the preferences of these employees as well as those of prospective employers; that is, those who work in processing plants may do so in part because they prefer such employment to construction employment and in part because the employment opportunities in construction may be limited due to the desire of contractors to hire from their traditional labor pools. To the degree that some processing plant workers remain in a distinct labor pool, the labor competition of the OCS industry will be less effective in attracting the labor which has traditionally been available to processing plants.

An additional aspect of the source of labor that determines the impact of labor competition is the size of the labor pool the fishing industry can utilize. If an almost inexhaustible source of labor is available, the labor requirements of the fishing industry can be met despite large OCS labor requirements. For the traditional summer fisheries, the seafood processing sector of the industry has had access to such a labor pool. The large differential between the minimum wage and the Alaska seafood processing wage and high seasonal unemployment rates in the United States have resulted in an almost unlimited supply of seasonal workers for Alaska processing plants.

The harvesting sector of the industry also has access to a very large labor pool of prospective fishermen who are attracted to Alaska fisheries. This is demonstrated by the large number of letters fishing boat owners receive from such individuals and the ability of a competent skipper to turn such individuals into productive fishermen during one season.

Effects of OCS Activity on the Supply of Labor

The OCS labor requirements can adversely or beneficially impact the fishing industry. If the increase in labor demand due to OCS activity is greater than the increase in labor supply due to OCS activity, less labor is available for the fishing industry and the impact is detrimental. However, if the OCS activity results in the labor supply increasing more rapidly than demand, more labor is available for the fishing industry and the impact is beneficial.

In the preceding sections, economic analysis is used to delineate factors that will tend to determine the impact of competition for labor. The proceeding sections provide additional insight into the nature of potential impacts by reviewing the impacts that have occurred in the past.

Cook Inlet 1961-1968

The petroleum development which occurred in the Lower Cook Inlet between . 1961 and 1968 provides an opportunity to measure the extent to which such competition existed and affected the processing sector of the commercial fishing industry. The experience in Cook Inlet is particularly useful in measuring the potential impact of high levels of OCS onshore employment because the development there was at first exclusively onshore and included the construction of several oil and gas processing plants.

The Cook Inlet and Alaska oil boom began with the Swanson River strike of 1957. Onshore production began in 1959; offshore production did not., however, begin until 1965. Between 1961 and 1968 the petroleum development activities included: (1) the exploration for and/or development of six oil fields and 15 natural gas fields; (2) the construction of an 82-mile gas pipeline to connect the Kenai field with the Anchorage area; (3) the construction of marine terminal facilities at Port Nikiski, completed in 1961; (4) the construction of the Standard Oil Company's refinery in 1962 and 1963; (5) the construction of offshore platforms, the first being completed in 1964; (6) the construction of pipelines connecting the offshore fields with on-shore facilities; (7) the construction of the Collier Carbon and Chemical Corp. ammonia plant, and the Collier Carbon and Chemical Corp. and Japan Gas-Chemical Co. urea plant; (8) the initiation of construction of the Phillips Petroleum Co. and Marathon Oil Co. liquified natural gas plant and the Alaskan Oil and

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Refining Co. refinery; and (9) the construction in 1961 of a 42 mile pipeline from Granite Point to the Drift River marine terminal and storage facilities which were completed the same year. This brief overview of the development which occurred between 1961 and 1968 is based on material in A Social and Economic Impact Study of Off-Shore Petroleum and Natural Gas i-n Alaska.

Employment data are not available for fish processing or the petroleum industry, but are available for groupings of industries which are dominated by one or the other. Employment related to the petroleum industry dominated mining and construction employment during the 1960s and fish processing was the principal source of employment in manufacturing. The employment in the former two sectors is, therefore, used as a proxy for employment in the petroleum industry, including petroleum-related construction. And manufacturing employment, minus an estimate of employment in the manufacturing of petroleum products, is used to represent fish processing employment.

A quick review of the employment, work force, and salmon harvest statistics presented in Table 5.12 indicates that the rate of increase in the labor force was sufficient to meet the growing employment requirements of the petroleum industry without adversely affecting employment in manufacturing. A more rigorous demonstration of the lack of an adverse effect is provided by the results of the following regression equations:

5.1 EM= 91.45 - 0.00156 CIS + 0.00312 RCS + 0.159 EC $\quad R^2 = 0.829$ D-W = 1.51
t-statistics (-0.34) (2.00) (3.07)

TABLE 5.12

UPPER COOK INLET COMMERCIAL FISHING AND PETROLEUM INDUSTRY STATISTICS 1961-1968

	Employment[1] (number of persons)						Salmon Catch (1,000 lbs)	
Year	Mining	Construction	Mining & Construction	Manufacturing Excluding Petroleum Products[2]	Total Employment	Working Force	Cook Inlet	Remainder of Central Alaska
1961	156	68	224	227	2,585	2,838	11,692	65,263
1962	219	149	368	286	3,477	3,724	34,133	110,709
1963	150	154	304	348	3,307	3,664	11,544	81,711
1964	233	182	415	511	3,551	3,807	25,140	121,249
1965	255	479	734	331	4,175	4,462	14,119	59,109
1966	458	582	1,040	447	5,160	5,537	27,393	89,252
1967	1,122	1,266	2,38$	426	6,362	6,768	14,616	33,023
1968	1,183	1,800	2,983	544	7,985	8,136	29,004	82,823

1 Third quarter employment July - August.

2 Manufacturing employment minus the employment at the Standard Oil Company refinery, the later was provided by a representative of the Standard Oil Company.

Sources: Catch and Production, ADF&G 1961-1968
Statistic] Quarterly and Workforce Estimates by Area, Employment and Security Division, Alaska Department of Labor 1961-1968

$$5.2 \quad EM = 65.60 - 0.00242\ CIS + 0.00348\ RCS + 0.102\ EMC$$
t-statistics (-0.56) (2.36) (3.48) $R^2 = 0.858$ D-W = 1.09

$$5.3 \quad EM = -95.61 - 0.00355\ CIS + 0.00342\ RCS + 0.0612\ WF$$
t-statistics (-0.95) (2.84) (4.32) $R^2 = 0.899$ D-W = 2.37

where

EM = third quarter employment in manufacturing, excluding petroleum products: this is predominantly fish processing;

CIS = Cook Inlet salmon harvest in 1,000 pounds;

RCS = rest of Central Alaska salmon harvest;

EC = third quarter construction employment;

EMC = third quarter mining and construction employment;

WF = third quarter total civilian work force; the employment and work force statistics are for the Kenai - Cook Inlet labor market.

Equations 5.1 and 5.2 are used to test the hypothesis that increases in construction employment or increases in construction and mining employment, respectively, were at the expense of fish processing employment. The coefficients of EC and EMC are not, however, negative; they are significant and positive which indicates that the hypothesis can be rejected with a high degree of confidence. The results of equation 5.3 provide an explanation of why the increased petroleum employment was not detrimental to fish processing. The coefficient of WF is positive and highly significant indicating that manufacturing (fish processing) employment increased as the work force increased. The increases in work force were primarily due to increased petroleum industry employment.

Commercial fishing industry sources associated with fish processing on the Kenai Peninsula during the period under investigation have also indicated that the supply of labor for processing plants was not adversely affected by the petroleum industry. Two persons who held management positions in Kenai fish processing plants during the period of the Kenai oil boom provided the following assessment of the impacts of the labor requirements of the petroleum industry. Petroleum industry activity did not adversely affect the supply of labor for fish processing because the fish processing labor force was dominated by students and women, for whom the petroleum industry offered limited employment opportunities, and because many of the petroleum related jobs were taken by people who were attracted to the area by the petroleum industry. Skilled workers in the fish processing plants were not hired away by the petroleum industry; this may in part be due to the petroleum industry's desire to be a good neighbor and cause as little conflict with existing industries as possible. Fish processing wages did not increase significantly as a result of the petroleum industry's demand for labor. This is no doubt due to the fact that these two industries drew from distinct labor pools.

The North Slope

The petroleum development activities associated with Prudhoe Bay provide another opportunity to determine whether the labor force can increase rapidly enough to meet the violatile labor requirements of the petroleum industry, without decreasing the quantity of labor available to other industries. As the data in Table 5.13 indicate, there was a dramatic increase in construction and total employment in 1974. Much of this was due to the large construction projects associated with the development of the Prudhoe Bay oil field.

TABLE 5.13

ALASKA EMPLOYMENT AND WORK FORCE STATISTICS 1970 - 1977

Year	Contract Construction Employment	Total Civilian Employment	Total Civilian Work Force	Unemploy- men t	Unemployment Rate Alaska	Unemployment Rate Us.
1970	6,893	99,000	109,000	10,000	9.1	4.9
1971	7,443	104,000	116,000	12,000	10.6	5.9
1972	7,893	110,000	123,000	13,000	10.6	5.6
1973	7,838	116,000	130,000	14,000	10.8	4.9
1974	14,066	134,000	149,000	15,000	10.2	5.6
1975	25,876	165,000	180,000	15,000	8.2	8.5
1976	30,233	176,000	195,000	19,000	9.7	7.7
1977	19,546	132,000	150,000	18,000	12.2	7.0

Sources: Alaska Department of Labor Statistical Quarterly 1970-1977, Federal Reserve Bank of San Francisco, Western Economic Indicators, November/ December 1978.

Although the construction of the Trans Alaska Pipeline, the production facilities at Prudhoe Bay, and the marine terminal and storage facilities at Valdez directly and indirectly generated phenomenal increases in employment, the increases in employment were more than matched by increases in the size of the work force. The unemployment rate was lower during the peak years of construction (1975 and 1976) than it had been in the previous four years, but it remained high by U.S. standards and the number of unemployed actually increased.

The data for both Cook Inlet and the North Slope suggest that large increases in the demand for labor due to petroleum development activity can be more than met by increases in the work force. This does not imply that increased employment opportunities in the petroleum industry have not caused shortages in the supply of specific types of labor, but it does suggest that the total supply of labor tends to increase more rapidly than the total demand. There will, therefore, tend to be an excess supply of workers who are, at least temporarily, part of the pool of unskilled labor, and this is the major source of labor for fish processing.

North Sea

The experience of Scotland's commercial fishing industry, relative to petroleum development in the North Sea, can be used to determine the extent to which the large labor requirements of the petroleum industry can adversely affect the fishing industry. In this section, the Scottish experience, as outlined by John Sevy in Technical Report Number 28, is so used.

The Scottish experience reaffirms the belief stated previously that, to the extent that labor requirements of the petroleum industry adversely affect the commercial fishing industry, it. is the processing sector, not the harvesting sector, that is affected. Sevy cites several references to the impact of petroleum development on fish processing employment. A brief summary of these citations and their applicability to the Gulf of Alaska is as follows. George Hunter has noted a decline in fish processing employment on the Shetland Islands, which he attributes to the higher job security offered by oil-related firms. Whether fish processing workers are paid an hourly wage, as they are in Alaska, or on a piece rate basis as Sevy indicates they are in Shetland, the irregularity of landings and resulting irregularity in hours worked per week or month does decrease income and job security. However, in Alaska the peak season for fish processing, and the period in which income and job security are the highest for fish processing workers are during the summer; so when the OCS demand for construction workers is at its height, there will typically be high job security in fish processing. The lack of job security in fish processing may, therefore, be less important in Alaska than Hunter suggests it was in Shetland. The seasonality of fish processing employment in Alaska and the degree of job security can be measured by dividing monthly employment by the average monthly employment for a year as a whole. When this is done using 1978 food processing employment data, the quotient for October through May ranges from 0.58 to 0.91 and the quotient for June through September ranges from 1.23 to 1.89. The implication is that fish processing employment is highly, although not exclusively, concentrated in the summer months. Hunter does not qualify the reduction in fish processing employment due to petroleum development, and Sevy provides a possible explanation why he does not; British employment statistics do not distinguish between fish processing and meat processing and the harvesting sector of the commercial fishing industry had been declining. It is, therefore, difficult to measure the decline in fish processing employment and even more difficult to determine what part of the decline was due to petroleum development.

Mackay agrees with Hunter that any adverse affects of the increased competition for labor have been concentrated on fish processing, not harvesting; he notes that less than 0.3 percent of the Shetland fishermen have taken employment directly related to the petroleum industry. Mackay indicates that the competition for labor is not only concentrated in fish processing, but within fish processing it has been focused on the skilled workers such as machine maintenance personnel. The competition for unskilled workers has had less effect because the unskilled employment in fish processing is female-intensive. The unskilled labor in Alaska fish processing can be characterized as highly transient and female-intensive; therefore, skilled fish processing workers are perhaps also more likely to be poached in Alaska, as Mackay suggests they are in the Shetlands. However, the access that most Alaska processors have to pools of skilled labor in the Pacific Northwest and the rest of the country should reduce the adverse effects of competition for skilled labor. It should be noted that Scottish fish processing plants had access to skilled labor in that there was high unemployment of both skilled and unskilled labor throughout much of Scotland; however, Scottish plants were apparently much less accustomed to accessing distant pools of labor than are Alaskan plants which are often managed from the Seattle area.

Mackay and Marr report that competition for labor was also concentrated on skilled labor in the Peterhead area. Steel indicates that, excluding fishermen, commercial fishing industry employment decreased by 20 percent in the Peterhead area between 1972 and 1976, but that only a negligible change occurred in Shetland. He does not, however, allocate the change to particular causes.

Perhaps what is best documented about impacts on the commercial fishing industry of the competition for labor generated by petroleum industry activity, as well as the other interactions between the petroleum and commercial fishing industries, is that the impacts and/or interactions are not well documented.

Commercial Fishing Industry Activities Potentially Affected by Competition for Labor

The preceding sections present an analysis of the factors which determine the extent to which competition for labor can be a source of impacts and an analysis of historical examples of competition for labor generated by the petroleum industry. The commercial fishing industry activities that can be affected by the competition for labor are the topic of this section.

The supply of labor available to the commercial fishing industry may increase, decrease, or not change as a result of OCS labor requirements. If it does not change, competition for labor is not a source of impacts. The impacts will tend to be favorable if it increases and detrimental if it decreases. Each case is examined below.

If OCS activities decrease the supply of labor available to the commercial fishing industry, the price of labor will increase; therefore costs will increase and activities constrained by market conditions will tend to decrease. These activities would typically include all processing activities and harvesting activities in fisheries for which quotas or local processing activities are binding constraints. The ability of the commercial fishing industry to respond to a decrease in the supply of labor is directly related to both the industry's ability to prepare for it and its duration. If there is little time to attempt to secure alternative sources of labor or to adopt labor-saving processing methods, the response will tend to be minimal, and the decreases in industry activity may be significant. The same will be true if the OCS impact on the price of labor is expected to be only temporary because the cost of responding may not be warranted by a temporary increase in the price of labor. In the extreme case, higher labor prices would make processing activities unprofitable, and processing activities would cease in the short run and perhaps also in the long run. It should be noted that an important determinant of the supply of labor is the availability of housing. OCS activities can decrease the supply of labor by hiring workers who were traditionally employed in the commercial fishing industry or by increasing the price of housing and thereby effectively reducing the housing available to the processing plant labor force.

OCS labor requirements are expected to primarily affect harvesting sector activities through their effects on processing activities. An increase in the price of labor which decreases processing activity will decrease the demand for fish and therefore tend to decrease exvessel prices; or in the extreme case, the termination of processing activities will eliminate the traditional market for fish. If harvesting activity is not constrained by market conditions, exvessel prices can decrease without decreasing fishing effort; income will of course decrease. If processing activities cease, alternative markets can be developed, but again the ability to respond is dependent on the time available and the duration of time for which an alternative market is necessary. For example, if local processing plants are expected to cease operations for only one season, the feasibility of developing a new market that will completely replace the traditional one is much less than if the existing processors are expected to permanently cease operations. However, the ability to tender and fly fish out of a community for processing elsewhere greatly increases the probability of developing alternative markets on a temporary or permanent basis.

OCS labor requirements can increase the supply of labor available to the commercial fishing industry by attracting more labor to coastal communities than is required by the direct and indirect OCS labor requirements or by increasing population and thus increasing the number of secondary workers who are available. Such an impact would be particularly beneficial to fisheries which do not occur during the summer months in which sufficient numbers of transients are typically available to adequately supplement resident labor forces. An increase in the supply of labor would eliminate one barrier to extending the processing season in an area. In many instances, the availability of labor is not, however, the only binding constraint on the length of the processing season; therefore, an increase in the supply of labor may not be enough to significantly affect the level of harvesting or processing activity.

COMPETITION FOR OCEAN SPACE

The use of ocean space by the OCS industry will prevent fishing in some areas and will make fishing more costly in others. The objective of this section is to discuss the characteristics of the OCS industry use of ocean space that lead to this conclusion, the nature of these costs, and how these costs may potentially impact a fishery.

Offshore structures such as drilling and production platforms will prevent fishing in some areas, however, unless the number of such structures is extremely large, the proportion of a fishing ground that is lost due to such structures will be insignificant. For example, a platform with a diameter of 61 meters (200 feet) and a 500 meter (1,640 foot) safety buffer preempts 89 hectares (220 acres) of ocean space (Olsen, 1977, pp. 226). And unless the target species is sedentary or attracted to such structures, the decrease in catch will be less than proportionate with the loss in fishing areas. The species under consideration are not sedentary. There is not sufficient biological information to determine the extent to which various species will be attracted to each structure.

In addition to preempting an area within a fishing ground, an offshore structure can also increase the cost of fishing in the remaining areas.

The increased costs can occur because the structure prevents the most efficient use of the remainder of the fishing ground or because of navigational hazards posed by the structure. The former can occur in a fishery which utilizes non-fixed gear such as trawls or long-lines. The latter can occur despite the fact that the positions of such structures are reported in Notices to Mariners and despite the fact that their presence is discernible from some distance by day or night. The cost associated with the navigational hazards such structures pose appears to be quite low; Coast Guard accident data indicate that collisions with such structures are infrequent, even in areas where there are a large number of such structures. This cost may, in fact, be offset by the navigational aid that such structures provide.

Submarine pipelines will preempt fishing grounds if fishing is prohibited in sections of the pipeline corridor. They will tend to make fishing more costly in the portion of the corridor in which fishing is permitted unless the pipe is buried and remains buried and no debris is left on the seafloor after the pipe laying and burying operations. Past experiences indicate that neither condition will be met; therefore, submarine pipelines are expected to increase the cost of harvesting activities.

Additional fishing costs would include gear losses and associated fishing time losses due to undersea obstacles associated with the pipeline, the cost associated with less efficient fishing patterns in non-fixed gear fisheries resulting from the position of the pipeline, and other costs incurred in avoiding pipeline-related gear losses. The avoidance costs could include the cost of additional onboard electronics that will allow a vessel to more readily avoid gear losses along the pipeline corridor, or the additional cost of fishing in a less productive area if the pipeline corridor is through a highly productive fishing area and, to avoid gear losses, less productive areas must be fished.

It is not known how a submarine pipeline will affect biological relationships in each fishery; therefore, any discussion of a pipeline attracting fish and thus concentrating them in an area in which they can easily be caught, or not caught at all, is highly speculative. The same is true for other offshore structures.

Vessel traffic generated by OCS activity will also use areas of ocean space within fishing grounds. These vessels include supply boats, exploration rigs, survey vessels, barges used in the construction of submarine pipelines, barges and tankers used to deliver the materials needed for OCS operations, production platforms prior to installation, tankers and LNG ships that will deliver Western Alaska oil and gas to markets elsewhere in the United States, and additional commercial traffic resulting from the population impacts of OCS activities. This additional vessel traffic will increase the cost of fishing. These costs will include the costs of gear losses and collisions that occur because of OCS generated marine traffic, and the costs incurred by fishermen in attempting to reduce the probability of such gear losses and collisions. The latter can include the cost of additional navigation equipment and the cost associated with having such marine traffic determine the areas fished.

Coast Guard marine accident data indicate that the number of collisions between fishing boats and the OCS generated marine traffic will probably be very small. Fishing vessels have been fairly successful in avoiding each other and other marine traffic both in Alaska and in areas where the volume of traffic is much greater and more concentrated than it is expected to be in Western Alaska during this century. The sophisticated navigation equipment on many fishing boats and vessels associated with OCS activity, good seamanship, and good fortune greatly reduce, but do not eliminate, the probability of collisions.

East Coast fishermen report that they bear the cost of collision and gear loss avoidance; they indicate that supply boats, which comprise the bulk of the OCS marine traffic, often ignore the right-of-way of fishing boats, run through fishing grounds on automatic pilot, and consider it the fishermen's fault when fishermen do not do what the supply boat tells them to do (National Fisherman, October, 1975, p. B.3). Even under more ideal conditions, gear losses are expected to occur. The potential for gear loss is greater for fixed gear fisheries than for non-fixed gear fisheries, since fixed gear such as crab pots and long lines are left unattended.

There are two gear loss problems associated with fixed and unattended gear; its presence is marked by a buoy that is much more difficult to observe visually or on radar than a fishing boat and, when it is lost, the cause of the loss is not known. Therefore, it is difficult for a fisherman to gain compensation for his gear losses. The crab and shrimp pot fishermen are more susceptible to gear losses than are halibut long-liners because the concentration of pot gear in some areas greatly increases the probability of gear losses when any OCS marine traffic enters the area. The necessity to completely avoid an area of pot gear to avoid gear losses is evidenced by the successful efforts of West Coast crab fishermen and tug boat operators to all but eliminate what were once substantial gear losses. This was accomplished by identifying routes that the tugs and barges could use to avoid areas of heavy pot concentrations. Halibut longline gear, which can extend for several miles and is marked only at the buoyed ends, is more vulnerable to vessels that have an exceptional draft or are dragging gear. Survey vessels are among those for which such gear provides a large but un-observable target.

Non-fixed gear such as a trawl, purse seine, or dredge is continuously monitored by and is in the relative proximity of the fishing boat; therefore, gear losses to marine traffic are more readily avoided than for fixed gear. However, the size of the gear and the lack of maneuver-ability of a vessel using such gear can result in gear losses to marine traffic under adverse conditions. The greatest source of gear losses to non-fixed gear is, however, expected to result not from marine traffic but from debris that results from marine traffic and other submarine obstacles that result from OCS activity.

Debris on the seafloor has been a problem in areas of offshore petroleum development despite prohibitions on intentional dumping and despite regulations requiring that the location of unintentional dumpings be reported. Evidence from the North Sea, Upper Cook Inlet, and the Gulf of Mexico suggests that the OCS debris problem can be reduced but not eliminated. For example, Cook Inlet fishermen have indicated that during early stages of the development of the Upper Cook Inlet offshore fields debris was often found in fishing nets, but since the problems of this debris were made known to the oil industry and since the industry has made a major effort to reduce intentional and accidental dumping, debris is seldom a problem. It should be noted that in Upper Cook Inlet, floating debris was the major problem since gill nets, not trawls, are used in Upper Cook Inlet fisheries. Therefore, gear losses will occur because of debris that results from OCS operations; and the cost of such losses in many cases will be borne by the fishermen, since it is in many instances difficult to determine whether it was, in fact, OCS debris that caused the loss.

The ability of a single undersea obstacle to continuously result in gear losses is demonstrated by a well-head in the Santa Barbara Channel which claimed the gear of five or more vessels over a period of several years before it was removed (National Fisherman, January, 1979, p. 38). There are several factors which make even known undersea obstacles hazardous. Fishermen may consider information on undersea obstacles to be proprietary, once they have found it at their own expense (in terms of gear loss and lost fishing time). Also, the exact location of such an obstacle may be difficult to determine, even after gear is lost, and information that the Coast Guard provides on the location of known obstacles is not in a form most readily usable by fishermen. The last problem existed in the Santa Barbara Channel because fishermen used loran A or C for navigation, but the location of obstacles as provided by the Coast Guard was in terms of latitude and longitude. An additional problem was that oil companies used the Lambert Grid system, which is different from the systems used by either the fishermen or the Coast Guard (National Fisherman, January, 1979).

If OCS uses of ocean space increase the cost of fishing, and if the fishermen cannot typically be compensated by the OCS industry because of the physical, legal, and theoretical difficulties associated with identifying the party responsible or the magnitude of the increased costs, the relevant question is, how will the increased costs affect harvesting activity? The answer to this question is less obvious than it is relevant.

If the binding constraint on harvesting activity is resource abundance and the subsequent quota, there is a margin within which costs can increase without causing harvesting activity to decline. In such a fishery, the sole effect of a cost increase within that margin would be a decrease in net income to the fishermen and/or boat owner. If entry into such a fishery is limited, the additional fishing costs would tend to reduce the value of the limited entry permit; in this case the burden of increased fishing costs is borne by those who own permits at the time when it is generally recognized that the cost of fishing will be higher due to OCS operations. New entrants into the fishery would not bear the higher costs if the price of the entry permit accurately reflects the increases in fishing cost that will result from such operations. It should also be noted that the margin within which costs can increase without reducing harvesting activity will tend to be larger for the limited entry fisheries, since much of the adjustment can occur through a decrease in the price of the limited entry permit.

Since costs and productivity vary among boats in any one fishery, the margins within which costs can increase without affecting harvesting effort vary. The least efficient boats will be the first to decrease harvesting effort, and as they do so, the harvesting activity of the more efficient boats will tend to increase as long as resource abundance remains the binding constraint for the fishery as a whole. In this case, the number of boats and fishermen participating in a fishery will be reduced but catch will not change, and the net income of fishermen and/or boat owners may increase. If the increase in costs due to OCS operation is less than the decrease in cost that occurs as fishing effort becomes concentrated among the more efficient boats and fishermen, net income will increase.

If market conditions impose the binding constraint, an increase in fishing costs will result in a decrease in harvesting effort unless ex-vessel prices are increased to compensate fishermen for the additional costs . However, since seafood products are quite mobile between areas and, therefore, tend to compete interregionally prior to processing, and since processed forms from different regions compete in the same markets, large exvessel price differentials are not possible. Small exvessel price differentials are possible and may be sufficient to compensate fishermen for increased costs.

If exvessel prices are not increased to compensate fishermen, harvesting activity will decrease. The least efficient boats would be the first to reduce their effort and, as they do so, the effort of the remaining boats may increase as the resources per boat increase. It is therefore possible, however unlikely, that the total harvest will not decrease.

It should be noted that replacing the activity of less efficient boats with increased activity among the more efficient boats is beneficial in that it tends to decrease the total cost of the harvest exclusive of gear loss costs; however, it reduces the number of fishermen who are employed in a specific fishery. The decrease in employment is an adverse effect to the extent that unemployed fishermen cannot readily find alternative employment.

If total harvest does decrease as a result of the increase in fishing cost caused by OCS operations, processing activity in the local community will also tend to decrease unless the decrease in harvest is matched by a decrease in sales to non-local processors, or unless the decrease in the harvest available to local processors can be offset by increased imports of fish from other areas, The conclusions are as follows:

- OCS uses of ocean space will increase the cost of fishing in the areas of joint use.
- The increase in fishing costs may be minimal and not decrease harvesting effort.
- A decrease in harvesting effort may be possible without decreasing catch.
- If catch decreases, local processing activity need not, but probably will, decrease.

COMPETITION FOR THE SERVICES OF THE INFRASTRUCTURE

The OCS industry requirements for the services of the infrastructure are substantial. If these requirements cannot be met without decreasing the services that would otherwise be available to and required by the commercial fishing industry, OCS operations will adversely affect the fishing industry. However, there are economies of scale associated with such services; if the OCS operations result in increases in the supply of these services that meet the OCS requirements, and also increase the supply and/or quality of the services available to the commercial fishing industry, the effect is beneficial. The services that are considered in this report are water, electric power, and port and harbor facilities.

Although the impact of competition for these services will depend upon the rates at which the supply of and demand for each service increase in each community, the general characteristics of the service requirements of the two industries and past experiences of OCS and fishing industry competition for services provide some general guidance in determining what the impacts may be. The remainder of this section summarizes information from such experiences in the Upper Cook Inlet and the North Sea, and addresses the characteristics of the requirements. The summary of the Cook Inlet experience is based on information provided by two persons who have held managerial positions in the Cook Inlet fish processing industry since the beginning of the Upper Cook Inlet oil boom. The summary of the North Sea experience is based on material presented by Sevy in Technical Report Number 28.

Commercial fishing industry sources reported that Upper Cook Inlet petroleum development did not adversely affect the supply of public serivces to the commercial fishing industry. A beneficial impact on the infrasturcture, although not. on the supply of public services, was said to be the establishment of businesses which existed to provide specialized services to the petroleum industry but which were also used by the fishing industry. Examples of such businesses or services would include underwater welding and marine electronics repair.

For the services for which the two industries will tend to compete, the impact will be determined by the rates of increase in the supply of and demand for these services as a result of OCS operations, and by the ability of the fishing industry to find alternative inputs if the changes in supply and demand are adverse. For other services, the characteristics and/or practices of the two industries will reduce or eliminate competition. The ability of the fishing industry to adapt when confronted with a lack of services and the factors that reduce competition are discussed below.

The commercial fishing industry has demonstrated a remarkable ability to survive and make do when "required" services are not available. An example of this is the fishing industry that continues to expand in Dutch Harbor/Unalaska despite the fact that adequate water, electric power, and port or harbor facilities are not provided by the community. When such services were not provided, the fishing industry has been capable of providing its own sources of services. Processing plants use diesel generators to produce their *own* electric power; and since many communities also use this high-cost method, the cost differential of generating their own electric power is minimal. Wells can often be drilled when the municipal water system is inadequate, and freighters with self-contained cargo handling equipment can be used when only minimal port facilities are available. The height to which self-sufficiency can be taken is demonstrated by the completely self-contained processing barges which have recently been built. The barges can receive fish on the fishing grounds directly from fishing boats, process the fish using workers who are hired for the duration of the season and who live onboard, and load the processed fish directly onto ships or barges bound for markets in Seattle or Japan.

The characteristics of the water and electric power required by the two industries are quite similar; therefore, their requirements will tend to be competitive. However, their requirements for port and harbor facilities are different enough to greatly reduce the effective competition of the OCS service requirements. The small boat harbors that provide moorage facilities for most commerical fishing boats in the Western Alaska are not designed to accommodate vessels as large as the smallest OCS vessels; these vessles will therefore not compete for moorage in the small boat harbors. However, there are two reasons why competition for moorage space will occur outside the small boat harbors until OCS vessels use only facilities that are built for their exclusive use. The reasons are that the small boat harbors are not large enough to provide moorage for all the fishing boats seeking it, nor are they large enough to service the larger fishing boats that are becoming more numerous. Their vessels tie up wherever possible and, in many cases, temporarily use the facilities that will be used by OCS vessels before their own facilities are available.

The desire of the OCS industry to have facilities dedicated to OCS vessels in order to assure that the facilities are available when required, once it becomes apparent that a community will be the site of field development support activities, will eliminate the competition between fishing boats and OCS boats for moorage space. However, this

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may also preclude the benefit to be had from development of a harbor facility that could both serve the OCS industry and provide better service to the fishing industry than is currently available from the small boat harbors. The OCS harbor requirements could provide the impetus necessary for construction of a more adequate facility. It should be noted that the larger fishing boats are quite similar in dimension to OCS supply boats and, in fact, the Alaska fishing fleet includes several vessels that were originally OCS supply boats or were built using the basic design of such boats.

This section has completed the review of past experiences of the interaction between the commercial fishing and OCS industries and the general analysis of the potential impacts OCS operations may have on a commercial fishing industry. In the following section, this information is used, together with the material presented in the first section of this chapter, to discuss the area- and scenario-specific impacts that may occur.

Potential Impacts

The nature of the potential impacts is sufficiently similar for each resource scenario that they can most efficiently be discussed together by source of impact. The discussion of the potential impacts due respectively to the competition for labor, ocean space use, and infrastructure services is followed by a summary of potential impacts.

COMPETITION FOR LABOR

The expected locations and characteristics of commercial fishing industry and OCS industry activities in Western Alaska will tend to prevent OCS labor requirements from being a significant source of impacts. The particular aspects of these activities which will limit impacts are as follow:

- OCS employment and population impacts will be principally concentrated in the Nome area. This is an area in which neither harvesting nor process" ng activities have been or' are expected to be significant in terms of either Western Alaska commercial fishing industry activities or the overall level of economic activity in the Nome area.

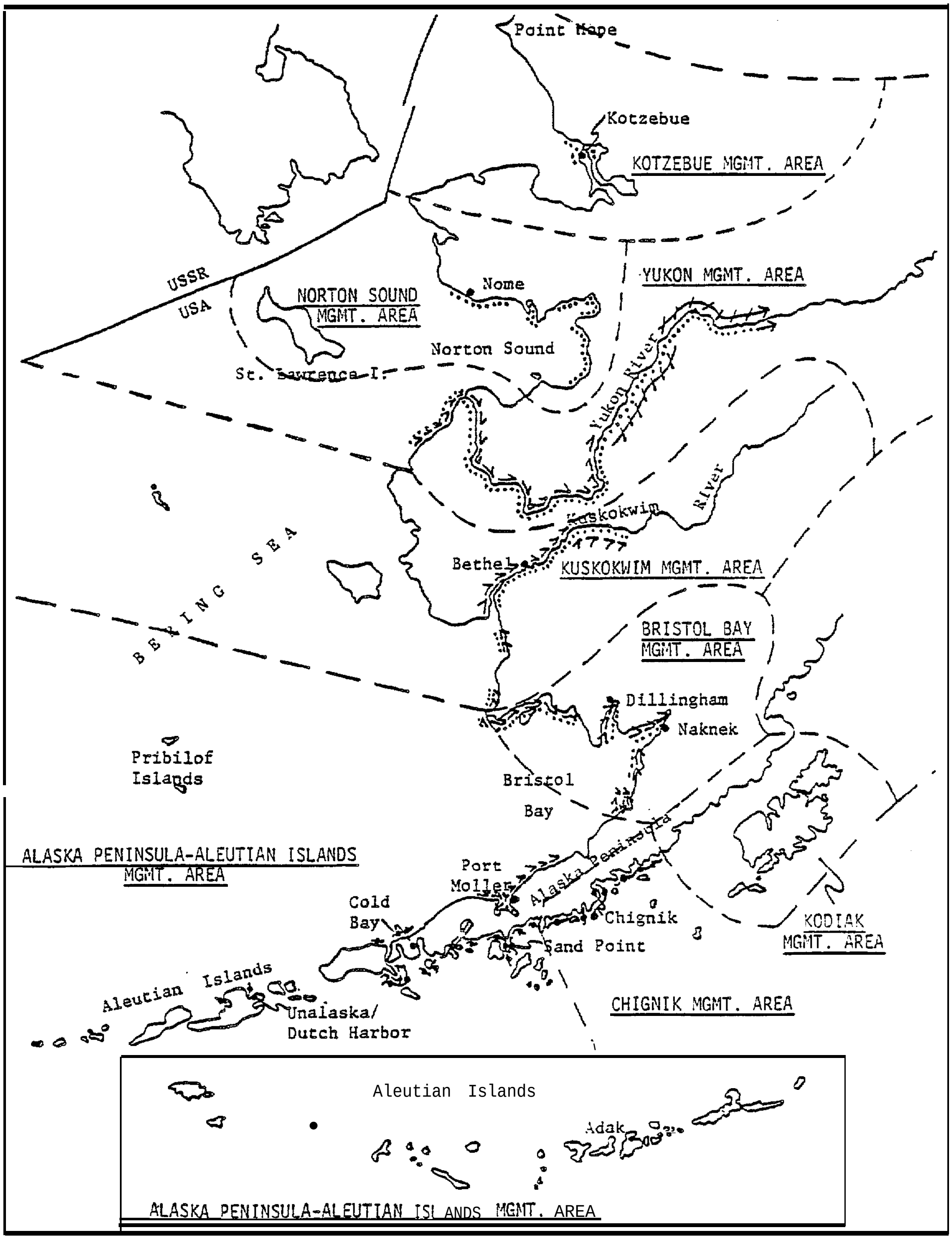
- OCS companies will build an enclave-onshore facility with dormitories and rotate onshore and offshore crews through Anchorage.

- Commercial fishing industry activities in the Aleutians, the site of an OCS rear support base, are principally conducted from self-sufficient enclaves which are not significantly dependent on resident labor forces.

These factors and the general determinants of the degree to which the commercial fishing and OCS industries effectively compete for labor, as presented in a previous section, suggest that OCS labor requirements will probably not significantly affect commercial fishing industry activities in Western Alaska as a whole or in the Nome area despite the magnitude of OCS labor requirements in Nome. They also suggest that the probability of beneficial impacts resulting from an increase in the population of Nome and from the resulting increase in the resident labor force is greater than the detrimental impacts.

COMPETITION FOR OCEAN SPACE USE

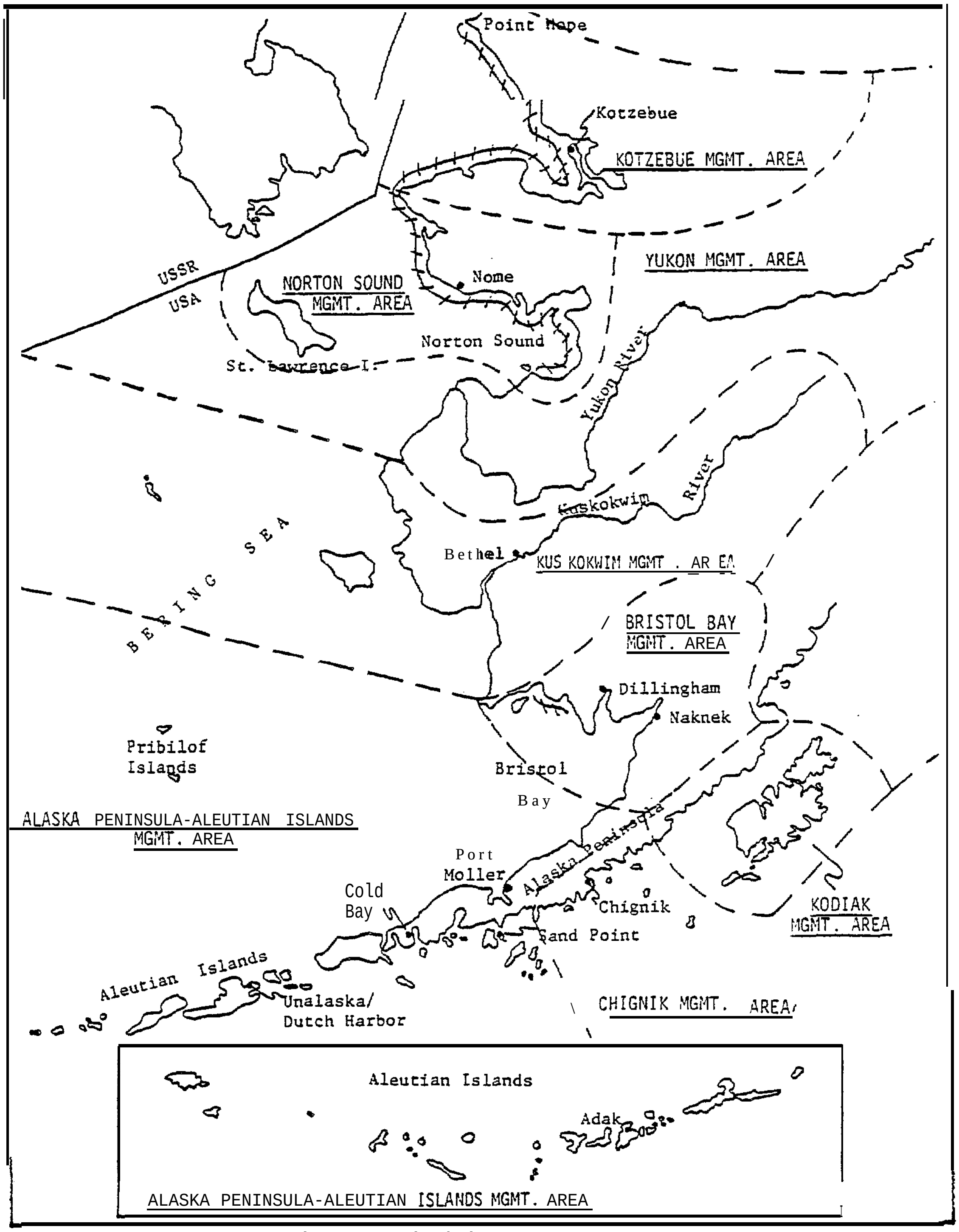
Area specific information about the nature and location of ocean space used by the commercial fishing and OCS industries is presented in this section, and, together with the previously presented analysis of the competition for ocean space, is used to determine the potential impacts of OCS use of ocean space. The extent to which OCS uses of ocean space will increase fishing costs in a particular fishery will depend on the extent to which the fishing grounds of each fishery are used for OCS operations, and on the nature of the fishing and OCS operations in areas of joint use. There are a number of fisheries that will not compete with the OCS industry for ocean space because their principal fishing grounds are not included in areas identified for OCS use. These fisheries include all the salmon and herring fisheries of Western Alaska with the exception of the Norton Sound fisheries (see Figures 5.4 and 5.5). OCS ocean space use on the Norton Sound fishing grounds includes the offshore pipeline corridors that cross near-shore salmon and herring fishing grounds near Cape Darby and Cape Nome in the mean and high find



Gear Types and Major Fishing Areas:
Drift Gill Net — Purse Seine
Set Gill Net — Fish Wheel
ADF&G Management Area Boundaries

Figure 5.4: Major Salmon Fishing Areas, Western Alaska

Source: Alaska Department of Fish and Game, Alaska's Fisheries Atlas, 1978.



--- Major Fishing Areas
——— ADF&G Management Area Boundaries

Figure 5.5: Major Herring Fishing Areas, Western Alaska.

Source: Alaska Department of Fish and Game, Alaska's Fisheries Atlas, 1978.

cases and near Cape Nome in the low find case (see Figures 5.1 through 5.3). The areas of joint use are very limited for the salmon and herring fisheries because both fisheries occur in near-shore areas where little OCS activity is expected.

The OCS activity along pipeline corridors is expected to minimally reduce the area available for fishing, but not to adversely affect the catch as a whole because a small area is affected and because harvesting activity is relatively light in the areas designated for OCS ocean space use. However, set gill net fishermen who have established property rights to the area of a pipeline corridor will suffer a loss unless equally productive areas are available to them. It should be noted that gill net site property rights are not as well established in Norton Sound as they are, for example, in Cook Inlet, and the loss to a particular Norton Sound fisherman is expected to be less than it would if property rights were well defined. Perhaps no more than one to two set gill net sites will be preempted by each pipeline corridor, and if the pipeline is buried, the sites would only be affected during the year in which the pipeline is constructed. The total loss is therefore expected to be minor since annual real gross income per gill net boat is not expected to exceed $6,000 in the salmon fishery or $4,000 in the herring fishery by the year 2000.

Long line halibut fishing grounds include large areas in the Bering Sea and in the Gulf of Alaska through which OCS vessels will pass as they transport supplies, equipment, oil, and gas to or from the lease sale area (see Figure 5.6). Gear losses which will increase fishing costs are expected to occur. However, there are two reasons such losses are not expected to measurably affect harvesting activity. OCS traffic is expected to be within well-established sea lanes, and quotas, not market conditions, are the binding constraints on harvesting activity.

The king crab and Tanner crab and, to a limited extent, the shrimp fishing grounds of Western Alaska also include large areas through which OCS vessels will pass in transporting equipment to the lease sale area and in transporting gas and oil from Cape Nome to markets outside the lease sale area (see Figures 5.7 through 5.9). Crab fishery gear (i.e., pots) are particularly susceptible to losses to marine traffic because the pots are left unattended and because of the high concentrations of gear in some areas. The fact that the gear is unattended makes it more difficult to spot and to avoid; it also makes it difficult for a fisherman to determine the cause of the loss and to receive compensation when gear is lost to marine traffic. Gear losses will undoubtedly occur as the result of OCS activities; the losses are not however expected to decrease harvesting activity. There are two reasons for this; OCS traffic will typically be in well established sea lanes and quotas, not market conditions, are the binding constraints except perhaps for the C. opilio Tanner crab fishery. Within Norton Sound, the king crab grounds are in areas designated for OCS ocean space use by OCS vessels and the mean-find case pipeline corridor.

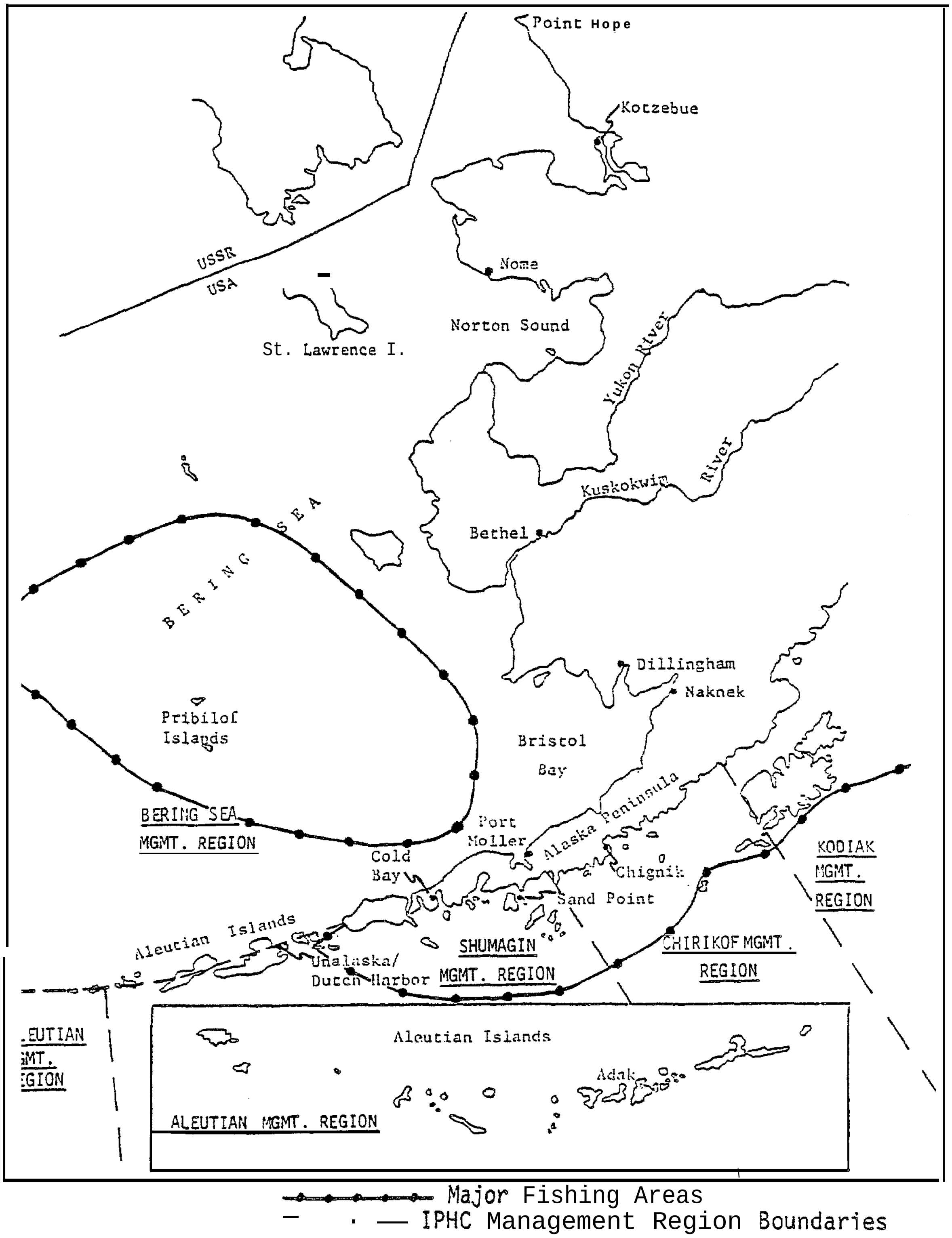
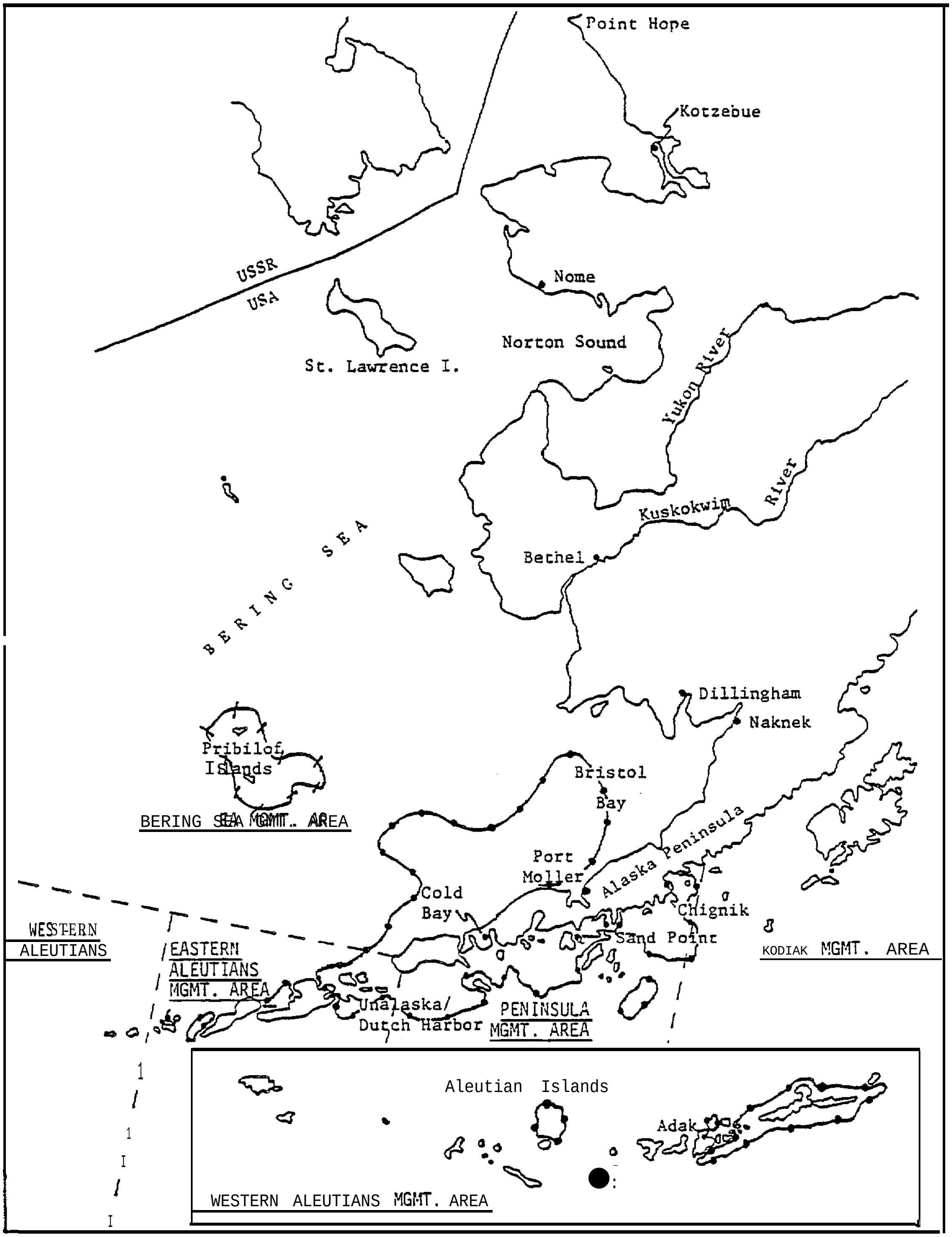


Figure 5.6 Major Halibut Fishing Areas

Source: International Pacific Halibut Commission, Technical Report No. 6; Alaska Department of Fish and Game.



— Major Blue King Crab Fishing Areas

-/-/-/-/-/- Major Red King Crab Fishing Areas

— — — ADF&G Management Area Boundaries

Figure 5.7: Major King Crab Fishing Areas, Western Alaska

Source: Alaska Department of Fish and Game, Alaska's Fisheries Atlas, 1978.

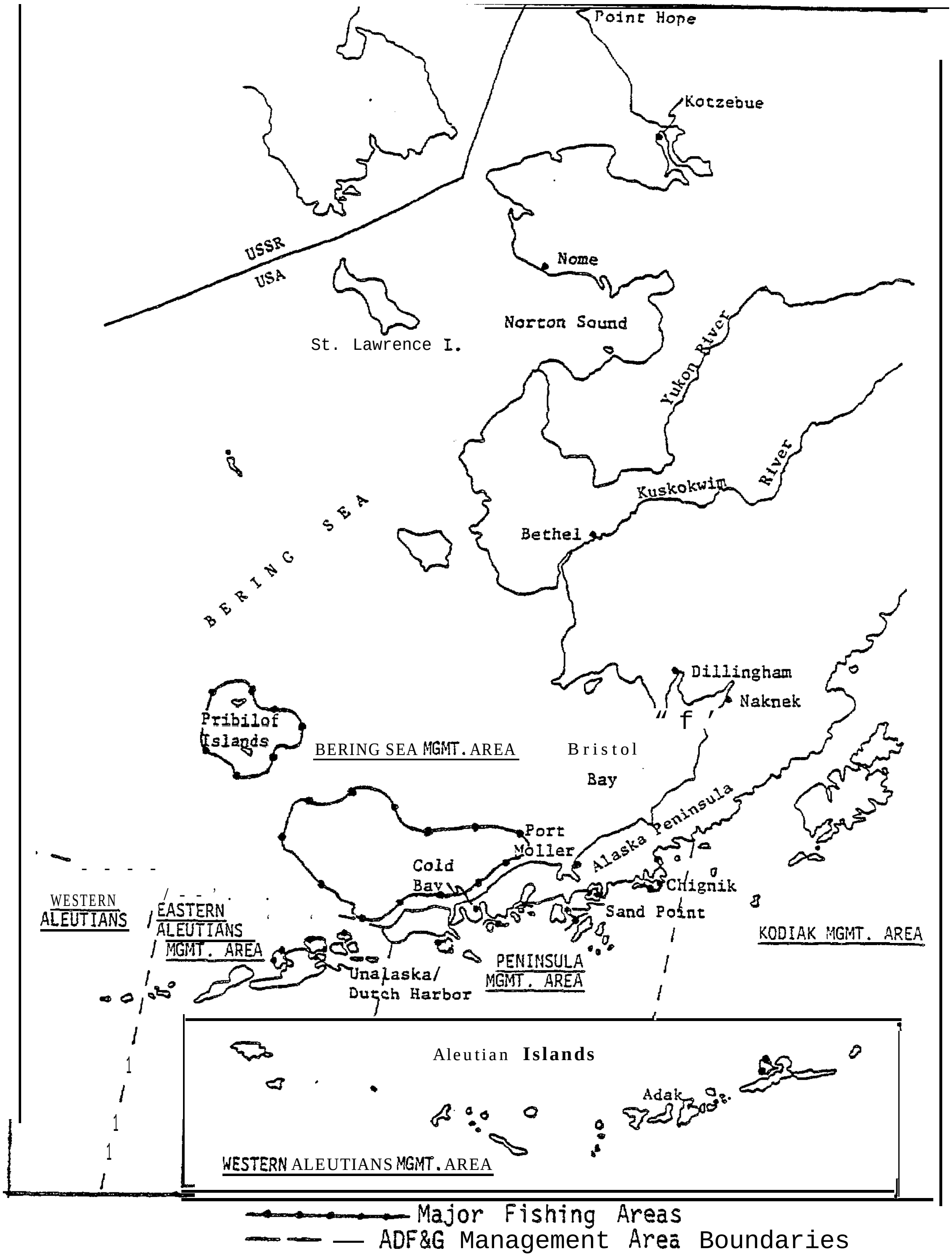


Figure 5.8: Major Tanner Crab Fishing Areas, Western Alaska

Source: Alaska Department of Fish and Game, Alaska's Fisheries Atlas, 1978.

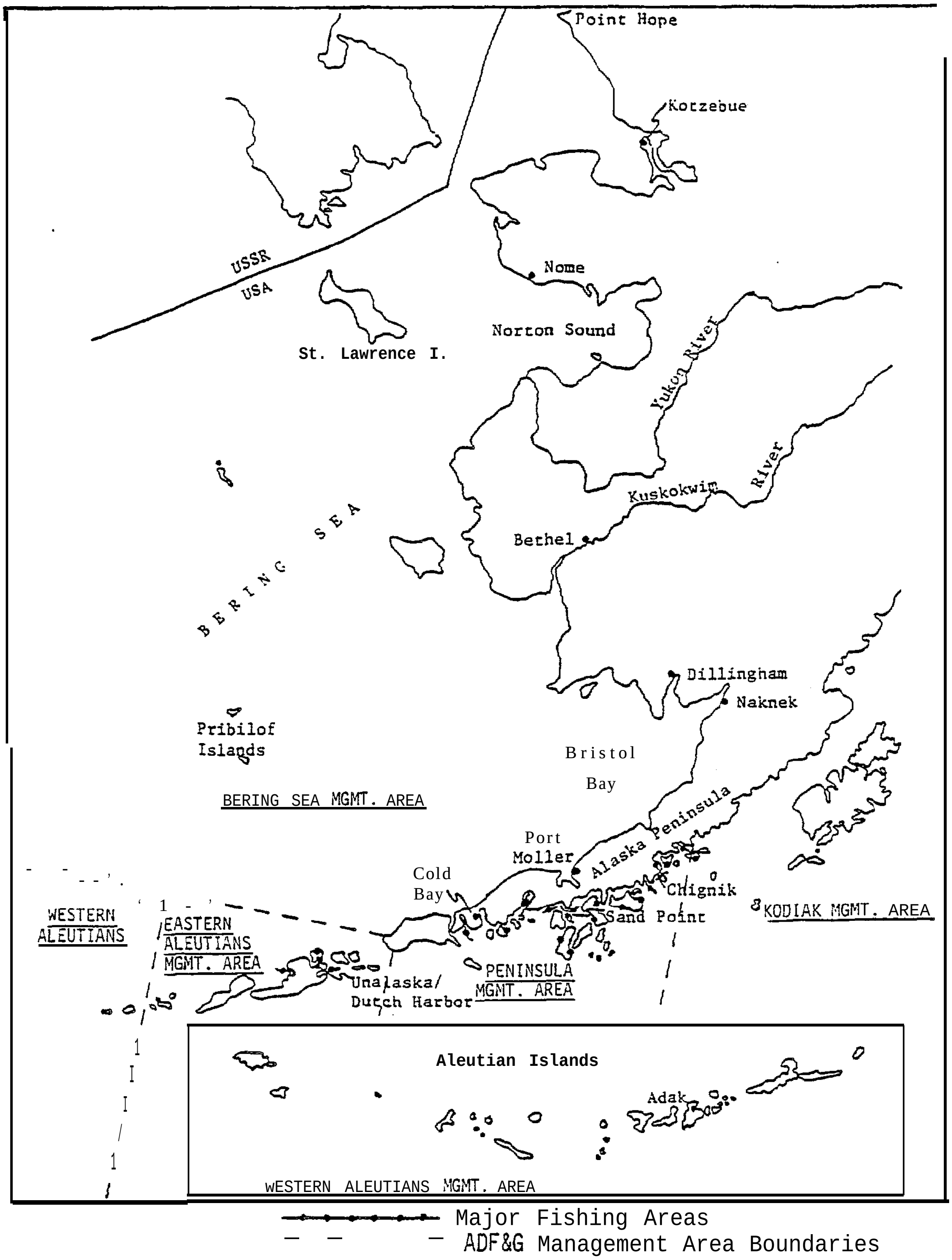


Figure 5.9: Major Shrimp Fishing Areas, Western Alaska

Source: Alaska Department of Fish and Game, Alaska's Fisheries Atlas, 1978.

Although it is not possible to determine the magnitude of the gear losses that will occur since the actual losses will depend on a number of factors, including the actions that both industries take to reduce losses, it is possible to consider the type of loss that could occur to a single vessel and to place an upper bound on gear losses. The former can be done by considering what could happen to an individual vessel; the latter can be done by considering other sources of gear loss such as other fishing vessels or ice flows.

The following is perhaps a high-loss scenario for a king crab or Tanner crab vessel. Crab boats in Western Alaska often fish with 400 to 500 pots and a pot typically costs about $500. The total potential loss in pots alone is therefore over $200,000 per boat. Pots are commonly placed at 183 to 274 meter (200 to 300 yard) intervals but are at times placed within 27 meters (30 yards) of each other and if the pots are set at low tide their buoys may not be visible. For the purposes of this scenario, assume that 100 pots are lost to OCS traffic. This would be a direct gear loss of $50,000, and it would reduce the fishing power of a 400 pot boat by 25 percent. If the pots are not replaced during the season, and they usually are not, if the losses occur at the beginning of the season, and if the boat's catch is proportional to the number of pots it fishes; the boat's annual catch would be reduced by 25 percent. This would amount to a loss of approximately $100,000 or $40,000 in real gross income for a Bering Sea king crab or Tanner crab boat, respectively. These estimates are based on the preceding assumptions and the projected real harvest value per boat month for each fishery as reported in Chapter IV. If the vessel or vessels which cause gear losses cannot be identified, and typically they cannot be since the losses usually occur when pots are unattended, the crab boat sustaining the losses is not compensated and therefore bears the full burden of the lost gear and perhaps the full burden of the reduced income. The latter cost of a gear loss may be shared by other boats in the fleet since it is common practice for other boats to lend pots to a boat which loses a large number of pots due to, for example, ice flows.

The high loss scenario can be put into perspective by considering normal gear losses and the longevity of the gear. Normal causes of gear loss include: broken lines, pots being dropped overboard, tangled lines pulling buoys under, and buoys being pulled under water when lines are not sufficiently long for the ocean depth. Pots are also lost to marine traffic, including other fishing vessels, and to ice flows. Gear losses and longevity vary greatly but it is not unusual for a 400-pot boat to buy 40 pots per year to replace lost and worn gear. However, gear losses can be much greater; for example, it has been estimated that between 4,000 and 10,000 pots in the Bering Sea for storage between the king and Tanner crab seasons were lost in 1980 due to ice flows which occurred further south than was expected (National Fisherman, June 1980).

There are two reasons gear losses due to the causes listed above are expected to be substantially greater than gear losses that will occur due to OCS marine traffic traversing fishing grounds in well-established sea lanes. The volume of the OCS traffic is expected to be significantly lower than the volume of non-OCS traffic and the nature of the OCS traffic is expected to be less conducive to gear losses. Two examples of fishing boat traffic are as follow: during February, 1980, a total of 194 individual foreign fishing and associated support ships engaged in fisheries off Alaska, the number of vessels present simultaneously varied from 143 to 166 (Fishery Market News, March 31, 1980, p. 2); and 373 trawlers and 124 catcher/processors are expected to participate in the Bering Sea domestic groundfish fishery by the year 2000.

The differences in the nature of the traffic which suggest that OCS traffic will not be the principal cause of gear losses include traffic patterns and vessel draft or gear depth. While OCS traffic will typically cross fishing grounds on a straight course to a specific destination, trawlers will remain on fishing grounds making repeated tows. The draft and beam of a trawler with gear in the water are typically greater than those of OCS marine traffic; fixed gear such as pots or long lines are therefore more vulnerable to losses to trawlers than they are to most OCS related marine traffic. This may to some extent be offset by a knowledge of areas of potential gear loss by commercial fishermen. However, the heavy gear losses sustained by domestic crab fishermen as the result of foreign trawler activities southeast of Kodiak Island in 1979, suggest that this may not be the case, at least not with foreign trawlers. Ten boats lost a total of more than 50 pots to trawlers in a two-week period (Alaska Fisherman Journal, December 1979).

The most recent and complete data on gear losses were collected by the Commercial Fisheries Entry Commission in the mid-1970s. These data indicate that the average annual gear loss of vessels participating in Alaska shellfish fisheries was approximately $8,400. This was about 13 percent of the total value of the gear used by these vessels or about 17 percent of the fishing costs excluding labor costs. These gear loss estimates include the cost of gear itself but do not include the cost associated with lost fishing time. Data on the cost of lost fishing time including the cost of lost fish are not available. OCS related gear losses are expected to be significantly lower than other types of gear losses.

Another aspect of the increased fishing cost is the cost associated with collisions between fishing vessels and OCS vessels or structures. It is not possible to determine the magnitude of these costs, but there are reasons for expecting them to be minor for the fishing industry as a whole. The probability of a collision increases as the volume of traffic increases, and OCS and fishing operations are expected to significantly increase the volume of marine traffic in the study area. However, as is indicated in the Technical Report Number 52, the volume of traffic is
9 expected to be insignificant compared to the capacity of the system; therefore, the projected increase in traffic is not expected to measurably increase the probability of a collision.

Fishing vessel accident data indicate, for the United States as a whole, collisions account for approximately 18 percent of fishing boat accidents and 45 percent of the collisions result from neglecting the rules of the road. The implication is that the expected increases in vessel traffic will not significantly affect the cost of vessel accidents, particularly if more attention is paid to the rules of the road.

COMPETITION FOR SERVICES OF THE INFRASTRUCTURE

The locations of and nature of commercial fishing industry and OCS industry activities are expected to prevent OCS requirements for electric power or water from adversely affecting the commercial fishing industry of Western Alaska. OCS activities requiring electric power and water will be concentrated at Cape Nome and to a lesser degree at the site of the rear support base in the Aleutian Islands. OCS operations at Cape Nome are expected to be self-sufficient in terms of both water and electric power; they are therefore not expected to adversely affect the limited commercial fishing activities which occur in the Nome area. The increased demand for electric power and water that does occur in Nome due to indirect OCS employment and population impacts will adversely affect the supply of water and electric power to all residential and commercial users, if the community's capacity to provide these utilities does not keep pace with demand. The potential ability of the community to increase capacity, the ability of the commercial fishing industry to provide its own sources of water and electric power, and the low level of commercial fishing industry activity in Nome suggest the industry will not be significantly affected by OCS-generated utility requirements in Nome. A potentially beneficial impact with respect to electric power will occur due to OCS activities. The availability of natural gas will substantially reduce the cost of generating electricity and will therefore increase the feasibility of commercial fishing industry activities in Nome. The cost reduction is not, however, expected to significantly increase such activities.

There are three reasons OCS water and electric power requirements for the rear support base in the Aleutians are not expected to significantly affect commercial fishing industry activities based in the Aleutians. OCS utility requirements will be minimal, OCS activities may occur in a self-sufficient enclave, and commercial fishing activities are not or need not be dependent on community-wide sources of electric power or water.

With respect to port and harbor facilities, commercial fishing industry activities in Nome will probably benefit from improvements to or the development of facilities that might not be feasible in the absence of OCS activities. These are expected to include significant improvements to the Nome port facilities and small boat harbor and the development of port facilities at Cape Nome. The port projects, which are expected to be principally financed by the OCS industry, will eliminate the need to lighter freight into or out of Nome. They will significantly decrease transportation costs and, therefore, increase the feasibility of commercial fishing activities in Nome. The improvements to the small boat harbor are expected to be, in part, financed by property tax revenues generated by OCS activities (Technical Report Number 53). The improved small boat harbor and port facilities will provide sufficient moorage space and water depth to allow larger boats to land fish in or operate out of Nome. This will significantly increase the ability of Nome to participate in the commercial fisheries of Norton Sound and the Bering Sea. Because there are other factors which will affect Nome's participation in these fisheries, it is not clear how the improved facilities will change the level of commercial fishing industry activity in Nome. However, the absence of such facilities will severely limit such activity.

The port facilities required by the rear supply base in the Aleutians will adversely affect the commercial fishing industry to the extent that they preempt the fishing industries' use of existing facilities or compete for future expansion sites. The facility and site requirements are sufficiently similar that the two industries will tend to compete; however, since the magnitude of the OCS activities are expected to be low in comparison to fishing activities, OCS activities are not expected to significantly affect the commercial fishing industry. For example, over 700 crab and groundfish vessels are expected to be operating in the Bering Sea in 2000 and to use the Aleutian Islands as a base of operations. The centers of commercial fishing industry activities are expected to include Dutch Harbor/Unalaska, Cold Bay, and Yakutan. The benefits of having a site which provides adequate room for a large supply base that can support exploration, development, and production activities throughout Western Alaska suggest that the OCS industry may choose its site where it does not have to compete with the fishing industry for either land or port facilities. The selection of such a site would significantly decrease the probability of adverse impacts for the fishing industry.

A potential benefit from OCS operations in the Aleutians is the additional impetus they may provide for the development of improved harbor and port facilities. However, due to the OCS industry's propensity to require dedicated port facilities such an impetus may not be provided; or if it is, it is not clear that the benefits that would accrue to the fishing industry once the improved facilities are available would be greater than the costs imposed on the fishing industry by the joint use of existing facilities in the interim.

Conclusions

The hypothesized locations and characteristics of both OCS industry activities are expected to severely limit the degree to which competition for labor, ocean space use, or the services of coastal community infrastructures will impact the commercial fishing industry. Although individual participants in the commercial fishing industry of Western Alaska may be significantly affected by OCS operations because the impacts will not be evenly distributed over all participants, the industry as a whole is not expected to be significantly impacted. The concentration of OCS activities in the Nome area suggests that commercial fishing activities in Nome will be more heavily affected than commercial fishing activities for Western Alaska as a whole. The short-term impacts may adversely affect the minimal fishing activities which occur in Nome; these activities may in fact all but cease during the years in which OCS-generated economic growth is most rapid if the explosive growth so disrupts the local economy that commercial fishing industry activities are not economically viable. The long-term benefits due to a larger population and labor forces and due to improved port and harbor facilities may allow Nome to become a much more active participant in the commercial fisheries of Western Alaska.

The expected impacts with respect to specific indexes of commercial fishing industry activity are as follow:

- Neither harvest weight nor value is expected to be measurably affected in Western Alaska as a whole or in Norton Sound.

- The level of fishing activity (i.e., number of vessels by type, employment, and income) is not expected to be affected in Western Alaska or in Norton Sound. However, the level of fishing effort associated with Nome is expected to decrease in the short run and increase in the long run as a result of OCS activities.

- The level of processing activity (i.e., number of plants by type, employment, and income) is not expected to be affected, however the concentration of processing effort in Nome may be decreased in the short run and increased in the long run.

- Local participation in harvesting and processing is not expected to be significantly affected for Western Alaska as a whole, but local participation in Nome is expected to increase in the long run.

- With the possible exception of increased marketing opportunities in Nome, fish markets are not expected to be significantly affected by OCS activities.

- With the exception of Nome, the capacity, suitability, and location of local ports, harbors, processing plants, fleets, and public services are not expected to be significantly affected by OCS activities.

- With the exception of Nome, siting and public service requirements of commercial harbors and onshore processing plants are not expected to be significantly affected. The requirements in Nome will probably increase as a result of OCS activities.

- Areas of conflict in ocean and harbor space use will tend to increase due to increased OCS and fishing industry traffic. The increased areas of conflict are not expected to significantly affect either industry.

- The frequency of ocean space and harbor use will increase due to OCS activities; the seasonality will tend to decrease because OCS use is less seasonal than that of the fishing industry. With the exception of Nome, the frequency and seasonality of use by the fishing industry is not expected to be affected.

- o The employment and population impacts of OCS activities will tend to increase recreational fishing activities in the study area but not sufficiently to result in significant conflicts between recreational and commercial fishing activities.

- o The organization of the commercial fishing industry and economic and political trends of significance to the commercial fishing industry of Western Alaska are not expected to be measurably affected by OCS activities. In Nome, economic conditions that are conducive to the long-run development of the industry are expected to occur. The dramatic change in the level and the composition of the Nome population may change the community's attitude toward the industry. However, since Nome is not now a commercial fishing community, the direction and impact of such a change are indeterminant.

With the exception of the exploration only case, the nature of the impacts is not expected to vary dramatically among development scenarios. The magnitude of some, but not all, impacts will be proportionate to the level of OCS activity. For example, the conflicts associated with joint ocean space use will tend to increase proportionately, although perhaps unmeasurable, with the volume of OCS marine traffic. But the benefits of improved port and harbor facilities in Nome may be quite similar for the low, mean, and high find cases since each case includes such improvements. The exploration only case does not include improvements to both facilities; therefore, the beneficial impacts are less in the exploration only case.

The limitations of the impact analysis presented in this report are summarized in Chapter II. The reader is urged to read or reread the appropriate section of Chapter II to be aware of the limitations. In particular, it should be noted that the potential impacts either resulting from chronic or major oil spills or resulting from other major ecological changes linked to OCS industry activities are not considered.

APPENDIX A

Exvessel Price Models and Data

Models Used to Project Boat Months
and Fisherman Months

Numerical Basis of Harvest Weight Projections

King Salmon Exvessel Price Model

0RD1NAR% LEASTSQUARES
DEPENDENT VARIABLE: PK

SUM OF SQUARED RESIDUALS = o*712155E-01
STANDARD ERROR OF THE REGRESSION = 0.689036E-01
MEAN OF DEPENDENT VARIABLE = 0.589997
STANDARD DEVIATION = 0.385557
R-SQUARED = 0.9734
ADJUSTED R-SQUARED = 0.9681
F-STATISTIC(3., 15.) = 182.865
LOG OF LIKELIHOOD FUNCTION = 26.1118
NUMBER OF OBSERVATIONS = 19.
SUM OF RESIDUALS = 0.55(1794E-08
DURBIN-WATSON STATISTIC (ADJ. FOR O. GAPs) = 1.5901

RIGHT-HAND VARIABLE	ESTIMATED COEFFICIENT	STANDARD ERROR	T-STATISTIC
C	-0.904171E-01	0.950882E-01	-0.950876
CSK	0.129334E-01	0.945712E-02	1.36759
FK	00158335	0.775821E-01	2.04087
PCO	0,984949	C).85109IE-O1	11.5728

ESTIMATE OF VARIANCE-COVARIANCE MATRIX OF ESTIMATED COEFFICIENTS

	C	CSK	FK	PCO
C	0.904176E-02	-0.856844E-03	0.296427E-03	0.125423E-03
CSK	-0.856844E-03	0.894371E-04	-0.815679E-04	-0.881152E-04
FK	0.296427E-03	-0.815679E-04	0.601899E-02	-0.521618E-02
PCO	0.125423E-03	-0.881152E-04	-0.521618E-02	0.724357E-02
	1	2	3	4

PLOT OF ACTUAL(*) AND FITTED(+) VALUES

ID	ACTUAL	FITTED	RESIDUAL
1961	0.2626	0.2179	0.448E-01
1962	0.3088	0.2547	0.541E-01
1963	0.3413	0.2338	0.108
1964	0.3166	0.2758	0.408E-01
1965	0.2769	0.3300	-0.531E-01
1966	0.3154	0.2993	0.161E-01
1967	0.2665	0.3538	-0.873E-01
1968	0.3437	0.3483	-0.459E-02
1969	0.3262	0.3735	-0.472E-01
1970	0.4360	0.4174	0.187E-01
1971	0.3916	0.3661	0.256E-01
1972	0.3742	0.5394	-0.165
1973	0.8837	0.9297	-0.460E-01
1974	0.7476	0.7884	-0.408E-01
1975	0.7473	0.7043	0.430E-01
1976	0.9474	0.9525	-0.506E-02
1977	1.200	1.196	0.351E-02
1978	1.301	1.226	0.760E-01
1979	1.423	1.403	0.192E-01

Historical and Forecasted Data

	EPK	CSK	FK	EPCO
1961	0.262637	8.54060	0.158159	0.175429
1962	0.308844	8.73859	0.182054	0.206374
1963	0.341316	9.16053	0.234885	0.171139
1964	0.316583	11.5670	0.304395	0.170949
1965	0.276935	11.0086	0.220171	0.246936
1966	0.315361	9.35009	0.267146	0.229960
1967	0.266515	11.6323	0.258496	0.256694
1968	0.343698	11.2457	0.261529	0.255701
1969	0.326232	10.7465	0.325651	0.277522
1970	0.436040	11.5466	0.427653	0.295161
1971	0.391611	11.9719	0.374122	0.246098
1972	0.374152	9.97290	0.498645	0.428307
1973	0.883747	8.91693	0.990770	0.759345
1974	0.747567	9.29003	0.580627	0.676901
1975	0.747293	7.16547	0.895684	0.568759
1976	0.947399	8.91553	0.247654	0.901926
1977	1.20000	12.0000	1.25000	0.948052
1978	1.30147	13.6000	0.786127	1.03109
1979	1.42254	14.2000	1.27928	1.12442
1980	1.37983	8.00000	1.27900	1.18206
1981	1.47805	10.1398	1.27900	1.25368
1982	1.55230	10.2815	1.27900	1.32721
1983	1.63203	10.4252	1.27900	1.40626
1984	1.71763	10.5710	1.27900	1.49126
1985	1.80955	10.7187	1.27900	1.58265
1986	1.90827	10.8686	1.27900	1.68091
1987	2.01429	11.0205	1.27900	1.78655
1988	2.12815	11.1745	1.27900	1.90013
1989	2.25045	11.3307	1.27900	2.02225
1990	2.38182	11.4891	1.27900	2.15354
1991	2.52293	11.6497	1.27900	2.29470
1992	2.67451	11.8126	1.27900	2.44646
1993	2.83735	11.9777	1.27900	2.60962
1994	3.01229	12.1451	1.27900	2.78503
1995	3.20024	12.3149	1.27900	2.97363
1996	3.40217	12.4870	1.27900	3.17638
1997	3.61912	12.6616	1.27900	3.39436
1998	3.85224	12.8386	1.27900	3.62871
1999	4.10271	13.0180	1.27900	3.88066
2000	4.37185	13.2000	1.27900	4.15152
	1	2	3	4

Source: ADF&G Catch and Product on Leaf ets, and Preliminary Catch and Production Reports.

EPK = Alaska king salmon exvessel price.
CSK = Alaska king salmon harvest (million pounds).
FK = CSK/Alaska canned king salmon pact (in 1,000 48-pound cases .
EPCO = Alaska coho salmon exvessel price.

Red Salmon Exvessel Price Model

ORDINARY LEAST SQUARES
DEPENDENT VARIABLE: PR

SUM OF SQUARED RESIDUALS = 0.669904E-01
STANDARD ERROR OF THE REGRESSION = 0.647063E-01
MEAN OF DEPENDENT VARIABLE = 0.393968
STANDARD DEVIATION = 0.238733
R-SQUARED = 0.9347
ADJUSTED R-SQUARED = 0.9265
F-STATISTIC(2., 16.) = 114.511
LOG OF LIKELIHOOD FUNCTION = 26.6928
NUMBER OF OBSERVATIONS = 19.
SUM OF RESIDUALS 0.111759E-07
DURBIN-WATSON STATISTIC (ADJ. FOR 0. GAPS) = 2.2768

RIGHT-HAND VARIABLE	ESTIMATED COEFFICIENT	STANDARD ERROR	T-STATISTIC
C	-0.904482E-01	0.398148E-01	-2.27173
CSR	0.887243E-03	0.352291E-03	2.51849
PP	1.94575	0.135510	14.3588

ESTIMATE OF VARIANCE-COVARIANCE MATRIX OF ESTIMATED COEFFICIENTS

	C	CSR	PP
C	0.158521E-02	-0.828424E-05	-0.332608E-02
CSR	-0.828424E-05	0.124109E-06	-0.733001E-05
PP	-0.332608E-02	-0.733001E-05	0.183628E-01
	1	2	3

PLOT OF ACTUAL(*) AND FITTED(+) VALUES

ID	ACTUAL	FITTED	RESIDUAL
1961	0.1842	o.1841	0.501E-04
1962	0.2102	0.2322	-0.219E-01
1963	0.2156	0.1661	0.495E-01
1964	0.2262	0.1635	0.627E-01
1965	0.2169	(-), 2353	-0.184E-01
1966	0.2128	0.2558	-0.430E-01
1967	0.2217	('). 1758	0.459E-01
1968	0.2613	0.2213	0.399E-01
1969	0.2516	0.2617	-O.1O1E-O1
1970	0.2470	0.3006	-0.536E-01
1971	0.2618	0.2919	-0.302E-01
1972	(-).3139	0. 2999	0.141E-01
1973	(3.4348	0.5609	-0.126
1974	0.6859	0.6112	0.747E-01
1975	0.4496	0.5727	-0.123
1976	0.6076	0.6392	-0.316E-01
1977	0.7606	0.6734	0.872E-01
1978	0.8237	0.7553	0.684F-01
1979	0.9001	0.8846	0.155E-01

Historicaland Forecasted Data

	EPR	CSR	EPP
1961	0.184178	95.2295	0.976921E-01
1962	0.210216	52.9464	0.141656
1963	0.215589	35.45s7	0.115670
1964	0.226237	54.1319	0.105829
1965	0.216865	142.034	0.102630
1966	0.212756	92.7667	0.135652
1967	0.221678	53.5217	0.112444
1968	0.?61275	48.6958	0.13$031
1969	0.251572	71.734$	0.]48269
1970	0.246992	150.812	0.132202
1971	0.261764	87.2077	0.156711
1972	0.313938	41.9835	0.181460
1973	0.434824	35.2481	0.318668
1974	0.685947	32.2465	0.345907
1975	0.449552	42.8483	0.321264
1976	0.607636	75.6894	0.340479
1977	0.760579	89.8000	0.351623
1978	0.823680	117.400	0.381111
1979	0.900107	187.200	0.415765
1980	0.913678	180.000	0.433983
1981	0.883477	71.2596	0.468045
1982	0.952304	72.5418	0.502834
1983	1.02625	73.8471	0.540?40
1984	1.10568	75.1759	0.580460
1985	1.19103	76.5286	0.623705
1986	1.28272	77.9056	0.670202
1987	1.38124	79*3(-)74	0.720196
1988	1.48709	80.7344	0.773948
1989	1.60083	82.1872	0.831"742
1990	1.72305	83.6660	0.893879
1991	1.85438	85.1715	0.960686
1992	1.99550	86.7040	1.03251
1993	2.14714	88.2641	1.10974
1994	2.31010	89.8523	1.19277
1995	2.48522	91.4691	1.28203
1996	2.67342	93.1150	1.37800
1997	2.87567	94.7905	1.48118
1998	3.09302	96.4961	1.59211
1999	3.32661	98.2324	1.71137
2000	3.57766	100.000	1.83959
	1	2	3

Source: ADF&G Catch and Production Leaflets and Preliminary Catch and Production Reports.

EPR = Alaska red salmon exvessel price.
CSR = Alaska red salmon harvest (million pounds).
EPP = Alaska pink salmon exvessel price.

Pink Salmon Exvessel Price Model

ORDINARY LEAST SQUARES
DEPENDENT VARIABLE: P P

SUM OF SQUARED RESIDUALS = 0.115517E-01
STANDARD ERROR OF THE REGRESSION = 0.287249E-01
MEAN OF DEPENDENT VARIABLE = 0.212793
STANDARD DEVIATION = 0.113899
R-SQUARED = 0.9505
ADJUSTED R-SQUARED = 0.9364
F-STATISTIC(4., 14.) = 67.2518
LOG OF LIKELIHOOD FUNCTION = 43.3911
NUMBER OF OBSERVATIONS = 19.
SUM OF RESIDUALS = -0.186265E-08
DURBIN-WATSON STATISTIC (ADJ. FOR 0. GAPS) = 1.4853

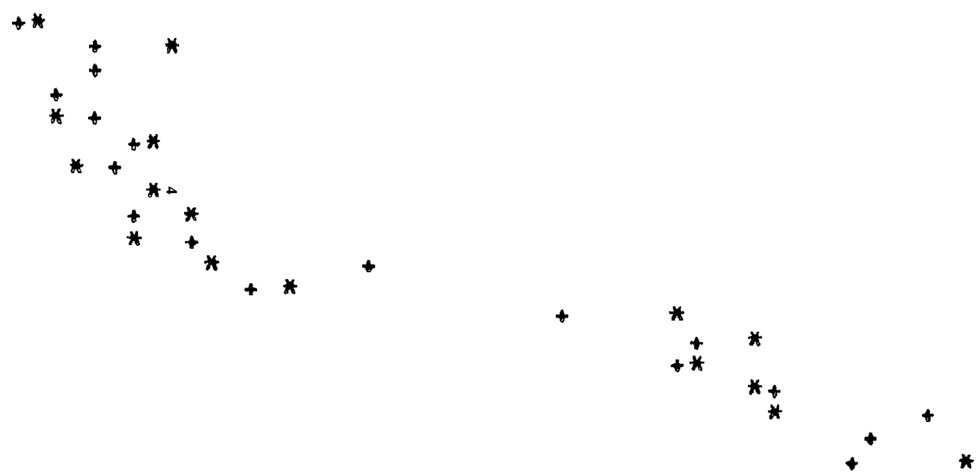
RIGHT-HAND VARIABLE	ESTIMATED COEFFICIENT	STANDARD ERROR	T-STATISTIC
C	0.447156	0.170531	2.62213
CSP	-0.736452E-04	0.138539E-03	-0.531586
FP	-3.02602	1.08488	-2.78927
CPIJ	0.186646	0.316882E-01	5.89009
EXCHJ	-0.582443E-03	0.331004E-03	-1.75963

ESTIMATE OF VARIANCE-COVARIANCE MATRIX OF ESTIMATED COEFFICIENTS

	C	CSP	FP	CPIJ	EXCHJ
C	0.290809E-01	0.225393E-06	-0.102477	-0.341310E-02	-0.501930E-04
CSP	0.225393E-06	0.191929E-07	-0.490084E-04	0.529104E-06	0.407048E-08
FP	-0.102477	-0.490084E-04	.17697	-0.792472E-02	0.466179E-04
CPIJ	-0.341310E-02	0.529104E-06	-0.7924?2E-02	0.100414E-02	0.888508E-05
EXCHJ	-0.501930E-04	0.407048E-08	0.466179E-04	0.888508E-05	0.109564E-06
	1	2	3	4	5

PLOT OF ACTUAL * AND FITTED + VALUES

ID	ACTUAL	FITTED	RESIDUAL
1961	0.9769E-01	0.9154E-01	0.615E-02
1962	0.1417	0.1157	0.259E-01
1963	0.1157	0.1147	0.938E-03
1964	0.1058	0.1062	-0.371E-03
1965	0.1026	0.1186	-0.159E-01
1966	0.1357	0.1307	0.490E-02
1967	0.1124	0.1259	-0.135E-01
1968	0.1380	0.1450	-0.702E-02
1969	0.1483	0.1342	0.141E-01
1970	0.1322	0.1488	-0.166E-01
1971	0.1567	0.2125	-0.558E-01
1972	0.1815	0.1731	0.838E-02
1973	0.3187	0.2791	0.396E-01
1974	0.3459	0.3209	0.250E-01
1975	0.3213	0.3133	0.796E-02
1976	0.3405	0.3474	-0.691E-02
1977	0.3516	0.4040	-0.524E-01
1978	0.3811	0.3857	-0.455E-02
1979	0.4158	0.3757	0.401E-01



Historical and Forecasted Data

	EPP	CSP	FP	CPIJ	EXCHJ
1961	0.976921E-01	103.537	0.823687E-01	0.600000	361.800
1962	0.141656	143.279	0.762932E-01	0.640000	359.600
1963	0.115670	125.117	0.796926E-01	0.690000	362.000
1964	0.105829	162.281	0.841704E-01	0.720000	358.300
1965	0.102630	74.8730	0.847939E-01	0.770000	360.900
1966	0.135652	162.866	0.807867E-01	0.810000	362.500
1967	0.112444	28.8221	0.876050E-01	0.840000	361.900
1968	0.138031	148.446	0.816534E-01	0.880000	357.700
1969	0.148269	105.967	0.893483E-01	0.930000	357.800
1970	0.132202	117.718	0.885761E-01	1.00000	357.600
1971	0.156711	86.2598	0.802416E-01	1.06000	314.800
1972	0.181460	59.9689	0.994509E-01	1.11000	302.000
1973	0.318668	36.6102	0.772366E-01	1.24000	280.000
1974	0.345907	40.0720	0.778097E-01	1.54000	301.000
1975	0.321264	49.9702	0.903621E-01	1.72000	305.200
1976	0.340479	102.419	0.900783E-01	1.88000	292.800
1977	0.351623	129.400	0.907433E-01	2.04000	240.000
1978	0.381111	210.700	0.107885	2.11000	194.600
1979	0.415765	194.100	0.104243	2.16000	248.800
1980	0.433983	120.000	0.100000	2.32200	232.000
1981	0.468045	98.8434	0.100000	2.49615	232.000
1982	0.502834	100.930	0.100000	2.68336	232.000
1983	0.540240	103.060	0.100000	2.88461	232.000
1984	0.580460	105.236	0.100000	3.10096	232.000
1985	0.623705	107.457	0.100000	3.33353	232.000
1986	0.670202	109.726	0.100000	3.58355	232.000
1987	0.720196	112.042	0.100000	3.85231	232.000
1988	0.773948	114.407	0.100000	4.14124	232.000
1989	0.831742	116.822	0.100000	4.45183	232.000
1990	0.893879	119.288	0.100000	4.78571	232.000
1991	0.960686	121.806	0.100000	5.14464	232.000
1992	1.03251	124.377	0.100000	5.53049	232.000
1993	1.10974	127.003	0.100000	5.94528	232.000
1994	1.19277	129.684	0.100000	6.39117	232.000
1995	1.28203	132.421	0.100000	6.87051	232.000
1996	1.37800	135.216	0.100000	7.38580	232.000
1997	1.48118	138.071	0.100000	7.93974	232.000
1998	1.59211	140.985	0.100000	8.53522	232.000
1999	1.71137	143.961	0.100000	9.17536	232.000
2000	1.83959	147.000	0.100000	9.86351	232.000
	1	2	3	4	5

Source: ADF&G Catch and Production Leaflets and Preliminary Catch and Production Data.

EPP = Alaska pink salmon exvessel price.
CSP = Alaska pink salmon harvest (million pounds).
FP = CSP/Alaska canned pink salmon pack in 1,000 48-pound cases).
CPIJ = Japanese consumer price index.
EXCHJ = Exchange rate (yen per dollar).

Chum Salmon Exvessel Price Model

ORDINARY LEAST SQUARES
DEPENDENT VARIABLE: PCH

SUM OF SQUARED RESIDUALS = 0.652483E-02
STANDARD ERROR OF THE REGRESSION = 0.208564E-01
MEAN OF DEPENDENT VARIABLE = 0.224182
STANDARD DEVIATION = 0.161258
R-SQUARED = 0.9861
ADJUSTED R-SQUARED = 0.9833
F-STATISTIC(3., 15.) = 353.685
LOG OF LIKELIHOOD FUNCTION = 48.8177
NUMBER OF OBSERVATIONS = 19.
SUM OF RESIDUALS = 0.279397E-08
DURBIN-WATSON STATISTIC (ADJ. FOR 0. GAPS) = 2.1729

RIGHT-HAND VARIABLE	ESTIMATED COEFFICIENT	STANDARD ERROR	T-STATISTIC
C	-0.105201	0.236782E-01	-4.41,293
CSCH	0.296339E-03	0.403141E-03	0.735076
FCH	0.298890	0.145595	2.05288
PP	1.31811	0.600937E-01	21.9342

ESTIMATE OF VARIANCE-COVARIANCE MATRIX OF ESTIMATED COEFFICIENTS

	C	CSCH	FCH	PP
C	0.560658E-03	-0.792316E-05	-0.140538E-02	-0.258356E-04
CSCH	-0.792316E-05	0.162523E-06	0.442386E-05	-0.576305E-06
FCH	-0.140538E-02	0.442386E-05	0.211980E-01	-0.608283E-02
PP	-0.258356E-04	-0.576305E-06	-0.608283E-02	0.361125E-02
	1	2	3	4

PLOT OF ACTUAL (*) AND FITTED (+) VALUES

ID	ACTUAL	FITTED		RESIDUAL
1961	0.8344E-01	o.6354E-01	+ *	0.199E-01
1962	0.8382E-01	0.1235	* +	-0.397E-01
1963	0.8522E-01	0.8254E-01	+	0.269E-02
1964	0.7489E-01	0.7991E-01	*+	-0.502E-02
1965	0.8123E-01	o*6810E-01	+ *	0.131E-01
1966	o*1095	(-).1158	+	-o.628E-02
1967	0.9781E-01	o.7998E-01	+ *	0.178E-01
1968	0.1255	0.1198	+	0.563E-02
1969	0.1295	0.1292	+	0.237E-03
1970	0.1214	0.1214	+	0.225E-04
1971	0.1377	0.1447	+	-0.704E-02
1972	0:1839	0.1927	*+	-0.878E-02
1973	o*3861	0.3671	+ *	0.191E-01
1974	(-).3759	0.3965	* +	-0.205E-01
1975	0.3304	0.3711	* +	-0.327E-01
1976	0.3898	0.3965	*+	-O*676E-02
1977	0.4587	0.4150	+ *	0.437E-01
1978	0.4538	0.4490	+*	0.476E-02
1979	0.5429	0.5431	+	-0.196E-03

Historical and Forecasted Data

	EPCH	CSCH	FCH	EPP
1961	0.834377E-01	46.1209	0.880170E-01	0.976921E-01
1962	0.838154E-01	57.6526	0.833129E-01	0.141656
1963	0.852220E-01	35.7484	0.825598E-01	0.115670
1964	0.748857E-01	62.6898	0.904615E-01	0.105829
1965	0.812253E-01	29.2625	0.981965E-01	0.102630
1966	0.109483	52.2296	0.892813E-01	0.135652
1967	0.978107E-01	31.5183	0.924290E-01	0.112444
1968	0.125464	55.9162	0.887559E-01	0.138031
1969	0.129451	22.6685	0.107945	0.148269
1970	0.121418	54.4905	0.121090	0.132202
1971	0.137710	54.7263	0.909075E-01	0.156711
1972	0.183877	64.8235	0.132023	0.181460
1973	0.386126	45.8808	0.129242	0.318668
1974	0.375944	37.1742	0.116170	0.345907
1975	0.338443	32.0605	0.145070	0.321264
1976	0.389780	47.6752	0.129905	0.340479
1977	0.458746	60.6000	0.129764	0.351623
1978	0.453763	46.5000	0.127397	0.381111
1979	0.542857	42.0000	0.293706	0.415765
1980	0.567440	47.0000	0.290000	0.433983
1981	0.612325	46.9560	0.290000	0.468045
1982	0.658563	48.2466	0.290000	0.502834
1983	0.708261	49.5727	0.290000	0.540240
1984	0.761679	50.9351	0.290000	0.580460
1985	0.819095	52.3351	0.290000	0.623705
1986	0.880810	53.7735	0.290000	0.670202
1987	0.947145	55.2514	0.290000	0.720196
1988	1.01845	56.7700	0.290000	0.773948
1989	1.09509	58.3303	0.290000	0.831742
1990	1.17746	59.9335	0.290000	0.893879
1991	1.26601	61.5807	0.290000	0.960686
1992	1.36119	63.2732	0.290000	1.03251
1993	1.46350	65.0123	0.290000	1.10974
1994	1.57346	66.7991	0.290000	1.19277
1995	1.69167	68.6351	0.290000	1.28203
1996	1.81873	70.5215	0.290000	1.37800
1997	1.95530	72.4597	0.290000	1.48118
1998	2.10211	74.4512	0.290000	1.59211
1999	2.25992	76.4975	0.290000	1.71137
2000	2.42954	78.6000	0.290000	1.83959
	1	2	3	4

Source: ADF&G Catch and Production Leaflets and Preliminary Catch and Production Reports.

EPCH = Alaska chum salmon exvessel price.
CSCH = Alaska chum salmon harvest (million pounds).
FCH = CSCH/Alaska canned chum salmon pack (in 1,000 48-pound cases).
EPP = Alaska pink salmon exvessel price.

Coho Salmon Exvessel Price Model

ORDINARY LEAST SQUARES
DEPENDENT VARIABLE: PCO

SUM OF SQUARED RESIDUALS = 0.430848E-01
STANDARD ERROR OF THE REGRESSION = 0.535940E-01
MEAN OF DEPENDENT VARIABLE = 0.472146.
STANDARD DEVIATION = o.32(3945
R-SQUARED = 0.9779
ADJUSTED R-SQUARED = 0.9735
F-STATISTIC(3., 15.) = 221.029
LOG OF LIKELIHOOD FUNCTION = 30.8859
NUMBER OF OBSERVATIONS = 19.
SUM OF RESIDUALS = -0.111759E-07
DURBIN-WATSON STATISTIC (ADJ. FOR O. GAPS) = 2.8225

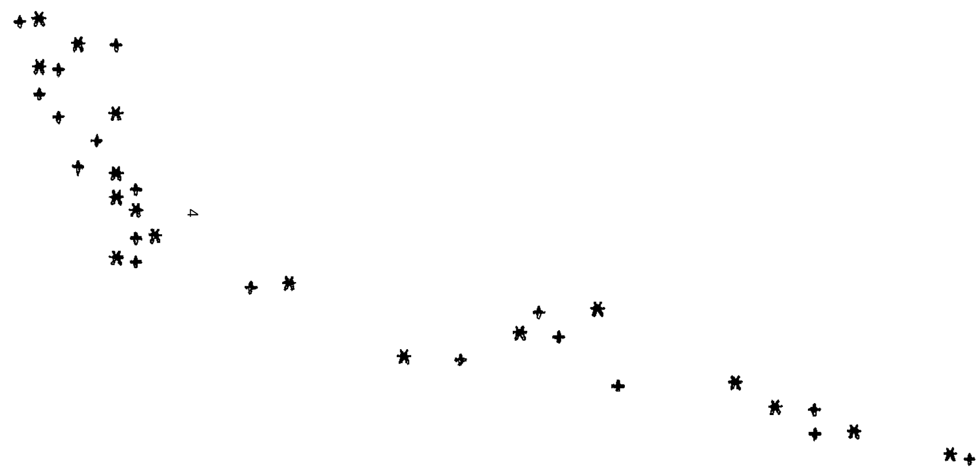
RIGHT-HAND VARIABLE	ESTIMATED COEFFICIENT	STANDARD ERROR	T-STATISTIC
C	-0.147475	0.535743E-01	-2.75272
CSCO	0.124126E-02	0.322235E-02	0.385204
FCO	0.569101	0.120971	4.70445
PP	2.11214	0.183119	11.5342

ESTIMATE OF VARIANCE-COVARIANCE MATRIX OF ESTIMATED COEFFICIENTS

	C	CSCO	FCO	PP
C	0.287021E-02	-0.149768E-03	0.219803E-02	-0.533839E-02
CSCO	-0.149768E-03	0.103836E-04	-0.162859E-03	0.201186E-03
FCO	0.219803E-02	-0.162859E-03	0.146340E-01	-0.176258E-01
PP	-0.533839E-02	0.201186E-03	-0.176258E-01	0.335327E-01
	1	2	3	4

PLOT OF ACTUAL * AND FITTED(+) VALUES

ID	ACTUAL	FITTED	RESIDUAL
1961	0.1754	0.1520	0.234E-01
1962	0.2064	0.2530	-0.466E-01
1963	0.1711	0.1956	-0.245E-01
1964	0.1709	0.1743	-0.338E-02
1965	0.2469	0.1870	0.600E-01
1966	0.2300	0.2374	-0.746E-02
1967	0.2567	0.2185	0.382E-01
1968	0.2557	0.2739	-0.182E-01
1969	0.2775	0.3389	-0.614E-01
1970	0.2952	0.2743	0.209E-01
1971	0.2461	0.2763	-0.302E-01
1972	0.4283	0.4034	0.249E-01
1973	0.7593	0.7127	0.466E-01
1974	0.6769	0.7227	-0.458E-01
1975	0.5688	0.6306	-0.619E-01
1976	0.9019	0.7780	0.124
1977	0.9481	0.9987	-0.507E-01
1978	1.031	0.9900	0.411E-01
1979	1.124	1.153	-0.290E-01



Historical and Forecasted Data

	EPCO	CSCO	FCO	EPP
1961	0.175429	11.3858	0.138851	0 [illegible] E-01
1962	0.206374	15.3215	0.144542	0
1963	0.171139	17.5812	0.135240	0.115670
1964	0.170949	20.9539	0.126993	0.105829
1965	0.246936	17.6660	0.168248	0.102630
1966	0.229960	16.1129	0.137717	0.135652
1967	0.256694	13.0221	0.197304	0.112444
1968	0.255701	20.9684	0.182334	0.138031
1969	0.277522	8.03357	0.286913	0.148269
1970	0.295161	11.8980	0.224490	0.132202
1971	0.246098	11.4594	0.138065	0.156711
1972	0.428307	13.0348	0.266015	0.181460
1973	0.759345	9.83684	0.307401	0.318668
1974	0.676901	12.8202	0.217291	0.345907
1975	0.568759	7.74503	0.158062	0.321264
1976	0.901926	11.1589	0.338150	0.340479
1977	0.948052	15.4000	0.675439	0.351623
1978	1.03109	19.3000	0.542135	0.381111
1979	1.12442	21.7000	0.695513	0.415765
1980	1.18206	14.0000	0.695000	0.433903
1981	1.25368	13.7389	0.695000	0.468045
1982	1.32721	13.7780	0.695000	0.502834
1983	1.40626	13.8171	0.695000	0 [illegible] 540240
1984	1.49126	13.8564	0.695000	0.587460
1985	1.58265	13.8958	0.695000	0.623705
1986	1.68091	13.9353	0.695000	0.670202
1987	1.78655	13.9749	0.695000	0.720196
1988	1.90013	14.0146	0.695000	0.773948
1989	2.02225	14.0544	0.695000	0.831742
1990	2.15354	14.0943	0.695000	0 [illegible] 893879
1991	2.29470	14.1344	0.695000	0.960686
1992	2.44646	14.1745	0.695000	1.03251
1993	2.60962	14.2148	0.695000	1.10974
1994	2.78503	14.2552	0.695000	1.19277
1995	2.97363	14.2957	0.695000	1.28203
1996	3.17638	14.3363	0.695000	1.37800
1997	3.39436	14.3771	0.695000	1.48118
1998	3.62871	14.4179	0.695000	1.59211
1999	3.88066	14.4589	0.695000	1.71137
2000	4.15152	14.5000	0.695000	1.83959
	1	2	3	4

Source: ADF&G Catch and Production Leaflets and Preliminary Catch and Production Reports.

EPCO = Alaska coho salmon exvessel price.
CSCO = Alaska coho salmon harvest (million pounds).
FCO = CSCO/Alaska canned coho salmon pack (in 1,000 48-pound cases).
EPP = Alaska pink salmon exvessel price.

Halibut Exvessel Price Model

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ORDINARY LEAST SQUARES
DEPENDENT VARIABLE:   PHAL

SUM OF SQUARED RESIDUALS =          0.149679
STANDARD ERROR OF THE REGRESSION =         0.938331E-01
MEAN OF DEPENDENT VARIABLE =         0.656263
STANDARD DEVIATION =          0.476905
R-SQUARED =  0.9634
ADJUSTED R-SQUARED =  0.9613
F-STATISTIC(    1.,     17.) =          447.969
LOG OF LIKELIHOOD FUNCTION =          19.0553
NUMBER OF OBSERVATIONS =      19.
SUM OF RESIDUALS =          0.111759E-07
DURBIN-WATSON STATISTIC (ADJ. FOR  0. GAPS) =  1.4 ⊂7
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RIGHT-HAND VARIABLE	ESTIMATED COEFFICIENT	STANDARD ERROR	T-STATISTIC
C	-0.867567	0.751461E-01	-11.5451
CPI	1.18639	0.560539E-01	21.1653

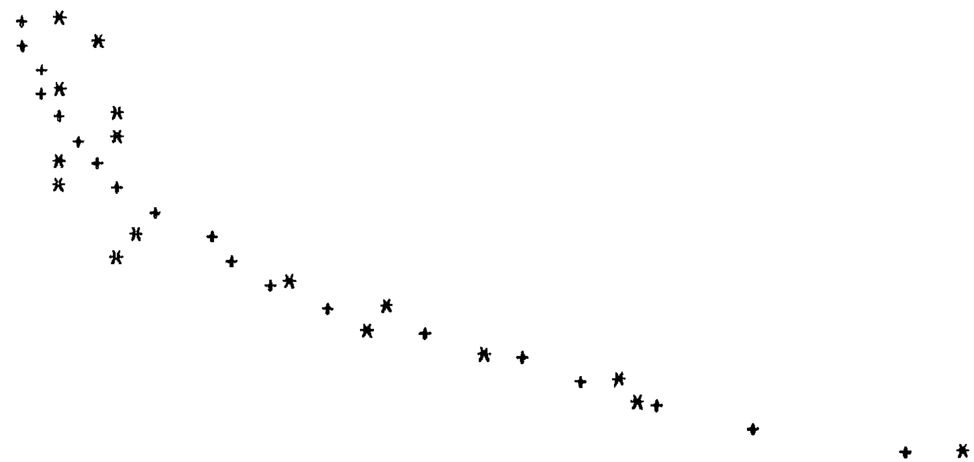
648

ESTIMATE OF VARIANCE-COVARIANCE MATRIX OF ESTIMATED COEFFICIENTS

	C	CPI
C	0.564693E-02	-0.403570E-02
CP	-0.403570E-02	0.314203E-02
	1	2

PLOT OF ACTUAL * AND F TTED +) VA UES

ID	ACTUAL	FITTED	RESIDUAL
1961	0.2570	0.1943	0.627E-01
1962	0.3280	0.2085	0.120
1963	0.2360	0.2227	0.133E-01
1964	0 *2670	0.2358	0.312E-01
1965	0.3500	0.2500	0.100E 00
1966	0.3560	0.2915	0.645E-01
1967	0.2560	0.3188	-0.628E-01
1968	0.2710	0.3746	-0.104
1969	0.4120	0.4292	-0.172E-01
1970	0.3920	0.5122	-0.120
1971	0.3680	0.5668	-0.199
1972	0.6420	0.6225	0.195E-01
1973	0.8[illegible]40	0.7056	0.128
1974	0.7[illegible]50	0.8847	-0.997E-01
1975	0.9[illegible]50	1.050	-0.746E-01
1976	1.[illegible]20	1.160	0.600E-01
1977	1.[illegible]60	1.285	-0.246E-01
1978	1.[illegible]50	1.451	-0.648E-03
1979	1.[illegible]10	1.707	0.103



Historical and Forecasted Data

	EPHAL	CPI
961	0.257000	0.895000
962	0.328000	0.907000
963	0.236000	0.919000
964	0.267000	0.930000
965	0.350000	0.942000
966	0.356000	0.977000
967	0.256000	1.00000
968	0.271000	1.04700
969	0.412000	1.09300
970	0.392000	1.16300
971	0.368000	1.20900
972	0.642000	1.25600
973	0.834000	1.32600
974	0.785000	1.47700
975	0.975000	1.61600
976	1.22000	1.70900
977	1.26000	1.81400
978	1.45000	1.95400
979	1.81000	2.17000
980	1.97978	2.40000
981	2.19504	2.58144
982	2.42657	2.77660
983	2.67561	2.98651
984	2.94347	3.21229
985	3.23159	3.45514
986	3.54148	3.71634
987	3.87481	3.99730
988	4.23333	4.29950
989	4.61896	4.62454
990	5.03374	4.97415
991	5.47988	5.35020
992	5.95975	5.75467
993	6.47589	6.18973
994	7.03106	6.65767
995	7.62819	7.16099
996	8.27047	7.70236
997	8.96131	8.28466
998	9.70437	8.91098
999	10.5036	9.58465
000	11.3633	10.3092
	1	2

Source: ADF&G Catch and Production Leaflets.

EPHAL = Alaska halibut exvessel price (Dollars/pound).
CPI = U.S. Consumer PRice Index.

King Crab Exvessel Price Model

COCHRANE-ORCUTT ITERATIVE TECHNIQUE
DEPENDENT VARIABLE: PKC

ITERATION	RHO
*********	***
1.	-0.789486
2.	-0.798476
3.	-0.798932

FINAL VALUE OF RHO = -0.798932
NO. OF ITERATIONS = 0.

STANDARD ERROR OF RHO = 0.141756
T-STATISTIC FOR RHO = -5.635944

SUM OF SQUARED RESIDUALS = 0.163756E-01
STANDARD ERROR OF THE REGRESSION = 0.369410E-01
MEAN OF DEPENDENT VARIABLE = 0.418000
STANDARD DEVIATION = 0.404781
R-SQUARED = 0.9941
ADJUSTED R-SQUARED = 0.9917
F-STATISTIC(5., 12.) = 405.829
LOG OF LIKELIHOOD FUNCTION = 37.4801
NUMBER OF OBSERVATIONS = 18.
SUM OF RESIDUALS = 0.686478E-05
DURBIN-WATSON STATISTIC (ADJ. FOR 0. GAPS) = 2.5703

RIGHT-HAND VARIABLE	ESTIMATED COEFFICIENT	STANDARD ERROR	T-STATISTIC
C	3.42098	0.152781	22.3914
S	-0.514105	0.290595E-01	-17.6915
LKC	-0.436571E-06	0.212562E-06	-2.05385
FXCHJ	-0.910514E-02	0.339992E-03	-26.7804
CPIJ	0.201634	0.350256E-01	5.75676
FKC	-0.417775E-05	0.100247E-05	-4.16744

PLOT OF ACTUAL * AND FITTED + VALUES

D	ACTUAL	FITTED	PLOT	RESIDUAL
962	0.1000	0.1440	*+	-0.440E-01
963	0.9600E-01	0.8342E-01	+	0.126E-01
964	0.9400E-01	0.8216E-01	+	0.118E-01
965	0.9700E-01	0.1181	*+	-0.211E-01
966	0.9800E-01	0.1048	+	-0.675E-02
967	0.1170	0.1318	*+	-0.148E-01
968	0.2670	0.2201	+ *	0.469E-01
969	0.2710	0.2230	+*	0.480E-01
970	0.2530	0.2997	*+	-0.467E-01
971	0.2700	0.2386	+*	0.314E-01
972	0.2940	0.2756	+*	0.184E-01
973	0.5820	0.5963	*+	-0.143E-01
974	0.4110	0.4135	+	-0.253E-02
975	0.3920	0.4428	* +	-0.508E-01
976	0.6480	0.6058	+*	0.422E-01
977	1.009	1.030	*+	-0.212E-01
978	1.590	1.571	+*	0.189E-01
979	0.9350	0.9432	+	-0.817E-02

Historica and Forecasted Data

	EPKC	S	LKC	EXCHJ	CPIJ	FKC
1961	0.900000E-01		43412.0	361.8	0.600000	21823.0
1962	0.100000		52782.0	359.6	0.640000	35152.0
1963	0.960000E-01		78740.0	362.0	0.690000	36142.0
1964	0.940000E-01		86721.0	358.3	0.720000	40676.0
1965	0.970000E-01		131671.	360.9	0.770000	27826.0
1966	0.980000E-01		159202.	362.5	0.810000	29918.0
1967	0.117000		127723.	361.9	0.840000	24090.0
1968	0.267000		81905.0	357.7	0.880000	24661.0
1969	0.271000		57730.0	357.8	0.930000	12231.0
1970	0.253000		52061.0	357.6	1.00000	11234.0
1971	0.270000	.00000	70703.0	314.8	1.06000	4784.00
1972	0.294000	.00000	74427.0	302.0	1.11000	4721.00
1973	0.582000	.00000	76824.0	280.00	1.24000	1279.00
1974	0.411000	.00000	95214.0	301.00	1.54000	2618.00
1975	0.392000	.00000	97629.0	305.20	1.72000	1.00000
1976	0.648000	.00000	105899.	292.80	1.88000	1.00000
1977	1.00900	.00000	99575.0	240.00	2.04000	1.00000
1978	1.59000	.00000	122925.	194.60	2.11000	1.00000
1979	0.935000	.00000	154389.	248.80	2.16000	1.00000
1980	1.26115	1.00000	140000.	232.00	2.32200	1.00000
1981	1.18902	1.00000	140000.	232.00	2.49615	1.00000
1982	1.31245	1.00000	140000.	232.00	2.68336	1.00000
1983	1.28457	1.00000	140000.	232.00	2.88461	1.00000
1984	1.38289	1.00000	140000.	232.00	3.10096	1.00000
1985	1.38609	1.00000	140000.	232.00	3.33353	1.00000
1986	1.47141	1.00000	140000.	232.00	3.58355	1.00000
1987	1.49771	1.00000	140000.	232.00	3.85231	1.00000
1988	1.57825	1.00000	140000.	232.00	4.14124	1.00000
1989	1.62307	1.00000	140000.	232.00	4.45183	1.00000
1990	1.70462	1.00000	140000.	232.00	4.78571	1.00000
1991	1.76563	1.00000	140000.	232.00	5.14464	1.00000
1992	1.85251	1.00000	140000.	232.00	5.53049	1.00000
1993	1.92889	1.00000	140000.	232.00	5.94528	1.00000
1994	2.02459	1.00000	140000.	232.00	6.39117	1.00000
1995	2.11661	1.00000	140000.	232.00	6.87051	1.00000
1996	2.22421	1.00000	140000.	232.00	7.38580	1.00000
1997	2.33295	1.00000	140000.	232.00	7.93974	1.00000
1998	2.45538	1.00000	140000.	232.00	8.53522	1.00000
1999	2.58257	1.00000	140000.	232.00	9.17536	1.00000
2000	2.72283	1.00000	140000.	232.00	9.86351	1.00000
	1	2	3	4	5	6

Source: ADF&G Catch and Production Leaf ets and Preliminary Catch and Production Reports.

EPKC = Alaska king crab exvessel price (Dollars pound).
S = Dummy variable.
LKC = Domestic Alaska king crab harvest ,000 pounds
EXCHJ = Exchange rate (Yen/Dollar).
CPIJ = Japanese Consumer Price Index.
FKC = Foreign Alaska king crab harvest (1,000 pounds).

Tanner Crab Exvesse Price Model

ORDINARY LEAST SQUARES
DEPENDENT VARIABLE: PTC

SUM OF SQUARED RESIDUALS = 0.245766E-02
STANDARD ERROR OF THE REGRESSION = 0.221705E-01
MEAN OF DEPENDENT VARIABLE = 0.243630
STANDARD DEVIATION = 0.160639
R-SQUARED = 0.9894
ADJUSTED R-SQUARED = 0.9810
F-STATISTIC(4., 5.) = 116.872
LOG OF LIKELIHOOD FUNCTION = 27.3663
NUMBER OF OBSERVATIONS = 10.
SUM OF RESIDUALS = 0.372529E-08
DURBIN-WATSON STATISTIC (ADJ. FOR 0. GAPS) = 2.6909

RIGHT-HAND VARIABLE	ESTIMATED COEFFICIENT	STANDARD ERROR	T-STATISTIC
C	0.119167	0.190211	0.626500
FTC	0.232136E-05	0.131070E-05	1.77108
EXCHJ	-0.114253E-02	0.267755E-03	-4.26706
CPI	0.172272	0.909180E-01	1.89481
PKCL	0.169831	0.558718E-01	3.03964

ESTIMATE OF VARIANCE-COVARIANCE MATRIX OF ESTIMATED COEFFICIENTS

	C	FTC	EXCHJ	CPI	PKCL
C	0.361802E-01	-0.174922E-06	-0.327362E-04	-0.159582E-01	[illegible]
FTC	-0.174922E-06	0.171794E-11	-0.404383E-11	0.940008E-07	[illegible]
EXCHJ	-0.327362E-04	-0.404383E-11	0.716929E-07	0.822388E-05	[illegible]
CPI	-0.159582E-01	0.940008E-07	0.822388E-05	0.826608E-02	[illegible]
PKCL	0.753332E-02	-0.549838E-07	-0.641565E-06	-0.459840E-02	[illegible]
	1	2	3	4	

PLOT OF ACTUAL * AND FITTED + VALUES

ID	ACTUAL	FITTED		RESIDUAL
1970	0.9800E-01	0.9076E-01	+*	0.724E-02
1971	0.1060	0.1223	*+	-0.163E-01
1972	0.1238	0.1236	+	0.213E-03
1973	0.1743	0.1556	+ *	0.187E-01
1974	0.2042	0.2068	+	-0.260E-02
1975	0.1498	0.1703	* +	-0.205E-01
1976	0.2001	0.1996	+	0.529E-03
1977	0.3601	0.3315	+ *	0.286E-01
1978	0.4590	0.4814	* +	-0.224E-01
1979	0.5610	0.5544	+*	0.656E-02

Historical and Forecasted Data

	EPTC	FTC	EXCHJ	CPI	PKCL
1970	0.980000E-01	57633.0	357.600	1.16300	0.271000
1971	0.106000	48063.0	314.800	1.20900	0.253000
1972	0.123800	37579.0	302.000	1.25600	0.270000
1973	0.174300	33603.0	280.000	1.32600	0.294000
1974	0.204200	33706.0	301.000	1.47700	0.582000
1975	0.149800	22239.0	305.200	1.61600	0.411000
1976	0.200100	23240.0	292.800	1.70900	0.392000
1977	0.360100	27562.0	240.000	1.81400	0.648000
1978	0.459000	33000.0	194.600	1.95400	1.00900
1979	0.561000	32600.0	248.800	2.17000	1.59000
1980	0.550000	16500.0	232.000	2.40000	0.935000
1981	0.512994	0.	232.000	2.58144	1.26115
1982	0.534363	0.	232.000	2.77660	1.18902
1983	0.591488	0.	232.000	2.98651	1.31245
1984	0.625649	0.	232.000	3.21229	1.28457
1985	0.684182	0.	232.000	3.45514	1.38289
1986	0.729724	0.	232.000	3.71634	1.38609
1987	0.792615	0.	232.000	3.99730	1.47141
1988	0.849142	0.	232.000	4.29950	1.49771
1989	0.918816	0.	232.000	4.62454	1.57825
1990	0.986658	0.	232.000	4.97415	1.62307
1991	1.06529	0.	232.000	5.35020	1.70462
1992	1.14533	0.	232.000	5.75467	1.76563
1993	1.23503	0.	232.000	6.18973	1.85251
1994	1.32862	0.	232.000	6.65767	1.92889
1995	1.43158	0.	232.000	7.16099	2.02459
1996	1.54047	0.	232.000	7.70236	2.11661
1997	1.65906	0.	232.000	8.28466	2.22421
1998	1.78542	0.	232.000	8.91098	2.33295
1999	1.92227	0.	232.000	9.58465	2.45538
2000	2.06870	0.	232.000	10.3092	2.58257
	1	2	3	4	5

Sources: ADF&G Catch and Production Leaflets and Preliminary Catch and Production Reports.

EPTC = Alaska Tanner crab exvessel price.
FTC = Foreign Alaska Tanner crab harvest (1,000 pounds).
EXCHJ = Exchange rate (Yen/Dollar).
CPI = U.S. Consumer Price Index.
PKCL = Alaska king crab exvessel price in the previous years.

Shrimp Exvessel Price Model

OPD1NAR% LEASTSQUARES
DEPENDENT VARIABLE: PSHR

SUM OF SQUARED RESIDUALS = 0.420087E-02
STANDARD ERROR OF THE REGRESSION = 0.167349E-01
MEAN OF DEPENDENT VARIABLE = 0.708947E-01
STANDARD DEVIATION = 0.488580E-01
R-SQUARED = [illegible]
ADJUSTED R-SQUARED = 0.8827
F-STATISTIC(3., 15.) = 46.1415
LOG OF LIKELIHOOD FUNCTION = 53.0007
NUMBER OF OBSERVATIONS = 19.
SUM OF RESIDUALS = -0.465661E-09
DURBIN-WATSON STATISTIC (ADJ. FOR o. GAPS) = 2.2436

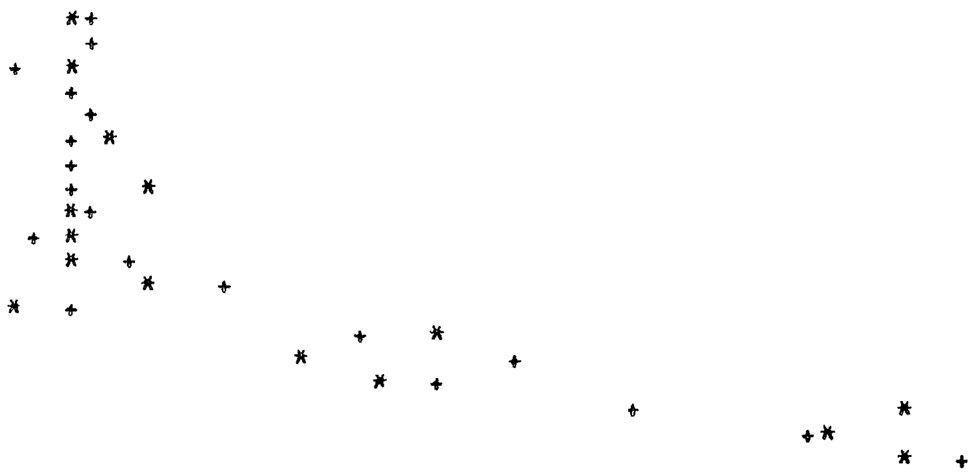
RIGHT-HAND VARIABLE	ESTIMATED COEFFICIENT	STANDARD ERROR	T-STATISTIC
c	-0.239599	0.767313E-01	-3.12256
AKLSHR	-0.527879E-06	0.145074E-06	-3.63868
RW	0.494155E-01	0.235463E-01	2.09865
CP 1	(-).138732	0.130361E-01	10.6421

ESTIMATE OF VARIANCE-COVARIANCE MATRIX OF ESTIMATED COEFFICIENTS

	C	AKLSHR	RW	CPI
C	0.588770E-02	0.578311E-08	-0.177773E-02	-0.226426E-03
AKLSHR	0.578311E-08	0.210465E-13	-0.169266E-08	-0.111793E-08
RW	-0.177773E-02	-0.169266E-08	0.554430E-03	0.232669E-04
CPI	-0.226426E-03	-0.111793E-08	0.232669E-04	0.169940E-03
	1	2	3	4

PLOT OF ACTUAL *) AND FITTED + VA UES

ID	ACTUAL	FITTED	RESIDUAL
1961	0.4000E-01	0.4508E-01	-0.508E-02
1962	0.4300E-01	0.4291E-01	0.862E-04
1963	0.4000E-01	0.3154E-01	0.846E-02
1964	0.4000E-01	0.4209E-01	-0.209E-02
1965	0.4500E-01	0.4535E-01	-0.353E-03
1966	0.4600E-01	0.4089E-01	0.511E-02
1967	0.4100E-01	0.4161E-01	-0.615E-03
1968	0.5500E-01	0.4155E-01	0.134E-01
1969	0.4000E-01	0.4411E-01	-0.411E-02
1970	0.4000E-01	0.3381E-01	0.619E-02
1971	0.4100E-01	0.5093E-01	-0.993E-02
1972	0.5400E-01	0.6587E-01	-0.119E-01
1973	0.3300E-01	0.4016E-01	-0.716E-02
1974	0.1020	0.8723E-01	0.148E-01
1975	0.8000E-01	0.1146	-0.346E-01
1976	0.9000E-01	0.9959E-01	-0.959E-02
1977	0.1760	0.1320	0.440E-01
1978	0.1650	0.1620	0.304E-02
1979	0.1760	0.1857	-0.970E-02



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Historical and Forecasted Data

	EPSH	AKLSHR	RW	CPI
1961	0.400000E-01	15981.0	3.41899	0.895000
1962	0.430000E-01	16943.0	3.35171	0.907000
1963	0.400000E-01	15127.0	3.06855	0.919000
1964	0:400000E-01	7727.00	3.17204	0.930000
1965	6-).450000E-01	16819.0	3.30149	0.942000
1966	o.460000E-01	28193.0	3.23439	0.977000
1967	0.410000E-01	41813.0	3*33000	1.00000
1968	0.550000E-01	42077.0	3.19962	1.04700
1969	o.400000E-01	47851.0	3.18390	1.09300
1970	o*400000E-01	74256.0	3.06105	1.16300
1971	o.41O(7OOE-01	94891.0	3.49876	1.20900
1972	0.540000E-01	83830.0	3.55096	1.25600
1973	0.330000E-01	119964.	3.22(321	1.3?600
1974	0.102000	108741.	3.62898	1.47700
1975	0.800000E-01	98984.0	3.68812	1.61,6(-)0
1976	0.900000E-01	128682.	3.44(-)61	1.70900
1977	0.176000	116995*	3*67696	1.814(-)0
1978	0.165000	73327.0	3.42375	1.95400
1979	0.176000	51(-)59.0	3.05991	2.17000
1980	0.235714	37600.0	3.28245	2.40000
1981	0.258185	37972.0	3:23179	2.58144
198?	0.282575	38389.0	3*18191	2.77660
1983	o.309024	38855.0	3.13280	2.98651
1984	0.337681	39378.0	3.08445	3.21229
1985	0.368711	39963.0	3.03685	3.45514
1986	0.4(32287	40619.0	2.98998	3.71634
1987	0.438596	41353.0	2.94384	3.99730
1988	0.477842	4?175.0	2.89840	4.29950
1989	0.520238	43097.0	2.85367	4.62454
1990	(-).566020	44128.(-l	2.80963	4.97415
1991	(-).615437	45284.0	2.76627	5.35020
1992	0.668758	46578.()	2.72358	5.75467
1993	o.726271	48027.0	2.68154	6.18973
1994	0.788288	49650.0	2.64016	6.65767
1995	0.855141	51469.0	2.59941	7.16099
1996	0.927190	53504.0	2.55930	7.70236
1997	1.00482	55785.0	2*51980	8.28466
1998	1.08844	58339.0	2.48091	8.91098
1999	1.17850	61200.0	2.44262	9.58465
2000	1.27547	64404.0	2*40492	10.3092
	1	2	3	4

***90*

659

Source: ADF&G Catch and Production Leaflets.

EPSH = Alaska shrimp exvessel price (Dollars/pound).
AKLSHR = Alaska shrimp harvest (1,000 pounds).
RW = Real wage, Alaska seafood processing.
CPI = U.S. Consumer Price Index.

Models Used to Project Boat Months and Fisherman Months

Salmon

	Month/Boat	Boats	Boat Months	Average Crew Size	Fisherman Months
Chignik Purse Seine	3	90	270	5	1,350
Peninsula Purse Seine	2	110	220	5	1,100
Peninsula Drift Gill Net	2	150	300	1.5	450
Peninsula Set Gil? Net	2	70	140	1.5	210
Bristol Bay Drift Gill Net	1.5	1,560	2,340	3	7,020
Bristol Bay Set Gill Net	1.5	540	810	2	1,620
Kuskokwim Set Gill Net	2.5	810	2,025	1	2,025
Lower Yukon Set Gill Net	2	700	1,400	1	1,400
Upper Yukon Set Gill Net	1.5	75	115	1	115
Upper Yukon Fish Wheel	1.5	160	240	1	240
Norton Sound Set Gill Net	2	225	450	1	450
Kotzebue Sound Set Gill Net	1.7	250	425	1	425

Boat Months = (months/boat) X boats

Fisherman Months = boat months X average crew size

Halibut

During 1978 351 licensed halibut vessels operated in IPHC Areas 3 and 4, and since limited entry is being considered for the halibut fishery, the number of boats is held constant at 351 for 1980 through 2000. The season is or is expected to be open during seven months and the average crew size is 6. The projected boat months and fisherman months for Areas 3 and 4 are then 2,457 and 14,742, respectively. The projections of boat months . and fisherman months for each Western Alaska halibut fishery are based on these totals and the proportion of Area 3 and Area 4 catch projected for each fishery.

Shellfish

Peninsula King Crab

lnBM = -0.0763 + 0.580 lnC - 0297 lnRP
Student's t-statistic:
(-0.81) (4.90) (-1.69)

Adjusted R-Squared = 0.785
Durbin-Watson statistic = 1.61
Number of observations = 11, 1969-1979
B = 40
Average crew size = 4

Eastern Aleutians King Crab

BM = 123 =mean BM 1969-1979
B = 75
Average crew size = 4

Western Aleutians King Crab

lnBM = -0.430+ 0.531 lnC
Student's t-statistic:
(-0.88) (8.81)

Adjusted R-Squared = 0.88
Durbin-Watson statistic = 2.15
Number of observations = 11, 1969-1979
B = 13
Average crew size = 4

Bering Sea King Crab

lnBM = 1.461 + 0.404 lnC
Student's t-statistic:
(2.58) (7.51)

Adjusted R-Squared = 0.85
Durbin-Watson statistic = 2.50
Number of observations = 11, 1969-1979
B = 250
Average crew size = 4

Peninsula Tanner Crab

BM = 57.48 + 0.00722C + 141.94RP
Student's t-statistic:
(3.45) (4.25) (2.43)

Adjusted R-Squared = 0.85
Durbin-Watson statistic = 2.58
Number of observations = 11, 1969-1979
B = 40
Average crew size = 4

Eastern Aleutians Tanner Crab

BM = 4.308 + 0.0119 C + 42.881RP
Student's t-statistic:
(-1.31) (3.93) (3.22)

Adjusted R-Squared = 0.92
Durbin-Watson statistic = 1.40
Number of observations = 10, 1969-1970 and 1972-1979
B = 10
Average crew size = 4

Western Aleutians Tanner Crab

BM = 8 =mean BM 1969, 1973-1976, 1973-1979
B = 5
Average crew size = 4

Bering Sea Tanner Crab

BM = 32.60+ 0.00536 C
Student's t-statistic:
(3.97) (23.0)

Adjusted R-Squared = 0.98
Durbin-Watson statistic = 1.96
Number of observations = 11, 1969-1979
B = 150
Average crew size = 4

Peninsula Shrimp

lnBM = -4.244+0.877 lnC
Student's t-statistic:
(-7.58) (15.67)

Adjusted R-Squared = 0.97
Durbin-Watson statistic = 1.83
Number of observations = 11, 1969-1979
8'35
Average crew size = 3

Eastern Aleutians Shrimp

BM = 11 = mean BM 1972-1979
B = 4
Average crew size = 3

Where:

BM = boat months
C = annual harvest (1,000 pounds)
RP = real exvessel price ($'s/pound)
in denotes natural log of

Shellfish

Peninsula King Crab

lnBM = -0.0763 + 0.580 lnC - 0297 lnRP
Student's t-statistic:
(-0.81) (4.90) (-1 .69)

Adjusted R-Squared = 0.785
Durbin-Watson statistic = 1.61
Number of observations = 11, 1969-1979
B = 40
Average crew size = 4

Eastern Aleutians King Crab

BM = 123 = mean BM 1969-1979
B = 75
Average crew size = 4

Western Aleutians King Crab

lnBM = -0.430 + 0.531 lnC
Student's t-statistic:
(-0.88) (8.81)

Adjusted R-Squared = 0.88
Durbin-Watson statistic = 2.15
Number of observations = 11, 1969-1979
B = 13
Average crew size = 4

Bering Sea King Crab

lnBM = 1.461 + 0.404 lnC
Student's t-statistic:
(2.58) (7.51)

Adjusted R-Squared = 0.85
Durbin-Watson statistic = 2.50
Number of observations = 11, 1969-1979
B = 250
Average crew size = 4

Peninsula Tanner Crab

BM = 57.48 + 0.00722C + 141.94RP
Student's t-statistic:
(3.45) (4.25) (2.43)

Adjusted R-Squared = 0.85
Durbin-Watson statistic = 2.58
Number of observations = 11, 1969-1979
B = 40
Average crew size = 4

Numerical Basis of Salmon Harvest Weight Projections

	Kings	Reds	Pinks	Silvers	Chums
Chignik					
Mean Harvest 1969-1979	2	1,000	720	25	135
Short-Term Objective	2	1,000	720	25	135
Long-Term Objective	2	1,300	1,500	45	135
Short-Term Growth Rate	0	1.3%	3.7%	3.0%	0
Long-Term Growth Rate	0	1.3%	3.7%	3.0%	0
Average Weight (pounds/fish)	21.0	7.5	3.8	7.5	7.4
Peninsula					
Mean Harvest 1969-1979	5	1,000	2,000	70	570
Short-Term Objective	5	1,000	2,000	70	570
Long-Term Objective	15	2,200	6,700	285	625
Short-Term Growth Rate	5.5%	3.9%	6.0%	7.0%	0.04%
Long-Term Growth Rate	5.5%	3.9%	6.0%	7.0%	0.04%
Average Weight (pounds/fish)	18.0	6.1	3.8	7.4	7.0
Bristol Bay					
Mean Harvest 1969-1979	105	8,200	700	70	585
Short-Term Objective	100	9,000	700	70	585
Long-Term Objective	100	12,500	1,000	90	600
Short-Term Growth Rate	0	1.3%	1.8%	1.3%	0.2%
Long-Term Growth Rate	0	1.9%	1.8%	1,3%	0.2%
Average Weight (pounds/fish)	21.0	5.5	3.5	7.1	6.5
Kuskokwim					
Mean Harvest 1969-1979	50	15	15	140	180
Short-Term Objective	50	15	15	140	180
Long-Term Objective	60	25	25	250	275
Short-Term Growth Rate	0.9%	2.5%	2.5%	2.9%	2.1%
Long-Term Growth Rate	0.9%	2.5%	2.5%	2.9%	2.1%
Average Weight (pounds/fish)	21.0	6.5	3.0	5.8	6.4
Yukon					
Mean Harvest[1] 1975-1979	95	0	0	20	1,000
Short-Term Objective	110	0	0	20	1,400
Long-Term Objective	140	0	0	20	2,000
Short-Term Growth Rate	2.9%	0	0	0	6.7%
Long-Term Growth Rate	1.6%	0	0	0	2.4%
Average Weight (pounds/fish)	23.0	0	0	7.0	6.7

	Kings	Reds	Pinks	Silvers	Chums
Norton Sound					
Mean Harvest[1] 1975-1979	4		100	7	165
Short-Term Objective	4		100	7	230
Long-Term Objective	5		100	7	240
Short-Term Growth Rate	1.1%		0	0	6.6%
Long-Term Growth Rate	1.1%		0	0	0.3%
Average Weight (pounds/fish)	18.0		3.3	7.2	6.7
Kotzebue Sound					
Mean Harvest[1] 1976-1979					150
Short-Term Objective					150
Long-Term Objective					150
Short-Term Growth Rate					0
Long-Term Growth Rate					0
Average Weight (pounds/fish)					8.8

Sources: Alaska Salmon Fisheries Plan, Provisional Draft for Review and Comment, ADF&G; ADF&G area finfish biologists; ADF&G data files.

[1]The means and objectives are in thousands of fish.

APPENDIX B

Conflicts Among Commercial Fisheries,
Recreational Fisheries and Nonfishing Marine Traffic

Fishing Vessel Accidents

Alaska Marine Oil Spills

Processing Plant Siting Requirements

Market Environment

Conflicts Among Commercial Fisheries, Recreational Fisheries and Non Fishing Marine Traffic

The conflicts among commercial fisheries, recreational fisheries, and nonfishing marine traffic have, except in a few notable instances, been relatively minor and have therefore not tended to constrain the development of the commercial fishing industry in Alaska. The following sections provide an overview of the nature of these conflicts.

COMPETITION FOR SMALL BOAT HARBORS

The demand for small boat harbors in Alaska has increased more rapidly than the supply; this combined with a reluctance to use the price mechanism to allocate the scarce harbor space has resulted in a shortage of harbor space in many coastal communities. The commercial fisheries ccmpete with each other and with other small boat harbor users (primarily recreational boaters) for the limited harbor space that is available. The term "small boat harbor" is perhaps a bit misleading; in Alaska the harbor facilities designed principally for fishing and recreational boats are referred to as small boat harbors although they may serve vessels over 40 meters (131 feet} in length. Harbor masters have demonstrated a great deal of imagination and dexterity in their handling of the overcrowding problem, and it would appear that the competition for harbor space has typically not hindered the development of a commercial fishery. There are, of course, limits on what can be done with a given harbor facility; this in part explains the harbor improvement plans underway in many communities.

COMPETITION FOR FISHERY RESOURCES

In Alaska the principal competition for fishery resources occurs in the salmon fisheries where commerical fishermen using various gear types compete with each other and with recreational and subsistence fishermen for the limited amounts of harvestable salmon. The competition and the resulting conflicts between gear types (e.g., purse seine, drift gill net, set gill net, beach seine, and troll) are in many cases limited by allocating different areas and/or periods to different gear types. The competition between commercial and recreational fishermen and the resulting conflicts are greatest in the areas which are most accessible to the one large metropolitan area of the state, Anchorage. In most other areas, recreational fishing is insignificant compared to commercial fishing and/or targets on species that are of less importance to commercial fisheries; therefore, the competition and the conflicts have been minimal. As the population of Alaska and/or regions of Alaska increase and as recreational fishing increases in terms of both size of catch and areas fished, the conflicts between commercial and recreational fishing will increase. In the fisheries other than salmon, there is generally little competition among commercial fishermen using different types of gear.

When the conflicts among commercial fishermen and/or recreational fishermen have arisen, the Alaska Board of Fisheries has often set policies to assign the resource to one user group. Such policies limit the physical if not the political conflicts between user groups. An example of such a policy is Policy #7727FB; see Exhibit B.1.

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EXHIBIT B.1

Policy #77-27-FB

COMPREHENSIVE MANAGEMENT POLICY
FOR THE UPPER COOK INLET

The dramatically increasing population of the Cook Inlet area has resulted in Increasing competition between recreational and commercial fishermen for the Cook Inlet salmon stocks. Concurrently, urbanization and associated road construction has increased recreational angler effort and may adversely affect fisheries habitat. As a result the Board of Fisheries has determined that a policy must now be determined for the long-term management of the Cook Inlet salmon stocks. This policy should rest upon the following considerations:

1. The ultimate management goal for the Cook Inlet stocks must be their protection and, where feasible, rehabilitation and enhancement. To achieve this biological goal, priorities must be set among beneficial uses of the resource.

2. The commercial fishing industry in Cook Inlet is a valuable long-term asset of this state and must be protected, while recognizing the legitimate claims of the non-commercial user.

3. Of the salmon stocks in Cook Inlet, the king and silver salmon are the target species for recreational anglers while the chum, pink, and red salmon are the predominant commercial fishery.

4. User groups should know what the management plan for salmon stocks will be in order that they can plan their use consistent with that plan. Thus, commercial fishermen must know if they are harvesting stocks which in the long-term will be managed primarily for recreational consumption so that they may plan appropriately. Conversely, as recreational demands increase the recreational user must be aware of what stocks will be managed primarily for commercial harvest in order that he not become overly dependent on these fish for recreational purposes.

5. Various agencies should be aware of the long-term management plan so that salmon management needs will be considered when making decisions in areas such as land use planning and highway construction.

6. It is imperative that the Department of Fish and Game receive long-range direction in management of these stocks rather than being called upon to respond to annually changing Board directives. Within the Department, divisions such as F.R.E.D. , must receive such long-term direction.

Therefore, the Board establishes priorities on the following Cook Inlet stocks north of Anchor Point. In so doing it is not the Board's intent to establish exclusive uses of salmon stocks; rather its purpose is to define the primary beneficial use of the stock while permitting secondary uses of the stock to the extent it is consistent with the requirements of the primary user group.

1. Stocks which normally move in Cook Inlet to spawning areas prior to June 30, shall be managed primarily as a non-commercial resource.

2. Stocks which normally move in Cook Inlet after June 30, shall be managed primarily as a non-recreational resource until August 15; however existing recreational target fish shall only be harvested incidental to the non-recreational use; thereafter stocks moving to spawning areas on the Kenai Peninsula shall be managed primarily as a non-commercial resource. Other stocks shall continue to be managed primarily as a non-recreational resource.

3. The *Susitna coho, the Kenai king, and the Kenai coho* runs cannot be separated from other stocks which are being managed primarily as non-recreational resources; however, efforts shall be made, consistent with the primary management goal, to minimize the non-recreational catch of these stocks.

Nicholas G. Szabo, Chairman
Alaska Board of Fisheries

ADOPTED: December 13, 1977

VOTED: 5-0

COMPETITION FOR OCEAN SPACE

A third source of conflict for commerical fisheries is the competition for ocean space in which to develop and/or harvest fishery resources. When two or more fisheries compete for the same ocean space, gear conflicts can cause gear losses and/or affect the abundance of other fishery resources. Gear loss conflicts are most likely to occur when fixed gear (e.g., crab or shrimp pots, and halibut long line gear) and nonfixed gear (e.g., trawl or dredge) are used in the same area at the same time. The timing and location of fisheries has tended to limit this type of conflict; but as the groundfish fishery, which will be primarily a trawl fishery, develops in the areas of ocean space used by the traditional fisheries, the potential for gear loss conflicts will increase.

Examples of gear conflicts which affect stock abundance in other fisheries include the following:

- destruction of juvenile king crab by scallop dredge
- incidental catch of a species that is the target species of another fishery (e.g., halibut and perch)
- destruction of juveniles by trawls

An additional source of conflict of ocean space use is that the species targeted on by some fisheries are food for other species, for example, the harvest of salmon, a predator of herring will depend to some degree on the harvest of herring. All else being equal, there will tend to be an inverse relationship between the salmon and herring harvest. The gear conflicts other than gear losses will also tend to increase as the groundfish fishery develops, with the major conflict being the incidental catch of halibut in groundfish trawl gear.

In addition to the competition for ocean space among commercial fisheries, there is also competition between commercial fisheries and other users of ocean space (e.g., vessels engaged in marine commerce). The potential impacts on commercial fisheries of this competition are the costs associated with collisions and gear losses. These costs include the costs of actual losses as well as the costs incurred in attempting to reduce actual losses. Due to the relatively small amount of nonfishery marine traffic in most areas of Alaska, the costs associated with this type of conflict have not been significant. Exceptions to this occur in Cook Inlet and Prince William Sound, where freighter and tanker traffic has been sufficiently heavy that attempts have been made to restrict such marine traffic to designated areas or lanes. The establishment of sea lanes through fishing grounds has, however, proved to be a difficult task in Cook Inlet. The fishermen favor a single narrow lane for other users so a small amount of fishing area is lost, while the marine transport users favor more and broader lanes to reduce the probability of congestion and/or collisions. Sea lanes which have been established in Prince William Sound have substantially reduced gear losses and associated conflicts. The potential for conflict will increase in Alaska as its marine transportation system grows and as more distant fisheries (e.g. groundfish) develop. The extent to which the conflict will remain concentrated in Cook Inlet will depend on the rates of growth of the various regions of Alaska and the ability of the ports of Seward, Whittier, or Valdez to compete with the Port of Anchorage for marine commerce.

Fishing Vessel Accidents*

Approximately 25,000 fishing vessels of five net tons or larger are currently documented with the U.S. Coast Guard (USCG). It is estimated that nearly four times that number of fishing vessels are less than five net tons and registered by individual states. These smaller boats accounted for only five percent of the casualty incidents recorded by the USCG during the 1972-1977 fiscal year period and, therefore, comprose a minor portion of the data utilized for analysis of fishing vessel casualties.

There has been a 51 percent increase in the number of American fishing vessels over the past 12 years. Along with this growth of the fishing fleet has been a 53 percent increase in the number of fishing vessel casualties (Figure B.I). The U.S. Coast Guard separates vessel casualties into five categories: operational collisions; grounding; explosion/fire; flooding/foundering/capsizing; and material failure. No particular type of casualty clearly predominated throughout the 1972-1977 period, but grounding and flooding/foundering/capsizing were the most prevalent casualties during the latter years of the period (Figure B.2). Each of the five categories experienced at least some net growth from 1972 to 1977, with large annual fluctuations in the occurrence of any particular type of casualty being quite common.

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*Data used in this section refers to fiscal year 1972-1977 period, and includes U.S. Coast Guard documented fishing vessels which are five net tons or larger.

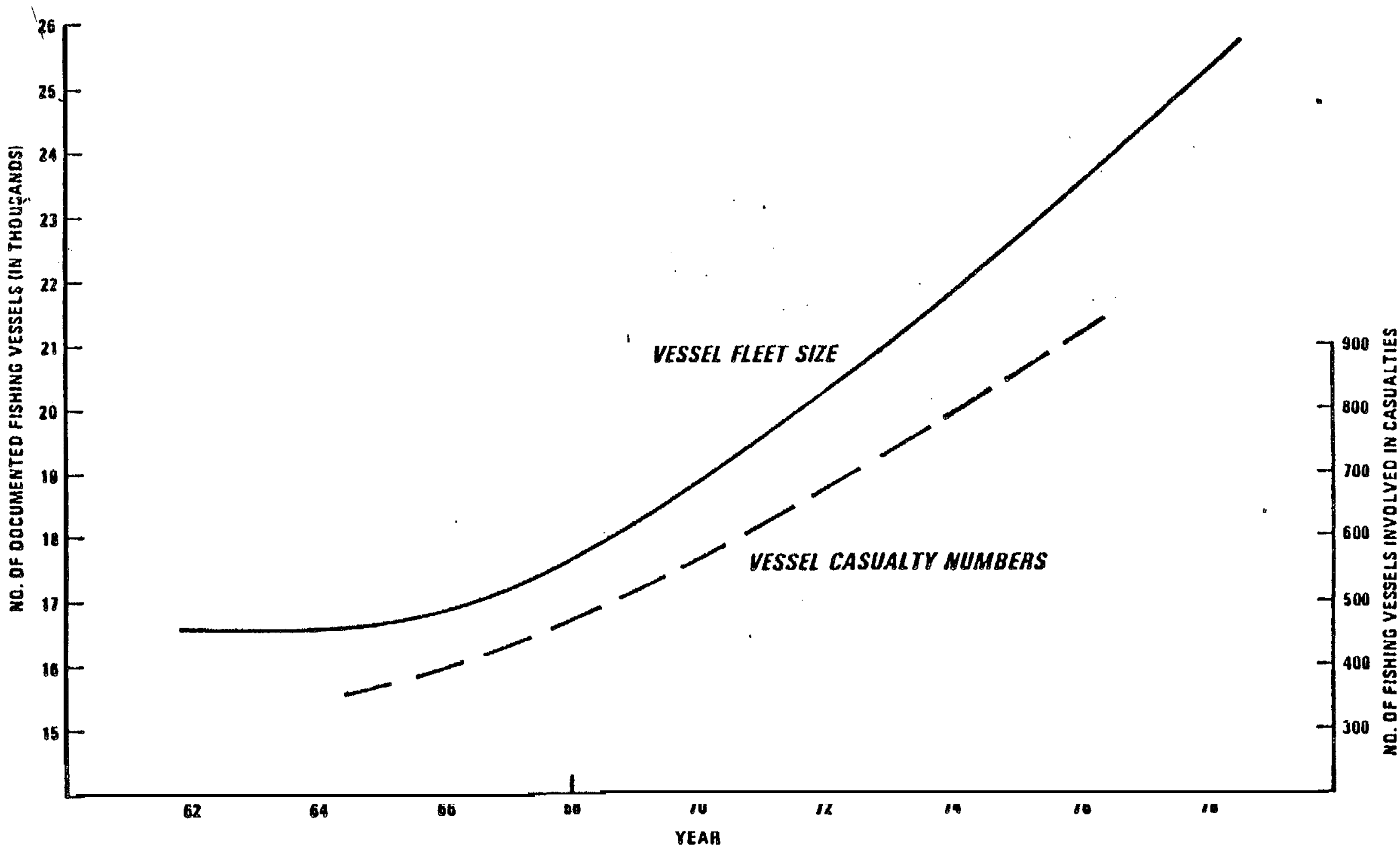

Figure B.1: Growth of the Documented Fishing F eet & Growth of Fishing Vessels Report ng Casua ties

Source: Ecker, mm Will am J., Safety Analysis of Fishing Vessel Casualties, U.S. Coast Guard. 1978.

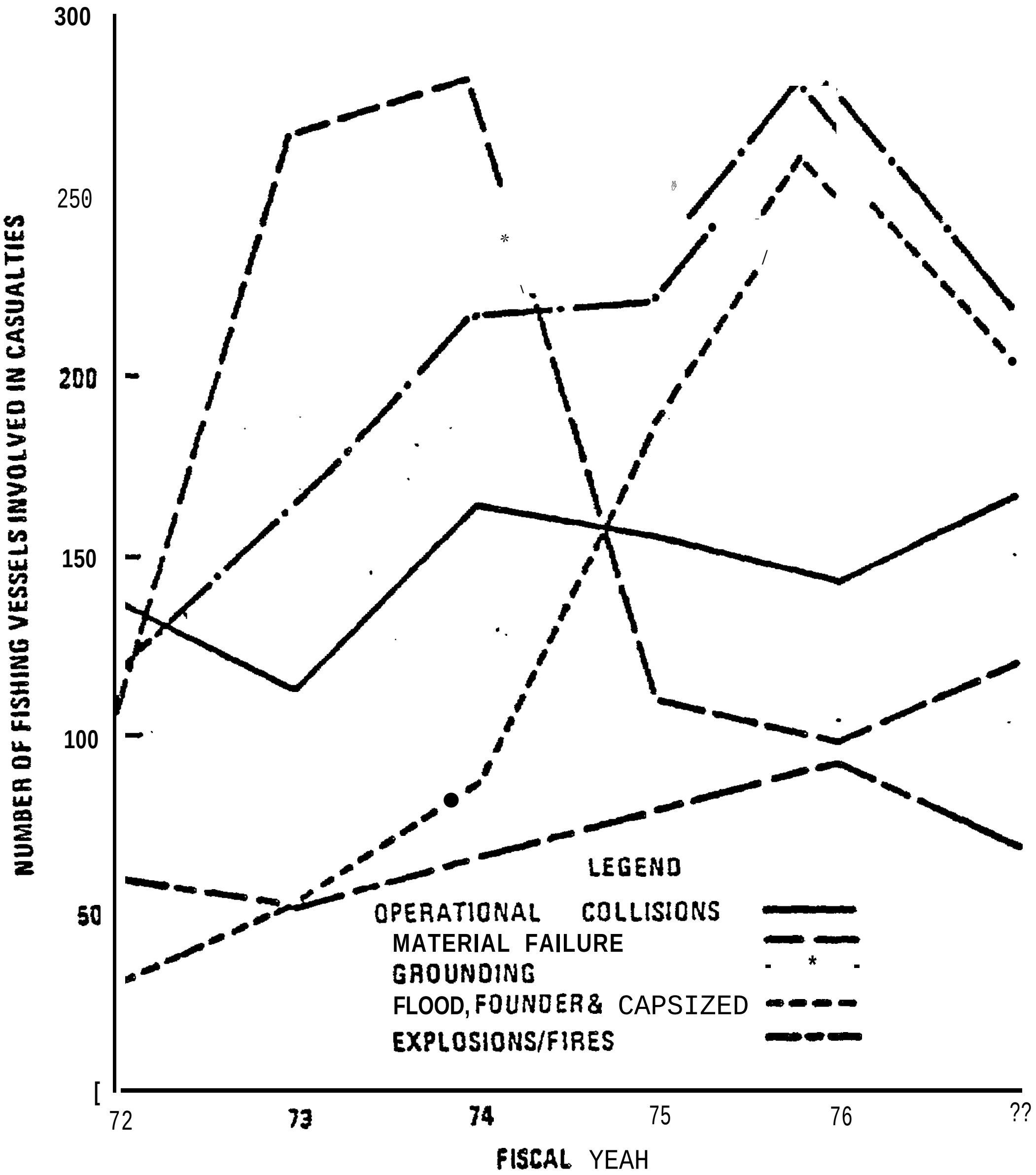

Figure 6.2: Fishing Vessel Casualties
No. of vessels involved in specific type casualties by fiscal year.

Source: Ecker, Commander William J., ~~A Safety Analysis of Fishing~~ Vessel Casualties, U.S. Coast Guard. 1978.

Nearly 13 percent of the United States' documented fishing vessels are located in Alaska (Table B.1). Additionally, many vessels migrate to Alaska from other states, particularly Washington, to participate in various fisheries throughout the year, and effectively increase the percentage of fishing vessels that actually operate in Alaskan waters. Though only 13 percent of America's fishing vessels were registered in Alaska, 24 percent of the fishing vessel-related deaths and 20 percent of fishing vessel losses occurred in Alaska (Table 6.2), attesting to the harsh conditions that vessels are subjected to and the danger faced by anyone who experiences emergency survival in Alaska's cold waters.

Flooding/Foundering/Capsizing (F/F/C) and grounding rated first and second respectively as causes of fishing vessel casualties in Alaska, in terms of number of deaths as well as number of vessels lost (Table B.2). This compares very closely with the ranking of casualty causes for the entire United States (Table B.3). The specific causes of F/F/C and grounding are presented in Tables B.4 and B 5. However, the information in Tables B.4 and B.5 is comprised of incidents from all portions of the United States, and it is very likely that adverse weather conditions were involved in a higher proportion of Alaskan casualties than in other parts of the country. Personnel fault was most commonly named as the cause of F/F/C and grounding, with inattention and navigational problems being most prevalent. Explosion/fire, material failure, and operational collisions are the remaining categories of fishing vessel casualties in Alaska, in order of frequency, with specific causes listed in Tables B.6 B.7, and B.8. Operational collisions are attributed to personnel fault nearly half of the time, while explosion/fire and material failure are more commonly the result of equipment failure.

TABLE B.1

U.S. FISHING VESSEL FLEET GEOGRAPHIC GROUPINGS - SELECTED AREAS

Area	Num. Vess.	Percent of Fleet	
New England Maine, Mass., R.I., Corm.	1,723	6.8%	
Middle Atlantic - North NY, NJ, Penn., Del.	828	3.3%	32.1% Atlantic Coast
Middle Atlantic - South MD, VA, Wash DC, NC, SC	3,729	14.7%	
Southern Atlantic Gee., Fla., Virg. 1s., Puerto Rico	1,856	7.3%	
Gulf Fla., Ala., Miss., LA, Texas	6,065	24. 0%	24. 0% Gulf Coast
Southern California San Diego, Los Angeles	1,075	4.3%	
Northern California SF, Eureka	1,881	7.4%	41.7% Pacific Coast
Pacific Northwest Oregon, Wash.	4,410	17.4%	
Alaska	3,196	12.6%	

Source: Ecker, Commander Will iamJ., A SafetyAnalysis of Fishing Vessel Casualties, U.S. Coast Guard, 1978. USCG Documentation Records (vessels of 5 net tons or more).

TABLE B.2

SPECIFIC LOCATION* COMPARISON

Location	Operational Collisions		Grounding		Explosion/ Fire		Flood/ Found/Cap.		Material Failure		Total	
	Deaths	Vess. Lost	Deaths	Vess. Lost	Deaths	Vess. Lost	Deaths	Vess. Lost	Deaths	Vess. Lost	Deaths	Vess. Lost
Maine		1		3		2	16	6	1		17	12
Massachusetts	4	3		5	1	7	11	21		8	16	44
Rhode Island				2		1	6	8		4	6	15
Corm, NY, NJ	1	1		3		4	10	12		10	11	30
Del. Bay		1		1			1	3			1	5
Del, MD, WA coast						1	1	2			1	3
Chesapeake Bay	4	6		3	3		17	12	6	5	30	26
North Carolina			4	3	3	8	4	7		2	11	20
South Carolina		1		9		2	1	5		5	1	22
Georgia		2		6		13	1	6	2	1	3	28
Florida East		4	1	8	3	9	4	15	5	5	13	41
Florida West	2	5		11		10	5	11	5	7	12	44
Alabama		2		4	3	9	1	4		1	4	20
Mississippi		2		1			4	2		2	4	9
Louisiana	1	9		5		10	1	8	6	2	8	34
Texas		25	1	32		16	11	16	1	19	13	108
Southern Calif.		4		26		14	10	27		10	10	81
Northern Calif.	4	10	1	10	2	8	8	22	8	10	23	60
Pacific Northwest	3	7	3	15	4	28	11	34	7	14	28	98
Alaska	5	8	13	45	4	38	36	59	8	21	66	171
TOTAL	24	91	23	192	23	180	159	280	49	128	278	871
Alaska, % of total	20.8	8.8	56.5	23.4	17.4	21.1	22.6	21.1	16.3	16.4	23.7	19.6

*All locations not included.

Source: Ecker, Commander William J., A Safety Analysis of Fishing Vessel Casualties, U.S. Coast Guard, 1978.

TABLE B.3

CASUALTY TYPE AND SERIOUSNESS OF CONSEQUENCES> FISHING VESSEL CASUALTIES FY 72 - 77

Selected Casualty Type	Casualty Freq. Num. Vessels	Casualty Freq. Ranking	Casualty Deaths Num. Vessels/ Num. Deaths	Casualty Deaths Ranking	Vessels Lost Num. Vessels	Vessels Lost Ranking
Grounding	1,221	1	19/29	3	218	2
Material Failure	980	2	36/63	2	158	4
Operational Collisions	880	3	14/24	4	114	5
Flooding, Foundering, & Capsizing	819	4	121/238	1	397	1
Explosion/Fire	412	5	16/20	5	215	3
All Others	542		23/40		72	

Source: Ecker, Commander William J., Safety Analysis of Fishing Vessel Casualties, U.S. Coast Guard, 1978.

TABLE B.4

PRIMARY CAUSES

Casualty type: Flooding/foundering/capsizing
Casualty period: FY 72 thru 77

PRIMARY CAUSES	PERCENT
1. Personnel Fault	17.6
a. carelessness/inattention (18.8%)	
b. improper securing of vessel (13.9%)	
c. poor seamanship (9.0%)	
d. misjudge effects of current, wind, etc. (6.3%)	
2. Storms, Heavy Weather	15.3
a. large swell across bar (37.6%)	
b. structural failure (11.2%)	
c. gale force winds (8.8%)	
d. hurricane winds (4.8%)	
e. cargo shift (3.2%)	
f. ice (2.4%)	
3. Equipment Failure	14.9
a. drainage system (27.0%) '	
b. electrical (8.2%)	
c. other (48.4%)	
4. Structural Failure	10.7
a. wasted plates & internals (53.4%)	
5. Striking Submerged Object	7.0
6. Unseaworthy	5.1
a. failure of wood hull (54.8%}	
b. failure of steel hull (14.3%)	
c. unsuitable for route (16.7%)	
7. Improper Maint. - Failure of Wood Hull	2.9
8. Exact Cause Unknown	24.5
a. progressive flooding (28.4%)	
b. questionable stability (10.4%)	
c. vandalism (8.0%)	
d. improper mooring (7.0%)	

Source: Ecker, Commander William J., A Safety Analysis of Fishing Vessel Casualties, U.S. Coast Guard. 1978.

TABLE B.5

PRIMARY CAUSES & CONTRIBUTING FACTORS

Casualty type: Groundings
Casualty period: FY 72 thru 77

PRIMARY CAUSES	PERCENT
1. Personnel Fault a. navigation - failed to ascertain position (43.6%) b. carelessness/inattention (11.3%) c. misjudge wind/current (11.1%) d. poor seamanship (4.3%) e. lack of Local Knowledge (4.3%) f. failed to determine height of tide (2.0%)	62.3
2. Equipment Failure	11.9
3. Heavy Weather, Storms, Currents	10
4. Depth Less Than Charted	9.4
5. Other Causes	6.4

CONTRIBUTING FACTORS FREQUENTLY MENTIONED

1. Restricted Maneuvering in Channel
2. Heavy Weather
3. Unusual Currents
4. Equipment Failure - Main Propulsion, Steering Gear, Rudder, Propeller Loss
5. Congested Area
6. Lack of Proper Lookout

Source: Ecker, Commander William J., A Safety Analysis of Fishing Vessel Casualties, U.S. Coast Guard. 1978.

TABLE B.6

PRIMARY CAUSES & CONTRIBUTING FACTORS

Casualty Type: Explosion/Fire
Casualty Period: FY 72 thru 76

PRIMARY CAUSES	PERCENT
1. Equipment Failure a. electrical (38.4%) b. fuel oil system (14.5%) c. ventilation (5.0%)	38.6
2. Engine Room Fires	20.6
3. Fire From Undetermined Sources	14.8
4. Personnel Fault a. improper safety precautions (54.3%) b. carelessness (30.4%)	11.2
5. Unknown	6.7

CONTRIBUTING FACTORS FREQUENTLY MENTIONED

1. Diesel and Gasoline Engines
2. Electrical - Wiring
3. Gas/Oil Heaters
4. Galley Equipment - Ovens & Ranges
5. Ventilation Systems
6. Yard Repairs

Source: Ecker, Commander William J., A Safety Analysis of Fishing Vessel Casualties, U.S. Coast Guard. 1978.

TABLE B.7

PRIMARY CAUSES

Casualty type: Materia Failure
Casualty period: FY 72 thru 77

PRIMARY CAUSE	PERCENT
1. Failure of On-Board Equipment a. electrical (9.3%) b. fuel oil system (6.1%) c. lube oil system (5.7%) d. salt water system (3.8%) e. fresh water system (3.5%) f. hydraulic (3.0%) g. hull drainage (1.5%)	74.8
2. Structural Failure - No Personnel Fault a. wasted plates/rotted hull (58.6%)	8.9
3. Unseaworthy a. failure of wood planking (81%)	4.3
4. Storms, Heavy Weather	2.9
5. Personnel Fault	2.4
6. Unknown	4.5

Source: Ecker, Commander William J., A Safety Analysis of Fishing Vessel Casualties, U.S. Coast Guard. 1978.

TABLE B.8

PRIMARY CAUSES & CONTRIBUTING FACTORS

Casualty type: Operational Collisions
Casualty period: FY 72 thru 77

PRIMARY CAUSES	PERCENT
1. Personnel Fault a. rules of road (44.8%) b. improper lookout (22.6%) c. carelessness/inattention (6.2%) d. misjudge wind/current (4.8%) e. poor seamanship (2.1%)	47.7
2. Presence of a Submerged Object	9.8
3. Equipment Failure	3.6
4. Fault Other Vessel	28.4
5. Other Causes	10.5

CONTRIBUTING FACTORS FREQUENTLY MENTIONED

1. Restricted Maneuvering in Channel
2. Congested Area
3. Lookout not Alert
4. Poor Visibility
5. Currents & Tides
6. Weather, Generally

Source: Ecker, Commander William J., A Safety Analysis of Fishing Vessel Casualties, U.S. Coast Guard. 1978.

Though operational collisions are not the most prevalent vessel" casualty in Alaska, this type of incident is of special interest in respect to increased marine traffic which may occur due to petroleum development in an area. Collisions in which vessels are meeting invo ve the most fishing vessels, followed by collisions with submerged objects (Table B.9). The frequency of vessel meeting collisions involving f shing vessels increased steadily throughout the study period of 1972-1977, while the frequency of other types of collisions showed little gain or sizable decreases.

Table B.10 reports the frequency of fishing vessel casualties according to the fishing activity at the time of the incident. U.S. Coast Guard documentation records indicate that approximately one-third of American fishing vessels participated in the shrimp fishery during the study period, and a similar number fished for salmon. An additional five percent were involved in the crab fisheries and the remainder of the American fishing fleet pursued other species of fish. However, it must be remembered that many vessels participated in more than one fishery. Forty-nine percent of the vessels lost and 34 percent of the fishermen killed were involved with shrimping, while only eight percent of the vessels lost and 11 percent of the fishermen killed were fishing for salmon. Six percent of the vessels lost and nine percent of the deaths were related to crabbing. Specific data were not available to indicate the proportion of accidents which were attributable to Alaska, nor the proportion of boats in each fishery. However, since Alaska is the top producer of crab and salmon, and has a very substantial shrimp fishery, it can be assumed that data concerning Alaska would indicate that

TABLE B.9

Trend Chart by Year
OPERATIONAL COLLISIONS - INCIDENTS & VESSEL INVOLVEMENT

	VESSEL MEETING			VESSEL CROSSING			COLLISION-VESSEL OVERTAKING			COLLISION-VESSEL ANCHORED OR MOORED			COLLISION-SUBMERGED OBJECT		TOTAL-OPERATIONAL COLLISIONS		
	Num Incid	Num Fishing Vess	Num Multiple Fish Vess Incid	Num Incid	Num Fish Vess	Num Multiple Fish Vess Incid	Num Incid	Num Fish Vess	Num Multiple Fish Vess Incid	Num Incid	Num Fish Vess	Num Multiple Fish Vess Incid	Num Incid	Num Fish Vess	Num Incid	Num Fish Vess	Num Multiple Fish Vess Incid
1972	16	26	9	18	26	8	12	16	4	21	35	12	35	36	102	139	34
1973	21	26	5	15	18	3	8	10	2	17	27	10	30	31	91	112	21
1974	26	35	9	17	26	9	10	13	3	33	50	15	42	42	138	166	36
1975	23	35	12	22	31	8	15	21	6	27	49	15	19	19	106	155	41
1976	33	41	8	8	12	4	12	15	3	26	47	16	27	27	106	142	31
1977	55	85	30	4	7	3	6	6	0	26	41	13	27	27	118	166	46
TOTALS	174	248	73	84	120	35	63	81	18	150	249	81	180	182	661	880	209

Source: Ecker, Commander William J., A Safety Analysis of Fishing Vessel Casualties, U.S. Coast Guard. 1978.

TABLE B.10

SPECIFIC FISHING ACTIVITY[1]

VESSEL ACTIVITY/ CONFIGURATION	NUM LOST VESSELS	% OF TOTAL	NUM PERSONS KILLED	% OF TOTAL
Shrimping[2]	294	49	59	34
Ground fishing	124	21	18	10
Salmon[2]	48	8	20	11
Tuna	36	6	15	8
Oystering	11	2	5	3
King crab[2]	26	4	11	6
Crab[2]	12	2	5	3
Menhaden	1	<1	3	2
Lobster	25	a	20	11
Clam	13	2	12	7
Scallop	4	<1		
Halibut[2]	5	1	3	2
Snapper/grouper	4	<1	5	3
Total	603		176	

[1]Where specifically noted on casualty report.

[2]Fisheries of substantial importance in Alaska.

Source: Ecker, Commander William J., Safety Analysis of Fishing Vessel Casualties, U.S. Coast Guard. 1978.

crabbing and shrimping are relatively hazardous, and that salmon fishermen face less danger.

Alaska Marine Oil Spills

Information concerning Alaska marine oil spills from 1973 through 1977 was obtained from data contained in the Pollution Incident Reporting System (PIRS), a system maintained at U.S. Coast Guard Headquarters in Washington, D. C. All Alaska marine-related oil spills recorded by the PIRS were examined in an attempt to expose any trends or occurrences which may be related to Alaska's increasing volume of marine traffic, and to its growing petroleum industry. With the exception of more spills being reported in recent years, which was fully expected based upon increasing marine activity, it appears that there was no substantial change in the types of spills occurring throughout the data period.

Inspection of Tables 6.11 through B.18 quickly verifies that oil spills are extremely diversified in quantity, source, cause, and even material spilled. Spills of 1,000 gallons or greater are presented individually in Tables B.11 through B.15, but many more spills of only one to five gallons were recorded by the Coast Guard, and the remainder lie between these extremes. Of particular interest may be the fact that in 1975, 1976 and 1977, the occurrence of spills in excess of 1,000 gallons actually declined by over one-third relative to 1973 and 1974 levels. Also, it is notable that in most years, a single spill has accounted for around three-fourths of the total recorded petroleum pollution in Alaska waters.

Light diesel fuel is the most common pollutant involving large spills (Table B.16). Light diesel is used extensively in Alaska, providing

TABLE B.11

1973 ALASKA MARINE OIL SPILLS ≥ 1,000 GALLONS

Material	Quantity (gallons)	Source	Cause
Light Diesel	196,182	Tankship 10,000-19,999 gross tons	Hull Rupture or Leak
Unidentified Heavy Oil	5,000	Onshore industrial plant or processing facility	Tank Rupture or Leak
Heavy Diesel	2,500	Onshore industrial plant or processing facility	Intentional discharge
Light Diesel	1,500	Onshore Non-transportation-related facility	Valve Failure
Light Diesel	8,000	Miscellaneous	Pipe Rupture or Leak
Light Diesel	3,700	Other vessel	Equipment Failure
Light Diesel	7,980	Tugboat or towboat	Tank Rupture or Leak
Other Oil	4,200	Onshore fueling	Intentional discharge
Light Diesel	1,500	Fishing vessel	Tank Rupture or Leak
Light Diesel	6,500	Other vessel	Structural Failure
Light Diesel	4,500	Tank barge 1,000-9,999 gross tons	Tank Rupture or Leak
Light Diesel	22,500	Miscellaneous	Pipe Rupture or Leak
Natural Occurrence	9,200	Natural source	Natural Phenomenon
Light Diesel	3,800	Miscellaneous	Tank Overflow
Total	277,062 gallons		

Largest single oil spill: 196,182 gallons
Average quantity spilled: 19,790 gallons
Average quantity spilled excluding-largest spill: 6,222 gallons

All 1973 Alaska Marine Oil Spills (all quantities):

Number: 133
Total quantity: 281,506 gallons
Average quantity per spill: 2,117 gallons
Number of fishing vessel oil spills: 36
Average quantity per fishing vessel oil spill: 51 gallons

Source: United States Coast Guard Pollution Incident Reporting System data.

TABLE B.12

1974 ALASKA MARINE OIL SPILLS ≥ 1,000 GALLONS

Material	Quantity	Source	Cause
Light diesel	19,000	Land transportaion facility	Personnel error
Light diesel	6,000	Tugboat or towboat	Hull rupture or leak
Jet Fuel	5,000	Miscellaneous	Equipment failure
Light diesel	5,200	Other vessel	Tank rupture or leak
Light diesel	40,000	Onshore non-transportation-related facility	Pipe rupture or leak
Light diesel	33,000	Onshore non-transportation-related facility	Pipe rupture or leak
Light crude oil	1,050	Offshore bulk cargo transfer	Improper equipment handling or operation
Light diesel	7,000	Miscellaneous	Structural failure
Light diesel	10,000	Onshore fueling	Tank rupture or leak
Light diesel	2,500	Land transportation facility	Value failure
Light diesel	33,000	Miscellaneous	Tank overflow
Gasoline	5,800	Unknown type of source	Unknown cause
Light diesel	1,200	Onshore non-transportation-related facility	Pipe rupture or leak
Light diesel	3,200	Onshore bulk cargo transfer	Transportation Pipeline rupture or leak
Light diesel	1,600	Highway vehicle liquid bulk	Natural or chronic phenomenon
Total	173,550 gallons		

Largest single oil spill: 40,000 gals. Average quantity spilled: 11,570 gals.
Average quantity spilled excluding largest spill: 9,539 gals.

All 1974 Alaska Marine Oil spills (all quantities):

Number: 153 Total quantity: 181,409 gals. Average quantity per spill: 1,186 gals.
Number of fishing vessel oil spills: 24
Average quantity per fishing vessel oil spill: 71 gals.

Source: United States Coast Guard Pollution Incident Reporting System data.

TABLE B.13

1975 ALASKA MARINE OIL SPILLS > 1,000 GALLONS

Material	Quantity	Source	Cause
Light diesel	1,100	Highway vehicle liquid bulk	Natural or chronic phenomenon
Heavy diesel	5,000	Fishing vessel	Hull rupture or leak
Light diesel	1,000	Miscellaneous	Unknown causes
Jet fuel	1,500	Onshore bulk storage facility	Equipment failure
Light diesel	2,000	Highway vehicle liquid bulk	Personnel error
Light diesel	65,000	Onshore pipeline	Pipeline rupture or leak
Gasoline	300,000	Onshore fueling	Tank rupture or leak
Total	375,600 gallons		

Largest single oil spill: 300,000 gallons
Average quantity spilled: 53,657 gallons
Average quantity spilled excluding largest spill: 12,600 gallons

All 1975 Alaska Marine Oil Spills (all quantities):

Number: 136
Total quantity: 380,275 gals.
Average quantity per spill: 2,796 gals.
Number of fishing vessel oil spills: 30
Average quantity per fishing vessel oil spill: 201 gals.

Source: United States Coast Guard Pollution Incident Reporting System data.

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TABLE B.14

1976 ALASKA MARINE OIL SPILLS ≥ 1,000 GALLONS

Material	Quantity	Source	Cause
Heavy diesel	40,000	Onshore bulk storage facility	Transportation pipeline rupture or-leak
Jet fuel	9,000	Rail vehicle liquid bulk	Railroad accident
Light crude oil	2,000	Onshore oil or gas production facility	Hose rupture or leak
Gasoline	1,500	Aircraft	Aircraft accident
Mixture of two or more petroleum products	2,000	Offshore production facility	Equipment failure
Light diesel	2,000	Onshore bulk storage facility	Tank rupture or leak
Light diesel	1,000	Fishing vessel	Tank rupture or leak
Light diesel	1,000	Railway fueling facility	Improper equipment handling or operation
Jet fuel	395,670	Tankship 10,000-19,999 gross tons	Hull rupture or leak
Light diesel	4,000	Highway vehicle liquid bulk	Highway accident
Light diesel	9,000	Onshore non-transportation-related facility	Improper equipment handling or operation
Total	467,170		

Largest single oil spill: 395$670 gals. Average quantity spilled: 42,470 gals.
Average quantity spilled excluding largest spill: 7,150 gals.

All 1976 Alaska Marine Oil Spills (all quantities):

Number: 234 Total Quantity: 475,820 gals. Average Quantity per Spill: 2,033 gals.
Number of fishing vessel oil spills: 48
Average quantity per fishing vessel oil spill: 75 gals.

Source: United States Coast Guard Pollution Incident Reporting System data.

TABLE B.15

1977 ALASKA MARINE OIL SPILL ≥ 1,000 GALLONS

Material	Quantity	Source	Cause
Jet fuel	10,192	Onshore bulk storage facility	Pipe rupture or leak
Light diesel	72,280	Fishing vessel	Hull rupture or leak
Light diesel	1,000	Fishing vessel	Hull rupture or leak
Heavy diesel	8,000	Fishing vessel	Hull rupture or leak
Light diesel	1,000	Onshore bulk cargo transfer	Personnel error
Light diesel	10,000	Onshore industrial plant or processing facility	Highway accident
Light diesel	8,000	Fishing vessel	Hull rupture or leak
Light diesel	2,600	Onshore non-transportation-related facility	Tank overflow
Unidentified light oil	1,600	Onshore bulk storage facility	Pipe rupture or leak
Total	114,672		

Largest single oil spill: 72,280 gals.
Average quantity spilled: 12,741 gals.
Average quantity spilled excluding-largest spill: 5,299 gals.

All 1977 Alaska Marine Oil Spills (all quantities):

Number 229
Total quantity: 123,633 gals.
Average quantity per spill: 540 gals.
Number of fishing vessel oil spills: 56
Average quantity per fishing vessel spill: 1,600 gals.

Source: United States Coast Guard Pollution Incident Reporting System data.

TABLE B.16

NUMBER OF ALASKA MARINE OIL SPILLS ≥ 1,000 GALLONS,
BY MATERIAL SPILLED 1973-1977

Material Spilled	Number of Incidents				
	1973	1974	1975	1976	1977
Light Crude Oil		1		1	
Gasoline		1	1	1	
Jet Fuel		1	1	2	
Light Diesel Fuel	10	12	4	5	
Heavy Diesel Fuel	1		1	1	
Mixture of Two or More Petroleum Products				1	
Unidentified Light Oil					
Unidentified Heavy Oil	1				
Other Oil	1				
Natural Occurrence	1				
Total	14	15	7	11	9

Source: United States Coast Guard Pollution Incident Reporting System data.

TABLE B.17

NUMBER OF ALASKA MARINE OIL SPILLS > 1.000 GALLONS.
BY CAUSE 1973-1977

Cause of Oil Spill	1973	1974	1975	1976	1977
Structural Failure or Loss					
Hull Rupture or Leak	1	1	1	1	4
Tank Rupture or Leak	4	2	1	2	
Transportation Pipeline Rupture or Leak		1		1	
Other Structural Failure	1	1			
Equipment Failure					
Pipe Rupture or Leak	2	3	1		2
Hose Rupture or Leak				1	
Valve Failure	1	1			
Other Equipment Failure	1	1	1	1	
Personnel Error (Unintentional Discharge)					
Tank Overflow	1	1			1
Improper Equipment Handling or Operation		1		2	
Other Personnel Error					
Intentional Discharge	2				
Other Transportation Casualty					
Railroad Accident				1	
Highway Accident				1	1
Aircraft Accident				1	
Natural or Chronic Phenomenon	1	1	1		
Unknown Causes		1	1		
Total	14	15	7	11	9

Source: United States Coast Guard Pollution Incident Reporting System data.

TABLE B.18

NUMBER OF ALASKA MARINE OIL SPILLS ≥ 1,000 GALLONS,
BY SOURCE OF SPILL 1973-1977

Source of Oil Spill	1973	1974	1975	1976	1977
Other Vessel	2	1			
Tankship 10,000-19,999 gross tons	1			1	
Tank Barge 1,000-9,999 gross tons	1				
Tugboat or Towboat	1	1			
Fishing Vessel	1		1	1	4
Onshore Bulk Cargo Transfer		1			1
Onshore Fueling	1	1	1		
Offshore Bulk Cargo Transfer		1			
Rail Vehicle Liquid Bulk				1	
Highway Vehicle Liquid Bulk		1	2	1	
Aircraft				1	
Other Land Transportation Facility		2			
Railway Fueling Facility				?	
Onshore Pipeline			1		
Other Onshore Non-Transportation-Related Facility		3		1	1
Onshore Bulk Storage Facility			1	2	2
Onshore Industrial Plant or Processing Facility					1
Onshore Oil or Gas Production Facility				1	
Offshore Production Facility				1	
Miscellaneous - or Natural Source	4	3	1		
Unknown Type of Source		1			
Total	14	15	7	11	9

Source: United States Coast Guard Pollution Incident Reporting System data.

power in a large portion of the boats and to produce electricity in most communities outside the Anchorage-Cook Inlet area. Therefore, many opportunities exist for diesel spills when large quantities are being loaded onto or unloaded from bulk supply vessels, and whenever a diesel-powered boat experiences problems which allow fuel to escape. Discarded waste oils and lubricating oils account for a sizable portion of small spills of several gallons or less. These incidents often occur within or near small boat harbors, and are often associated with the performance of minor boat maintenance. However, harbor masters have reported that the occurrence of such spills is decreasing due to stricter prevention measures and better cooperation by boat operators who are becoming increasingly aware of environmental concerns.

The causes of oil spills and the sources of the pollutants cover a wide range (Tables B.17 and B.18). In many cases, rather large quantities of oil were lost in shore-based operations such as refueling and fuel tank overflow. Large shore-based spills far outnumbered large nonshore-based spills which were often attributable to hull rupture or leak or tank rupture or leak. Smaller oil spills often involve the intentional discharge of waste oils, or losses in which rather moderate amounts of lubricating oils, hydraulic fluids, or engine fuels escape unintentionally. Frequently personnel error or equipment malfunction is the primary cause of small spills.

The number of fishing vessels involved with oil spills increased between 1973 and 1977. The proportion of total spills attributable to fishing vessels fluctuated from approximately 15 percent to 24 percent of all spills, but it did not exhibit a secular trend. Most fishing vessel incidents involved diesel fuel, lubricating oils or hydraulic oils or waste oil, and only rarely were spills larger than a few hundred gallons.

Very little information was available concerning the affect the oil spills had upon the environment. Beginning with 1977 data, some oil spills were recorded with an assessment of their environmental impact. Prior to 1977, a damage assessment was not included. Many 1977 spills did not include assessments, however, and none of the spills of 1,000 gallons or more were assessed. All spills of which the degree of impact was evaluated received a rating of "potential" or "negligible", except for one spill rated "slight". Depending upon the location of the spill, the resources most likely to be affected by the spills were boats and fish.

Processing Plant Siting Requirements

Fish processors have a number of criteria that must be met when choosing a site for a land-based plant. Oftentimes sites are chosen in close proximity to population centers so as to utilize already existing amenities. Other times, plants are located in quite remote areas to maintain closeness to the fishing grounds, and must be completely self-sufficient. However, the particular needs are met and almost all plants, processing nearly any species of fist-t, have similar basic needs.

Adequate and suitable land must be available in a desirable location. Various processors have indicated that around 0.8 hectares (two acres) of land is adequate for a fairly large plant, but an additional 1.2 or 1.6 hectares (three or four acres) of open storage area would be very desirable. Additional space would allow storage of container vans away from the plant, greatly reducing congestion. Also, many fishermen do not have adequate storage facilities for their gear, especially the large crab pots, and safe storage of their gear is a service which many plants try to extend to regular customers when space allows.

A plant must have a means of obtaining the raw fish for processing. This normally necessitates the location of the plant where facilities can be constructed for off-loading of fishing vessels. Fishing boats often have a draft of around 2.4 m (8 feet), but drafts in excess of 3.7 m (12 feet) when loaded are no longer rare. Also, the current trend toward larger, multi-purpose vessels must be considered to insure usefulness of the facilities well into the future. Some plants presently receive considerable portions of their fish by air-freight or truck. This suggests that with ingenuity, sites that at first appear inappropriate for fish processing facilities and are located away from the shore may actually prove adequate and more readily available.

Electricity and fresh water are indispensable for the operation of a fish processing plant. Both must be readily available to supply the plant at peak usage levels. Fish processing is usually seasonal, and a plant's entire pack for the year may be produced in a few short weeks during which the lines run nearly full time. Vast amounts of water are needed at various points along the processing lines, with cleaning accounting for the largest consumption. Electricity powers most of the machinery along the processing lines and must be provided by a reliable source, as any delays in processing fish can result in considerable quality loss. Some plants opt to generate their own electricity, often due to having no other source available. The use of electricity has grown more critical to the fish processing industry with the growing prevalence of freezing, because freezing consumes much more electricity than the Canning process it is replacing.

Due to increasingly stringent environmental protection regulations, plants must provide adequate means of industrial waste disposal. More leniency is exercised in remote areas where several plants are not grouped together. Particular EPA waste disposal requirements for any potential plant site could noticeably alter construction and operating costs.

Nodes of transportation available for servicing the plant site are a critical consideration. Nest Alaskan fisheries products are eventually transported to the Seattle area by freighter or barge in container vans for further processing and distribution. Plants must be serviced regularly and with such frequency to assure a supply of vans for loading so freezing and warehousing facilities do not become overburdened, thus resulting in a production bottleneck.

Many other factors, such as availability of labor and certain economic factors, enter into the choice of a fish processing plant site. However, unless essential physical criteria are first met by a site, further investigation is unnecessary.

Market Environment

This section contains a description of the market environment in which the commercial fishing industry is expected to operate during the remainder of this century. It includes assumptions concerning the structure of the fishery industry, the availability of inputs and the rate of technical progress.

FINANCING PROGRAMS AVAILABLE TO COMMERCIAL FISHING VENTURES

Besides commercial bank financing, there are eight other programs available for financing fishing operations as well as a capital construction fund program available through the National Marine Fisheries Service (NMFS). In addition, Alaska Fisheries Development Corporation has been granted a block of SK funds through NMFS to help mitigate risk in the development of the bottomfish fishery in the waters off Alaska. A brief description of each of these programs will now be given.

The Federal Farm Credit System offers lending programs to fishermen through the Bank for Cooperatives and Production Credit Associations.

Bank for Cooperatives (BC), as its name implies, requires bona fide cooperative organizations to qualify for loans. BC provides a full range of credit services requiring 40 percent equity at money market rates with a margin of 0.5 to 1.0 percent.

The Production Credit Association (PCA) extends short and intermediate credit services to individual borrowers. Maximum term is seven years with a three-year extension possibility. PCA requires a 50 percent equity on loans for used vessels.

The Alaska Commercial Fishing Loan Act (A.S. 16.10.300 - A.S. 16.10.370) provides for loan funds available to individual fishermen through the Alaska Department of Commerce and Economic Development. Loans are available up to $150,000 at an interest rate not to exceed seven percent for a term of up to 15 years.

The Alaska Small Business Loan Program extends credit to resident individuals (one year) or corporations (head-quartered in Al aska) engagi ng i n smal l business operations. The loan ceiling is $300,000, with 25 percent equity at 8.0 percent interest for up to 15 years.

The Fishing Vessel Obligation Guarantee program is administered by the National Marine Fisheries Service and provides loans for construction, reconstruction or overhaul of vessels over 4.5 MT (five net tons) in weight. Gear integrally a part of an operating vessel, is included. The loan will cover up to 75 percent of cost and fishermen pay a 0.75 percent charge on the outstanding balance. Conditional fisheries in Alaska (salmon and crab) are not eligible. The Farm Credit System and NMFS have reached an agreement whereby the vessel loan guarantee could be used with PCA loans.

Under moratorium since 1973 is another NMFS loan program, the Fisheries Loan Fund. Authorized by the Fish and Wildlife Act of 1956 as amended, the Fund made secured loans up to $40,000 at eight percent interest for a maximum term of 14 years if the applicant had no" other source of funding. Alaska fishermen still had $91,000 in loans outstanding as of October 1977. Draft legislation was under development as of the same date to revive the Loan Fund as a more comprehensive fisheries development financing program.

NMFS also administers a Fishing Vessel Capital Construction Fund (CCF). The CCF allows fishermen to save taxable income for construction, reconstruction or (under limited circumstances) acquisition of fishing vessels by deferring federal tax payments on program accounts. This, in effect, constitutes an interest-free loan from the government.

The Community Economic Development Corporation (nonprofit) extends credit at low interest rates to rural Native fisheries development businesses who are otherwise not considered creditworthy by other institutions. The Corporation is funded by a grant from the Office of Economic Development, Community Service Administration.

Commercial banking institutions also provide vessel financing for up to 75 percent of construction costs or 60 percent on used vessel acquisition. Financing duration is seven to ten years at a current interest rate of between 11.0 and 11.5 percent.

Alaska Fisheries Development Corporation has been chosen to receive federal SK funds administered through the National Marine Fisheries Service for Technical Assistance, demonstration projects and scientific stock assessment work on groundfish in Alaska waters.

Representatives of the Federal Intermediate CreditBank and the NMFS Financial Assistance Division indicate that capital is currently seeking investment opportunities in the Alaskan and Pacific Northwest fishing industry. Much of the current boat construction is being financed by surplus cash flow from within the industry. The Capital Construction Fund is a common vehicle for accomplishing this internal financing.

The current capital market situation is in marked contrast to the situation of ten years ago when the internal return on investment and surplus cash flow was somewhat below that of agriculture and other natural resource based industries[1] It might be assumed that capital will be available to meet growth needs of the industry for loans of 15 years or less at the prevailing interest rates. Several financial experts concur in this assumption.

A probable explanation of the increased availability of financing for fishing vessels is the change in property rights to fishery resources that has occurred in the past few years. Both the Fisheries Conservation and Management Act and the implementation of the limited entry programs in Alaska have done much to increase fishermen's rights to particular resources and thus to increase their ability to borrow investment funds. The former gives domestic fishermen the exclusive right to resources within the 200 mile zone as soon as they are prepared to harvest them and the latter gives those who receive the limited number of gear permits the exclusive right to commercially harvest Alaska salmon and/or herring.

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[1] Smith, Frederick J., September, 1971. "Economic Condition of Selected Pacific Northwest Seafood Firms," Experiment Station Bulletin Special Report No. 27, Oregon State University.

NEW BOATS'

The major capital good required for the growth of the Gulf of Alaska fishing industry will be boats capable of harvesting groundfish and pelagic species. The ability of domestic boatyards to meet the annual demand for new boats to be used in the traditional Alaska fisheries has been well established; and since the demand for such boats is not expected to exceed that of the past few years it is believed that the growth of the traditional fisheries will not be constrained by boat yard capacity.

However, the ability of the U.S. boatbuilding industry to produce trawlers in excess of 27.4 meters (90 feet) LOA in adequate numbers is uncertain. Five major boat builders--Marco, Seattle, Washington; Martinac, Tacoma, Washington; Bender, Mobile, Alabama; and Desco and St. Augustine Trawlers--were questioned regarding their capacity and plans for capacity expansion.

Four of the five were optimistic that they could meet the increasing need. One (Martinac) was constricted on space and expansion of capacity would be a major undertaking.

The combined current capacity of these five yards is in excess of 30 boats over 27.4 meters (90 feet) in length, per year and Martinac estimates the industry could build 150 new boats per year in the 27.4-36.6 meter (90-120 foot) class with present facilities. Although Alaska will not be the only source of demand for new vessels it is expected to be the major source since for the remainder of the U.S., the existing fleets are capable of harvesting the entire allowable catch inside the 200 mile zone including current foreign allocations (Keen, 1978).

If the present facilities prove inadequate there are three potential sources of additional boat building capacity. The yards that have traditionally built fishing boats could expand their capacity; the ability of these yards to expand capacity is demonstrated by the over 300 percent increase in capacity of the Hillstrom Shipbuilding Company in Coos Bay, Oregon during the past year and the expansion of the Patti Boatbuilding Industries boat yard in Pensacola, Florida to allow the construction of steel fishing vessels. Both yards are currently building vessels of 26 to 42 meters (85-135 feet) for Alaska fisheries, (Fishing News International, April 1979). Foreign vessels and fore"ign shipbuilding capacity could be made available to U.S. fisheries through a change in the Jones Act; such a change might become politically fess"ible if the U.S. yards could not meet the demand for new vessels. And finally, boat yards that have not built fishing boats could begin to do so. Examples of such boat yards would include those that are currently building boats under Navy contracts and those currently building offshore oil supply boats. The ability of the latter to build fishing boats is demonstrated both by a supply boat yard, which recently constructed a modified revision of its standard supply boat to be used as a catcher/processor in the Alaska crab fisheries and by the conversion of a supply boat for the use in the same fisheries (National Fisherman, March, 1979). The ability of non-fishing boat yards to serve the fishing industry is further evidenced by the Foss Shipyard in Seattle which until last year concentrated on the maintenance of the Foss tug boat fleet. The Foss yard does not now build fishing boats but it converts boats into fishing boats (National Fisherman, July 1978).

To determine whether boat yard capacity will tend to constrain the development of the Alaska groundfish fishery it is necessary to speculate about the probable rate of growth of the fishery as well as about boat yard capacity. The Alaska groundfish fleet is expected to consist of over 400 vessels by 2000 but the growth of the fleet is not expected to exceed 25 boats per year until the mid-1990s. The largest addition to the fleet is expected to be over 100 boats and is projected to occur in 1999. It is believed that the ability of boat yards to increase the supply of new vessels and the nature of the projected growth of the Alaska groundfish fleet will prevent boat yard capacity from constraining the projected long-term development of the groundfish fishery and/or the projected long-term growth of the traditional fisheries. This does not mean that a prospective boat owner will be able to walk into any boat yard and expect to have work on the boat begun immediately, rather it means that the prospective boat owner can find a boat yard that can build the desired boat within one to two years.

PROCESSING EQUIPMENT

A large proportion of domestically used seafood processing equipment is purchased from foreign manufacturers. These manufacturers have demonstrated considerable resilience and flexibility in the past. Although foreign manufacturers of processing equipment were not interviewed directly, there are indications that their ability to manufacture and supply processing equipment will match the industry's needs for the next 20 years.

Perhaps a more significant factor is the existence of a large agricultural food processing equipment manufacturing capability in the U.S. Several of these U.S. firms have experimented with the production of seafood processing equipment but have been unable to compete with the foreign manufacturers--not because of lack of capacity, but because of lack of experience with the product.

One expert felt that the major bottleneck in seafood processing would be the ability of the domestic manufacturing industry to understand the difference between "peeling potatoes" and "skinning a pollock."[2] In the absence of mergers or joint ventures, any equipment manufactured domestically will have to go through a development period already completed by foreign manufactured equipment.

Another problem will be the inclination (or lack thereof) of processors to employ a technical expert in their plants. The present approach is to get by with a "shade tree" mechanic who barely keeps the equipment operating. Performance of processing equipment will suffer until this

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[2]Personal communication with John Peters, Food Technologist, University of Washington.

approach is changed.[3] In general, it does not appear that capital goods manufacturing capacity will be a significant deterrent to fishery development in Alaska.

LABOR

With respect to the supply of labor, the commercial fishing industry is in a relatively favorable position because its current labor requirements are primarily for seasonal and unskilled labor, Due to both the relatively high wages unskilled workers currently receive in the commercial fishing industry and the high unemployment rate for seasonal and unskilled labor in the U.S., there is, for all practical purposes, an unlimited supply of unskilled labor during the summer months. The industry wage is expected to remain above the minimum wage and high rate of unemployment for unskilled labor in the U.S. is expected to continue, therefore it is assumed that sufficient labor will be available during the summer months to meet the requirements for unskilled labor both on fishing vessels and in fish processing plants. The availability of unskilled labor for fishing boats is further demonstrated by boat owners' reports of receiving several letters a week from individuals seeking employment on a fishing boat.

However, the supplies of skilled skippers and year round labor are limited. The spotty record of success of domestic skippers entering new fisheries (e.g. hake and pollock in the Pacific Northwest) suggests that upon entering a new fishery, it takes time for a skipper to learn how to

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[3] Personal communication with Bob Price, Food Technologist, University of California at Davis.

use gear, find fish, and generally become proficient. But once a new fishery begins to develop,' the crews of the boats in the developing fishery provide a potential source of new skippers. For example, if out of a crew of five, including the skipper, one crew member is capable of becoming skipper the following year, the number of skippers can increase by 100 percent a year. The rate of development projected for the groundfish fleet would require this to happen in about one out of every four crews.

The availability of adequate year round labor is dependent to a significant degree on the availability of low income housing. Typically there is insufficient low income housing in the Alaska fishing communities of the Gulf of Alaska to meet the current demand and unless substantial increases in housing occur the development of a year round fishery with onshore processing dependent on a permanent labor force will be limited. The development of a year round groundfish fishery may, however, be possible in the absence of housing adequate for a permanent work force. The problem of an inadequate local labor force due to the absence of adequate housing can be reduced by increasing the amount of processing which occurs aboard fishing boats and by using self contained floating processors to reduce the local labor requirement, and/or by rotating a work force in and out of an area to reduce the housing requirements. The State of Alaska is also aware of the housing problem and is at least considering possible remedies.

Whether or not the availability of skippers and/or the size of the permanent local force hinder the development of the commercial fishing industry will depend on both the rate at which the industry and its labor requirements expand and the extent to which the expansion can be planned for. This is, of course, true for the other inputs. If the development is steady and thus the input requirements become predictable, the increases in requirements can effectively be planned for and fewer bottlenecks will occur. The development of the groundfish industry is expected to be gradual enough that it can be well planned.

TECHNOLOGY

Predicting technological breakthroughs in the fishing industry is risky at best. Attempting such a prediction for 20 years into the future is a blind plunge into uncertainty.

After consulting with nine technology experts, a rather clear historical pattern emerges. The domestic industry has usually taken up to 20 years to adopt available technology. For example, mid-water trawling techniques have been well developed for 20 years, yet domestic fishermen are only now beginning to adopt this technique. Net transducers have been available for 20 years, but not generally used by domestic fishermen until very recently. Exceptions are notable because they are so rare (i.e., the much publicized power block).

There are, however, factors at work that may tend to change the role the U.S. fisheries have had as followers and slow adopters of harvesting and processing technology. The increased property rights of domestic fishermen to U.S. fishery resources and the opportunities for more assured sources of fish for processors due to the FCMA and the Alaska limited entry and resource enhancement programs have decreased the uncertainty historically associated with the commercial fishing industry and thus have increased the incentive for innovation and/or more rapid adoption of available technology. Although major changes in harvesting and processing methods will perhaps be more possible in the future than they were in the past, it is not possible to predict what the timing and/or nature of such changes will be; it is, therefore, assumed that due to technical progress, the gradual replacement of labor with capital and economies of scale and regularity of operations, output per unit of labor will increase by two percent a year and that no technological breakthroughs that would radically transform harvesting or processing methods will occur.

TRANSPORTATION

As the Alaska commercial fishing industry has grown and expanded into new fisheries and as the industry's demand for transportation has increased, it has become increasingly apparent that adequate transportation to obtain needed supplies and to move processed fish products to markets is critical to the development of the industry. This section briefly discusses the dominant characteristics of the transportation system used by the commercial fishing industry and considers the transportation system's potential for providing the increased services that would be required by the expansion of traditional fisheries and the development of an Alaska groundfish industry.

Generally, Alaska fish processing plants do not have large storage capacity, therefore transportation services for processed products are required at frequent intervals. Most Alaska seafood products are shipped in refrigerated truck-trailer vans that are loaded aboard seagoing freighters for reprocessing in the Seattle area or Japan. The direct containerized shipments to Japan began in the Spring of 1979 and are expected to become increasingly important. The vessels serving Alaska from the Seattle area are typically capable of carrying 6,208 metric tons (13.7 million pounds) of processed fish. This capacity figure is based on a freighter carrying 365 vans from 35 to 40 feet in length and holding 35,000 to 40,000 pounds of processed fish and is typical of the Sealand freighters serving Alaska from Seattle. The direct containerized shipments to Japan were initiated by Sealand and American President Lines (APL). Kodiak and Unalaska/Dutch Harbor will be the initial ports of call and will be serviced by each company approximately once every three weeks. The three week schedule can be provided by one vessel allowing for delays due to maintenance, bad weather, and other circumstances that might prevent one vessel from providing more frequent service. The Sealand freighter serving the direct Alaska-Japan route is smaller than those that typically service Alaska from Seattle; it has a capacity of approximately 2720 metric tons (6 million pounds), (i. e., 172 vans of 35 feet in length); however by mid 1979 Sealand expects to replace this freighter with one capable of transporting 4,445 metric tons (9.8 million pounds), (i.e., 280 35-foot vans). APL has indicated that it will use a smaller freighter capable of carrying 60 vans to service its Alaska-Japan route.

APL's plans to provide direct service from Kodiak to Japan have temporarily been complicated by Sealand's long term contract for preferential use of the containerized cargo pier and equipment in the port of Kodiak.

The ability of the transportation system to respond to growth in the commercial fishing industry is demonstrated by the interest several freight companies have shown in providing service to Kodiak and comments by a Sealand representative indicating that the service to any port can rapidly be increased by contracting the services of available freight vessels. The need f'or increased cargo handling equipment and docking facilities is minimized by the use of onboard cranes.

The industry's demand for transportation services will continue to increase due to enhancement and/or management programs for the traditional fisheries and the expansion of the industry into new fisheries. However, as the following model indicates even a facility capable of loading or unloading only one vessel at a time has a very large freight handling capacity. Industry sources indicate that a vessel can be unloaded and/or loaded in one day; therefore assuming freighters with a capacity of 6,200 metric tons (13.7 million pounds), 2,253,000 metric tons (5 billion pounds) of freight could annually go through a port facility capable of handling one vessel at a time. Allowing for days lost due to bad weather, breakdowns, and days in which the port facility is occupied by vessels that are not servicing the commercial fishing industry, perhaps 200 days per year would be available to the industry; in that case, 1,240,000 metric tons (2.7 billion pounds) of processed fish products could be handled a year. This capacity is in excess of the processed fish products that are expected to be shipped out of Alaska in any one year before the end of this century; the foregoing analysis therefore suggests that the transportation system can rapidly respond to the increases in fish processing that are expected to occur by the year 2000.

For the Alaska commerical fishing industry, air freight is the only viable transport alternative. However, due to both the cost advantages of shipping by sea and the good storage characteristics of frozen fish products, air transportation is used almost exclusively to serve the markets for fresh fish products. At the present time fresh fish products account for a relatively small part of Alaska seafood production. The availability of airports capable of handling jet transports, the current underutilization of these airports, and the excess capacity in the air transport industry should allow a rapid response to increases in the demand for air transportation services.

Many factors will determine whether the transportation systems will be adequate for the expected growth in the commercial fishing industry. The growth of both the commercial fishing industry and other industries such as agriculture and mineral extraction and the resulting growth in the rest of the economy will generate increased economic activity that may compete for the available transportation services and/or provide the impetus for improved transportation services for all users. Since economies of scale exist in transportation, the latter effect will tend to dominate in the long run, and the short run transportation bottlenecks that occur will not tend to limit the long run development of the industry.

MARKET ARRANGEMENTS

Research at Oregon State University indicates that traditional market arrangements and the resulting distribution of risk between the harvester and processor may be a major deterrent to fishery growth in Alaska.[4]

In investing in the exploitation of a new fishery the boat owner retains a high degree of flexibility. He can switch from fishery to fishery in Alaska depending upon relative profitability. He can also fish in other geographic locations and deliver wherever he wants.

The processor, however, must make an investment in inflexible and fixed-in-place processing capability and in market development. The market development investment may be as risky as the capital facilities. If the market development effort succeeds, the initial investor must compete successfully with other entrants to reap the benefits of that initial investment. If the effort fails, the initial investor is the sole bearer of the total development cost.

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[4]Martin, John B. 1978. "An Evaluation of the Economic Feasibility of Pollock Processing in Southeast Alaska." MS Thesis, Oregon State University.

Fishery development in Alaska may, therefore, be constrained until market arrangements between harvester and processor are modified to more equally distribute the risks and benefits of investing in a new fishery. Delivery contracts between harvesters and processors provide one way of doing this.

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