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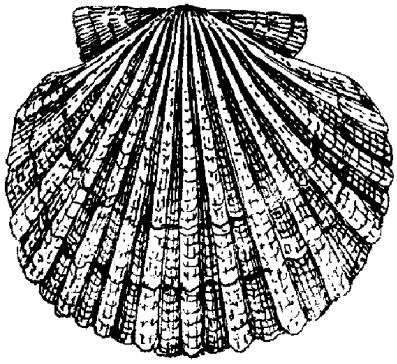
Fishery Management Plan for the Scallop Fishery Off Alaska



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September 13, 2004

Table of Contents

Executive Summary

This Fishery Management Plan (FMP) governs scallop fisheries in federal waters off the State of Alaska. The FMP management unit is the U.S. exclusive economic zone (EEZ) of the Bering Sea, Aleutian Islands, and the Gulf of Alaska, and includes weathervane scallops and other scallop species not currently exploited. The GOA is defined as the U.S. EEZ of the North Pacific Ocean, exclusive of the Bering Sea, between the eastern Aleutian Islands at 170°W longitude and Dixon Entrance at 132°40'W longitude. The BSAI is defined as the U.S. EEZ south of the Bering Strait to the Alaska Peninsula and Aleutian Islands and extending south of the Aleutian Islands west of 170° W long.

This FMP was approved on July 26, 1995, which established a 1 year interim closure of federal waters to scallop fishing to prevent uncontrolled fishing. This FMP has since been amended nine times. The scallop fishery is jointly managed by the National Marine Fisheries Service (NMFS) and the Alaska Department of Fish and Game (ADF&G) under this FMP.

Management measures in this FMP fall into two categories: Category 1 measures are those delegated to the State for implementation, while Category 2 measures are limited access management measures which are fixed in the FMP, implemented by Federal regulation, and require and FMP amendment to change. Category 1 and 2 measures are listed below.

This new version of the FMP has been revised to remove or update obsolete references to management measures, outdated catch information and other scientific information. The FMP has also been reorganized to provide readers with a clear understanding of the Scallop fishery and conservation and management measures promulgated by this FMP.

CATEGORY 1 (Delegated to the State)	CATEGORY 2 (Fixed in FMP, Implemented by Federal Regulation)
Guideline Harvest Levels	Vessel moratorium
Registration Areas, Districts, Subdistricts and Sections	License limitation program
Gear Limitations	
Crew and Efficiency Limits	
Fishing Seasons	
Observer Requirements	
Prohibited Species and Bycatch Limits	
Recordkeeping and Reporting Requirements	
In-season Adjustments	
Closed Areas	
Other	

Management measures used to manage the scallop fishery off Alaska by category.

1.0 Introduction

The scallop fishery in Alaska's Exclusive Economic Zone (EEZ; 3-200 miles offshore) is jointly managed by the state and federal government under the FMP. Most aspects of scallop fishery management are delegated to the State of Alaska, while limited access and other federal requirements are under jurisdiction of the federal government. The FMP was developed by the North Pacific Fishery Management Council under the Magnuson Stevens Act and approved by NMFS on July 26, 1995.

Although the FMP covers all scallop stocks off the coast of Alaska including weathervane scallops (*Patinopecten caurinus*), pink or reddish scallops (*Chlamys rubida*), spiny scallops (*Chlamys hastata*), and rock scallops (*Crassadoma gigantea*), the weathervane scallop is the only commercially exploited stock at this time. Commercial fishing for weathervane scallops occurs in the Gulf of Alaska, Bering Sea, and Aleutian Islands.

1.1 Amendments to the Fishery Management Plan:

The original FMP authorized an interim closure of Federal waters to fishing for scallops. The intent of the FMP was to prevent an unregulated and uncontrolled fishery for scallops while a Federal management regime was established to authorize and manage the fishery. Amendments 1 through 3 to the FMP established the specifics of the State-Federal management regime. Subsequent amendments to the FMP established a license limitation program, refined overfishing levels, designated EFH and AFA sideboard measures and modified aspects of the FMP to better manage the fishery.

Amendment 1: State-Federal Management Regime

Amendment 1 was approved by NMFS on July 10, 1996 (61 FR 38099). Amendment 1 established a joint State- Federal management regime under which NMFS implemented Federal scallop regulations that duplicated most State scallop regulations, including definitions of scallop registration areas and districts, scallop fishing seasons, closed waters, gear restrictions, efficiency limits, crab bycatch limits, scallop catch limits, in-season adjustments, and observer coverage requirements. This joint State-Federal management regime was designed as a temporary measure to prevent unregulated fishing in Federal waters until changes in the Magnuson-Stevens Act would enable the Council to delegate management of the fishery to the State. Federal and State waters were re-opened to fishing for scallops on August 1, 1996.

Amendment 2: Vessel Moratorium

Amendment 2 to the FMP, establishing a temporary moratorium on the entry of new vessels into the scallop fishery in Federal waters off Alaska was approved on April 11, 1997 (62 FR 17749). To qualify its owner for a moratorium permit, a vessel must have made a legal landing of scallops during 1991, 1992, or 1993, or during at least 4 separate years from 1980 through 1990. The moratorium was intended to remain in effect through June 30, 2000, or until replaced by a permanent limited access system. Eighteen vessel owners qualified for moratorium permits under the Federal vessel moratorium.

Amendment 3: Delegate Management Authority to the State

Amendment 3 delegated to the State the authority to manage all aspects of the scallop fishery in Federal waters, except limited access, including the authority to regulate vessels not registered under the laws of the State. The final rule implementing Amendment 3 was published on July 17, 1998 (63 FR 38501).

Amendment 3 simplified scallop management in the Federal waters off Alaska by eliminating the unnecessary duplication of regulations at the State and Federal levels.

Amendment 4: License Limitation Program

In December 1996, the Council initiated analysis of a license limitation program for the scallop fishery. An LLP was proposed to limit access to the fishery, because re-entry of latent capacity would adversely affect the economic viability of the current participants in the fishery.

The Council adopted an LLP, which limited the fishery to a total of 9 licenses. Only one license was issued for each qualifying vessel. Only those holders of moratorium permits who made legal landings of scallops from a vessel in two of the three years 1996, 1997, or 1998 received a license. Of the 9 licenses issued, 7 had no gear restrictions outside of Cook Inlet (except to comply with state regulations limiting dredge gear to no more than 2-15ft dredges) while 2 licenses were limited to the use of a single 6ft dredge. The Council further adopted several options from the analysis, including no area endorsements and restrictions and limits on vessel replacement size.

Amendment 5: Description and Identification of Essential Fish Habitat.

On April 26, 1999, NMFS approved Amendment 5 to the FMP which implemented the Essential Fish Habitat (EFH) provisions contains in the Magnuson-Stevens Fishery Conservation and Management Act and 50 CFR 600.815. Amendment 5 describes and identifies EFH fish habitat for scallops and describes and identifies fishing and non-fishing threats to scallop EFH, research needs, habitat areas of particular concern, and EFH conservation and enhancement recommendations.

Amendment 6: Established overfishing levels for weathervane scallops

Amendment 6 established an overfishing level for weathervane scallops as a fishing rate ($F_{overfishing}$) in excess of the natural mortality rate M = 0.13. An Optimum Yield range was specified as 0-1.24 million pounds of shucked scallop meats. The upper bound of this range is the established MSY for weathervane scallops, and is based upon the average catch from 1990-1997 (excluding 1995). This amendment also added additional information to the FMP on bycatch data collection.

Amendment 7: Habitat Areas of Particular Concern (HAPC)

This amendment number is a placeholder for forthcoming HAPC designations. This analysis is currently on-going and is expected to be completed with regulations promulgated for any applicable designations in 2006.

Amendment 8: Sideboard measures for AFA qualified vessels

Amendment 8 established sideboard measures for the AFA qualified vessels, whereby a limited amount of scallops could be taken by a vessels that was qualified as a Bering Sea pollock vessel under the American Fisheries Act.

Amendment 9: Description and Identification of Essential Fish Habitat

This amendment number is a placeholder for forthcoming revised Essential Fish Habitat designations. This analysis is currently on-going and is expected to be completed with regulations promulgated for any applicable designations in 2006.

Amendment 10: Modify License Limitation Program and Revise FMP
This amendment package is currently under Council review.

1.2 Foreign Fishing

Because scallops only have been harvested by U.S. vessels in the past, and effort remains high, it is likely that the OY can be fully harvested by U.S. vessels and fully processed by U.S. processors in future years. Hence, no considerations have been made to allow a foreign fishery on Alaskan scallops.

2.0 Management Policy and Objectives

2.1 National Standards for Fishery Conservation and Management

The Magnuson-Stevens Fishery Conservation and Management Act, as amended, sets out ten national standards for fishery conservation and management (16 U.S.C. § 1851), with which all fishery management plans must be consistent.

1. Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.
2. Conservation and management measures shall be based upon the best scientific information available.
3. To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.
4. Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be A) fair and equitable to all such fishermen; B) reasonably calculated to promote conservation; and C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.
5. Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.
6. Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.
7. Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.
8. Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to A) provide for the sustained

participation of such communities, and B) to the extent practicable, minimize adverse economic impacts on such communities.

9. Conservation and management measures shall, to the extent practicable, A) minimize bycatch and B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

10. Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

2.2 NPFMC Policy and Objectives

The objective of the FMP is to prevent localized overfishing of scallop stocks and protect the long term productivity of the resource to allow for the achievement of optimum yield on a continuing basis. This objective is based on the premise that uncontrolled fishing for scallops in Federal waters could result in irreversible damage to the resource's ability to recover in a reasonable period of time. Fishing on a stock at a level that severely compromises that stock's future productivity is counter to the goals of the Magnuson Act and seriously jeopardizes the opportunity to harvest optimum yield on a continuing basis under a future management regime that would authorize a regulated fishery for scallops in Federal waters. Conservative management of the scallop resource is warranted given (1) unprecedented activity of vessels fishing for scallops in Federal waters outside the jurisdiction of Alaska State regulations, (2) the harvesting and processing capacity of the scallop fleet, which, if allowed to fish unregulated in Federal waters, could exceed State harvest guidelines by several orders of magnitude, (3) inadequate data on stock status and biology, and (4) the vulnerability of the scallop resource to localized depletion.

The Council, in cooperation with the State, is committed to developing a long-range plan for managing the scallop fishery that will promote a stable regulatory environment for the seafood industry and maintain the health of the resources and environment. The management system conforms to the Magnuson-Stevens Act's national standards as listed in Section 2.1.

2.2.1 Management Goal

The management goal is to maximize the overall long-term benefit to the nation of scallop stocks by coordinated Federal and State management, consistent with responsible stewardship for conservation of the scallop resource and its habitats.

2.2.2 Management Objectives

Within the scope of the management goal, seven specific objectives have been identified. These relate to stock condition, economic and social objectives of the fishery, gear conflicts, habitat, weather and ocean conditions affecting safe access to the fishery, access of all interested parties to the process of revising this FMP and any implementing regulations, and necessary research and management. Each of these objectives requires relevant management measures. Several management measures may contribute to more than one objective, and several objectives may mesh in any given management decision on a case-by-case basis.

1- Biological Conservation Objective: Ensure the long-term reproductive viability of scallop populations.

To ensure the continued reproductive viability of each scallop population through protection of reproductive potential, management must prevent overfishing. Management measures also may be adopted to address

other biological concerns such as restricting harvest of scallops during spawning periods and maintaining low bycatch of finfish and crab. The maintenance of adequate reproductive potential in each scallop stock will take precedence over economic and social considerations.

2- Economic and Social Objective: Maximize economic and social benefits to the nation over time.

Economic benefits are broadly defined to include, but are not limited to: profits, income, employment, benefits to consumers, and less tangible or less quantifiable social benefits such as the economic stability of coastal communities. To ensure that economic and social benefits derived for fisheries covered by this FMP are maximized over time, the following will be examined in the selection of management measures:

1. The value of scallops harvested during the season for which management measures are considered,

2. The future value of scallop stocks,

3. Economic impacts on coastal communities.

This examination will be accomplished by considering, to the extent that data allow, the impact of management alternatives on the size of the catch during the current and future seasons and their associated prices, harvesting costs, processing costs, employment, the distribution of benefits among members of the harvesting, processing and consumer communities, management costs, and other factors affecting the ability to maximize the economic and social benefits as defined in this section.

Social benefits are tied to economic stability and impacts of commercial fishing associated with coastal communities. While social benefits can be difficult to quantify, economic indices may serve as proxy measures of the social benefits which accrue from commercial fishing. In 1984, 7 percent of total personal income or 27 percent of total personal income in the private sector in Alaska was derived from commercial fishing industries. On a statewide basis, shellfish accounted for 21 percent of the total exvessel value of commercial fish harvested in Alaska in 1984, however, the bulk of shellfish harvests were king and Tanner crab.

3- Gear Conflict Objective: Minimize gear conflict among fisheries.

Management measures developed for the scallop fisheries will take into account the interaction of those fisheries, and the people engaged in them, with other fisheries. To minimize gear conflict among fisheries, the compatibility of different types of fishing gear and activities on the same fishing grounds should be considered. Scallop fisheries are conducted with dredge gear. Many other fisheries in the fishery management unit are conducted with fixed gear (pot and hook-and-line). Fishing seasons, gear storage, and fishing areas may be arranged to eliminate, insofar as possible, conflicts between gear types and preemption of fishing grounds by one form of gear over another.

4- Habitat Objective: To protect, conserve, and enhance adequate quantities of EFH to support a fish population and maintain a healthy ecosystem

Habitat is defined as the physical, chemical, geological, and biological surroundings the support healthy, self-sustaining populations of living marine resources. Habitat includes both the physical component of the

environment which attracts living marine resources (e.g. salt marshes, sea grass beds, coral reefs, intertidal lagoons, and near shore characteristics) and the chemical (e.g. salinity, benthic community) and biological characteristics (e.g. marine and salmonid life stage histories, oceanography) that are necessary to support living marine resources. The quality and availability of habitat supporting the scallop populations are important. Fishery managers should strive to ensure that those waters and substrate necessary to scallops for spawning, breeding, feeding, or growth to maturity are available. It is also important to consider the potential impact of scallop fisheries on other fish and shellfish populations. The essential fish habitat of Alaskan scallops, and the potential effects of changes in that EFH on the fishery, are described in sections 4.2.2 through 4.2.4 of this FMP.

Those involved in both management and exploitation of scallop resources will actively review actions by other human users of the management area to ensure that their actions do not cause deterioration of habitat. Any action by a State or Federal agency potentially affecting scallop habitat in an adverse manner may be reviewed by the Council for possible action under the Magnuson-Stevens Act. The Council will also consider the effect on scallop habitat of its own management decisions in other fisheries.

5- Vessel Safety Objective: Provide public access to the regulatory process for vessel safety considerations.

Upon request, and when appropriate, the Council and the State shall consider, and may provide for, temporary adjustments, after consultation with the Coast Guard and persons utilizing the fishery, regarding access to the fishery for vessels otherwise prevented from harvesting because of weather or other ocean conditions affecting the safety of vessels.

6- Due Process Objective: Ensure that access to the regulatory process and opportunity for redress are available to all interested parties.

In order to attain the maximum benefit to the nation, the interrelated biological, economic and social, habitat, and vessel safety objectives outlined above must be balanced against one another. A continuing dialogue between fishery managers, fishery scientists, fishermen, processors, consumers, and other interested parties is necessary to keep this balance. Insofar as is practical, management meetings will be scheduled around fishing seasons and in places where they can be attended by fishermen, processors, or other interested parties.

Access to the FMP development and regulatory process is available through membership in a Council work group, testimony on the record before the Council's Advisory Panel or SSC, or before the Council itself, testimony before the Board, conversations with members of the plan team or officials of regulatory agencies, and by commenting on the FMP, any subsequent amendments and any regulations proposed for their implementation.

This FMP defers much of day-to-day scallop management to the State. Means of access to the regulatory process at the State level and of redress of perceived wrongs by the State are necessary.

7- Research and Management Objective: Provide fisheries research, data collection, and analysis to ensure a sound information base for management decisions.

Necessary data must be collected and analyzed in order to measure progress relative to other objectives and to ensure that management actions are adjusted to reflect new knowledge. Achieving the objective will

require new and ongoing research and analysis relative to stock conditions, dynamic feedback to market conditions, and adaptive management strategies.

An annual area management report discussing current biological and economic status of the fisheries, guideline harvest ranges, and support for different management decisions or changes in harvest strategies will be prepared by the State (ADF&G lead agency), with NMFS and scallop plan team input when appropriate. Such information will be made available to the public.

The management program authorized under this FMP conforms to the Magnuson Act's national standards as listed in section 2.1. Under this FMP, the prevention of overfishing of the Alaska scallop stocks and the maintenance of adequate reproductive potential for the scallop resource takes precedence over other economic, social, management and research considerations.

2.3 Procedures for FMP Implementation (Federal/State)

A primary objective of the FMP is to establish and maintain consistent management efforts at the State and Federal levels. To the extent practicable, NMFS will coordinate with ADF&G to maintain uniform management measures throughout the EEZ that are consistent with the objectives of the FMP and the Magnuson Act. Nothing in this FMP is intended to preempt State of Alaska scallop regulations set out under Chapter 38 of the Alaska Administrative Code for vessels fishing for scallops in Federal waters off Alaska which are registered under the laws of the State.

The Secretary (through the Council and NMFS) and the State of Alaska have established the following protocol which describes the roles of the Federal and State governments in managing the scallop fishery off Alaska.

1. The Council will maintain the FMP (and develop future amendments) to govern management of the scallop fisheries in Federal waters off Alaska. The FMP prescribes objectives and any management measures found by the Secretary to be necessary for effective management. The State will promulgate regulations applicable to all vessels fishing for scallops in Federal waters that are consistent with the FMP, Magnuson-Stevens Act, and other applicable Federal law. The FMP contains two categories of management measures: (1) General management measures delegated to the State for implementation that may be freely adopted or modified by the State, subject to other Federal law, and (2) Limited access management measures that are fixed in the FMP, implemented by Federal regulation, and require an FMP amendment to change.

2. If at any time the Secretary determines that a State law or regulation applicable to a vessel fishing for scallops in Federal waters is not consistent with the FMP, the Secretary shall promptly notify the State and the Council of such determination and provide an opportunity for the State to correct any inconsistencies identified in the notification. If, after notice and opportunity for corrective action, the State does not correct the inconsistencies identified by the Secretary, the delegating of authority granted to the State under this FMP shall not apply until the Secretary and the Council find that the State has corrected the inconsistencies.

3. ADF&G will have responsibility for developing the information upon which to base State fishing regulations, with continued assistance from NMFS. In carrying out this responsibility, ADF&G will consult actively with the NMFS (Alaska Regional Office and Alaska Fisheries Science Center), NOAA General Counsel, the plan team, and other fishery management or research agencies in order

to prevent duplication of effort and assure consistency with the Magnuson-Stevens Act, the FMP, and other applicable Federal law.

4. An annual area management report discussing current biological and economic status of the fisheries, guideline harvest ranges, and support for different management decisions or changes in harvest strategies will be prepared by the State (ADF&G lead agency), with NMFS and scallop plan team input incorporated as appropriate. This report will be available for public review.

5. Federal enforcement agents (NOAA) and the U.S. Coast Guard (DOT) shall work in cooperation with the State to enforce scallop fishing regulations in the EEZ off Alaska.

3.0 Conservation and Fishery Management Measures

3.1 Areas and Stocks Involved

3.1.1 Geographic description of the management area

The management areas covered under the FMP includes all Federal waters of the Gulf of Alaska (GOA) and the Bering Sea/Aleutian Islands area (BSAI). The GOA is defined as the U.S. exclusive economic zone (EEZ) of the North Pacific Ocean, exclusive of the Bering Sea, between the eastern Aleutian Islands at 170°W longitude and Dixon Entrance at 132°40'W longitude. The BSAI is defined as the U.S. EEZ south of the Bering Strait to the Alaska Peninsula and Aleutian Islands and extending south of the Aleutian Islands west of 170° W long.

3.1.2 Registration Areas, District, Subdistrict, and Section Boundaries

This FMP adopts existing State registration areas. The management unit historically has been divided by the State into nine scallop registration areas composed of the Federal waters and adjacent State waters described in each area (Appendix B). Registration areas may be further divided into fishing districts, subdistricts, and sections for purposes of management. For the purpose of scallop management, the State has divided the Yakutat, Cook Inlet, and Kodiak Registration Areas into districts.

Registration areas are characterized by relatively homogeneous established fisheries on scallop stocks. State regulations require vessels to register for fishing in these areas, and may require vessels to register for specific fishing districts within a registration area. Registration requirements allow estimation of fishing effort and the rate at which the resource will be harvested. Existing Registration Areas and districts are defined in Appendix B.

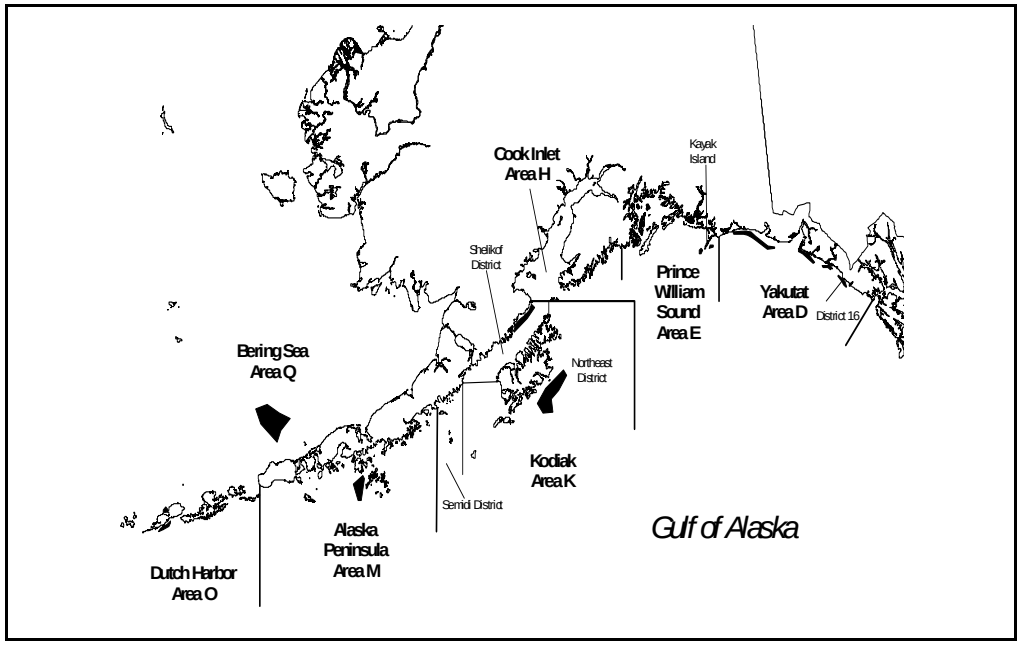

Figure 1: Map showing registration areas and general fishing locations (dark polygons) for weathervane scallops off Alaska.

3.1.3 Physical characteristics of the management area

The continental shelf parallels the southeastern Alaska coast and extends around the GOA. Total area of continental shelf in the GOA is about 160,000 square km, which is more than the shelf area in the Washington-California region but less than 25 percent of the eastern Bering Sea Shelf. Between Canada and Cape Spencer the Continental Shelf is narrow and rough. North and west of Cape Spencer it is broader. Although its width is less than 10 miles at some points, it is generally 30 to 60 miles wide. As it curves westerly from Cape Spencer towards Kodiak Island it extends some 50 miles seaward, making it the most extensive shelf area south of the Bering Sea. West of Kodiak Island and proceeding along the Alaska Peninsula toward the Aleutian Islands, the shelf gradually becomes narrow and rough again. More detailed information on the Alaskan shelf can be found in Sharma (1979).

Coastal waters overlying the continental shelf are subject to considerable seasonal influences. Winter cooling accompanied by turbulence and mixing due to major storms results in a uniform cold temperature in the upper 100 m. Seasonal changes in temperature and salinity diminish with increasing depth and distance from shore. Along the outer shelf and upper slope, bottom water temperatures of 4 to 5° C persist year-round throughout the periphery of the GOA. With further increase in depth, water temperature shows no significant seasonal change but gradually decreases with depth, reaching 2° C or less at greater depths. The water circulation pattern in both the eastern Bering Sea and Gulf of Alaska is a counterclockwise gyre (Sharma 1979). Inshore current flow patterns are affected by weather, tides, and topography.

All commercial fisheries for Alaskan scallops take place in relatively shallow waters (< 200 m) of the continental shelf. Weathervane scallops are found at depths ranging from intertidal waters to depths of 300 m (Foster 1991), but abundance tends to be greatest between depths of 45-130 m on substrates consisting of mud, clay, sand, or gravel (Hennick 1973). Although weathervane scallops are widely distributed along the shelf, the highest densities in Alaska have been found to occur in discrete areas. Areas fished during the 1993 scallop fishery included beds in the Bering Sea, off the Alaska Peninsula, in Shelikof Strait, on the east side of Kodiak Island, and along the Gulf coast from Yakutat to Kayak Island (Figure 1).

3.1.4 Stocks

This FMP covers all scallop stocks off the coast of Alaska including weathervane scallops (*Patinopecten caurinus*), pink or reddish scallops (*Chlmys rubida*), spiny scallops (*Chlamys hastata*), and rock scallops (*Crassadoma gigantea*). However, the weathervane scallop is the only commercially exploited scallop in Alaskan waters at this time.

3.2 Determination of Harvest Levels

3.2.1 Optimum Yield and Overfishing

According to the Magnuson-Stevens Act, a fishery management plan for scallops must specify an optimum yield (OY) for the scallop fishery. The OY for a fishery means the amount of fish which will provide the greatest overall benefit to the nation, with particular reference to food production and recreational activities. The OY is specified on the basis of the maximum sustainable yield from the fishery, as modified by any relevant economic, social, or ecological factors. The national standard 1 guidelines (50 CFR 600.310) state that the most important limitation on the specification of OY is that the choice of OY, and the conservation and management measures proposed to achieve it, must prevent overfishing. If a stock or stock complex becomes overfished, OY provides for rebuilding to the MSY level.

Overfishing is a level of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis. The definition of overfishing for a stock or stock complex may be expressed in terms of maximum level of fishing mortality or minimum stock size threshold. Overfishing must be defined in a way to enable the Council and the Secretary to monitor and evaluate the condition of the stock or stock complex relative to the definition. Overfishing definitions must be based on the best scientific information available and reflect appropriate consideration of risk. Risk assessments should take into account uncertainties in estimating harvest levels, stock conditions, or the effects of environmental factors.

3.2.1.1 Assessment of the available scientific data

The State of Alaska's draft fishery management plan for scallops (Kruse, 1994) presents a succinct summary of the best scientific data available on Alaska scallop life history traits and other biological parameters that should be considered in assessing an appropriate concept of MSY, OY, and overfishing for the scallop fishery. Pertinent portions of the State's management plan addressing current management concerns about recruitment overfishing and sustainable yield are incorporated in this FMP and are repeated below as follows:

Recruitment Overfishing

Definition. It is widely accepted that fishery harvest levels should be prescribed in ways to prevent "recruitment overfishing"--the condition that occurs when stocks are reduced to levels too low to produce adequate numbers of young scallops--the future recruits to the fishery (Gulland 1983). Recruitment is a prerequisite for maintenance of a viable population, and is needed for sustainable harvests that support long-term economic benefits from the fishery.

Worldwide History of Scallop Overfishing. Although there are a number of cases of scallop fisheries that have been sustainable over long time periods....overfishing has occurred in many, if not most, scallop fisheries worldwide...Stock recovery has been either slow or non-existent. Attempts to develop aquaculture in many countries ... are largely attributable to the collapse of natural populations [Kruse (1994) provides examples of numerous cases of scallop overfishing that are not repeated here]. . .

Implications of Stock Structure. Prevention of overfishing requires knowledge about a species stock structure and the biological productivity of each stock. For species with populations that are well-connected by extensive larval drift, risk of overfishing is relatively low at least on an area-specific level. In such cases, local depletions can be replenished by settlement of larvae carried by ocean currents from spawning stocks located elsewhere. However, as described in section [1.3.4], a growing body of evidence indicates that many benthic invertebrates, such as scallops, exist as a number of discrete, self-sustaining populations. To prevent overfishing for species with such a population structure, it is necessary to manage each stock separately (Caddy 1989; Fevolden 1989; Sinclair et al. 1985.)

Unfortunately, the stock structure of weathervane scallops in Alaska is not well understood. Studies of genetic structure and comparative population characteristics (e.g., growth rate, gonadal somatic index) are needed to resolve uncertainties. In the absence of such information, a reasonable and conservative approach is to assume that each major fishing area compromises a separate stock (Caddy 1989; Sinclair et al. 1985). However, even with this approach, the possibility exists that multiple self-sustaining populations exist within a fishing area. For example, the apparent existence of separate self-sustaining populations of sea scallops on the Northern Edge and Northeast Peak of Georges Bank (Tremblay and Sinclair 1992; McGarvey et al.

1993) is somewhat unexpected given ocean currents and proximity of these areas to other scallop fishing grounds on Georges Bank.

Importance of Spawning Stock Biomass. Even after scallop stocks have been defined, overfishing will occur unless fishing mortality is limited to a level commensurate with the productivity of each stock based on life history and other biological characteristics. Worldwide, scallop populations are characterized by recruitment variability....Often, scallop populations are dominated by a few strong year classes that are separated by long periods of poor recruitment... Potential stock-recruitment relationships have not been well studied for scallops. A recent study by McGarvey et al. (1993) provides a rare example with good evidence of a relationship between spawning stock (total egg production) and recruitment for sea scallops on Georges Bank. In that instance, higher egg production was directly related to higher recruitment.

[Conversely], it is commonly assumed that scallop recruitment is linked to environmental conditions (Hanock 1973)... However, even when recruitment of a marine species is primarily driven by environmental effects, it is commonly held that parental spawning biomass affects recruitment, at least at low population sizes...Recently, Peterson and Summerson (1992) showed that the bay scallop (Argopecten irradians concentricus) was recruitment limited due to reduced abundance of adults caused by a red tide (Ptychodiscus brevis) outbreak. In relating their findings to fishery management, the authors noted that a common assumption of shellfish fisheries management was that fishing pressure on adults will not adversely affect subsequent recruitment. Peterson and Summerson (1992) concluded that this assumption was unjustified.

Sustainable Yield

Ideally, an appropriate harvest rate is developed from yield models based on a species' life history traits and other biological parameters. Then, annual catches are specified by applying these harvest rates to annual biomass estimates derived from stock assessment surveys. Unfortunately, limited information on biological productivity is available for weathervane scallops to promote the conservation of stocks and sustained yields of the fishery. Biomass estimates are unavailable and yield models have not been developed.

In Alaska, most available information was collected during the early years of the fishery (Haynes and Powell 1968; Hennick 1970b, 1973), although it has been summarized more recently by Kaiser (1986). In the early 1950's the Bureau of Commercial Fisheries began systematic surveys to determine whether commercial quantities were available. The only assessment survey since 1972 was conducted in 1984 in lower Cook Inlet (Hammarstrom and Merritt 1985). Likewise, until the implementation of [the State's] onboard observer program in 1993, there have been no routine biological or fishery sampling programs conducted on weathervane scallops in Alaska.

Implications of Natural Mortality Rate. Natural mortality is one of the biological reference points commonly used in fisheries management to establish appropriate exploitation rates (Clark 1991). As discussed in section [1.3.3], the longevity (28 years) of weathervane scallops in Alaska implies that this species experiences a very low natural mortality rate (M = 0.13 percent annual mortality). The biological reference point, obtained by setting instantaneous fishing mortality (F) equal to M, implies that scallop harvest rates should not exceed 13 percent annually on any given stock. Unfortunately, other potentially useful benchmarks that would bear on the choice of appropriate exploitation rates for weathervane scallops are not presently available.

The biological reference point, F=M=0.13, implies that weathervane scallop stocks are at greater risk of overfishing than red king crab (Paralithodes camtschaticus) and Tanner crab (Chionoecetes bairdi) for which

M=0.2 and M=0.3, respectively (NPFMC 1998). Also, unlike many crab stocks off Alaska, stock assessments of weathervane scallop biomass have not been made. Given these two observations, maintenance of healthy weathervane scallop stocks poses a serious challenge to fishery managers.

Implications of Natural Mortality Rate. Natural mortality is one of the biological reference points commonly used in fisheries management to establish appropriate exploitation rates (Clark 1991). As discussed in section [1.3.3], the longevity (28 years) of weathervane scallops in Alaska implies that this species experiences a very low natural mortality rate (M approximates 0.16 or 15 percent annual mortality). The biological reference point, obtained by setting instantaneous fishing mortality (F) equal to M, implies that scallop harvest rates should not exceed 15 percent annually on any given stock. Unfortunately, other potentially useful benchmarks that would bear on the choice of appropriate exploitation rates for weathervane scallops are not presently available. A study of alternatives in is progress [by the ADF&G].

The biological reference point, F=M=0.16, implies that weathervane scallop stocks are at greater risk of overfishing than red king crab (Paralithodes camtschaticus) and Tanner crab (Chionoecetes bairdi) for which an M=0.3 has been estimated (NPFMC 1990). Also, unlike many crab stocks [off Alaska], there are not stock assessments of weathervane scallop biomass. Given these two observations, maintenance of healthy weathervane scallop stocks poses a serious challenge to fishery managers.

Implications of Recruitment Variability. Large annual fluctuations in recruitment, typical of scallop populations, have management implications. Weathervane scallops spawn annually after reaching maturity at age 3 or 4. This feature of multiple spawning (termed *iteroparity*) is likely to be an evolutionary response to environmentally-induced recruitment variations (Murphy 1968). Iteroparous species, with highly variable recruitment, are particularly vulnerable to overfishing when high levels of harvest create a recruit-only fishery.

Murphy (1967) simulated the effects of fishing on Pacific sardine (Sarinops sagax) age structure so that the population approached a single reproducing age class. Compared to an unfished populations with a protracted age structure, abundance of the fished population was much lower and more variable. The fished population recovered slowly even when fishing was terminated and it had a higher probability of extinction than the unfished population.

These results led Murphy (1967) to assert the need to maintain age structure in populations with long life spans that experience environmentally-driven recruitment. This same advice was advanced by Leaman (1991) for the long-lived rockfishes (Sebastes). By comparison of longevity with other scallop species (Orensanz et al. 1991), weathervane scallops, with a maximum age of 28 (Hennick 1973), may be the longest-lived scallop species in the world. That is, the advice of Murphy (1967, 1968) and Leaman (1991) is apropos.

Sustainability of Weathervane Scallop Harvests. Changes in the Alaskan scallop fishery through 1992 raised concerns that harvests may not be sustainable on a local or regional level for several reasons. First, recent landings were 2-3 times higher than the long-term average harvest taken over a 20-year period during the 1970s and 1980s. In fact, these harvests are at levels comparable to those taken in the late 1960s and early 1970s which proved not to be sustainable by the fishery. Reduced scallop abundance was at least partly responsible for the fishery collapse in the 1970s. Second, high harvests since 1990 were at least partly attributable to shifts in fishing effort to new scallop beds. Third, during 1992 limited inseason catch reports from some areas indicated that small scallops were constituting an increased portion of landings as had occurred prior to the fishery decline in the mid-1970s. Last, misreporting was suspected. If misreporting

was widespread, it would seriously compromise the data base of historical catches upon which assessments of sustainable harvests are based.

3.2.1.2 Specification of OY and Overfishing

The following definitions are based on the national standard 1 guidelines (50 CFR 600.310).

Maximum Sustainable Yield (MSY). MSY is the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions. The long-term average stock size obtained by fishing year after year at this rate under average recruitment may be a reasonable proxy for the MSY stock size, and the long-term average catch so obtained may be a reasonable proxy for MSY

MSY for weathervane scallops is 1.24 million lbs. (562.46 metric tons) of shucked adductor muscles. MSY was estimated based on the average catch from 1990-1997, (1995 data not included as fishery was closed most of the year), which was 1,240,000 lbs. (562.46 metric tons) of shucked meats. The time period from 1990 to 1997 reflects prevailing ecological conditions. The fishery was fully capitalized during this time period, and all areas of the state were where scallops could be harvested were being exploited. Prior to that time period, vessels moved into and out of the scallop fishery, in part in response to economic opportunities available in other fisheries (Shirley and Kruse, 1995). However, since 1993, the fishery has been somewhat limited by crab bycatch limits, closure areas, and season length. As a consequence, a stable period during the history of this fishery does not exist. MSY estimation by averaging catches is problematic, however, a better solution does not exist at this point.

MSY Control Rule (F_{msy}). The MSY control rule is a harvest strategy which, if implemented, would be expected to result in a long-term average catch approximating MSY. The MSY control rule establishes a maximum fishing mortality threshold (MFMT), which may be expressed either as a single number or as a function of spawning biomass or other measure of productive capacity. The MFMT is set at the fishing mortality rate or level associated with the relevant MSY control rule. Exceeding the MFMT for a period of 1 year or more constitutes overfishing

In choosing an MSY control rule, Councils should be guided by the characteristics of the fishery, the FMP's objectives, and the best scientific information available. In any MSY control rule, a given stock size is associated with a given level of fishing mortality and a given level of potential harvest, where the long-term average of these potential harvests provides an estimate of MSY. The MSY control rule is based on natural mortality, using the estimate of M = 0.13, the MSY control rule F_{msy} equals M, or $F_{msy} = 0.13$. No control rule for spiny, pink, or rock scallops is recommended at this time.

MSY Stock Size (B_{msy}). The MSY stock size is the long term average size of the stock or stock complex, measured in terms of spawning biomass or other appropriate units, associated with the production of MSY. It is the stock size that would be achieved under an appropriate MSY control rule. It is also the minimum standard for a rebuilding target when remedial management action is required.

As noted earlier, MSY for weathervane scallops is established at 1.24 million lbs. (562.46 mt) of shucked adductor muscles. Therefore, MSY stock size is estimated as MSY/M = 9.54 million lbs. (4,326.6 mt) of shucked meat biomass. In terms of whole animals (including shells and gurry) B_{msy} would be 95.4 million lbs. (43,273 mt), as expanded by a product recovery rate of 10%. This assumes that the stock was at B_{msy} and that catches were at MSY during 1990-1997, and that the logistic equation holds.

Minimum Stock Size Threshold (MSST). The minimum stock size threshold (MSST), to the extent possible, should equal whichever is greater: one half the MSY stock size, or the minimum stock size at which rebuilding to the MSY level would be expected to occur within 10 years if the stock or stock complex were exploited at the maximum fishing mortality threshold. Should the actual size of the stock or stock complex in a given year fall below MSST, the stock or stock complex is considered overfished. The MSST should be expressed in terms of spawning biomass or other measure of reproductive capacity. Based on the national standard guidelines, a MSST for weathervane scallops is established based on ½ MSY stock size = $½B_{msy}$ = 4.77 million lbs. (2,163.7 mt) of shucked adductor muscles.

Overfishing Control Rule ($F_{overfishing}$). The national standard guidelines define the terms "overfishing" and "overfished" to mean a rate or level of fishing mortality that jeopardizes the capacity of a fishery to produce MSY on a continuing basis. Overfishing is established for weathervane scallop stocks as a fishing rate in excess of the natural mortality rate. Hence, $F_{overfishing} = M = 0.13$.

Optimum Yield (OY). Optimum yield should be established on the basis of MSY. OY is upper bounded by $MSY = F_{msy} B_{msy} = M B_{msy}$ (= 1,240,000 lbs or 562.46 mt.). Hence, a numerical range for OY of 0-1,240,000 lbs. (562.46 mt) can thus be established for Alaska weathervane scallops. Because MSY cannot be estimated for the other scallop species, OY cannot be quantified for rock scallops, pink scallops, or spiny scallops.

Sufficient conservatism is built into establishing an annual OY cap of 1.24 million lbs. (562.46 mt) for the following reasons:

1. the years of averaging include years when no fishing occurred in the Bering Sea, but obviously some sustainable harvest was possible;
2. the period of averaging includes other areas and years when the harvest was constrained by fishery controls, such as recently by bycatch PSCs, and therefore the resulting catch underestimates the productivity of scallop stocks;
3. substantial areas are closed to scallop dredging due to concerns about bycatch, yet these areas have substantial productivity;
4. closed areas can almost be thought of as marine refuges and potential yields from these areas are not factored into MSY estimates;
5. there are years during the history of the fishery when effort was low due to market (not abundance) conditions;
6. $F_{30\%}$ is probably a better estimator of $F_{overfishing}$ than is F=M, yet $M<F_{30\%}$ so the overfishing rule is conservative; and
7. In years of good recruitment, the stocks are likely greater than B_{msy}, thus we will fish at $F<F_{overfishing}$ to achieve OY=MSY (recall $MSY = F_{msy} B_{msy}$, so if $B>B_{msy}$, then $F<F_{msy}$).

In the future, better quantitative estimates of appropriate scallop yields by area may be generated based on observer data analysis. Additional information on biomass and long-term potential yield of pink, spiny and rock scallops also may be available in the future. At such time, MSY and OY would be re-estimated and the FMP amended.

3.3 Management Measures

Two categories of management measures are described in the FMP (Table 1): Category 1 measures are general management measures delegated to the State for implementation. These measures may be freely adopted or modified by the State, subject to other Federal law. Category 2 measures are limited access management measures that are fixed in the FMP, implemented by Federal regulation and require an FMP amendment to change.

The following description of management measures is not intended to limit the State government to only these measures. However, implementation of other management measures not described in the FMP must be consistent with the FMP, the Magnuson-Stevens Act, and other applicable Federal law. Although specific strategies for attainment of objectives in the FMP are not described, management measures described in this chapter are all derived to attain one or more of those objectives.

CATEGORY 1 (Delegated to the State)	CATEGORY 2 (Fixed in FMP, Implemented by Federal Regulation)
Guideline Harvest Levels	Vessel moratorium
Registration Areas, Districts, Subdistricts and Sections	License limitation program
Gear Limitations	
Crew and Efficiency Limits	
Fishing Seasons	
Observer Requirements	
Prohibited Species and Bycatch Limits	
Recordkeeping and Reporting Requirements	
In-season Adjustments	
Closed Areas	
Other	

Management measures used to manage the scallop fishery off Alaska by category.

3.3.1 Category 1: Management Measures Delegated to the State

The following Category 1 management measures are measures which are delegated to the State for implementation.

3.3.1.1 Setting harvest limits

In areas of Alaska where the scallop fishery has traditionally occurred, ADF&G has established annual guideline harvest ranges (GHRs) which are equivalent to total allowable catch (TAC) amounts. These areas include all or parts of Scallop Registration Areas A (Southeast), D (Yakutat), E (Prince William Sound), H (Cook Inlet), K (Kodiak) and O (Dutch Harbor). In areas where crab bycatch is of concern, ADF&G has also established bycatch limits for red king crab and Tanner crab species. These areas include all or parts of Scallop Registration Areas K (Kodiak), M (Alaska Peninsula), O (Dutch Harbor), Q (Bering Sea) and R

(Adak). In areas where an adequate historic scallop catch record does not exist (areas M, Q and R) ADF&G has not established GHRs and has managed the fishery on the basis of crab bycatch limits alone.

The FMP authorizes the State to set preseason GHRs under State regulations. The term GHL corresponds closely to the term total allowable catch (TAC) used in the groundfish FMPs for the Bering Sea and Aleutian Islands Management Area and the Gulf of Alaska, although GHL is often expressed as a range and TAC is not. A range of harvest levels allows the State to make in-season management decisions based on current data obtained from the fishery. Seasons or areas may be closed when the GHR is reached, or earlier or later based on current in-season information. GHR is used in this FMP in lieu of TAC because the State has used this term and it corresponds with the State's current management program. The sum of all upper ranges of the GHRs for scallops crab must fall within the OY ranges established in this FMP.

The GHR is the result of a process which includes the examination of the effects of different harvesting strategies on the seven objectives of management listed previously in this FMP. While harvest strategies will be evaluated relative to all seven of these objectives, GHRs will most frequently be used as a management measure to achieve only the first two objectives. For this reason, the GHR is primarily composed of two interrelated components: a biological component and a socioeconomic component.

In overview, the biological component, acceptable biological catch (ABC), is set to achieve the biological conservation objective of preventing overfishing. Because the maintenance of adequate reproductive potential takes precedence over economic and social considerations, the ABC serves as an upper bound constraint on harvest. A target harvest level is then chosen within ABC to maximize the anticipated discounted benefits to the fishery over the long term. These benefits include: profits, personal income, employment, benefits to consumers, and less tangible or less quantifiable social benefits such as the economic stability of coastal communities. The GHR range represents a confidence interval around the proposed harvest level reflecting the uncertainty in stock status and the uncertainty in estimates of socioeconomic benefits. Ideally, bioeconomic analysis such as Matulich, et al. (1987a, b, c) should be used to determine the GHR. However, such modeling efforts are relatively new and complex; in the future they should be employed along with more conventional means of determining the GHR.

Regardless of the specific approach, the process of determining a GHR which prevents overfishing and maximizes socioeconomic benefits includes the routine collection and analysis of biological, economic, social, and other data. Scallop resources in various registration areas off Alaska vary in the level of scientific information available for management. Consequently, exact procedures for determining appropriate ABCs and GHRs vary due to differences in the quality and quantity of resource data bases.

As discussed within the Research and Management Objective, an annual area management report will be prepared which describes the determination of GHRs and ABCs for all types of stocks using the best available information. The GHRs contained in this report will be updated when new information is available. This information will be made available to the public.

NMFS and the Council will, to the extent possible, coordinate with ADF&G in the establishment of TAC amounts and crab bycatch limits (CBLs) that are consistent with current State harvest limits. TAC amounts and CBLs will apply to both the Federal and State waters within each scallop registration area so that the fishery in each registration area is managed as a unit throughout its range. The following procedure has been established for setting annual harvest levels:

1. The State of Alaska, at the March Board of Fish meeting, will, after notice and opportunity for public testimony and comment, propose scallop TAC amounts and CBLs for review by the Council.

2. After the March Board of Fish meeting, the Council will distribute a summary of the preliminary recommendations and their basis to the public through its mailing list, as well as provide copies of the information at the Council office and to the public upon request. The Council will notify the public of its intent to develop final recommendations at the next Council meeting (usually April) and solicit public comment both before and during its next meeting.

3. Following the April Council meeting, the Council will submit its TAC and CBL recommendations along with the rationale and supporting information to NMFS for review and implementation.

4. As soon as practicable after receiving recommendations from the Council, NMFS will publish in the Federal Register annual specifications of TAC amounts and CBLs for the succeeding 12-month period extending from July 1 through June 30 of the following year.

This FMP authorizes the commercial harvest of scallops species listed in Chapter 3.1 of this plan. It is prohibited for a person to take or retain scallops in any registration area unless the season for that species within those waters is open. It is prohibited for a person to possess, purchase, barter, sell, or transport scallops if that person knows or has reason to know that such shellfish were taken or possessed in contravention of this FMP.

3.3.1.1.2 Total allowable catch (TAC)

Annual scallop TAC amounts will be specified by registration area for the time period extending from July 1 through June 30 of the following year.

3.3.1.1.2.1 Registration Areas A, D, E, H, K and O

The annual TAC amounts specified for scallops in registration areas A, D, E, H, K, and O shall be established as a weight in pounds of shucked scallop meats based on a review of the following:

1. Assessments of the biological condition of each scallop species. Assessment will include, where practicable, updated estimates of MSY and ABC; historical catch trends and current catch statistics, assessments of alternative harvesting strategies; and relevant information relating to changes in scallop markets.

2. Socioeconomic considerations that are consistent with the goals and objectives of the FMP.

3.3.1.1.2.2 Registration Areas M, R, and Q

The annual TAC amounts of scallops in Registration Areas M, R, and Q shall be equal to the weight in pounds of shucked scallop meats harvested under the CBLs specified for these areas.

3.3.1.2 Gear Limitations

Gear limitations may include restrictions on the number and width of dredges that may be deployed by vessels fishing in a particular area, and minimum ring sizes for dredges to prevent the taking of undersize scallops. Gear restrictions will be specified in State regulations.
Gear Limitations

The following gear restrictions apply to the taking of scallops under this FMP:

1. A vessel fishing for weathervane scallops (Patinopectin caurinus) may use or carry only scallop dredges with rings having an inside diameter of four inches (10.16 cm) or larger.

2. A vessel fishing for scallops other than weathervane scallops may use or carry only scallop dredges with rings having an inside diameter of three inches (7.62 cm) or larger.

3. A person may not use chafing gear or other devices that decrease the legal inside ring diameter of a scallop dredge.

4. No more than two scallop dredges may be operated at one time from a vessel, and the opening of a scallop dredge may not be more than 15 feet (4.57 meters) wide.

5. In the Kamishak, Southern, and Central Districts of Scallop Registration Area H, scallops may be taken only with a single dredge. The opening of a dredge may not be more than six feet (1.87 meters) in width.

3.3.1.3 Crew and Efficiency limits

Efficiency limits may be necessary to prevent overcapitalization in the Scallop fishery off Alaska. Efficiency limits may include prohibitions on automatic shucking machines and restrictions on the number of crew that may be on board a vessel when engaged in fishing for scallops. Efficiency limits will be specified in State regulations.

Efficiency limits

1. Scallops may be shucked by hand only. A mechanical shucking machine must not be on board a vessel that is fishing for scallops.

2. A vessel that is fishing for scallops may have on board no more than 12 persons who are crew members of the vessel. Crew member means a person who is involved with the operations of the vessel, and includes a captain, mate, engineer, cook, deckhand and processing worker, but does not include an ADF&G or NMFS observer.

3.3.1.4 Fishing Seasons

Fishing seasons will be specified in State regulation to achieve various management objectives including (1) limiting fishing during spawning periods, (2) timing fishing seasons during periods when product quality is highest, (3) limiting gear conflicts with other fisheries, (4) and increasing vessel safety.

Scallops may be taken in Scallop Registration Areas D and E from 12 noon A.l.t., January 10 until 12 midnight, December 31, subject to the other provisions of the FMP.

Scallops may be taken in Scallop Registration Areas K, M, O, Q and R from 12 noon A.l.t., July 1 through 12 noon A.l.t., February 15 of the following year, subject to the other provisions of the FMP.

Scallops may be taken in the Kamishak District of Scallop Registration Area H from 12 noon A.l.t., August 15 through 12 noon A.l.t., October 31. In other districts of Scallop Registration Area H, scallops may be taken from 12 noon, January 1 until 12 midnight, December 31, subject to the other provisions of the FMP.

3.3.1.5 In-season Adjustments

The State may make in-season adjustments to GHRs, fishing seasons, bycatch limits, and to close areas under State regulations. In making such in-season adjustments, the State may consider appropriate factors to the extent in-season data are available on: (1) overall fishing effort, (2) catch per unit of effort and rate of harvest, (3) relative scallop abundance, (4) achievement of GHRs and bycatch limits, (5) general information on stock condition, (6) timeliness and accuracy of catch reporting, and (7) other factors that affect ability to meet objectives of the FMP.

All in-season adjustments must be recorded and justified in writing. These justifications are attached to the emergency order and will be made available for review to the public, the State, NMFS, and other regulatory agencies.

Inseason adjustments may be issued by NMFS to implement the closure, extension, or opening of a season in all or part of a scallop registration area; and the adjustment of TAC amounts and CBLs.

3.3.1.6 Closed areas

State regulations implementing the FMP may include time and area closures designed to minimize bycatch and protect habitat. Existing State regulations close most areas to that are also closed to bottom trawling to protect crab and other sensitive habitat.

Regulations implementing the FMP may include time and area closures designed to minimize crab bycatch and protect crab habitat. Closed areas will be specified in regulations.

3.3.1.6.1 Notices of closure

If the Regional Director determines that a TAC amount or CBL has been or will be reached, NMFS will publish a notice in the Federal Register declaring that the taking or retention of scallops is prohibited in the area or part thereof where the notice is applicable.

3.3.1.7 Prohibited Species and Bycatch Limits

State regulations may prohibit vessels fishing under this FMP from retaining certain species identified as prohibited including salmon, halibut, king crab, Tanner crab, and herring. Species identified as prohibited must be avoided while fishing and must be immediately returned to the sea with a minimum of injury when caught and brought aboard. Prohibited species bycatch limits may be established for specified areas or subareas to limit bycatch of prohibited species in the scallop fishery.

It is prohibited to retain any species of salmon, halibut, king crab, Tanner crab, and herring. Species identified as prohibited must be avoided while fishing and must be immediately returned to the sea with a minimum of injury when caught and brought aboard.

3.3.1.7.1 Crab bycatch limits (CBLs)

Annual CBLs may be specified for red king crab and Tanner crab species in each registration area or district thereof.

3.3.7.1.1.1 Registration Area Q

The annual CBLs in Registration Area Q shall equal the following amounts:

1. The CBL of red king crab caught while conducting any fishery for scallops shall be within the range of 500 to 3,000 crab based on the considerations listed in paragraph 2.4.3.2.

2. The CBL of C. opilio Tanner crab caught while conducting any fishery for scallops is 0.003176 percent of the most recent estimate of C. opilio abundance in Registration Area Q.

3. The CBL of C. bairdi Tanner crab caught while conducting any fishery for scallops is 0.13542 percent of the most recent estimate of C. bairdi abundance in Registration Area Q.

3.3.1.7.1.2 All other registration areas

Except as provided for under 2.4.3.1, CBLS will be based on the biological condition of each crab species, historical bycatch rates in the scallop fishery, and other socioeconomic considerations that are consistent with the goals and objectives of the FMP.

3.3.1.7.1.3 Time period for CBLs

Annual CBLs will be specified for the time period from July 1 through June 30 of the following year.

3.3.1.8 Observer Requirements

Observer coverage requirements may be specified in State regulations. The State may place observers aboard scallop fishing and/or processing vessels to obtain, for example, catch and effort data; species, and size composition data. Observers provide better scientific and enforcement information than is otherwise available. The State currently has a mandatory observer requirement on all vessels fishing for scallops outside the Cook Inlet Registration Area as a condition to obtaining a processing permit. Scallop vessels fishing in the GOA or BSAI must carry an NMFS or ADF&G-certified scallop observer when required to do so. Observer coverage requirements for these vessels will be specified in regulations. No one shall forcibly assault, resist, impede, intimidate, or interfere with an observer placed aboard a fishing vessel under this FMP.

The State of Alaska requires 100% onboard observer coverage. The primary purposes of the onboard observer program are to collect biological and fishery-based data, monitor bycatch, and provide for regulatory enforcement. Data are collected on crab and halibut bycatch, discarded scallop catch, retained scallop catch, catch composition, scallop meat weight recovery, location, area, and depth fished, and catch

per unit effort (CPUE). Observers report scallop harvest, number of tows, area fished, and crab bycatch to ADF&G tri-weekly during the season. Data are used to manage the fishery inseason and to set GHRs for the following season.

3.3.1.8.1 At-Sea Catch Sampling

The focus of the State of Alaska's onboard scallop observer program is two-fold. One is to monitor bycatch, and the second is to collect biological and commercial fishing information relating to the weathervane scallop. Onboard sampling is designed to answer questions necessary to the successful management of the resource.

The scallop observer program collects a variety of biological data on a daily basis. The daily goal is to sample a single dredge from one tow for species haul composition and a single dredge from six different tows for crab and halibut bycatch and discarded scallop catch as well as sampling two tows for scallop meat (adductor muscle) recovery data.

Haul composition sampling is used to document all species of bycatch by weight. Dredge contents, including noncommercial species, are sorted into baskets by species and weighed. Observer haul composition samples are summarized and reported by management area and district. Data from each management area and district is then summarized.

From each of the six tows sampled daily for crab and halibut bycatch, one dredge per tow is examined. Observers identify, count, and record the number of crab and halibut encountered as well as examining both the retained and discarded scallop catch. In addition to enumerating crab, carapace measurements, shell age, sex, injuries and mortality are recorded. All Pacific halibut encountered are measured for length and examined for injuries and overall body condition. The discarded scallop catch is collected from the deck and weighed. A subsample is examined to determine the weight and number of broken and intact scallops, and shell heights. From the retained scallop catch; shell height, sex, and gonad development is collected. Shells are collected from both the retained and discarded scallop catch for shell aging.

3.3.1.9 Recordkeeping and Reporting Requirements

The State may implement recordkeeping and reporting requirements as necessary to meet the management objectives of the FMP. As the commercial scallop fisheries have grown over recent years, so has our knowledge of this species. Information gained through scientific surveys, research, and fishermen's observations have all led to a better understanding of the biology, environmental requirements, and behavior of the scallop stocks. Since fishery managers monitor harvest rates in-season to determine areas of greatest fishing effort, thereby preventing overharvest of individual scallop stocks, State catch and processing reporting requirements are an important component in achieving the biological conservation, economic, social, research and management objectives of this FMP.

NMFS, in coordination with other management agencies, should initiate efforts to identify and gather the data needed to improve management agency understanding of the dynamics of the scallop resource and the effect of exploitation on the stocks capacity to produce MSY on a continuing basis. The type of information that should be pursued Alaska include (1) stock abundance and size/age structure, (2) scallop biology, life history, and stock production parameters, (3) analyses of population thresholds and recruitment overfishing; (4) estimation of optimum dredge ring size or minimum shell height based on studies of rates of growth and mortality; (5) investigations of exploitation rates and alternative management strategies; (6) genetic stock

structure; and (7) new gear designs to reduce bycatch and to minimize adverse effects on bottom habitat. This objective may be attained, in part, with data collected by the Alaska State observer program. However, assessments of the scallop resource off Alaska, as well as the conduct of other scallop research will be dependent on Federal funding, State of Alaska general fund appropriations, or future amendments to the FMP that would authorize experimental fishing under Federal permit conditions.

3.3.1.10 Other

As previously noted, the State government is not limited to only the management measures described in this FMP. However, implementation of other management measures not described in the FMP must be consistent with the FMP, the Magnuson-Stevens Act, and other applicable Federal law.

3.3.2 Category 2 Measures: Fixed in FMP

These measures are fixed in the FMP, implemented by federal regulations and require an FMP amendment to change.

3.3.2.1 Limited Access Management

A system for limiting access, which is an optional measure under section 303(b) of the Magnuson-Stevens Act, is a type of allocation of fishing privileges that may be used to promote economic efficiency or conservation. For example, "*limited access may be used to combat overfishing, overcrowding, or overcapitalization in a fishery to achieve OY*" (50 CFR 600.330(c)). The Magnuson-Stevens Act (Section 3(28)) further defines"... The "optimum" with respect to the yield from a fishery, means the amount of fish which -- (A) will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; (B) is prescribed on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant social, economic, or ecological factor; and (C) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery.

As of 2001, a Federal scallop license is required for vessels participating in all scallop fisheries in the EEZ off Alaska. NPFMC created the scallop LLP to limit the number of participants and reduce fishing capacity in the scallop fishery. The LLP license is required on board any vessel deployed in the weathervane scallop fishery in federal waters off Alaska. NMFS granted 7 vessel owners licenses to fish statewide (outside of the Cook Inlet Registration Area) utilizing two 15-foot dredges. Additionally, NMFS granted two vessels owners licenses to fish statewide utilizing a single 6-foot dredge. All 9 licenses allow vessel owners to fish inside Cook Inlet with a single 6-foot dredge.

3.3.2.1.1 Elements of the License Limitation Program

1. Qualification Criteria. A license authorizes the license holder to use a vessel from which directed fishing for scallops can be conducted. A license was issued to a moratorium permit holder who made legal landing of scallops in each of any 2 years in the period from January 1, 1996 through October 9, 1998. Licenses are not vessel specific.

2. License Recipients. Licenses were issued to U.S. Citizens, or U.S. business (corporation, partnership, or other association) that satisfy the above qualification criteria.

3. Who May Purchase Licenses. Licenses may be transferred only to "persons" defined as those "eligible to document a fishing vessel" under Chapter 121, Title 46, U.S.C. Licenses may not be leased.

4. Area Endorsements. The licenses have no area endorsements. All licenses are statewide. However, some licenses (2) are restricted for use with a single 6 ft (1.8 m) dredge when fishing for scallops in all areas as defined in Federal Regulations.

5. Vessel Length. No increases in vessel length will be allowed. A license will be designated with a MLOA that will limit the length of a vessel that could be used by the license holder.

6. License Ownership Caps. No person could hold more than 2 scallop licenses at once unless that person is initially issued more than 2 licenses, in which case the person can hold the number of licenses initially issued. However, a person who has more than 2 scallop licenses could not receive a scallop license by transfer until the number of scallop licenses which that person has is less than 2. After obtaining transfer eligibility by dropping below 2 licenses, the person could not again exceed 2 licenses, regardless of his or her earlier status of being allowed to exceed 2 licenses on initial issuance.

7. Appeals. The appeals process is established in Federal Regulations at 50 CFR part 679.43.

4.0 Description of Stocks and Fishery

4.1 Stocks

4.1.1 General Biology

Weathervane scallops are distributed from Point Reyes, California, to the Pribilof Islands, Alaska. The highest known densities in Alaska have been found to occur in the Bering Sea, off Kodiak Island, and along the eastern gulf coast from Cape Spencer to Cape St. Elias.

The weathervane scallop (Patinopecten caurinus), is a bivalve and classified by having a single adductor muscle, a socket-like hinge, and distinct dorsal and ventral valves. Scallops have a limited swimming ability by utilizing hydraulic water pressure achieved by clapping the valves together. Numerous eyes, or ocelli, are located along the outer mantle on stalks. Scallops are non-burrowing filter feeders, subsisting primarily on phytoplankton.

Although the weathervane scallop has been the principal commercial species off Alaska, several other species of scallop found in the EEZ off Alaska have commercial potential. These scallops, thought to be closely related to the Icelandic scallops (Chlamys islandica) of the North Atlantic, grow to smaller sizes than weathervanes, and thus have not been extensively exploited in Alaska. Chlamys behringiana inhabit the Chukchi Sea to the Western Bering Sea. Chlamys albida are distributed from the Bering Sea and Aleutian Islands to the Japan Sea. Pink scallops, Chlamys rubida, range from California to the Pribilof Islands. Spiny scallops, Chlamys hastata, are found in coastal regions from California to the Gulf of Alaska.

Little is known about the biology of these scallop species. Chlamys species occupy different habitats and have different growth characteristics than weathervanes. Pink scallops are found in deep waters (to 200 m) in areas with soft bottom, whereas spiny scallops occur in shallower (to 150 m) areas characterized by hard bottom and strong currents. Spiny scallops grow to slightly larger sizes (75 mm) than pink scallops (60 mm). Both species mature at age 2, or about 35 mm, and are characterized by high natural mortality, with

maximum age of about 6 years. Spiny scallops are autumn spawners (August-October), whereas pinks are winter spawners (January-March) (Bourne and Harbo 1987).

Rock scallops, Crassadoma gigantea, range from Mexico to Unalaska Island. The abundance of this species is not known, and a commercial fishery has never been developed. Because they attach themselves to rocks, trawls and dredges are not efficient in capturing rock scallops. As suggested by the species name, these scallops attain a large size (to 250 mm) and exhibit fast growth rates. Rock scallops are found in relatively shallower water (0-80 m) with strong currents. Apparently, distribution of these animals is discontinuous, and the abundance in most areas is low. Rock scallops may spawn during two distinct periods, one in the autumn (October -January), and one in the spring-summer (March-August) (Jacobsen 1977).

4.1.1.1 Reproduction and early life history

For weathervanes and the other scallop species, sexes are separate although one case of hermaphroditism in weathervanes has been observed (Hennick 1971). Mature male and female scallops are distinguishable: female gonads are pink or orange-red whereas gonads of males are white (Haynes and Powell 1968; Robinson and Breese 1984). Although spawning time varies with latitude and depth (Robinson and Breese 1984; MacDonald and Bourne 1987; Starr and McCrae 1983), weathervane scallops in Alaska appear to mature in mid-December to late January and spawn in May to July depending on location (Hennick 1970a).

Scallops develop through egg, larval, juvenile, and adult life stages. Eggs and spermatozoa are released into the water, where the eggs become fertilized (Cragg and Crisp 1991). After a few days, eggs hatch, and larvae rise into the water column and drift with ocean currents. Larvae are pelagic and drift for about one month until metamorphosis to the juvenile stage (Bourne 1991). The "post-larvae" settle and attach to a hard surface on the bottom with strings called "byssal threads". Young juveniles may remain attached, or they may become mobile by use of a "foot", or they may swim. Within a few months the shell develops pigmentation, and juveniles then resemble the adult in appearance.

Weathervane scallops mature by age 3 at about 7.6 cm (3 inches) in shell height (SH), and virtually all scallops are mature by age 4 (Haynes and Powell 1968; Hennick 1970b, 1973). Growth is most rapid during the first 10-11 years (Hennick 1973). However, growth, maximum size, and size at maturity vary significantly within and between beds and geographic areas. For example, on average, maximum size as measured by (SH), tends to be about 190 mm (7.5 inches) SH for Marmot Flats off Kodiak Island and only 144 mm (5.7 inches) SH for the Cape Fairweather - Cape St. Elias area. The largest recorded specimen measured 250 mm (9.8 inches) SH and weighed 340 g (12 ounces, Hennick 1973). Although increasing with age and size, weight varies seasonally; meat yield declines during the spawning season and increases during the growing season. In addition, adductor weights of weathervane scallops apparently vary among regions, with the west side of Kodiak Island producing the largest meats relative to shell size.

4.1.1.2 Longevity and natural mortality

Weathervane scallops are long-lived; individuals may live 28 years or more (Hennick 1973). The natural mortality rate (M) is thought to be low, although estimates vary. Instantaneous natural mortality (M) for weathervane scallops has been estimated by Kruse and Funk (1995), based on data presented in published papers (Kaiser 1986, Hennick 1973). A median M value of 0.13 was estimated using the methodology of Alverson and Carney (1975) based on growth parameters, Robson and Chapman (1961) based on catch curves, and Hoenig (1983) and Beverton (1963) based on maximum age. Little is known about the causes of natural mortality for scallops. Scallops are likely prey for various fish and invertebrates during the early

part of their life cycle. Flounders are known to prey on juvenile weathervane scallops and seastars also may be important predators (Bourne 1991).

Weathervane scallops begin to mature by age 3 at about 7.6 cm (3 inches) in shell height (SH), and virtually all scallops are mature by age 4. Growth, maximum size, and size at maturity vary significantly within and between beds and geographic areas. Weathervane scallops are long-lived; individuals may live 28 years old or more. The natural mortality rate is thought to be about 15% annually (M = 0.16).

4.1.2 Stock Structure and Productivity

The stock structure of weathervane scallops has not been studied. Until recently, benthic ecologists generally believed that invertebrate species generally have "open" populations that are well-connected to other, geographically-distinct populations by advection of pelagic larvae. Growing evidence exists, however, that some invertebrate populations are actually comprised of multiple discrete, self-sustaining populations (Sinclair 1988; Orensanz et al. 1991). Sinclair et al. (1985) suggested that three species of scallops in the North Atlantic Ocean were comprised of a number of discrete, self-sustaining populations. From Virginia to Newfoundland, at least 19 discrete concentrations of Atlantic scallops may be self sustaining populations (Sinclair 1988). Fevolden (1989) provided strong evidence for restricted gene flow among different concentrations of Iceland scallop (Chlamys islandica) in the northeast Atlantic Ocean and concluded that scallops sampled from different areas of the northeast Atlantic Ocean should be treated as discrete genetic units for management purposes. Last, Caddy (1989) asserted that it is reasonable to assume that historically-maintained centers of scallop concentrations are self-sustaining populations. Further, he recommended that these commercially-important scallop beds should compose the unit stock upon which management measures are based. He also noted that a scallop fishing ground may contain several beds of high scallop density that are surrounded by a number of low-density scallop fishing areas.

4.1.3 Present Condition and Abundance

The State of Alaska Scallop Fishery Management Plan established 9 scallop registration areas in Alaska for vessels commercially fishing for scallops. These include the Southeastern Alaska Registration Area (Area A);Yakutat Registration Area (Area D and District 16); Prince William Sound Registration Area (Area E); Cook Inlet Registration Area (Area H); Kodiak Registration Area (Area K), which is subdivided into the Northeast, Shelikof and Semidi Districts; Alaska Peninsula Registration Area (Area M); Dutch Harbor Registration Area (Area O); Bering Sea Registration Area (Area Q); and Adak Registration Area (Area R). Although the overfishing definition is based on the statewide scallop stock, ADF&G establishes GHRs and manages the fishery by registration areas within regions. Stocks in each area are independently assessed with methods that vary by region. Currently there are no statewide estimates of stock size and stocks are instead assessed by individual regions.

ADF&G conducts biennial dredge surveys in the Kamishak District of the Cook Inlet Registration Area and near Kayak Island in the Prince William Sound Registration Area. For registration areas without surveys, stocks are assessed and managed conservatively based on data collected by the scallop observer program. These data consist of scallop catch and fishing effort, including total harvest, catch-per-unit-effort (CPUE), fishing locations, size structure of the catch, and crab bycatch. The observer program also provides management personnel with inseason summary reports. Areas may be closed due to concerns about localized depletion, overall trends in CPUE, or high crab bycatch. ADF&G research personnel are also developing methodology for fishery-independent video surveys of scallop stocks, but these methods must undergo further refinement and review before the estimates are used for scallop fishery management.

GHRs for registration areas where scallop fishing traditionally occurred were first established by the State of Alaska in 1993 under the Interim Management Plan for Commercial Scallop Fisheries in Alaska. The upper limit of the GHR, in pounds of shucked meats, from traditional areas included Yakutat (250,000 pounds), Prince William Sound (50,000), Kamishak District of Cook Inlet (20,000 pounds), Kodiak (400,000 pounds), and Dutch Harbor (170,000) pounds. The combined upper limits of the GHRs totaled 890,000 pounds of shucked meats. The GHR for each area was determined by averaging historic catches from 1969 to 1992 excluding years when there was no fishing or "fishing-up effect" occurred (Barnhart 2003). "Fishing-up" is considered to over-estimate production. Typically, early catches exceed sustainable levels as the fishery crops off large, old individuals from the population including concentrations on marginal beds that rebuild slowly. This widely recognized phenomenon is known as the "fishing-up effect" or "removal of accumulated stock".

Prior to the August 1, 1996 opening of the weathervane scallop fishery, ADF&G established GHRs for non-traditional registration areas. GHR upper limits were established for the Alaska Peninsula (200,000 pounds), Bering Sea (600,000 pounds), District 16 (35,000 pounds) and Adak (75,000 pounds). The historic high catches for each registration area were established as the GHR upper limit. The combination of GHRs from traditional and non-traditional areas totaled 1.8 million pounds of shucked scallop meats, which was defined as maximum sustainable yield (MSY) in Amendment 1 to the federal Fishery Management Plan for the Scallop Fishery off Alaska (FMP).

In 1998, the scallop plan team recommended a more conservative approach, defining MSY as 1.24 million pounds of shucked scallop meats based on average landings from 1990-1997, excluding 1995 when the fishery was closed most of the year. Subsequently, MSY was established in Amendment 6 of the FMP at 1.24 million pounds and optimum yield (OY) as a range from 0 to 1.24 million pounds. To accommodate the lower limits the department reduced the upper end of the GHR in Kodiak from 400,000 to 300,000 pounds, in Dutch Harbor from 170,000 to 110,00 pounds, and in the Bering Sea from 600,000 to 400,000 pounds.

Vessel participation and total catch by registration area and year are shown in Tables 1-10. With the exception of Kodiak, Prince William Sound and Cook Inlet (except recent years), catches have been well below state GHRs for each area. Additional years and other information on harvest rates and recruitment are available in the annual SAFE reports. The Alaska Department of Fish and Game has confidential release forms signed by vessel operators in order to display specific catch information. Whenever possible, unless otherwise indicated as “confidential”, catch records have been made available for publication by the State.

Table 1. Yakutat Area D scallop fishery summary statistics. (Confidential catch information was made available voluntarily by the Scallop fleet unless otherwise noted)

Season	Number vessels	GHR ceiling (lbs meat)	Dredge hours	Catch (lbs meat)	CPUE (lbs meat per dredge hr)
1993	7[a]	250,000	1,999	139,057	70
1994	10[a]	250,000	4,130	246,862	60
1995	8[b]	250,000	4,730	237,417	50
1996	4	250,000	4,438	238,736	54
1997/98	4	250,000	3,956	243,810	62
1998/99	8	250,000	4,154	241,337	58
1999/00	3	250,000	3,840	249,681	65
2000/01	3	250,000	4,241	195,699	46
2001/02	2	200,000	2,406	103,800	43
2002/03	2	200,000	2,439	122,718	50
2003/04	2	200,000	3,360	160,918	48

[a] One additional vessel fished by waiver without an observer; data not included.
[b] Two additional vessels fished by waiver without observers; data not included.

Table 2. Yakutat District 16 scallop fishery summary statistics.

Season	Number vessels	GHR ceiling (lbs meat)	Dredge hours	Catch (lbs meat)	CPUE (lbs meat per dredge hr)
1993	1	35,000		confidential	
1994	7[a]	35,000	408	22,226	54
1995	6[a]	35,000	1,095	33,260	30
1996	2	35,000	917	34,060	37
1997/98	4	35,000	561	22,020	39
1998/99	2	35,000	702	34,090	49
1999/00	2	35,000	674	34,624	51
2000/01	3	35,000	476	30,904	65
2001/02	2	35,000	417	20,398	49
2002/03	2	35,000	100	3,685	37
2003/04	2	35,000	18	1,072	59

[a] One additional vessel fished by waiver without an observer; data not included.

Table 3. Prince William Sound Area E scallop fishery summary statistics**.** (Confidential catch information was made available voluntarily by the Scallop fleet unless otherwise noted)

Season	Number vessels	GHR ceiling (lbs meat)	Dredge hours	Catch (lbs meat)	CPUE (lbs meat per dredge hr)
1993	7	50,000	638	63,068	99
1994		Closed			
1995	3	50,000		108,000[a]	
1996		Closed			
1997	1	17,200	171	18,000	105
1998/99	2	20,000	179	19,650	110
1999/00	2	20,000	149	20,410	137
2000/01	3	30,000	221	30,266	137
2001/02	1	30,000	263	30,090	114
2002/03	2	20,000	122	15,641	121
2003/04	1	20,000	216	19,980	93

[a] Poundage includes illegal fishing by one vessel; effort data not available.

Table 4. Cook Inlet, Kamishak District scallop fishery summary statistics. (Confidential catch information was made available voluntarily by the Scallop fleet unless otherwise noted)

Season	Number vessels	GHR ceiling (lbs meat)	Dredge hours	Catch[a] (lbs meat)	CPUE (lbs meat per dredge hr)
1993	3		529	20,115	38
1994	4		454	20,431	45
1995		closed			
1996	5		534	28,228	53
1997	3	20,000	394	20,336	52
1998/99	1	20,000	390	conf	
1999/00	3	20,000	333	20,315	61
2000/01	3	20,000	276	20,516	74
2001/02	2	20,000	406	confidential	
2002/03	3	20,000	311	8,591	28
2003/04	2	20,000		confidential	

[a] Includes estimated dead loss.

Table 5. Kodiak Northeast District scallop fishery summary statistics. (Confidential catch information was made available voluntarily by the Scallop fleet unless otherwise noted)

Season	Number vessels	GHR ceiling (lbs meat)	Dredge hours	Catch (lbs meat)	CPUE (lbs meat per dredge hr)
1993/94	10	NA	6,940	155,187	22
1994/95	7	NA	1,773	35,207	20
1995/96		closed			
1996/97	3	NA	581	11,430	20
1997/98	3	NA	2,604	95,858	37
1998/99	4	NA	2,749	120,010	44
1999/00	3	75,000	1,384	77,119	56
2000/01	4	80,000	1,101	79,965	73
2001/02	3	80,000	1,142	80,470	70
2002/03	2	80,000	1,350	80,000	59
2003/04	2	80,000	1,248	79,965	64

Table 6. Kodiak Shelikof District scallop fishery summary statistics. (Confidential catch information was made available voluntarily by the Scallop fleet unless otherwise noted)

Season	Number vessels	GHR ceiling (lbs meat)	Dredge hours	Catch (lbs meat)	CPUE (lbs meat per dredge hr)
1993/94	5	NA	2,491	105,017	42
1994/95	11	NA	8,662	314,051	36
1995/96		closed			
1996/97	3[a]	NA	3,491	219,305	63
1997/98	4	NA	5,492	258,346	47
1998/99	8	NA	4,081	179,870	44
1999/00	6	180,000	4,304	187,963	44
2000/01	5	180,000	2,907	180,087	62
2001/02	4	180,000	3,398	177,112	52
2002/03	3	180,000	3,799	180,580	48
2003/04	2	180,000	3,258	180,011	55

[a] One additional vessel fished but data are not available.

Table 7. Kodiak Semidi District scallop fishery summary statistics.

Season	Number vessels	GHR ceiling (lbs meat)	Dredge hours	Catch (lbs meat)	CPUE (lbs meat per dredge hr)
1993/94	6[a]	NA	1,819	55,487	32
1994/95	2	NA	272	confidential	
1995/96		closed			
1996/97	3	NA	1,017	37,810	37
1997/98	1	NA	349	6,315	18
1998/99	2	NA	106	1,720	16
1999/00	1	NA	45	930	21
2000/01		NA	0		
2001/02		NA	0		
2002/03		NA	0		
2003/04		NA	0		

[a] Two additional vessels registered but did not fish

Table 8. Alaska Peninsula Area scallop fishery summary statistics. (Confidential catch information was made available voluntarily by the Scallop fleet unless otherwise noted)

Season	Number vessels	GHR ceiling (lbs meat)	Dredge hours	Catch (lbs meat)	CPUE (lbs meat per dredge hr)
1993/94	8	NA	1,847	112,152	61
1994/95	7	NA	1,664	65,282	39
1995/96		closed			
1996/97	2	200,000	327	12,560	38
1997/98	4	200,000	1,752	51,616	29
1998/99	4	200,000	1,612	63,290	39
1999/00	5	200,000	2,025	75,535	37
2000/01	3	33,000	320	7,660	24
2001/02		closed			
2002/03		closed			
2003/04		10,000			

Table 9. Bering Sea Area scallop fishery summary statistics.

Season	Number vessels	GHR ceiling (lbs meat)	Dredge hours	Catch (lbs meat)	CPUE (lbs meat per dredge hr)
1993/94	9	NA	5,764	284,414	49
1994/95	8	NA	11,113	505,439	45
1995/96		closed			
1996/97	1	600,000	2,313	150,295	65
1997/98	2	600,000	2,246	97,002	43
1998/99	4	400,000	2,319	96,795	42
1999/00	2	400,000	3,294	164,929	50
2000/01	3	200,000	3,355	205,520	61
2001/02	3	200,000	3,072	140,871	46
2002/03	2	105,000	2,038	92,240	45
2003/04	2	105,000	1,020	42,590	42

Table 10. Dutch Harbor Area scallop fishery summary statistics. (Confidential catch information was made available voluntarily by the Scallop fleet unless otherwise noted)

Season	Number vessels	GHR ceiling (lbs meat)	Dredge hours	Catch (lbs meat)	CPUE (lbs meat per dredge hr)
1993/94	2	170,000	838	confidential	46
1994/95	3	170,000	81	1,931	24
1995/96	1	170,000	1,047	26,950	26
1996/97		170,000	0		
1997/98	1	170,000	171	5,790	34
1998/99	4	110,000	1,025	46,432	45
1999/00	1	110,000	273	6,465	24
2000/01		closed			
2001/02		closed			
2002/03	1	10,000	184	6,000	33
2003/04		closed			

4.1.4 Ecological Relationships

Scallop predators have not been well studied. Scallops are likely prey to various fish and invertebrates during the early part of their life cycle. Flounders are known to prey on juvenile weathervane scallops, and seastars may also be important predators.

4.2 Habitat of managed stocks

4.2.1 Habitat Types

Major scallop fishing locations in Alaska coastal waters are shown in Figure 1. Many areas of Alaska's coast are closed to scallop dredging to protect habitats important to other species. Bottom substrate types inhabited by weathervane scallops are variable throughout the state and include mud, clay, silt, sand, and pebble.

4.2.2 Determination of Essential Fish Habitat

Summaries and assessments of habitat information for scallops off the coast of Alaska are provided in the "Essential Fish Habitat Assessment Report for the Scallop Fisheries Off the Coast of Alaska" dated March 31, 1998. Habitat descriptions and life history information was reviewed and the levels of information available for each life history stage was determined. The approach set forth in regulations at 50 CFR 600.815(a)(2) for gathering and organizing the data necessary to identify EFH was applied. In evaluating the level of knowledge available, a level 0 was defined as a subset of level 1. For scallops, it was determined that information at levels 0, 1, and 2 was available.

The information available for weathervane scallops and other scallop species is primarily broad geographic distributions based on specific samples from surveys and fisheries which have not been linked with habitat characteristics. The ability to precisely define the habitat (and its location) of each life stage in terms of its oceanographic (temperature, salinity, nutrient, current) trophic (presence of food, absence of predators), and physical (depth, substrate, latitude and longitude) characteristics is very limited. Consequently, the information included in the habitat descriptions and life stage is restricted primarily to broad biogeographic and bathymetric areas and occasional references to known bottom type associations.

Information about the entire range of a species is included in the textual descriptions of EFH; however, the maps only show EFH and known areas of high weathervane scallop concentrations in the State and Federal waters off Alaska. Identification of EFH for weathervane scallops included historical range information. Traditional knowledge and sampling data have indicated that distributions may contract and expand due to a variety of factors including, but not limited to, temperature change, current patterns, changes in population size, and changes in predator and prey distribution.

4.2.1.1 EFH definition for each scallop species

<u>EFH definition for Alaskan weathervane scallops</u>

Eggs (several days) - Level 0_a
Demersal waters of the inner and middle continental shelf of the Gulf of Alaska and to a lesser extent in the Bering Sea and Aleutian Islands. Eggs are released in the late spring and early summer.

Larvae (2-3 weeks) - Level 0_a
Pelagic waters along the inner, middle, and outer continental shelf of the Gulf of Alaska west of Dixon entrance, extending into the Bering Sea and Aleutian Islands.

Juveniles (to 3 years of age) - Level 1
Areas of clay, mud, sand, and gravel along the mid-continental shelf of the BSAI and GOA.

Adults (3+ years of age) - Level 2
Areas of clay, mud, sand, and gravel along the mid continental shelf of the GOA and BSAI. Areas of concentration are those between the depths of 40-130 m. Scallop beds are generally elongated in the direction of current flow.

EFH definition for Alaskan weathervane scallops

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Pelagic waters along the inner, middle, and outer continental shelf of the Gulf of Alaska west of Dixon entrance, extending into the Bering Sea and Aleutian Islands.

Juveniles (to 3 years of age) - Level 1
Areas of clay, mud, sand, and gravel along the mid-continental shelf of the BSAI and GOA.

Adults (3+ years of age) - Level 2
Areas of clay, mud, sand, and gravel along the mid continental shelf of the GOA and BSAI. Areas of concentration are those between the depths of 40-130 m. Scallop beds are generally elongated in the direction of current flow.

EFH descriptions and identification are currently under the process of revision by NMFS and the Council. A copy of the draft EFH EIS analysis is available on the NMFS Alaska Region website at http://www.fakr.noaa.gov/habitat/seis/efheis.htm .
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Habitat Description for Weathervane Scallops
(*Patinopectin caurinus*)

Weathervane scallops are found from intertidal waters to depths of 300 m, but abundance tends to be greatest between depths of 40-130 m on beds of mud, clay, sand, and gravel. Beds tend to be elongated along the direction of current flow. A combination of large-scale (overall spawning population size and oceanographic conditions) and small-scale (site suitability for settlement) processes influence recruitment of scallops to these beds. Sexes are separate and mature male and female scallops are distinguishable based on gonad color. Although spawning time varies with latitude and depth, weathervane scallops in Alaska spawn in May to July depending on location. Eggs and spermatozoa are released into the water, where the eggs become fertilized. After a few days, eggs hatch, and larvae rise into the water column and drift with ocean currents.

Larvae are pelagic and drift for about one month until metamorphosis to the juvenile stage when they settle to the bottom.

Several other species of scallops found in the EEZ off Alaska have commercial potential. These scallops grow to smaller sizes than weathervanes, and thus have not been extensively exploited in Alaska. Pink scallops, *Chlamys rubida*, range from California to the Pribilof Islands. Pink scallops are found in deep waters (to 200 m) in areas with soft bottom, whereas spiny scallop occur in shallower (to 150 m) areas characterized by hard bottom and strong currents. Pink scallops mature at age 2, and spawn in the winter (January-March). Maximum age for this species is 6 years. Spiny scallops, *Chlamys hastata*, are found in coastal regions from California to the Gulf of Alaska. Spiny scallops grow to slightly larger sizes (75 mm) than pink scallops (60 mm). Spiny scallops also mature at age 2 (35 mm) and spawn in the autumn (August-October). Rock scallops, *Crassadoma gigantea*, range from Mexico to Unalaska Island. Rock scallops are found in relatively shallower water (0-80 m) with strong currents. Apparently, distribution of these animals is discontinuous, and the abundance in most areas is low. These scallops attach themselves to rocks, attain a large size (to 250 mm), and exhibit fast growth rates. Rock scallops are thought to spawn during two distinct periods, one in the autumn (October -January), and one in the spring-summer (March-August).

SPECIES: Weathervane Scallops off Alaska

Stage - EFH Level	**Duration or Age**	**Diet/Prey**	**Season/Time**	**Location**	**Water Column**	**Bottom Type**	**Oceanographic Features**
Eggs	several days	None	May-July	MCS, ICS	D		N/A
Larvae	2-3 weeks		May-August	ICS, MCS, OCS	P		N/A
Juveniles	Age 0 to Age 3		Aug. +	MCS	D	CL, M, S, G	N/A
Adults	Age 3 - 28		Spawning May-July	MCS	D	CL, M, S, G	UNK

Habitat and Biological Associations

Scallops are found from intertidal waters and to 300 m. Abundance tends to be greatest between 45-130 m on beds of mud, clay, sand and gravel (Hennick 1973). Weathervane scallops are associated with other benthic species, such as red king crabs, Tanner crabs, shrimps, octopi, flatfishes, Pacific cod, and other species of benthic invertebrates and fishes.

Levels of essential fish habitat information currently available for Alaska scallops, by life history stage. Juveniles were subdivided into early and late juvenile stages based on survey and fishery selectivity curves.

Species	Eggs	Larvae	Early Juveniles	Late Juveniles	Adults
Weathervane scallops	0a	0a	0a	1	2
Pink scallops	0a	0c	0a	0a	0a
Spiny scallops	0a	0c	0a	0a	0a
Rock scallops	0a	0c	0a	0a	0a

Note: for the larval stages of Pink, Spiny, and Rock scallops information is insufficient to infer general distributions.
0a: Some information on a species' life stage upon which to infer general distribution.
0c: No information on the actual species' life stage and no information on a similar species or adjacent life stages, or where complexity of a species stock structure prohibited inference of general distribution.

Abbreviations used in the EFH report tables to specify location, depth, bottom type, and other oceanographic features.

Location
BCH = beach (intertidal)
ICS = inner continental shelf (1-50 m)
MCS = middle continental shelf (50-100 m)
OCS = outer continental shelf (100-200 m)
USP = upper slope (200-1000 m)
LSP = lower slope (1000-3000 m)
BSN = basin (>3000 m)
BAY = nearshore bays, give depth if appropriate (e.g., fjords)
IP = island passes (areas of high current), give depth if appropriate

Water column
D = demersal (found on bottom)
SD/SP =semi-demersal or semi-pelagic if slightly greater or less than 50% on or off bottom
P = pelagic (found off bottom, not necessarily associated with a particular bottom type)
N = neustonic (found near surface)

Bottom Type
M = mud S = sand R = rock
SM = sandy mud CB = cobble C = coral
MS = muddy sand G = gravel K = kelp
SAV = subaquatic vegetation (e.g., eelgrass, not kelp)

Oceanographic Features
UP = upwelling G = gyres F = fronts
CL = thermo- or pycnocline E = edges

General
U = Unknown NA = not applicable

4.2.3 HAPC

[PLACEHOLDER]

4.2.4 EFH Habitat Recommendations

[PLACEHOLDER]

4.3 Fishing Activities Affecting the Scallop Stocks

4.3.1 History of exploitation

Since the early 1980's, between 4 and 20 vessels annually have participated in the Alaska scallop fishery. Gross earnings experienced by the fleet during this same period of time has ranged from almost $.9 million in 1983 to about $7 million in 1992. Between 1969 and 1991, about 40 percent of the annual landings of scallops from waters off Alaska were comprised of scallops harvested from State waters. Since 1991, however, scallop harvests have increasing occurred in Federal waters. In 1994, only 14 percent of the scallop landing came from State waters, with the remainder harvested in Federal waters off Alaska (Table 11). The State of Alaska has managed the scallop fishery in State and Federal waters, consistent with section 306(a)(3) of the Magnuson Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.), which allows a state to directly regulate any fishing vessel outside state waters if the vessel is registered under the law of that state.

Table 11. Percentage of Alaska scallop landings from State (within 3 miles) and Federal waters (3-200 miles), by year from 1990 through 1994.

Year	*State Waters*	*Federal waters*
1990	46.9	53.1
1991	37.9	62.1
1992	73.6	26.4
1993	23.9	76.1
1994	13.7	86.3

Source: ADF&G.

[PLACEHOLDER: UPDATED TABLE TO BE ADDED]

The Alaska Department of Fish and Game (ADF&G) initiated development of a management plan for the scallop fishery in response to overfishing concerns resulting from recent changes in the weathervane scallop fishery off Alaska. Weathervane scallops possess biological traits (e.g., longevity, low natural mortality rate, and variable recruitment) that render them vulnerable to overfishing. Record landings occurred in the late 1960's (about 1.8 million pounds shucked scallop meat), followed by a significant decline in catch through the 1970's and 1980's when landed catch ranged between 0.2 and 0.9 million pounds. The ADF&G believes this decline is due, in part, to reduced abundance of scallop stocks (Kruse, 1994). Landings since 1989 have increased to near record levels. During this period, the number of vessels fishing for scallops has not

increased (about 10 - 15 vessels annually), although an increase in fishing power is evidenced by a substantial increase in average vessel length (from 84 feet registered length in 1981 to 110 feet in 1991), a predominance of full-time scallop vessels, and an increased number of deliveries. Until 1993, the State did not have a data collection program, although some indication exists that overfishing, or at least localized depletion may have occurred. Data voluntarily submitted by participants in the scallop fishery during the early 1990's showed that an increase in meat counts per pound has occurred, indicating that smaller scallops now account for a greater proportion of the harvest. These data also suggest that catch per unit of effort in traditional fishing grounds has decreased.

Limited age data suggest that the scallop stock historically exploited off west Kodiak Island experienced an age-structure shift from predominately age 7 and older scallops in the late 1960's to an age structure predominated by scallops less than age 6 during the early 1970's. This shift indicated that harvest amounts had exceeded sustainable levels. Changes in fleet distribution from historical fishing grounds primarily in State waters to previously unfished grounds in the EEZ compounded management concerns.

In response to these concerns, the ADF&G implemented a management plan for the scallop fishery in 1993-94 that established a total of nine fishery registration areas corresponding to the Southeastern, Yakutat, Prince William Sound, Cook Inlet, Kodiak, Alaska Peninsula, Dutch Harbor, Adak, and Bering Sea portions of the State. To prevent overfishing and maintain reproductive potential of scallop stocks, ADF&G established a guideline harvest range (GHR) for each of the traditional weathervane scallop fishing areas. In the absence of biomass estimates needed to implement an exploitation rate harvest strategy, the upper limit of the GHRs are specified as the long-term productivity (catch) from each of the traditional harvest areas. The ADF&G may adjust GHRs based on changes in stock status, such as shifts in population size/age structure coupled to changes in area-specific catch-per-unit-effort. If a GHR for a registration area is not specified, ADF&G may authorize fishing for weathervane or other scallop species under special use permits that generally include location and duration of harvests, gear limitations and other harvest procedures, periodic reporting or logbook requirements, requirements for onboard observers, and scallop catch or crab bycatch limits.

The ADF&G also has implemented king and Tanner crab bycatch limits to constrain the mortality of Tanner crab and king crab incidentally taken by scallop dredge gear. Generally, crab limits are set at 1 percent of total crab population for those management areas where crab stocks are healthy enough to support a commercial fishery. In areas closed to commercial fishing for crab, the crab bycatch limits for the scallop fishery are set at 0.5 percent of the total crab population.

[PLACEHOLDER: Table of CBLs]

Specified waters are closed to fishing for scallops to prevent scallop dredging in biologically critical habitat areas, such as locations of high bycatch of crab or nursery areas for young fish and shellfish. State regulations also require each vessel to carry an observer at all times to provide timely data for monitoring scallop catches relative to GHRs and for monitoring crab bycatch. Observers also collect scientific data on scallop catch rates, size distribution and age composition. This information is required by ADF&G for potential adjustment of GHRs based on changes in stock status and productivity.

Last, ADF&G regulations establish gear specifications to minimize the catch of undersized scallops and efficiency controls to reduce the economic feasibility of harvesting scallops much smaller than sizes associated with optimum yield. Current efficiency controls include a ban on automatic shucking machines and a crew limit of 12 persons.

4.3.2 Commercial Fishery

The weathervane scallop fishery is prosecuted with standard New Bedford style scallop dredges. On average, fully-rigged[1] dredges weigh the following: a 6ft dredge weighs between 900-1200 pounds (J. Barnhart, ADF&G pers. comm.); an 8ft dredge weights between 1500-1600 pounds (J. Barnhart, ADF&G, pers. comm.); and a 15ft dredge weighs between 3300-3500 pounds (Tom Minio, pers. comm.). The frame design provides a rigid, fixed dredge opening. Attached to and directly behind the frame is a steel ring bag consisting of 4-inch (inside diameter) rings connected with steel links. A sweep chain footrope is attached to the bottom of the mesh bag. The top of the bag consists of 6-inch stretched mesh polypropylene netting which helps hold the bag open while the dredge is towed along the ocean floor. A club stick attached to the end of the bag helps maintain the shape of the bag and provides for an attachment point to dump the dredge contents on deck. Steel dredge shoes that are welded onto the lower corners of the frame bear most of the dredge's weight and act as runners, permitting the dredge to move easily along the substrate. Each dredge is attached to the boat by a single steel wire cable operated from a deck winch.

All vessels fishing inside the Cook Inlet Registration Area are limited to a single dredge not more than 6 feet in width. Unless otherwise restricted by the LLP, vessels fishing in the remainder of the state may simultaneously operate a maximum of 2 dredges that are 15 feet or less in width. Vessels used in the weathervane scallop fishery range in size from 58 feet to 124 feet length overall with a maximum of 850 horsepower.

Federal LLP permits have been voluntarily consolidated by the fleet through an industry cooperative. Three larger vessels with LLP permits, including one limited by American Fisheries Act (AFA) sideboards, participate in the federal water portion of the fishery and harvest the majority of the scallop quota in the federal (statewide) fishery outside of Cook Inlet. Three smaller vessels with LLP permits participate primarily in the Cook Inlet fishery. Occasionally, one of the smaller vessels participates in the scallop fishery outside of Cook Inlet. Of all scallop vessels currently active in Alaska, only two are permitted to fish in state waters, and one is a small vessel that typically fishes in Cook Inlet, however as of July 1, 2004 one additional vessel is permitted to fish in state waters.

4.3.2.1 Voluntary Scallop Cooperative

In May 2000, six of the nine LLP owners formed the North Pacific Scallop Cooperative under authority of the Fishermen's Cooperative Marketing Act, 48 Stat. 1213 (1934), 15 U.S.C. Sec. 521. Cooperative operations are transparent to the managers of the fishery. The cooperative regulates individual vessel allocations within the GHR and caps under the terms of their cooperative contract. The purpose of the cooperative was to slow the race for fish enabling participants to develop better techniques for bycatch avoidance, as well as to improve efficiency in targeting scallops.

According to members of the cooperative, the cooperative members negotiate allocations of scallops and crab bycatch among members annually and enforce those allocations through provisions in the cooperative contract. Participants must stop fishing once they have reached either their scallop allowance or crab caps. The cooperative contract gives co-op members the authority to seek injunctive relief if a member fails to cease fishing once their allocation is met.

[1] Fully-rigged dredge ready to fish includes ring bag, club stick and attachments

According to cooperative members, some owners opted to remove their boats from the fishery due to decreased profitability in the scallop fishery in recent years. The catch history associated with those permits is then fished by the remaining vessels in the cooperative. Since formation of the cooperative, fewer vessels participate and fishing effort occurs over a longer time period each season.

4.3.3 Subsistence Fishery

There has been no known subsistence fishery for scallops.

4.3.4 Recreational Fishery

Anecdotal reports by ADF&G managers have indicated that some limited fishing for scallops by scuba divers in Southeast has occurred. Scallop dredges are legal personal use gear. Limited recreational harvest by longline fishermen, and by a personal use dredge in Prince William Sound has occurred.

4.4 Economic and Socioeconomic Characteristics

Table 12 shows the commercial catch, effort and value in the scallop fishery from 1967 to 2003. Vessel participation reached a high of 19 vessels in 1968-69, and since the LLP and the consolidation of permits with the voluntary co-op, participation of vessels has declined to 4 vessels in 2002/03 and 2 in 2003/04.

Average price per pound has been stable in the last three years, but has declined from a high of $6.50/lb in 1997 (Table 12). The total value of the fishery has also declined in the last ten years, from a high of approximately 9.6 million dollars in 1993 to 2.7 million dollars in 2003. Total landings in the fishery (Table 12) have declined from a high of 691.9 tons in 1993 to 239.7 tons in 2003.

4.5 Fishing Communities

Table 13 lists the landings (in number of offloads) of weathervane scallops by ports from 1990-2003. Ports range from Dutch Harbor in the Aleutian Islands, to Homer, Seward and Kodiak in South Central Alaska to Southeast communities of Yakutat, Sitka, Petersburg and Ketchikan. Communities outside of Alaska include Bellingham, WA and Seattle, WA.

Table 12: Historic commercial catch effort and value weathervane scallops 1967-2003

Year	Number of Vessels	Total (t)	Total Value (USD)
1967	2	0.352895	2486.757991
1968	19	760.7969	6252972.807
1969	19	839.1228	6606953.571
1970	7	653.3271	5784489.96
1971	5	420.0992	3740257.5
1972	5	529.3583	5007795.149
1973	5	503.2182	4671178.947
1974	3	228.8095	2095109.904
1975	4	196.4801	1788877.876
1976	7	120.106	1172737.939
1977	2	10.03393	115816.7539
1978	No Fishery		
1979	2	11.27451	158485.5046
1980	8	279.7385	4587151.24
1981	18	409.7554	6830661.626
1982	13	413.8105	5285131.462
1983	5	88.29458	1666575.342
1984	6	176.8182	2568810.544
1985	7	287.8868	4049001.595
1986	8	318.0226	4663154.538
1987	4	298.8071	3438287.746
1988	4	154.7069	1832317.664
1989	7	242.5647	2898505.336
1990	9	666.5688	6720655.107
1991	6	515.5759	5588158.533
1992	8	809.9686	8883498.844
1993	15	691.8984	9627047.733
1994	17	570.0465	8735295.846
1995	10	186.3101	2910834.039
1996	9	332.2223	5267432.877
1997	9	364.7082	5839418.436
1998	8	378.8911	5887654.626
1999	10	380.0977	5649750.539
2000	8	325.8856	4049740.71
2001	6	252.4882	2969881.25
2002	6	223.6508	2588591.25
2003	4	239.7343	2712361.437

[Placeholder: Information on individual communities to be added]

Table 13: Statewide weathervane scallop landings by port, 1990 through 2003
Landings are indicated by the number of offloads at a specific port.

Landed pounds ar															
Port	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Total Landings
Bellingham, WA													1	1	2
Cordova	1		6	1		1		1	1	1	8				19
Dutch Harbor	12	13	8	32	27	1		14	4	3	2	4	4	3	127
Homer	2			15	12	2	11	7	12	4	8	6	7	13	99
Kodiak	70	48	49	64	44	6	15	14	15	12	6	8	9	10	370
Ketchikan	1														1
Petersburg	2														2
Pelican				3											3
Seattle, WA												1	2		3
Seldovia														1	1
Seward	5		1	3	4	2	7	5	20	21	10	3			81
Sitka	8	24	15	6	2	2								1	58
Sand Point										1					1
Yakutat	22	16	34	3	5	3	4	6	10	3	3	12	7	2	130
At Sea												1	1	4	6
Total Landings	123	101	113	127	94	17	37	47	62	45	37	35	31	35	904

5.0 Relationship to Applicable Law and Other Fisheries

Under the Federal FMP initiated in 1995, all management measures, except limited access, are delegated to the State of Alaska. The FMP must also conform with all applicable federal laws, including NEPA, Magnuson-Stevens Act, EO 12866 and Regulatory Flexibility Act. ADF&G management of the weathervane scallop fishery covers both state and federal waters off Alaska.

6.0 Reference Material

6.1 Sources of Available Data

Additional sources of information on Scallop fisheries may be found on the following web sites:

National Marine Fisheries Service:

http://www.fakr.noaa.gov/sustainablefisheries/scallop/default.htm

North Pacific Fishery Management Council:

http://www.fakr.noaa.gov/npfmc/fmp/scallop/scallop.htm
Alaska Department of Fish and Game, Division of Commercial Fisheries:

http://www.cf.adfg.state.ak.us/geninfo/shellfsh/shelhome.php

6.2 Management & Enforcement Considerations

6.2.1 Cooperative Management of Statewide Weathervane Scallop Fisheries

This project is funded by a NOAA grant for the continued Cooperative management between the Council, NMFS, the BOF and ADF&G for the weathervane scallop fishery in the EEZ off Alaska under a federal FMP.

Federal support is provided to the state to cover additional costs incurred to meet federal oversight and FMP objectives. This includes management and reporting responsibilities required by the FMP. These additional requirements, beyond those required under a wholly state managed program, require additional staff to coordinate with Council and NMFS personnel, travel to public meetings, aid in FMP amendment analyses, provide information to assure public process, achievement of OY and meet compliance with federal laws. Alaska has developed a comprehensive system for managing the scallop fisheries both within state waters and the U.S. EEZ. This system represents the acquired expertise of numerous state employees across the management regions of the state. The benefits of cooperative management provides: 1) some financial relief to the state for incurred costs of federal compliance; 2) significant cost savings to the NMFS, which does not have to duplicate and develop an extensive new management program to meet FMP requirements needed if they were to assume management under the federal program; and 3) scallop fisheries managed to optimum yields.

Cost: $259,000 including indirect charges

6.2.2 Scallop Stock Assessment

Central Region. Cook Inlet and Prince William Sound weathervane scallop stock assessment.
Cost: $83,000 including indirect charges

Statewide. Three year rotating schedule between the Yakutat Registration Area, Kodiak Registration Area and Bering Sea Registration Area.
Cost: $72,000

6.2.3 Other Costs

Approximately 11 biologists and technicians, in three administrative regions of Alaska, whose Salaries, office space and associated costs are not covered in the Cooperative Management grant, are involved with some aspect of the weathervane scallop fishery. This includes briefing and debriefing onboard observers, management of the fishery, preparing for and attending Alaska Board of Fisheries meetings, and other duties.

6.2.4 Enforcement Costs

The primary purpose of the onboard scallop observer program is to collect biological and fishery-based data, monitor bycatch, and provide for regulatory enforcement. Beyond that, the Alaska State Troopers have been involved with enforcement activities involving scallop vessels. These activities range from routine inspections to case work.
Cost: The cost range is 1 man-hour to 35 man-hours per year.

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Appendix A History of the Alaska Scallop Fishery and FMP

The scallop resource off Alaska has been commercially exploited for almost 30 years. Weathervane scallop stocks off Alaska were first commercially explored by a few vessels in 1967. The fishery grew rapidly over the next 2 years with about 19 vessels harvesting almost 2 million pounds of shucked meat. Since then vessel participation and harvests have fluctuated greatly, but have remained below the peak participation and harvests experienced in the late 1960's. Between 1969 and 1991, about 40 percent of the annual scallop harvests came from State waters. Since 1991, Alaska scallop harvests have increasingly occurred in Federal waters. In 1994, only 14 percent of the 1.2 million lbs landed were harvested in State waters, with the remainder harvested in Federal waters off Alaska.

The State of Alaska has managed the scallop fishery in State and Federal waters, consistent with section 306(a)(3) of the Magnuson Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.) (Magnuson Act), which allows a state to directly regulate any fishing vessel outside state waters if the vessel is registered under the laws of that state. Until 1995, all vessels participating in the Alaska scallop fishery were registered under the laws of the State of Alaska and the fishery was monitored and controlled under State jurisdiction. The North Pacific Fishery Management Council (Council) concluded that the scallop management program implemented by the State provided sufficient conservation and management of the Alaska scallop resource and did not need to be duplicated by direct Federal regulation. Therefore, no Federal regulations were implemented to govern the scallop fishery in Federal waters.

The Council currently is considering options for a fishery management plan for the scallop fishery off Alaska that would authorize a moratorium on vessel entry into the fishery. A vessel moratorium cannot be implemented under Alaska State regulations given existing State statutes. At its April 1994 meeting, the Council requested NMFS to initiate rulemaking to implement a fishery management plan for the scallop fishery off Alaska that would establish a vessel moratorium and defer most other routine management measures to the State of Alaska. The Council was informed that section 306(a)(3) of the Magnuson Act prohibits a state from regulating a fishing vessel in Federal waters unless the vessel is registered under the laws of that state. As a result, routine management measures deferred to the State of Alaska under the Council's proposed management plan could not be applied in Federal waters to vessels not registered with the State. The Council recognized the potential problem of unregistered vessels fishing in Federal waters, but noted that all vessels fishing for scallops in Federal waters were registered under the laws of the State of Alaska. Therefore, the Council recommended that NMFS proceed with implementing the Council's proposed fishery management plan given that all vessels used to fish for scallops off Alaska had been registered with the State and that no information was available to indicate that vessels would not continue to register with the State.

During the period of time that NMFS was developing regulations to implement the Council's proposed management plan, the State of Alaska informed NMFS that a fishing vessel was fishing for scallops in Federal waters of the Prince William Sound management area closed by the State and that the vessel was not registered under the laws of the State. As a result, the vessel operator was not subject to State regulations governing the scallop fishery, including requirements to carry an observer at all times to monitor scallop catch and crab bycatch. The State could not stop this uncontrolled fishing activity because the vessel was not registered with the State of Alaska and was, therefore, operating outside the State's jurisdiction. On February 17, 1995, the Council held a teleconference to address concerns about uncontrolled fishing for scallops in Federal waters by one or more vessels fishing outside the jurisdiction of State regulations and requested that NMFS implement an emergency rule to close Federal waters to fishing for scallops to prevent overfishing of the scallop stocks. Subsequent to the Council's recommendation, the U.S. Coast Guard

boarded the vessel fishing for scallops outside the jurisdiction of the State and was informed that 54,000 lbs of shucked scallop meat was on board. This amount exceeded the State's guideline harvest level for the Prince William Sound area (50,000 lbs) by over 100 percent.

NMFS implemented the emergency rule to close Federal waters off Alaska to fishing for scallops on February 23, 1995 (60 FR 11054, March 1, 1995) to respond to concerns that continued uncontrolled harvest of scallops in Federal waters would result in localized overfishing of the scallop resource. At its February 17, 1995, teleconference, the Council recommended that NMFS should extend the emergency rule for a second 90-day period, through August 28, 1995.

Based on recent events in the scallop fishery that warranted the emergency interim rule, the Council's proposed management plan no longer is an appropriate option for the management of the scallop fishery in Federal waters. Recent participation in the scallop fishery by at least one vessel fishing outside the jurisdiction of the State, contemplation by other vessel owners to fish in Federal waters outside State regulations governing the scallop fishery, and the likelihood that uncontrolled fishing for scallops could occur anywhere off Alaska by the highly mobile scallop processor fleet now requires that Federal regulations be implemented to control scallop fishing activity by vessels that choose not to register with the State of Alaska.

To respond to the need for Federal management of the scallop fishery once the emergency rule expires, the Council prepared the Fishery Management Plan for the Scallop Fishery off Alaska (FMP) under section 304(c) of the Magnuson Act. The FMP originally authorized an interim closure of Federal waters to fishing for scallops. The intent of the FMP was to prevent an unregulated and uncontrolled fishery for scallops in Federal waters that could result in overfishing of scallop stocks during the period of time an alternative fishery management plan is prepared that would authorize fishing for scallops under a Federal management regime. The Council pursued this approach because it determined that the suite of alternative management measures necessary to support a controlled fishery for scallops in Federal waters could not prepared, reviewed, and implemented before the emergency rule expires. Instead, the Council prepared the proposed FMP to protect the long-term productivity of scallops stocks off Alaska necessary to support the future harvest of optimum yield on a continuing basis without the "boom and bust" syndrome that other scallop fisheries historically have portrayed.

Vessel Moratorium Program:

The vessel moratorium remained in effect until June 30, 2000. A vessel qualified for inclusion in the moratorium program if it made a legal landing of scallops during 1991, 1992 or 1993; or during at least 4 separate years from 1980 through 1990. The moratorium permit program was superceded by the scallop license limitation program.

Fishery

The weathervane scallop resource consists of multiple, discrete, self sustaining populations that are managed as separate stock units. Scallop stocks in Alaska have been managed under a federal fishery management plan (FMP) since 1995. The FMP controls the fishery through permits, registration areas and districts, seasons, closed waters, gear restrictions, efficiency limits, crab bycatch limits, scallop catch limits, inseason adjustments, and observer monitoring. Most of these regulations were developed by the State prior to 1995. Dredge size is limited to a maximum width of 15 feet, and only 2 dredges may be used at any one time. In the Kamishak District of Cook Inlet, only 1 dredge with a 6' maximum width is allowed. Dredges are

required to have rings with a 4" minimum inside diameter. To reduce incentives to harvest small scallops, crew size on scallop vessels is limited to 12 persons and all scallops must be manually shucked. Dredging is prohibited in areas designated as crab habitat protection areas, similar to the groundfish FMPs.

Since 1967, when the first landings were made, fishing effort and total scallop harvest (weight of shucked meats) have varied annually. Total commercial harvest of weathervane scallops has fluctuated from a high of 157 landings totaling 1,850,187 pounds of shucked meats by 19 vessels in 1969 to no landings in 1978. Prices and demand for scallops have remained high since fishery inception. Prior to 1990, about two-thirds of the scallop harvest has been taken off Kodiak Island and about one-third has come from the Yakutat area; other areas had made minor contributions to overall landings. Harvests in 1990 and 1991 were the highest on record since the early 1970s. The 1992 scallop harvest was even higher at 1,810,788 pounds. The increased harvests in the 1990s occurred with new exploitation in the Bering Sea.

Appendix B Geographical Coordinates of Areas Described in the FMP

B.1 Scallop Registration Areas

For the purpose of managing the scallop fishery, the FMP area is divided into nine scallop registration areas (Figure 4) composed of the Federal waters and adjacent State waters described in each area. These areas are identical to the State of Alaska scallop registration areas set out at 5 AAC 38.076(b). The Yakutat, Cook Inlet, and Kodiak Registration Areas are further divided into districts.

Registration Area A (Southeastern Alaska) has as its southern boundary the International Boundary at Dixon Entrance, and as its northern boundary Loran-C line 7960-Y-29590, which intersects the western tip of Cape Fairweather at 58° 47' 58" N. lat., 137° 56' 30" W. long., except for ADF&G District 16 defined as all waters north of a line projecting west from the southernmost tip of Cape Spencer and south of a line projecting southwest from the westernmost tip of Cape Fairweather.

Registration Area D (Yakutat) has as its western boundary the longitude of Cape Suckling (143° 53' W. long.), and as its southern boundary Loran-C line 7960-Y-29590, which intersects the western tip of Cape Fairweather at 58° 47' 58" N. lat., 137° 56' 30" W. long., and ADF&G District 16 defined as all waters all waters north of a line projecting west from the southernmost tip of Cape Spencer and south of a line projecting southwest from the westernmost tip of Cape Fairweather.

Registration Area E (Prince William Sound) has as its western boundary the longitude of Cape Fairfield (148° 50' W. long.), and its eastern boundary the longitude of Cape Suckling (143° 53' W. long.).

Registration Area H (Cook Inlet) has as its eastern boundary the longitude of Cape Fairfield (148° 50' W. long.) and its southern boundary the latitude of Cape Douglas (58° 52' N. lat.).

> Northern District: north of a line extending from Boulder Point at 60 46' 23" N. lat., to Shell Platform C, then to a point on the west shore at 60° 46' 23" N. lat.
>
> Central District: all waters between a line extending from Boulder Point at 60° 46' 23" N. lat., to Shell Platform C, to a point on the west shore at 60° 46' 23" N. lat., and the latitude of Anchor Point Light (59° 46' 12" N. lat.).
>
> Southern District: all waters enclosed by a line from Anchor Point Light west to 59° 46' 12" N. lat., 152° 20' W. long., then south to 59° 03' 25" N. lat., 152° 20' W. long., then in a northeasterly direction to the tip of Cape Elizabeth at 59° 09' 30" N. lat., 151° 53' W. long., then from the tip of Cape Elizabeth to the tip of Point Adam at 59° 15' 20" N. lat., 151° 58' 30" W. long.
>
> Kamishak Bay District: all waters enclosed by a line from 59° 46' 12" N. lat., 153° 00' 30" W. long., then east to 59° 46' 12" N. lat., 152° 20' W. long., then south to 59° 03' 25" N. lat., 152° 20' W. long., then southwesterly to Cape Douglas (58° 52' N. lat.). The seaward boundary of the Kamishak Bay District is three nautical miles seaward from the shoreline between a point on the west shore of Cook Inlet at approximately 59° 46' 12" N. lat., 153° 00' 30" W. long., and Cape Douglas at approximately 58° 52' N. lat., 153° 15' W. long., including a line three nautical miles seaward from the shorelines of Augustine Island and Shaw Island, and including the line demarking all state waters shown on National Oceanic and Atmospheric Administration nautical chart number 16640, 21st Ed., May 5, 1990.

Barren Island District: all waters enclosed by a line from Cape Douglas (58° 52' N. lat.) to the tip of Cape Elizabeth at 59° 09' 30" N. lat., 151° 53' W. long., then south to 58° 52' N. lat., 151° 53' W. long., then west to Cape Douglas.

Outer District: all waters enclosed by a line from the tip of Point Adam to the tip of Cape Elizabeth, then south to 58° 52' N. lat., 151° 53' W. long., then east to the longitude of Aligo Point (149° 44' 33" W. long.), then north to the tip of Aligo Point.

Eastern District: all waters east of the longitude of Aligo Point (149° 44' 33" W. long.), west of the longitude of Cape Fairfield (148° 50' W. long.), and north of 58° 52' N. lat.

Registration Area K (Kodiak) has as its northern boundary the latitude of Cape Douglas (58° 52' N lat.), and as its western boundary the longitude of Cape Kumlik (157° 27' W. long.).

Northeast District: all waters northeast of a line extending 168° from the easternmost tip of Cape Barnabas, east of a line from the northernmost tip of Inner Point to the southernmost tip of Afognak Point, east of 152° 30' in Shuyak Strait, and east of the longitude of the northernmost tip of Shuyak Island (152° 20' W. long.).

Southeast District: all waters southwest of a line extending 168° from the easternmost tip of Cape Barnabas and east of a line extending 222° from the southernmost tip of Cape Trinity.

Southwest District: all waters west of a line extending 222° from the southernmost tip of Cape Trinity, south of a line from the westernmost tip of Cape Ikolik to the southernmost tip of Cape Kilokak and east of the longitude of Cape Kilokak (156° 19' W. long.).

Semidi Island District: all waters west of 156° 19' W. long. at Cape Kilokak and east of the longitude of Cape Kumlik at 157° 27' W. long.

Shelikof District: all waters north of a line from the westernmost tip of Cape Ikolik to the southernmost tip of Cape Kilokak, west of a line from the northernmost tip of Inner Point to the southernmost tip of Afognak Point, west of 152° 30' W. long., in Shuyak Strait, and west of the longitude of the northernmost tip of Shuyak Island (152° 20' W. long.).

Registration Area M (Alaska Peninsula) has as its eastern boundary the longitude of Cape Kumlik (157° 27' W. long.), and its western boundary the longitude of Scotch Cap Light. The registration area also includes all waters of Bechevin Bay and Isanotski Strait south of a line from the easternmost tip of Chunak Point to the westernmost tip of Cape Krenitzen.

Registration Area O (Dutch Harbor) has as its northern boundary the latitude of Cape Sarichef (54° 36' N. lat.), as its eastern boundary the longitude of Scotch Cap Light, and as its western boundary 171° W. long., excluding the waters of Statistical Area Q.

Registration Area Q (Bristol Bay-Bering Sea) has as its southern boundary a line from Cape Sarichef (54° 36' N. lat.), to 54° 36' N. lat., 171° W. long., to 55° 30' N. lat., 171° W. long., to 55° 30' N. lat., 173° 30' E. long., as its northern boundary the latitude of Point Hope (68° 21' N. lat.).

Registration Area R (Adak) has as its eastern boundary 171° W. long., and as its northern boundary 55° 30' N. lat.

Appendix C Section 211 of AFA

American Fisheries Act (AFA) sideboard restrictions

On October 21, 1998, the President signed into law the American Fisheries Act (AFA) which mandated sweeping changes to the conservation and management program for the pollock fishery of the BSAI and to a lesser extent, affected the management programs for the other groundfish fisheries of the BSAI, the groundfish fisheries of the GOA, the king and Tanner crab fisheries of the BSAI, and the scallop fishery off Alaska. With respect to the fisheries off Alaska, the AFA requires a suite of new management measures that fall into four general categories: (1) regulations that limit access into the fishing and processing sectors of the BSAI pollock fishery and that allocate pollock to such sectors, (2) regulations governing the formation and operation of fishery cooperatives in the BSAI pollock fishery, (3) sideboard regulations to protect other fisheries from spillover effects from the AFA, and (4) regulations governing catch measurement and monitoring in the BSAI pollock fishery.

While the AFA primarily affects the management of the BSAI pollock fishery, the Council is also directed to develop and recommend harvesting and processing sideboard restrictions for AFA catcher vessels that are fishing for scallops in the EEZ off Alaska. Section 211 of the AFA addresses sideboard protections for other fisheries off Alaska and this entire section of the AFA is incorporated into he AFA by reference. Scallop harvesting sideboard restrictions that are consistent with Section 211 of the AFA will be implemented through regulation or provided to the Board of Fish as recommendations. Any measure recommended by the Council that supersedes Section 211 of the AFA must be implemented by FMP amendment in accordance with the provisions of Section 213 of the AFA and the Magnuson-Stevens Act.

> Limits on participation by AFA vessels. NMFS may issue regulations, as approved by the Council, which define the participation criteria for AFA vessels that wish to participate in the scallop fishery off Alaska.
>
> Harvest limitations for AFA Vessels. The Council may provide scallop harvesting sideboard recommendations to the Board of Fisheries. The State of Alaska, through the Board if Fisheries, may issue regulations to establish an allowable harvest percentage of the GHL by AFA eligible vessels in any scallop fishery, and to govern the in-season management of any sideboard harvest levels established for AFA eligible vessels.

Appendix D EFH

[PLACEHOLDER FOR EFH MAPS/DESCRIPTIONS]

Appendix G Required MSA provisions of FMPs

[PLACEHOLDER]

Appendix H Research Needs

[PLACEHOLDER: for discussion at Scallop Plan Team meeting]