STATE OF ALASKA
GROUNDFISH FISHERIES

ASSOCIATED INVESTIGATIONS IN 2005

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A. Agency Overview

1. Description of the State of Alaska commercial groundfish fishery program:

The Alaska Department of Fish and Game (ADF&G) has jurisdiction over all commercial groundfish fisheries within the internal waters of the state and to three miles offshore along the outer coast. A provision in the federal, Gulf of Alaska (GOA) Groundfish Fishery Management Plan (FMP) gives the State of Alaska limited management authority for demersal shelf rockfish in federal waters east of 140^{O} W. longitude. North Pacific Fisheries Management Council (NPFMC) action in 1997 removed black and blue rockfish from the Gulf of Alaska FMP thus the state manages these species in both state and federal waters (of the GOA). The state also manages the lingcod resource in both state and federal waters of Alaska. Other groundfish fisheries in Alaskan waters are managed by the federal government, or in conjunction with federal management of the adjacent Exclusive Economic Zone (EEZ). The information related in this report is from the state-managed groundfish fisheries only.

The State of Alaska is divided into three maritime regions for marine commercial fisheries management. The Southeast Region extends from the Exclusive Economic Zone (Equi-distant line) boundary in Dixon Entrance north and westward to 144^{o} W. longitude and includes all of Yakutat Bay (Appendix II). The Central Region includes the inside and outside Districts of Prince William Sound (PWS), Cook Inlet including the North Gulf District off Kenai Peninsula, and Bristol Bay. The Westward Region includes all territorial waters of the Gulf of Alaska south and west of Cape Douglas and includes North Pacific Ocean waters adjacent to Kodiak, and the Aleutian Islands as well as all U.S. territorial waters of the Bering, Beaufort, and Chukchi Seas.

a. Southeast Region

The **Southeast Region** Commercial Fisheries Groundfish Project is based in Sitka with the groundfish project leader, assistant project leader and a port biologist located there. Seasonal technicians and port samplers are employed in Petersburg, Sitka, and Douglas. The project also received biometrics assistance from the regional office in Douglas.

The Southeast Region's groundfish project has responsibility for research and management of all commercial groundfish resources in the territorial waters of the Eastern Gulf of Alaska as well as black and blue rockfishes and lingcod in the EEZ. The project cooperates with the federal government for management of the waters of the adjacent EEZ. The project leader participates as a member of the North Pacific Fisheries Management Council's Gulf of Alaska Groundfish Plan Team and produces the annual stock assessment for demersal shelf rockfish for consideration by the North Pacific Fishery Management Council.

Project activities center around fisheries monitoring, resource assessment, and in-season management of the groundfish resources. In-season management decisions are based on data collected from the fisheries and resource assessment surveys. Primary tasks include fish ticket collection, editing, and data entry for both state and federal-managed fisheries; dockside sampling of sablefish, lingcod, Pacific cod, and rockfish landings; and skipper interview and logbook collection and data entry. Three resource assessment surveys were conducted during 2005. Funding for the Southeast Groundfish project comes from NOAA Grants NA17FN2591, NA04NMF4070163, and NA04NMF4370176.

b. Central Region

Central Region groundfish staff is headquartered in Homer and is comprised of a regional groundfish management biologist, a regional shellfish/groundfish research project leader, a groundfish sampling coordinator, a groundfish fish ticket entry position, two marine research biologists, and one seasonal commercial catch sampler. An area management biologist and a seasonal commercial catch sampler are also located in Cordova and regional support comes from Anchorage. The research project leader also functions as a member of the North Pacific Fishery Management Council's Gulf of Alaska Groundfish Plan Team. The R/V *Pandalus*, home ported in Homer, and the R/V *Solstice,* home ported in Cordova, conduct a variety of groundfish-related activities in Central Region waters.

Groundfish responsibilities in Central Region include research and management of most groundfish species harvested in territorial waters of Central Region. Within Central Region, groundfish species of primary interest include sablefish, rockfish, pollock, Pacific cod, lingcod, sharks, and skates. Stock assessment data are collected through port sampling, and through ADF&G trawl, longline, jig, scuba, and remotely operated vehicle (ROV) surveys. Commercial harvest data (fish tickets) are processed in Homer for state and federal fisheries landings in Central Region ports.

c. Westward Region

The **Westward Region** Groundfish management and research staff is located in Kodiak and Dutch Harbor. Kodiak staff is comprised of a regional groundfish management biologist, an area groundfish management biologist, an assistant area groundfish management biologist, a groundfish research project leader, a groundfish research project assistant biologist, a groundfish dockside sampling coordinator, a seasonal age-determination unit biologist, two seasonal fish ticket processing technicians, and a seasonal dockside sampler. A full-time assistant area groundfish management biologist, a seasonal fish ticket processing technician, and a seasonal dockside sampler are located in the Dutch Harbor office. Seasonal dockside sampling also occurs in Chignik, Sand Point, King Cove, and Adak. The R/V *Resolution*, R/V *K-Hi-C*, and R/V *Instar* are home ported in Kodiak and conduct a variety of groundfish related activities in the waters around Kodiak, the south side of the Alaska Peninsula, and in the eastern Aleutian Islands.

Major groundfish activities include: fish ticket editing and entry for approximately 11,000 tickets from both state and federal fisheries, analysis of data collected on an annual multi-species trawl survey encompassing the waters adjacent to the Kodiak archipelago, Alaska Peninsula and Eastern Aleutians, management of black rockfish, state-waters Pacific cod, lingcod, and Aleutian Island state-waters sablefish fisheries, conducting dockside interview and biological data collections from commercial groundfish landings, and a number of research projects. In

addition, the Westward Region has a member on the North Pacific Fisheries Management Council's Bering Sea/Aleutian Island Groundfish Plan Team (Ivan Vining) and the Gulf of Alaska Groundfish Plan Team (Nick Sagalkin).

d. Headquarters

The Alaska Fisheries Information Network (AKFIN) project began in 1997 in response to the 1996 Magnuson-Stevens Act. The Alaska Department of Fish and Game (ADF&G) entered into a contract with the Pacific States Marine Fisheries Commission to expand data collection and management duties previously carried out under PACFIN. The purpose of the AKFIN program is to collect and make available the fishery catch information from Alaska's marine fisheries. This includes the major federal and state groundfish fisheries as well as the Bering Sea and Aleutian Island crab fisheries. The AKFIN project provides accurate and timely fishery data that has been essential for management, pursuant to the biological conservation, economic and social, and research and management objectives of the fishery management plans for groundfish and crab resources.

The Alaska Fisheries Information Network also:

1. Provides a forum for agencies to develop coordinated relational data/information systems encompassing State of Alaska and Federal fisheries data for use by fishery managers, associated agencies and the public.
2. Provides data management consultation and technical advice to participating agencies upon request.
3. Promotes the efficiency, effectiveness and timeliness of data acquisition and delivery with a minimum of duplication.
4. Maintains the AKFIN Support Center which conducts such projects set forth in the AKFIN work plan to insure that all available data are accessible to fishery managers, the North Pacific Fishery Management Council and its Plan Development Teams and Scientific and Statistical Committee, and each participating agency to meet respective fisheries management responsibilities.
5. Facilitates and support a comprehensive and coordinated program to collect, record, store, and make available social and economic data relating to fisheries and fishing communities.
6. Provides support for the acquisition, maintenance, and analysis of fishery dependent data (including but not limited to GIS-based fishing locations, otolith-based age determination, and port sampling) for inclusion in agency databases as appropriate.

The foundation of the state's AKFIN project is an extensive port sampling system for collection and editing fish ticket data from virtually all of the major ports of landing from Ketchikan to Adak and the Pribilof Islands, with major emphasis on Sitka, Homer, Kodiak, and Dutch Harbor. The port sampling program includes collection of harvest data, such as catch and effort, and also the collection of biological data on the fish and crab species landed, and age determination based on samples of age structures collected from landed catches. ADF&G personnel continued to collect, review, edit and amend, data capture, and archive all ADF&G fish tickets submitted to local offices. These fish tickets include those required as well as tickets voluntarily submitted by EEZ operators.

The state's AKFIN program is supported by a strong commitment to development and maintenance of a computer database system designed for efficient storage and retrieval of the

catch and production data on a wide area network. It supports the enhancement of the fish ticket information collection effort including; regional fishery monitoring and data management, GIS database development and fishery data analysis, catch and production database development and access, the age determination unit laboratory, database management and administration, Bering sea crab data collection and reporting, various fishery economic projects, and fisheries information services.

Local ADF&G personnel in nine locations throughout the state of Alaska (Craig, Ketchikan, Petersburg, Sitka, Juneau, Seward, Homer, Cordova, Kodiak, and Dutch Harbor) maintain close contact with fishers, processors and enforcement to maintain a high quality of accuracy in the submitted fish ticket records. Following processing, the data is electronically transferred to Headquarters. The research analyst working with this project works as part of a team to maintain a master statewide groundfish fish ticket database. Data feeds to Headquarters are merged to this master database. Data is routinely reviewed for accuracy with corrections applied as required. Within the confines of confidentiality agreements, raw data is distributed to the National Marine Fishery Service (both NMFS-ARO and NMFS-AFSC), the North Pacific Fishery Management Council (NPFMC), the Commercial Fisheries Entry Commission (CFEC), the Pacific States Fisheries Information Network (PACFIN) and the AKFIN Support Center on a regularly scheduled basis. Summary groundfish catch information is also provided back to regional ADF&G offices as well as to the State of Alaska Board of Fisheries, NMFS, NPFMC and the AKFIN Support Center (Contact Lee Hulbert).

Electronic Fish Ticket System (contact Gail Smith)

The Alaska Department of Fish and Game maintains a commercial harvest database, based on landing report receipts – fish tickets. These data are comprehensive for all commercial salmon, herring, shellfish, and groundfish from 1969 to present. Data is stored in an Oracle relational database and available to regional staff via the State of Alaska network.

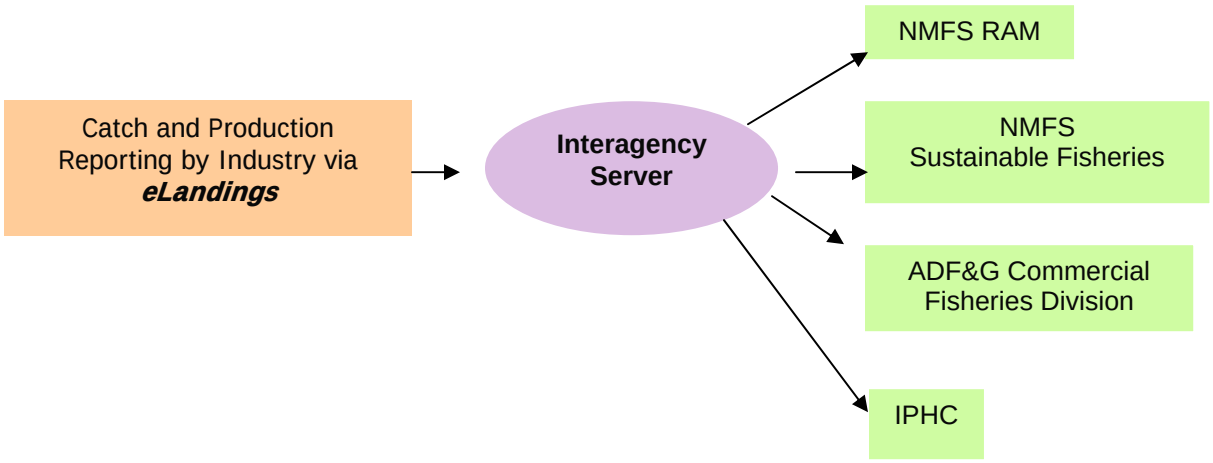
AKFIN funded ADF&G personnel are cooperating with an Interagency Steering Committee to develop and implement an online electronic catch and production reporting program for the rationalized crab fishery. The features implemented include electronic landing and production reports, real time quota monitoring, immediate data validation, and printable (.pdf) fish ticket reports. The goal is to move to statewide implementation of electronic reporting in all groundfish fisheries by January of 2006.

The three resource management agencies tasked with commercial fisheries management in Alaska are the Alaska Department of Fish and Game (ADF&G), the International Pacific Halibut Commission (IPHC), and the National Marine Fisheries Service – Alaska Region (NMFS-AK). Since 2001, these agencies have been working to develop consolidated landing, production, and IFQ reporting from a sole source. This collaborative effort, the Interagency Electronic Reporting System, was developed with funding provided through the Pacific States Marine Fisheries Commission. The web-based reporting component of this system is ***eLandings***. An additional application was developed, designed to be installed on local computers for the at-sea, catcher processor fleet.

The web-based application provides the seafood industry with the ability to submit landing reports (fish tickets), IFQ fisher/processor quota harvest, and processor production information

from a single location. The information submitted via the web application, ***eLandings***, is stored in a single repository database. The ADF&G, the IPHC, and the NMFS-AK copy data submitted by industry to their individual data systems.

DATA FLOW MODEL



This new commercial harvest reporting provides several benefits for fisheries management agencies and industry, when compared to current recordkeeping and reporting. The most obvious benefit is a sole source reporting site for landing and production data. Fisheries managers, individual processing facilities, and the parent company will have the ability to obtain landing report catch and production information immediately. Additional benefits include:

- Significant reduction of redundant reporting to management agencies.
- Immediate data validation when the landing, IFQ, or production report is submitted.
- Real time harvest data availability to management agencies.
- Staged reporting to accommodate the work flow of industry.
- Application function to allow processors to import or export the catch and production information they submit, facilitating one time data entry for processors.

The eLandings applications were deployed initially with the Rationalized Crab fisheries of the Bering Sea and Aleutian Islands. The implementation for statewide groundfish will begin on May 15, 2006.

Local ADF&G personnel in six locations throughout the state of Alaska (Petersburg, Sitka, Juneau, Homer, Kodiak and Dutch Harbor) maintain close contact with groundfish fishers, processors and state/federal enforcement to maintain a high quality of accuracy in the submitted fish ticket records. The Interagency Electronic Reporting System – eLandings applications, with immediate data validation and business rules, should continue to improve data quality and allow personnel to function at a higher level while review of submitted data.

Landing and production data are submitted to a central database, housed in Juneau, validated and reviewed, and pulled to the individual agency databases. Landing data is available to agency personnel within seconds of submission of the report. Printable documentation of the landing

report and the Individual Fishery Quota debit are created within the applications. Signed fish tickets will continue to be submitted to local offices of ADF&G for additional review and comparison to other data collection documents. These documents include vessel/fisher logbooks, agency observer datasets, and dockside interviews with skippers.

Within the confines of confidentiality agreements, raw data is distributed to the State of Alaska Commercial Fisheries Entry Commission (CFEC) daily and to the National Marine Fishery Service NMFS-ARO and AKFIN Support Center on a monthly schedule. The CFEC merges the ADF&G fish ticket data with fisher permit and vessel permit data. This dataset is then provided to the AKFIN Support Center, which distributes the data to the professional staff of the North Pacific Fishery Management Council (NPFMC) and summarized data to the Pacific States Fisheries Information Network (PACFIN). Summary groundfish catch information is also posted on the ADF&G Commercial Fisheries website: http://www.cf.adfg.state.ak.us/geninfo/finfish/grndfish/grndhome.php.
Summarized data is provided to the State of Alaska Board of Fisheries, the North Pacific Fisheries Management Council, and to the State of Alaska legislature as requested.

e. Gene Conservation Laboratory

The ADF&G Gene Conservation Laboratory continued studies on genetic diversity and gene flow for a variety of groundfish species in 2002. Efforts focused on black rockfish, light and dark dusky rockfish, and pollock (a list of *Sebastes* tissue samples stored at ADF&G's Gene Conservation Laboratory can be found in Appendix III).

f. Age Determination Unit (contact Kristine Munk)

The ADFG's centralized statewide age reading program at the Age Determination Unit (ADU) in Juneau continued to provide age data to ADFG regional managers in 2005. Age structures from approximately 8,882 groundfish, representing 14 species, were received through statewide commercial and survey harvest sampling efforts and 9,559 age data were released back to managers. Additional age data were produced through training and precision testing. A total of 16,047 otoliths were measured. The majority (74%) of funding for this project is through the Alaska Fisheries Information Network (federal), approximately 24% from the Fisheries Management Plan Early Jurisdiction (Project 15; federal), and ~1% of general funding (state) or outside contract. Seven people were employed for approximately 43 work months to age groundfish age structures or conduct associated work (sample preparation, data entry, archiving, otolith measurements, project work). Only one employee was full-time and funded year round. Other individuals were seasonal, employed for 1-11 months duration.

Quality of age data is routinely assessed through second-reading at least 15% of the sample, either by the initial-reader or by a reader with equal or greater experience. Species-specific control limits are imposed and further guide release of age data; transgression of control limits direct reviewing of some or the entire sample.

In 2005 the ADU was in production status for all species received. Effort continues toward increasing objective information (age structure measurements) to strengthen foundation of pattern interpretation for all species.

The ADU Oracle database AegIS, Age Information System, was used for simple importing and exporting of data throughout 2005. In late 2005, AegIS began a 3 phase redevelopment with the first of three phases being completed: reprogramming of the initial shell to increase user success and incorporating data validation. Phase II (early 2006) will completely rewrite AegIS in Java programming language, and, incorporate biological measurements such as fish and age structure dimensions. Phase III (late 2006?) will increase interactivity and automated reporting capability of AegIS. Programming work is conducted by 2 non-ADU personnel and funding sources. Limited refinements to the ADU website (http://tagotoweb.adfg.state.ak.us/ADU/) were made.

2. Description of the State of Alaska recreational groundfish fishery program (Sport Fish Division)

ADF&G has jurisdiction over all recreational groundfish fisheries within the internal waters of the state, in coastal waters out to three miles offshore, and throughout the EEZ. The Alaska Board of Fisheries extended existing state regulations governing the sport fishery for all marine species into the waters of the EEZ off Alaska in 1998. This was done under provisions of the Magnuson-Stevens Fishery Conservation and Management Act, which stipulate that states may regulate fisheries that are not regulated under a federal fishery management plan or other applicable federal regulations.

Most management and research efforts are directed at halibut, rockfish, and lingcod, the primary species targeted by the recreational fishery. Statewide data collection programs include an annual mail survey to estimate overall harvest (in number) of halibut, rockfish, lingcod, and sharks, and a mandatory logbook to assess harvest of the same species in the charterboat fishery. The Deputy Director of the Division of Sport Fish (Rob Bentz), located in Juneau, takes the statewide lead in federal-state jurisdictional management issues.

Regional programs with varying objectives address estimation of recreational fishery statistics including harvest and release magnitude and biological characteristics such as species, age, size, and sex composition. Research is funded through the Federal Aid in Sport Fish Restoration program and through a NOAA grant administered by NMFS. There are essentially two maritime regions for marine sport fishery management in Alaska. The Southeast Region extends from the Exclusive Economic Zone (Equi-distant line) boundary in Dixon Entrance north and westward to Cape Suckling, at approximately 144^{o} W. longitude. The Southcentral Region includes state and federal waters from Cape Suckling to Cape Newenham, including Prince William Sound (PWS), Cook Inlet, Kodiak, the Alaska Peninsula, the Aleutian Islands, and Bristol Bay.

a. Southeast Region Sport Fish

Regional staff in Douglas coordinates a data collection program for halibut and groundfish in conjunction with a region wide Chinook salmon harvest studies project. The project leader is Mike Jaenicke while assistant project biologists were also located in Ketchikan (Kathleen Wendt) and in Juneau (Diana Tersteeg). The project biometrician (Steve Fleischman) is located in Anchorage. A total of 21 technicians work at the major ports in the Southeast region, where they interview both anglers and charter operators and then collect data from sport harvests of halibut and groundfish while also collecting data on sport harvests of salmon. Data collected on groundfish are limited to species composition, length of halibut and lingcod, and sex of lingcod; no otoliths or other age structures are collected. Data are provided to the Alaska Board of

Fisheries, other ADF&G staff, the public, and a variety of other agencies such as the NPFMC and the IPHC.

Area management biologists in Yakutat, Haines, Sitka, Juneau, Petersburg, Klawock, and Ketchikan are responsible for groundfish management in those local areas. In general, sport fisheries for groundfish are not actively managed inseason.

b. Southcentral Region Sport Fish

The **Southcentral Region** groundfish staff consisted of the area management biologists and assistants for the following areas: (1) PWS and the North Gulf areas, (2) Lower Cook Inlet, and (3) Kodiak, Alaska Peninsula, and the Aleutian Islands. In addition, a region-wide harvest assessment project was based in the Homer office, consisting of a project leader, field supervisor, and six technicians. The research project biometrician was located in Anchorage. Ongoing assessment of sport harvest and fishery characteristics at major ports throughout the region is the primary activity. Data are collected from harvested halibut, rockfishes, lingcod, and sharks, and anglers and charter boat operators are interviewed for fishery performance information. All age reading is done in Homer, and the staff are active participants in the Committee of Age Reading Experts (CARE). Seasonal technicians collected data from the sport harvest at seven major ports in the region, and two of them read all rockfish and lingcod age structures. Halibut otoliths were collected from the harvest and will be forwarded to the International Pacific Halibut Commission for age reading.

Southcentral region staff is responsible for management of groundfish fisheries in state and federal waters. For all species, the lack of stock assessment information has precluded development of abundance-based fishery objectives. As a result, management is based on building a regulatory framework specifying bag and possession limits, seasons, and methods and means that provides for sustained yield over the long term. Inseason management action has generally been unnecessary, but increasing harvests of some species will eventually necessitate development of a well-defined harvest strategy.

Typical duties also include providing sport halibut harvest statistics to the International Pacific Halibut Commission (IPHC) and NPFMC, assisting in development and analysis of the statewide charter logbook program and statewide harvest survey, working with Alaska Board of Fisheries, advisory committees, and local fishing groups to develop local area management plans (LAMPs), drafting and reviewing proposals for recreational groundfish regulations, and dissemination of information to the public.

B. By Species

1. Pacific cod

Catch rate and biological information is gathered from fish ticket records, port sampling programs, a tagging program, and during stock assessment surveys for other species. A mandatory logbook program was initiated in 1997 for the state waters of Southeast Alaska. Commercial landings in Southeast, Central Region and the Westward Region are sampled for length, weight, age, sex, and stage of maturity.

a. Research

The **Westward Region** has continued the cod-tagging program that was initiated in 1997 in the Central and Western Gulf of Alaska. Approximately 350 fish were tagged in 2005, bringing the total number of tags released to 13,150. By year's end, 713 tags had been recovered, 518 of them with useable recovery location information. Results to date show that while the vast majority of Pacific cod are recovered within 15 km of their tagging location, much longer recapture distances are possible. Several fish were recaptured more than 500 km from their tagging location. The relatively small number of long distance recaptures show movement of cod is occurring from the Shumagin Islands into the Bering Sea, the Alaska Peninsula to Kodiak waters, and several fish tagged in Kodiak waters were recovered in Southeast Alaska.

b. Stock Assessment

No stock assessment programs were active for Pacific cod during 2004.

c. Management

Regulations adopted by the Alaska Board of Fisheries during November 1993 established a guideline harvest range (GHR) of 340 to 567 mt for Pacific cod in the internal waters of **Southeast Alaska**. The GHR was based on average historic harvest levels rather than on a biomass-based ABC estimate. Pacific cod along the outer coast are managed in conjunction with the Total Allowable Catch (TAC) levels set by the federal government for the adjacent EEZ.

In 1996, the Alaska Board of Fisheries adopted Pacific cod Management Plans for fisheries in 5 groundfish areas, **Prince William Sound**, Cook Inlet, Kodiak, Chignik and South Alaska Peninsula. The plans did not restrict participation to vessels qualified under the federal moratorium program. Included within the plans were season, gear and harvest specifications. Fishing seasons begin seven days after the close of the initial federal season in all areas except Cook Inlet, which begins 24 hours after the closure and Chignik, which has a regulatory opening date of March 1. The BOF restricted the state waters fisheries to pot or jig gear in an effort to minimize halibut bycatch and avoid the need to require onboard observers in the fishery. The guideline harvest levels (GHL) are allocated by gear type. The annual GHL's are based on the estimate of allowable biological catch (ABC) of Pacific cod as established by the NPFMC. Current GHL's are set at 25% of the Western Gulf ABC to be reserved for the South Alaska Peninsula Area, 25% of the Central Gulf ABC to be apportioned between the Kodiak, Chignik and Cook Inlet Areas and 25% of the Eastern Gulf ABC for the Prince William Sound Area. Action by the BOF in 2004 reduced the GHL in Prince William Sound to 10% of the Eastern Gulf ABC with a provision to increase subsequent GHLs to 25% if the GHL is achieved in a year.

Additional regulations include a 58' vessel size limit in the Chignik and South Alaska Peninsula Areas and allocations between gear types in Kodiak, Cook Inlet and Prince William Sound. The fishery management plans also provided for removal of restrictions on exclusive area registrations, vessel size and gear limits after October 31 to increase late season production to promote achievement of the GHL.

Efforts have increased to collect biological data through port sampling. In addition, observers are used on day-trips to document catches and at-sea discards in the nearshore pot fisheries.

There is no bag, possession, or size limit for Pacific cod in the recreational fisheries in Alaska. Pacific cod harvest and release information is not collected in the creel surveys and port sampling of the recreational fisheries in Southcentral or Southeast Alaska.

d. Fisheries

Most of the Pacific cod harvested in Southeast Alaska are taken by longline gear in NSEI during the winter months. Pots have been the dominant gear in both the Cook Inlet and Prince William Sound areas. Overall Pacific cod harvest from the Cook Inlet and PWS areas during the parallel season has declined in recent years. In the Westward Region, trawl gear takes over 60% of the harvest, with the remainder split between longline, jig, and pot gear. Prior to 1993 much of the cod taken in Southeast was utilized as bait in fisheries for other species. Pacific cod harvested since that time is roughly evenly divided between bait use and human consumption. In other areas of the state, Pacific cod are harvested in both state and federal waters and utilized primarily as food fish. Harvests of Pacific cod totaled 213 mt in the Southeast state-managed fishery during 2005, up slightly from the 2004 catch. The 2005 GHL's for the state-managed Pacific cod seasons in the **Central** Region were set at 1,243 mt and 407 mt, respectively. Due to the low number of vessels making landings from the PWS Area in 2005 harvest figures remain confidential. Harvest from the Cook Inlet Area state-managed Pacific cod fishery totaled 1,052 mt. Harvest from the 2005 state managed fishery in the Kodiak Area totaled 3,877 mt, while 2,625 mt of cod were harvested in the Chignik Area, and the South Alaska Peninsula Area harvest totaled 5,192 mt. The Kodiak and South Alaska Peninsula Areas obtained their maximum GHL 'step up' provisions for 2000 and all subsequent years. The Kodiak Area will receive 12.5% of the Central Gulf ABC and the South Alaska Peninsula will receive 25% of the Western Gulf ABC in all future years. The Chignik Area achieved its maximum GHL 'step' up in 2003. The Chignik Area will receive 8.75% of the Central Gulf ABC in 2004 and all future years. Action by the Alaska Board of Fisheries during 2004 increased the Pacific cod allocation in the Cook Inlet Area from 3% to 3.75% of the Central Gulf ABC, the maximum allowed under regulation.

2. Rockfishes

Rockfishes are managed under three assemblages: demersal shelf (DSR), pelagic shelf (PSR), and slope rockfish. Demersal Shelf Rockfish include the following species: yelloweye, quillback, china, copper, rosethorn, canary, and tiger. Pelagic shelf rockfish (PSR) include black, blue, dusky, yellowtail, and widow. Black and blue rockfish were removed from the PSR assemblage in the federal fisheries management plan and placed totally under state management in 1998. Slope rockfish contain all other *Sebastes* and *Sebastolobus* species.

a. Research

Detecting spatial structure in the genetic variation of some marine fishes is challenging as populations are often closely related through high gene flow and the relationships between populations may change over years. However, recent advances in molecular markers provide a large array of potentially valuable approaches to address these questions. The Alaska Department of Fish and Game Gene Conservation Laboratory is currently conducting studies of spatial and temporal variation in black rockfishes using analyses of microsatellite DNA.

Studies of black rockfish are investigating the spatial structure throughout the range of the species from the Pacific Northwest through the Bering Sea. Sample collection efforts were largely completed in 2001. Sites range from Oregon through the Alaska Peninsula. Ten

individual collections were analyzed for eight microsatellite loci derived from black and quillback rockfishes. Loci were highly variable with an average heterozygosity of 0.748. Preliminary statistical analyses indicate small but significant differences among collections. F_{st} values by locus varied from 0.001 to 0.020. A manuscript and final report are in preparation (Contact Lisa Seeb).

In the **Southeast Region** port sampling and the mandatory logbook program for rockfish fisheries continued in 2005. The logbook and interview programs are designed to furnish detailed catch and effort information, to estimate at-sea discards, and to obtain more detailed information regarding specific harvest location. The port-sampling program provides species composition from the landed catch and an opportunity to collect biological samples. Otoliths were obtained from principal demersal shelf rockfish species and black rockfish and sent to the age-reading laboratory in Juneau for age determination. Data from these programs is entered into a regional database. Closures in the 2005 directed fishery for demersal shelf rockfish in CSEO and SSEO significantly reduced the sampling opportunity for these species. In 2005, 459 yelloweye and 63 black rockfish were sampled for age, weight, length, sex, and maturity (Contact Mike Vaughn).

Rockfish habitat mapping projects continue in the Southeast Region. The objective of this project is to continue a bottom-mapping project of the Eastern Gulf of Alaska to provide detail on habitat characterization in this important fishing ground. To date ADF&G has mapped approximately 2100 km^2 of seafloor. This represents over 7% of the total habitat inside the 100-fm contour along the outer coast of Southeast. More importantly, over 980 km^2 of rocky habitat has been mapped, approximately 32% of what is estimated to occur. The goals of this project are to: Produce a GIS compatible sun-illuminated multibeam mosaic of these areas complete with bathymetric contour mosaics and a geological habitat interpretation of the mosaics. Quantification of rockfish habitat based on the geological interpretation of multibeam data is subcontracted to Moss Landing Marine Laboratories.

Beginning in 2004 we contracted Fugro Pelagos to post process multibeam data that was collected by NOAA for the purpose of updating the nautical charts for the areas close to Sitka Sound. Our hope is that data collected by NOAA will be useful to us and save us the cost of mobilizing surveys of our own. The NOAA survey Fugro Pelagos is post processing is from the south end of Kruzof Island and approximately half of it was collected in a manner that will result in maps that will be useful for the delineation of rocky habitat in that area.

Skipper interviews and port sampling of commercial rockfish deliveries in **Central Region** during 2005 occurred in Homer, Seward, Whittier, Anchorage and Cordova. Efforts during the first half of the year primarily sampled rockfish delivered as bycatch in other groundfish fisheries, primarily slope and demersal shelf species. During the last half of the year, sampling focused primarily on the directed jig fishery that targets pelagic rockfish. Additional sampling occurred during the Cook Inlet and PWS trawl and sablefish longline surveys. Sample data collected included date and location of harvest, species, length, weight, sex, and gonad condition. Otoliths were collected from most sampled fish. Homer office staff determined ages of pelagic and demersal rockfish otoliths. Otoliths from all other rockfish species were sent to the Age Determination Unit (Contact Willy Dunne).

In 2000, **Central Region** staff initiated a three-year project to evaluate sampling approaches for estimating black rockfish (*Sebastes melanops*) abundance in specific nearshore habitats of Southcentral Alaska along the Northern Gulf of Alaska. Harvest guidelines are currently based on long-term harvest levels of all rockfish species in aggregate and have not been established to reflect changes either in the abundance of individual species or in fishing patterns. Black rockfish comprise the largest component of state waters rockfish harvest along the northern Gulf of Alaska. This project attempts to use in-situ scuba diver observations and mark-recapture to obtain black rockfish abundance and density estimates and will assess the use of these and other methods as indices of relative abundance. In addition, protocols are being developed for diver observations of habitat type to aid in elucidating black rockfish habitat associations. A second project initiated in 2001 involves the use of an ROV for the purpose of habitat and stock assessment of a variety of marine species, including rockfish. This three-year project will focus on equipment purchase and the development of proficiency with the ROV (Contact Ken Goldman).

The **Westward Region** continued its port sampling of the commercial rockfish and Pacific cod harvests in 2004. Rockfish sampling consisted mainly of black rockfish with opportunistic sampling of light duskies, dark duskies, and other miscellaneous *Sebastes* species. Skippers were interviewed for information on effort, location, and bycatch. Length, weight, gonadal maturity, and otolith samples were collected (contact Kally Spalinger or Carrie Worton). Staff from the Kodiak office have completed aging black rockfish otoliths through the 2005 season while a number of Pacific cod ototlihs remain to be read.

The Westward Region also continued several studies on Western Gulf of Alaska black rockfish. Monthly gonad collections continued through June 2005 in an effort to determine reproductive seasonality and size of maturity. This completed the collections for that project and the results are being compiled. In addition, monthly samples were started for dark rockfish from both male and female fish. Beach seining was conducted in August and September in the Kodiak area to collect juvenile black rockfish and determine their habitat preferences and early life history parameters (Contact Carrie Worton).

The **Division of Sport Fish—Southeast Region** continued to collect catch and harvest data from rockfish as part of a marine harvest onsite survey program with rockfish harvests tabulated back to 1978 in some selected ports. Data collected in the program include statistics on effort, catch, and harvest of the primary rockfish species commonly taken by Southeast Alaska anglers. Ports sampled in 2005 included Juneau, Sitka, Craig/Klawock, Wrangell, Petersburg, Gustavus, Elfin Cove, Ketchikan, and Yakutat. Primary species harvested in Southeast Alaska included yelloweye, black, and quillback rockfish (Contact Mike Jaenicke).

The **Division of Sport Fish—Southcentral Region** continued collection of harvest and fishery information on rockfish as part of the harvest assessment program. Rockfish objectives included estimation of 1) species composition, 2) age, sex, and length composition, and 3) the geographic distribution of harvest by the fleets by port. Approximately 2,284 rockfish were sampled at Seward, Valdez, Whittier, Kodiak, and Homer in 2005 (Contact Scott Meyer).

b. Stock Assessment

The **Southeast Region** uses line-transect methods, conducted from the submersible "Delta", to collect density estimates of yelloweye rockfish. Biomass is the product of density, average weight, and area of rock habitat.

New density surveys were conducted during 2005 in SSEO. Yelloweye rockfish density for this stock assessment is based on the last best estimate by management area. The EYKT and CSEO areas were last surveyed in 2003 and NSEO was surveyed in 2001. Density estimates by area range from 1,420 to 3,557 adult yelloweye per km^2 . The density estimate for SSEO in 2005 was 2,196 adult yelloweye/km^2 (CV=17.16%). This is higher than the previous estimate obtained in 1999 of 1,879 adult yelloweye/km^2 (CV=17.11%), however the difference is not significant. The model is a hazard rate model with 11 cutpoints ending at a width of 28 ft (Contact Tory O'Connell).

In the **Southeast Region** no black rockfish surveys were conducted in 2005.

Beginning in 2000, **Central Region** groundfish staff initiated a three-year project designed to develop and implement a sampling approach for estimating black rockfish abundance in specific nearshore habitats of Southcentral Alaska along the Northern Gulf of Alaska. Harvest guidelines are currently based on long-term harvest patterns of all rockfish species in aggregate and have not been established to reflect changes either in the abundance of individual species or in fishing patterns. Black rockfish comprises the largest component of rockfish harvests along the northern Gulf of Alaska. This project used tagging and SCUBA to explore habitat-based assessment of black rockfish. In 2004, an additional project with funding for two seasons began, this project compares scuba and acoustic-based rockfish indices to catch indices from a commercial jig vessel. Rockfish are also tagged during these cruises (Contact Ken Goldman).

In the **Westward Region** hydroacoustic equipment was deployed in a preliminary effort at stock assessment of black rockfish. Surveyed areas included the eastern Aleutians and Shumagin Islands. The **Westward Region** also coordinated with the **Central Region** in a project using divers, jig machines, and hydroacoustics to develop protocols for the surveying of black rockfish (Contact Dan Urban or Mike Byerly).

c. Management

Management of DSR is based upon a combination of guideline harvest ranges, seasons, gear restrictions, and trip limits. The state has management authority for demersal shelf rockfish in both state and federal waters of **Southeast Alaska**.

Directed harvest of demersal shelf rockfish is restricted to hook-and-line gear. Directed fishing quotas are set for the 4 outside water management areas (SEO) individually and are based on the poundage remaining after assigning a 2% harvest rate to the adult yelloweye biomass estimate and estimating bycatch (reported and nonreported) mortality. Directed fishery quotas for the two internal water management areas are set at 25 mt annually. Regulations adopted in 1994 include trip limits (within any 5 day period) of 6,000 pounds per vessel (12,000 pounds in EYKT), and added a requirement that logbook pages must be submitted with fish tickets for each fishing trip. The directed DSR fishery quota is now allocated with 2/3 of the quota apportioned to the January 1- March 15 season and 1/3 of the quota apportioned to the November 16- December 31 season. The 2005 TAC for DSR in SEO was 410 mt. A significant portion of the total harvest is taken as

bycatch mortality during the halibut fishery, estimated at 328 mt for 2005. In 2005 the directed DSR fishery in SEO was opened in the EYKT area only. The CSEO and SSEO fisheries were not opened in 2005. Prior to 2005, sport fish catch data was not available for DSR and had not been considered in estimating total mortality. In late fall of 2004, the 2003 sport fish data was tabulated and it was determined that the combined harvest of DSR in the halibut fishery, directed commercial fishery, and the sport fish fishery would result in over-harvest in the SSEO and CSEO areas. The directed commercial fishery was closed in these two areas (Contact Tory O'Connell).

Management of black rockfish is based upon a combination of guideline harvest limits and gear restrictions. The state has management authority for black rockfish in both state and federal waters of Southeast Alaska. Directed fishery guideline harvest limits are set by management area, and range from 11.3 mt in IBS to 57 mt in SSEO, totaling 136 mt. A series of open and closed areas was also created so managers could better understand the effect a directed fishery has on black rockfish stocks. Halibut and groundfish fishermen are required to retain and report all black rockfish caught. The directed fishery for black rockfish had very little participation in 2005, with less than 5 mt landed in directed and bycatch fisheries combined.

Shortspine thornyhead, shortraker rockfish, rougheye rockfish and redbanded rockfish may be taken as bycatch only (no directed fishing). A total of 117 mt of slope rockfish were landed in NSEI and SSEI during 2005.

Rockfish in **Central Region's** Cook Inlet and PWS Areas are managed under their respective Rockfish Management Plans. Plan elements include a fishery GHL of 68 mt for each area and 5-day trip limits of 0.5 mt in the Cook Inlet District, 1.8 mt in the North Gulf District, and 1.4 mt in PWS. Rockfish regulations underwent significant change beginning in 1996 when the Alaska Board of Fisheries formalized the GHL into a 68 mt harvest cap for all rockfish species in Cook Inlet and PWS and a 5% rockfish bycatch limit for jig gear during the state waters Pacific cod season. In 1998 the board adopted a directed rockfish season opening date of July 1 for the Cook Inlet Area and restricted legal gear to jigs, primarily because the fishery typically targets pelagic rockfish species. At the spring 2000 meeting, the board closed directed rockfish fishing in the PWS area and established a bycatch-only fishery with mandatory full retention of all incidentally harvested rockfish. In November 2004 the board also adopted a full retention requirement for rockfish in the Cook Inlet Area and restricted the directed harvest to pelagic shelf rockfish. Rockfish bycatch levels were also set at 20% during sablefish and 10% during other directed fisheries. Proceeds from rockfish landed in excess of allowable bycatch levels are surrendered to the State of Alaska. (Contact Charlie Trowbridge)

The **Westward Region** has attempted to conservatively manage black rockfish since 1997, when management control was relinquished to the State of Alaska. Area guideline harvest levels were set at 75% of the average production from 1978-1995 and sections were created to further distribute effort and thereby lessen the potential for localized depletion. Since 1997, section GHL's have been reduced in some areas that have received large amounts of effort.

In the Kodiak Area, vessels may not possess or land more than 5,000 pounds of black rockfish in a 5-day period. Additionally, vessel operators are required to register for a single groundfish fishery at a time. A registration requirement also exists for the Chingik Area; that area was also designated as super-exclusive for the black rockfish fishery beginning in 2003.

In 2005, 102 mt of black rockfish were harvested from six sections in the Kodiak Area. Effort and harvest decreased in 2005 compared to 2004. Guideline harvest levels were attained in four sections. The 2005 black rockfish harvest in the Chignik Area totaled 22 mt and totaled 26 mt in the South Alaska Peninsula Area. The staff of the Westward region is currently seeking an economically feasible and statistically valid means to conduct stock assessments on the rockfish resources of the region. A voluntary logbook program was initiated in 2000 in the hope of obtaining CPUE estimates as well as more detailed harvest locations; the logbook program was made mandatory in 2005. (Contact: Nick Sagalkin).

State wide, the majority of sport caught rockfish are taken incidental to recreational fisheries for halibut or while trolling for salmon. In **Southeast Alaska, sport** bag limits consist of 5 pelagic rockfish and 5 non-pelagic rockfish per day of which only 2 may be yelloweye rockfish. In addition, bag limits in areas near Ketchikan and Sitka are limited to 3 non-pelagic rockfish, only 1 of which may be a yelloweye rockfish (Contact Mike Jaenicke).

In most of the fisheries in **Southcentral Alaska**, bag limits in most areas have been designed to discourage targeting of rockfish yet allow for retention of incidental harvest. Bag limits in Prince William Sound, the North Gulf, and Cook Inlet are five rockfish daily, with no more than one or two being non-pelagic (DSR and slope) rockfish. The Alaska Board of Fisheries has allowed a 10-rockfish bag limit in the Kodiak and Alaska Peninsula areas because of lower levels of effort and predominance of pelagic species in the catch.

Given the lack of quantitative stock assessment information for much of Alaska, sport fish managers have established conservative harvest strategies for recreational rockfish fisheries. Recreational seasons and bag and possession limits for rockfish in Alaska are among the most restrictive on the West Coast.

d. Fisheries

Reported harvest of rockfishes, from commercial fisheries in **Southeast,** totaled 809 mt in 2004, 198 mt of which was the directed DSR fishery and 17 mt the directed black rockfish fishery. The majority (23%) of the remaining rockfish taken in the Southeast district were DSR bycatch made in conjunction with the IFQ halibut fishery. All rockfish harvested in state-managed fisheries in Southeast is taken by hook-and-line gear either in directed fisheries or incidental to fisheries for other species.

The 2005 **Cook Inlet Area** directed rockfish fishery opened July 1 and closed December 31 with a total harvest of 30 mt, primarily pelagic rockfish. This was the sixth year that the jig-only gear restriction was in place. Total rockfish harvest for the PWS Area rockfish bycatch-only fishery was 27 mt. This included a 3.8 mt incidental catch of slope rockfish from the walleye pollock trawl fishery and a 22.9 mt incidental harvest of demersal and slope rockfish from the sablefish and halibut longline fisheries.

Estimates of **sport harvest** are obtained by three methods – the Statewide Harvest Survey (SWHS), charter vessel logbooks, and, in major ports, creel survey dockside sampling. Harvest reporting areas for these programs are different than commercial reporting areas making direct comparisons difficult. Additionally, species-specific data is available only from creel surveys.

The SWHS reports harvest for the general category of "rockfish", and the charter vessel logbook records rockfish harvest in two categories: "non-pelagic" and "pelagic". DSR are part of the "non-pelagic" category. Recreational rockfish harvest is typically estimated in numbers of fish. Estimates of the 2005 harvest are not yet available from the statewide harvest survey, but the 2004 estimates were 87,700 fish in Southeast and 92,500 fish in Southcentral Alaska. There were historic highs for each region. The average estimated annual harvest for the most recent five-year period (200-2004) was 63,900 rockfish (all species) in Southeast Alaska and 69,600 fish in Southcentral Alaska.

Creel survey data for Sitka indicates that 12,847 individual yelloweye (approximately 36 mt) were retained by anglers in an area roughly equivalent to the CSEO in 2005. This is a 43% increase in the harvest of yelloweye since 2001. Creel and SWHS data for SWHS Area B (Prince of Wales Island) indicates that 4,000 yelloweye (approximately 13 mt) were retained in 2004. This area includes the SSEO and a portion of the SSEI. Given the restrictive bag limit for yelloweye (1 or 2 depending on area) it is likely that these numbers underestimate total sportfish induced mortality. These numbers do not include harvest of other species of DSR.

3. Sablefish

a. Research

In 2005, sablefish longline surveys were conducted for the NSEI area. These surveys are designed to measure trends in relative abundance and biological characteristics of the sablefish population. Biological data collected in these surveys include length, weight, sex and maturity stage. Otoliths are collected and sent to the ADF&G age determination unit in Juneau for age reading. The cost of these surveys is offset by the sale of the fish landed. Because of a restriction on testfish revenues in FY05 the longline survey for SSEI had to be canceled for 2005.

In the NSEI survey, the 2005 overall CPUE (kg/hook) was 1.09, up slightly from 2004 (0.96) and similar to 2003 (1.09). Thornyhead rockfish dominated the bycatch in all areas except the northern-most statistical area.

The on-going mandatory logbook program in the sablefish fisheries provides catch and effort data by date, location, and set. In the SSEI sablefish fishery, overall CPUE (adjusted for hook spacing) increased in 2005 to 0.24 kg lbs./hook compared to 0.18 rd. kg/hook in 2004. The lack of longline survey removals in 2005 may have had a positive effect on CPUE. In the NSEI fishery, the overall CPUE adjusted for hook spacing, in round kg/hook for vessels, was 0.32, identical to 2004.

In 2005, ADF&G continued a mark/recapture study in NSEI, tagging and releasing 7,119 sablefish using pot gear to capture the fish 1.5 months prior to the start of the fishery (August 15, 2005). Fish were caught with pot gear to minimize the apparent "hook shyness" pattern of tag returns observed in 1997, 1998 and 1999 when longline gear was use to catch fish for tagging.

Within **Central Region,** ADF&G initiated a limited mark-recapture study in 1999 within PWS using the biennial bottom trawl survey as the capture vehicle. Tagging was continued in the 2003 PWS bottom trawl survey. Fewer than ten tagged fish have been recovered to date (Contact Ken Goldman).

Skipper interviews and port sampling occurred in Whittier, Cordova and Seward for the PWS Area fishery and in Seward and Homer for the Cook Inlet Area fishery. Data obtained included date and location of harvest, length, weight, sex, and gonad condition. Otoliths were removed and sent to the Age Determination Unit (Contact Willy Dunne).

b. Stock Assessment

In **Southeast**, the department is using mark-recapture methods with tags and fin clips to estimate abundance and exploitation rates for sablefish in the NSEI Subdistrict. Sablefish are captured with pot gear in mid-summer, marked with a tag and a fin clip then released. Tags are recovered from the fishery and fish are counted at the processing plants and observed for fin-clips. Based on Chapman's modification of the Petersen estimator, there were an estimated 2,675,118 sablefish in NSEI at the time of the 2004 fishery (Chapman 1948). The 90% confidence interval for the 2004 sablefish abundance estimate was 2,501,350 – 2,872,325 sablefish. Decrementing this estimate to account for natural mortality, and forecasting the exploitable numbers, the lower 90% confidence interval forecast for 2005 was 2,276,411 sablefish and 17,403,486 pounds of sablefish. In addition to the mark-recapture work, annual longline surveys are conducted in both NSEI and SSEI to provide biological data as well as relative abundance information (Contact Sherri Dressel).

A longline survey, using ADF&G vessels, has been conducted in **Prince William Sound** annually since 1996. Mean CPUE has ranged from 0.07 fish/hook in 1997 to 0.13 fish/hook in 2000. Longline survey effort was recently extended into the North Gulf District in 1999, 2000 and 2002. The 2001 PWS survey focused on the northwest and southwest PWS, and was limited to the northwest area in 2002 and 2003. Relative to recent surveys, sablefish catch rates (not weighted for available depth strata) increased from 2002 to 2003, but remained below rates in 2001. Survey costs are partially offset by the sale of the fish (Contact Ken Goldman).

c. Management

There are three separate internal water areas in Alaska which have state-managed sablefish fisheries. The Northern Southeast Inside Subdistrict (NSEI), the Southern Southeast Inside Subdistrict (SSEI), and the Prince William Sound District each have separate seasons and guideline harvest ranges.

In the **Southeast Region** both the SSEI and NSEI sablefish fisheries have been managed under a license limitation program since 1984. In 1994 the BOF adopted regulations implementing an equal share quota system where the annual guideline harvest level was divided equally between permit holders and the season was extended to allow for a more orderly fishery. In 1997 the BOF adopted this equal share system as a permanent management measure for both the NSEI and SSEI sablefish fisheries.

Due to declines in fishery CPUE and preliminary results from our mark-recapture work, ADF&G reduced the NSEI quota 35% in 1999 to 1,415 mt where it remained through 2000. Beginning in 2001 a biomass estimate was available and the NSEI area total allowable catch (TAC) set using an $F_{40\%}$ applied to the lower 90% confidence limit of the estimate of biomass. The TAC is then decremented by estimated mortality in other fisheries before the directed fishery quota is set. The quota was decreased in 2001 to 990 mt and to 909 mt for 2002 and 2003. In 2004 the quota was increased to 1,018 mt. The 2005 directed fishery quota was 931

mt with 106 permit holders (longline). The SSEI quota was set at 316 mt in 2000, and has remained the same thru 2005 with 28 permit holders (4 pot gear, 24 longline).

During the January 2003 Alaska Board of Fisheries (BOF) meeting, the BOF made several major changes in regulations affecting the NSEI and SSEI sablefish fisheries: The opening date for the NSEI fishery was changed from September 1 to August 15; permit holders are allowed to release healthy sablefish and are required to document the number of fish released in their logbook (all injured or dead sablefish must be retained); the retention of sablefish for use as bait is prohibited in state waters; Permit holders are allowed to carry-over up to 5% of their annual equal quota share as an overage or underage or transfer up to 5% of their legal harvest to another permit holder; and if requested by ADF&G permit holders may fish outside of the regular season if they carry a state observer on board.

During 2004 and 2005, ADF&G issues permits to allow permit holders to fish outside of the regular season. Vessels participating in this program were required to take an ADF&G biologist on the trip and data regarding catch rates, bycatch, and biological samples were taken. In 2004 one vessel fished in early February and 5 vessels (7 permits) fished in late April. In 2005, 3 vessels fished in mid-February, 2 vessels (3 permits) fished in mid March, and 5 vessels (6 permits) fished in late April. In general, catch rates were low in February and there were very high bycatch rates of dogfish. The CPUE improved by mid-March and was strong in April as well.

Sablefish fisheries in outer coastal state waters (0-3 miles) have been managed in conjunction with the federal-managed fishery in the EEZ. There is no open-access sablefish fishery in the Southeast Outside District as there are limited areas that are deep enough to support sablefish populations inside state waters. In some areas of the Gulf, the state opens the fishery concurrent with the EEZ opening. These fisheries, which occur in the North Gulf District of Cook Inlet and the Aleutian Island District, are open access in state waters, as the state cannot legally implement IFQ management at this time. The quotas are based on historic catch averages and closed once these have been reached.

The GHL for the North Gulf District is set using an historic baseline harvest level adjusted annually by the same relative reduction to the TAC in the Central Gulf Area. The 2005 fishery GHL was 40 mt. In 2004 the BOF adopted sablefish fishery-specific registration and logbook requirements and a 48-hours trip limit of 1.3 mt. For PWS, a limted entry program that included gear restrictions and established vessel size classes was adopted in 1996. Additionally a commissioner's permit, which stipulates logbook and catch reporting requirements, must be obtained prior to participation in the fishery. The fishery GHL is set at 110 mt, which is the midpoint of the harvest range set by a habitat-based estimate. Fishery management continued to develop through access limitation and then into a quota share system wherein permit holders are allocated shares of the harvest guideline. Shares are equal within each of four vessel size classes, but differ between size classes. Central Region staff annually conducts dockside interviews and sample landings in the ports of Cordova, Whittier, and Seward.

There is no bag, possession, or size limit for sablefish in the recreational fisheries in Alaska. Sablefish harvest and release information is not collected in the creel surveys and port sampling of the recreational fisheries in Southcentral or Southeast Alaska.

d. Fisheries

In the **Southeast Region** the 2005 NSEI sablefish fishery opened August 15 and closed November 15. The 106 permit holders landed a total of 918 mt of sablefish. The fishery is managed by equal quota share; each permit holder was allowed 8.8 mt. The 2005 SSEI sablefish fishery opened June 1 and closed November 15. Twenty-eight permit holders landed a total of 290 mt of sablefish, each with an equal quota share of 11.3 mt (Contact Tory O'Connell).

In the **Central Region** the 2004 open access sablefish fishery in the North Gulf District opened for 24 hours beginning noon July 15 and closed 3 PM on July 23. Ten vessels harvested 38 mt. In the Prince William Sound area, a "shared quota" system was adopted by the Board of Fish and instituted during the 2003 season. Season dates for 2005 were March 15 - May 15 and August 1 – 21. The system allocates half of the 110 mt GHL equally among all registered participants with the balance of the GHL allocated between each vessel size class based on historic harvest within each class resulting in the following percentages: Classes A and B (90 and 60 feet maximum length = 18.53%; Class C (50 feet maximum length) vessels = 70.33% and Class D (35 feet maximum length) vessels = 11.14%. All sablefish landed in excess of an individual's quota are sold and the proceeds go to the State of Alaska. Skipper interviews and biological sampling were conducted in-season which gathered effort and location information as well as age, length, weight, sex and gonad condition data (Contact Charlie Trowbridge).

Within the **Westward Region**, only the Aleutian Islands have sufficient habitat to support mature sablefish populations of sufficient magnitude to permit commercial fishing. All other sections within the region are closed by regulation to avoid the potential for localized depletion from the small amounts of habitat within the jurisdiction of the state. Bycatch from the areas closed to directed fishing is limited to 1%. The 2004 Aleutian Island fishery opened on May 15, 2005. Additional requirements for the fishery include registration and logbook requirements. The GHL was set at 249 mt for the state managed fishery. The preliminary harvest from the 2005 Aleutian Islands sablefish fishery was 92 mt. The season remained open until the November 15 closure date (Contact Barbi Failor-Rounds).

4. Flatfish

a. Research

There was no research on flatfish during 2005.

b. Stock Assessment

There are no stock assessments for flatfish.

c. Management

Trawl fisheries for flatfish are allowed in three small areas in the internal waters of **Southeast Alaska** under a special permit issued by the department. The permits are generally issued for no more than a month at a time and specify the area fished and other requirements. Trawl gear is limited to beam trawls, and mandatory logbooks are required, observers can be required, and there is a 20,0000 weekly trip limit.

d. Fisheries

There has been almost no effort in the **Southeast** fishery for the past five years, with no harvest reported for the 2004-2005 season. The Southeast flatfish trawl areas are also the sites of a shrimp beam trawl fishery. Most of the Southeast harvest is starry flounder. NMFS manages the flatfish fishery and harvest in the state waters of **Westward Region**.

5. Pollock

State-managed pollock is limited to the Central Region

a. Research

Pollock continue to be a dominant species in the **Central Region** ecosystem. Due to uncertainty about the appropriate harvest level for the PWS pollock fishery, assessment in 2005 included commercial fishery catch sampling and bottom trawl surveys of the summer (post-spawning) population. Skipper interviews and port sampling of **Central Region** commercial pollock deliveries during 2005 occurred in Kodiak. Additional sampling occurred during the Cook Inlet and PWS trawl and sablefish longline survey. Sample data collected included date and locatioin of harvest, species, length, weight, sex, and gonad condition. Otoliths were collected from most sampled fish. Homer office staff determined ages of pollock otoliths (Contact Willy Dunne).

In 1996, interactions between pollock, herring, and juvenile salmon were also examined as part of Sound Ecosystem Assessment (SEA) funded by the *EXXON Valdez* Oil Spill Restoration.

In pollock we are testing for spatial patterns of genetic variation in six population samples from three regions: North America – Gulf of Alaska; North America – Bering Sea; Asia – East Kamchatka. We tested for annual stability of the genetic signal in replicate samples from three of the North American populations. These studies, begun in 1998 and 1999, continued into 2000. A manuscript documenting the findings is under internal review. Allozyme and mtDNA markers provide concordant estimates of spatial and temporal genetic variation. These data show significant genetic variation between North American and Asian pollock as well as evidence that spawning aggregations in the Gulf of Alaska, such as Prince William Sound, are genetically distinct and may merit management as distinct stocks. These data also provide evidence of inter-annual genetic variation in two of three North American populations. Gene diversity values show this inter-annual variation is of similar magnitude to the spatial variation among North American populations, suggesting the rate and direction of gene flow among some spawning aggregations is highly variable (Contact Lisa Seeb).

b. Stock Assessment

Hydroacoustic surveys, with sample collection by mid-water trawl, were conducted in PWS in the winters of 1995, 1997, 1998, 2000, 2001, and 2002 by the Prince William Sound Science Center in cooperation with ADF&G. Biomass estimates of prespawning pollock aggregations have been relatively stable, except for 1998, with a slight decline indicated in more recent years. The department also conducts a biennial bottom trawl survey during the summer in PWS, and develops a pollock biomass estimate used to establish the harvest guideline for the winter commercial fishery. This approach is justified, despite the belief that a significant portion of the spawning population targeted by the winter fishery immigrated from federal waters, because the summer population is not assessed by the NMFS summer survey. Survey biomass estimates

from the biennial bottom trawl survey have declined in recent years, and the fishery harvest level has been reduced accordingly (Contact Ken Goldman).

c. Management

Prince William Sound pollock fishery regulations include a commissioner's permit and a registration deadline of January 13. The permit stipulates logbooks, catch reporting, and accommodation of a department observer upon request. Vessels are required to check in and check out of the area and fishery as well as contact the department daily to report catch, effort, and fishing location. In 2001 new regulations were adopted dividing the PWS Inside District into three sections (Port Bainbridge, Knight Island, and Hinchinbrook) and limiting harvest to a maximum of 40% of the GHL from any section (Contact Bob Berceli).

d. Fisheries

The 2005 fishery opened on January 20 with a GHL of 923 mt. Catch and effort remained low until late February when aggregations of pollock in the Hinchinbrook section increased resulting in achievement of the 40% harvest level for that section. The section closed by emergency order on March 5. Subsequently, fishing improved in the Knight Island and Bainbridge sections, which closed on March 9 due to concerns over increased bycatch. Total pollock harvest for all sections combined was 761 mt. As in past years, fishery bycatch was dominated by squid (2.7 mt), sharks (5.2 mt), and rockfish (3.8 mt).

6. Sharks

a. Research

In the **Central Region** Spiny dogfish and Pacific sleeper sharks have been tagged annually since 1997 as part of the PWS longline survey for sablefish, and since 2000 during bottom trawl surveys in Cook Inlet and PWS. Through 2003, over 400 each of spiny dogfish and Pacific sleeper sharks have been tagged. To date, ten tagged sleeper sharks have been recovered from PWS; maximum time-at-large was 1,259 days and most sharks moved less than 20 km between tagging and recapture locations. No spiny dogfish have been recovered. In 2003, 340 spiny dogfish were sacrificed and the posterior dorsal spine removed for age determination. In addition, 10-15 sleeper sharks have been sacrificed annually during 2000 to 2003 for parasite and contaminant analysis (Contact Ken Goldman).

In recent years, a small **recreational** fishery targeting salmon sharks has developed in the Gulf of Alaska and Prince William Sound. Little information is available to assess the status or structures of targeted stocks. The Division of Sport Fish initiated a modest cooperative tagging program with a few charterboat operators in 1998 and continues to collect biological data on all sharks harvested in the sport fishery through the port-sampling program.

b. Stock Assessment

Among **Central** Region assessment projects sharks are caught in the trawl surveys and the PWS longline survey. Among **Central** Region assessment projects sharks are caught in trawl surveys and the PWS longline survey. Catch per unit effort for Pacific sleeper shark ranged from 1.1 fish/set in 1996 to 4.3 fish/set in 1999. Spiny dogfish CPUE has ranged from 0.9 to 9.2 fish/set except for a dramatic increase to 51.3 fish per set in 1998. The high catch rates of spiny dogfish in 1998 appear to have been an anomaly (Contact Ted Otis).

The **Division of Sport Fish—Southcentral Region** collected harvest and fishery information on sharks through the groundfish harvest assessment program although no specific research objectives were identified. Shark harvest is still at a relatively low level, but it is hoped that size and age composition of the harvest can be estimated using multiple years of data. In 2005, 44 salmon sharks and 12 spiny dogfish were sampled for length, sex, and age structures from the sport harvest throughout the region (Contact Scott Meyer).

c. Management

The Alaska Board of Fisheries prohibited all directed commercial fisheries for sharks in 1998. In 2000 the BOF increased the bycatch allowance in **Southeast Region** for dogfish taken while longlining for other species to 35% round weight of the target species and also allowed full retention of dogfish bycatch in the salmon setnet fishery in Yakutat. This action was an effort to minimize waste of dogfish in these two fisheries and to encourage sale of bycatch. In **Central Region**, bycatch is set by regulation at 20% of the round weight of the directed species on board.

Recreational fishing for sharks is allowed under the statewide Sport Shark Fishery Management Plan adopted by the BOF in 1998. The plan recognizes the lack of stock assessment information, the potential for rapid growth of the fishery, and the potential for overharvest, and sets a statewide daily bag limit of one shark and a season limit of two sharks of any species. Recreational demand for spiny dogfish remains low and they are widely considered a nuisance species. There is, however, a small directed charter boat fishery for salmon sharks in Southcentral Alaska, primarily at Seward and in Prince William Sound. Pacific sleeper sharks are occasionally caught but rarely retained.

In 2000 the BOF prohibited the practice of "finning", requiring that all shark retained must be sold or utilized and have fins, head, and tail attached at the time of landing. "Utilize" means use of the flesh of the shark for human consumption, for reduction to meal for production of food for animals or fish, for bait, or for scientific, display, or educational purposes.

d. Fisheries

Regulations adopted by Alaska Board of Fisheries in 1998 restricted all commercial shark fisheries to bycatch-only. However in 2004 the BOF amended regulatioins to provide fro a directed fishery for spiny dogfish in the Cook Inlet area under terms of a permit issued by the commissioner. No permits were requested in 2005.

Estimates of **recreational shark harvest** in 2005 are not yet available, but in 2004 an estimated 243 sharks of all species were harvested in Southeast Alaska and 502 were harvested in Southcentral Alaska. The statewide charter logbook program also requires reporting of the number of salmon sharks kept and released in the charter fishery. Charter anglers' account for the vast majority of the recreational salmon shark harvest. In 2004, charter operators reported harvesting 30 salmon sharks in Southeast Alaska and 111 salmon sharks in Southcentral Alaska.

7. Lingcod

a. Research

Over the past nine years 8,787 lingcod have been tagged and 345 fish recovered. Opportunistic tagging of 287 young lingcod in Sitka Sound occurred during 2005. Length, sex and tagging location were recorded for all tagged fish (Contact Cleo Brylinsky).

In the **Central Region**, skipper interviews and port sampling were conducted in Cordova, Whittier, Seward and Homer. Data obtained included date and location of harvest, length, weight, sex and age. Gonad condition was generally not determined as nearly all fish delivered were already gutted (Contact Willy Dunne).

The **Division of Sport Fish—Southeast Region** continued to collect catch, harvest, and biological data from lingcod as part of a marine harvest survey program with lingcod harvests tabulated back to 1987 in some selected ports. Data collected in the program include statistics on effort, catch, and harvest of lingcod taken by Southeast Alaska sport anglers. Ports sampled in 2005 included Juneau, Sitka, Craig/Klawock, Wrangell, Petersburg, Gustavus, Elfin Cove, Yakutat, and Ketchikan. Length and sex data were collected from 1,644 lingcod in 2005, primarily from the ports of Sitka, Ketchikan, Craig, Gustavus, Elfin Cove, and Yakutat (Contact Mike Jaenicke).

The **Division of Sport Fish—Southcentral Region** continued collection of harvest and fishery information on lingcod through the groundfish harvest assessment program. Lingcod objectives include estimation of 1) the age, sex, and length composition of lingcod harvests by ports and 2) the geographic distribution of harvest by each fleet. A total of 674 lingcod were sampled from sport harvest at Seward, Valdez, Whittier, Kodiak, and Homer in 2005. These ports accounted for the majority of recreational lingcod harvest in Southcentral Alaska (Contact Scott Meyer).

b. Stock Assessment

The **Southeast Region** is not currently able to reliably estimate lingcod biomass or abundance. Lacking abundance estimates, and given the complex life history and behavior of lingcod, impacts to lingcod populations from fishing are difficult to assess. Analysis of catch per unit effort data (CPUE), in terms of fish per hook-hour for 1988–1998, showed that CPUE had declined between 21 to 62% in areas where a directed fishery and increased recreational catch had developed. Consequently the quota for lingcod was reduced in all areas in 1999. Commercial logbook data for the period 1999-2005 shows a recent increasing trend in CSEO and NSEO beginning in 2000. CPUE increased in EYKT in 2001 and has remained level. There is also a level trend in the NSEO area.

The Sport Fish Division, Southcentral Region, is continuing efforts toward a lingcod stock assessment. Initial work focused on compiling data from sport and commercial fisheries, mining existing survey data from other agencies, estimating natural mortality from age data, and estimating length-weight and growth parameters. Some of the next steps include standardization and comparison of CPUE indices and compilation of spatial data.

c. Management

Management of lingcod in **Southeast Alaska** is based upon a combination of guideline harvest ranges, season and gear restrictions. The state has management authority for lingcod in both state and federal waters. Regulations include a winter closure for all users except longliners between December 1 and May 15 to protect nest-guarding males. Guideline harvest limits were greatly reduced in 2000 in all areas and allocations made between directed commercial fishery, sport fishery, longline fisheries, and salmon troll fisheries. This was the first time sport catch was included in a quota allocation. The 27” minimum commercial size limit remains in effect and fishermen must keep their lingcod with the head on, and proof of gender to facilitate biological

sampling of the commercial catch. Vessel registration and trip limits are allowed when needed to stay within allocations. The directed fishery is limited to jig or dinglebar troll gear. In 2003 the Board of Fish established a super-exclusive directed fishery for lingcod in the IBS Subdistrict.

Regulations for the **Central Region** lingcod fishery include open season dates of July 1 to December 31 and a minimum size limit of 35 inches (89 cm) overall or 28 inches (71 cm) from the front of the dorsal fin to the tip of the tail. In 1997, the BOF adopted a jig only gear requirement for the directed lingcod fishery in the Cook Inlet Area. Beginning in 1997, the department set commercial lingcod fishery GHL's for the Central Region at 50% of the average harvest for the period 1987 to 1996. However, GHL's were increased to 75% of this average in 2001 for PWS and in 2003 in Cook Inlet.

In **Southeast Alaska**, the sport fishery for lingcod is open from May 16 through November 30. The region wide bag and possession limits are two per day, four in possession, with no size limit. However, the bag and possession limits in two areas near Sitka and Ketchikan are one per day, two in possession, and the Pinnacles area near Sitka is closed to sport fishing year-round for all groundfish.

In 2000, sport harvests of lingcod in Southeast Alaska were incorporated into a region wide lingcod management plan, which reduced GHL's for all fisheries (combined) in seven management areas, and allocated a portion of the GHL for each area to the sport fishery. Since 2000, harvest limits reductions, size limits, and mid-season closures have been implemented by emergency order in various management areas to ensure sport harvests do not exceed allocations.

In 2005, lingcod bag limits were reduced from 2 to 1 fish per day region wide, slot limits were imposed for guided and nonresident anglers in all management areas except Southern Southeast Inside near Ketchikan, and the season was closed in northern Southeast management areas (NSI, CSO, and NSO) from June 16 through August 15 (Contact Charlie Swanton).

Conservative harvest strategies have been established for recreational lingcod fisheries in **Southcentral Alaska** in light of the lack of quantitative stock assessment information. Resurrection Bay is closed to lingcod fishing year-round to rebuild the population, although no formal rebuilding plan is in place. The season is closed region-wide from January 1 through June 30 to protect spawning and nest guarding lingcod. Daily bag limits are 2 fish in all areas except the North Gulf, where the daily bag limit is one fish. All areas except Kodiak have a minimum size limit of 35 inches to protect spawning females (Contact Scott Meyer).

d. Fisheries

Lingcod are the target of a "dinglebar" troll fishery in **Southeast Alaska**. Dinglebar troll gear is power troll gear modified to fish for groundfish. Additionally lingcod are landed as significant bycatch in the DSR longline fishery (35% limit), as bycatch in the halibut fishery (5% limit), and as bycatch in the salmon troll fishery. The directed fishery landed 81 mt of lingcod in 2005 and an additional 78 mt was landed as bycatch in other fisheries. The halibut longline fishery accounted for roughly 68% of lingcod bycatch in the Southeast Region and the salmon troll fishery accounted for 15%.

Central Region lingcod harvests have primarily occurred in the North Gulf District of Cook Inlet and the Outside District of PWS. In 2005, the Cook Inlet GHL was 24 mt and the PWS GHL was 11 mt. Lingcod harvests in 2005 totaled 9.4 mt in Cook Inlet and 11.8 mt in PWS. The majority Cook Inlet Area lingcod harvest was by directed jig fishing, while the PWS harvest was mainly from longline bycatch to other (primarily halibut) fisheries.

Limited directed effort occurred for lingcod in the **Westward Region** during 2004. Incidental harvest in other fisheries totaled 23 mt for the year. The majority of the harvest occurred in the Kodiak Area with a minor amount occurring in the Chignik Area.

Recreational lingcod harvest is estimated in numbers of fish. Estimates of the 2005 harvest are not yet available from the statewide mail survey, but in 2004 an estimated 16,100 lingcod were harvested in Southeast Alaska while 11,800 lingcod were taken in Southcentral Alaska. The average estimated annual harvest for the most recent five-year period (2000-2004) was 15,070 fish in Southeast Alaska and 11,874 fish in Southcentral Alaska.

8. Other species

In 1997 the BOF based a new policy that would strictly limit the development of fisheries for other groundfish species in Southeast. Fishermen are required to apply for a "permit for miscellaneous groundfish" for all fisheries that do not already have specific regulations and permits do not have to be issued if there are management and conservation concerns. At this time that includes all species except sablefish, rockfish, lingcod, flatfish, and Pacific cod. At this time most other groundfish species taken in state waters are taken as bycatch in fisheries for other groundfish and halibut. The State also has a regulation that requires that the bycatch rate of groundfish be set annually for each fishery by emergency order unless otherwise specified in regulation.

A commissioner's permit is required before a directed fishery may be prosecuted for skates and rays. This permit may restrict depth, dates, area, and gear, establish minimum size limits, and require logbooks and/or observers, or any other condition determined by the commissioner to be necessary for conservation and management purposes. In 2005, interest continued for a skate fishery in the Cook Inlet and Kodiak Areas. In the Cook Inlet Area, harvest information is confidential due to limited participation. In the Kodiak Area, twenty-one vessels obtained commissioner's permits and prosecuted target fisheries for skates in state-waters; several additional vessels participated exclusively in federal waters. The majority of these vessels targeted the big skate *Raja binoculata* and Longnose skate *Raja rhina.* The 2004 harvest from state waters was 86 mt. In addition to the permit requirements listed above, vessel operators were required to notify ADF&G of deliveries. This was done to ensure that ample opportunity occurred to collect biological data from the landed catch. Dockside samplers performed species identification and obtained sexed lengths from the catch. In addition, vertebrae were collected for age analysis. A commissioner's permit is also required before any trawl fishery besides the existing beam trawl fishery for flatfish may be prosecuted in the Southeast District.

As part of a cooperative research study, tissue samples were collected from approximately 40 longnose skates in Prince William Sound for contaminant analysis.

Work on a "Developing Fisheries" policy, intended to reduce the potential for a fishery to escalate beyond management control, has halted at present.

The recreational halibut fishery is the focus of a statewide research and management effort. Data on the recreational fishery and harvest are collected through port sampling effort in Southcentral Alaska and creel surveys and port sampling in Southeast Alaska. These data are provided annually to the International Pacific Halibut Commission for use in an annual stock assessment, and to the North Pacific Fishery Management Council. The council has used the information in the design and analysis of regulations governing the sport charter fishery.

As stated earlier in this report, the BOF took action in 2000 prohibiting the development of a live fish fishery for groundfish in the Southeast District.

C. Other Related Studies

Beginning in 1999, representatives of the Alaska Department of Fish and Game (ADF&G) and the National Marine Fisheries Service – Alaska Region (NMFS) met to address fishery data acquisition issues. As a result of this meeting the NMFS and the ADF&G agreed to pursue the development of a single reporting system for Alaska fisheries. To meet the goal of single source reporting of landings data, the International Pacific Halibut Commission was invited to join this initiative. A cooperative interagency electronic fisheries data collection steering committee was formed and funding was secured from the Pacific States Marine Fishery Commission.

This is a complex and ambitious project that requires careful planning, design, and staged implementation to succeed. Consolidated reporting has required an analysis of all data elements collected. An interagency database is in the final stages of development to meet the projected needs of all agencies. The primary focus on the interagency electronic reporting project goes beyond front-end application development. A substantial portion of the work on this project has been directed at consolidated reporting, data storage, and data interface with each agency. At each stage of the implementation, the system requires additional analysis and functionality.

Full implementation is scheduled to be finalized at the end of Fiscal Yr 2007. Upon full implementation specifications will be developed for private software developers (Contact Gail Smith).

Staff in the **Central Region** has implemented a multi-year study to explore the utility of a remotely operated vehicle (ROV) as a stock assessment tool for a variety of groundfish resources. Initial efforts are focusing on identification of suitable rockfish and lingcod habitat along the northern Gulf of Alaska, and comparing ROV study results with habitat available in a GIS format form NOAA (Contact Mike Byerly).

The Department of Fish and Game manages state groundfish fisheries under regulations set triennially by the Board of Fisheries. The department announces the open and closed fishing periods consistent with the established regulations, and has authority to close fisheries at any time for justifiable conservation reasons. The department also cooperates with NMFS in regulating fisheries in the offshore waters.

By regulation, fish tickets are required for all shore-based landings in Alaskan ports and for all landings from state-managed fisheries. The catch data from the fish tickets is used as the primary means of tracking the in-season harvest levels. Groundfish fish tickets are collected

from as many as thirty or more processors within the state. The fish tickets are edited for accuracy and the data is entered on microcomputers in Petersburg, Douglas, Sitka, Homer, Kodiak, and Dutch Harbor. Because of the intensity of many of the groundfish fisheries, a "soft data" accounting system using processor contacts is also utilized, when necessary, to track landings during a fishery.

In 1997 at the Southeast Groundfish meeting, the Board of Fisheries adopted a regulation that requires all groundfish fishermen to complete mandatory logbook pages while fishing. These logbook pages must be submitted as part of their landing record and attached to their fish ticket at delivery. The Board also requires that fishermen obtain a conditional use permit when fishing for any species for which specific regulatory language is not in effect. This will allow ADF&G to deny permits for some species and allow exploratory or controlled fishing for others.

1. Dixon Entrance Area

Total removals from the Dixon Entrance area (Alaska statistical areas 325431, 315431, 325401, and 315401) have declined in recent years, due mostly to reductions in sablefish quotas and the prohibition on directed fishing for slope rockfishes. The table below lists the catch by species group from 1988 through 2005 rounded to the nearest mt.

Year	# Permits	# Landings	DSR	Other Rock	Sablefish	Other	Total
1988	20	25	3	3	82	3	91
1989	8	7	1	1	20	0	22
1990	16	17	3	5	182	1	191
1991	24	21	6	12	150	2	170
1992	19	19	3	5	150	1	159
1993	27	26	6	14	232	1	253
1994	27	26	1	20	216	2	239
1995	21	18	0	20	137	0	157
1996	16	14	1	12	83	0	96
1997	37	30	1	18	103	0	122
1998	26	23	1	8	95	0	104
1999	23	24	0	7	71	0	78
2000	27	22	0	14	49	0	63
2001	23	29	1	14	86	0	101
2002	30	46	1	11	106	0	118
2003	29	44	8	12	89	2	111
2004	23	33	5	9	114	2	130
2005	10	24	tr	6	84	tr	91

2. Marine Reserves

In September of 1997 the ADF&G submitted proposals to both the BOF and the NPFMC requesting that they implement a small no-take marine reserve in **Southeast**. The purpose of these proposals was to permanently close a 3.2 sq. mile area off Cape Edgecumbe to all bottomfish and halibut fishing (including commercial, sport, charter, bycatch and subsistence) and anchoring to prevent over-fishing and to create a groundfish refuge. Two large volcanic pinnacles that have a diversity and density of fishes not seen in surrounding areas dominate the Edgecumbe Pinnacles Marine Reserve. The pinnacles rise abruptly from the seafloor and sit at the mouth of Sitka Sound where ocean currents and tidal rips create massive water flows over this habitat. These two pinnacles provide a very unique habitat of rock boulders, encrusted with *Metridium*, bryazoans and other fragile invertebrate communities, which attracts and shelters an extremely high density of juvenile rockfishes. The area is used seasonally by lingcod for spawning, nest-guarding, and post-nesting feeding. Yelloweye rockfish and pelagic rockfish species as well as large numbers of prowfish and Puget Sound rockfish also densely inhabit the pinnacles. This closure protects the fragile nature of this rare habitat, and prevents the harvest or bycatch of these species during critical portions of their life history. In February 1998 the BOF approved of the reserve and the NPFMC approved of the reserve at their June 1998 meeting. The NPFMC recommended to the BOF that they consider closure of the area to salmon trolling which would make the area a complete-no take zone. In February 2000 the BOF rejected closing the area to salmon trolling. The area is an important “turn-around” area for commercial trollers and the BOF did not believe there was sufficient conservation benefit to warrant closing the area to salmon fishing.

In 2004 a short movie of the Edgecumbe Pinnacles Marine Reserve was created because of increased public interest in our work, and to give others an opportunity to learn about, and view the pinnacles from below the waters surface. This movie is available in either VHS or DVD format for schools or non-profit organizations through the Sitka office of the Alaska Department of Fish and Game.

3. User Pay/ Test Fish Programs

The state of Alaska Department of Fish and Game receives receipt authority from the state legislature that allows us to conduct stock assessment surveys by recovering costs through sale of fish taken during the surveys. Receipt authority varies by region. In **Southeast Alaska** we have several projects that are funded through test fish funds (total allocation approximately 400k), notably the sablefish longline assessments, the king crab survey, and the herring fishery and dive surveys. Also in 1995 the Southeast Region was given a separate receipt authority for $250,000 to conduct sea urchin research using test fish funds. In the case of sea urchins the industry placed bids on the right to harvest and market sea urchins. The low bidder was responsible for paying for the department's expenses in research and management of this fishery and was limited to a 12% profit after state expenses were paid.

4. GIS

The ADF&G Division of Commercial Fisheries Headquarters Office is using ArcGIS 9.0 for general map production, project planning and spatial analysis. Basemaps are maintained in ArcGIS format. Statistical area charts are currently being updated using ArcGIS 9.0 and the NAD83 datum. All data and maps requests are made in NAD83 (the State of Alaska standard) or will be converted into NAD83, if possible. Final output and all metadata will be in NAD83. Some users in other divisional offices use ArcGIS 8 and ArcView 3.x for their GIS work. The Headquarters Office has reduced its GIS staff to one cartographer.

Hardcopy and digital groundfish and shellfish statistical area charts are available. Digital are available in Abode PDF and can be viewed or downloaded at http://www.cf.adfg.state.ak.us/geninfo/statmaps/charts.htm or in ArcGIS format at http://maps.cf.adfg.state.ak.us. The ADF&G Commercial Fisheries GIS Maps and Data Server will be home for all publicly available GIS maps developed by the division in the future. The server will also feature online maps using ArcIMS (Internet Map Server) software (contact Evelyn Russell).

5. Logbooks

In 1997 logbooks became mandatory for all state-managed commercial fisheries in Southeast Alaska. Logbooks for rockfish and lingcod had been mandatory for a number of years. All usable longline and jig logbook data through 2005 has been entered.

Number of commercial fishery logbooks collected by fishery, target species, and year.

SE	Longline				Jig/dinglebar			
Year	DSR	Pacific cod	Slope Rock	Sablefish (includes pot gear)	Lingcod	Black rockfish	DSR	PSR
1986	21	1						
1987	25							
1988	20							
1989	19							

1990	50	1	2					
1991	232	8	1					
1992	259	7						
1993	190	8						
1994	197	9	3		108			
1995	140	13			215			
1996	261	8			252	31	6	
1997	204	98	4	466	177	64	8	1
1998	177	135	15	552	153	70	3	4
1999	165	223	9	405	89	21	1	1
2000	153	97	4	421	153	30		
2001	128	48	2	332	44	2	2	
2002	143	27	5	276	53	31	4	0
2003	115	53	closed	298	54	37	2	closed
2004	96	55	closed	229	40	23	3	closed
2005	14	53	closed	240	52	23	1	closed

Since 1998, marine recreational charter operators have been required to log port of landing, effort and harvest, and ADF&G statistical area for every charter trip made. The 2005 logbook was similar to the 2004 logbook format. Data collected for each vessel trip included port of landing, location(s) fished, effort for salmon and bottomfish, and harvest and/or release (in numbers) of chinook, coho, sockeye, pink, and chum salmon, pelagic rockfish, other rockfish, lingcod, and salmon sharks. In 2001 the **Sport Fish Division** conducted an initial evaluation of the 1998-2000 charter logbook data, including comparisons of data from the logbook, the statewide mail survey, and on-site interviews.

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Sport Fish Division Home Page:
http://www.sf.adfg.state.ak.us/statewide/sf_home.cfm
Sport Fish Division Southcentral Region Halibut and Groundfish Program:
http://www.sf.adfg.state.ak.us/region2/groundfish/gfhome.cfm
Age Determination Unit Home Page: http://tagotoweb.adfg.state.ak.us/ADU/default.asp
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Commercial Fisheries Entry Commission: http://www.cfec.state.ak.us/
State of Alaska home page: http://www.state.ak.us/
Gene Conservation Laboratory Home Page:
http://www.cf.adfg.state.ak.us/geninfo/research/genetics/genetics.php

Adobe PDF versions of groundfish charts can be viewed or downloaded at
http://www.cf.adfg.state.ak.us/geninfo/statmaps/charts.php
ArcView- and MapInfo-compatible charts can be downloaded from the ADF&G CF GIS Maps and Data Server at http://maps.cf.adfg.state.ak.us/. This server will be the home for all publicly available GIS maps developed by the division. In the future this server will also feature online maps using ESRI's ArcIMS (Internet Map Server) software (Contact Evelyn Russell).

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APPENDIX I. ALASKA DEPARTMENT OF FISH AND GAME PERMANENT FULL-TIME GROUNDFISH STAFF DURING 2004.

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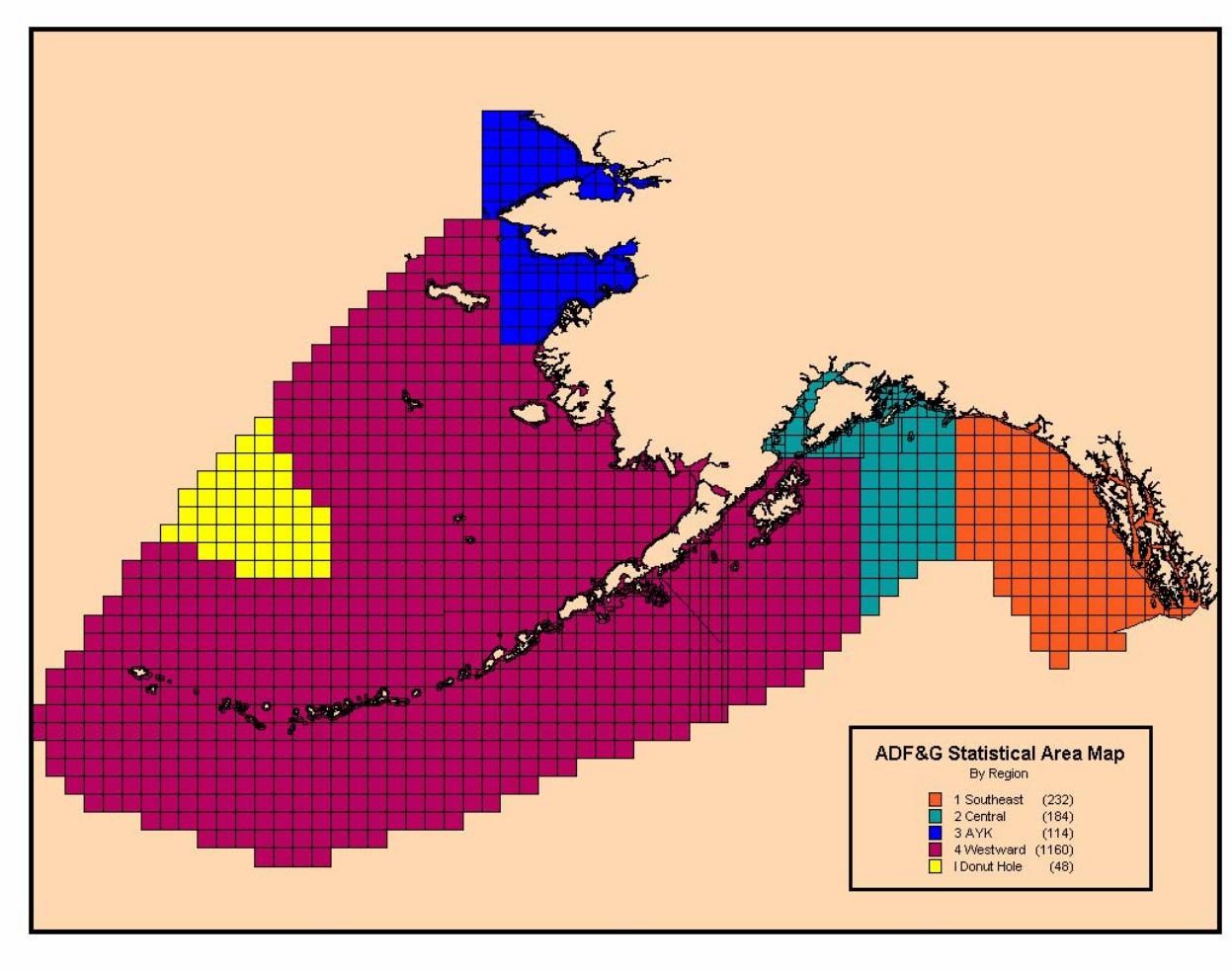
Appendix II. Map Depicting State of Alaska Management Regions.



Appendix III. Tissue samples of *Sebastes* species collected for genetic analyses and stored at Alaska Department Fish and Game, Gene Conservation Laboratory, Anchorage. Species, sampling location and collection ID, year collected, sample size, and tissue type are given.

Species	Silly Name - Location	Year	Size	Tissue Type
Yelloweye Rockfish	YERFLAM98 - Flamingo, British Columbia.	1998	46	fin clips; larvae
S. ruberrimus	YERTASU98 - Tasu, British Columbia.	1998	50	fin clips
	YERTOPK98 - Topknot, British Columbia.	1998	49	fin clips
	YERTRI98 - Triangle, British Columbia.	1998	63	fin clips; larvae
	YERSE298 - Sitka	1998	49	fin clips
	YRSE99 - Stat areas 355601, 365701	1999	100	fin clips
	YERYAK99 - Fairweather grounds	1999	100	fin clips
	YEPW91 – Prince William Sound; Gravina, Danger, Herring	1991	27	muscle, liver, eye
	YERGA98 – Prince William Sound, Knight Is./Naked Islands area	1998	100	fin clips
	YERPWS100 - Whittier	2000	97	fin clips
	YERPWS200 - Whittier	2000	50	fin clips
	YERRES99 – Resurrection Bay	1999	100	fin clips
	YERKACH99 - Kachemak Bay	1999	58	fin clips
	YERKOD99 – Kodiak Island	1999	115	fin clips
Black Rockfish	BRORE99 – Pacific Northwest; Oregon	1999	50	muscle, liver, heart
S. melanops	BRWASH98 - 47°08' / 124°37'; Washington	1998	20	fin clips
	BRSIT98 - Sitka	1998	50	fin clips
	BRSIT99T - Sitka Sound	1999	200	fin clips
	BRSIT99 – Sitka	1999	83	fin clips
	BRPWS100 - Valdez	2000	13	fin clips
	BRPWS200 - Whittier	2000	16	fin clips
	BRRESB97 - Resurrection Bay	1997	82	muscle,liver,heart,eye,fin
	BRRESB98 – Resurrection, North Fox Island	1998	24	fin clips
	BRKOD96 - Kodiak Island	1996	2	muscle, liver, heart, eye
	BRKOD197 - Ugak Bay	1997	100	muscle,liver,heart,eye,fin
	BRKOD398 - Westside Kodiak Island	1998	114	fin clips
	BRKOD198 - Eastside Kodiak Island	1998	100	fin clips
	BRKOD298 - Southwest side Kodiak Island	1998	86	fin clips
	BRSAND98 - Carpa Island near Sand Point	1998	40	fin clips
	BRSAND99 - Castle Rock near Sand Point	1999	60	fin clips
	BRKOD00 - Chignik	2000	100	fin clips
	BRBERS99- Akutan	1999	100	fin clips
	BRDUTS00 - Dutch Harbor	2000	6	fin clips
	BRYAKU03- Yakutat	2003	130	fin clips