STATE OF ALASKA
GROUNDFISH FISHERIES

ASSOCIATED INVESTIGATIONS IN 2003

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AGENDA ITEM VII. REVIEW OF AGENCY GROUNDFISH RESEARCH, STOCK ASSESSMENT, AND MANAGEMENT

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). This is a change from recent years when the Central Region began at 140^{o} W. longitude. The Central Region includes the internal waters of Prince William Sound (PWS), Cook Inlet, and Bristol Bay and the Outer District off the Kenai Peninsula. The Westward Region includes all territorial waters of the Gulf of Alaska 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 2 port biologists located there. Seasonal port samplers and data entry staff were employed in Petersburg, Ketchikan, Sitka, Craig 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. Five resource assessment surveys were conducted during 2003. Funding for the Southeast Groundfish project comes from NOAA Grants NA16FN1273 and NA06F10074 and NA97FN0121, CFDA 11-407.

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 occurring 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 ROV surveys. Commercial harvest data (fish tickets) are processed in Homer for state and federal fisheries landings at 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 (Mike Ruccio).

d. Headquarters

ADF&G personnel continued to collect, review, edit and amend, data capture, and archive all ADF&G fish tickets submitted to local offices. These tickets include those required as well as tickets voluntarily submitted by EEZ operators.

In 1997 ADF&G entered into a contract with the Pacific States Marine Fisheries Commission to expand previous data collection and management duties previously carried out under PACFIN. This new contract, which funds most of the ground fish fisheries data collection and analysis by ADF&G, is part of the Alaska Fisheries Information Network (AKFIN). It supports the enhancement of the fish ticket information collection effort including; GIS database development and fishery data analysis, catch and production database development and access, the age reading laboratory, database management and administration, Bering sea crab data collection and reporting, various fishery economic projects, fisheries information systems and regional fishery monitoring and data management.

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.

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

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 2003. Age structures from approximately 15,500 groundfish, 22 species, were received through statewide commercial and survey harvest sampling efforts and 13,309 age data were released back to managers. Additional structures were aged with release of data pending their review. The majority of funding for this project is through the Alaska Fisheries Information Network (federal), with a small degree (<5%) of general funding (state) and outside contract. Eleven people were employed for a total of 39 work months to age groundfish age structures or conduct associated work (sample preparation, data entry, archiving). Only one employee is funded year round. Other individuals are seasonal (employed for 1-8 months duration. In the present job-rich environment of ADFG, turnover of Fishery Biologist I/Age reader positions continues to seriously impact operations.

All Fishery Biologist I/Age Readers received additional training (basic or species-specific following initial training) during 2003. "Basic" training involves aging previously aged Southeast Alaska yelloweye rockfish samples. Readers are cleared for production status once their aging error has diminished to an acceptable level, generally achieved in 2-4mos. Species-specific training times can vary greatly: accomplishment of black rockfish pattern interpretation may be achieved in 2-4 weeks, while it may take 6 months of work on pollock or lingcod before sufficient age-range calibration and consistency therein is observed. Samples aged by readers-in-training are often 100% reaged by more experienced readers to ensure consistency in data.

Quality of age data is routinely assessed through second-reading 20% of the sample, either by the initial-reader or by a reader with equal or greater experience. Species-specific control limits are imposed and guide release of age data; transgression of control limits direct reviewing some or the entire sample.

The ADU completed review of age reading criteria for walleye pollock and reinstated production aging for this species effective June 2003. In year 2000 we had realized substantial differences in age determination of pollock between ADFG and an out of state federal aging lab, and suspended production aging while criteria were reviewed. Over 2000 pollock age data have since been released to managers. Additional work continues to document objective information to lend credibility to the reinterpretation of pollock growth patterns. Our data seem to reasonably suggest, with support of objective otolith measurements, that pollock are consistently and substantially older than what was previously aged. Other notable species with ongoing need for significant criteria evaluation and documentation work are: pacific cod, sablefish, shortraker, rougheye, thornyhead, and lingcod (SEA). The goal for these is to better assess the correct species age range (for example, in pacific cod) or improve accuracy and precision (for the remaining species).

The ADU Oracle database AegIS, Age Information System, was deployed in 2003. It is presently utilized in importing and exporting data. It still requires substantial programming support to ensure integrity of data and to increase user facility.

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. 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 (Dennis Hubartt [retired as of October 2003 and replaced by Kathleen Wendt]) and in Juneau (Bruce White). The project biometrician (Steve Fleischman) is located in Anchorage. About 20 technicians at major ports in the Southeast region 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.

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 PWS and the North Gulf areas, Lower Cook Inlet, and 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 port samplers. 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 collected in 2003 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 long-term, sustainable regulatory framework specifying bag and possession limits, seasons, and methods and means. Inseason management action has generally been unnecessary.

Typical duties also include providing sport halibut harvest statistics to the International Pacific Halibut Commission (IPHC) and NPFMC, coordinating 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 1,500 fish were tagged in 2003, bringing the total number of tags released to11,300. By year's end, 664 tags had been recovered, 450 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 are occurring from the Shumagin Islands into the Bering Sea and from the Alaska Peninsula to Kodiak waters.

b. Stock Assessment

No stock assessment programs were active for Pacific cod during 2003.

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 state water Pacific cod Management Plans for fisheries in 5 groundfish areas, Prince William Sound, Cook Inlet, Kodiak, Chignik and South Alaska Peninsula. Under these plans, participation is not restricted 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 Chignik, which has a regulatory opening date of March 1. The BOF restricted state fisheries to pot or jig gear in an effort to reduce crab bycatch. 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. The initial GHL's were set at 15% of the Western Gulf ABC to be reserved for the South Alaska Peninsula Area, 15% 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.

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

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, and the North Gulf District of the Cook Inlet Area is taken by longline gear during the parallel season. Pots have been the dominant gear in the Cook Inlet District and in the Prince William Sound area. 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 175 mt in the Southeast state-managed fishery during 2003, up 35% from the 2002 catch. The 2003 GHL's for the Cook Inlet and Prince William Sound state-managed Pacific cod harvest were originally set at 653 mt and 798 mt, respectively. Action by the Alaska Board of Fisheries during 2002 reduced the initial Pacific cod allocation for Prince William Sound from 25% to 10% of the Eastern Gulf ABC, effective May 14, 2003, thereby reducing the GHL to 320 mt. The Cook Inlet state-managed Pacific cod fishery achieved its GHL in 2003 and step up provisions will result in an increase to 3% of the Central Gulf ABC in subsequent years. Due to the low number of vessels making landings in the PWS Area in 2003, harvest figures remain confidential. Harvest from the Central Region state-managed Pacific cod fishery totaled 603 mt from Cook Inlet. There was no effort or harvest by pot or jig vessels in the PWS Area in 2002. Harvest from the 2003 state managed fishery in the Kodiak Area totaled 3,694 mt, while 2,028 mt of cod were harvested in the Chignik Area, and the South Alaska Peninsula Area harvest totaled 5,224 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. Cook Inlet will remain at its current percentages of the Federal TAC for 2004. The Alaska Board of Fisheries reduced the Prince William Sound Area Pacific cod allocation from 25% to 10% of the Eastern Gulf TAC beginning in 2003.

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 2003. 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. In 2003, 1,197 yelloweye, 542 quillback, and 409 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.

In 2003 ADF&G obtained processed multibeam data collected by NOAA (R/V Rainier) in 2002 of the area surrounding Salisbury Sound. NOAA also provided bathymetry data from the Edgecumbe Pinnacles Marine Reserve Area, collected by the R/V Rainier in 2003. Habitat classification of the multibeam and backscatter data collected by ADF&G in 2002 of 219 km^2 of seafloor on Fairweather Ground and 41 km^2 of seafloor inside Yakutat Bay was finalized and used in the 2003 stock assessment for DSR. The submersible "Delta" was used in 2003 to ground-truth multibeam habitat mapping data collected on the East Bank of the Fairweather grounds in 2002.

Skipper interviews and port sampling of commercial rockfish deliveries in **Central Region** during 2003 occurred in Homer, Seward, Whittier, Anchorage and Cordova. Efforts during the first half of the year primarily sampled slope and species delivered as bycatch in other groundfish fisheries. 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 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 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 a remotely operated vehicle (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 Bill Bechtol).

The **Westward Region** continued its port sampling of the commercial rockfish and Pacific cod harvests in 2002. 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 is currently aging otoliths collected during the 2002 and 2003 seasons.

The **Westward Region** began several studies on Western Gulf of Alaska black rockfish. Monthly collections were made of female fish in an effort to determine reproductive seasonality and size of maturity. Hydroacoustic equipment was purchased and a training class was attended by several staff members in preparation for assessment work in the summer of 2004 (Contact Dan Urban).

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 2003 included Juneau, Sitka, Craig/Klawock, Wrangell, Petersburg, Gustavus, Elfin Cove and Ketchikan. 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 2,900 rockfish were sampled at Seward, Valdez, Whittier, Kodiak, and Homer in 2003. (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 2003 in CSEO and EYKT. There were no new surveys of NSEO and SSEO. The SSEO area was last surveyed in 1999, 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 CSEO in 2003 was 1,864 adult yelloweye/km^2 (CV=11.22%). This is significantly lower than the previous estimate obtained in 1997 of 2,534 adult yelloweye/km^2 (CV=16.6%). The 2003 stock assessment was based on 102 transects compared to 32 transects run in 1997. The PDF has a better fit to the data in 2003 compared to 1997.

The density estimate for EYKT in 2003 was 3,557 adult yelloweye/km^2 (CV=17.2%). This is higher than the 1999 estimate of 2,322 adult yelloweye/km^2 (CV=30.8%). The sample sizes were equal in both survey years (20 transects run) however the PDF has a better fit to the 2003 data compared to the 1999 data set.

In the **Southeast Region** no black rockfish surveys were conducted in 2003 however, one dive was made with the submersible "Delta" off Cape Georgiana, where more than 3,000 fish were tagged and released in 1999 and 2000. Black rockfish were observed but no tags were noted.

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. The 2003 field season involved a 12-day cruise. An additional project with funding for two seasons beginning in 2004 will compare scuba and acoustic-based rockfish indices to catch indices from a commercial jig vessel. Rockfish will also be tagged during these cruises (contact Bill Bechtol).

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 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 2003 TAC for DSR was 389 mt in Southeast Outside. 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. A significant portion of the total harvest is taken as bycatch mortality during the halibut fishery and 211 mt of the TAC was reserved for bycatch in other fisheries. In 2003 the directed DSR fishery was again pre-empted by the halibut fishery in the EYKT area (Contact Tory O'Connell).

The Alaska Board of Fisheries adopted several new regulations regarding rockfish during its 2003 meeting cycle. The Board established guideline harvest limits for the directed black rockfish fishery in Southeast Alaska. Directed fishery quotas are by management area, ranging from 11.3 mt in IBS to 57 mt in SSEOC, and totaling 136 mt. The Board also created a series of open and closed areas so managers could better understand the effect a directed fishery has on the black rockfish stocks. Halibut and groundfish fishermen are required to retain and report all black rockfish caught.

The BOF specifically made thornyhead, shortraker, rougheye and redbanded rockfish bycatch only and removed language allowing directed fishing on other species of rockfish. This action closes the directed fisheries for slope rockfish and non-black pelagic species in state waters of Southeast Alaska.

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 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 68 mt 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 this 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. 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 2003, 37 mt of black rockfish were harvested from six sections in the Kodiak Area. Directed effort and harvest were both lower in 2003; the section guideline harvest levels were attained in only one section. Unlike previous years, much of the harvest occurred as bycatch in other directed fisheries. The 2003 black rockfish harvest in the Chignik Area totaled 19 mt and totaled 4 mt in the South Alaska Peninsula Area. Harvest and effort also declined in these two

management areas. Few processors within a reasonable distance from these fishing areas were willing to purchase black rockfish in 2003. 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. (Contact: Mike Ruccio).

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**, the majority of rockfish are taken incidental to the recreational halibut fishery or while trolling for salmon. Bag limits in most areas have been designed to discourage targeting of rockfish yet allow for retention of incidental harvest. Bag limits in most areas are five fish daily and the harvest of non-pelagic (DSR and slope) rockfish is further restricted to one or two fish per day in most areas. The Alaska Board of Fisheries has allowed more liberal bag limits in the Kodiak and Alaska Peninsula areas because of lower levels of effort and predominance of pelagic species in the catch (Contact Len Schwarz).

Given the lack of quantitative stock assessment information for much of Alaska, sport fishery 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 state-managed commercial fisheries in **Southeast** totaled 804 mt in 2003, 188 mt of which was directed DSR and 40 mt black rockfish. The majority of the remaining rockfish taken in the Southeast district were DSR rockfish 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 2003 **Cook Inlet Area** directed rockfish fishery opened July 1 and closed October 23 with a total harvest of 64 mt, primarily pelagic rockfish. This was the fourth year that the jig-only gear restriction was in place. Total rockfish harvest for the PWS Area rockfish bycatch-only fishery was 22 mt. This included a 2 mt incidental catch of slope rockfish from the walleye pollock trawl fishery and a 20 mt incidental harvest of demersal and slope rockfish from the sablefish and halibut longline fisheries.

Recreational rockfish harvest is typically estimated in numbers of fish. Estimates of the 2003 harvest are not yet available from the statewide mail survey, but the average estimated annual harvest for the most recent five-year period (1998-2002) was 58,400 rockfish (all species) in Southeast Alaska and 56,900 fish in Southcentral Alaska.

3. Sablefish

a. Research

In 2003, sablefish longline surveys were conducted for the two **Southeast Alaska** state-managed sablefish fisheries, Southern Southeast Inside (SSEI) and Northern Southeast Inside (NSEI). 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. The fish are dressed and iced according to industry standards and the state receives all the revenues from the sale of the fish.

In the SSEI survey, the overall CPUE (kg/hook) was 0.49 in 2003, 0.41 in 2002, 0.38 in 2001 and 0.43 in 2000. Spiny dogfish (*Squalus acanthias*) dominated the bycatch in all areas surveyed. In the NSEI survey, the 2003 overall CPUE (kg/hook) of 1.09 was up slightly from 2002 (1.05) and similar to 2001 (1.1). 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) in round pounds/hook for vessels using conventional gear increased 9% in 2003 (0.453 rd. lbs./hook) compared to 0.413 rd. lbs./hook in 2002 and 32% increase from 2001 (0.31 rd. lbs./hook). In the NSEI fishery, overall adjusted CPUE in round lbs./hook for vessels using conventional gear, was 0.75 in 2003, 16% higher than in 2002(0.63).

In 2003, ADF&G continued the mark/recapture study in NSEI, marking and releasing 7,781 sablefish using pot gear to capture the fish 1.5 months prior to the fishery opening date August 15, 2003. The external tags are also a part of the on-going study to describe movement patterns between the Gulf of Alaska and the inside waters of Southeast Alaska. Fish were caught with pot gear to minimize the apparent “hook shyness” pattern of tag returns observed in 1997, 1998 and 1999. Tag returns from the fishery in 2000 (the first year pot gear was used to capture sablefish for the mark/recapture study) were significantly higher than in previous years. This suggests that using different gear to capture the fish and extending the time period between capture and recapture may have minimized the “hook shyness” phenomenon. The higher returns could also be a result of a higher exploitation of fish in 2000 compared to 1998 and 1997.

In September of 2003 ADF&G initiated a tag shedding study, using PIT tags, at the Seward Marine Center (University of Alaska Fairbanks). Preliminary results will be available late in 2004. The department is investigating the use of PIT tags on sablefish to determine population size and exploitation rate. Our intent in exploring the use of PIT tags is to minimize or alleviate potential problems associated with misidentification of clipped fins and intentional discards of fish with external marks by individuals, perhaps intending to influence management decisions based on returns of marked fish.

During the fall and winter of 2003-2004 the Alaska Department of Fish and Game (ADF&G) captured, tagged and held 152 adult sablefish (*Anoplopoma fimbria)*. Sablefish were tagged using passive integrated transponder (PIT) tags in order to: 1) test for differences in tag shedding rates between two candidate tagging sites on the fish 2) estimate a tag-shedding rate for each site and 3) estimate tagging-related mortality. Seventy-six of the 152 fish were implanted with a tag

in the head (muscle mass just behind and below the left eye). The other half was implanted with a tag in the peritoneal cavity. The sablefish were then placed in 1 of 4 saltwater tanks (1/4 in each tank), with half of each treatment type per tank. Sablefish tagged in the cheek musculature showed a significantly higher tag retention rate than fish tagged in the peritoneal cavity 96% and 75% respectively. A complete report of these activities will be available latter this year.

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 Bill Bechtol).

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 external 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, tagged with either an external tag and/or a fin clip and released. Tags are recovered from the fishery and fin-clipped fish are counted at the processing plants. In 2003, with tag recovery data collected from the 2003 fishery, we estimated abundance and used the lower 90 percent confidence limit for abundance to forecast the 2004 biomass. An $F_{40\%}$ harvest rate was used to set total allowable catch (TAC). The directed annual harvest objective was set after deducting estimated sablefish mortality in other fisheries and unreported mortality in the directed fishery from the TAC. The department intends to use PIT tags during the 2004 field season. In addition to the mark-recapture work, annual longline surveys are conducted in both NSEI and SSEI and provide biological data as well as relative abundance information. (Contact David Carlile).

A longline survey has been conducted in **Prince William Sound** annually since 1996 using ADF&G vessels. 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 Bill Bechtol).

c. Management

There are three separate internal water areas in Alaska, which are managed exclusively by the state. 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. Sablefish fisheries in outer coastal state waters (0-3 miles) have been managed in conjunction with the federal-managed fishery in the EEZ. 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. 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.

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 2003 fishery GHL was 34 mt. The sablefish fishery in PWS has occurred under limited entry since 1996. Permit holders are restricted to gear and vessel size classes. Additionally a commissioner's permit, which stipulates a 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 conduct post fishery dockside interviews and samples landings in the ports of Cordova, Whittier, and Seward.

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 3,120,000 pounds. The quota in NSEI decreased from 911 mt in 2002 to 909 mt in 2003, however due to the elimination of one permit holder the individual quota increased The SSEI quota was 0.696 million round lbs. in 2002, and remained the same in 2003.

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. Randomly selected permit holders will be allowed to fish outside of the regular season at the department's request to gather biological and catch data. 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.

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 NSEI sablefish fishery landed a total of 909 mt by 108 permits, averaging 8.4 mt per permit between August 15 and November 15, 2002. A total of 298 mt was landed by 28 permits in the SSEI Subdistrict, averaging 10.6 mt per permit between June 1 and August 15, 2002 (contact Tory O'Connell).

In the **Central Region** the 2003 open access sablefish fishery in the North Gulf District was open from July 15 – 17 and harvested 55 mt. Although effort declined from 23 to 14 vessels, catch per landing in the fishery almost doubled in 2003. 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 were April 7 - May 15 and August 1 – 21. The new system allocated half of the GHL equally among all registered participants with the balance of the GHL allocated using the number of registered permit holders within 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 must be sold with the proceeds going 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 2003 Aleutian Island fishery opened on May 15, 2003. Additional requirements for the fishery include registration and logbook requirements. The GHL was set at 286 mt for the state managed fishery. The preliminary harvest from the 2003 Aleutian Islands sablefish fishery was 124 mt. The season remained open until the November 15 closure date. This was the first time since the state-waters season began in 1995 that the total quota was not obtained (Contact Barbi Failor-Rounds).

4. Flatfish

a. Research

No research activities were planned for flatfish during 2003.

b. Stock Assessment

No stock assessment programs were active for flatfish during 2003.

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 may restrict the type of gear used. Mandatory logbooks are required and some areas cannot be fished unless there is an ADF&G

observer on board. This restrictive management is necessary because of reduced flatfish stocks and because of a history of very high, prohibited species bycatch rates, particularly crab and halibut. New regulations adopted in November 1993 implemented a 20,000-pound maximum weekly trip limit in the trawl fishery. This was an industry proposal, the intent of which was to keep large catcher-processor vessels out of this fishery. In 1997 a different industry proposal to the BOF requesting an increase in weekly trip limit was rejected.

d. Fisheries

The **Southeast Alaska** inside waters flatfish trawl fishery was restricted to three small areas during the 2002-03 season with a harvest objective set for each area. There has been almost no effort in the Southeast fishery for the past five years, with no harvest reported for the 2002-2003 season. The BOF restricted the Southeast flatfish trawl fishery to the use of beam trawl only. The Southeast flatfish trawl areas are also the sites of a shrimp beam trawl fishery. Most of the Southeast harvest is starry flounder and is used for bait in other groundfish fisheries while the **Prince William Sound** harvest is a mixture of shallow-water species.

5. Pollock

a. Research

Pollock continue to be a dominant species in the **Central Region** ecosystems. Due to uncertainty about the appropriate harvest level for the PWS pollock fishery, assessment in 2003 included commercial fishery catch sampling and bottom trawl surveys of the summer (post-spawning) population. 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.

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, using pollock biomass estimates to establish the harvest guideline for the winter commercial fishery. This is because a significant portion of the spawning population targeted by the winter fishery is thought to have immigrated from federal waters, whereas 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, with the subsequent fishery harvest level reduced accordingly (Contact Bill Bechtol).

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 2003 fishery opened on January 20 with a GHL of 1724 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 2. Subsequently, fishing improved in the Knight Island and Bainbridge sections, which closed on March 31 due to concerns over increased bycatch. Total pollock harvest for all sections combined was 1099 mt. As in past years, fishery bycatch was dominated by squid (9 mt), sharks (4 mt), and rockfish (2 mt). Salmon bycatch totaled 0.09mt in 2002.

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 Bill Bechtol).

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 the 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 Bill Bechtol).

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. Forty salmon sharks and two spiny dogfish were sampled from the sport harvest throughout Southcentral Alaska for length, sex, and age structures. Interviewed anglers caught 36 salmon sharks in 41 angler-days of effort and kept 22 of them. An additional 21 salmon sharks were released by interviewed anglers fishing for other species. (Contact Scott Meyer).

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 2003 charter operators reported harvesting 30 salmon sharks in Southeast Alaska and 143 salmon sharks in Southcentral Alaska.

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 "fining", 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 shark fisheries to bycatch-only.

7. Lingcod

a. Research

In 2003, the **Southeast Region** continued a lingcod mark/recapture study, conducting one cruise for the purpose of tagging fish for a movement and migration study, and to estimate exploitation rate. Because the movement of local stocks of lingcod in Southeast Alaska is not well understood, a tagging study was launched in the spring of 1996; we plan to continue tagging lingcod in 2003. Over the past seven years 8,340 lingcod have been tagged and 261 fish recovered. A total of 1,654 lingcod were tagged during the 2003 reporting period: 1,187 lingcod were tagged using dinglebar gear, and sport fishermen tagged 443 young fish. Length and sex were recorded for all tagged fish. Research surveys to obtain catch per unit effort independent of the fishery have been conducted seasonally since 1993. Catch per unit effort data from these surveys indicates a moderate increase in 2003 for all areas except NSEO (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 2003 included Juneau, Sitka, Craig/Klawock, Wrangell, Petersburg, Gustavus, Elfin Cove, Yakutat, and Ketchikan. Length and sex data were collected from 817 lingcod in 2003 (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. Approximately 750 lingcod were sampled from sport harvest at Seward, Valdez, Whittier, Kodiak, and Homer in 2003. 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. The directed

commercial fishery data are indicative of stock declines and serial depletion. Analysis of catch per unit effort data (CPUE), in terms of fish per hook-hour for 1988–1998, show that CPUE had declined between 21 to 62% in areas where a directed fishery has developed. There appears to be some serial depletion in the CSEO and NSEO and the commercial fleet has moved into the EYKT and SSEO. For these reasons the AHOs for lingcod were reduced in all areas, an action taken at the 1999 BOF meeting. Commercial logbook data shows a decline in CPUE in 2001, followed by an increase in 2002 and in 2003 there was a slight increase in overall CPUE.

c. Management

The BOF made significant changes in lingcod management in the **Southeast District** during 2000. These changes included a total winter closure for all users except longliners between December 1 and May 15 in an effort to protect nest-guarding males. Guideline harvest limits were greatly reduced in all areas and allocations made between directed commercial fishery, sport fishery, longline fisheries, and salmon troll fisheries. The 27" minimum 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. 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. More recently, the Board of Fisheries 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 2000, **sport** harvests of lingcod in **Southeast Alaska** were incorporated into a region wide lingcod management plan, which set GHL's for 7 areas, and sport harvest in pounds was allocated for each of these 7 areas. The opening date of the lingcod sport fishery as of 2000 was also moved back about 2 weeks from May 1, and is now open from May 16 through November 30. In addition, harvest of sport-caught lingcod in 2002 and 2003 was prohibited during June 16 to August 15 in northern Southeast Alaska and the outer coast of Prince of Wales Island. There was no mid-season lingcod sport harvest closure in 2002 or 2003 for southern inside Southeast Alaska or for Yakutat. The bag and possession limits of 2 and 4 lingcod, respectively, were reduced to 1 and 2 lingcod, respectively, in Southeast Alaska in 2001 through 2003 to reduce harvests in this area to meet allocation guidelines. Guided and nonresident anglers in 2002 and 2003 were restricted to harvesting lingcod within a slot limit of 30 inches (minimum) to 40 inches (maximum) in northern Southeast Alaska and the outer coast of Prince of Wales Island and a slot limit of 32 inches (minimum) to 42 inches (maximum) in Yakutat; furthermore, all lingcod caught by guided and nonresident anglers in these areas with slot limits in 2002 and 2003 could only be landed by hand or landing net. There were no slot limit restrictions for any anglers in southern inside Southeast Alaska area (Ketchikan) in 2002, but in 2003 the guided and nonresident anglers in this area (i.e., Ketchikan area) were restricted to harvesting within a slot limit of 30 inches (minimum) to 40 inches (maximum). Lingcod caught by guided and

nonresident anglers in 2001 were restricted to harvesting fish with a minimum size of 39 inches in northern Southeast Alaska (including Yakutat) and a 34 inch minimum size along the outer coast of Prince of Wales Island; furthermore, all lingcod caught by guided and nonresident anglers in these two areas with minimum size restrictions in 2001 could only be landed by hand or landing net. There was no minimum size limit in the inner area of southern Southeast Alaska for guided and nonresident anglers in 2001. Resident anglers fishing from private vessels throughout Southeast Alaska have never had a lingcod size restriction imposed upon them. Since the department wished to increase biological sampling of lingcod for better determination of length and sex composition, heading or filleting of lingcod prior to offloading was also prohibited in all sampled ports to enable the department to maximize fishery information obtained. The only area totally closed to lingcod sport fishing was the Pinnacles area near Sitka, which is closed to sport fishing year-round for all groundfish (Contact: Tom Brookover).

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 salmon power troll gear modified to fish for groundfish. Additionally lingcod are landed as significant bycatch in the DSR longline fishery and as a limited bycatch in the halibut fishery. The directed fishery landed 111 mt of lingcod in 2003 and an additional 83 mt was landed as bycatch in other fisheries. The halibut longline fishery accounted for roughly 24% of lingcod bycatch in the Southeast Region and the salmon troll fishery accounted for 8%.

Central Region lingcod harvests have primarily occurred in the North Gulf District of Cook Inlet and the Outside District of PWS. The Cook Inlet GHL was 24 mt and the PWS GHL was 11 mt in 2003. Lingcod harvests in 2003 totaled 12 mt in Cook Inlet and 11 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.

No directed effort occurred for lingcod in the **Westward Region** during 2003. Incidental harvest in other fisheries totaled 10 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 2003 harvest are not yet available from the statewide mail survey, but the average estimated annual harvest for the most recent five-year period (1998-2002) was 17,800 fish in Southeast Alaska and 9,800 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 more valuable groundfish and halibut. The State also has a regulation that requires that the bycatch rate of groundfish be set by fishery annually 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 2003, interest in a fishery for skates occurred in the Kodiak Area. Thirty-seven 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 2003 harvest from state waters was 527 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.

A "Developing Fisheries" policy is being drafted for new fisheries which will reduce the possibility that a fishery can escalate beyond management control and will also outline which species may be restricted from being harvested in a directed fishery.

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

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 manage 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, Sitka, Ketchikan, 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. The table below lists the catch by species group from 1988 through 2003 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

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 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 300k), 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

ADF&G Commercial Fisheries is currently using ArcView version 3.x and 8.2 and MapInfo version 4.5 and 5.1 for general map production, project planning and spatial analysis. More advanced spatial analyses are performed using ArcView's Spatial Analyst and 3-D Analyst and MapInfo's Vertical Mapper.

The Division currently maintains its basemaps in both ArcView and MapInfo format; however, beginning in 2002 the ArcView shapefile format will be the Division's standard data distribution format. The Division is also supporting data in both the NAD27 and NAD83 datums. The NAD27 datum is primarily used for terrestrial-based mapping and the NAD83 datum is used for marine-based mapping. Because the Division's managed fisheries span both the terrestrial and marine environments, both datums will be supported. Basemaps, which originated in the NAD27 datum, are being converted to the NAD83 datum. Most of the conversion was completed by mid-2001.

In 2000, the Division developed new hardcopy and digital groundfish and shellfish statistical area charts. These charts became effective January 1, 2001, and hardcopy charts were distributed to processors in early January. Digital versions of the charts are available in two forms. Adobe PDF versions of the charts can be viewed or downloaded at http://www.cf.adfg.state.ak.us/geninfo/statmaps/charts.htm. 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 Tim Haverland).

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 2003 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	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

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 2003 logbook was similar to the 2002 logbook format. Data collected for each vessel trip included port of landing, location(s) fished, angler residency, 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. Information that has been dropped from collection in the saltwater charter vessel logbook program is angler residency (as of 2000) and halibut harvest and release data (as of 2002). 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.

Web Pages

ADF&G Home Page: http://www.adfg.state.ak.us/
Commercial Fishery Division Home Page: http://www.cf.adfg.state.ak.us/
News Releases: http://www.adfg.state.ak.us/news/dept_news.php
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
Mark Tag Age Lab Home Page: http://tagotoweb.adfg.state.ak.us/ADU/default.asp
Region 1 Groundfish Home Page:
http://www.cf.adfg.state.ak.us/region1/finfish/grndfish/grndhom1.php
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 Tim Haverland).

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APPENDIX I. ALASKA DEPARTMENT OF FISH AND GAME PERMANENT FULL-TIME GROUNDFISH STAFF DURING 2002.

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AKFIN Program Coordinator Vacant (907) 465-6109	Age Determination Unit Kristen Munk Box 25526 Juneau, AK 99802 (907) 465-3054	

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Groundfish Sampling Coordinator Kally Spalinger 211 Mission Road Kodiak, AK 99615 (907) 486-1840	Assistant Area Management Biologist Mike Cavin 211 Mission Road Kodiak, AK 99615 (907) 486-1840	Assistant Area Management Biologist Barbi Failor-Rounds P.O. Box 920587 Dutch Harbor, AK 99692 (907) 581-1239
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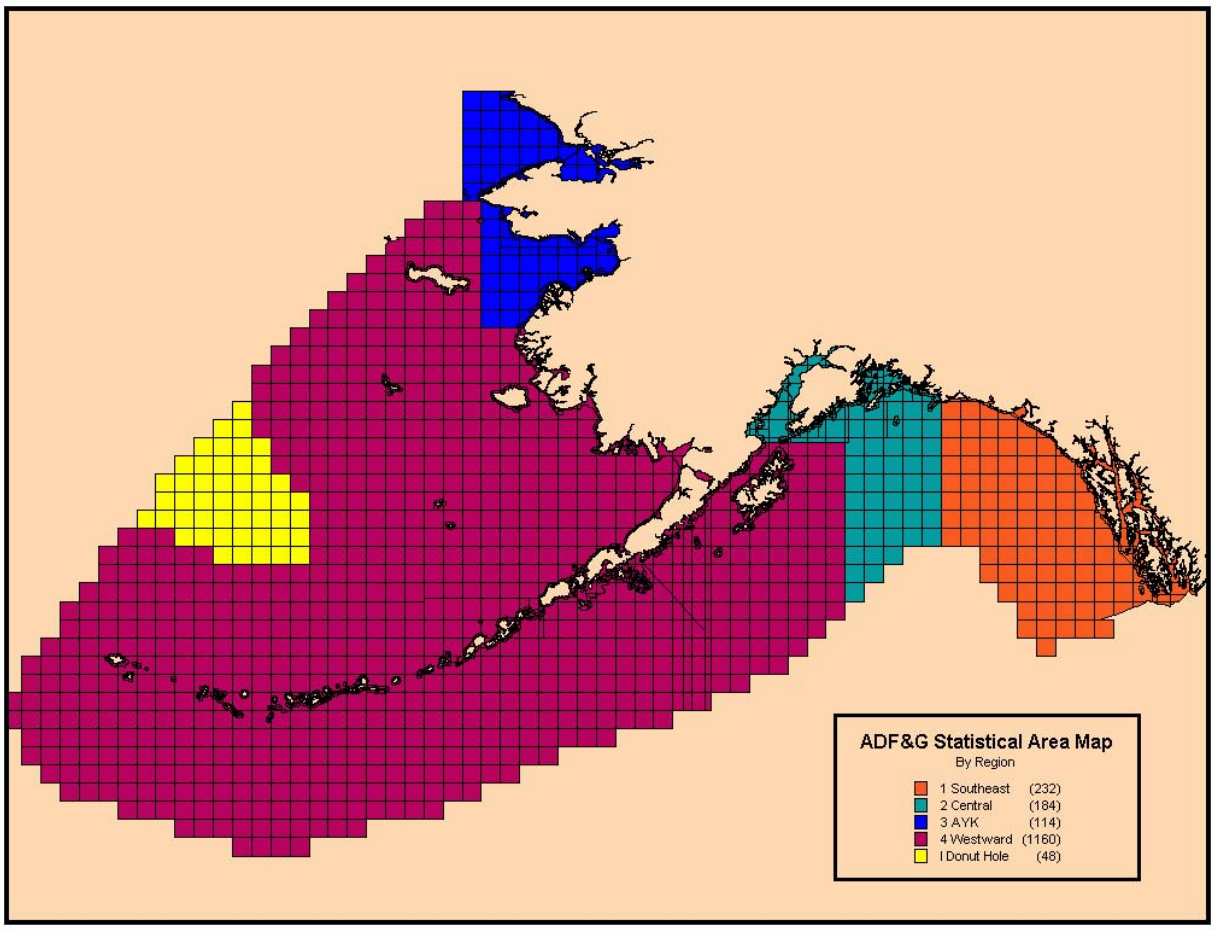
Appendix II. Map Depicting State of Alaska Management Regions.



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