STATE OF ALASKA

GROUNDFISH FISHERIES

ASSOCIATED INVESTIGATIONS IN 1999

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A. Agency Overview

1. Description of the State of Alaska groundfish 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 federal Gulf of Alaska (GOA) Groundfish Fishery Management Plan (FMP) gives the State of Alaska limited management authority for demersal shelf rockfish in the federal waters east of 140° W. longitude. Council action in 1997 removed black and blue rockfish from the Gulf of Alaska FMP so the state now 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 the federal management of the adjacent Exclusive Economic Zone (EEZ). The information related in this report is from the state-managed groundfish fisheries only.

ADF&G also has jurisdiction over all recreational groundfish fisheries within the internal waters of the state and to three miles offshore along the outer coast. In 1998, 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. This was done under provisions of the Magnuson-Stevens Fishery Conservation and Management Act, which stipulates that states may regulate fisheries that are not regulated under a federal fishery management plan or other applicable federal regulations.

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 140^{o} W. longitude and includes all of Yakutat Bay. 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 Kodiak Island, the Aleutian Islands, and the Bering Sea.

a. Southeast Region

The Southeast Region Commercial Fisheries Groundfish Project is based in Sitka with the groundfish project leader, assistant project leader and two port biologists located there. Seasonal port samplers and data entry staff were employed in Petersburg, Ketchikan, Sitka, and Craig. 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. The project also cooperates with the federal government for management of the waters of the adjacent EEZ and 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. Inseason 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; skipper interview and logbook collection and data entry; and biological studies of important commercial species. Five resource assessment surveys were conducted during 1999. Funding for the Southeast Groundfish project comes from NOAA Grants NA77FM0209, NA76FI0210, and NA67FN0441B, and AKFIN AR 41713/GR 41934.

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 fish ticket entry position, and several commercial catch samplers. An area management biologist is also located in Cordova, a seasonal part-time sampler in Seward, 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.

Groundfish responsibilities in Central Region include research and management duties for most groundfish species occurring in territorial waters of Central Region. Area boundaries shifted in 1997 when the eastern boundary was moved from Cape Suckling (143°53' W. long) to 140°00 W. long. Within the Central Region, groundfish species of primary interest include sablefish, rockfish, pollock, Pacific cod, and lingcod. Stock assessment data are collected through port sampling, acoustic surveys, and through ADF&G trawl and longline surveys. Commercial harvest data (fish tickets) are processed in Homer for state and federal fisheries landings to Central Region ports. The development of a state waters Pacific cod fishery in 1997 has provided an extended opportunity for smaller vessels fishing pot and jig gear. Sampling this fishery has become a primary focus of port samplers.

c. Westward Region

The Westward Region shellfish management and research staff is located in Kodiak and Dutch Harbor, with seasonal dockside sampling in Chignik, Sand Point, and King Cove. The *R/V Resolution* and *R/V K-Hi-C* 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 Kodiak archipelago, Alaska Peninsula, and Eastern Aleutians, management of the black rockfish, state water Pacific cod, and Aleutian Island 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 (David Jackson).

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 1998 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 groundfish fisheries data collection and analysis by ADF&G, is part of the Alaska Fisheries Information Network (AKFIN). It specifically supports the enhancement of the fish ticket information collection effort and includes: GIS database development and fishery data analysis, catch and production database development and access, age reading laboratory, database management and Administration, Bering sea crab data collection and reporting, and regional fishery monitoring and data management.

Local ADF&G personnel in six locations throughout the state of Alaska maintained close contact with fishers, processors, and enforcement to maintain a high quality of accuracy in the submitted fish ticket records. Following processing, the electronic data was transferred to headquarters on a regularly scheduled basis. 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 were merged to this master database. Data was routinely reviewed for accuracy with corrections applied as required. Within the confines of confidentiality agreements, raw data was distributed to the Alaska regional office of National Marine Fishery Service (NMFS-ARO), 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 was also provided back to regional ADF&G offices as well as to the State of Alaska Board of Fish, NMFS, NPFMC and the AKFIN Support Center.

The genetics lab continued working on genetic stock separation of a variety of groundfish species in 1999. Work continued on black rockfish, yelloweye rockfish, and light and dark dusky rockfish and pollock.

2. Age Determination Unit

In June 1999, the previous “Otolith Lab” became the “Age Determination Unit” (ADU) and broadened both its scope and time commitment to reading age-structures year-round. In addition to groundfish species, this section within the “CWT & Otolith Processing Lab” will also receive age structures from invertebrates (geoduck, sea urchins, scallop, abalone, etc). The majority of our work is federally funded through AKFIN (groundfish). Recent additional funding to further accommodate our increased volume allowed for the addition of an 11-month fisheries biologist/age reader.

The volume and disposition of groundfish samples received through 2000 are indicated in Table 1, however it does not include a substantial backlog of samples collected between 1983-1990 which are still being catalogued. These latter samples were collected and amassed (some aged) in Kodiak prior to the inception of the Otolith Laboratory in 1991. Recent additional funding was secured to exclusively inventory and read these samples.

Significant time is being expended to fully and quickly train two age readers hired in the past one and a half years. Two other age-readers, one in Kodiak the other in Homer, have been employed for a few months each year to assist with reading operations. Annual "rap 'n burn" calibration sessions bring the remote readers to Juneau to work with resident staff in resolving age-reading conflict.

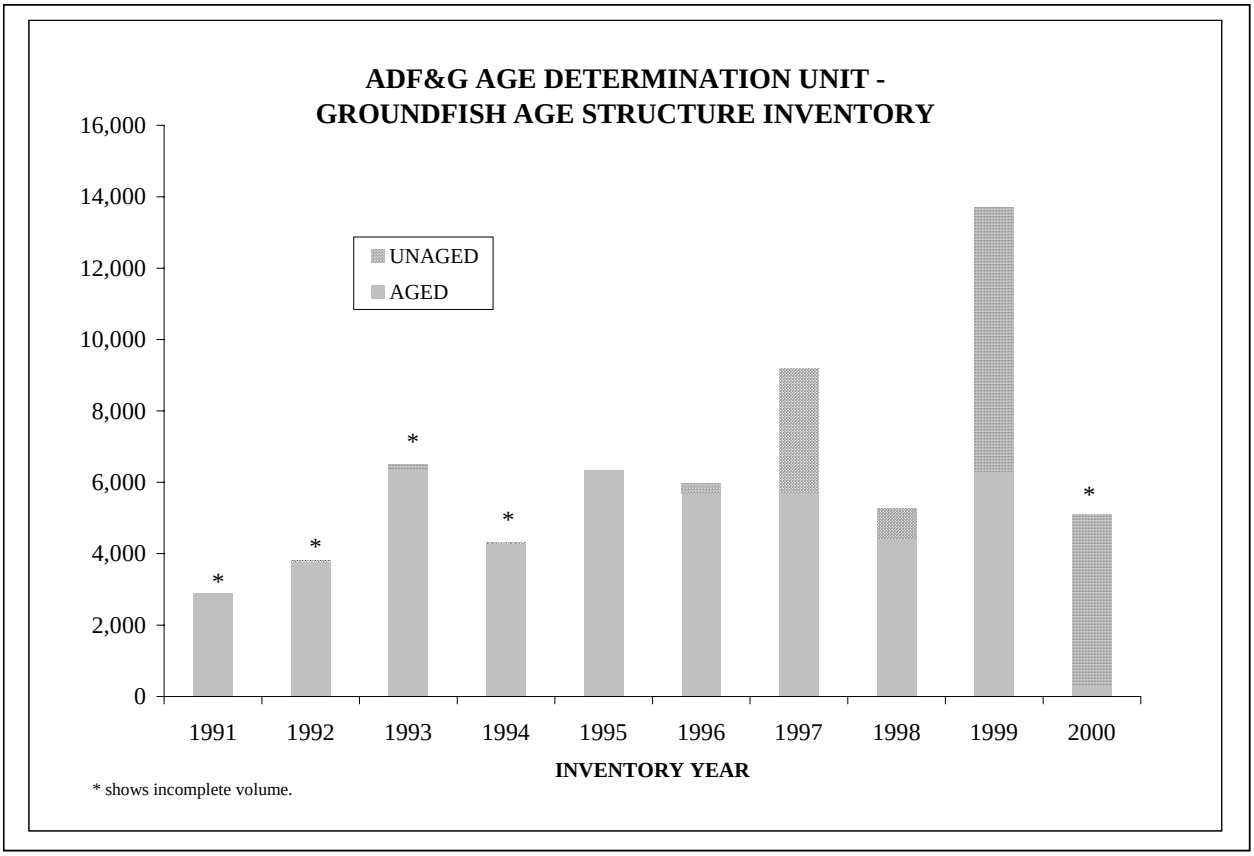
The ADU is currently developing an Oracle-based database for all age data. Data will be hand-entered and downloaded nightly to regional databases. In-house future adjustments to the data will automatically be included into nightly downloads, so that managers have the most current data. A further goal is to develop application screens to allow for routine quality control analyses and summaries, inventory log-in and crosschecks, and data quality filters.

These "data quality filters" are an outgrowth of present in-house strategies to monitor and "correct" age-reading criteria. An evolving opinion is that routine acceptance of standardized age-reading criteria (and subsequent age data), accepted solely for the tenure of such, is insufficient for production and a final supposition of data quality. Basic biological precepts of "increasing age at length" should not be overlooked. If resulting age data defy this, age-readers and age-data-users must react in appropriate and coordinated ways to resolve and adjust criteria if necessary.

This simple filtering of the data compares an age estimate to an accepted length range (derived from the best available data). To counteract the effect of past age-reading error broadening this range, the filter could be rigorously applied as "accepted range, less x% from both tails." Thus-flagged specimens may then be re-examined for possible reclassification. This filtering concept must be carefully and strategically applied, encumbering the following assumptions:

1) These filters should be developed by both age-readers and managers/researchers;
2) In all cases, an experienced reader should re-examine the flagged specimens;
3) An age estimate will not necessarily be changed (acknowledging that outliers do exist), and should only be done so in light of convincing information;
4) This filter may work best (and therefore routinely applied) on only those species with dynamic and ambiguous patterns which might otherwise result in rejection of age-data for specific samples, or species;
5) "Filtering" should be rigorously applied initially, and relaxed when experience warrants;
6) Training of readers should incorporate this process to generate confidence in their data, lend credibility to otherwise unbelievable pattern interpretation, and tie them to the outcome of the age estimates they produce.

Table 1. Age-structure inventory at the ADF&G Age Determination Unit.



3. Sport Fish Division

Recreational fisheries for groundfish occur primarily within state waters and nearby adjacent federal waters. The Division of Sport Fish has management authority for all recreational groundfish fisheries (halibut excluded) in state and federal waters of Alaska. Several biologists are specifically assigned to this effort. Rob Bentz (in Juneau-Douglas) provides groundfish oversight in Southeast Alaska and takes the lead in federal-state jurisdictional management issues. In the central and western Gulf of Alaska, Scott Meyer (in Homer) is the management and research biologist for groundfish. In Southeast Alaska, no biologists are specifically assigned to groundfish; rather groundfish activities are incorporated into various area management biologist's duties.

Most of the management and research effort is directed at halibut, rockfish, and lingcod, the primary species targeted by the recreational fishery. Statewide data collection programs include a mail survey to estimate overall harvest (in number) of halibut, rockfish, and lingcod, and a mandatory logbook to assess harvest of the same species in the charter boat fishery. Regional programs with varying objectives also address estimation of recreational fishery statistics including harvest and release magnitude and biological characteristics such as species, age, size, and sex composition.

B. By Species

1. Pacific cod

a. Research

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 for state waters of Southeast Alaska in 1997 to provide a relative index of CPUE. Commercial landings in Southeast and the Westward Region are sampled for length, weight, age, sex, and stage of maturity.

The Westward Region has continued several projects in 1999, which relate to Pacific cod. A cod-tagging program that was initiated in 1997 in the Central and Western Gulf of Alaska continued. Approximately 1500 fish were tagged in 1999, bringing the total number of tags released to 4,165. By year's end, 95 tags had been recovered. This project is continuing in 2000.

A seasonal trawl study in cooperation with NMFS was completed in 1999. This study re-surveyed 32 stations in Marmot Bay, off Kodiak Island, six times from June 1998 to June 1999 with trawl gear. A final project report has been published (Pengilly et al. 1999), but the otoliths, stomach samples, and reproductive organs collected from Pacific cod flathead sole, arrowtooth flounder, and rock sole have not yet been completely analyzed.

Westward staff also continued a study of cod pot design aimed at reducing the bycatch of Tanner crab. Pot modifications were solicited from industry. Modifications should best exclude Tanner crabs without decreasing the cod catch. One final at-sea trial was conducted in this study during 1999. Information from that trial is available (Watson et al 1999).

b. Management

Regulations adopted by the Alaska Board of Fisheries during November 1993 established a guideline harvest range (GHR) of 340 to 570 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 allowable biological catch (ABC) estimate.

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. However, there are gear restrictions in state waters in PWS, lower Cook Inlet, and around Kodiak Island to reduce crab bycatch.

In 1996, the Alaska Board of Fisheries adopted state water Pacific cod management plans for fisheries in five 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. The fishing seasons are prosecuted after the federal season, which generally closes in the spring. The annual guideline harvest levels (GHLs) are based on the estimate of ABC of Pacific cod as established by the NPFMC. The initial GHLs 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.

c. 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. Pots are the dominant gear in the Cook Inlet District and in the Prince William Sound area. 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 366 mt in the Southeast state-managed fisheries during 1999. The 1999 GHL’s for the Cook Inlet and Prince William Sound state-managed Pacific cod harvest were set at 1179 mt and 422 mt respectively. Harvest from the Central Region state-managed Pacific cod fisheries totaled 688 mt from Cook Inlet and 177 mt from PWS. Harvest from the 1999 state managed fishery in the Kodiak Area totaled 4,890 mt, while 2,927 mt of cod were harvested in the Chignik Area, and the South Alaska Peninsula Area harvest totaled 5,389 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 2000 and all future years. Prince William Sound, Chignik, and Cook Inlet will remain at their current percentages of the Federal TAC for 2000.

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 include dusky, yellowtail, and widow. Slope rockfish contain all other *Sebastes* and *Sebastalobus* species. Black and blue rockfish have recently been removed from the PSR assemblage in the Gulf of Alaska and placed totally under state management.

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 dusky and black rockfishes and walleye pollock using analyses of microsatellite DNA. Investigations of dusky rockfish are focusing on the genetic relationships and level of gene flow between the light and dark forms. Studies of black rockfish are investigating the spatial structure throughout the range of the species from the Pacific Northwest through the Bering Sea. 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. The department is also testing for annual stability of the genetic signal in replicate samples from three of the North American populations. These studies, begun in 1998 and 1999, are continuing into 2000. We anticipate results from these studies will be available in June 2000.

During 1999, ADF&G continued genetic studies on dusky rockfish *S. ciliatus*, black rockfish *S. melanops*, and yelloweye rockfish *S. ruberrimus*. Objectives of the projects were to: 1) develop DNA markers for *Sebastes* species, 2) assess the genetic diversity of the species within the greater Gulf of Alaska area, and 3) utilize genetic techniques to aid in juvenile and larval identification. Both mitochondrial (mtDNA) and nuclear DNA (microsatellite) approaches were initiated. To date, five collections of black rockfish have been obtained from throughout the Gulf of Alaska as well as outliers from Washington State and Sand Point, Alaska. Target sample sizes for each collection have been set at 100. Approximately three collections of yelloweye rockfish and dusky rockfish (both light and dark morphs) have also been obtained. Sampling continued in 1999 to increase coverage for each species.

Laboratory efforts have been concentrated in two areas. Data collection for mtDNA for use in population screenings as well as individual identifications began in 1998 and continued in 1999. Secondly, we developed tetra-nucleotide primers for microsatellite loci. Approximately 20 microsatellite loci (*Sme* 1-20) have been cloned from black rockfish, and initial screening of these loci for resolution in a variety of *Sebastes* species (including the three in this study) is underway. Routine screening of the collection for the microsatellite loci will began in 1999 following the completion of the development screening.

Funding for this project has been provided by the *Exxon Valdez* Trustee Council Restoration Project 252 and the State of Alaska (contact Lisa Seeb).

ADF&G port sampling, skipper interview, and logbook programs for rockfish fisheries continued in Southeast Alaska in 1999. 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 and dusky rockfishes and sent to the age-reading laboratory in Juneau for age determination. Data from these programs is entered onto a database in Sitka. In 1999, 1,689 yelloweye, 1,704 quillback, 162 rougheye rockfish and 387 black rockfish were sampled for age, weight, length, sex, and maturity (contact Tory O'Connell). Fin clip samples for genetic analysis were taken from 200 yelloweye rockfish and 83 black rockfish from commercial port samples (contact Lisa Seeb).

As part of the ongoing rockfish/habitat investigations, ADF&G contracted Delta Oceanographics to survey portions of the Fairweather Ground in East Yakutat and the area between Cape Ommaney and Cape Muzon to collect density counts of yelloweye rockfish. We conducted 67 line transect dives for density estimates, 10 dives to groundtruth geology and the Fairweather sidescan mosaic, and four dives on rockfish longline gear. This information was used to update the annual stock assessment for demersal shelf rockfish in the Eastern Gulf of Alaska. Also during 1999 the *F/V Ida June* was contracted to conduct a longline survey for DSR on the Fairweather Grounds. Catch rates were significantly lower on this survey compared to past surveys but there were also difficulties encountered in landing gear on survey stations making direct comparisons difficult (contact Tory O'Connell).

Port sampling of rockfish in the Central Region during 1999 occurred in Homer, Seward, Whittier, and Cordova. These efforts primarily sampled slope and demersal species. Additional sampling occurred during the Cook Inlet and PWS trawl and sablefish longline surveys. Data collected included length, sex,

and gonad condition. Otoliths were collected from most sampled fish. A new catch sampling position was hired in Seward during July 1998. Since then, this position has sampled Pacific cod, rockfish, sablefish, and pollock.

The Westward Region continued its port sampling of the commercial rockfish harvest in 1999. Most dockside sampling looked at black rockfish, although some yelloweye, and light and dark dusky rockfish were also sampled. Skippers were interviewed for information on effort, location, and bycatch. Length, weight, gonadal and ovarian maturity, and otolith samples were collected (contact Carrie Worton). Otoliths collected during the 1999 season are currently being aged by staff from the Kodiak office. Genetic sampling of deliveries of rockfish to the Westward region began in 1998. Ports included in sampling were Kodiak, Chignik, Sand Point, and Dutch Harbor. Quester Tangent Corporation habitat mapping equipment for use with a ship's echosounder was purchased in 1999, with several days of sea trials. In 2000, mapping of rockfish reef habitats is scheduled (contact Dan Urban).

The Division of Sport Fish continued to collect harvest and fishery information on rockfish throughout Southcentral Alaska as part of a harvest assessment program started in 1991. The objectives of this program are to estimate: 1) species, age, sex, and size composition of rockfish harvests at selected Gulf of Alaska ports, and 2) the geographic distribution of harvest by each fleet. Ports sampled in 1999 included Seward, Valdez, Whittier, Cordova, Kodiak, Homer, and Deep Creek/Anchor Point. In combination, these ports represent the primary areas of recreational rockfish harvest in Southcentral Alaska. The DSR and PSR assemblages make up the vast majority of the recreational rockfish harvest. Primary species harvested include black, dusky, and yelloweye rockfish (contact Scott Meyer)

The Division of Sport Fish—Southeast Region continued to collect catch, harvest, and biological data from rockfish as part of a marine harvest onsite survey program which dates back to 1977 in some selected ports. The objectives of the program include the estimation of effort, catch, and harvest of the primary rockfish species commonly targeted and taken by Southeast Alaska anglers. Ports sampled in 1999 include Juneau, Sitka, Craig, Wrangell, Petersburg, and Ketchikan. Similar to Southcentral Alaska, the DSR and PSR assemblages make up the vast majority of the rockfish harvest in the sport fishery (contact Brian Frenette).

b. Stock Assessment

Results of the 1999 line transect survey were analyzed and used to recommend harvest levels for demersal shelf rockfish (DSR) in the Southeast Outside Subdistrict for 2000. In the Southern Southeast Outside area, which had not been surveyed since 1994, the estimated density of adult yelloweye increased 38%, from 1,173 adult yelloweye per km^2 to 1,879. Survey techniques have changed considerably since 1994 and some of this increase may be attributable to these changes as well as the larger sample size in 1999. The Fairweather density estimates dropped markedly from the 1997 survey estimates. Density declined 44% from 4,176 adult yelloweye per km^2 to 2, 323. More seafloor was covered in 1999 than in 1997 but fewer fish were seen and there was a 54% drop in the number of yelloweye per meter traversed. Estimates of rocky habitat were revised using a combination of information available from submersible dives, sidescan data, NOS data, and commercial fishery logbook data. Areas were digitized into GIS instead of using grids. Changes from previous estimates were significant and varied by area with some areas showing an increase and some a decrease in estimated area of rock habitat. The overall change was down 46%, with 3,095 km^2 compared to 5,758 km^2. The exploitable biomass estimate for yelloweye rockfish in the Southeast Outside Subdistrict, based on the sum of the lower 90% confidence limits of biomass is 15,100 mt. The total allowable catch limit for DSR for 2000 was set at 340 mt.

c. Management

The DSR assemblage is the component of the rockfish complex most actively managed by the state in Southeast Alaska at this time. Rockfish management for this group is based upon a combination of guideline harvest ranges, 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. Separate harvest ranges have been established for each of six Southeast Alaska management areas based upon the best available information on the condition of rockfish stocks in each area. Regulations adopted in 1994 include reduced GHRs in internal waters, reduced weekly trip limits from 7,500 pounds per vessel to 6,000 pounds per vessel (12,000 pounds in EYKT), and added a requirement that logbook pages must be submitted with fish tickets from each fishing trip. The 1999 TAC for DSR was 560 mt in Southeast Outside. A significant portion of the harvest is taken as bycatch mortality during the halibut fishery and 324 mt of the TAC was reserved for landed and unreported bycatch. An additional 50 mt of DSR are available for harvest in the Southeast inside waters. In Southeast Alaska all other rockfish are managed under an area-wide annual harvest limit of 500 mt.

The implementation of the federal IFQ fishery for halibut impacted the directed DSR fishery. Previous to 1995, DSR were managed based on three seasonal allocations: January, July, and October. Because of the bycatch provisions inherent in the IFQ fishery ADF&G does not allow directed fishing for DSR during the IFQ season, March 15 - November 15. 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. (contact Tory O'Connell)

The department has submitted several proposals regarding rockfishes to the Alaska Board of Fisheries (BOF) for consideration during the winter 2000 meeting cycle. Included in these proposals are a request to require full retention of demersal shelf rockfish in all water in the Eastern Gulf and full retention of other rockfish species in the internal waters of southeast Alaska. Poundage in excess of existing bycatch limits or trip limits would need to be documented but, if sold, proceeds for the overage would be forfeited to the State of Alaska. These proposals are an attempt to provide better catch accounting of these species without promoting "topping off" of high value species.

Rockfish have continued to be a major concern in the Central Region fisheries. In 1996 the Board of Fisheries adopted 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. Additionally, there are five-day trip limits of 1.4 mt in PWS, 1.8 mt in the North Gulf District, and 0.5 mt in the Cook Inlet District. In 1998 the Board of Fisheries adopted a directed rockfish season opening date of July 1 and restricted legal gear to jig only in the Cook Inlet Area primarily because this fishery typically targets pelagic rockfish species. Since 1997 the department has set a 10% rockfish bycatch allowance by emergency order for both Cook Inlet and PWS once the directed fishery closed.

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 GHLs have been reduced in some areas that have received large amounts of effort. In 1999, 90 mt of black rockfish were harvested from the seven sections comprising the Kodiak Area. The vast majority of this harvest came from directed fisheries or as bycatch in the state managed Pacific cod fishery. The 1999 black rockfish harvest in the Chignik Area totaled 39 mt and totaled 42mt in the South Alaska Peninsula Area. The staff of the Westward region is currently seeking an economically feasible and statistically valid means to conduct stock assessments on the rockfish resources of the region. A voluntary logbook program will be initiated in

2000 in the hope of obtaining CPUE estimates as well as more detailed harvest locations. The detailed harvest location may be useful in tracking age composition in small habitat areas. (contact Dave Jackson).

Given the lack of quantitative stock assessment information for much of Alaska, 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. 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 are generally set at five fish daily, and in some areas, the harvest of non-pelagic (DSR and slope) rockfish is further restricted to one or two-fish per day. The intent of the additional limitations on non-pelagic species is to allow for retention of bycatch and discourage targeting of these species (contact Scott Meyer).

d. Fisheries

Reported harvest of rockfishes from state-managed commercial fisheries in Southeast totaled 736 mt in 1999, of which 417 mt was directed DSR and 20 mt was black rockfish. The majority of the remaining rockfish taken in the Southeast district were shortraker and rougheye landings made in conjunction with the NSEI sablefish 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 1999 Cook Inlet area directed rockfish fishery opened January 1 and closed March 27 when reported catches totaled 22.6 mt. The department reopened the directed fishery on July 1 when the jig-only regulation became effective. The directed jig fishery remained open for the balance of 1999 with a total harvest of 32 mt. In PWS the directed fishery opened January 1 and closed March 21 when catches in PWS state waters totaled 17 mt, this was primarily yelloweye rockfish taken as bycatch to the longline directed Pacific cod fishery. Bycatch limits were set at 10% by emergency order but were raised to 20% during the PWS sablefish fishery. Total harvest was 40 mt. Rockfish fisheries in both PWS and Cook Inlet did not achieve their fishery GHLs due to declines in effort during directed fisheries and a more restrictive management approach to the directed fishery which has closed early in recent years to ensure that sufficient amounts of the GHL are available as bycatch to other directed fisheries.

Recreational rockfish harvest is typically estimated in numbers of fish. Estimates of the 1999 harvest are not yet available from the statewide mail survey, but the average estimated annual harvest for the period 1994-1998 was 44,000 fish in Southeast Alaska and 49,000 fish in Southcentral Alaska.

3. Sablefish

a. Research

In 1999, sablefish longline surveys were conducted in the two Southeast Alaska state-managed sablefish fishery management areas, Southern Southeast Inside (SSEI) and Northern Southeast Inside (NSEI). These surveys are designed to measure trends in relative abundance and the data is useful for estimation of absolute abundance. In addition, the surveys provide AWL, sex, and maturity stage biological data from the sablefish populations in each area. Otoliths taken during the survey are sent to the ADF&G age

reading laboratory in Juneau for age determination. The cost of these surveys are 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 (fish/hook) in 1999 was 0.22, approximately 54% higher than the CPUE in 1998 (0.14) and 30% higher than 1997 (0.17). The overall CPUE based on biomass was 0.41 kg/hook in 1999 compared to 0.30 in 1998 and 0.34 in 1997. Although the bycatch species composition varied widely between stations, spiny dogfish *Squalus acanthias* dominated the bycatch in all areas surveyed. In the NSEI survey, the 1999 mean CPUE based on fish/hook (0.26) showed a 4% decline from 1997 and 1998 (0.27). Biomass/hook was 0.90 kg/hook in 1999 compared to 1.02 and 0.93 in 1998 and 1997 respectively. Thornyheads 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. The overall CPUE in the vessels using conventional gear was 35% higher in 1999 (0.50 round pounds/hook) compared to 1998 and 1997 (0.37 round pounds/hook in both years). In the NSEI fishery, the round pounds/hook was 0.52 in 1999, similar to 1998 (0.53 round pounds/hook) but below 1997 (0.68 round pounds/hook).

In 1999, ADF&G tagged and released 2,875 fish in Chatham Strait as part of the on-going study to describe movement patterns between the Gulf of Alaska and the inside waters of Southeast Alaska. Fish were not doubled marked and observed in the fishery this year because of the apparent “hook-shyness” suggested in 1998. Of the 5,600 tags released in 1997, 80 tags were recaptured in 1997 and 154 tags in 1998. Tag returns in 1999 have not been summarized to-date. Because hook avoidance violates the assumption of equal capture probabilities of marked and unmarked fish, we were unable to estimate abundance using a Petersen estimator. In 2000, we plan to capture and tag 5,000-6,000 sablefish using pot gear and releasing fish 1.5 months prior to the fishery in an effort to minimize the “hook shyness” behavior. We will resume the observation of recaptured marked fish during the first 20 days of the fishery in September 2000 (contact Meg Cartwright).

In 1999, ADF&G initiated a mark-recapture study in PWS using the bottom trawl survey as the capture vehicle (contact Bill Bechtol).

b. Stock Assessment

Age structured analyses (ASA) were conducted to estimate numbers of age-2 recruits in to the NSEI fishery, the numbers of sablefish at ages 3 through 16+ from 1980-1998, and two parameters which define a longline gear selectivity function. Full input data used in the estimation of these parameters included an independent estimate of natural mortality, annual age and length composition data, fishery CPUE, and survey CPUE from 1988-1998, mean annual weights-at-age, and annual catch. A variety of modifications to the full input data or aspects of the modeling process were made to try to improve the performance of the model and to investigate the response of the model to changes in input data. Preliminary results from the 1998 ASA model were inconsistent, with estimates of abundance varying widely among runs depending upon data included and assumptions made regarding mortality and selectivity. Model estimates of biomass ranged from 8,940 mt to 37,230 mt. The model output that used all available data resulted in a biomass estimate of 10,620 mt. Because we changed our survey design in 1997, we believe it is premature to rely on the result of the ASA model to set the annual quota in NSEI. As the time series of data increases, model outputs will hopefully become more stable and consistent (contact Dave Carlile).

A longline survey has been conducted in PWS annually since 1996 using ADF&G vessels. Mean cpue has ranged from 0.37 fish per hook in 1997 to 0.56 fish per hook in 1999. A longline survey was also conducted in the North Gulf District for the first time in 1999. Survey costs are 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. Although the North Gulf District and the Aleutian Island District are not classified as internal waters in the strictest sense, the state manages the sablefish fishery within the three-mile limit in these areas as an open-access fishery. 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 sablefish fishery in PWS occurred under limited entry for the first time in 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. Central Region staff annually conduct post fishery dockside interviews and sample landings in the ports of Cordova, Whittier, and Seward.

Since 1984 both SSEI and NSEI sablefish fisheries have been managed under a license limitation program. Because of increased vessel efficiency, the season for the NSEI Subdistrict had been reduced to a 24-hour per year "derby" style fishery by 1987. Even in that short season, the pre-season harvest objectives set by ADF&G have been consistently exceeded. Beginning in 1994 a new harvest strategy was adopted for the NSEI Subdistrict sablefish fishery. In response to a concern for potential over-exploitation, the Board of Fisheries adopted regulations that restrict the harvest to no more than 3,000,000 pounds dressed weight for the 1994, 1995, and 1996 seasons. In 1997 the BOF adopted this equal share system as a permanent management measure for both the NSEI and SSEI sablefish fisheries. The department sets the overall annual quota and evenly divides the total quota by the number of eligible permits for each fishery. Prior to 1999, the relative abundance estimate from the survey immediately prior to the fishery was the primary stock assessment tool used to set the annual quota. Because of the expansion of the department's stock assessment analysis to use fishery performance data and age data in the ASA model, the department will set the annual quota in each fishery based on the data collected prior to the current year. The department initiated this change in the 1999 NSEI fishery. The 1999 quota in NSEI was reduced 35% from 2,177 to 1,415 mt (round), because of the declining survey and fishery catch rates. The SSEI quota was 326 mt (round) in 1999, a 10% increase from 1998 due to elevated CPUE in the 1999 survey.

Sablefish fisheries in outer coastal state waters (0-3 miles) are 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 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 extremely limited areas that fall inside state waters and are deep enough to support sablefish populations.

d. Fisheries

The NSEI sablefish fishery landed a total of 1,380 mt by 112 permits, averaging 12.3 mt per permit between September 1 and November 15, 1999. In the SSEI management area, a total of 300 mt were landed by 30 permits, averaging 10 mt per permit between June 1 and July 15, 1999 (contact Meg Cartwright).

During the 1999 season, in the Prince William Sound area, a 42-hr fishery opened at 12:00 PM on May 1 and closed at 6:00 AM on May 3. The harvest totaled 95 mt by 38 vessels. Due to the relatively small remaining GHL, and the fleet harvest efficiency, the fishery did not reopen. The open access sablefish fishery in the North Gulf District was open from March 15 to May 19 with a guideline harvest level of 33 mt. The fishery harvest totaled 35 mt (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 on an annual basis by emergency order 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 1999 Aleutian Island fishery opened concurrent to the federal IFQ season on March 15. The 1999 GHL was set at 122 mt for the state managed fishery. The preliminary harvest from the 1999 Aleutian Islands sablefish fishery was 115 mt. (contact Skip Gish).

4. Flatfish

a. Research

Westward Region has contracted with the University of Minnesota Electrical Engineering Department to develop a computer imaging system that would be able to identify and measure various flatfish species from a video image. The contract specifies the system needs to be rugged enough for use on board a survey vessel or in a fish processing plant. A specific goal of the project is the digital identification of the Northern and Southern rock sole. These species are not readily discriminated with the unaided human eye by external features, but it is hoped computer imaging can readily accomplish this task. Westward Region staff in cooperation with National Marine Fisheries Service is working on a seasonal trawl survey to study distribution and food habits of crabs and groundfish in the Marmot Bay complex. The study area will be sampled 6 times between June 1998 and June 1999 (contact Dan Urban).

b. 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, in flatfish trawl fisheries conducted in the internal waters of the state. 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.

c. Fishery

The Southeast Alaska inside area flatfish trawl fishery was restricted to three small areas during the 1999-2000 season with a harvest objective set for each area. As has been the case for the past five years, there was almost no effort in the Southeast fishery, with less than 5 mt of harvest reported. 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 1999 included commercial fishery catch sampling, collection of samples for genetic and isotope analysis, acoustic surveys of the spawning population, 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.

b. Assessment

A hydroacoustic and mid-water trawl survey were conducted in PWS in the winters of 1995, 1997, and 1998. (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. In recent years, the GHL has been based on the estimated pollock biomass during the summer. 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 (contact Bill Bechtol).

d. Fisheries

The 1999 fishery opened on January 20 and closed February 25 with a GHL of 2100 mt. Similar to prior years, most of the harvest came from Port Bainbridge in southwestern PWS. Early on cpue was low however, as the fishery progressed cpue increased. The directed fishery achieved the GHL. Fishery bycatch remained quite low with squid predominating and salmon totaling 2,144 pounds.

6. Dogfish

a. Research

The relative catch rate of spiny dogfish is monitored in the Southern Southeast Inside area in conjunction with the annual sablefish survey in that area. Commercially landed dogfish are sampled for length, weight, sex, and spines taken for aging.

Spiny dogfish and pacific sleeper sharks have been tagged annually since 1997 as part of the PWS longline survey for sablefish. To date, four tagged sleeper sharks have been recovered.

b. Assessment

Sharks are caught in the PWS longline survey. Catch per unit effort for Pacific sleeper sharks has increased from 1.1 fish per set in 1996 to 4.3 fish per set in 1999. Spiny dogfish CPUE has ranged from 0.9 – 2.7 fish per set except for a dramatic increase to 51.3 fish per set in 1998.

c. Management

The Alaska Board of Fisheries prohibited all directed fisheries for sharks in 1998. In Southeast the bycatch rate for sharks taken during other longline fisheries is 20% of the target species however, there is a proposal in front of the Board of Fisheries that would increase the bycatch rate to 35% in an effort to reduce wastage without promoting topping off. In Central Region, bycatch is set by regulation at 20% of the round weight of the directed species on board.

7. Lingcod

a. Research

Three lingcod research surveys were conducted during 1999 to collect CPUE information and to tag fish for a movement and migration study and to estimate exploitation rate. A total of 979 lingcod were tagged during the reporting period: 127 fish were tagged off Kruzof Island by the *F/V Jennie Leigh*, 583 fish were tagged on the Fairweather grounds by the *F/V Swan* and *F/V Anna J*, and 269 fish were tagged along the beach of the EYKT area by the *F/V Swan* and *F/V Anna J*. Length and sex were recorded for all tagged fish and sub-samples of biological specimens were taken for age, growth, and sexual maturity analysis. Over the past four years 3,638 lingcod have been tagged and 102 fish were recovered (contact Cleo Brylinsky).

The Division of Sport Fish continued to collect harvest and fishery information on lingcod throughout Southcentral Alaska as part of a harvest assessment program started in 1991. The objectives of this program are to estimate: 1) the age, sex, and size composition of lingcod harvests at selected Gulf of Alaska ports, and 2) the geographic distribution of harvest by each fleet. Ports sampled in 1999 included Seward, Valdez, Whittier, Kodiak, Homer, and Cordova. In combination, these ports represent the primary areas of recreational lingcod harvest in Southcentral Alaska.

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 which dates back to 1977 in some selected ports. The objectives of the program include the estimation of effort, catch, and harvest of lingcod taken by Southeast Alaska sport anglers. Ports sampled in 1999 include Juneau, Sitka, Craig, Wrangell, Petersburg, and Ketchikan.

b. Assessment

The Division of Sport Fish also has collected fishery-independent stock assessment data on lingcod on an intermittent basis in the North Gulf of Alaska to assess recruitment. Available information suggests that recruitment is highly variable and has not occurred at a rate necessary for replacement. A survey was conducted in 1998 to assess changes since 1994 in the relative abundance and length composition of lingcod in waters near Seward. The survey indicated very low abundance of lingcod in Resurrection Bay and recommended continuing the sport and commercial fishery closure of those waters. Survey results also indicated a relative downward shift in the size distribution in waters just outside Resurrection Bay (contact Scott Meyer).

c. Management

A lingcod management plan adopted for the Southeast Alaska Region during 1993 went into effect until April 1994. The main elements of the plan included: 1) Extension of the winter closure outward from the surf line to three miles from shore, 2) Modification of the winter spawning closure period by one month to December 1 through April 30, 3) Establishment of guideline harvest ranges for all six of the Southeast Region management areas based on 1/4 to 1/2 mt per nautical mile of rocky habitat inside 100 fm within each area, and 4) Apportionment of the fishery seasonally and among user groups in the two management areas where the fishery is fully utilized. The 27-inch (69 cm) minimum size limit remains in effect in the Southeast District. A portion of the CSEO section was closed to harvest of lingcod in an attempt to prevent localized depletion in an area that seasonally has large aggregations of lingcod. Because of high effort in portions of the EYKT and SSEO, local areas were closed in-season to distribute harvest.

The department has proposed significant changes in the lingcod management plan for the southeast region. These proposals will be addressed by the Alaska Board of Fisheries at their winter 2000 meetings. Recommended changes include significant reductions in the harvest level for lingcod and incorporation of the sport fish harvest into the total allowable catch.

Regulations for the Central Region lingcod fishery include: 1) a complete area closure from January 1 through June 30, and 2) 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 lingcod in the Cook Inlet Area. These regulatory changes were adopted to reduce the harvest and effort from previous levels in the Central Region. Additionally, beginning in 1997, the department set commercial lingcod fishery GHLs for the Central Region at 50% of the recent 10-year harvest.

Conservative harvest strategies have been established for recreational lingcod fisheries in Southcentral Alaska in light of the lack of quantitative stock assessment information. Seasons and bag and possession limits are among the most restrictive on the West Coast. Resurrection Bay is closed to lingcod fishing year-round, and the fishery is managed in most areas under a spawning/nest guarding season closure

through June, a minimum size limit of 35 inches to protect spawners, and bag and possession limits of two fish or less daily (contact Scott Meyer).

In Southeast Alaska, the Pinnacle area is closed to fishing year-round for groundfish, including lingcod. Southeast Alaska is also managed under a winter closure through April, and bag and possession limits are two and four fish. In 1997, bag and possession limits for non-residents only were reduced to one and two fish in Sitka Sound in response to public concerns over local depletion.

d. Fishery

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. In 1997 the Board of Fisheries adopted a regulation that would allow longliners fishing for demersal shelf rockfish to retain 35% lingcod by weight of their target catch.

There was less pressure on lingcod in the directed fishery in 1999 compared to earlier years although harvest in EYKT and SSEO remained high. A total of 36 permits were used in the directed lingcod fishery, accounting for 124 mt of lingcod. An additional mt was taken as bycatch in other fisheries.

Central Region lingcod harvests have primarily occurred in the North Gulf District of Cook Inlet and the Outside District of PWS. The North Gulf commercial harvest was restricted to 16-mt and the PWS harvest was set at 12 mt beginning in 1997. During 1999, Cook Inlet Area lingcod harvest totaled 12.8 mt and PWS reached 14 mt. The overage in PWS is primarily due to bycatch to federal waters longline and trawl fisheries during the closed season. Declines in harvest are primarily attributable to the relatively low allowable harvest and market value.

Recreational lingcod harvest is typically estimated in numbers of fish. Estimates of the 1999 harvest are not yet available from the statewide mail survey, but the average estimated annual harvest for the period 1994-1998 was 17,000 fish in Southeast Alaska and 8,000 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. Fishers 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. Reported landings in Southeast during 1998 were approximately 1 mt. 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.

Regulations adopted by the BOF in 1998 restricted all shark fisheries to bycatch only and skate to directed harvest under a commissioner’s permit. Under 5 AAC 28.070 bycatch is restricted to no more than 20 percent of the directed groundfish on board. There is a very low-level fishery for salmon shark in Prince William Sound and there has been increasing interest in marketing of skate and dogfish bycatch taken in other longline fisheries. The Alaska Board of Fisheries closed this, and other commercial shark

fisheries, in 1988. The board also adopted a management plan governing the recreational fisheries for salmon and other sharks. This plan includes a statewide annual bag limit of one and a statewide annual limit of two sharks.

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 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.

In recent years, a small recreational fishery targeting primarily 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. In an attempt to collect information, the Division of Sport Fish initiated a modest cooperative tagging program with a few charter boat operators in 1998 and will continue to collect biological data on all sharks harvested in the sport fishery. The division is also cooperating with other agencies in joint research efforts aimed at stock assessment.

The department has submitted a proposal to the BOF that would prohibit the development of a live-fish fishery for nearshore groundfish in the southeast region. Currently there are no live-fish fisheries in the area and therefore there would not be an immediate economic impact of prohibiting their development.

C. Other Related Studies

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

By regulation, fish tickets are required for all shore-based landings in Alaskan ports and for all landings from state-managed fisheries. The catch data from the fish tickets is used as the primary means of tracking the in-season harvest levels. Groundfish fish tickets are collected from as many as thirty or more processors within the state. The fish tickets are edited for accuracy and the data is entered on microcomputers in Petersburg, 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 will require all groundfish fishers 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 now requires that fishers 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 1999 rounded to the nearest mt.

Year	# vessels	# landings	DSR	Other Rock	Sablefish	Other	Total
1988	20	27	4	2	83	3	92
1989	8	8	1	1	20	0	22
1990	16	18	3	5	182	1	191
1991	24	24	6	12	149	2	170
1992	19	22	3	4	150	1	159
1993	26	30	7	13	232	1	254
1994	27	27	1	20	216	3	240
1995	21	23	0	20	137	0	157
1996	16	17	1	12	83	0	95
1997	37	45	1	18	103	1	123
1998	26	31	1	8	95	0	105
1999	23	30	0	7	74	1	82
Total	125	302	28	123	1522	13	1686

2. Marine Reserves

In September of 1997 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 is 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. This area is dominated by two large volcanic pinnacles that have a diversity and density of fishes not seen in surrounding areas. The pinnacles rise abruptly from the seafloor and sit at the mouth of Sitka Sound were ocean currents and tidal rips create massive water flows over the habitat from the rich fauna. 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 would protect the fragile nature of this rare habitat, and prevent 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 they BOF did not believe there was sufficient conservation benefit to warrant closing the area.

3. User Pay/ Test Fish Programs

The State of Alaska, Department of Fish and Game receives receipt authority from the state legislature that allows the department to conduct stock assessment surveys by recovering costs through the sale of fish taken during surveys. Receipt authority varies by region. In Southeast Alaska the department has 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

The ADF&G began its first real GIS efforts in 1991 with a PacFIN project that measures groundfish bycatch in the Bering Sea. The primary data for this project comes from the NORPAC observer database. This project's initial analysis tool was ArcInfo 6.0, though much of the work is now done in ArcView. ARC/INFO is currently used in ADF&G, Division of Commercial Fisheries, headquarters and by Habitat Division in Region II (Anchorage). Region IV (Kodiak) has an ARC/INFO license and is planning on using it in the future.

The ADF&G, Division of Commercial Fisheries currently supports MapInfo 4.5 and 5.1 and ArcView 3.0 as its primary GIS tools for the desktop. The department's first real desktop GIS projects began in 1990 with MapInfo 2.0, primarily due to the need to map and display results from studies related to the *Exxon Valdez* oil spill. A pilot salmon project initiated in 1993 introduced ArcView 2.0 to the department. Vertical Mapper, a MapInfo add-on package, is currently used for desktop spatial analysis. A similar tool for ArcView (Spatial Analyst) is beginning to be used by Sport Fish Division in Region I.

Basemaps, as a rule, are obtained from other agencies of the state and from the federal government. Tim Haverland, ADF&G Headquarters is currently responsible for maintenance and distribution of its basemaps. Current coverages in use at ADF&G, Division of Commercial Fisheries are maintained in MapInfo and ArcView formats. Datum NAD27 continues to be the primary display standard for the division's maps, although the department is moving to NAD83 as a standard in the next couple of years.

Basemaps unique to ADF&G, Division of Commercial Fisheries include its groundfish and salmon statistical areas. The first release of these coverages is anticipated in the second quarter of 1998, although there are no plans making these data available to the general public. It must be understood that these basemaps are for display purposes only, and not for legal use, since they rely on undocumented and unproofed versions of crucial maritime boundaries (e.g., the 3 nautical mile line and the 200 nautical mile line delineating the EEZ). The Habitat and Restoration Division also has developed and maintained a line coverage and catalog of anadramous waters in the state.

The Division of Commercial Fisheries has no formal protocols for the maintenance and distribution of its GIS data. It has established a GIS technical committee, which is charged with formalizing these and other GIS policies within the division (contact Tim Haverland).

5. Logbooks

Beginning in 1997 logbooks are mandatory for all state-managed fisheries in Southeast. Logbooks for rockfish and lingcod have been mandatory for a number of years. All usable longline and jig logbook data through 1999 has been entered.

Since 1998, marine recreational charter operators have been required to log effort and harvest for every charter trip made. The 1999 logbook was modified slightly to improve reporting and accuracy. Data collected for each vessel trip included port of landing, location(s) fished, angler residency, effort for salmon and bottomfish, and harvest and release (in numbers) of salmon, halibut, rockfish, and lingcod. A copy of this logbook and the associated instructions are appended to this document.

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

S.E.	Longline					Jig/dinglebar			
Year	DSR	Pcod	Slope Rock	PSR	Sablefish	Ling	Black rock	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		6		215			
1996	261	8		5		252	31	6	
1997	204	98	4	0	466	177	64	8	1
1998	177	135	15		552	153	70	3	4
1999	165	223	9	0	405	89	21	1	1
Total	742	553	28	61	1424	596	160	19	8

6. Web Pages

ADF&G: http://www.state.ak.us/local/akpages/FISH.GAME/adfghome.htm

Division of Commercial Fisheries: http://www.cf.adfg.state.ak.us/cf_home.htm

News Releases: http://www.cf.adfg.state.ak.us/region1/news/news_rel.htm

Sport Fish Division: http://www.state.ak.us/local/akpages/FISH.GAME/sportf/sf_home.htm

Tag Lab: http://tagoweb.adfg.state.ak.us/

Commercial Fisheries Entry Commission: http://www.cfec.state.ak.us

State of Alaska: http://www.state.ak.us/

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APPENDIX I

ALASKA DEPARTMENT OF FISH AND GAME
PERMANENT FULL-TIME GROUNDFISH STAFF DURING 1998

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APPENDIX II
LOGBOOKS NEW TO ADF&G IN 1999

State of Alaska • Department of Fish & Game • Division of Sport Fish • Saltwater Sport Fishing Charter Vessel Logbook

INSTRUCTIONS: Mark each inactive date. Mail white copy to ADF&G; keep pink copy for your records. Return signed sheets for **ALL** days, active and inactive, between your first and last 1999 charter trips.

WEEK OF May 3-May 9, 1999. This sheet must be postmarked by May 16, 1999. No. 0237

☐ This form has my FIRST charter of the season. ☐ This form has my LAST charter of the season.

ADF&G No. (CFEC Permit) | Vessel Name

Day	No. of Multi-Day Trip	PORT OR SITE OF OFF-LOADING	NUMBER OF CLIENTS AND CREW	SALMON FISHING: Primary Area Fished (Write 1 Salmon Code no. per Date)	SALMON FISHING: No. Rods Fished for Salmon	SALMON FISHING: Boat Hours Fished	Number of KING SALMON: 28" and Larger Kept	Number of KING SALMON: 28" and Larger Released	Number of KING SALMON: "Shakers" Less Than 28" Kept	Number of KING SALMON: "Shakers" Less Than 28" Released	Number of Other Salmon: Coho Kept	Number of Other Salmon: Coho Released	Number of Other Salmon: Sockeye Kept	Number of Other Salmon: Pinks Kept	Number of Other Salmon: Chum Kept	BOTTOMFISH FISHING: Primary Area Fished (Write 1 Bottomfish Code no. per Date)	BOTTOMFISH FISHING: No. Rods Fished for Bottom-fish	BOTTOMFISH FISHING: Boat Hours Fished	Number of Halibut: Kept	Number of Halibut: Released	Number of Pelagic Rockfish (Black Rock, etc.) See instructions for definitions: Kept	Number of Pelagic Rockfish (Black Rock, etc.) See instructions for definitions: Released	Number of Other Rockfish (Red Snapper, etc.) See instructions for definitions: Kept	Number of Other Rockfish (Red Snapper, etc.) See instructions for definitions: Released	Number of Lingcod: Kept	Number of Lingcod: Released
DATE	Trip																									
MON																										
MAY			RESIDENT																							
3			NONRESIDENT																							
Inactive ☐			CREW																							
TUES																										
MAY			RESIDENT																							
4			NONRESIDENT																							
Inactive ☐			CREW																							
WED																										
MAY			RESIDENT																							
5			NONRESIDENT																							
Inactive ☐			CREW																							
THURS																										
MAY			RESIDENT																							
6			NONRESIDENT																							
Inactive ☐			CREW																							
FRI																										
MAY			RESIDENT																							
7			NONRESIDENT																							
Inactive ☐			CREW																							
SAT																										
MAY			RESIDENT																							
8			NONRESIDENT																							
Inactive ☐			CREW																							
SUN																										
MAY			RESIDENT																							
9			NONRESIDENT																							
Inactive ☐			CREW																							

CERTIFICATION I certify that the information contained in this document is true and correct to the best of my knowledge.

X BUSINESS OWNER OR AGENT SIGNATURE DATE

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State of Alaska
Department of Fish & Game
Division of Sport Fish

Instructions for Saltwater Charter Vessel Logbook

NOTE:
Both the Logbook form and the Supplemental form require a break down by residency. "**Residents**" hold a valid State of Alaska **resident** sport fishing license for the given year. "**Nonresidents**" hold a valid State of Alaska **nonresident** sport fishing license for the given year.

Catch information must ALSO be recorded for captains, crew and/or non-paying clients.

When Must the Logbook Forms be Completed?

As the owner or agent of the business operating this vessel, you are required to complete an entry into this logbook:

1. **After** returning to the dock and **before** off-loading any fish caught and kept during a particular trip.

OR

2. If the vessel is launched from a trailer in an area without docking facilities, **before the vessel departs the area** or is removed from the site of landing, and **before** off-loading any fish caught and kept during a particular trip.

How to Complete the Logbook Forms

If you have any questions, please call your local ADF&G office for further clarification.

ADF&G No. (CFEC Triangle)

Write the 5-digit number (the "triangle number") assigned to the vessel by the Commercial Fisheries Entry Commission (CFEC). A vessel must have this number to be a legally licensed sport charter vessel in Alaska.

Vessel Name

Write the name of the vessel, or identify the vessel so that it corresponds to the CFEC Triangle No.

Date

PLEASE NOTE: the dates are preprinted on the Weekly forms. Make sure that the row you're writing in is the actual date of the trip!

If your charter season starts before or ends after the preprinted dates (before April 26 or after September 26), use one of the Supplemental Logbook Forms located toward the back of your logbook. Turn in the Supplemental Logbook Form when you have filled it up completely or when you are through chartering for the season. If you need additional forms, contact your nearest ADF&G office.

Inactive

If you do not go charter sport fishing on this vessel for a date that is preprinted, mark an "X" in the inactive box and leave the rest of the row blank. Resume filling in the sheet when you are active again (charter sport fishing). Be sure the preprinted date matches the date of your next active charter.

Day No. of Multi-day Trip

If you have a trip that goes more than one day (or several days), then you will need to mark which day of the trip it is (day 1, 2, or 3...etc.). Information should be recorded for each day of the trip.

For example; you leave on Wed. Sept. 30 for a 4-day trip, and plan to return Sat. Oct. 3. You would write down "1" on Wed., "2" on Thurs., "3" on Fri., ...etc. Each day's entry should also contain all the effort and harvest information for that specific day, and it must be filled in after completing fishing for that day, even though you are not returning to your primary port (*see* "Port or Site of Off-Loading").

Port or Site of Off-Loading

Record the port (or site) to which you are returning for off-loading clients and fish. On a multi-day trip, you would **not** record a port until the day the trip actually ends (when you off-load your clients and their fish).

Number of Clients and Crew

For each trip, write the number of clients who **actively** sport fished from your vessel (do **not** include those clients who were just whale watching, bear viewing, etc.) Break down the number of **residents** and the number of **nonresidents**.

Write the number of crew who sport fished.

Primary Area Fished (For Salmon)

Write the 6-digit area code (from the maps provided) where you caught the **highest percentage** of your salmon catch (if you fished for salmon on this trip). Enter only one code per salmon fishing trip.

No. Rods Fished for Salmon

Write down the **highest** number of rods/lines fished for salmon at any one time during this trip. Be sure to break out the number of rods used by residents, and the number used by nonresidents while fishing for salmon during this trip.

Boat Hours Fished (For Salmon)

Write the number of boat hours that active salmon fishing occurred. **DO NOT include the time it took to run to the fishing grounds from port.** Record to the nearest whole hour.

The Alaska Department of Fish and Game administers all programs and activities free from discrimination on the bases of race, color, national origin, age, sex, religion, marital status, pregnancy, parenthood, or disability. The department administers all programs and activities in compliance with Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972.

If you believe you have been discriminated against in any program, activity, or facility, or if you desire further information please write to ADF&G, P.O. Box 25526, Juneau, AK 99802-5526; U.S. Fish and Wildlife Service, 4040 N. Fairfield Drive, Suite 300, Arlington, VA 22203 or O.E.O., U.S. Department of the Interior, Washington DC 20240.

For information on alternative formats for this and other department publications, please contact the department ADA Coordinator at (voice) 907-465-4120, (TDD) 907-465-3646, or (FAX) 907-465-2440.