

Special Publication No. 06-24

**Summary: ADF&G Statewide Groundfish Meeting,
Captain Cook Hotel, Anchorage, AK, 10-11 April 2006**

by

David Carlile

October 2006

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)		General		Measures (fisheries)	
centimeter	cm	Alaska Administrative Code	AAC	fork length	FL
deciliter	dL	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	mid-eye-to-fork	MEF
gram	g	all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.	mid-eye-to-tail-fork	METF
hectare	ha	at	@	standard length	SL
kilogram	kg	compass directions:		total length	TL
kilometer	km	east	E		
liter	L	north	N	Mathematics, statistics	
meter	m	south	S	<i>all standard mathematical signs, symbols and abbreviations</i>	
milliliter	mL	west	W	alternate hypothesis	H _A
millimeter	mm	copyright	©	base of natural logarithm	<i>e</i>
		corporate suffixes:		catch per unit effort	CPUE
Weights and measures (English)		Company	Co.	coefficient of variation	CV
cubic feet per second	ft ³ /s	Corporation	Corp.	common test statistics	(F, t, χ^2 , etc.)
foot	ft	Incorporated	Inc.	confidence interval	CI
gallon	gal	Limited	Ltd.	correlation coefficient (multiple)	R
inch	in	District of Columbia	D.C.	correlation coefficient (simple)	r
mile	mi	et alii (and others)	et al.	covariance	cov
nautical mile	nmi	et cetera (and so forth)	etc.	degree (angular)	°
ounce	oz	exempli gratia	e.g.	degrees of freedom	df
pound	lb	(for example)		expected value	<i>E</i>
quart	qt	Federal Information Code	FIC	greater than	>
yard	yd	id est (that is)	i.e.	greater than or equal to	≥
		latitude or longitude	lat. or long.	harvest per unit effort	HPUE
Time and temperature		monetary symbols		less than	<
day	d	(U.S.)	\$, ¢	less than or equal to	≤
degrees Celsius	°C	months (tables and figures): first three letters	Jan, ..., Dec	logarithm (natural)	ln
degrees Fahrenheit	°F	registered trademark	®	logarithm (base 10)	log
degrees kelvin	K	trademark	™	logarithm (specify base)	log ₂ , etc.
hour	h	United States (adjective)	U.S.	minute (angular)	'
minute	min	United States of America (noun)	USA	not significant	NS
second	s	U.S.C.	United States Code	null hypothesis	H ₀
		U.S. state	use two-letter abbreviations (e.g., AK, WA)	percent	%
Physics and chemistry				probability	P
all atomic symbols				probability of a type I error (rejection of the null hypothesis when true)	α
alternating current	AC			probability of a type II error (acceptance of the null hypothesis when false)	β
ampere	A			second (angular)	"
calorie	cal			standard deviation	SD
direct current	DC			standard error	SE
hertz	Hz			variance	
horsepower	hp			population	Var
hydrogen ion activity (negative log of)	pH			sample	var
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

SPECIAL PUBLICATION NO. 06-24

**SUMMARY: ADF&G STATEWIDE GROUND FISH MEETING, CAPTAIN
COOK HOTEL, ANCHORAGE, AK, 10-11 APRIL 2006**

by

David Carlile,

Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau

October 2006

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
333 Raspberry Road, Anchorage, Alaska, 99518-1565

The Division of Sport Fish Special Publications series was established in 1991 for the publication of techniques and procedures manuals, informational pamphlets, special subject reports to decision-making bodies, symposia and workshop proceedings, application software documentation, in-house lectures, and other documents that do not fit in another publication series of the Division of Sport Fish. Since 2004, the Division of Commercial Fisheries has also used the same Special Publication series. Special Publications are intended for fishery and other technical professionals. Special Publications are available through the Alaska State Library and on the Internet: <http://www.sf.adfg.state.ak.us/statewide/divreports/html/intersearch.cfm>. This publication has undergone editorial and peer review.

*David Carlile,
Alaska Department of Fish and Game, Division of Commercial Fisheries,
1255 W. 8th Street, Juneau, AK 99811-5526*

This document should be cited as:

Carlile, D. 2006. Summary: ADF&G Statewide groundfish meeting, Captain Cook Hotel, Anchorage, AK, 10-11 April 2006. Alaska Department of Fish and Game, Special Publication No. 06-24, Anchorage.

The Alaska Department of Fish and Game (ADF&G) administers all programs and activities free from discrimination based on 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 (ADA) 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 please write:

ADF&G ADA Coordinator, P.O. Box 115526, Juneau AK 99811-5526

U.S. Fish and Wildlife Service, 4040 N. Fairfax Drive, Suite 300 Webb, Arlington VA 22203

Office of Equal Opportunity, U.S. Department of the Interior, Washington DC 20240

The department's ADA Coordinator can be reached via phone at the following numbers:

(VOICE) 907-465-6077, (Statewide Telecommunication Device for the Deaf) 1-800-478-3648, (Juneau TDD) 907-465-3646, or (FAX) 907-465-6078

For information on alternative formats and questions on this publication, please contact:

ADF&G, Sport Fish Division, Research and Technical Services, 333 Raspberry Road, Anchorage AK 99518 (907)267-2375.

TABLE OF CONTENTS

	Page
ABSTRACT	1
INTRODUCTION	1
SESSION SUMMARIES	1
Overview of Commercial Fisheries Region IV Groundfish Management & Assessment/Research (Nick Sagalkin, Barbi Failor, and Dan Urban)	1
Overview of Commercial Fisheries Region II Groundfish Management & Assessment/Research (Charlie Trowbridge)	5
Overview of Commercial Fish Fisheries Region I Groundfish Management & Assessment/Research (Tory O’Connell)	9
Overview of Sport Fisheries Region II Groundfish Management & Assessment/Research (Scott Meyer)	11
Overview of Sport Fisheries Region I Groundfish Management & Assessment/Research (Mike Jaenicke)	14
eLandings Demonstration (Gail Smith, Phil Witt, and Chris Keller)	16
Overview of Age Determination Unit Activities (Jodi Neil and Kris Munk)	17
Assessing Stages of Groundfish Maturity (Mike Byerly)	19
Assessing Stages of Groundfish Maturity: Skates (Ken Goldman)	20
Groundfish Ageing (Kris Munk)	20
GIS Coordination (Evelyn Russell, Lee Hulbert, Cleo Brylinsky, and Margaret Spahn)	22
Region II Sport Fisheries Research Highlights (Scott Meyer)	25
Region I Commercial Fisheries Project Highlight: DSR Habitat Density Relationships (Tory O’Connell)	26
Region II Commercial Fisheries Project Highlight: ROV-Based Groundfish Assessment (Mike Byerly)	27
Region IV Commercial Fisheries Project Highlight: Hydroacoustic Assessment of Black Rockfish Habitat (Dan Urban)	29
Current and Prospective Groundfish Assessment Approaches and Reference Points (Scott Meyer and Dave Carlile)	31
Coordination/Collaboration Among Divisions and Regions (Dave Carlile)	31
WRAP-UP: PLANS FOR SUMMARY DOCUMENT, FOLLOWUP (DAVE CARLILE)	33
ACKNOWLEDGEMENTS	33
LIST OF PARTICIPANTS	34

ABSTRACT

A meeting of Alaska Department of Fish and Game staff involved in groundfish research and management was convened in Anchorage, AK during 10-11 April 2006. The purpose of the meeting was to acquaint staff with groundfish issues and activities, as well as other staff members involved in groundfish work, around the state. The meeting was comprised of 19 sessions. Session topics ranged from reviews of assessment and management programs among the regions in the Sport and Commercial Fisheries Divisions through groundfish aging and Geographic Information System applications in management and assessment to highlights of selected research projects within the various regions. This report summarizes each of the sessions.

Keywords: groundfish, stock assessment, groundfish management, sampling, rockfish, lingcod, pollock, Pacific cod

INTRODUCTION

During 10–11 April 2006, staff from Alaska Department of Fish and Game (ADF&G) met at the Hotel Captain Cook in Anchorage, AK. The primary purpose of the meeting was information exchange; to acquaint ADF&G staff involved in groundfish management and/or assessment with groundfish-related issues and activities and staff members involved in ADF&G groundfish work from around the state. Among the 50 participants were staff from the Westward, Central and Southeast Regions of the Division of Commercial Fisheries, the Southcentral and Southeast Regions of the Sport Fish Division and the Commercial Fisheries Entry Commission. The meeting was comprised of 19 sessions. Session topics discussed during the meeting ranged from overviews of assessment and management programs among the regions in the Sport and Commercial Fisheries Divisions through groundfish aging and Geographic Information System (GIS) applications in management and assessment to highlights of selected research projects within the various regions.

Each of the sessions is summarized below.

SESSION SUMMARIES

OVERVIEW OF COMMERCIAL FISHERIES REGION IV GROUND FISH MANAGEMENT & ASSESSMENT/RESEARCH (NICK SAGALKIN, BARBI FAILOR, AND DAN URBAN)

Nick Sagalkin, Barbi Failor and Dan Urban presented an overview of management, assessment and research activities for Region IV (Westward Region) of the Division of Commercial Fisheries.

Nick Sagalkin summarized fishery management activities for Pacific cod, black rockfish and pollock in the Kodiak, Chignik, and South Alaska Peninsula (SAP) Management Areas. Prominent among groundfish fisheries in these areas are “parallel fisheries” for Pacific cod and pollock and state-waters fisheries for Pacific cod. The state managed parallel fisheries occur simultaneously with federally managed fisheries, using the same gear as federal fisheries, but are prosecuted in state waters. Guideline harvest levels (GHL) for state-waters fisheries are set at 25% of the federal allowable biological catch.

In addition to the parallel season, a Pacific cod state-waters season occurs in the Kodiak District 7 days after the closure of the Central Gulf Pacific cod season, in the South Alaska Peninsula District 7 days after the closure of the Western Gulf Pacific cod season, and in the Chignik District on 1 March. Management plans for these state-waters seasons are in regulation. Notable differences between fisheries that occur in state waters during the parallel season and the state-waters season are that state-waters fisheries are limited to pot and jig gear and there are gear limits.

In the Kodiak Management Area the overall harvest of Pacific cod has attained the GHL in the last 3 years, in part due to fishermen becoming more adept at catching Pacific cod. Prior to that, catches were below the GHL. In the Kodiak Management Area there is a 50:50 jig:pot allocation of the GHL. Despite the 50:50 allocation, more than 50% of the GHL has been caught with pot gear in most of the last 8 years, with jig catches not attaining the allowable 50% of the overall GHL in most years. The Pacific cod fishery has been valued at approximately \$2.5 to \$3.0 million overall for both gear groups combined. Effort has been fairly constant for pots and more variable for jig gear.

Funding for management of Pacific cod is provided 50% by the Alaska Fisheries Information Network (AKFIN) and 50% by state general funds. While fisheries are in progress, catch accounting for management is accomplished with daily processor reports and voluntary “call outs” which are compared to fish ticket numbers to verify consistency.

Dockside sampling is conducted during the Pacific cod fisheries. Biological samples and data are collected including otoliths, maturity determinations and length measurements.

In the Kodiak Area the Pacific cod GHL is often difficult to achieve, due in part to high variability in daily catch. Within the 40-vessel pot fleet, harvest can vary from 8,000 to 20,000 pounds per day among different vessels.

In the SAP Area, the fleets are composed of 50 to 70 pot vessels and over 100 jig vessels. Fishermen can and do switch between gear types, and the pot fleet in particular has high fishing power. Harvest in the SAP Area has been very close to the GHL during 1997 to 2004 and effort more consistent than in the Kodiak Area. As in the Kodiak Area, management precision, (the ability to achieve harvest close to the GHL) is difficult due largely to highly variable daily catches. As in the Kodiak Area, daily per-vessel catch can vary from 8,000 to 20,000 lbs. Catch information used for harvest management is received primarily from processors, less so from fleet. The SAP fleet is comprised of 40 pot vessels and 40 to 50 jig vessels, with home ports primarily in Sand Point and King Cove and a few boats in False Pass and Kodiak.

The Pacific cod pot fishery in the Chignik Area is prosecuted more slowly than either the Kodiak or SAP Areas. There is little participation by jig boats in the Chignik Area. Because of limited jig effort in 2005, the jig allocation was reduced to 10% of the GHL. Unlike in the Kodiak and SAP Areas, season timing of Pacific cod fisheries in the Chignik Area is not tied to the parallel Pacific cod fisheries. However, like the SAP fishery, effort in the Chignik Area is more stable than around Kodiak. During the last 3 years catch has attained, or come close to, the GHL. Prior to that harvests were below (often substantially below) the GHLs. Value of the fishery has fluctuated over the past several years, sometimes directly and sometimes indirectly with the GHL.

Due partly to the remoteness of the Chignik Area and fisheries, management support functions such as port sampling are relatively expensive. Such programs are funded through the AKFIN and general funds and yield data on age, length and maturity. Management actions, such as fisheries closures, are based largely on information received from processor’s reports verified by fish tickets. The lower effort and slower pace of the Pacific cod fishery in the Chignik Area, compared to the other 2 areas, facilitate management of the fishery. Most of the fleet participating in the Chignik Area fisheries consists of pot boats from Kodiak.

Black rockfish are managed by the state in federal, as well as state waters. Openings, closings, gear types, and GHGs are established by the state. Skates are managed using parallel season rules although state regulations require a Commissioner's Permit that may further restrict fishing activity.

Fisheries for black rockfish are managed within the same management areas used for Pacific cod with the areas further divided in to smaller geographic units with separate GHGs. The GHGs are based on historical harvests which, since 1998, have been incrementally decreased to 200,000 lbs. The fisheries open 1 January, but there is usually no effort until March or April. Fishing effort for black rockfish increased during the 1990s then leveled off beginning around 2001 due to implementation of more stringent management measures. Management measures include exclusive or super-exclusive registration in most areas, prohibition on fishing for other groundfish species when registered to fish for black rockfish and jig-only gear limits. Like Pacific cod in the Chignik Area, harvest monitoring and management actions are based on processor reports. Management is complicated by uncertainties about appropriate GHGs and actual harvest rates.

Management regulations for the Kodiak Area include section and single species registration and trip limits (5,000 lbs in 7-day period; 2,500 lbs for a single trip). These limits were implemented in the Kodiak Area because of concerns about possible localized depletion.

In the Chignik Area, black rockfish harvest is driven more by market than resource availability although the effort has been fairly stable. There is not a local processor in the area, so fishermen need to go to Sand Point or Kodiak. Section caps are included as management measure in the Chignik Area.

In the SAP Area, harvest dropped dramatically in 2003 and 2004 due to a downturn in market demand.

Dockside sampling during fisheries produce data on age, length and maturity as well as fishery-related information from logbooks. Although sampling of the fishery is conducted, further development of an assessment program may be needed to address aforementioned concerns about appropriate GHGs and actual rates of harvest.

Barbi Failor reviewed management activities and issues further to the west in Region IV, in the Bering Sea and Aleutian Islands Management Areas.

State waters fisheries for black rockfish, sablefish and Pacific cod are conducted in the Aleutian Islands. Seasons for these fisheries are 1 January to 31 December, 15 May to 15 November and 15 March to 31 December, respectively.

ADF&G established a directed fishery for nearshore pelagic shelf rockfish in state waters of the eastern Aleutian Islands in December 1994 in response to local public inquiries regarding the possibility of a state-managed black rockfish fishery. Under federal management, black and other pelagic shelf rockfish were included in the "other rockfish" assemblage. This "other rockfish" assemblage was managed as bycatch-only by the National Marine Fisheries Service (NMFS) through November of 1994. ADF&G, with notification to NMFS and the North Pacific Fishery Management Council (NPFMC), assumed management authority of nearshore pelagic shelf rockfish for a state-waters fishery by emergency order on December 21, 1994. In 1994, ADF&G established 2 areas of harvest in the eastern Aleutian Islands: the state waters around Unalaska, Sedanka and Unalga Islands, and the state waters around Akutan and Akun Islands.

The fishery area expanded in 1998 to include all state waters of the Aleutian Islands west of Unalaska Island and federal waters of the Gulf of Alaska between 164°44' and 170° W long.

Management of black rockfish in federal waters was transferred from federal to state government in 1998.

For purposes of managing the black rockfish fishery, the Aleutian Area is divided into 3 smaller management areas: Akutan, Unalaska and Western. The black rockfish fishery began around Akutan Island and subsequently moved west, leading to the creation of the new management areas and the division of GHLs. The fishery is small, with 2 vessels participating in the fishery with a total harvest since 1995 of 227,000 lbs. The average annual exvessel value of the fishery over the last 5 years has been a little over \$5,000.

A state-waters fishery for sablefish was established in the Aleutian Islands where there have been historic harvests. The season runs from 15 May to 15 November. Permissible gear types include longline, pots, jigs and hand troll gear. Registration and logbooks are required for each landing. The effort in this fishery has been sporadic. The harvest equaled the GHL from 1995 through 2002 but fell short of the GHL during the last three seasons. This decline was attributed to a reduction in effort perhaps associated with greater abundance in federal compared to state waters. Participation in the state-waters sablefish fishery requires Individual Fishing Quota (IFQ) shares for the federally-managed fishery in the Bering Sea/Aleutian Islands (BS/AI) area or no IFQs anywhere. For example, fishermen with IFQs in Southeast are precluded from participating in the state-waters sablefish fishery in the Aleutian Islands.

No stock assessment activities are conducted by ADF&G. The quota is set at 5% of the total allowable catch (TAC) for the federally-managed fishery in the BS/AI. The state-waters fishery is managed by reviewing weekly processor catch reports and fish tickets, monitoring the average size of each delivery and by plotting logbook data to verify harvest location.

Harvest in the state-waters Aleutian Island sablefish fishery was 269,220 lbs during the first year, and has ranged from a low of 203,498 lbs in 2005 to a high of 477,970 lbs in 2002. From 1995 to 2005 over 150 vessels have harvested over 3.8 million lbs of sablefish, for an estimated exvessel fishery value of over \$7.0 million.

The state-managed fishery for Pacific cod in the BS/AI Management Areas is a non-exclusive fishery requiring area-specific registration and daily catch reporting by catcher vessels and processors. Restrictions include Steller sea lion closures and no-transit areas, vessel length and gear restriction zones, coral garden area closures and 150,000 lbs per day/300,000 pound onboard limits.

The GHL for the area is 12.8 million lbs. Harvest of the GHL is split, with 70% of the harvest allowed prior to 10 June and the remaining 30% harvested after that date. In 2006, the initial season (i.e. pre-10 June) opened on 15 March and closed 9 days later on 24 March. During that time 96% of the allocation was caught by 26 registered vessels. In addition to the directed state managed fishery for Pacific cod there are parallel fisheries associated with the federally managed fisheries in the BS/AI Areas.

Dan Urban presented an overview of groundfish research and stock assessment activities for Region IV. He noted that there are separate groundfish management and research staffs in Region IV.

Among groundfish fisheries in Region IV, those for Pacific cod and pollock have had the highest harvests. Dan showed results of research he has conducted on trophic level and balance indices. His results suggest patterns or conditions characteristic of Westward Region commercial fisheries that are similar to conditions associated with the collapse of some Atlantic Ocean fisheries.

Westward Region research on Pacific cod diet indicates that cod eat primarily crustaceans (e.g. Tanner crab and pink shrimp) but consume from a wide range of trophic levels. The high consumption of young Tanner crab by cod suggests the possibility that cod may, at times, have a significant impact on Tanner crab populations.

Westward Region groundfish research staff has released over 13,000 tagged cod since 1997. Of that number, 750 have been recovered, with 460 of those being usable recoveries. Among those recovered, 60% have been recovered within 20 miles of the release point, suggesting that at least some Pacific cod within the tagging area are resident or semi-resident.

Much of the past and current research on black rockfish has been funded through federal grants under the Nearshore Marine Research Program. Dan highlighted some of the known population-level attributes of black rockfish. Although there appears to be Gulf-of-Alaska-wide periodic recruitment, there are also Gulf-wide growth differences. Notably, black rockfish growth parameters in the Kodiak area differ from other areas around the Gulf.

Current research toward development of stock assessment methods for black rockfish includes evaluations of hydroacoustic (Northeast Section of Kodiak Management Area), underwater camera and habitat delineation (Shumagin Islands) techniques. As a step in addressing concerns about possible localized depletion, Westward Region research staff will be starting a sonic tagging program near Kodiak in 2006, with a goal of better understanding movements, site affinity and stock distinctness of black rockfish.

Because the State of Alaska may take responsibility for management of dark rockfish, Westward research staff will also be addressing questions similar to those associated with black rockfish. Research may include stomach analysis, determination of age and growth characteristics, determination of maturity (including histological examination) and ecological separation from black rockfish.

Tory O'Connell mentioned that Southeast Region staff had not seen any spawning black rockfish in Southeast and asked whether spawning fish had been encountered by Westward Region researchers. Dan said spawning black rockfish had not been seen in Westward Region either and speculated that spawning black rockfish were either not selected by the fishing gear used so far or were not spawning in the areas sampled.

Doug Woodby mentioned that the NPFMC was drafting a proposal to transfer dark rockfish from federal to state management, but that it may not occur for more than a year.

OVERVIEW OF COMMERCIAL FISHERIES REGION II GROUND FISH MANAGEMENT & ASSESSMENT/RESEARCH (CHARLIE TROWBRIDGE)

As in the Westward Region, there are separate groundfish management and research staffs in Region II.

Charlie Trowbridge summarized groundfish management activities in Central Region by Management Area. Management Areas include Prince William Sound (PWS), North Gulf, and

Cook Inlet. Species of greatest commercial importance include sablefish, Pacific cod, pollock, lingcod, yelloweye rockfish, black rockfish, rougheye and shortraker rockfish.

Most of the sablefish catch in Central Region comes from PWS, followed by Cook Inlet. The 2005 GHL for PWS sablefish was 242,000 lbs, compared to 87,000 lbs GHL in Cook Inlet.

In the Inside District of PWS there is a split season, the first opening occurring 15 March to 15 May and the second during 1–21 August. The fishery has been limited entry since 1996, with 34 vessels participating in 2005. The fishery is a shared quota system with a registration deadline, logbook required, and since 2003, a requirement of prior notice of landing.

In the North Gulf District, the sablefish season ranges from 24 hours to 8 days. Although other gear types are allowed, longline is the predominant gear. It is an open access fishery in state waters, with 10 vessels participating in 2005. Trip limits and area registration requirements were instituted in 2005. Fishery sampling is accomplished via logbooks, dockside interviews and port sampling. The GHL of 87,000 lbs is set at a 10-year (1987 to 1996) historical average adjusted proportional to changes of TAC for sablefish in federally-managed sablefish fishery in the central Gulf of Alaska.

A longline survey is conducted annually as part of the stock assessment effort for sablefish in PWS. A similar survey was conducted formerly in Cook Inlet but was discontinued in 2003. The fishery GHL in PWS is set at the midpoint of the harvest range estimated from yield-per-habitat model developed for similar habitat in Clarence Strait. During port sampling, otoliths are collected and sent to the Age Determination Unit (ADU) at ADF&G's Mark, Tag, and Age Laboratory in Juneau for age determination. A backlog of otoliths has been reduced during the past 2 years. There is currently no abundance estimator for either area. However an age-structured model, as well as alternative methods, are being considered for assessing abundance of sablefish in PWS.

A parallel season for Pacific cod occurs inside and outside PWS followed by a state-waters-only season, usually in February. The parallel season is all gears while the state-waters season is for pot gear only, with a limit of 60 pots. Recently this fishery has had 24 participating vessels. The state-waters season has an allocation of 60/40 to pot/jig gear with exclusive area registration. Also, pot closure areas exist for both seasons. Two vessels participated in 2005. Pacific cod may be retained as bycatch to other directed fisheries at a maximum of 20%. The catch is sampled in port to collect age, weight, and length (AWL) data. The state-waters season GHL is set at 10% of federal eastern Gulf of Alaska allowable biological catch.

The parallel Pacific cod season in Cook Inlet is also followed closely (24 hours after closure of the federal fishery) by a state-managed fishery. Regulations for Cook Inlet are similar to those for PWS. The GHL in Cook Inlet is determined as 3.75% of the quota in the federal fishery. There is currently no specific survey done by the state to assess abundance and condition of Pacific cod in state waters. With the intent of advancing stock assessment for Pacific cod in Region II, age structures and data are being collected. However questions remain about the ability to age Pacific cod adequately.

In PWS the pelagic shelf rockfish catch is comprised of 96% black and 4% dark rockfish. There is a 5% rockfish bycatch limit for jig gear during state-waters Pacific cod season. There are fishery-specific bycatch limits for pelagic shelf rockfish; 20% during sablefish and 10% during other fisheries. There are also 5-day trip limits of 3,000 lbs. There is mandatory retention of all

rockfish and proceeds from the sale of bycatch overages go to the State of Alaska. Efforts are currently being made to enable return of funds from such overages to fisheries research projects.

A periodic trawl survey provides some information about the relative abundance of these rockfish species. In Cook Inlet, the season for pelagic shelf rockfish opens 1 July, and recently had a GHF of 68 metric tons. There are 5-day trip limits of 1,000 lbs in the Cook Inlet District and 4,000 lbs in the North Gulf District. There are target-fishery-specific bycatch limits for pelagic shelf rockfish. The limit is 5% during the Pacific cod directed fishery, 10% during other fisheries and 20% during the lingcod fishery when the directed rockfish fishery is closed. There were 2 vessels in the directed fishery in 2005 and 50 vessels landed rockfish.

Occasional jig and trawl surveys have provided some relative abundance data on black and dark rockfish in Cook Inlet. Port sampling is conducted to collect AWL data. Habitat-based stock assessment methods are being investigated for possible application to these rockfish species in the Central Region.

Demersal shelf rockfish (DSR) catch in PWS and Cook Inlet is bycatch only and is comprised largely of yelloweye rockfish. In PWS, target-fishery-specific bycatch limits for DSR are 20% during sablefish and 10% during other fisheries. In Cook Inlet, those limits are 5% during Pacific cod, 10% during other fisheries, and 20% during lingcod when directed rockfish fisheries are closed. There are 5-day trip limits of 3,000, 1,000 and 4,000 lbs in PWS, Cook Inlet and North Gulf, respectively. There is a 150,000 pound harvest cap each for PWS and Cook Inlet, which includes all rockfish species. Directed fisheries which take DSR as bycatch may close before the directed GHF of the target fish is reached to accommodate bycatch in other fisheries.

Stock assessment activities in PWS and Cook Inlet include port sampling to collect AWL (otoliths age via break and burn techniques) data, and skipper interviews. The feasibility of using a remotely operated vehicle-conducted strip transects to estimate DSR abundance is being investigated with federal funding from the Nearshore Marine Research Program.

Shortraker and rougheye rockfish are the 2 species comprising the largest percentage of catch from the slope rockfish management assemblage in the Central Region. These species are taken as bycatch in fisheries for other species. As with pelagic and demersal shelf rockfish, in PWS there are fishery-specific bycatch limits for these slope species: 20% during sablefish and 10% during other fisheries. There is a 5-day trip limit of 3,000 lbs. In Cook Inlet, the slope bycatch limits are 5% during Pacific cod, 10% during other fisheries, and 20% during lingcod when directed rockfish fisheries (e.g. Cook Inlet pelagic shelf rockfish) are closed. Five-day trip limits in Cook Inlet are 1,000 lbs in the Cook Inlet District and 4,000 lbs in the North Gulf District.

There are not surveys conducted specifically for these species, although age structures are collected opportunistically. As with other rockfish species, port sampling is conducted for AWL and skipper interviews are conducted.

Most lingcod caught in the Central Region are taken by sport fishermen. The majority of lingcod caught in commercial fisheries is taken as bycatch in other directed fisheries. The directed fishery for lingcod in PWS opens 1 July and closes when the GHF is attained. The fishery is managed by emergency order. The GHFs for PWS are set at 75% of average harvest from 1987 to 1996. No retention is allowed during closed seasons, and there is a 35-inch minimum size limit. These regulations are considered effective because of the low discard mortality of lingcod. In 2005, 30 vessels landed lingcod as directed catch and bycatch from PWS. Sampling of the

commercial fishery in both PWS and Cook Inlet includes skipper interviews and AWL sampling (otoliths and fin rays collected).

The GHLS for lingcod in the PWS Area are 5,500 lbs in the Inside District and 19,000 lbs in the Outside District and adjacent federal waters.

The lingcod season in Cook Inlet opens 1 July and closes 31 December, or when the GHL is attained. The directed fishery is jig only and other gears are permitted only for bycatch. The commercial lingcod fishery GHL is set at 75% of average harvest from 1987 and 1996. As in PWS, no retention of lingcod is allowed during closed season and there is a 35-inch minimum size limit. Resurrection Bay is closed area. By emergency order ADF&G can require lingcod landed with head attached.

In the Cook Inlet Area and adjacent Exclusive Economic Zone (EEZ) there is a 52,500 pound GHL. Four jig (directed) and 44 other (longline and trawl) vessels participated in Cook Inlet lingcod fisheries in 2005.

Strip transect density estimates via remotely operated vehicle (ROV) are being investigated as a method for estimating lingcod abundance in the Central Region. Surveys with an ROV were conducted in 2004 and 2005. A habitat based abundance estimate from the 2005 Chiswell Ridge survey is anticipated during 2006.

Pollock catch occurs in both PWS and Cook Inlet, although, with the exception of 1998, the catch in Cook Inlet has been much smaller than in PWS. In PWS, the season is 20 January to 31 March. Midwater trawl is the gear used in the fishery. A maximum of 40% of the GHL may be harvested from any one three sections with a 5% fishery bycatch cap further apportioned by sections. A Commissioner's Permit and vessel check in and out is required. The PWS pollock fishery is restricted to trip limits of 300,000 lbs. Sampling associated with the PWS pollock catch includes logbooks, inseason catch reporting, observers (upon request), and port and observer sampling for AWL.

The GHL in PWS is 2,034,000 lbs and is based on area swept estimates of abundance.

For Cook Inlet, the Alaska Board of Fisheries is considering state-waters fishery in Resurrection Bay.

The gear for this fishery would be midwater trawl and longline. It would be bycatch only, limited to 20% of the catch. However, state-waters Pacific cod jig fishermen would be able to retain all pollock. A miscellaneous groundfish Commissioner's Permit could apply for this fishery.

Various methods are, or have been, used to assess abundance of pollock in PWS, including hydroacoustics, bottom and pelagic trawls, and longline surveys. The GHL is determined primarily from trawl survey data.

Directed harvest of flatfish in Central Region is limited to special permits only. Permits in Cook Inlet Area have been issued for pot, jig and longline gear. The season is open year-round. An area swept estimate from trawl survey data is used to set allowable harvest for permit fisheries. As with other fisheries, catch sampling activities include port sampling for AWL, logbooks, and observers. There is no set GHL; it can be set based upon requested species, although no trip bycatch total may exceed 20%.

Directed fisheries for sharks are prohibited in the Central Region, except for a spiny dogfish permit fishery for the Cook Inlet area in 2005. There were no permits requested for 2005. Data

which may be useful for future assessments has been collected in the form of aging structures (e.g. dorsal fin spines for spiny dogfish) and relative abundance indices (catch per unit effort (CPUE) data from trawl surveys) in both PWS and Cook Inlet. In addition, some tagging of sleeper sharks, and to a lesser extent dogfish, are being conducted opportunistically during surveys.

Any directed fisheries for skates in Central Region require a special Commissioner's Permit, although the season is open year-round. There are logbook, gear, area, and observer requirements as conditions of a permit and a permittee must accommodate a department observer on request. There is no GHL and no trip bycatch total may exceed 20%. No permits have been issued to date for PWS. In Cook Inlet, 12 permits have been issued for longline gear. Sampling and GHL specifics are the same as for PWS.

A proposal was submitted to the North Pacific Research Board to conduct directed research on skates in lower Cook Inlet. For age assessment, vertebrae are being aged at NMFS Sandpoint Lab, and at Moss Landing Marine Labs, CA. Beginning in 2005, caudal thorns have been collected for potential use as an alternative aging structure. Central Region biologists would like to see statewide effort to collect vertebrae and reproductive maturity data from all skate species. There currently is no abundance estimator for skates. Possible stock assessment data includes skate CPUE from trawl and longline surveys.

OVERVIEW OF COMMERCIAL FISH FISHERIES REGION I GROUND FISH MANAGEMENT & ASSESSMENT/RESEARCH (TORY O'CONNELL)

Tory O'Connell reviewed Region I groundfish management, assessment and research.

A general goal for all Southeast Region is to apply a biomass-based harvest rate for managing groundfish fisheries. For those species for which this harvest rate approach has been applied, the harvest rate is applied to the lower 90% confidence limit of the biomass estimate to yield a quota or GHL.

Southeast groundfish fisheries are tracked with the use of a mandatory logbook program, port sampling (length, weight, sexual maturity, and otoliths), and fish ticket accounting. For some fisheries, such as DSR and sablefish, unreported catch is also estimated. Tagging programs have been in place for several years for sablefish, lingcod, black rockfish and DSR. These programs incorporate tag rewards to increase the likelihood of tag returns.

With the exceptions of black rockfish and DSR, rockfish fisheries are bycatch only. Because of high mortality of rockfish when caught, Region I staff perform substantial fleet/industry outreach to promote full retention of rockfish.

There are 2 limited entry, equal quota share, sablefish fisheries in southeast. The Chatham (Northern Southeast Inside, or NSEI) fishery had a 2005 GHL of 2.053 million lbs and 106 permits. Stock assessment for the NSEI fishery is based on mark-recapture estimates of abundance. Tagging for the mark-recapture estimates occurs one to two months prior to the fishery and the recapture is accomplished during the commercial fishery. Quotas are set by applying an $F_{40\%}$ ¹ (recently = .101) harvest rate to the lower bound of the 90% confidence limit of the biomass estimate determined from the mark-recapture work. This approach requires an assumption of a closed population. (Note: Tagging data indicate that the sablefish within the

¹ $F_{40\%}$ = The fishing mortality rate that reduces the spawning biomass per recruit to 40% of the unfished level.

NSEI do not actually constitute a closed population. There is movement into and out of NSEI. But, in the application of mark–recapture methods, Southeast staff have assumed closure, (at least sufficient to minimize bias to an acceptable level) because of the relatively short time between the mark and recapture phases of the sampling. Region I staff also use longline surveys to estimate CPUE and collect additional biological information.

Based on public interest in a longer sablefish season, ADF&G began issuing permits for an “off-season” January to April sablefish fishery in 2004 and 2005. In 2004, 5 vessels and 7 permits participated and in 2005, 9 vessels and 12 permits participated. These vessels must carry department observers. The early start date forces staff to rush to determine the sablefish quota and also conveys to the public a perception that it is a simple exercise for ADF&G to extend the sablefish season (some members of the fleet desire a season concurrent with federal IFQs). Because permitted off-season vessels must carry a department observer, the extended season can be problematic and staff safety is an issue on some vessels. The department would like to keep the off-season fishery as a “tool” but not be committed to allowing it every year.

The off-season harvest is composed of more immature sablefish in January and February with mature, spent sablefish showing in late February. Dogfish bycatch has been greater during the early portion of the off-season. The average length of the early season is similar to that of the regular season. The CPUE is low in January and highest in February and March but vessels that participated tended to have higher CPUE during regular season than the fleet average. There was not much difference in CPUE when compared inseason within vessel.

The Clarence (Southern Southeast Inside, or SSEI) fishery had a GHF of 696,000 lbs with 24 longline and 4 pot permits. The season for pots runs from 1 May to 15 July and for longlines from 1 August to 15 September. The Clarence Strait fishery does not yet employ a biomass-based estimate. Sablefish in Clarence Strait are younger and smaller and apparently more ready movement of sablefish into and out of Clarence Strait may compromise the ability to provide a sufficiently unbiased estimate of abundance based on a closed population mark–recapture model. An annual longline survey provides an index of relative abundance and biological sample data. Currently, survey CPUE is much higher than fishery CPUE for unknown reasons. Biological sampling is also conducted on the commercial harvest.

There is a limited entry program for the directed lingcod fishery. Allowable lingcod harvest is allocated between user groups and gear types and among areas. There are separate regulations for the directed commercial, troll bycatch, halibut longline bycatch, jig bycatch and sport fisheries. The directed commercial fishery is restricted to dinglebar troll gear which has proven to be a clean fishing gear type. To protect nest-guarding males, there is no directed troll or sport harvest from 1 December to 15 May. Although the historic high harvest was greater than 900,000 lbs, recent harvests have ranged from 350,000 to 400,000 lbs. Recent prices paid for lingcod bycatch and directed catch are \$1.00/pound and \$0.50/pound, respectively.

Although highly desirable, there is, as yet, no stock assessment model for lingcod. The Region I staff uses logbooks from a subset of experienced fishermen to calculate relative changes in CPUE. A tagging project has released 8,800 tags with 345 recovered tags showing as much as 700 km movement. An acoustic tag project at the Sitka Pinnacles resulted in 83 fish tagged and tracked over 18 months.

Although traditionally a bait fishery in the Southeast Region, other markets have started to develop in the region for Pacific cod. The harvest is predominantly taken by longline gear.

Recent exvessel price was \$0.60/pound. Although a lower priority than lingcod, the Southeast staff would like to eventually develop a stock assessment approach for Pacific cod. There is no fishery-independent sampling being conducted on Pacific cod in the Southeast Region.

A small, flatfish beam trawl fishery occurs in SSEI. There is a split season during fall and winter. Harvest data are confidential due to the low level of participation. However, staff expects fishing pressure to increase as other Gulf of Alaska opportunities decline in the face of fishery rationalization efforts. There are no fishery-independent surveys on Southeast flatfish and little is known about the current condition of flatfish resources or potential impacts of a large fishery on other species. There is a need to develop a flatfish stock assessment and collect biological data.

The State of Alaska is authorized to manage DSR in adjacent federal waters of the Eastern Gulf of Alaska. The DSR assemblage is managed under a biomass/harvest rate approach with a 410 mt allowable biological catch and overfishing level defined. Although the directed fishery developed 25 years ago, yelloweye is the primary bycatch species in the IFQ halibut fishery. The directed fishery is managed for the remaining allowable catch after bycatch needs are met by the halibut fishery. Overall bycatch levels are high to the extent that participation in the directed fishery has declined from 85 to 90 permits in the mid-1990s to less than 60 permits since 2000. Partial area emergency order closures in 2005 for Central Southeast Outside (CSEO) and Southern Southeast Outside (SSEO) and 2006 Southeast Outside (SEO) are attributed to the high level of sport harvest. There are some regulatory closure areas as well. The DSR TAC was allocated 84% to commercial and 16% to sport by the Alaska Board of Fisheries. This will become effective by June 2006 and may require adjustments to sport fishing due to the trend of increasing harvests.

Stock assessment for DSR is based on submarine line transects to estimate density, port sampling to estimate mean weight, and area estimates of habitat. From these elements, biomass is estimated as the product of density, mean weight, and habitat area. Federal funds formerly used for assessment have recently become unavailable. The possibility of supplementing the habitat-based approach to assessing DSR with an age-structured model is being investigated. However with no directed fishery, the program is unable to reliably collect additional age structures. Full retention in federal fisheries may provide better total catch information.

Region I landed catch of black rockfish peaked in 2003 at over 90,000 lbs and declined to less than 10,000 lbs in 2005. There is currently no stock assessment program in place but some tagging was undertaken to learn about movements and site fidelity of black rockfish.

OVERVIEW OF SPORT FISHERIES REGION II GROUND FISH MANAGEMENT & ASSESSMENT/RESEARCH (SCOTT MEYER)

Region II is divided into 4 management areas: Prince William Sound, Kodiak-Alaska Peninsula, Lower Cook Inlet, and North Gulf. Boundaries for the region differ from those of the Division of Commercial Fisheries and include all areas between Cape Suckling and Cape Newenham. Management for Sport Fish includes both state and federal waters and applies to all recreational fisheries except halibut.

Management and assessment data come from a variety of sources, including statewide mail surveys (since 1997), saltwater logbooks (since 1988), port samples (since 1991), and fisheries independent surveys. Port samples are collected at 7 ports, constituting 96% of all recreational

landings, and include age, size, and species composition. In 1998, lingcod surveys and salmon shark tagging programs were initiated.

Funding for this division comes from the National Oceanic and Atmospheric Administration (NOAA)/NMFS halibut grant, federal aid (WB-DJ money), as well as the sport license fund. The NOAA/NMFS halibut grant provides half of the funding for the program and allows biologists to collect data on other species.

The main recreational fish species managed by sport fish are halibut, rockfish, lingcod, and salmon sharks. Pacific cod, pollock, sablefish, dogfish, and greenling are caught either as bait or incidental to other targeted species.

The recreation halibut fishery has developed since the mid-1970s. The season runs from May to September and most anglers fish with herring bait, circle hooks, and jigs. The majority of lingcod and rockfish are caught as bycatch in the halibut fishery.

Prior to 1977, there were no estimates of rockfish caught in the recreational fishery. The region has seen a steady increase in the harvest of rockfish since the 1980s and 1990s. The majority of the harvest comes from North Gulf, specifically Seward, but PWS has been growing steadily. There is a trend in species composition from west to east, where pelagic species (black and dusky) dominate the catch in Kodiak and Homer, while the DSR (yelloweye, quillback) complex dominates the PWS catch. There is a very small directed fishery for rockfish. Most are caught as bycatch in the halibut fishery or as an alternative or additional target. In all areas, the number of rockfish released nearly equals the number harvested. Management goals for rockfish include being proactive, evaluating size and age composition, and setting bag limits high enough to accommodate incidental catch but low enough to avoid targeting.

The first bag limit of 10 fish per day was set for Cook Inlet and North Gulf in 1973. In 1989, 1993, and 1995, differential bag limits for “red rockfish” were set for PWS, Kodiak, and the Alaska Peninsula, respectively. In 1996, differential bag limits were set for pelagic and non-pelagic fish for Cook Inlet to PWS. The bag limit for PWS was modified in 1997, 1998, and 2000. Currently, the bag limit for the Alaska Peninsula and Kodiak is 10 per day/10 in possession and applies to any rockfish species. The bag limit for Cook Inlet and North Gulf is 5 per day/10 in possession and only 1 per day/2 in possession can be non-pelagic. Similarly, the bag limit for PWS is 5 per day/10 in possession and only 2 per day/2 in possession can be non-pelagic. Gear in all areas is limited to 1 line/2 hooks.

Monitoring of the rockfish harvest includes collecting data on species, age, length and sex composition and spatial distribution. Some of the issues associated with management of rockfish include the lack of stock assessment and harvest monitoring or strategy, coupled with increased harvest. One possible strategy suggested for stock assessment is to document the spatial distribution of commercial and sport harvest history and compare catch curves. A suggested approach to consider would be to set harvest guidelines for the overall fishery (commercial and sport) to achieve a target exploitation (e.g., $F_{60\%}$ or $F=0.75M$, etc.).

There is some concern that fishermen that have been educated about the effects of barotrauma on rockfish may try to “safely” release the fish and end up causing more harm and/or delayed mortality.

Management of the recreational lingcod fishery in Region II began in 1987 with the first bag limit of 2 per day set for Cook Inlet and North Gulf, followed by a 2 fish per day bag limit for

PWS in 1991. The regulations were modified in 1993 and included a 1–2 per day bag limit, closure of Resurrection Bay year-round, an open season from July to December, and a 35-inch minimum size limit. Research has shown that the larger lingcod are predominantly females, and according to data from Washington and British Columbia, the 35-inch minimum size requirement allows fish to spawn at least twice. Limiting harvest of smaller individuals has shown to be successful in increasing spawning biomass.

Currently, the recreational fishery accounts for most of the lingcod removals in Region II, especially in Cook Inlet and PWS. The number of lingcod harvested is less than the number released and the released mortality rate is assumed to be fairly low (at or below 4.5%). The bag limit for the Alaska Peninsula and Kodiak is 2 per day/4 in possession with no size limit. The bag limit for Cook Inlet is 2 per day/2 in possession, North Gulf is 1 per day/1 in possession, and PWS is 2 per day/4 in possession. The 35-inch minimum size limit is required for Cook Inlet, North Gulf, and PWS.

Management goals for lingcod include being proactive and conservative, maintaining increased proportion of spawning biomass in order to increase reproduction, protect nest-guarding males, and evaluate size and age composition. Lingcod management concerns include a lack of harvest reference points and a harvest strategy, as well as the increase in harvest in PWS and North Gulf. Of particular concern was the increase in the harvest of lingcod in these areas in 2004 as a result of the forest fires in the interior causing an increased number of tourists on the coast.

Development of a stock assessment approach for lingcod is in progress and is focusing on the use of data from harvest monitoring, including age, length, and sex composition, spatial distribution, and CPUE and harvest per unit effort (HPUE). Additional assessment elements may include:

- Standardization of sport fishery CPUE,
- Evaluation of catch curves on standardized cohort CPUE to see if F (instantaneous fishing mortality rate) is great enough to proceed,
- An age-structured approach modeling (fit to age or length composition, and tuned to CPUE) and,
- Ather alternative models (non-equilibrium biomass, delay-difference) and comparison of spatial patterns of harvest density to habitat.

Salmon sharks are caught in a directed fishery in PWS and North Gulf by charter fishermen who either release them or harvest them for consumption. The total number of sharks caught is monitored through port samples and charter logbooks. A statewide sportfish bag limit of 1 per day/2 per year was adopted in 1998 and extended to all shark species. Currently, the season for salmon sharks is year-round and has quickly become Alaska's big game fishery. Salmon sharks have a life span of 20 to 30 years and reproduce a single offspring every 2 to 5 years. Data has shown that salmon sharks are sexually segregated, with females predominantly in Eastern waters and males predominantly in Western waters. The harvest is predominantly female. As big game fishing becomes more popular there is a potential for a rapid increase in the overall harvest and a decrease in spawning abundance.

Management goals are to evaluate the population using age composition, changes in spatial distribution, and anecdotal information, and manage the population conservatively.

Some issues facing management are the lack of harvest reference points and stock status information, the need to improve logbook reporting and the effects of catch and release on the

salmon sharks. Currently, Goldman's 2002 demographic model is being used for stock assessment. The model uses data from harvest monitoring such as age, length, sex, and location of harvest.

OVERVIEW OF SPORT FISHERIES REGION I GROUND FISH MANAGEMENT & ASSESSMENT/RESEARCH (MIKE JAENICKE)

As an integral part of their management program, Region I Sport Fish Division conducts an annual statewide harvest survey (SWHS), and makes estimates of effort and harvest within 8 sub-areas of Southeast Alaska. The sub-areas include Ketchikan, Prince of Wales Island, Petersburg/Wrangell, Sitka, Juneau, Haines/Skagway, Glacier Bay, and Yakutat. These differ from the Commercial Fisheries Region I groundfish and lingcod management areas. In addition to the SWHS, Region I also collects sport fish effort and harvest data via the charter logbook program and onsite creel surveys.

The 4 primary groundfish sport fisheries in Southeast Alaska are for rockfish, lingcod, salmon shark, and Pacific cod.

Prior to 1989 there were no bag and possession limits for rockfish in Southeast Alaska.

From 1989 to 1993 the bag and possession limits were 5 rockfish per day/10 in possession and only 2 per day could be yelloweye rockfish. Exceptions to these limits were in the Ketchikan and Sitka areas where the bag and possession limits were 3 rockfish, only 1 of which could be a yelloweye rockfish. From 1994 to 2005 the limits for pelagic and non-pelagic (i.e. DSR) rockfish were 5 per day/10 in possession. However, for non-pelagics only 2 daily and 4 in possession could be yelloweye. Exceptions to these regulations were in the Ketchikan Area and Sitka Sound Special Use Area where the limits were 3 daily and in possession, only 1 of which could be a yelloweye rockfish. The Pinnacles near Sitka was closed to groundfish fishing.

Recreational rockfish harvest has been cyclic but on the rise in recent years from less than 20,000 fish in 1977 to over 80,000 fish in 2004.

From 1993 to 2004 the number of resident participants was fairly steady but there was a large increase for non-residents in 2004. This increase was due perhaps to 1) increased catch incidental to the halibut fishery and 2) possibly due to an increase in the cruise ship industry and more domestic travel after 9/11.

From 1993 to 2004, there has been a significant increase in recreational rockfish harvest in the outside waters of Southeast Alaska. Logbook charter data indicates that approximately 50% of non-pelagic rockfish are retained and 50% released. For pelagic rockfish these numbers are 25% retained versus 75% released.

Prior to 2006, creel survey technicians had been collecting rockfish harvest information by major species (i.e. yelloweye, quillback, copper, black, dusky, silvergray, "other non-pelagic", and "other pelagic") at all ports except Juneau (which prior to 2005 was only recorded as "generic" rockfish). Also prior to 2006, species-specific release information was not collected providing only "generic" rockfish release estimates. This lack of specificity was due to ADF&G's inability to examine released fish. Beginning in 2006, the creel survey will be collecting species-specific release information from anglers. Creel survey species release trends will be compared with charter logbook data for ground-truthing.

Prior to 2006, Region I had been using average weights from commercial landings for estimating total biomass of the catch. Beginning in 2006 the creel survey program will be collecting length and weight data on harvested rockfish at all ports in Southeast Alaska. These data will be used to determine average weight by rockfish species group to be used with harvest estimates to estimate total biomass caught (harvest + release).

Due to the time constraints of interviewing sport anglers for salmon and bottomfish effort, harvest, and release information, in addition to collecting biological data from Chinook salmon and coho salmon (primarily collection of coded wire tags (CWT) and associated data) and other groundfish, the creel survey technicians will continue not collecting otoliths or genetic samples from rockfish. The first priority of creel technicians for biological sampling is to sample Chinook and coho salmon for CWT. Due to the need for meeting sampling goals for both salmon and bottomfish biological samples, the creel technicians are systematically assigned either “salmon sampling priority days” or “groundfish sampling priority days”.

From 1998 to 2005, data were collected on pelagic and non-pelagic rockfish harvest and release through a charter logbook program. Beginning in 2006, harvest and release data on 3 rockfish groups, yelloweye rockfish, other non-pelagic rockfish (excluding yelloweye), and pelagic rockfish, will also be collected in logbooks. In contrast, the SWHS will continue to collect only “generic” rockfish harvest information from surveyed anglers, and it will not be broken down further into non-pelagic/pelagic or finer species detail.

In 2006 the Alaska Board of Fisheries set an annual allocation of the allowable biological catch biomass removal (harvest + release) of outer coast DSR to 84% for the commercial fishery and 16% for the sport fishery. A reduction of daily bag limits of yelloweye rockfish from 2 to 1 fish and a requirement to retain the first 3 DSR rockfish landed are planned, at least along the outer coast SSEO/CSEO/NSEO groundfish areas.

Prior to 1994 there were no bag, possession, or size limits, nor seasonal closures for sport caught lingcod. From 1994 through 1999, bag limits were 2 per day/4 in possession from 1 May to 30 November. The season was closed during the winter and early spring spawning and egg-guarding period. Currently, the season is usually from 16 May to 30 November, with summer closures in some areas by emergency order. Daily bag limit reduced from 2 per day/4 in possession to 1 per day/2 in possession. In addition, depending on the area, there may be slot or minimum length limits for guided or non-resident anglers. Lingcod must be landed with a net or by hand when size limits apply; gaffs are prohibited.

The majority of lingcod are harvested by non-residents. In the East Yakutat Area, lingcod harvest peaked in 2000, declined through 2002, increased again in 2003 and has declined through 2005. The GHL for this area is 33,300 lbs. Harvest in the CSEO and NSEO also increased to a peak in 2001 and then dropped markedly in 2002. Harvest since 2002 has increased consistently to about half the 2001 peak in 2005. Roughly similar historical harvest patterns have prevailed in the SSEO and NSEI. In contrast, harvest in the Southern Southeast Inside (SSEI) increased from 1991 to a peak in 1994, declined but fluctuated until again peaking in 2000 near the 1994 level, then declined through 2003 before showing increases in 2004 and 2005. The declines in harvest after 2000 were generally due to added restrictions.

Lingcod harvest and release data have been collected at the various ports since 1987 as part of a creel survey program. Length and sex data from harvested lingcod has been collected at the various ports since 1993 and 2000, respectively.

Management actions being considered for the Southeast lingcod sport fishery for 2006 included a 2-fish annual limit for nonresidents, restriction on charter operators and crew from retaining lingcod while clients are on board, and continuation of length limits, seasons, and gear restrictions in place in 2005.

There is an annual limit of 2 sharks (any species, including salmon shark) per year per angler. Shark catches must be recorded on a harvest record at time of harvest. Salmon sharks are usually caught as bycatch while targeting salmon or groundfish. Only a few anglers specifically gear-up and fish for salmon sharks in Southeast Alaska. Sport fish harvest data available specifically for salmon shark is from the charter logbook program. The SWHS has provided estimates of shark harvest (all species) and release from 1997 through 2004.

Logbook data from 2000 to 2004 indicate a peak harvest of 40 salmon sharks in Southeast, in 2000, followed by a decline to 9 salmon sharks in 2001 with a steady increase to 32 salmon sharks in 2004. Between 1999 and 2004, most areas of Southeast Alaska, with the exception of northern Lynn Canal, recorded catches of salmon sharks in the charter logbook data. During the same time period the same areas had even greater numbers of salmon sharks released. In 2004 there were 576 salmon sharks released in the Yakutat area.

There are currently no restrictions (bag/possession, annual or size limits) in the Pacific cod sport fishery in Southeast Alaska. Pacific cod are usually caught as bycatch while targeting groundfish. The only sport fish harvest data available are from the SWHS database beginning in 1996. Since 1996 annual sport fish harvests of Pacific cod have tended to be greatest in the Prince of Wales Island, Ketchikan and Juneau areas and lowest in the northern Lynn Canal and Yakutat.

eLANDINGS DEMONSTRATION (GAIL SMITH, PHIL WITT, AND CHRIS KELLER)

The Interagency Electronic Reporting Systems program (eLandings) is a Web-based program for shared landing data that has been in development for a number of years. It was slated for rollout on 15 May 2006. There have been demonstrations for all users including the International Pacific Halibut Commission (IPHC), NMFS, ADF&G and processors with everyone providing feedback for the development.

The web-based eLandings system will replace the paper fish tickets in most instances. A desktop application is available for those processors without internet connections. There is an agency desktop application also, which is used by agencies to edit fish tickets. The system has a major hub for storage of all information.

This eLandings system has been used for the rationalized crab fishery since August of 2005.

In 2000 initial scoping of needs and objectives occurred. This dealt with confidentiality, trip information, timeliness, one time data entry and the legal needs of various agencies.

There are 3 servers in the current system. The production server is a “real” web system which provides for Web reporting and email reporting and is the agency desktop. The test server incorporates the version of eLanding software under development. It has fictitious names but real static codes and, at the time of this writing, was used for testing and training sessions.

The training server is identical to the production server, but also has fictitious names and test IFQ permits. This sever is for future training sessions or practice for agencies and industry.

The system has the ability to import and export in Extensible Markup Language (XML) format; it produces PDF documents as well for the legal fish ticket, IFQ landing receipts, and one can view landing reports. With some limitations, some changes to landing reports are possible.

Changes between the date of the Statewide Groundfish Meeting (Anchorage, 10–11 April) and 15 May 2006 were limited. At the time of the Statewide Groundfish Meeting, the eLandings system was being used in the crab fisheries. Currently 89% of crab landings are being done in the Westward Region with this system. It was slated to be optional for use in the groundfish fisheries beginning 15 May and possibly being mandatory 1 January 2007. Salmon and herring are also in future plans.

There are some technology limits with factory processors. The web-based IFQ system is currently being used 94% of the time. There are currently agreements between agencies regarding budgets, operational plans, and bar codes on future Commercial Fisheries Entry Commission cards.

A test site for the eLandings system included the eLanding login page and user profile page where buying stations and permits can be entered and where default values are set. The user profile page provides for an agreement and PDF to be signed and submitted for approval by staff. The administrator has the ability at the user profile page to limit or restrict the user or users.

A major difference between the paper fish ticket system and the eLandings system is the description of a landing report, and what constitutes a trip. There may be multiple permits that produce multiple fish tickets. The new system has a variety of capabilities for manipulating landing reports, including the ability to display multiple permits. A variety of modifiers and disposition of fish are available. The system allocates the permits, a PDF is generated showing the landing report, and an XML is generated. The processors need to develop software to import this into their own reporting systems

With the agency desktop, the user has a wide variety of capabilities, including the ability to query reports by office, vessel, permit, etc. The agency users can add or modify harvest codes. A complete audit trail is visible and tracked.

There was some discussion regarding changes, revisions and notification. For ADF&G use, the data is imported into either the Venus or Neptune data base systems. There will be some additional fields and a line item break out based on the statistical area worksheet.

New fields include, crew size, observer, management program, trip number, custom processor, buying station. Disposition code is the biggest change as an additional field.

OVERVIEW OF AGE DETERMINATION UNIT ACTIVITIES (JODI NEIL AND KRIS MUNK)

There are 3 major ongoing projects in the ADU. The first is bomb-radiocarbon research. Leading off presentations on activities of the ADU, Jodi Neil discussed the project on bomb-radiocarbon slot-validation conducted for shortspine thornyhead. Atomic bomb testing in the 1950s and 1960s released radiocarbon, which settled in the ocean and was incorporated into animal calcium structures like otoliths and vertebrae. This information can be used to validate age determination using the slot (i.e. range) of years from 1955 to 1974 when radiocarbon was most prevalent in the environment. The method of bomb-radiocarbon slot-validation provides greater precision when comparing between-reader age estimates.

To conduct the project, 50 shortspine thornyhead specimens from PWS were selected for processing. Otoliths were collected from the thornyheads and the age estimates were reviewed. The otoliths were prepped by coring them down to the first year of growth and grinding away the overgrowth material. The cores were sent to Livermore Lab in California for radiocarbon analysis using accelerator mass spectrometry. It was anticipated that results would become available from Livermore between May and July 2006 and a report completed later in 2006. The project was funded by a federal grant.

Kris Munk presented an overview of the ADU, including program, inventory status, aging issues, projects, age reading plan, and future work.

The ADU is supported primarily by federal funds (over 96% of budget) from both AKFIN (groundfish) and the Fishery Management Plan Extended Jurisdiction program (rockfish aging in FY05-08), with minor funding by state (less than 2%) and contracts (less than 2%). There are currently 4 permanent staff in the ADU and the services of an analyst programmer are donated.

Part of the ADU program includes development of the Age Info System (AegIS) database system. Phase I of the development is complete. This involved rewriting past applications and resulted in a more stable system. Phase II, involving incorporating age structure measurements and somatic data and increased data validation, was partly complete but has been delayed. Phase III of development of the ADU database development will include online interactivity, automated data notification and an ftp file. The timing of this phase is uncertain.

A recent inventory of aging structures indicated specimens for 48 groundfish species and 5 invert species in the ADU archives, with more than 167,000 specimens and more than 150,000 age estimates. The archived specimens include contemporary (i.e. with sampling/field data to match with each specimen) groundfish and invertebrate samples, which began in 1988, as well as earlier years “pre-contemporary” specimens with no field data. There is a backlog in contemporary groundfish samples “not aged”, which are largely from three species: sablefish, Pacific cod, and lingcod. There is also some backlog of some rockfish species (shortraker, rougheye). There is a slightly larger backlog of samples from Southcentral than Southeast.

A variety of aging issues are being addressed within the ADU. The ADU aims to achieve 700 age estimates per month. Since 2000 ADU has added age reader staff to help achieve this goal and decrease the backlog of samples. However even with the addition of readers, given other assignments and regular duties, there is great variation in when samples are processed and aged. Another issue regularly addressed within the ADU is data precision. Data precision in aging is monitored regularly through the estimation and review of summary statistics (e.g., average percentage error, coefficient of variation, index of agreement, percentage agreement) to assess consistency in age determination both between and within readers (agreement between readers in aging a specimen and agreement within reader via multiple-readings).

Two age reading technical problems were highlighted. The first problem is determining young versus old ages in pollock and Pacific cod. This problem has arisen due to differences in age reader interpretations of otolith characteristics which include “transition zones” and senescent growth, and “banding versus splitting”. The second problem is a range error issue in rougheye rockfish ages 7 to 30 years, and Southeast Region lingcod. Range errors—errors in characterizing the range of ages in a population of groundfish—can occur when different criteria are used to enumerate annuli on an otolith. For example, where one ager might count 3 lines on an otolith as 3 annuli (i.e. “splitting”) another might determine that the 3 lines are all part of a

single annulus (i.e. “banding”). These problems are more age-driven than specimen-driven, though environmental effects may create cycles or other oddities that affect age determination.

Data quality, or examining age reader effect versus sample effect, can be assessed by plotting age determination versus fish length (for one or multiple agers) and/or looking for trends by plotting age determined by reader X versus reader Y to look at patterns by each reader versus a 1:1 line on the plot. Ken Goldman suggested looking at a correlation matrix and a Coefficient of Variation (CV) to examine age bias between readers.

The second ADU project is investigating the use of otometrics. Otometrics is the use of otolith dimensions (i.e., length, weight, etc.) and other characteristics (e.g. external appearances such as “crystallized”, “dysmorphic”) and comparison of these characteristics with somatic measures and estimates of correlations (among and within species) to incorporate into pattern interpretation criteria. Otolith techniques have been done with more than 56,000 specimens among more than 25 species.

The third project is a planned investigation of accretion in pollock otoliths by capture/culture of known-aged fish. For this project, otoliths will be sampled once each year from the captive population. Otoliths will be weighed to estimate mean increase in otolith size and compared with estimated accretion rates of otoliths from wild-caught pollock aged by both alternative aging criteria.

The current production aging priorities for the ADU are to complete all lingcod aging by 31 May and complete aging of sablefish harvested in the 2005 NSEI commercial fishery by late summer 2006. A secondary priority will be completion of production aging of shortraker and rougheye samples from Southcentral PWS, and completing aging of dusky rockfish from Southcentral by 30 June.

Future plans for the ADU include re-aging of historic age data sets to improve time-series (sablefish 1988 to 1997; yelloweye 1999 to 2000; lingcod 1992 to 1999; rougheye ≤ 30 years to look for 8-modal issue) by applying improved aging criteria. However, completion of this task will require a number of focused months with few or no other commitments.

In the discussion following presentation of the ADU program, Kris Munk indicated that lingcod from Southcentral are easy to age for most part, because break/burn provides fairly clear banding patterns. This contrasts with lingcod from Southeast which are more difficult to age. There was also some discussion about “double-banding”, which is a species-specific problem that an ager must be aware of, but generally can be handled. The potential application of biochronology for aging groundfish was also discussed. Biochronology works well for aging trees but can have limitations when applied to aging structures for deep sea fish. Biochronology relies on identification and measurement of unique, climatically-induced, variations in growth patterns as reflected in some biological structure to age organisms. This environmental signal is generally easier to identify, interpret and use for aging of stationary land organisms (primarily trees) than it is for deep sea organisms.

ASSESSING STAGES OF GROUND FISH MATURITY (MIKE BYERLY)

Mike Byerly does trawl and longline surveys each year and frequently has questions about determining sexual maturity of groundfish. This session was prompted by Mike’s questions about assessing groundfish sexual maturity and his perception that others might share his interest. Southeast Region collects biological data—including assessment of sexual maturity—

during port sampling and longline and pot surveys. In Westward Region, samples are collected for determining sexual maturity during dockside surveys. In addition, Region IV has conducted some laboratory studies related to determination of sexual maturity. Initially the focus was on black rockfish but more recently they have also begun to focus on dark dusky.

Regional difficulties in determining sexual maturities that were noted include lingcod in the summer time, black rockfish for Southcentral (Region II) and sablefish for the Southeast Region (especially the Stage 2 versus the mature young in a resting stage after spawning).

Participants discussed the merits of histological versus visual examination to determine state of maturity. Because indicators of maturity can be variable, it was recommended that a concerted effort be made in the field to do gross examinations of gonads to visually assess stages of maturity and collect samples and do histology to establish parameters for various stages of maturity. A primary goal is determination of maturity or immaturity.

Mike Byerly showed slides of gonads from various species. Meeting participants familiar with assessing stages of maturity shared opinions about the stages of maturity depicted in Mike's slides and discussed criteria for assessing the various stages. The sometimes difficult nature of identifying a particular stage of maturity was highlighted by the assessments of differing stages of maturity for some of the specimens shown. Species shown and discussed included black rockfish, Pacific cod and rougheye rockfish.

ASSESSING STAGES OF GROUND FISH MATURITY: SKATES (KEN GOLDMAN)

Ken Goldman gave a presentation on assessing maturity in skates.

Determining the sex of skates is straightforward. The diagnostic characteristic is claspers; female skates do not have claspers and males do. Claspers are long modified fins on males that are used in reproduction to pass sperm to the female; sperm travels down a groove to the end of the claspers.

Maturity stage can be difficult to determine for skates of intermediate maturity. The clasper size can be used in a variety of ways to help determine sexual maturity in males. In juvenile males claspers do not extend beyond the posterior end of the pelvics. In adolescents, the claspers extend beyond posterior end of pelvics but the terminal cartilage is not calcified. In adult male skates the claspers are elongate and stiff and the terminal cartilage calcified. In addition, spurs on the claspers also provide an indication of maturity. If the spurs are sheathed the skate has never spawned. If spurs are unsheathed, the skate has spawned before.

In females skates, undeveloped ovaries, shell gland and uterus are signs of a juvenile. Adolescent females have small ovaries without vascularization, with some differentiation and some development of the shell gland. In adult females, ovarian eggs are vascularized, the shell gland differentiated, the uterus pendulous.

Ken began, but ran out of time, for his presentation on sexual maturity in sharks.

GROUND FISH AGEING (KRIS MUNK)

Kris Munk elaborated on issues associated with groundfish aging. She indicated her desire to have the participants use her presentation as an opportunity to raise questions or concerns about the aging program, as well as an overview of some candidate future work.

Kris elaborated on the topic of biochronology to age groundfish. Biochronology involves using identifiable growth sequences caused by weather/climate events in some physical attribute of certain species and comparing those sequences to other species (e.g. trees). It is similar to using dendrochronology (tree aging) techniques on fish. The most effective application of biochronology requires species that show strong growth patterns. These patterns may not be seen in all species or areas, but are more likely to be found and be of use in species living in areas where the habitat conditions are harsher. Kris used 4 sablefish specimens to highlight apparent large summer growth. A basic element of biochronology is identifying distinctive years in growth patterns (e.g. tree rings in trees or annuli in groundfish otoliths) and correlating those with known weather events. You can match the pattern on one species to other patterns however the relationship between the patterns is proportional, not direct.

In the last 5 years Kris has seen significant patterns in the growth that has occurred during the past 15 years. These patterns are more distinctive than anything seen before that time for the previous 100 years growth. These significant growth patterns are from the early 1990s to 2005, and include 3 or 4 anomalous summer growth zones. Kris indicated that what is presumably summer growth is faster and looks lighter in color on the otolith. Strong correlation with growth events in a long-lived, and relatively easy to age species, such as yelloweye rockfish, would facilitate the use of such a species for a baseline which could be used to relate those growth events to weather events such as El Nino. In California, growth of sharpchin rockfish is negatively correlated to sea surface temperature. That may not be the case in Alaska. In the south, El Nino does not favor growth, but as you move north it does favor growth. The ADU will begin investigations into biochronology by first looking at geoducks, particularly the point after the animal has reached its growth threshold.

Age readers often describe above or below average growth events. Two ways to further examine these events are biochronology and digitizing. Particularly with below average growth events, often the age reader sees one darker-than-usual band. This band is often split by the age reader into at least 2 different annuli. Biochronology may enable determinations to be made about the actual number of years that dark bands represent.

To begin to validate ages with biochronology, an identifiable pattern is needed that has minimal error associated with it. Examination of the oldest animals first is desirable, to try to correlate any growth patterns with known environmental events. This brings up the concern that some fish may actually be older than the age assigned by the age reader.

Some Southeast Alaska rockfish have very strong growth events correlating to the El Nino cycle, but at this point ADU cannot say which year correlates to the growth.

To correlate growth events with environmental phenomenon such as El Nino, it is desirable to have a population that is somewhat geographically limited in its distribution. The geoduck is a good candidate. Geoducks are limited by habitat. Because they are non-migratory there are more local signals that could affect growth. In addition, there is a good time series of recorded temperatures from the lighthouse system, USCG lightships/vessels and hatcheries, which can provide a long term, climate-related data set. Also, geoducks are a long-lived species, some living up to 143 years. There have even been reports of 150 year old geoducks.

On the topic of revisiting historical age data sets to potentially re-age structures because of refined and newly-developed aging methods, there was general agreement that this could be desirable. Applications of population assessment models, such age-structured models, rely on a

consistent time series age data. If aging protocols have changed, it is desirable to at least subsample archived specimens, to promote increased consistency. This could be more important for short-lived species. It was pointed out that for long-lived species that are modeled using age structure, even one years' difference could be very important for modeling time of maturity.

Considerations proffered for prioritizing possible revisitation of aging time series included individual regional priorities and the logic of emphasizing current needs (e.g. stock assessment for GHM determination) over previous years' projects. It was pointed out that new protocols may cause changes in age structure not currently reflected in historic data.

With regard to aging protocol changes or enhancements, it was pointed out that it is not always as straightforward to identify when protocols may have changed. This is due partly to the variable growth patterns within a species presenting as many different patterns as there are growth variations. Therefore, precise rules may be difficult to formulate.

A question was posed regarding how, (with a variety of age readers) you deal with different readers interpreting patterns differently. Although acknowledged to be difficult, as age readers gain experience with less difficult patterns they are also gaining the tools and confidence they need for successful pattern interpretation. An age validation/training manual mentioned previously during discussions of age committee may also help address some training issues.

The ADF&G age committee and the topic of having a central age lab or doing regionally based aging were mentioned. A question was posed about the need for extensive groundfish aging when age-structured models are not currently used to assess any state managed groundfish species. Response to the comments included descriptions of initial aging and particular concerns or issues with individual groundfish species and discussion of pattern interpretation related to the patterns of the otoliths versus patterns in human cognition. Collection of age structures not currently used in age structured models was discussed. Comments favored continued collection to observe changes in age-structure of populations and provide background data that may be needed in the future if age-structured models were developed.

Age validation using oxytetracycline was discussed as a future project. This method intrinsically marks annuli so the age reader can see, but will require help in the field to mark fish using this method. Further, on the subject of age validation, it was pointed out that bomb radiocarbon techniques do not validate longevity, but rather validate birth years from 1955 to 1972.

The role of somatic thresholds in groundfish age determination was introduced. Somatic thresholds are areas between the large, rapid growth of a juvenile and the slower, adult growth. The ADU does not currently keep track of somatic thresholds, but it could be useful to attempt to ground-truth those thresholds using gonad maturities. It may also be useful to look at the slope of the broken edge of the otoliths, which is similar to a growth curve, and identify slope changes and decreases in the growth zone.

Growth rate may also be reflected in what is referred to as opalescence of the otolith. This opalescence apparently occurs when the fish grows very slowly and annuli overlap.

GIS COORDINATION (EVELYN RUSSELL, LEE HULBERT, CLEO BRYLINSKY, AND MARGARET SPAHN)

With GIS an active area of interest and application in each of the 3 regions, 4 people made presentations highlighting some aspect of GIS.

Evelyn Russell presented and discussed improvements she's made in groundfish statistical area charts. Improvements include better alignment of statistical areas with land masses for specific areas (i.e. areas outlined in the regulation book), exclusion of areas beyond the bounds of the specific area depicted, availability of electronic web-based chart images, and map based storage for digital maps in ArcIMS. As part of these improvements, the entire state will be contained in one image mosaiced together.

A request was made to have minutes, as well as degrees of latitude and longitude labeled along the axes of the statistical area charts. Evelyn said this would be done before the new charts went to the printer.

Lee Hulbert has worked on a project to resurrect maps of groundfish and shellfish marine managed areas. The project is a catalog of mostly state-managed areas of marine reserves, areas of species or assemblage closures, or gear closures. The project was previously developed and worked on by 3 different people. This led to problems due to different spacing characteristics or configurations. There were also problems with old, cryptic, confusing file names. Previous end products were reports with static maps and text. This project is an ongoing effort which should continue because year-to-year changes in the areas can be included. To accommodate these expected changes Lee created a dynamic catalog with maps and metadata in a dynamic state. The shape files for this system reside in an Access database. Among the element of the system, the data set gives boundary coordinates and spatial features. Feature classes are synched with 1983 Albers GCS North American spatial characteristics. Files were given long descriptive file names to make the system more user friendly.

Residence of the shape files in the access data base allows the user to open up a map form, click on the area needed (there is an index of all areas), and obtain a pop up report with all text dynamically linked to the table. The user can create a query to attach to the report and all data carries over. If something is changed in the MXD file, the changes will appear. The master file is on a network drive at ADF&G Division of Commercial Fisheries headquarters and can be easily updated and exported from the geodatabase.

Next on the agenda for this project is a web-based index with which a click on area would provide a map as a downloadable pdf file. The intent is to publish the work on a CD so that users can work dynamically from the hard drive of their computer. One application of this system could be to display areas with closures.

In the Southeast Region, Cleo Brylinsky has been using GIS methods for delineation and estimation of rockfish habitat. Yelloweye rockfish are caught in a directed fishery and as bycatch in other longline fisheries. The stock assessment program for yelloweye relies on estimates of density obtained from line transects, port sampling for mean weight data, and area habitat estimates. Area habitat estimates are derived from National Ocean Service data, NOAA nautical charts, fishery logbook information, multibeam/side-scan images, and direct observations from a submersible.

He showed how logbook information, including information on set location and catch is used in concert with GIS capabilities to estimate the area of yelloweye habitat. Logbooks are required for landing groundfish catch. The logbook indicates the fisherman, target species, gear amount and types, latitude and longitude, and catch. To delineate preferred habitat only start locations sets with a minimum of .04 Yelloweye per hook (or 1 Yelloweye per 25 hooks) were used, as this catch rate would keep a vessel fishing in the area. Start positions on qualified sets were

buffered to ½ nm to highlight potential habitat. This approach was only used for areas without geophysical data.

Multibeam and side scan surveys (remote sensing), conducted in various areas of Southeast, provided additional information on yelloweye habitat. The areas of habitat delineated using these methods were small compared to the size of the Eastern Gulf. As an example of the type of data produced with these methods, an area off Cape Ommaney was presented, with multi-beam data showing bathymetry and backscatter data showing details of ocean bottom hardness.

These data have been interpreted, and maps of this type produced, by Gary Greene, a marine geologist at Moss Landing Marine Lab. The data interpretation yields a habitat code and type. Only areas of hard bottom (strongly associated with yelloweye) are incorporated into the stock assessment.

This method combining of several types of data to delineate habitat does not always produce consistent results. In some cases, when habitat delineated by the method using fisherman's sets is overlaid on the map of habitat defined by multibeam and side scan surveys they don't always match.

Direct observations from a submersible, supplement data from logbooks, and multibeam and sidescan surveys were accumulated over 16 years and 600 submersible dives. These data showed that the highest density of Yelloweye was on the most physically complex bottoms. As with the comparison of multibeam/sidescan- versus logbook-delineated habitat, habitats defined by multibeam/sidescan did not always align with that determined by actual submersible observations. These inconsistencies indicate the need to ground-truth habitat determinations on a variety of spatial scales, from micro- to macro-scale. Despite some inconsistencies among the 3 sources of information, the end result of combining 3 types of data is a best available map of rock habitat in the yelloweye management area.

NOAA is updating their nautical charts. In the future it may be possible to use their bathymetry data to describe hardness of the bottom by running the data through the Benthic Terrain Modeler. The Benthic Terrain Modeler is a collection of ArcGIS-based tools that can be used with bathymetric data sets to delineate and measure deepwater benthic environment.

Margaret Spahn talked about the bathymetric coverage data she produced for Region II from hundreds of available survey data sets. Original data sets ranged from the old lead line surveys up to modern Multi Beam Echo Sounder data collected in recent years by NOAA. This map can be used to design surveys and is an important resource for the region. These bathymetry data are available to all Region II staff.

A variety of remote sensing bathymetric surveys and research covering areas within Region II were described. These surveys distinguish rock from soft bottom. High resolution surveys give data in 2 meter pixels which are quite accurate and effective. Such high resolution is obtained from back scatter data from NOAA. Lower resolution surveys give data in 75 meter pixels which, although not as detailed, can still be useful.

One GIS application used in the Region II groundfish program is to map data from PWS longline surveys, and large and small mesh trawl surveys. This is useful for checking data for sampling location errors (e.g. trawl tows recorded as having occurred on land).

Transects conducted with an ROV as part of the effort to develop a stock assessment approach for lingcod have been overlaid on bathymetric charts to evaluate and illustrate habitat affinities of lingcod.

The current data sets residing with Region II as well as the region's GIS needs were listed. The office in Homer has recently had a server upgrade and 16 employees took a 4-day GIS course. Among the needs to improve GIS capabilities are tools for using NOAA backscatter data, oceanographic data in their data sets, statewide mapping of groundfish/shellfish management areas and more software licensing.

REGION II SPORT FISHERIES RESEARCH HIGHLIGHTS (SCOTT MEYER)

Scott Meyer presented research and assessment highlights from the Region II groundfish program.

Region II port sampling for groundfish started in 1991 and focuses on halibut, rockfish, lingcod, and sharks. The primary ports sampled during May to September include Deep Creek/Anchor Point, Valdez, Whittier, Seward, Homer, and Kodiak. Sampling involves interviewing fishermen and charter captains and collecting length, weight, age and sex data, as well as information on spatial distribution of effort, catch and harvest.

Halibut mean weights, length, and sex composition from port sampling are applied to obtain harvest estimates, used by the IPHC and NPFMC. Also obtained are data on the species and sex composition, and age and spatial distribution of rockfish and lingcod.

Age composition data from interviews show that black rockfish age distribution tracks well over years when a 1-year adjustment is made to older data (to fix an error in reading first year in earlier data). However, yelloweye age data do not track as well, probably due at least partly to greater difficulty in aging yelloweye. Both species show a wide range of ages with the presence of older fish; a good sign.

Yelloweye data, largely from port sampling in Whittier, yielded catch curve estimates of fishing mortality of 6%. This was judged a higher-than-desirable fishing mortality.

From 1991 through 2000 maturity data on black and yelloweye rockfish were collected. These data were used to document monthly reproductive condition of males and females and the timing of spawning season. This data collection program was dropped, however, because histology was never conducted on maturity stages, which were more difficult to determine.

Sequences of notably larger age classes moving through the population over time were not as pronounced in the North Gulf lingcod fisheries (i.e. Cook Inlet and PWS) as in Kodiak.

The pattern of increasing mean weight from 1987 to 2003 for lingcod from Cook Inlet and PWS, but not Kodiak, may be attributable to the minimum size limit in Cook Inlet and PWS.

Catch curve analyses for lingcod provided estimates of $Z=0.31$ (78 year class)² and $Z=0.12$ (84 yr class). The curves are flatter when based on recent years, perhaps because of increasing effort. This problem might be corrected by doing catch curves on CPUE, rather than on numbers of fish. However, there are many zeros because lingcod are not targeted but are mainly bycatch in sport

² Z =instantaneous rate of total mortality.

halibut fishery. Additional catch curve analyses will need to first “filter out” the effect of non-targeting in the CPUE data.

The percent of females in the harvest has increased (up to 60%) in the Homer, Seward, and Valdez samples, but has declined in Kodiak. Harvesting mainly females is a concern and raises the question of the extent to which the increase in female percent may be due to the minimum size limit? Spawning biomass per recruit analysis may help address possible effect of size limits.

Based on a variety of methods (e.g. Alverson-Carney, Hoenig, etc.), estimates of male lingcod natural mortality rate ranged from 0.158 to 0.200; female natural mortality from 0.130 to 0.230.

Estimates of lingcod harvest available from 2 sources, charter logbooks versus mail surveys, are fairly similar in trend.

There has been a change in the distribution of harvest from 1998 to 2004, including a developing fishery off Shuyak Island along the outer coast off Homer, the Seward fleet fishing further to west, and an increase of catch from the Montague Island area.

Recently, Region I sport fish biologists have begun collecting data on sex and age composition from the shark harvest. The harvest is dominated by females, with an age mode at 10 years. The highest salmon shark harvests from 1998 to 2004 have occurred in PWS in the vicinities of Hinchinbrook Entrance, Orca Bay, Port Gravina and Hawkins Island Cutoff, and in Montague Strait.

In response to a question about possibly using fishery-independent data to complement commercial catch data on lingcod Scott indicated that, although sex, size, and age data are collected, the trawl survey data is very spotty and some years are completely lacking in data.

REGION I COMMERCIAL FISHERIES PROJECT HIGHLIGHT: DSR HABITAT DENSITY RELATIONSHIPS (TORY O’CONNELL)

Tory O’Connell presented and discussed work Region I scientists have been conducting on demersal shelf rockfish, as part of stock assessment development and application for these species.

Yelloweye rockfish are prosecuted now as a bycatch only fishery, and are the primary bycatch in the commercial halibut fishery. In the SEO Management Area yelloweye are assessed using a habitat based method, combining line transects from the Delta submersible and geophysical bottom habitat mapping (multibeam and sidescan sonar). Both activities are expensive and so have been conducted on alternating years—transects one year, mapping the next.

Biomass estimates are a product of density from line transects, mean weight of fish, and area of yelloweye (i.e. rocky) habitat. Because mapping is expensive, logbook data of fishing locations are also used to supplement geophysical habitat data. To date, 800 km² of an estimated total 1,400 km² rock habitat has been surveyed using geophysical mapping.

Habitat offshore of Cape Ommaney has been mapped by Gary Greene using backscatter data. Habitat types were lumped into three simplified classes: hard, soft, and mixed bottom. Submersible surveys are targeted on hard, rocky bottom. There is some disagreement between logbook and multibeam-mapped bottom as to what is hard, with logbooks estimating lower coverage of rocky habitat. Using logbook data provides higher density estimates because the logbooks indicate more limited rocky habitat than that estimated from multibeam data. However, the total biomass estimate is higher based on the multibeam mapped area due to the larger

estimated area of rocky habitat. A large portion of the multibeam mapped habitat is marginal habitat. It is important to assess the marginal habitat, as this is where it is hypothesized that changes in population may first be detected. Densities are estimated to be highest in high relief areas (8.2K fish/km²), versus in marginal areas (1.2K fish/km²).

Management advice may differ depending on which habitat data are used in the assessment. For Cape Ommaney, refining habitats to broad categories (high versus low relief) increased the biomass estimate by 30%. For the Fairweather Grounds, the logbook data would yield a larger estimate of biomass, than would multibeam data, due in part to a larger estimate of rock habitat.

To date, the project has mapped 8% of SEO seafloor, 2,200 km², including 18% of estimated rocky habitat. This mapping has helped discover 4 volcanic features with columnar basalt, which is ideal habitat for lingcod and juvenile rockfish. These include the Fairweather Ground volcanic ring remnant, a volcano west of Kruzof Island, the Mt. Edgecumbe Pinnacles, and a pit crater off of Cape Addington.

REGION II COMMERCIAL FISHERIES PROJECT HIGHLIGHT: ROV-BASED GROUND FISH ASSESSMENT (MIKE BYERLY)

The acquisition of an ROV and research toward development of ROV-based stock assessment has been accomplished using federal funding through the Nearshore Marine Research Program.

There is currently no well-established assessment for some groundfish species for which there are currently Region II commercial fisheries. These species include lingcod and yelloweye rockfish. There are no fishery independent data which might be used to assess stock condition. However, scientists in the Division of Sport Fish have conducted a jig survey on the outer coast.

In the development of stock assessment methods for lingcod and rockfish, knowledge of habitat is the key to designing efficient surveys and obtaining density estimates. The first step in utilizing habitat information was to inventory habitat data including bathymetry, shore zone and bottom type. The primary interest at this stage was to delineate rocky habitat. Also of interest were closed fishing areas (e.g. Steller sea lion no transect areas) and historical harvest areas, since this information is relevant to assessment of population abundance for the species of interest.

A long term goal is to have a series of study areas along the North Gulf Coast and outer PWS to monitor population abundance. A necessary step in developing methods to monitor population abundance was obtaining multibeam or side scan sonar data from geographic areas of interest to produce high resolution habitat maps. Toward that end they located existing NOAA multibeam habitat data. Within the North Gulf Coast, multibeam data were available for Harris, Ailiak, and Resurrection Bays (including the Chiswell Ridge). It included the Southwestern entrance to PWS. A secondary step in delineating potential habitat is to obtain funding to map areas where habitat data do not exist.

Lingcod and yelloweye rockfish “abundance” data are obtained by rotating periodic ROV transect surveys among the study areas.

As part of the habitat delineation, in areas of interest existing seabed types with 50 to 500 m bathymetry in Electronic Navigation Charts were used to identify probable rocky reefs. Seabed types were originally identified based on bathymetry and grab samples obtained during initial surveys. This information was supplemented with data from 2 to 100 m multibeam bathymetry to refine identification of areas of probable rocky reef. This process of identifying areas of probable

rocky reef yielded a cumulatively large, though non-contiguous, area along the outer Kenai Peninsula of potential lingcod habitat. In addition to identification of probable lingcod habitat, areas with high commercial or sport lingcod catch were noted as areas of particular interest. These areas of high catch rates are probably areas of good habitat. There are habitat data available for some of the areas with high catch rates. In addition to habitat and catch data, birds are indicators of productive regions that may be areas of upwelling.

Chiswell Ridge (southwest of Seward), an area of rocky reefs, was the location of the first major ROV survey in 2004. It was a successful survey for learning to run the ROV in complex habitats, and also provided valuable data. NOAA multibeam didn't cover entire the Chiswell study area, although there is a proposal to finish multibeam surveys of this location. Sport fish CPUE varies across the study area probably due to habitat variation.

Only ROV dive sites in rocky habitat were planned for the 2004 survey. Sites were selected randomly in proportion to the size of polygons using ArcView. Transect direction was also chosen at random, with the condition that transects must run upslope to enhance ROV image quality and habitat assessment. Sites were selected from within 2 strata to partition variance due to gradient in catches (and likely density) and also to scale estimates up to habitat. Multibeam data were available only for the north part of the site.

Habitat classification was based on previous studies and substrate type, vertical relief and crevice size and density.

To operate the ROV, the umbilical was connected to a ground line that ran through a crab block, with a clump weight of chain secured to the end of the ground line to eliminate transmission of surface motion to the ROV. The position of the ROV relative to boat was tracked and GPS was used to continually document boat location. Hipac software was used for survey planning and data acquisition. This software allowed simultaneous monitoring and recording of both the support vessel and the ROV paths and locations relative to the pre-determined transect paths. Safety and efficiency of navigating the ROV along the ocean bottom was enhanced markedly by the ability to track the ROV over 3-D images of the ocean bottom generated from multibeam data. The time from the GPS unit was recorded on video tapes and shown on the computer monitor.

To adequately process video tapes of survey transects, 3 to 4 reviews of each tape were conducted. Multiple reviews were necessary to assess quality, determine habitat types, and make fish observations, with subsampling of some data for second readings.

Data were stored in a relational database using time and transect to relate data.

Data analyses included comparison of lingcod occurrence with prevalence of different habitat categories, including computation of an Index of Habitat Electivity, logistic regression and odds ratio. Generally, there was a gradient of fish presence based on habitat. Habitat classification categories included substrate type, vertical relief, and crevice size and density. In graphic examples shown, greater lingcod prevalence was associated with "bedrock" and/or "block" primary substrates (compared to e.g. "block", "cobble", etc.) with high relief. There was a general increase in lingcod toward the south end of Chiswell Ridge. However some transects toward the southern end of the study area were over sand, so the variance in lingcod numbers was high in strata to the south.

Lingcod density estimates were not obtained because the lasers intended to demarcate the strip transect boundaries were not working. However, encounter rates, a potential measure of relative abundance, were estimated. In 2004 approximately 22 km of transects were conducted. In 2005, 35 km were conducted.

Although initial results are promising, Mike indicated they were not yet ready to use the ROV as a production assessment tool. Questions remain about the 100% detectability assumption for valid application of strip transects. A proposed research project will address responsive movement of lingcod and yelloweye to the ROV. The research is set up as a balanced design to test the effects of light and speed of ROV on responses of lingcod and yelloweye. Auxiliary cameras will be used to evaluate detectability of fish.

During the discussion in this session, points were made about the role that habitat and other behavior (e.g. nest guarding and moving) has in determining evasive behavior of lingcod and the applicability of *in situ* transect methods for assessing abundance of lingcod. It was pointed out that the habitats where lingcod are not seen could be a result of evasive behavior, rather than lingcod being absent from a particular type of habitat.

Closing comments for this session included one about considering surveying beyond the bounds of prime habitat to adequately assess lingcod.

REGION IV COMMERCIAL FISHERIES PROJECT HIGHLIGHT: HYDROACOUSTIC ASSESSMENT OF BLACK ROCKFISH HABITAT (DAN URBAN)

Dan Urban presented highlights of his work developing hydroacoustic surveys of black rockfish habitat.

Dan first reviewed the fundamentals of hydroacoustics. An echosounder emits a pulse of electrical energy which turns to sound, echos back off fish and other objects, and the echo is received by the echosounder. Return time and voltage can be used determine characteristics such as the type of bottom and kinds of fish. For this work, a single beam echosounder was utilized. Black rockfish are good hydroacoustic targets because they tend to swim in the water column, above the ocean bottom, and are not a tightly schooling species, so hydroacoustic systems can detect individual fish. In some areas black rockfish congregate in homogeneous, single species schools, further facilitating assessment using hydroacoustics.

An area south of Akutan Island, in the Aleutians, was one area chosen for preliminary work on hydroacoustics. This area was selected for initial work because it had received considerable fishing pressure in the past and had been closed as a result. The department had no criteria for re-opening the area because, lacking a proven method of assessing rockfish abundance, abundance levels were unknown. Hydroacoustic methods were used in the closed area and an area open to fishing to compare hydroacoustically-assessed abundance between the 2 areas.

From a support vessel a Biosonics echosounder was towed just below the surface (below bubble layer in water). A computer monitor aboard the vessel was equipped with a navigation system and echogram, allowing the skipper to observe the boat's progress along a predetermined transect line. Locations of fish schools detected with the hydroacoustic gear were also recorded. Dan noted that individual fish may get more than one "ping" and that it was often a little difficult to track individual fish. Individual fish detections could be facilitated with other hydracoustics software, such as Echoview.

With fish locations recorded, the coordinates and depth of the detections can be exported into a GIS package and the location of the fish (position over the bottom and depth in the water column) can be displayed. Dan showed an example of a school of rockfish up in the water column and streaming out from an underwater pinnacle, probably feeding on concentrations of pelagic snails. Dan speculated that the phenomenon of schools moving away from underwater features such as pinnacles, (e.g. during foraging) may be a promote movement among submarine features. Acoustic signals interpreted to be fish were periodically confirmed using mechanical jigging and a buoy camera.

The same data files used to locate fish schools can be used to classify bottom habitats.

Areas with dense layers of kelp rising to the surface were problematic to survey because the echosounder tow-fish could not be towed through kelp beds. These areas were at least superficially surveyed for the presence of fish using sunken gillnets. Areas with newly emergent bull kelp also proved problematic because, hydroacoustically, air bladders on the kelp looked similar to fish.

Dan discussed some of the difficulties of using hydroacoustics to assess rockfish abundance. There is a limitation on how close to bottom you can count fish. Fish mixed in kelp are probably not counted, and those swimming along the bottom may or may not be detected.

One area surveyed was Akutan Bay, by Akutan Point. At this location, jigging produced mixed catches of dark and light dusky rockfish, black rockfish and an Atka mackerel.

An estimate of fish abundance in an area was determined by subtracting from the acoustic signals those signals determined to be kelp, rather than fish, and then adding the fish detected in kelp zones using gill nets. In some cases there were higher estimates of fish abundance in some of the areas that were open to fishing, compared to the closed areas.

Survey design for rockfish is also problematic, due to the close association of rockfish with isolated features such as pinnacles and ridges. Survey vessels trying to follow individual transects to pass over such features may actually miss the feature due to the relatively small target presented by the feature and to navigation challenges such as strong winds and/or currents. During the surveys it was discovered that a star pattern (by which several transects are selected to run over a feature using differing bearings) was more likely to hit the feature than would a single transect line. Although this survey pattern adversely affected speed, the skipper did a good job of staying on track. This survey pattern worked well even in some strong currents.

The star pattern was used for the hydroacoustic phase of comparative surveys off Nuka Island comparing hydroacoustics, SCUBA diver counts, and jig machines as methods for estimating abundance of black rockfish. The diver counts were considered the most accurate indicator of abundance, compared to the hydroacoustics and jigging. Jig catches compared well to diver counts. However, there is an obvious problem in using jig machines for this kind of assessment because rockfish may be in the area fished, but not biting at the time the survey is being conducted.

Assuming funding can be obtained, intended future work includes periodic surveys of key areas for black rockfish, perhaps using these as index areas to monitor abundance trends. They would also like to use available multibeam data in a benthic terrain model to identify areas of potentially good black rockfish habitat. After identifying areas with potential habitat they would

like to conduct hydroacoustic surveys to determine which habitat characteristics are good for black rockfish.

Bottom type data collected from the hydroacoustic surveys was fairly consistent with habitat information generated through the Questar Tangent bottom classification system. However there was not a close correlation between habitat and fish.

Dan mentioned another possible method of identifying habitat and/or possibly estimating abundance—LIDAR, or Light Detection And Ranging. He indicated that there is a notable learning curve associated with this method.

CURRENT AND PROSPECTIVE GROUND FISH ASSESSMENT APPROACHES AND REFERENCE POINTS (SCOTT MEYER AND DAVE CARLILE)

This discussion touched on a number of issues associated with assessment approaches and reference points for groundfish fisheries. With respect to rockfish management, one suggestion was to collect baseline data for rockfish age distribution, taking into consideration that maintenance of biomass of older females may be a desirable management goal and a long time series of age data could be useful in achieving this goal. Mention was made of intent to rewrite management plans for Cook Inlet fisheries from a 14- to a 9-point plan. A point was made that the focus in evaluating assessment approaches and reference points for groundfish fisheries should be on DSR, black rockfish and lingcod as these are sole responsibility of state. The Pacific cod fishery in Southeast inside waters also needs a defensible assessment.

In the absence of adequate stock assessment, as a means of managing a species, “bycatch only” status is not necessarily adequate as evidenced by the case of overfished skate stocks in the Atlantic. Other common assessment tools, such as catch-curve analysis, might not apply to many of our groundfish fisheries because of necessary assumptions about equilibrium in recruitment and fishing mortality.

Because of the difficulties in assessing groundfish stocks and the limited availability of resources to conduct assessments, a suggestion was made to use fishery value as a threshold for deciding the fisheries for which to conduct stock assessments.

It was suggested that closed waters are needed to be able to evaluate whether rockfish population changes are due to environmental versus fishing effects. Black rockfish closures in the SEO are an example of closed areas that can serve this purpose. Steller sea lion closure areas are defacto closed waters that could be used as controls for comparison with fished areas.

COORDINATION/COLLABORATION AMONG DIVISIONS AND REGIONS (DAVE CARLILE)

A number of examples of intra and inter-agency collaboration were discussed.

Within the Division of Commercial Fisheries, a collaborative project was underway involving scientists from Westward and Central Regions to compare jigging versus hydroacoustic surveys as potential methods for assessing abundance of black rockfish. There is also a fledgling interstate (Alaska, Washington, California) and inter-agency (ADF&G, Washington Department of Fish and Wildlife, Moss Landing Marine Lab) cooperative effort to try to address some common questions with respect to assessment and basic biological and ecological questions for black rockfish.

Examples were provided of sharing of sport fish and commercial fisheries division staff and survey efforts, collaboration and data sharing between divisions in Central Region.

A point was made about the need to standardize maturity codes between regions, divisions, and agencies. This issue has specific impact on those working with age structured models for Pacific cod and sablefish, in part because differing approaches to maturity determination could lead to varying maturity schedules. With the goal of comparing histological data to a photographic record and visual maturity code given to samples, Carrie Worton (Region IV) has been doing some histological work on black rockfish gonads using NMFS-developed techniques. Chris Lunsford at the Auke Bay Laboratory revised the Pacific Ocean perch maturity schedule using histology, resulting in a significant effect on biomass estimates.

Cleo Brylinsky mentioned regional coordination in GIS data. She suggested that efforts could be made to coordinate among the regions regarding requests (i.e. to NOAA) for multi-beam sonar data to cut down on multiple requests for the same data. Cleo also mentioned coordination of research vessel cruise scheduling.

Although collaboration and cooperation is desirable where it can be effective, it was mentioned that there is also uniqueness in divisional and regional needs which should be recognized in considering and promoting collaborative efforts.

The discussion moved from inter-departmental collaboration to ADF&G/IPHC collaboration. Bob Bercelli indicated that IPHC data is not very useful to him because IPHC does not provide data in pounds, only numbers of fish. He mentioned that the Canadians place their own observer on IPHC vessels to collect data they need for management.

Tory O'Connell noted that IPHC will take requests for special data collections during their survey and will take observers on survey vessels. A stipulation is that outside observers must be listed on the survey permit and the permit must be applied for well in advance. The IPHC gives half of rockfish survey bycatch revenue to the Southeast region. Tory also mentioned the Technical Subcommittee of the Canada-U.S. Groundfish Committee, a group working on transboundary species, may provide some funding for transboundary species. Such funding is administered through PSMFC.

It was suggested that perhaps IPHC bycatch revenues could be used to pay for ADF&G staff sea duty pay while on IPHC surveys. In response to a question about whether it would be desirable to have headquarters coordination of ADF&G/IPHC collaborative efforts, Tory expressed the opinion that each region should develop a working relationship with IPHC and not be constrained by going through headquarters.

Charlie Trowbridge mentioned that Central Region does not work much with IPHC. With IFQ halibut fishing occurring closer to shore there is more DSR bycatch now than in the past. Charlie suggested that IPHC could be encouraged to provide more data on halibut fishing in nearshore waters. Central region has offered to provide an observer on inshore halibut boats but the offer has not been accepted.

A comment was made that Technical Subcommittee might be a possible funding source for sonic tagging of (Pacific or black) cod since these ideally would be coastwide projects.

Tory indicated that in Southeast, bycatch sale revenues could be used to place an observer on the IPHC survey vessel in cooperation with IPHC. She mentioned that Eastern Gulf longliners are pursuing a grant for pilot program to evaluate a video observer program. In British Columbia

there is either an observer or camera on every halibut and groundfish boat. Tory suggested that this technology, if proven, could help with observer coverage in smaller Alaskan fisheries. She added that the Southeast Region may experiment with a video observer camera on Chatham sablefish survey to free up a staff member for data collection.

Tory requested that staff share Alaska Board of Fisheries statewide groundfish proposals with staff in other regions that may be impacted by the proposal. Sometimes in Southeast Region, staff do not see the proposals before they reach the Board of Fisheries.

WRAP-UP: PLANS FOR SUMMARY DOCUMENT, FOLLOWUP (DAVE CARLILE)

Responding to a question about the usefulness of a periodic Statewide Groundfish Meeting, one opinion was that the timing of any future meetings (e.g. annual, biannual) was not particularly critical but treatment of topics in some greater detail would be desirable. A follow-on suggestion for future statewide meetings was to have focus groups, such as stock assessment, maturity, aging and reference points, as examples.

Dave Carlile indicated his intent to produce a summary of the presentation and discussions.

Doug Woodby called attention to the availability of a new web site:

<http://www.cf.adfg.state.ak.us/geninfo/finfish/grndfish/grndhome.php>

This site provides a general overview of groundfish fisheries in Alaska as well as specifics about individual groundfish species and fisheries.

ACKNOWLEDGEMENTS

Names listed (alphabetical order) are those that gave presentations and/or served as rapporteurs for a session: Forrest Bowers, Joan Brodie, Cleo Brylinsky, Mike Byerly, David Carlile, Wayne Donaldson, Sherri Dressel, Barbi Failor, Ken Goldman, James Hasbrouck, Kyle Hebert, Deidra Holum, Lee Hulbert, Mike Jaenicke, Chris Keller, Rebecca Knight, Mo Lambdin, Scott Meyer, Kris Munk, Jodi Neil, Tory O'Connell, Doug Pengilly, Evelyn Russell, Nick Sagalkin, Gail Smith, Margaret Spahn, Charlie Trowbridge, Dan Urban, Mike Vaughn, Ivan Vining, Phil Witt, and Doug Woodby.

LIST OF PARTICIPANTS

Participant	Division ^a	Location	Participant	Division	Location
Bob Berceli	CF	Cordova	Rebecca Knight	CF	Petersburg
Forrest Bowers	CF	Dutch Harbor	Mo Lambdin	CF	Homer
Joan Brodie	CF	Kodiak	Jim McCullough	CF	Kodiak
Cleo Brylinsky	CF	Sitka	Scott Meyer	SF	Homer
Mike Byerly	CF	Homer	Kris Munk	CF-ADU	Juneau
Dave Carlile	CF	Juneau	Jodi Neil	CF	Juneau
Stefanie Carlson	CFEC	Juneau	Tory O'Connell	CF	Sitka
Kamala Carrol	CF	Sitka	Doug Pengilly	CF	Kodiak
Bob Clark	SF	Anchorage	Michael Plotnick	CF	Juneau
Wayne Donaldson	CF	Kodiak	Evelyn Russell	CF	Juneau
Sherri Dressel	CF	Douglas (Juneau)	Nick Sagalkin	CF	Kodiak
Willy Dunne	CF	Homer	Herman Savikko	CF	Juneau
Barbi Failor-Rounds	CF	Dutch Harbor	Dan Sharp	SF	Anchorage
Lowell Fair	CF	Anchorage	Gail Smith	CF	Juneau
Steve Fleischman	SF	Anchorage	Margaret Spahn	CF	Homer
Ken Goldman	CF	Homer	Kally Spalinger	CF	Kodiak
Rich Gustafson	CF	Homer	Charlie Stock	SF	Homer
James Hasbrouck	SF	Anchorage	Cathy Tide	CFEC	Juneau
Kyle Hebert	CF	Douglas (Juneau)	Charlie Trowbridge	CF	Homer
Deidra Holum	CF	Douglas (Juneau)	Dan Urban	CF	Kodiak
Lee Hulbert	CF	Juneau	Tom Vania	SF	Anchorage
Kurt Iverson	CFEC	Juneau	Mike Vaughn	CF	Sitka
Mike Jaenicke	SF	Douglas (Juneau)	Ivan Vining	CF	Kodiak
Rhiannon Jensen	CF	Juneau	Phil Witt	CF	Juneau
Chris Keller	W	Juneau	Doug Woodby	CF	Juneau
Scott Kelley	CF	Douglas (Juneau)			

^a CF = Commercial Fisheries, SF = Sport Fisheries, CFEC = Commercial Fisheries Entry Commission, CF-ADU = Commercial Fisheries, Age Determination Unit, W = Wostmann and Assoc.