

**Technical Paper No. 337**

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**Subsistence Harvests and Local Knowledge of  
Rockfish *Sebastes* in Four Alaskan Communities**

**Final Report to the North Pacific Research Board**

by

**Michael Turek,**

**Nancy Ratner,**

**William E. Simeone,**

and

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July 2009

Alaska Department of Fish and Game

Division of Subsistence



## Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the reports by the Division of Subsistence. 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)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

### Weights and measures (English)

cubic feet per second	ft <sup>3</sup> /s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

### Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

### Physics and chemistry

*all atomic symbols*

alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

### General

*all commonly-accepted abbreviations*  
e.g., Mr., Mrs., AM, PM, etc.

*all commonly-accepted professional titles* e.g., Dr., Ph.D., R.N., etc.

Alaska Administrative Code AAC  
at @

compass directions:

east	E
north	N
south	S
west	W

copyright ©

corporate suffixes:

Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.

District of Columbia D.C.

et alii (and others) et al.

et cetera (and so forth) etc.

exempli gratia (for example) e.g.

Federal Information Code FIC

id est (that is) i.e.

latitude or longitude lat. or long.

monetary symbols (U.S.) \$, ¢

months (tables and figures): first three letters (Jan, ..., Dec)

registered trademark ®

trademark ™

United States (adjective) U.S.

United States of America (noun) USA

U.S.C. United States Code

U.S. state use two-letter abbreviations (e.g., AK, WA)

### Measures (fisheries)

fork length	FL
mid-eye-to-fork	MEF
mid-eye-to-tail-fork	METF
standard length	SL
total length	TL

### Mathematics, statistics

*all standard mathematical signs, symbols and abbreviations*

alternate hypothesis	H <sub>A</sub>
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics (F, t, χ <sup>2</sup> , etc.)	
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	E
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	log <sub>2</sub> , etc.
minute (angular)	'
not significant	NS
null hypothesis	H <sub>0</sub>
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

***TECHNICAL PAPER NO. 337***

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ROCKFISH *SEBASTES* IN FOUR ALASKAN COMMUNITIES**

**FINAL REPORT TO THE NORTH PACIFIC RESEARCH BOARD**

by

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July 2009

Development and publication of this manuscript were partially financed by the North Pacific Research Board under Project 645.

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*This document should be cited as:*

*Turek, M., N. Ratner, W.E. Simeone, and D.L. Holen. 2009. Subsistence harvests and local knowledge of rockfish Sebastes in four Alaskan communities; Final report to the North Pacific Research Board. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 337, Juneau.*

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## ABSTRACT

This report describes the results of a study to estimate the subsistence harvest of rockfish *Sebastes* in 4 Alaskan communities: Sitka in Southeast Alaska, and Nanwalek, Port Graham, and Chenega Bay in Southcentral Alaska. This report also includes local traditional knowledge (LTK) about rockfish from these communities. Rockfish have been used for subsistence purposes in Alaska for centuries, but changes in federal subsistence fishery regulations for Pacific halibut *Hippoglossus stenolepis* governing the use of longlines raised concerns that the incidental catch of rockfish was increasing. Data for this study came from several sources: 1) an annual survey administered to all federal halibut certificate (SHARC) holders, 2) an additional survey specifically about rockfish catches conducted in person with fishers, 3) key respondent interviews conducted with knowledgeable fishers in each of the study communities, and 4) fishery participant observations. Most of the incidental harvest of rockfish occurred in Southeast Alaska (federal halibut regulatory area 2C), and Southcentral Alaska (federal halibut regulatory area 3A). A majority of the catches took place incidental to halibut fishing while fishers were using rod and reel, except in Chenega Bay, where rockfish were targeted under state subsistence regulations. Respondents described traditional methods for harvesting and strategies to avoid rockfish while using longlines to catch halibut. In the Southcentral Alaska communities, the most commonly-harvested rockfish were pelagic black rockfish *S. melanops*, known as “black bass”, and other unspecified black rockfish species. In Sitka, non-pelagic quillback rockfish *S. maliger* were the most commonly-caught.

Key words: Rockfish, *Sebastes*, Sitka, Nanwalek, Port Graham, Chenega Bay, federal subsistence halibut, SHARC, local and traditional knowledge, LTK, subsistence fishing, longline.

## CHAPTER 1: INTRODUCTION

This report describes the results of a study to gather subsistence harvests and local and traditional knowledge (LTK) of rockfish *Sebastes* in 4 Alaskan communities: Sitka in Southeast Alaska, and Nanwalek, Port Graham, and Chenega Bay in Southcentral Alaska (Figure 1). While there are data on subsistence rockfish harvest levels, there has been very limited investigation into contemporary subsistence harvest methods for rockfish. Prior research did not specifically gather contemporary local and traditional knowledge about rockfish, though such knowledge has been collected as collateral information in comprehensive studies conducted by the Alaska Department of Fish and Game (ADF&G) Division of Subsistence in Sitka (Gmelch and Gmelch 1985), Port Graham and Nanwalek (Stanek 1985), Chenega Bay (Stratton and Chisum 1986), and Tatitlek (Stratton 1990).

Development of successful management programs for rockfish in Alaska waters requires not only accurate subsistence harvest estimates by species and gear type, but also descriptions of strategies used to minimize or target rockfish harvests, especially strategies linked to habitats and seasons. Harvest locations, stock status, trend data, and other factors are also important.

## Alaska Rockfish Study Communities

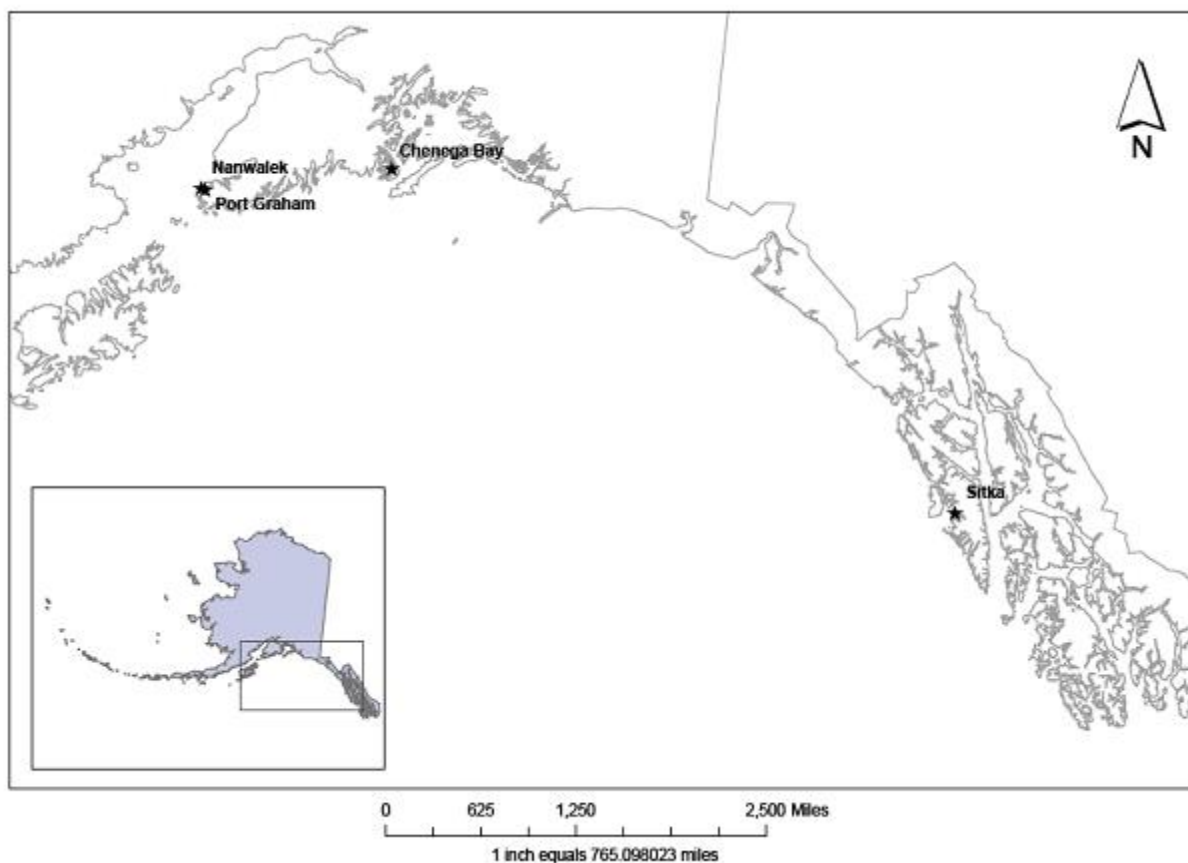


Figure 1.—Study communities.

## RESEARCH GOALS AND OVERALL OBJECTIVES

The primary goal of the project was to describe contemporary subsistence harvest strategies for rockfish in order to assist in subsistence fisheries management planning. The research questions were

1. What were local fishers' observations about rockfish populations and trends?
2. What were the contemporary subsistence harvest strategies for targeting or avoiding subsistence rockfish in terms of gear, species selection, and harvest locations?
3. What was the relationship between the subsistence fishery for Pacific halibut *Hippoglossus stenolepis* and rockfish harvests?
4. What, if any, changes occurred in rockfish harvests since federal regulations governing subsistence halibut fishing went into effect?
5. What was the species composition of contemporary subsistence rockfish harvests?

This project also provided documentation of local traditional knowledge (LTK) applications that minimized incidental harvests of rockfish during noncommercial halibut fishing. Potential links between the numbers of hooks fished and the number of rockfish caught were also explored.

The project had 5 research components:

1. A review of literature that describes historical and contemporary subsistence harvests and uses of rockfish in 4 study communities.
2. Key respondent interviews with 19 individuals describing their local and traditional knowledge about rockfish and their contemporary harvest and use patterns.
3. Case studies of subsistence halibut and rockfish fisheries based on participant observation of fishing activities.
4. In-person household surveys to obtain harvest estimates by species, location, and gear for the more active subsistence halibut and rockfish fishers in the study communities.
5. A final report.

## **STUDY CHRONOLOGY**

Work on the project began July 2006. Semiannual progress reports were submitted to the North Pacific Research Board (NPRB) in July 2006, January 2007, July 2007, and February 2008.

## **ROCKFISH GENERAL DESCRIPTION AND STOCK STATUS**

Rockfish are in the family Scorpaenidae, or “scorpion fishes,” named for the mildly venomous spines on their dorsal fins (Lamb and Edgell 1986:102). The rockfish in this study are members of the genus *Sebastes*, Greek for “magnificent” (Love et al. 2002). Of the 102 *Sebastes* species worldwide, only about 6 exist outside the North Pacific and Gulf of California regions. European explorers and immigrant fishers, unfamiliar with rockfish in their native countries, inaccurately grouped northeastern Pacific rockfish into more familiar categories of fish, such as snappers, basses, groupers, and rock cods (Love et al. 2002).

Over 30 species of rockfish inhabit the Gulf of Alaska (Kramer and O'Connell 2003; Love et al. 2002). The rockfishes of Alaska are categorized by their preferred habitat and other life history characteristics into 3 assemblages: pelagic shelf, demersal shelf, and slope. The pelagic shelf assemblage (Table 1) consists of species that inhabit waters of the continental shelf and typically exhibit midwater schooling behavior. This includes black *S. melanops* and dusky rockfish *S. ciliatus*. The demersal shelf assemblage consists of species that inhabit the continental shelf and are typically associated with bottom habitat and occur alone or in small groups. This group includes yelloweye rockfish *S. ruberrimus*. The slope assemblage includes species typically found in deeper waters off the continental slope (Meyer 2000). In this report, data are broadly organized by pelagic and non-pelagic species.

Table 1.–Rockfish *Sebastes* of the Gulf of Alaska.

Common name	Scientific name
<b>Pelagic shelf assemblage</b>	
Black rockfish	<i>S. melanops</i>
Dusky rockfish	<i>S. ciliatus</i>
Widow rockfish	<i>S. entomelas</i>
Yellowtail rockfish	<i>S. flavidus</i>
<b>Non- pelagic assemblage</b>	
<i>Demersal shelf assemblage</i>	
Canary rockfish	<i>S. pinniger</i>
China rockfish	<i>S. nebulosus</i>
Copper rockfish	<i>S. caurinus</i>
Quillback rockfish	<i>S. maliger</i>
Rosethorn rockfish	<i>S. helvomaculatus</i>
Tiger rockfish	<i>S. nigrocinctus</i>
Yelloweye rockfish	<i>S. ruberrimus</i>
<i>Slope assemblage</i>	
Bocaccio	<i>S. paucispinus</i>
Harlequin rockfish	<i>S. variegatus</i>
Northern rockfish	<i>S. polyspinus</i>
Pacific ocean perch	<i>S. alutus</i>
Redstripe rockfish	<i>S. proriger</i>
Rougheye rockfish	<i>S. aleutianus</i>
Shortraker rockfish	<i>S. borealis</i>
Silvergray rockfish	<i>S. brevispinis</i>
Splitnose rockfish	<i>S. diploproa</i>

Source Meyer 2000.

The yelloweye rockfish (Figure 2) is known by at least 9 alternative names (Lamb and Edgell 1986:117), the most common of which is “red snapper” (Kramer and O'Connell 2003:61), which is also frequently used as a name for other species of red-colored rockfish such as canary *S. pinniger* and vermilion *S. miniatus* rockfish (Lamb and Edgell 1986).

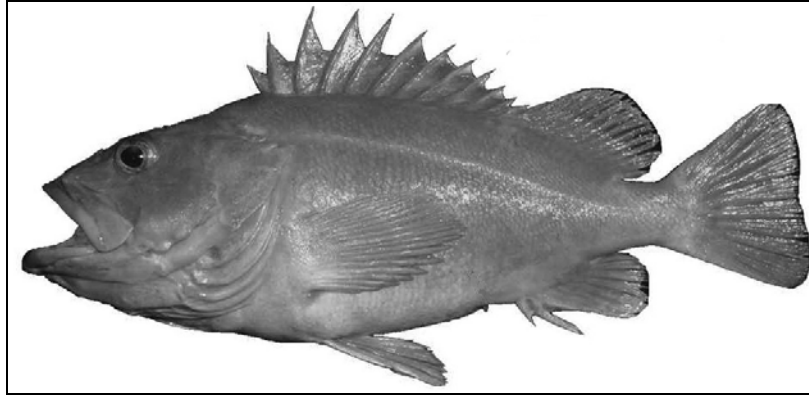


Figure 2.–Yelloweye rockfish *Sebastes ruberrimus*.

Source AFSC 2008.

The taxonomic outline shown in Table 1 does not always compare with locally-understood groupings. Regional fishers may include species that are not considered to be rockfish in the biological taxonomy, such as lingcod *Ophiodon elongatus*. Black rockfish are generally locally referred to as “black bass.” At other times, residents do not distinguish black rockfish as a separate species; rather, they use that name when referring to any rockfish that is generally black in color. For that reason, in this report we retain the distinction between black rockfish, “black bass,” and “unknown black rockfish.”

As a group, rockfish are long-lived, with some reaching ages of over 100 years. They have low productivity, and are thus unable to sustain high levels of fishing mortality. Also, rockfish do not have a vented swim bladder, so if they are caught and brought to the surface, the lower atmospheric pressure allows the swim bladder to expand, compressing internal organs and forcing the stomach inside-out and into the mouth.

Most non-pelagic rockfish, and many pelagic rockfish, appear to have small home ranges, and thus are subject to local depletions. Because of their preferred habitats and their physiologies, many traditional stock status assessment methods, such as tagging and trawl surveys, are ineffective (Meyer 2000:7). As noted by the American Fisheries Society (AFS) (Parker et al. 2000:23), a common theme in rockfish management is “a lack of stock status and biological information.” Meyer (2000:7) noted that “stock status is essentially unknown for near-shore species,” even though these are the species most frequently harvested in sport and subsistence fisheries. The AFS concluded that, “even for many commercially harvested species, much needed information concerning stock identification, genetic diversity, spawning behavior, bycatch levels, total removals, and migration patterns are not known or are based on limited data from small geographic areas” (Parker et al. 2000:23).

In a policy statement on the management of Pacific rockfish, the AFS (Parker et al. 2000:26) recommended a conservative approach, including the reduction of mortality through lower harvests and the reduction of bycatch and discards. Another AFS recommendation was to determine “total mortalities by species, including mortalities associated with recreational and subsistence fishing to allow the total catch of each species to be monitored with high confidence” (Parker et al. 2000:26). Other than this reference, the AFS policy statement did not specifically mention subsistence rockfish fisheries. However, another AFS recommendation was to establish marine protected areas (MPAs), which would serve as buffers against fishing pressures (Parker et al. 2000:26). Incorporating baseline data on subsistence fisheries and developing effective, consultative relationships with tribes and rural communities engaged in these subsistence fisheries, would be key to the success of rockfish MPAs.

## STATE AND FEDERAL NONCOMMERCIAL ROCKFISH FISHERY REGULATIONS

The state of Alaska manages all noncommercial (subsistence, personal use, and sport) rockfish fisheries in state waters and has delegated management authority for demersal shelf and black rockfish in federal waters. In Southeast Alaska, under state regulations, there are no restrictions pertaining to the subsistence take of rockfish, except the restriction against using rod and reel during state subsistence fishing effort. Currently, there are no daily or annual bag limits for subsistence groundfish in areas with positive customary and traditional use findings<sup>1</sup> for groundfish.

State regulations for the subsistence harvest of rockfish in Cook Inlet (5 AAC 01.570) and Kodiak (5 AAC 01.010) were adopted by the Alaska Board of Fisheries (Board) in 1998-1999, and went into effect during the 1999-2000 season. Similar regulations were adopted for Prince William Sound in 2001-2002 (5 AAC 01.620). State subsistence regulations for Kodiak Island specify that rockfish and lingcod may be taken only by hand-held lines or longlines<sup>2</sup> with no more than 5 hooks. In Cook Inlet, and Prince William Sound, legal gear for rockfish and lingcod also includes single hand troll<sup>3</sup> and single longline, with no more than 5 hooks attached.

In October 2000, the NPFMC adopted a policy for the management of a new subsistence halibut fishery in waters in and off Alaska, as delineated by the International Pacific Halibut Commission (IPHC) (Figure 3). The study communities in this report are contained in IPHC areas 3A and 2C. Nanwalek, Port Graham, and Chenega Bay are in Area 3A, which the IPHC defines as all waters between Area 2C and a line extending from the most northerly point on Cape Aklek (57°41'15" N., 155°35'00" W.) to Cape Ikolik (57°17'17" N., 154°47'18" W.), then along the Kodiak Island coastline to Cape Trinity (56°44'50" N., 154°08'44" W.), then 140° true. Sitka is in Area 2C, which the IPHC defines as all waters off Alaska that are east of a line running 340° true from Cape Spencer Light (58°11'57" N., 136°38'18" W.) and south and east of a line running 205° true from said light.

According to the NPFMC, the new fishery was necessary to allow qualified persons to practice the long-term customary and traditional harvest of halibut for food in a non-commercial manner (FR Vol. 68. No. 72, April 15, 2003:18146). As a result, residents of 117 rural communities and members of 123 Alaska Native tribes became eligible to participate in the federal subsistence halibut fishery (Fall et al. 2004). Those who were eligible had to register with the National Marine Fisheries Service (NMFS) and obtain a Subsistence Halibut Registration Certificate (SHARC), a plastic card. Regulations for the fishery became effective in May 2003 and allowed SHARC holders to use longlines (also called "skates") with up to 30 hooks.

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<sup>1</sup> Under the Alaska subsistence law (AS 16.05.258(a)), the Alaska Board of Game and the Alaska Board of Fisheries are required to identify the game and fish stocks, or portions of stocks, that are customarily and traditionally taken or used for subsistence (a "C&T finding").

<sup>2</sup> According to state regulations, a longline is a stationary buoyed or anchored line or a floating, free drifting line with lures or baited hooks attached (5 AAC 39.105 (13)).

<sup>3</sup> According to state regulations, hand troll gear consists of a line or lines with lures or baited hooks which are drawn through the water from a vessel by hand trolling, strip fishing or other types of trolling, and which are retrieved by hand power or hand-powered crank and not by any type of electrical, hydraulic, mechanical or other assisting device or attachment (5 AAC 39.105(8)).

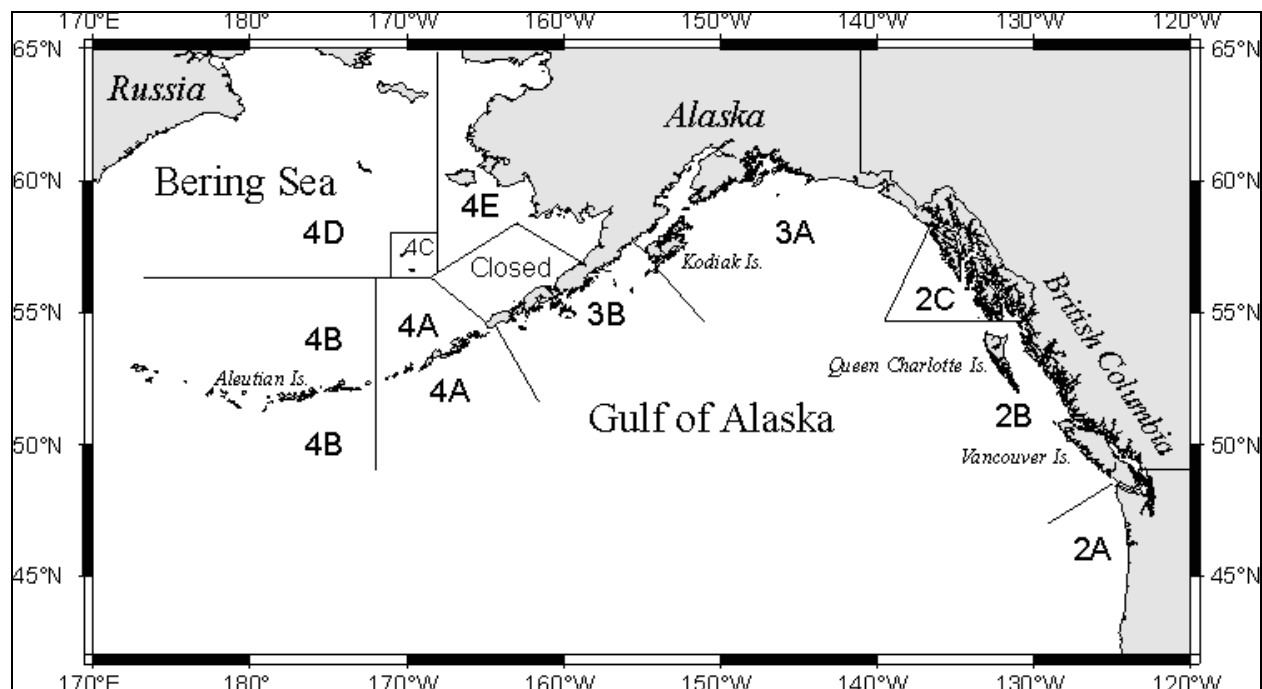


Figure 3.–International Pacific Halibut Commission regulatory areas, 2008.

Source IPHC 2008.

Harvest and effort data in the federal subsistence halibut fishery has been collected by the Division of Subsistence, in partnership with NMFS, on an annual basis since 2003 through the administration of a one-page postal survey of the approximately 14,000 SHARC holders. Harvest data collected from the returned surveys have been reported annually by the Division of Subsistence (Fall et al. 2004; Fall et al. 2005; Fall et al. 2006; Fall et al. 2007). The survey also collects a limited number of harvest and effort data on other groundfish.

After the federal subsistence halibut fishery commenced, the focus then turned to potential levels of rockfish bycatch incidental to the fishery. The 30 hooks allowed in the federal subsistence halibut fishery significantly exceeded the 5 allowed in the state-managed subsistence fisheries in Cook Inlet, Kodiak, and Prince William Sound, and created uncertainty in Southeast fisheries, in which there had been no gear limit. In addition, the federal subsistence halibut fishery was open in all Alaska waters (except nonrural areas), whereas the state subsistence fisheries were allowed only in those waters opened by the Alaska Board of Fisheries.

The NPFMC requested that the Alaska Board of Fisheries review the federal subsistence halibut fishing program (NMFS 2004). The Board responded with a “Findings for Recommendations on Subsistence Halibut Regulations” (Alaska Board of Fisheries 2001). In their findings, the Board observed that the potential pool of participants in the federal subsistence halibut fishery was in fact unknown due to the definition of eligibility adopted by the NPFMC. This definition included all residents of Alaska rural communities and all members of Alaska Native tribes that had customary and traditional uses of halibut. The latter included tribal members living in urban areas. The Board was particularly concerned that in Prince William Sound, Cook Inlet, and Sitka Sound, which are easily accessible to urban populations, species of fish other than halibut would be overharvested. The Board was also concerned about the increase in rockfish bycatch by “nonlocal users” who, although federally qualified to fish in the area, would not necessarily possess the knowledge necessary to avoid rockfish while targeting halibut with 30-hook longlines. The Board recommended reducing the number of hooks allowable on a longline used

during the federal subsistence halibut fishery to 5 in Prince William Sound, Cook Inlet, and Kodiak road-connected areas, and to 2 in Sitka Sound. This recommendation was consistent with Board actions beginning in 1998-1999 which reduced to 5 hooks the allowable subsistence gear for groundfish in the Kodiak (5 AAC 01.520(f)), Cook Inlet (5 AAC 01.570(n)), and Prince William Sound (5 AAC 01.620(h)) management areas.

The NPFMC, citing a relatively low harvest of rockfish reported in the 2003 SHARC survey, and the lack of a directed study on the effects of the fishery on fishes other than halibut, took no action to adopt the recommendations of the Board (see FR. Vol. 70, No. 62, April 1, 2005, 50 CFR Parts 300 and 679, pp. 16749-16750; NMFS 2004).

Specific federal and state regulations are detailed in Appendix A.

## **SUBSISTENCE HARVESTS AND USES OF ROCKFISH**

Rockfish have been used for subsistence purposes in Alaska for centuries (e.g., De Laguna 1956; Stanek 1985; Stratton and Chisum 1986), and are still widely harvested (Jennings et al. *In prep*). Under state law, the Alaska Board of Fisheries has made positive customary and traditional use findings for rockfish in Southeast Alaska (5 AAC 01.716), Prince William Sound (5 AAC 01.616), Cook Inlet (5 AAC 01.566), and Kodiak (5 AAC 01.536), among other areas.

There are no annual permitting requirements or harvest reporting requirements specifically for state or federal subsistence harvests of rockfish in Alaska. Harvest data derive from 3 sources: 1) the postal surveys conducted by ADF&G and NFMS of SHARC holders (Fall et al. 2004; Fall et al. 2005; Fall et al. 2006; Fall et al. 2007), 2) in-person household harvest surveys conducted by the Division of Subsistence in the study communities<sup>4</sup>; and 3) a 2006 in-person rockfish survey administered in each of the study communities as a supplement to the annual SHARC survey.

Table 2 summarizes the subsistence rockfish harvests as collected during in-person household surveys conducted by the Division of Subsistence in the communities of Nanwalek, Port Graham, Chenega Bay, and Sitka. Note that the data were collected at the level of “rockfish,” “red rockfish,” and “black rockfish,” not at the individual species level. In addition, the data include all harvests, without distinguishing between directed and incidental harvests.

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<sup>4</sup> Data from household harvest surveys conducted by the Division of Subsistence may be found in the ADF&G on-line Community Subsistence Information System database.



Table 2.—Estimated subsistence harvests of rockfish from Division of Subsistence in-person household surveys, study communities, 1985–2003.

Community	Year	Percentage of households interviewed	Percentage of households harvesting rockfish	Number of fish harvested	Estimated harvest	
					Estimated number of pounds harvested	95% CL (+/- %)
Nanwalek	1987	82.5%	39.4%	485.0	722.0	33.0%
Nanwalek	1989	80.4%	6.1%	149.0	379.0	67.0%
Nanwalek	1990	85.3%	5.7%	82.0	123.0	52.0%
Nanwalek	1991	70.7%	31.0%	184.0	276.0	42.0%
Nanwalek	1992	78.0%	18.8%	129.0	193.0	41.0%
Nanwalek	1993	89.1%	18.2%	102.0	159.0	28.0%
Nanwalek	1997	76.3%	17.2%	189.0	316.0	71.0%
Nanwalek	2003	100.0%	27.3%	991.0	1,486.0	125.0%
<b>Total estimated Nanwalek rockfish harvest</b>				<b>2,311.0</b>	<b>3,654.0</b>	
8 year estimated average, Nanwalek				289.0	457.0	
Port Graham	1987	85.7%	22.2%	235.0	301.0	33.0%
Port Graham	1989	78.6%	14.6%	325.0	1,130.0	70.0%
Port Graham	1990	83.6%	26.1%	385.0	742.0	29.0%
Port Graham	1991	84.4%	30.6%	526.0	1,191.0	31.0%
Port Graham	1992	82.7%	27.1%	203.0	383.0	25.0%
Port Graham	1993	83.6%	21.6%	172.0	333.0	30.0%
Port Graham	1997	69.8%	15.9%	153.0	336.0	46.0%
Port Graham	2003	100.0%	23.4%	236.0	403.0	34.0%
<b>Total estimated Port Graham rockfish harvest</b>				<b>2,235.0</b>	<b>4,819.0</b>	
8 year estimated average, Port Graham				279.0	602.0	
Chenega Bay	1984	100.0%	50.0%	55.0	205.0	0.0%
Chenega Bay	1985	94.1%	43.8%	67.0	257.0	28.0%
Chenega Bay	1989	85.7%	11.1%	62.0	195.0	51.0%
Chenega Bay	1990	85.7%	27.8%	124.0	495.0	38.0%
Chenega Bay	1991	81.8%	55.6%	432.0	1,648.0	29.0%
Chenega Bay	1992	88.4%	52.2%	707.0	2,652.0	40.0%
Chenega Bay	1993	82.1%	43.5%	1,084.0	3,229.0	55.0%
Chenega Bay	1997	71.4%	66.7%	951.0	1,682.0	37.0%
Chenega Bay	2003	82.3%	43.8%	323.0	745.0	23.0%
<b>Total estimated Chenega Bay rockfish harvest</b>				<b>3,805.0</b>	<b>11,108.0</b>	
9 year estimated average, Chenega Bay				423.0	1,234.0	

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Table 2. Page 2 of 2.

Community	Year	Percentage of households interviewed	Percentage of households harvesting rockfish	Number of fish harvested	Estimated harvest	
					Estimated number of pounds harvested	95% CL (+/- %)
Sitka	1985	10.3%	34.1%	22,764.0	45,529.0	30.0%
Sitka	1996	4.9%	28.4%	13,260.0	43,344.0	68.0%
<b>Total estimated Sitka rockfish harvest</b>				<b>36,024.0</b>	<b>88,873.0</b>	
2 year estimated average, Sitka				18,012.0	44,437.0	

Sources ADF&G Community Subsistence Information System; Fall et al. 2005; Gmelch and Gmelch 1985.

Note the Exxon Valdez oil spill occurred in 1989.

As part of the annual postal survey of SHARC holders, respondents are asked to report the harvest of rockfish taken during their federal subsistence halibut efforts. Table 3 summarizes historical data from these postal surveys and shows that from 2003 to 2006, the most current data year available, the majority of rockfish incidentally harvested as part of the federal halibut subsistence fishery were harvested in Southeast and Southcentral Alaska. The data also show a consistent pattern in which SHARC holders in Southeast Alaska (Area 2C) reported an incidental rockfish catch of approximately 67% of the state's total. SHARC holders in Southcentral Alaska (Area 3A) reported catching about 24% of the state's total incidental harvest of rockfish.

Table 3.—Estimated incidental harvest of rockfish by SHARC holders fishing under federal subsistence halibut regulations, by IPHC regulatory area fished, 2003–2006.

IPHC regulatory area	2003	2004	2005	2006
Area 2C Southeast Alaska	9,917 (67%)	12,845 (67%)	7,764 (62%)	11,486 (67%)
Area 3A Southcentral Alaska	3,548 (24%)	5,090 (27%)	3,638 (29%)	3,977 (23%)
Area 3B Alaska Peninsula	240 (2%)	325 (2%)	384 (3%)	1,014 (7%)
Area 4A Eastern Aleutians	952 (6%)	546 (2%)	337 (3%)	247 (1%)
Area 4B Western Aleutians	5 (0%)	3 (0%)	94 (0%)	9 (0%)
Area 4C Pribilof Islands	93 (0%)	0 (0%)	141 (0%)	0 (0%)
Area 4D Central Bering Sea	4 (0%)	9 (0%)	4 (0%)	19 (0%)
Area 4E East Bering Sea Coast	111 (0%)	183 (0%)	31 (0%)	194 (1%)
<b>Total</b>	<b>14,870</b>	<b>19,001</b>	<b>12,393</b>	<b>16,946</b>

Sources Fall et al. 2004; Fall et al. 2005; Fall et al. 2006; Fall et al. 2007; ADF&G Division of Subsistence, 2007.

Table 4 provides rockfish harvest data collected from the annual postal surveys to SHARC holders for the communities discussed in this report. The data show that SHARC holders in the communities of Port Graham, Nanwalek, and Chenega Bay contributed between 6% and 21% of the incidental subsistence rockfish harvest in Southcentral Alaska, while SHARC holders from Sitka contributed between 32% and 44% of the incidental subsistence rockfish harvest in Southeast Alaska.

Table 4.—Estimated incidental harvest of rockfish as reported by SHARC holders in study communities, annual postal survey, 2003-2006.

Community	Estimated number of rockfish incidentally harvested in			
	2003	2004	2005	2006
Port Graham	181.0	132.0	2.0	39.0
Nanwalek	330.0	124.0	230.0	68.0
Chenega Bay	246.0	60.0	197.0	222.0
<b>Community totals</b>	<b>757.0</b>	<b>316.0</b>	<b>429.0</b>	<b>329.0</b>
<b>Southcentral total</b>	3,548.0	5,090.0	3,638.0	3,998.0
Percentage of Southcentral total	21.0%	6.0%	12.0%	8.0%
Sitka	4,354.0	4,451.0	2,514.0	4,182.0
<b>Southeast total</b>	9,917.0	12,845.0	7,764.0	11,483.0
Percentage of Southeast total	44.0%	35.0%	32.0%	36.0%

Sources Fall et al. 2004; Fall et al. 2005; Fall et al. 2006; Fall et al. 2007; ADF&G Division of Subsistence, 2007.

Reporting of overall commercial, sport, and subsistence rockfish catches varies according to estimation method and level of species and regional detail, and is not directly comparable. However, it is evident that subsistence rockfish harvests represent a small fraction of overall harvests. Preliminary data from ADF&G show that commercial fishers caught over one million pounds of rockfish statewide in 2007. About 25% was caught in Southeast Alaska and less than 3% was caught in Prince William Sound and

Cook Inlet.<sup>5</sup> Based on the average annual historical poundage shown in Table 2, Sitka's average annual subsistence harvest in pounds was about 6% of the pounds commercially harvested in Area 2C. In Area 3A, Port Graham, Nanwalek, and Chenega Bay's subsistence rockfish poundage together is less than 1% of the commercial or sport levels.

Sport fishers reported a 10-year average annual rockfish catch of about 65,000 lbs in both Southeast and Southcentral Alaska (Jennings et al. *In prep*). Sitka's historical average sport harvest cannot reliably be compared with this estimate, though, because prior to 2003, anglers fishing for rockfish with rod and reel would have been fishing under sport regulations, but since then they may have been fishing under federal subsistence halibut regulations, which allow rod and reel.

## **CHAPTER 2: METHODS**

### **LITERATURE REVIEW**

The literature reviewed for this project included ethnographies on historical Alaska Native cultures such as Birket-Smith (1953) and De Laguna (1956) on the Alutiiq of Prince William Sound; and De Laguna (1960), Emmons (1991), Goldschmidt and Haas (1998), Langdon (1979), and Newton and Moss (2005) on the Tlingit of Southeast Alaska. The Division of Subsistence technical papers reviewed include Stanek (1982; 1985) on Nanwalek and Port Graham; Stratton and Chisum (1986) on Chenega Bay; Stratton (1990) on Tatitlek; and Gmelch and Gmelch (1985) on Sitka.

### **KEY RESPONDENT INTERVIEWS**

Methods for this project included interviews with key respondents who were active fishers, in-person observations of participants during their fishing efforts (with their permission), and voluntary postal and in-person household surveys.

The number of key respondent interviews, participant observations, and harvest surveys conducted in each community are shown in Table 5.

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<sup>5</sup> *Source* ADF&G Commercial Fisheries commercial groundfish harvests & exvessel values in state-managed fisheries <http://www.cf.adfg.state.ak.us/geninfo/finfish/grndfish/catchval/07grndf.php>.

Table 5.–Resident SHARC holders, surveys, interviews, and participant observations, 2006.

Community	Number of residents who held SHARCs	Number of SHARC halibut surveys returned	Number of rockfish surveys administered	Number of participant observations conducted	Number of key respondent interviews conducted
Chenega Bay	19	10	5	2	1
Nanwalek	31	30	6	1	3
Port Graham	50	33	2	1	3
Sitka	1,895	67	67	1	12
<b>Total</b>	<b>1,995</b>	<b>140</b>	<b>80</b>	<b>5</b>	<b>19</b>

Source ADF&G Division of Subsistence, 2007.

The Division of Subsistence followed the *Ethical Principles for the Conduct of Research in the North* (Association of Canadian Universities for Northern Studies 2003). Community municipal and tribal governments were informed of the research, and their consent sought and obtained, before fieldwork began. Cooperative agreements for assistance in conducting the research were developed with the tribal governing body in each study community. This included the Sitka Tribe of Alaska (STA), the Port Graham Village Council, the Nanwalek Indian Reorganization Act (IRA) Council, and the Native Village of Chenega IRA Council. Each tribal organization was given the opportunity to provide input into interview protocols and to hire local researchers to assist in key respondent interviewing and participant observation.

The researchers respected the contributions and privacy of the people involved in the research, and asked for their informed consent. All participants could choose not to answer any particular question or section of a survey, questionnaire, or interview. The people interviewed remained anonymous, unless they expressly consented to letting their names be used in certain instances. No participant names appeared on survey forms, questionnaires, or interview schedules and participant names did not become part of any electronic database.

### Structure of Key Respondent Interviews

Key respondent interviews were conducted by regional Division of Subsistence field staff and local research assistants. Community harvest studies conducted by the Division of Subsistence throughout Alaska have consistently found that approximately 30% of local harvesters account for the majority of the harvest (Fall et al. 2001:274-290). Therefore, a focus on key harvesters was an appropriate sampling strategy for documenting prevailing harvest practices. Key respondents were selected, in part, because they were identified as high rockfish harvesters who held SHARCs. Tribal members and other fishers also provided referrals.

Interviews were guided by a flexible protocol that allowed key respondents to talk at length about subjects with which they were most familiar, and which they felt were important to share. The flow of the interview was determined by the respondent's responses, and interview questions were reviewed prior to ending the session to ensure all questions had been addressed. Key research themes in the interview protocol, shown in Appendix B, included: 1) halibut fishing methods and locations, 2) relationships between halibut and rockfish harvests, 3) harvests during targeted rockfish effort, 4) changes in fishing practices or harvests as a result of the 2003 federal subsistence halibut fishery regulations, 5) processing and distribution of rockfish and halibut, 6) rockfish and halibut biology and population trends, 7) conflicts with other users, 8) perceptions of management and regulations, and 9) the cultural importance of rockfish.

Interviews conducted in Sitka were audio-recorded and transcribed. The interviews that were conducted in Chenega Bay, Nanwalek, and Port Graham were not audio-recorded. Instead, notes were taken at the time of the interview and summations prepared afterwards. In addition to key respondent interviews conducted by the Division of Subsistence, Thomas Thornton, PhD, conducted interviews with Sitka elders. Thornton had established relationships with them while conducting research at the University of Alaska (Thornton and Kitka 1996).

In Sitka, 12 key respondent interviews were conducted in the summer and fall of 2006. Two of the respondents were identified as rockfish harvesters during a NMFS in-season subsistence halibut survey conducted by the Division of Subsistence in 2006 as an adjunct to the annual SHARC survey. The remainder were referrals from local researchers, other respondents, or attendees of a November 2006 community forum held at the Sitka Tribe of Alaska community building. Fifteen people attended the forum, including 2 Division of Subsistence staff members who led the forum and 2 partners from the Sitka Tribe. Three commercial longline fishermen, one ADF&G fishery biologist, the traditional foods coordinator from the Sitka Tribe, 4 other subsistence users, and a fisheries student from Sheldon Jackson College and her visiting friend also attended. A semi-structured discussion process was followed, similar to that designed for key respondents. The meeting lasted for 2 hours, from 4 PM until 6 PM.

Five key respondent interviews were conducted the day after the community forum. The interview schedule followed the same outline used in the community forum, with more specific questions informed by information shared during the public discourse.

Researchers conducted 3 key respondent interviews in Nanwalek and 3 in Port Graham. Tribal representatives in Chenega Bay, Nanwalek, and Port Graham identified the key respondents. A semi-structured interview schedule was followed in order to facilitate conversation with the respondents and to help guide the interviews. In Chenega Bay, the researcher was able to conduct brief interviews/conversations with several local fishers during the survey portion of the research. He conducted one in-depth key respondent interview. That interview provided most of the Chenega Bay information. In Nanwalek, 2 key respondent interviews were completed in the fall, to capture 2006 data, and one additional interview was conducted in March 2007. Researchers were able to interview 3 key respondents in Port Graham during summer 2007.

## **PARTICIPANT OBSERVATION**

In order to observe contemporary methods for targeting rockfish and halibut, and avoiding incidental catch of rockfish, participant observation fieldwork was conducted in Sitka, Chenega Bay, and Port Graham. Researchers were unable to observe Nanwalek participants because of an abundance of spiny dogfish *Squalus acanthias* in August 2006 that prevented local fishers from making their usual trips. Information gathered during this fieldwork was compiled and summarized.

## **HOUSEHOLD SURVEYS**

An in-person survey was conducted so as to obtain rockfish catch estimates by species, location, and gear. Cooperative agreements were developed with tribal governments in each community and residents were hired to either conduct the survey or to assist Division of Subsistence researchers in conducting the survey. If respondents reported catching rockfish on the 2005 annual postal SHARC survey, they were then asked to participate in the household rockfish survey as part of this study. In Sitka, if respondents reported high catches of rockfish or halibut on their 2005 SHARC survey, they were asked to be part of this study. Because of information highlighted by key respondents during the interviews, detail was also sought about techniques and strategies used to avoid rockfish while targeting other species. Those household survey respondents were asked to recall, for 2006:

1. Species or type of rockfish caught.
2. Number caught.

3. Number discarded.
4. Gear type.
5. Number of hooks.
6. Type of bait.
7. Areas fished.
8. Whether they fished under sport or subsistence regulations.
9. Incidental or targeted harvest of rockfish.
10. Methods to avoid rockfish catches.

The survey instruments are shown in Appendix C.

In Chenega Bay, Nanwalek, and Port Graham, all residents with SHARCs were contacted and asked to complete the SHARC survey for 2006. If incidental rockfish catch was recorded, the respondent completed an additional survey specifically about rockfish harvests. A researcher from the Division of Subsistence conducted the survey with the assistance of a local research assistant.

For Sitka, “purposive” sampling, a form of nonprobability sampling (Singleton Jr. et al. 1993) was used to select a pool of potential respondents. The 2005 SHARC survey data were used to identify the active harvesters who would fall into at least one of the following categories: 1) high (incidental) rockfish harvesters, 2) the total of high halibut harvesters with all gear groups, combined (longline, sport rod and reel, and subsistence rod and reel), 3) high federal subsistence halibut harvesters who used longlines, and 4) high halibut harvesters who used sport rod and reel and/or federal subsistence rod and reel combined. Both the number and the pounds of halibut harvested were considered because some halibut fishers harvested high poundage but relatively few halibut.

Screening criteria were applied to create a sample of the 2005 Sitka SHARC survey respondents, and the sample size was set at 91 using the following method. The top 190 halibut and rockfish harvesters were first identified; these included respondents harvesting either more than 400 lbs of halibut or more than 10 rockfish. The 91 highest harvesters were identified as the sample. Sixty-seven were contacted, and all completed both the 2006 SHARC survey and the additional rockfish harvest survey. The survey was conducted by staff of the Sitka Tribe in summer 2007 to collect data about the 2006 fishing season.

## **METHODS OF DATA ANALYSIS**

Division of Subsistence staff performed the data processing and analysis. The rockfish household harvest survey data were coded, entered into a database, and analyzed using SPSS<sup>f</sup> statistical software. Rockfish were categorized into pelagic and non-pelagic species. Since the Sitka survey targeted the more active fishers, those who had the highest catches of rockfish, recorded rockfish catches were not expanded to either the universe of all fishers targeting rockfish or to the community. For the Port Graham, Chenega Bay, and Nanwalek data, the recorded catches and other data were expanded using a weighting factor. This factor was calculated as the number of SHARC surveys completed divided by the number of resident SHARC holders. Missing data were replaced with mean values.

Analysis of the key respondent and participant observation information was conducted by a qualitative research process. The findings were derived as an iterative process between the initial literature review, the results of systematically-administered, open-ended key respondent interviews, and new sources of data identified by key respondents. This process is known as “open coding” of information, and relies on the professional expertise, experience, and judgment of the researcher. The objective of this process was

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<sup>f</sup> Product names are given for scientific completeness, and do not constitute an endorsement.

to discover and categorize potential patterns in rockfish catches. This approach is typical of research into relatively-unexplored areas, and served to illuminate issues of consistency or non-consistency with data from other sources.

## **CHAPTER 3: RESULTS**

### **HOUSEHOLD SURVEYS**

#### **Sitka**

In 2006, the population of Sitka was 8,989 (ADLWD 2008), of which 1,895 were SHARC holders (Fall et al. 2006). The Division conducted household harvest surveys in Sitka in 1985 and 1996, prior to the introduction of the federal subsistence halibut fishery in 2003 (Table 2). Estimates of subsistence rockfish harvests for 1985 and 1996 were 22,764 and 13,260 fish respectively (Gmelch and Gmelch 1985; ADF&G Community Profile Database). Estimates for 2003 and subsequent years were based on responses to the SHARC postal surveys. These data were not directly comparable to the 1985 and 1996 results because the SHARC survey data represented fish caught incidental to halibut fishing under federal subsistence rules.

In 2006, respondents to the SHARC survey reported catching 1,978 rockfish (Table 6). They retained 60% of the total catch, or 1,197 fish. Respondents indicated that that they were more likely to keep larger rockfish. One respondent said that the recovery rate of meat from rockfish was only 30% and that the rest was waste, which made smaller fish not worthwhile to keep. Similar comments were collected during a Division household survey in Sitka in 1985, when respondents reported that rockfish yielded little meat, about 35% of total weight (Gmelch and Gmelch 1985:40).



Table 6.—Estimated harvest of rockfish, Sitka, 2006

Species	Longline			Setnet	Rod and reel			Totals for all gear types		
	Retained	Discarded	Total	Retained	Retained	Discarded	Total	Retained	Discarded	Total
Non-pelagic rockfish	508.5	140.0	648.5	0.0	310.9	196.0	506.9	819.4	336.0	1,155.4
Yelloweye (“red snapper”)	153.0	2.0	155.0	0.0	32.0	8.0	40.0	185.0	10.0	195.0
Pacific ocean perch	0.0	0.0	0.0	0.0	10.0	8.0	18.0	10.0	8.0	18.0
Rougheye	4.0	0.0	4.0	0.0	6.0	35.0	41.0	10.0	35.0	45.0
Copper	25.0	20.0	45.0	0.0	43.0	9.0	52.0	68.0	29.0	97.0
Quillback	246.2	100.0	346.2	0.0	162.0	91.0	253.0	408.2	191.0	599.2
China	29.0	5.0	34.0	0.0	25.9	34.0	59.9	54.9	39.0	93.9
Bocaccio	0.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	5.0	5.0
Silvergray	9.3	0.0	9.3	0.0	32.0	11.0	43.0	41.3	11.0	52.3
Unknown red rockfish	42.0	8.0	50.0	0.0	0.0	0.0	0.0	42.0	8.0	50.0
Pelagic rockfish	105.0	153.0	258.0	0.0	256.3	274.0	530.3	361.3	427.0	788.3
“Black bass”	37.0	121.0	158.0	0.0	205.0	195.0	400.0	242.0	316.0	558.0
Dusky	12.0	5.0	17.0	0.0	21.3	10.0	31.3	33.3	15.0	48.3
Yellowtail	0.0	0.0	0.0	0.0	10.0	30.0	40.0	10.0	30.0	40.0
“Brown bombers” <sup>a</sup>	0.0	4.0	4.0	0.0	0.0	0.0	0.0	0.0	4.0	4.0
Unknown black rockfish	56.0	23.0	79.0	0.0	20.0	39.0	59.0	76.0	62.0	138.0
Unknown rockfish	0.0	0.0	0.0	0.0	16.0	18.0	34.0	16.0	18.0	34.0
<b>Total rockfish</b>	<b>613.5</b>	<b>293.0</b>	<b>906.5</b>	<b>0.0</b>	<b>583.3</b>	<b>488.0</b>	<b>1,071.3</b>	<b>1,196.8</b>	<b>781.0</b>	<b>1,977.7</b>

Source ADF&G Division of Subsistence, 2007.

<sup>a</sup> One colloquial name for dusky rockfish, but may also be used by local fishers to describe other schooling species.

In 2006, the catch was composed primarily of non-pelagic rockfish (58%), followed by pelagic species (40%) and a smaller amount of unknown rockfish, as well as non-rockfish species that respondents thought were rockfish. The most frequently-caught pelagic species was “black bass,” the colloquial name for *S. melanops* (71%), with lesser amounts of unspecified black rockfish and dusky rockfish. Quillback rockfish *S. maliger* were the most frequently caught non-pelagic species caught (52%), followed by copper *S. caurinus* and China rockfish *S. nebulosus* (Table 6). Overall, quillback rockfish represented 30% of the catch, followed by “black bass” with 28%.

Sitka fishers said they used 2 types of gear to catch rockfish: longlines and rod and reel. There are no federal regulations specific to the subsistence harvest of rockfish. Under state subsistence regulations, Sitka residents can harvest rockfish and halibut using a longline or a hand-held line, but not rod and reel (Appendix A). Under federal subsistence halibut regulations, rod and reel gear may be used, so rockfish could be caught incidentally by either method in the federal program. Over one-half, 54%, of the rockfish catch was made with rod and reel, while 46% was taken on longlines. According to survey results, the mean number of hooks used by Sitka fishers on their longlines was 24.

Non-pelagic rockfish were caught more often with longlines (56%), and pelagic fish more often with rod and reel (67%). Survey results by species show that the majority of the most commonly-caught species, quillback rockfish (18%), were caught using longline gear (Table 6).

Table 7.—Estimated number of rockfish caught by type of gear and type of bait, Sitka SHARC holders, 2006.

Species	Longline				Rod and reel				Jig/Lure
	Type of bait used			Totals	Type of bait used			Totals	
	Herring	Salmon	Other		Herring	Salmon	Other		
Non-pelagic rockfish	343.5	235.0	70.0	648.5	251.0	0.0	0.0	251.0	255.9
Yelloweye (“red snapper”)	84.0	55.0	16.0	155.0	19.0	0.0	0.0	19.0	21.0
Pacific ocean perch	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.0
Rougheye	4.0	0.0	0.0	4.0	35.0	0.0	0.0	35.0	6.0
Copper	43.0	2.0	0.0	45.0	12.0	0.0	0.0	12.0	40.0
Quillback	195.2	147.0	4.0	346.2	143.0	0.0	0.0	143.0	110.0
China	8.0	26.0	0.0	34.0	39.0	0.0	0.0	39.0	20.9
Bocaccio	0.0	5.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0
Silvergray	9.3	0.0	0.0	9.3	3.0	0.0	0.0	3.0	40.0
Unknown red rockfish	0.0	0.0	50.0	50.0	0.0	0.0	0.0	0.0	0.0
Pelagic rockfish	111.0	65.0	82.0	258.0	342.3	0.0	0.0	342.3	188.0
“Black bass”	87.0	61.0	10.0	158.0	238.0	0.0	0.0	238.0	162.0
Dusky	17.0	0.0	0.0	17.0	25.3	0.0	0.0	25.3	6.0
Yellowtail	0.0	0.0	0.0	0.0	20.0	0.0	0.0	20.0	20.0
“Brown bombers” <sup>a</sup>	0.0	4.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0
Unspecified black rockfish	7.0	0.0	72.0	79.0	59.0	0.0	0.0	59.0	0.0
Unknown rockfish	0.0	0.0	0.0	0.0	22.0	0.0	0.0	22.0	12.0
<b>Total rockfish</b>	<b>454.5</b>	<b>300.0</b>	<b>152.0</b>	<b>906.5</b>	<b>615.3</b>	<b>0.0</b>	<b>0.0</b>	<b>615.3</b>	<b>455.9</b>
Other (nonrockfish) <sup>b</sup>	33.0	117.0	0.0	150.0	15.0	0.0	0.0	15.0	120.0

Source ADF&G Division of Subsistence, 2007.

<sup>a</sup> One colloquial name for dusky rockfish, but may also be used by local fishers to describe other schooling species.

<sup>b</sup> Other (nonrockfish) = fishes that respondents reported as being rockfish, but were not (e.g., lingcod).

Hooks baited with herring were the most common type of terminal tackle used to catch rockfish, followed by lures, and then hooks baited with salmon (Table 7). Of all rockfish species caught by Sitka fishers, 54% were taken using herring as bait, 23% were taken using jigs/lures, and 15% were taken using salmon as bait. Of all the rockfish caught using a longline, 50% were caught with herring, 33% with salmon, and the rest with other types of bait. Herring was the only bait used with rod and reel.

Figure 4 shows rockfish catches by the species targeted and the management regimes under which they were fished. The largest incidental catch (45% of the total harvest) was 886 rockfish caught when respondents said that they were subsistence halibut fishing under federal regulations (Table 8). This incidental catch was composed of both non-pelagic (72%) and pelagic species (26%). Of non-pelagic species, quillback rockfish were the most frequently caught (36%), followed by yelloweye rockfish, also known as “red snapper” (18%). Of the pelagic species, “black bass” were the most frequently caught (15%). Overall, respondents reported retaining 65% of the rockfish catch. (Table 8).

The second-largest reported incidental catch of rockfish was 710 fish (36%) when respondents were fishing for fish other than halibut under sport fishing regulations (Table 10). Respondents reported retaining 52% of this catch, which was composed primarily of pelagic “black bass” rockfish (40%), and quillback rockfish (19%).

Sitka residents reported relatively small incidental catches of rockfish when targeting halibut under sport regulations, and when targeting other fish under state subsistence fishing regulations (Figure 4 and Tables 9 and 12). When specifically targeting rockfish, respondents reported catching 266 fish and retaining 73%

of that harvest. Non-pelagic species were the most frequently caught (67%), especially quillback rockfish, which comprised 59% of non-pelagic catches. “Black bass” comprised 100% of the targeted pelagic catches.

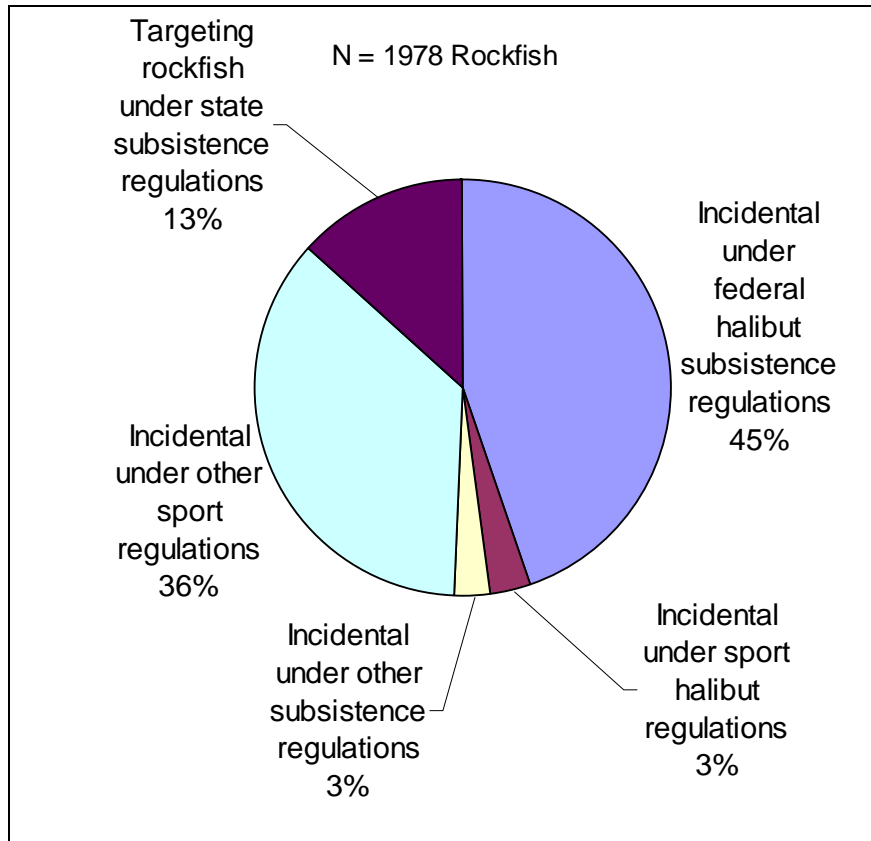


Figure 4.—Sitka rockfish catches by species targeted (rockfish or halibut) and fishery management regime, 2006.

Table 8.–Estimated incidental catch of rockfish while fishing under federal subsistence halibut regulations, Sitka, 2006.

Species	SHARCs catching	Rockfish caught			Percentage of total catch		Percentage of total rockfish catch by species		
		Retained	Discarded	Total	Retained	Discarded	Retained	Discarded	Total
Non-pelagic rockfish	39.0	461.5	180.0	641.5	71.9%	28.1%	52.1%	20.3%	72.4%
Yelloweye (“red snapper”)	26.0	156.0	4.0	160.0	97.5%	2.5%	17.6%	0.5%	18.1%
Rougeye	1.0	4.0	0.0	4.0	100.0%	0.0%	0.5%	0.0%	0.5%
Copper	4.0	25.0	20.0	45.0	55.6%	44.4%	2.8%	2.3%	5.1%
Quillback	26.0	192.2	127.0	319.2	60.2%	39.8%	21.7%	14.3%	36.0%
China	8.0	33.0	15.0	48.0	68.8%	31.3%	3.7%	1.7%	5.4%
Bocaccio	1.0	0.0	5.0	5.0	0.0%	100.0%	0.0%	0.6%	0.6%
Silvergray	3.0	9.3	1.0	10.3	90.2%	9.8%	1.0%	0.1%	1.2%
Unknown red rockfish	1.0	42.0	8.0	50.0	84.0%	16.0%	4.7%	0.9%	5.6%
Pelagic rockfish	13.0	107.0	127.0	234.0	45.7%	54.3%	12.1%	14.3%	26.4%
“Black bass”	7.0	37.0	96.0	133.0	27.8%	72.2%	4.2%	10.8%	15.0%
Dusky	3.0	16.0	9.0	25.0	64.0%	36.0%	1.8%	1.0%	2.8%
“Brown bombers” <sup>a</sup>	1.0	0.0	4.0	4.0	0.0%	100.0%	0.0%	0.5%	0.5%
Unknown black rockfish	2.0	54.0	18.0	72.0	75.0%	25.0%	6.1%	2.0%	8.1%
Unknown rockfish	1.0	10.0	0.0	10.0	100.0%	0.0%	1.1%	0.0%	1.1%
<b>Total rockfish</b>	<b>43.0</b>	<b>578.5</b>	<b>307.0</b>	<b>885.5</b>	<b>65.3%</b>	<b>34.7%</b>	<b>65.3%</b>	<b>34.7%</b>	<b>100.0%</b>
Other (nonrockfish) <sup>b</sup>	15.0	99.0	51.0	150.0	66.0%	34.0%	11.2%	5.8%	16.9%

Source ADF&G Division of Subsistence, 2007.

<sup>a</sup> One colloquial name for dusky rockfish, but may also be used by local fishers to describe other schooling species.

<sup>b</sup> Other (nonrockfish) = fishes that respondents reported as being rockfish, but were not (e.g., lingcod).

Table 9.–Estimated incidental catch of rockfish while fishing for halibut under state sport regulations, Sitka, 2006.

Species	SHARCs catching	Rockfish caught			Percentage of total catch		Percentage of total rockfish catch by species		
		Retained	Discarded	Total	Retained	Discarded	Retained	Discarded	Total
Non-pelagic rockfish	1.0	26.0	0.0	26.0	100.0%	0.0%	44.8%	0.0%	44.8%
Yelloweye (“red snapper”)	1.0	4.0	0.0	4.0	100.0%	0.0%	6.9%	0.0%	6.9%
Quillback	1.0	20.0	0.0	20.0	100.0%	0.0%	34.5%	0.0%	34.5%
Silvergray	1.0	2.0	0.0	2.0	100.0%	0.0%	3.4%	0.0%	3.4%
Pelagic rockfish	3.0	8.0	24.0	32.0	25.0%	75.0%	13.8%	41.4%	55.2%
“Black bass”	2.0	6.0	24.0	30.0	20.0%	80.0%	10.3%	41.4%	51.7%
Dusky	1.0	2.0	0.0	2.0	100.0%	0.0%	3.4%	0.0%	3.4%
<b>Total rockfish</b>	<b>3.0</b>	<b>34.0</b>	<b>24.0</b>	<b>58.0</b>	<b>58.6%</b>	<b>41.4%</b>	<b>58.6%</b>	<b>41.4%</b>	<b>100.0%</b>
Other (nonrockfish) <sup>a</sup>	3.0	12.0	0.0	12.0	100.0%	0.0%			

Source ADF&G Division of Subsistence, 2007.

<sup>a</sup> Other (nonrockfish) = fishes that respondents reported as being rockfish, but were not (e.g., lingcod).

Table 10.—Estimated incidental catch of rockfish while fishing for fish other than halibut under state sport fishing regulations, Sitka, 2006.

Species	SHARCs catching	Rockfish caught <sup>a</sup>			Percentage of total catch		Percentage of total rockfish catch by species		
		Retained	Discarded	Total	Retained	Discarded	Retained	Discarded	Total
Non-pelagic rockfish	14.0	180.0	109.0	289.0	62.3%	37.7%	25.3%	15.3%	40.7%
Yelloweye (“red snapper”)	4.0	11.0	6.0	17.0	64.7%	35.3%	1.5%	0.8%	2.4%
Pacific ocean perch	1.0	10.0	8.0	18.0	55.6%	44.4%	1.4%	1.1%	2.5%
Rougheye	2.0	6.0	35.0	41.0	14.6%	85.4%	0.8%	4.9%	5.8%
Copper	1.0	0.0	2.0	2.0	0.0%	100.0%	0.0%	0.3%	0.3%
Quillback	8.0	105.0	30.0	135.0	77.8%	22.2%	14.8%	4.2%	19.0%
China	4.0	18.0	18.0	36.0	50.0%	50.0%	2.5%	2.5%	5.1%
Silvergray	1.0	30.0	10.0	40.0	75.0%	25.0%	4.2%	1.4%	5.6%
Pelagic rockfish	22.0	187.3	216.0	403.3	46.4%	53.6%	26.4%	30.4%	56.8%
“Black bass”	17.0	142.0	141.0	283.0	50.2%	49.8%	20.0%	19.8%	39.8%
Dusky	4.0	15.3	6.0	21.3	71.9%	28.1%	2.2%	0.8%	3.0%
Yellowtail	3.0	10.0	30.0	40.0	25.0%	75.0%	1.4%	4.2%	5.6%
Unknown black rockfish	2.0	20.0	39.0	59.0	33.9%	66.1%	2.8%	5.5%	8.3%
Unknown rockfish	2.0	0.0	18.0	18.0	0.0%	100.0%	0.0%	2.5%	2.5%
<b>Total rockfish</b>	<b>28.0</b>	<b>367.3</b>	<b>343.0</b>	<b>710.3</b>	<b>51.7%</b>	<b>48.3%</b>	<b>51.7%</b>	<b>48.3%</b>	<b>100.0%</b>
Other (nonrockfish) <sup>b</sup>	3.0	3.0	0.0	3.0	100.0%	0.0%	0.4%	0.0%	0.4%

Source ADF&G Division of Subsistence, 2007.

<sup>a</sup> Estimates do not include numbers of rockfish harvested incidental to SHARC holders’ federal subsistence halibut or state sport fishing efforts.

<sup>b</sup> Other (nonrockfish) = fishes that respondents reported as being rockfish, but were not (e.g., lingcod).

Table 11.—Estimated incidental catch of rockfish while fishing for fish other than halibut under state subsistence regulations, Sitka, 2006.

Species	SHARCs catching	Rockfish caught			Percentage of total catch		Percentage of total rockfish catch by species		
		Retained	Discarded	Total	Retained	Discarded	Retained	Discarded	Total
Non-pelagic rockfish	1.0	10.0	10.0	20.0	50.0%	50.0%	17.2%	17.2%	34.5%
Quillback	1.0	10.0	10.0	20.0	50.0%	50.0%	17.2%	17.2%	34.5%
Pelagic rockfish	2.0	7.0	25.0	32.0	21.9%	78.1%	12.1%	43.1%	55.2%
“Black bass”	1.0	5.0	20.0	25.0	20.0%	80.0%	8.6%	34.5%	43.1%
Unknown black rockfish	1.0	2.0	5.0	7.0	28.6%	71.4%	3.4%	8.6%	12.1%
Unknown rockfish <sup>a</sup>	1.0	6.0	0.0	6.0	100.0%	0.0%	10.3%	0.0%	10.3%
<b>Total rockfish</b>	<b>4.0</b>	<b>23.0</b>	<b>35.0</b>	<b>58.0</b>	<b>39.7%</b>	<b>60.3%</b>	<b>39.7%</b>	<b>60.3%</b>	<b>100.0%</b>

Source ADF&G Division of Subsistence, 2007.

<sup>a</sup> Other (nonrockfish) = fishes that respondents reported as being rockfish, but were not (e.g., lingcod).



Table 12.—Estimated catch of rockfish while targeting rockfish under state subsistence regulations, Sitka, 2006.

Species	SHARCs catching	Rockfish caught			Percentage of total catch		Percentage of total rockfish catch by species		
		Retained	Discarded	Total	Retained	Discarded	Retained	Discarded	Total
Non-pelagic rockfish	4.0	141.9	37.0	178.9	79.3%	20.7%	53.4%	13.9%	67.3%
Yelloweye (“red snapper”)	2.0	14.0	0.0	14.0	100.0%	0.0%	5.3%	0.0%	5.3%
Copper	2.0	43.0	7.0	50.0	86.0%	14.0%	16.2%	2.6%	18.8%
Quillback	4.0	81.0	24.0	105.0	77.1%	22.9%	30.5%	9.0%	39.5%
China	2.0	3.9	6.0	9.9	39.5%	60.5%	1.5%	2.3%	3.7%
Pelagic rockfish	2.0	52.0	35.0	87.0	59.8%	40.2%	19.6%	13.2%	32.7%
“Black bass”	2.0	52.0	35.0	87.0	59.8%	40.2%	19.6%	13.2%	32.7%
<b>Total rockfish</b>	<b>4.0</b>	<b>193.9</b>	<b>72.0</b>	<b>265.9</b>	<b>72.9%</b>	<b>27.1%</b>	<b>72.9%</b>	<b>27.1%</b>	<b>100.0%</b>
Other (nonrockfish) <sup>a</sup>	3.0	120.0	0.0	120.0	100.0%	0.0%			

Source ADF&G Division of Subsistence, 2007.

<sup>a</sup> Other (nonrockfish) = fishes that respondents reported as being rockfish, but were not (e.g., lingcod).

## **Nanwalek**

Nanwalek is located at the southern tip of the Kenai Peninsula, 10 miles southwest of Seldovia. In 2006, the population was 228 people (ADLWD 2008), 31 of whom had SHARCs. Thirty SHARC holders were interviewed for the 2006 SHARC survey, and 6 of those respondents also answered the rockfish harvest survey. The estimated total catch of rockfish was 170 fish, all of which were retained (Table 13). This estimate falls within the range of harvests recorded through Division of Subsistence household surveys conducted in the late 1980s and 1990s (Table 2).

Pelagic “black bass” made up a majority of the rockfish catch (74%) (Table 13). The remainder of rockfish were of unknown species. No one reported catching any species of non-pelagic rockfish. Almost three-fourths of the catch (74%, or 125 fish) was caught with rod and reel, while another 16% was secured using longlines. However, non-rockfish, that many respondents nevertheless considered to be rockfish (such as lingcod), outnumbered the other categories. Four hundred twenty-five non-rockfish catches were reported, representing 71% of all reported rockfish catches in Nanwalek. (Table 13)

The rockfish survey data indicated that Nanwalek halibut fishers used an average of 27 hooks on their longlines. A few rockfish were also caught in subsistence set nets. Most respondents did not report bait used for longlines, and only a few more were reported for rod and reel. The most common terminal tackle reported was hooks baited with herring or lures (Table 14).

Table 13.—Estimated number of rockfish caught by type of gear, Nanwalek, 2006.

Species	Longline				Setnet				Rod and reel				Any gear type			
	SHARCs	Retained	Discarded	Total	SHARCs	Retained	Discarded	Total	SHARCs	Retained	Discarded	Total	SHARCs	Retained	Discarded	Total
Pelagic rockfish	2.1	26.9	0.0	26.9	2.1	18.1	0.0	18.1	5.2	81.6	0.0	81.6	6.2	126.6	0.0	126.6
“Black bass”	2.1	26.9	0.0	26.9	2.1	18.1	0.0	18.1	5.2	81.6	0.0	81.6	6.2	126.6	0.0	126.6
Unknown rockfish	2.1	0.0	0.0	0.0	2.1	0.0	0.0	0.0	5.2	43.4	0.0	43.4	6.2	43.4	0.0	43.4
<b>Total rockfish</b>	<b>2.1</b>	<b>26.9</b>	<b>0.0</b>	<b>26.9</b>	<b>2.1</b>	<b>18.1</b>	<b>0.0</b>	<b>18.1</b>	<b>5.2</b>	<b>125.0</b>	<b>0.0</b>	<b>125.0</b>	<b>6.2</b>	<b>170.0</b>	<b>0.0</b>	<b>170.0</b>
Other (nonrockfish) <sup>a</sup>	2.1	170.5	0.0	170.5	2.1	114.7	0.0	114.7	5.2	139.5	0.0	139.5	6.2	424.7	0.0	424.7

Source ADF&G Division of Subsistence, 2007.

<sup>a</sup> Other (nonrockfish) = fishes that respondents reported as being rockfish, but were not (e.g., lingcod).

Table 14.—Estimated number of rockfish caught by type of gear and type of bait, Nanwalek, 2006.

Species	Longline				Rod and reel				
	Herring	Salmon	Other	Missing	Herring	Salmon	Other	Jig/Lure	Missing
Pelagic rockfish	0.0	1.0	0.0	25.8	33.1	0.0	0.0	22.7	25.8
“Black bass”	0.0	1.0	0.0	0.0	33.1	0.0	0.0	22.7	0.0
Unknown rockfish	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
<b>Total rockfish</b>	<b>0.0</b>	<b>1.0</b>	<b>0.0</b>	<b>25.8</b>	<b>33.1</b>	<b>2.0</b>	<b>0.0</b>	<b>22.7</b>	<b>67.2</b>
Other (nonrockfish) <sup>a</sup>	0.0	0.0	0.0	113.7	24.8	9.0	0.0	27.9	51.7

Source ADF&G Division of Subsistence, 2007

<sup>a</sup> Other (nonrockfish) = fishes that respondents reported as being rockfish, but were not (e.g., lingcod).

Of the total rockfish catch, Nanwalek fishers reported harvesting 31%, or 54 fish, when targeting rockfish. The remainder of the harvest was reported to have been caught incidentally while fishers were either federal halibut subsistence fishing (40%), state subsistence fishing for other fish (27%), or fishing under state sport regulations (1%) (Figure 5). Fifty-eight percent of the incidental catch of rockfish occurred when federal subsistence halibut fishing (68 fish), and all of the catch was retained (Table 15). This catch was composed of pelagic (39%) and unknown rockfish (61%). Nanwalek fishers reported catching 2 rockfish when fishing under state sport regulations (Table 16), and no incidental catch when fishing under state sport halibut regulations. Forty-six rockfish were caught incidentally when state subsistence fishing for fish other than rockfish or halibut (Table 17). The reported non-incidental or directed harvest was 54 fish (32% of the total catch) all of which were retained (Table 18).

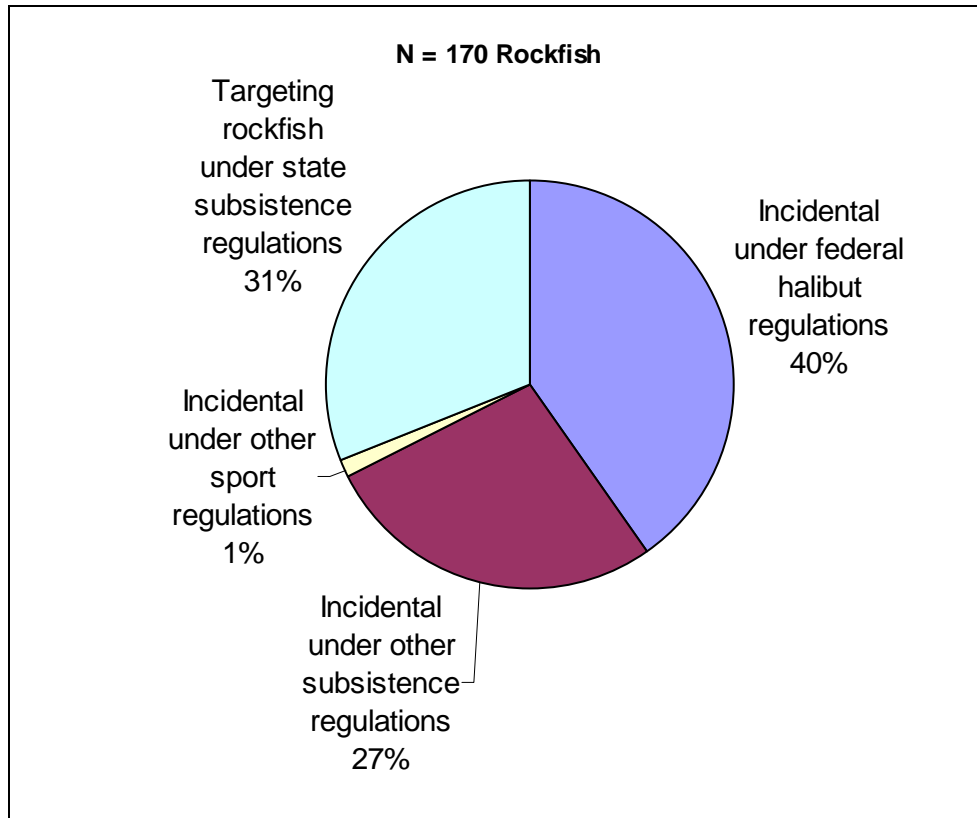


Figure 5.—Nanwalek rockfish catches by species targeted (rockfish or halibut) and fishery management regime, 2006.

Table 15.—Estimated incidental catch of rockfish while fishing under federal subsistence halibut regulations, Nanwalek, 2006.

Species	SHARCs catching	Rockfish caught			Percentage of total catch		Percentage of total rockfish catch by species		
		Retained	Discarded	Total	Retained	Discarded	Retained	Discarded	Total
Pelagic rockfish	2.1	26.9	0.0	26.9	100.0%	0.0%	39.4%	0.0%	39.4%
“Black bass”	2.1	26.9	0.0	26.9	100.0%	0.0%	39.4%	0.0%	39.4%
Unknown rockfish	1.0	41.3	0.0	41.3	100.0%	0.0%	60.6%	0.0%	60.6%
<b>Total rockfish</b>	<b>3.1</b>	<b>68.2</b>	<b>0.0</b>	<b>68.2</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>
Other (nonrockfish) <sup>a</sup>	4.1	170.5	0.0	170.5	100.0%	0.0%			

Source ADF&G Division of Subsistence, 2007.

<sup>a</sup> Other (nonrockfish) = fishes that respondents reported as being rockfish, but were not (e.g., lingcod).

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Table 16.—Estimated incidental catch of rockfish while fishing for fish other than halibut under state sport fishing regulations, Nanwalek, 2006.

Species	SHARCs catching	Rockfish caught			Percentage of total catch		Percentage of total rockfish catch by species		
		Retained	Discarded	Total	Retained	Discarded	Retained	Discarded	Total
Unknown rockfish	1.0	2.1	0.0	2.1	100.0%	0.0%	100.0%	0.0%	100.0%
<b>Total rockfish</b>	<b>1.0</b>	<b>2.1</b>	<b>0.0</b>	<b>2.1</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>
Other (nonrockfish) <sup>a</sup>	8.3	198.4	0.0	198.4	100.0%	0.0%			

Source ADF&G Division of Subsistence, 2007.

<sup>a</sup> Other (nonrockfish) = fishes that respondents reported as being rockfish, but were not (e.g., lingcod).

Table 17.—Estimated incidental catch of rockfish while fishing for fish other than halibut under state subsistence regulations, Nanwalek 2006.

Species	SHARCs catching	Rockfish caught			Percentage of total catch		Percentage of total rockfish catch by species		
		Retained	Discarded	Total	Retained	Discarded	Retained	Discarded	Total
Pelagic rockfish	1.0	46.0	0.0	46.0	100.0%	0.0%	100.0%	0.0%	100.0%
“Black bass”	2.1	46.0	0.0	46.0	100.0%	0.0%	100.0%	0.0%	100.0%
<b>Total rockfish</b>	<b>1.0</b>	<b>46.0</b>	<b>0.0</b>	<b>46.0</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>
Other (nonrockfish) <sup>a</sup>	4.1	46.5	0.0	46.5	100.0%	0.0%			

Source ADF&G Division of Subsistence, 2007.

<sup>a</sup> Other (nonrockfish) = fishes that respondents reported as being rockfish, but were not (e.g., lingcod).

Table 18.—Estimated catch of rockfish while targeting rockfish under state subsistence regulations, Nanwalek, 2006.

Species	SHARCs catching	Rockfish caught			Percentage of total catch		Percentage of total rockfish catch by species		
		Retained	Discarded	Total	Retained	Discarded	Retained	Discarded	Total
Pelagic rockfish	3.1	53.7	0.0	53.7	100.0%	0.0%	100.0%	0.0%	100.0%
“Black bass”	3.1	53.7	0.0	53.7	100.0%	0.0%	100.0%	0.0%	100.0%
<b>Total rockfish</b>	<b>3.1</b>	<b>53.7</b>	<b>0.0</b>	<b>53.7</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>
Other (nonrockfish) <sup>a</sup>	3.1	9.3	0.0	9.3	100.0%	0.0%			

Source ADF&G Division of Subsistence, 2007.

<sup>a</sup> Other (nonrockfish) = fishes that respondents reported as being rockfish, but were not (e.g., lingcod).

## **Port Graham**

The community of Port Graham is located at the southern end of the Kenai Peninsula on the shores of Port Graham Bay, 7.5 miles southwest of Seldovia and 28 air miles from Homer. In 2006, the community had a population of 136 people (ADLWD 2008), and 50 residents held SHARCs. The SHARC survey was administered to 33 SHARC holders, and 2 also answered the rockfish harvest survey. The estimated harvest was 74 rockfish, all of which were caught using rod and reel (Table 19) with one hook. This estimate falls below the range of harvests previously documented in Division household surveys. Those estimates ranged from 526 rockfish in 1991 to 153 in 1997 with an 8-year average of 279 fish (Table 2). The lower 2006 estimate could be a result of the small sample size.

The rockfish survey results indicated that about 5% of the catch was discarded. The harvest was composed of 74% pelagic and 26% non-pelagic rockfish (Table 19). Herring was the preferred bait (Table 20).

Table 19.—Estimated number of rockfish caught by type of gear, Port Graham, 2006.

Species	Longline				Setnet				Rod and reel				Any gear type			
	SHARCs	Retained	Discarded	Total	SHARCs	Retained	Discarded	Total	SHARCs	Retained	Discarded	Total	SHARCs	Retained	Discarded	Total
Non-pelagic rockfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	15.5	3.8	19.3	3.0	15.5	3.8	19.3
China	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	15.5	3.8	19.3	3.0	15.5	3.8	19.3
Pelagic rockfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	54.5	0.0	54.5	3.0	54.5	0.0	54.5
“Black bass”	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	54.5	0.0	54.5	3.0	54.5	0.0	54.5
<b>Total rockfish</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>3.0</b>	<b>70.1</b>	<b>3.8</b>	<b>73.9</b>	<b>3.0</b>	<b>70.1</b>	<b>3.8</b>	<b>73.9</b>
Other (nonrockfish) <sup>a</sup>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	22.7	45.5	68.2	3.0	22.7	45.5	68.2

Source ADF&G Division of Subsistence, 2007.

<sup>a</sup> Other (nonrockfish) = fishes that respondents reported as being rockfish, but were not (e.g., lingcod).

Table 20.—Estimated catch of rockfish by type of gear and type of bait, Port Graham, 2006.

Species	Longline			Rod and reel			
	Herring	Salmon	Other	Herring	Salmon	Other	Jig/Lure
Non-pelagic rockfish	0.0	0.0	0.0	19.3	0.0	0.0	0.0
China	0.0	0.0	0.0	19.3	0.0	0.0	0.0
Pelagic rockfish	0.0	0.0	0.0	45.5	6.0	3.0	0.0
“Black bass”	0.0	0.0	0.0	45.5	6.0	3.0	0.0
<b>Total rockfish</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>64.8</b>	<b>6.0</b>	<b>3.0</b>	<b>0.0</b>
Other (nonrockfish) <sup>a</sup>	0.0	0.0	0.0	68.2	0.0	0.0	0.0

Source ADF&G Division of Subsistence, 2007.

<sup>a</sup> Other (nonrockfish) = fishes that respondents reported as being rockfish, but were not (e.g., lingcod).



Figure 6 shows rockfish caught by effort under each fishery management regime. An incidental catch of 68 rockfish was reported from federal subsistence halibut fishing efforts (Table 21). Fishers retained 94% of this catch, which was composed primarily of pelagic rockfish (72%). No other incidental harvest of rockfish was reported. The targeted harvest was 6 rockfish, of which 100% were retained, and all were pelagic “black bass” (Table 22).

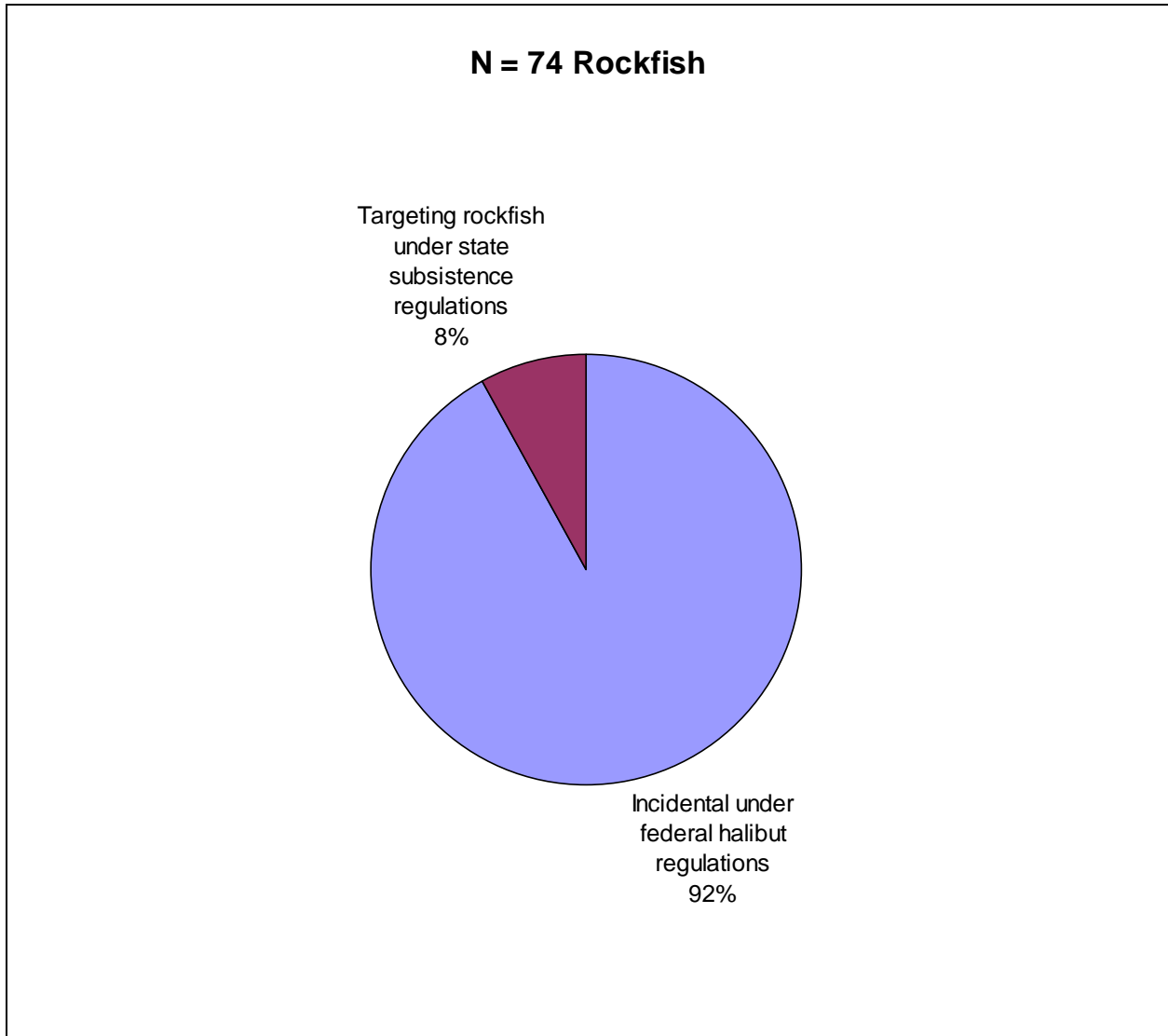


Figure 6.—Port Graham rockfish catches by species targeted (rockfish or halibut) and fishery management regime, 2006.

Table 21.—Estimated incidental catches of rockfish while fishing under federal subsistence halibut regulations, Port Graham, 2006.

Species	SHARCs catching	Rockfish caught			Percentage of total catch		Percentage of total rockfish catch by species		
		Retained	Discarded	Total	Retained	Discarded	Retained	Discarded	Total
Non-pelagic rockfish	1.5	15.5	3.8	19.3	80.4%	19.6%	22.9%	5.6%	28.5%
China	1.5	15.5	3.8	19.3	80.4%	19.6%	22.9%	5.6%	28.5%
Pelagic rockfish	3.0	48.5	0.0	48.5	100.0%	0.0%	71.5%	0.0%	71.5%
“Black bass”	3.0	48.5	0.0	48.5	100.0%	0.0%	71.5%	0.0%	71.5%
<b>Total rockfish</b>	<b>3.0</b>	<b>64.0</b>	<b>3.8</b>	<b>67.8</b>	<b>94.4%</b>	<b>5.6%</b>	<b>94.4%</b>	<b>5.6%</b>	<b>100.0%</b>
Other (nonrockfish) <sup>a</sup>	4.5	22.7	45.5	68.2	33.3%	66.7%			

Source ADF&G Division of Subsistence, 2007.

<sup>a</sup> Other (nonrockfish) = fishes that respondents reported as being rockfish, but were not (e.g., lingcod).

Table 22.—Estimated catch of rockfish while targeting rockfish under state subsistence regulations, Port Graham, 2006.

Species	SHARCs catching	Rockfish caught			Percentage of total catch		Percentage of total rockfish catch by species		
		Retained	Discarded	Total	Retained	Discarded	Retained	Discarded	Total
Pelagic rockfish	1.5	6.1	0.0	6.1	100.0%	0.0%	100.0%	0.0%	100.0%
“Black bass”	1.5	6.1	0.0	6.1	100.0%	0.0%	100.0%	0.0%	100.0%
<b>Total rockfish</b>	<b>1.5</b>	<b>6.1</b>	<b>0.0</b>	<b>6.1</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>

Source ADF&G Division of Subsistence, 2007.

## **Chenega Bay**

Chenega Bay is located in Crab Bay on Evans Island, which is 42 miles southeast of Whittier in Prince William Sound. In 2006, the community had a population of 85 people (ADLWD 2008). For this project, 10 of the 19 SHARC holders completed the 2006 SHARC survey, and 5 also answered the rockfish harvest survey. The 2006 rockfish catch estimate was 633 fish, of which 74% were retained (Table 23). This estimate falls within the range of harvests documented by prior Division household surveys, but is larger than average. Rockfish harvests documented by prior Division household surveys ranged from 55 in 1989 to 1,084 in 1993, with a 9-year average of 423 rockfish (Table 2).

About two-thirds of Chenega Bay's 2006 total catch was pelagic rockfish (66%), with fewer numbers of non-pelagic rockfish (34%) (Table 23). Most of the pelagic species caught by Chenega Bay fishers were unknown black rockfish (68%), followed by "black bass" (25%), and dusky rockfish. The most commonly caught non-pelagic species was quillback rockfish (58%). Almost 95% of all rockfish caught were taken by rod and reel, with one hook. Of the rockfish caught with rod and reel, 70% were pelagic and 30% non-pelagic species (Table 23). Lures were the favorite form of terminal tackle, followed by hooks baited with salmon and herring (Table 24).

Table 23.—Estimated number of rockfish caught by type of gear, Chenega Bay, 2006.

Species	Longline				Setnet				Rod and reel				Any gear type			
	SHARCs	Retained	Discarded	Total	SHARCs	Retained	Discarded	Total	SHARCs	Retained	Discarded	Total	SHARCs	Retained	Discarded	Total
Non-pelagic rockfish	5.7	20.9	11.4	32.3	0.0	0.0	0.0	0.0	7.6	171.0	9.5	180.5	9.5	191.9	20.9	212.8
Yelloweye (“red snapper”)	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	39.9	0.0	39.9	9.5	39.9	0.0	39.9
Quillback	5.7	20.9	11.4	32.3	0.0	0.0	0.0	0.0	7.6	81.7	9.5	91.2	9.5	102.6	20.9	123.5
Tiger	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	3.8	0.0	3.8	9.5	3.8	0.0	3.8
China	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	38.0	0.0	38.0	9.5	38.0	0.0	38.0
Bocaccio	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	7.6	0.0	7.6	9.5	7.6	0.0	7.6
Pelagic rockfish	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	279.3	140.6	419.9	9.5	279.3	140.6	419.9
“Black bass”	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	66.5	38.0	104.5	9.5	66.5	38.0	104.5
Dusky	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	22.8	7.6	30.4	9.5	22.8	7.6	30.4
Unknown black rockfish	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	190.0	95.0	285.0	9.5	190.0	95.0	285.0
<b>Total rockfish</b>	<b>5.7</b>	<b>20.9</b>	<b>11.4</b>	<b>32.3</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>7.6</b>	<b>450.3</b>	<b>150.1</b>	<b>600.4</b>	<b>9.5</b>	<b>471.2</b>	<b>161.5</b>	<b>632.7</b>
Other (nonrockfish) <sup>a</sup>	5.7	85.5	79.8	165.3	0.0	0.0	0.0	0.0	7.6	125.4	250.8	376.2	9.5	210.9	330.6	541.5

Source ADF&G Division of Subsistence, 2007.

<sup>a</sup> Other (nonrockfish) = fishes that respondents reported as being rockfish, but were not (e.g., lingcod).

Table 24.—Estimated rockfish catch by type of gear and type of bait, Chenega Bay, 2006.

Species	Longline			Rod and reel			
	Herring	Salmon	Other	Herring	Salmon	Other	Jig/Lure
Non-pelagic rockfish	32.3	0.0	0.0	30.4	34.2	0.0	115.9
Yelloweye (“red snapper”)	0.0	0.0	0.0	9.5	11.4	0.0	19.0
Quillback	32.3	0.0	0.0	20.9	22.8	0.0	47.5
Tiger	0.0	0.0	0.0	0.0	0.0	0.0	3.8
China	0.0	0.0	0.0	0.0	0.0	0.0	38.0
Bocaccio	0.0	0.0	0.0	0.0	0.0	0.0	7.6
Pelagic rockfish	0.0	0.0	0.0	0.0	38.0	0.0	381.9
“Black bass”	0.0	0.0	0.0	0.0	38.0	0.0	66.5
Dusky	0.0	0.0	0.0	0.0	0.0	0.0	30.4
Unknown black rockfish	0.0	0.0	0.0	0.0	0.0	0.0	285.0
<b>Total rockfish</b>	<b>32.3</b>	<b>0.0</b>	<b>0.0</b>	<b>30.4</b>	<b>72.2</b>	<b>0.0</b>	<b>497.8</b>
Other (nonrockfish) <sup>a</sup>	165.3	0.0	0.0	165.3	0.0	0.0	210.9

Source ADF&G Division of Subsistence, 2007

<sup>a</sup> Other (nonrockfish) = fishes that respondents reported as being rockfish, but were not (e.g., lingcod).

Twenty percent of incidental catches of rockfish occurred while federal subsistence halibut fishing (Table 25) and 1% while subsistence fishing for other fish under state sport regulations (Table 26). Chenega Bay fishers reported catching 498 rockfish while targeting them under state subsistence regulations (79%) (Table 27). While targeting rockfish, 77% of the rockfish caught were pelagic, most often unknown black rockfish. Chenega Bay residents did not report any incidental harvest of rockfish during sport halibut fishing efforts, or during state subsistence fishing efforts for other fish. Chenega Bay catches by fishing effort under management regimes are shown in Figure 7.

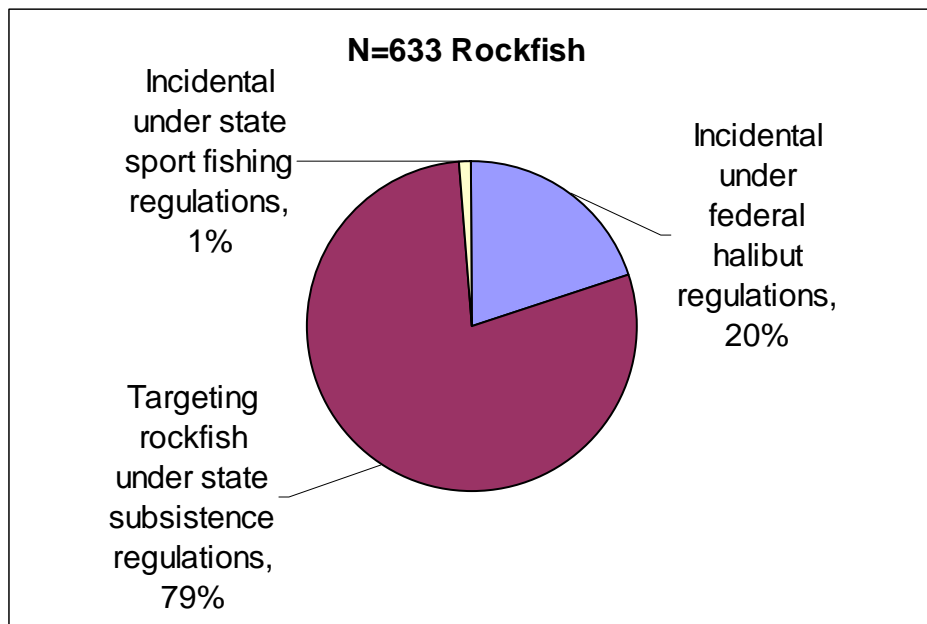


Figure 7.—Chenega Bay rockfish catches by species targeted (rockfish or halibut) and fishery management regime, 2006.

Table 25.—Estimated incidental harvest of rockfish while fishing for halibut under federal subsistence regulations, Chenega Bay, 2006.

Species	SHARCs catching	Rockfish caught			Percentage of species catch		Percentage of total rockfish catch by species		
		Retained	Discarded	Total	Retained	Discarded	Retained	Discarded	Total
Non-pelagic rockfish	5.7	76.0	11.4	87.4	87.0%	13.0%	60.6%	9.1%	69.7%
Yelloweye (“red snapper”)	3.8	20.9	0.0	20.9	100.0%	0.0%	16.7%	0.0%	16.7%
Quillback	5.7	55.1	11.4	66.5	82.9%	17.1%	43.9%	9.1%	53.0%
Pelagic rockfish	1.9	38.0	0.0	38.0	100.0%	0.0%	30.3%	0.0%	30.3%
“Black bass”	1.9	38.0	0.0	38.0	100.0%	0.0%	30.3%	0.0%	30.3%
<b>Total rockfish</b>	<b>5.7</b>	<b>114.0</b>	<b>11.4</b>	<b>125.4</b>	<b>90.9%</b>	<b>9.1%</b>	<b>90.9%</b>	<b>9.1%</b>	<b>100.0%</b>
Other (nonrockfish) <sup>a</sup>	13.3	171.0	159.6	330.6	51.7%	48.3%			

Source ADF&G Division of Subsistence, 2007.

<sup>a</sup> Other (nonrockfish) = fishes that respondents reported as being rockfish, but were not (e.g., lingcod).

Table 26.—Estimated incidental catch of rockfish while fishing for fish other than halibut under state sport fishing regulations, Chenega Bay, 2006.

Species	SHARCs catching	Rockfish caught			Percentage of total catch		Percentage of total rockfish catch by species		
		Retained	Discarded	Total	Retained	Discarded	Retained	Discarded	Total
Non-pelagic rockfish	1.9	9.5	0.0	9.5	100.0%	0.0%	100.0%	0.0%	100.0%
Quillback	1.9	9.5	0.0	9.5	100.0%	0.0%	100.0%	0.0%	100.0%
<b>Total rockfish</b>	<b>1.9</b>	<b>9.5</b>	<b>0.0</b>	<b>9.5</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>

Source ADF&G Division of Subsistence, 2007.

<sup>a</sup> Other (nonrockfish) = fishes that respondents reported as being rockfish, but were not (e.g., lingcod).

Table 27.—Estimated catch of rockfish while targeting rockfish under state subsistence regulations, Chenega Bay, 2006.

Species	SHARCs catching	Rockfish caught			Percentage of total catch		Percentage of total rockfish catch by species		
		Retained	Discarded	Total	Retained	Discarded	Retained	Discarded	Total
Non-pelagic rockfish	3.8	106.4	9.5	115.9	91.8%	8.2%	21.4%	1.9%	23.3%
Yelloweye (“red snapper”)	1.9	19.0	0.0	19.0	100.0%	0.0%	3.8%	0.0%	3.8%
Quillback	3.8	38.0	10.0	47.5	80.0%	20.0%	7.6%	2.0%	9.5%
Tiger	1.9	3.8	0.0	3.8	100.0%	0.0%	0.8%	0.0%	0.8%
China	1.9	38.0	0.0	38.0	100.0%	0.0%	7.6%	0.0%	7.6%
Bocaccio	1.9	7.6	0.0	7.6	100.0%	0.0%	1.5%	0.0%	1.5%
Pelagic rockfish	5.7	241.3	140.6	381.9	63.2%	36.8%	48.5%	28.2%	76.7%
“Black bass”	3.8	28.5	38.0	66.5	42.9%	57.1%	5.7%	7.6%	13.4%
Dusky	1.9	22.8	7.6	30.4	75.0%	25.0%	4.6%	1.5%	6.1%
Unknown black rockfish	1.9	190.0	95.0	285.0	66.7%	33.3%	38.2%	19.1%	57.3%
<b>Total rockfish</b>	<b>5.7</b>	<b>347.7</b>	<b>150.1</b>	<b>497.8</b>	<b>69.8%</b>	<b>30.2%</b>	<b>69.8%</b>	<b>30.2%</b>	<b>100.0%</b>
Other (nonrockfish) <sup>a</sup>	11.4	39.9	171.0	210.9	18.9%	81.1%			

Source ADF&G Division of Subsistence, 2007.

<sup>a</sup> Other (nonrockfish) = fishes that respondents reported as being rockfish, but were not (e.g., lingcod).

## LOCAL KNOWLEDGE AND SUBSISTENCE USES OF ROCKFISH

A second objective of this project was to document local traditional knowledge (LTK) of rockfish. This included collecting information on:

1. Local terms for rockfish.
2. Traditional and contemporary harvest methods and strategies, including types of gear, species selection, species composition of contemporary harvests, and harvest locations
3. Description of habitats, life histories, and population trends for each rockfish species known.
4. The relationship between the federal subsistence halibut fishery and rockfish harvests.
5. Changes in rockfish harvests since federal subsistence halibut regulations went into effect.

### Local Rockfish Taxonomies in Alaska Native Languages

The Tlingit of Southeast Alaska have indigenous names for at least 2 species of rockfish: *léik'w* for yelloweye rockfish, locally known as “red snapper,” and *lit.isdúk* for black rockfish, locally known as “black bass” (ISER 2008). The term “rockfish” in the current Sitka taxonomy includes all bottomfish that live in the rocks. One respondent, for example, who participated in the rockfish survey in Sitka, included lingcod with rockfish harvests. Residents also had different ways to group rockfish. A commercial fisher interviewed for this project considered rougheye rockfish *S. aleutianus* to be a “red snapper,” but not a yelloweye rockfish, while other respondents said a “red snapper” was the same as a yelloweye rockfish.

In the Alutiiq language, the general term for rockfish is *tu kuq*, which can also mean “black bass.” Yelloweye rockfish are called *ushmaq* (Preiksot and Leer n.d.). In Nanwalek and Port Graham, key respondents also gave different groupings of species identification. For example, Nanwalek residents used the term “rockfish” to refer to a number of species caught over rock piles. A Nanwalek fisher said that he considered species such as the red Irish lord (“bullhead”) *Hemilepidotus hemilepidotus*, Pacific cod *Gadus macrocephalus*, black rockfish, skate *Raja* sp and *Bathyraja* sp, flounder *Platichthys stellatus* or *Atheresthes stomias*, and spiny dogfish as rockfish since they were often caught over rock piles and in kelp beds, but he added that black rockfish were the only true rockfish he caught and that he might harvest only one or two per season. If he caught a “black bass,” he harvested it, as he did kelp greenling *Hexagrammos decagrammus* or Pacific cod, but he discarded species such as Irish lords.

When Port Graham key respondents were asked about fishing for rockfish, they talked about “black bass,” which they said were found near kelp beds and which moved with the tide. A Port Graham resident recognized photographs of rougheye *S. aleutianus* and yellow mouth rockfish *S. reedi*, which he called *tilpuuk* in the Alutiiq language. He thought Aurora rockfish *S. aurora* looked more like what people in Port Graham caught. Two respondents said that striped or banded rockfish were not usually found in the area.

## TRADITIONAL AND CONTEMPORARY HARVEST METHODS AND STRATEGIES

### Sitka – Traditional Harvest and Use

Information about traditional or historical use of rockfish in Tlingit culture presented in this section was derived primarily from Mr. Herman Kitka during an interview conducted for this project by Thomas Thornton and Division of Subsistence staff member Nancy Ratner. Kitka is a knowledgeable respected elder of the Sitka Tribe of Alaska, as well as an active subsistence harvester, Tlingit canoe and commercial fishing boat builder, and a commercial fisher with many years of experience fishing in Sitka Sound. Kitka and Thornton worked together previously on research concerning subsistence and local traditional knowledge (Thornton and Kitka 1996).



According to Kitka, yelloweye rockfish, locally called “red snapper,” historically provided fresh supplemental winter food. Kitka discounted the notion that the Tlingit relied solely on dried fish during winter. He said they also ate fresh crabs and shrimps, which they caught in traps, as well as fresh clams and bottomfish. The bottomfish used were “red snapper,” Pacific cod (also called “grey cod”) lingcod, halibut, flounder, and sablefish *Anoplopoma fimbria* (also called “black cod”).

To harvest rockfish and halibut, the Tlingit used hooks made from hardened copper or from thick abalone shell obtained in trade from California. In the early 20<sup>th</sup> century, the Tlingit people used fishing jigs composed of a single hook made from lead, often alloyed with other metals. Kitka said it was easy to catch “red snapper” by using lead jigs that had been scraped to make them shiny. A hand-held line was pulled back and forth. When the rockfish was caught and the line partially retrieved, the rockfish often surfaced on its own because of its decompressed air bladder. Small rockfish were sometimes caught using a cone-shaped fish trap.

“Red snapper” were targeted from winter to spring, after most of the halibut had migrated out of Sitka Sound. Effort took place in sheltered areas in the Sound, because the open ocean was too rough during winter for the smaller vessels. Young Tlingit boys did the fishing, which gave them something to do during the winter. An older man, or “uncle,” went with the boys to make sure that they caught what was needed and no more. They fished for the clan and the uncle knew exactly how much fish each family needed. Small “red snapper” were released: the fish would often splash at the surface and then submerge, unless they were taken by a foraging eagle. Fishers fished from many different harvest locations so that they did not take too many fish from one area.

Rockfish were cleaned immediately so as to keep the stomach acid from ruining the meat, then filleted and separated into portions, each sized to the needs of a particular family. Rockfish were eaten fresh, never smoked, according to Kitka. Every part of the “red snapper” was eaten except the backbone and the skin. Rockfish were fried, made into soup, and the “shoulders,” front fins, and “neck” (collar) were also fried. The meat on the collar tasted like chicken.

## **Sitka – Contemporary Harvest and Use**

Information in this section comes from interviews with fishers and observations made while accompanying fishers to the fishing grounds. In 2006, Sitka was the home port for numerous commercial halibut longliners. If rockfish were caught in state waters by commercial fishers targeting other species, the rockfish bycatch could be sold and proceeds surrendered to the state. If the rockfish were caught in federal waters, the bycatch or overage could only be kept by the individual fisher, or donated. Such sales and donations provided Sitka residents access to yelloweye and other demersal rockfish. A key respondent, who fished for halibut commercially, froze her rockfish bycatch in order to consume it during winter. She also shared her rockfish bycatch with 8 or 9 other households. One commercial halibut fisher said he was concerned about the “. . .in some cases, thousands of pounds of yelloweye that the cannery has to get rid of and go do something with,” and requested a list of people who could use the fish. During the November 2006 community forum, the Sitka Tribe traditional foods coordinator told participants of the tribe’s program to fillet and distribute “red snapper” donated by commercial fishers.

Aside from receiving donated rockfish, key respondents indicated that they preferred using rod and reel to harvest rockfish. They usually used their longlines when targeting halibut, and their rod and reels when fishing exclusively for rockfish. Respondents said they set their longline gear on sandy or muddy bottoms, away from rocks, pinnacles and coral, in order to avoid both snagging their gear and catching rockfish. Several respondents said that the type of bait used on longline gear could deter rockfish. One respondent said that rockfish preferred herring, salmon, and octopus, but not sablefish heads. Another said that he used larger hooks and bigger pieces of salmon in order to avoid catching rockfish. One respondent went into some detail and said that hooks that were spaced farther apart (5 to 10 feet) on the longline tended to catch fewer rockfish.

One respondent said it was not efficient to target rockfish with a longline set using 30 or fewer hooks. In one case, however, a respondent did say he used his subsistence longline to target yelloweye rockfish. He used a conventional longline, locally called “stuck” gear, on which the gangions and hooks were permanently attached to the main longline. He used 20 to 30 size 16/0 hooks spaced 30 feet apart (consistent with other stuck gear), and herring for bait. The only difference between his sets targeting halibut and his sets targeting rockfish was their location. The remaining respondents, both those surveyed and those interviewed as key respondents, said they used rod and reel when targeting rockfish. The terminal tackle ranged from hooks baited with herring or salmon entrails, to unbaited artificial lures such as lead jigs. For example, one survey respondent used 5/0 “double j-hooks” and herring or salmon entrails for bait. Another used a “white jig.” The hooks used were either J-hooks or treble hooks. One key respondent who used a circle hook to jig for halibut said he used a J-hook if he were targeting rockfish. The artificial lure used to target rockfish on the participant observation trip was a 4-3/4 ounce “Point Wilson Dart,” a lure designed to mimic a sandlance Ammodytidae family, and which respondents said was appropriate for a range of groundfish as well as Chinook salmon *Oncorhynchus tshawytscha*.

Harvesters targeted rockfish over pinnacles, such as the “seven-ten pinnacles” and a pair of 49-50 fathom pinnacles between Middle Island and the Old Sitka Rocks. During the key respondent interviews, one respondent reported targeting yellowtail rockfish *S. flavidus*, a pelagic species which he nicknamed “turbo trout,” and quillback rockfish, a demersal species. Respondents said they were more likely to keep larger rockfish, especially yelloweye rockfish. One key respondent from Sitka said that the best yelloweye rockfish harvest location used to be Silver Bay, but that people no longer fished there due to their concerns about toxins from a pulp mill previously located there. A second key respondent said that although her son caught a yelloweye rockfish from Silver Bay, and they ate it because it was against their values to waste fish, considering the longevity of these fish, she did ask her son not to fish there again because it was still not safe to eat the rockfish caught there.

### **Nanwalek and Port Graham - Traditional Harvest and Use**

Traditionally, the people of Nanwalek and Port Graham jigged for halibut and rockfish from their skiffs, set out small longlines, and, after big storms, gathered the storm-killed fish, especially halibut and rockfish, off the beaches. People also used to throw a hook to catch halibut that were following salmon into the lagoon. A resident of Nanwalek said that fishers also used hand-held lines made from seine-hanging twine, or a rope with a single hook.

They set *rrtuwaq*, which means “to swing it and throw out,” and which was a line tied to a log or other heavy object on the beach then left to fish overnight. Red Irish lords and halibut were caught this way. Figure 8 illustrates this method of fishing, used in the early 1900s, as described by Nanwalek resident Sergius Moonin. The hooks were usually baited with salmon heads or other unused parts. Variations of this method, in addition to hand-held lines rigged with weighted and baited hooks, were used by 2 of the key respondents interviewed for this project.

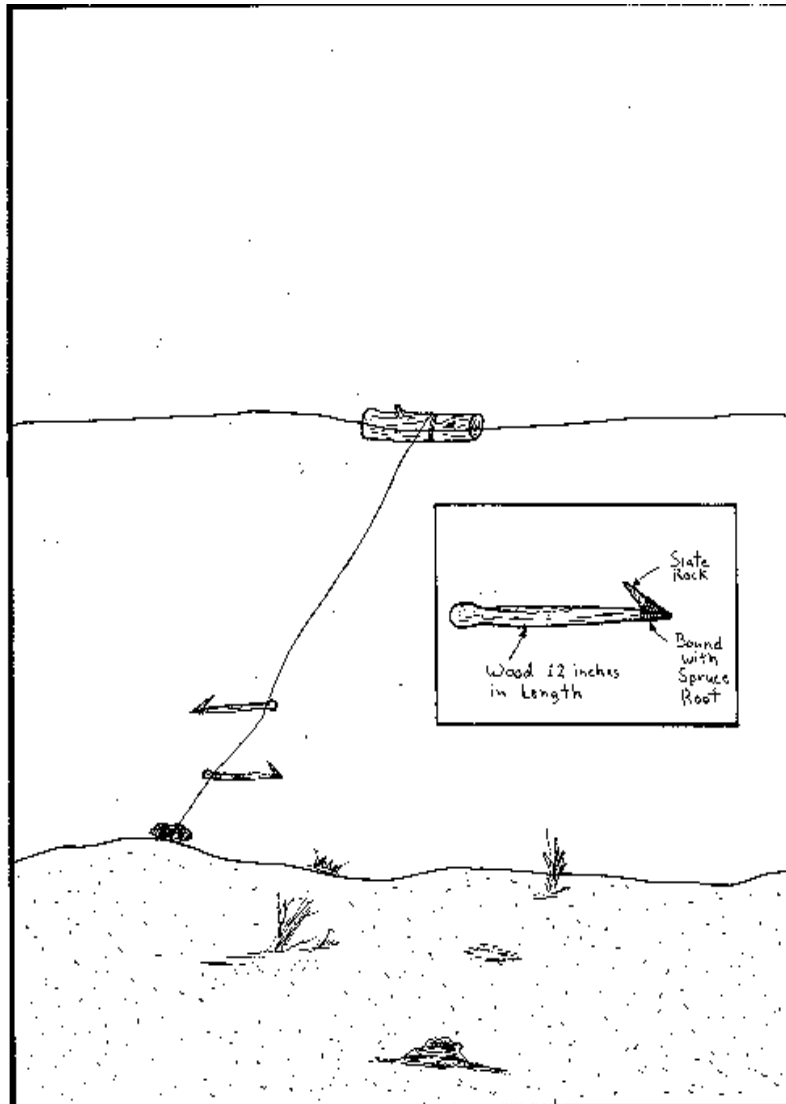


Figure 8.–Halibut gear set up, 1900s, as described by Sergius Moonin.

Source: Stanek unpublished field notes, 1986.

Halibut harvested in the spring was cut into strips and dried for *tamuuq*. This had to be done early in the season, before the flies became a problem. During summer months, fishers gave halibut to the elders. In the fall, fishers set skates in order to harvest large quantities of halibut to preserve for the winter. Unlike earlier times, the majority of contemporary residents had freezers, so they caught halibut as late as possible in the season so that it was as fresh as possible. If they dried fish during fall, they had to use smoke to keep away the flies. No smoke was used in the spring (Stanek 1985).

### **Nanwalek and Port Graham – Contemporary Harvest and Use**

The sources of the information in this section are participant observations and interviews with key respondents. Nanwalek and Port Graham residents said that they used to know exactly where to find deep water fishes, but, at the time of the survey, most of the young people no longer ate rockfish, and if they caught them, they discarded them. Another respondent said that he did not often target rockfish; he caught only 6 or 8 “black bass” in the fall to freeze them for use during winter. Halibut was the preferred species

and most of the residents' comments, either during key respondent interviews or in less formal conversations, were directed toward halibut harvest and effort. One key respondent from Nanwalek said that there were many species in the deeper waters, but they required a lot of gear and work to catch, and were in locations that were too risky to travel to. In addition, rays, skates, and sharks have created problems for fishers using longlines. During summer 2007, for example, there were so many "sand sharks" that fishers in Nanwalek pulled their gear.

In 2007, there were approximately 7 fishers in Nanwalek who regularly set longlines under federal subsistence halibut rules. There were about 5 others who regularly used rod and reel, and a number of other residents who occasionally fished for halibut who also used a rod and reel. Very few hand-held lines were used, mainly because people could afford rod and reel gear. Residents had adopted commercial longline methods to their federal subsistence halibut efforts. Their longlines (also called "skates") consisted of 200-300 feet of mainline tied to anchored buoys. The mainline was deployed over the side or back of a skiff and gangions with baited hooks, which were prepared at home before the fishing trip, were snapped on at regular intervals. The number of hooks varied according to the level of attention the fisher paid to regulations and harvest limits. Circle hooks (also called "C" hooks) were the preferred hook type; previously, only J-hooks were available. One respondent said that he used 20 to 40 circle hooks on a single longline that was attached to 2 anchors and buoys. Herring was the preferred bait, but waste pieces of subsistence-caught salmon were also used. Fresh herring caught locally was preferred; otherwise, frozen or salted bait was used.

For safety and efficiency, residents preferred to fish with crewmembers or partners, either regular partners or individuals who wanted halibut for their families. Crewmembers received a share of the catch, depending on previous arrangements and the amount of fish caught.

One respondent from Nanwalek said that he set his skates in shallow water because it was too much work to set them in deep water, and that it was not necessary to set out a lot of gear in order to catch what was needed. He used 20 to 40 circle hooks on gangions attached to a mainline with 2 anchors and buoys. If he caught a very large halibut he gaffed it rather than shot it, in accordance with his philosophy that one should not use firearms to kill fish. Other fishers often used a .22-caliber firearm to kill big fish. He caught larger fish in the fall because they moved closer to shore in order to feed on salmon. Most of the fish he caught averaged 30 to 60 lbs; he did not often catch very large fish. The larger halibut were favored for making strips and for drying. He said that the larger fish did not taste as fresh as the smaller fish, so making halibut strips was a good way to use the larger fish.

Two respondents in Port Graham said that they occasionally caught halibut and large rockfish while trolling for salmon, an important and popular activity in both Port Graham and Nanwalek. Many households owned trolling gear, including downriggers. One young man said he gave all of the rockfish he caught while trolling to his elders since he did not like cleaning them. Fishers used electronic "fish finders" when trolling, which enabled them to see rock piles and fish. Fishers said they knew what they expected to catch in the different types of marine habitat they fished. In areas where there was no kelp, for example, there would be very few "black bass."

A Port Graham resident recalled that he used to harvest rockfish in Port Chatham Bay because there was a deep channel in the bay where "black bass" were found. Rockfish were also known to be along the edge of a current because there would be food there. "Black bass" were also caught at Dangerous Cape, at the mouth of Port Graham Bay when jigging for halibut, and a place called "Coal Mine" one hour before high tide. The resident said that the fish moved into the kelp with the tide.

Nanwalek residents primarily reported harvesting "black bass," but a few reported harvesting dusky and silvergray rockfish *S. brevispinis*. Port Graham residents said they harvested mainly "black bass," but that they also caught some "red rockfish" and China rockfish.

A Nanwalek fisher estimated that he gave 70% or more away of the halibut he caught to other people. Some of the halibut was used to barter for goods and services in and outside the village. He said that most other households did not have the equipment, time, or skill to fish for halibut. He also said that when a fisher went out he or she notified those people who wanted fish and they must take what was caught. If, for example, he caught nothing, they got nothing. If he caught a large-sized fish or a large number of fish, the person who wanted the fish had to take all the fish. Usually those who got the fish would either use all of it or further distribute what they could not use.

When the fish were caught they were bled and gutted in the skiff and then delivered immediately. Stripping and drying for *tamuuq* was the primary way halibut was used. If a fisher caught 60 or 80 lbs of fresh halibut, he or she might retain 50 lbs of fish to make into dried strips. Dried halibut was dipped in either seal oil or olive oil mixed with soy sauce. Dried halibut was the most popular way of eating halibut and stores of dried halibut never lasted through the winter. Halibut was also deep fried and made into soups and chowders.

### **Chenega Bay – Traditional Harvest and Use**

Respondents said that halibut were traditionally the most commonly-targeted bottomfish, followed by “red snapper.” “Red snapper” were caught year-round, but especially in the fall and winter (Stratton and Chisum 1986:32).

### **Chenega Bay – Contemporary Harvest and Use**

The data presented here are from observations made during one trip made by the researchers to the fishing grounds and from interviews with key respondents. Contemporary Chenega Bay residents targeted either halibut or rockfish, and usually did not fish for both species at the same time. As one person pointed out, if halibut were targeted in a rocky area, fishers would often lose their gear.

In Chenega Bay in 2006, rockfish were harvested primarily with rod and reel, either using bait, such as herring, or a lure. Longlines were used primarily to target halibut, which were found in deep waters over sandy bottoms. Electronic depth finders were often used by local fishers in order to find fish and suitable habitat. A depth finder helped to ensure that halibut longlines were not set over rocky terrain. Since a sandy bottom was not habitat preferred by rockfish, few rockfish were caught on halibut longlines. However, quillback rockfish were sometimes caught by longline sets as they fell to the bottom. While quillback generally inhabit rocky bottoms, according to Chenega Bay residents, they forage for food in the middle depths and that is when they were caught.

Chenega Bay residents targeted 3 rockfish species: 1) the younger dusky and black rockfish often caught in rocky areas, 2) quillback rockfish that were found in deeper waters near the community, and 3) the longer-living yelloweye rockfish that were found in deep waters further from the community. The most commonly-caught rockfish were the dusky and black rockfish, which were targeted in rocky areas. Quillback rockfish were often caught from the ferry dock in the summer, or were sometimes caught from mid-depths while fishing for halibut. Yelloweye rockfish were caught from the deep waters of the channel, which was also one of the main channels where commercial activity took place. Tiger rockfish *S. nigrocinctus* were also seen by Chenega Bay residents, although they were rare. A key respondent and active rockfish fisher related that he caught about 2 of these a year in the deep waters near the Gulf of Alaska.

## **LOCAL AND TRADITIONAL KNOWLEDGE ABOUT ROCKFISH HABITATS, LIFE HISTORIES, AND POPULATION TRENDS**

### **Sitka**

Because “red snapper” was primarily supplemental winter food, one key respondent did not think the Tlingit people knew much about rockfish life cycles and habits. He did say that “red snapper” were slow-

growing, they preferred rocky bottoms, and they stayed in Sitka Sound year-round, but he had no knowledge of when or where rockfish spawn. He had observed large numbers of eggs inside harvested female “red snapper” and he did not understand why “red snappers” did not increase their numbers faster. He said “red snappers” ate their young.

Two respondents said that adult rockfish often preyed on juvenile rockfish. Adult rockfish also ate anything that was moving and that was small enough to fit into their mouths, such as juvenile salmon, herring, shrimp, and brittle stars. One respondent often found rockfish, or sometimes squid or octopus, in the stomachs of the large halibut caught near rock piles. Another found rockfish spines in halibut cheeks, and said that Steller sea lions had been observed removing yelloweye rockfish from the hooks of commercial fishers.

Some respondents suggested that rockfish, yelloweye especially, change locations more than biologists believe. Commercial fishers interviewed for this project said that it did not make sense that they could continue to fish over the same pinnacle (a 5-fathom drop) and continue to catch large yelloweye rockfish. They reasoned that some fish must move there to fill the niche vacated by fish caught in the fisheries.

Respondents from Sitka reported that quillback rockfish were found in shallow habitat and were caught on both hand-held lines and rods and reels, and that rosethorn rockfish *S. helvomaculatus* usually did not bite and were not often caught. Yelloweye rockfish were sometimes seen venturing away from the rocks onto mud or sand flats. According to ADF&G, the rockfish species most likely to overlap with halibut habitat in the Sitka area were tiger, canary, yelloweye and possibly China rockfish (*Personal communication* July 31, 2006, Cleo Brylinsky, ADF&G Fishery Biologist III, Sitka).

A respondent who fishes commercially and for subsistence provided the following observations about rockfish:

1. Yelloweye are found at every depth and are the most abundant rockfish.
2. More yelloweye are caught from pinnacles.
3. Quillback and China rockfish are found in shallower water, usually fewer than 30 fathoms deep.
4. Vermillion and canary rockfish are usually found at depths of 50 fathoms, but could be found at 30 fathoms.
5. He found northern sand lance (“needlefish”) *Ammodytes dubius* and their egg sacs in rockfish stomachs.

Many respondents observed that rockfish had parasites and 2 key respondents mentioned strategies for avoiding or killing them. One discarded the belly meat when filleting rockfish, because he believed this is where most of the parasites were found. Another always froze her rockfish before eating them in order to kill any parasites. She also held fillets so that a light could shine through them, thus showing her cysts or worms in the flesh.

Most respondents interviewed for this project agreed that the abundance of both the halibut and rockfish populations was depleted in Sitka Sound. One respondent however, thought that the abundance of rockfish had not declined, but that the rockfish were smaller. The sport charter fleet was often blamed for much of the decline, but one respondent did say that the commercial rockfish fishers “cleaned out” some of the areas around Sitka. Some respondents expressed concerns about the impacts of using longline gear in the Sound during federal subsistence halibut fishery efforts, and they suggested a moratorium on longlines for all user groups, until the stocks rebounded. Some respondents specified areas where they had been able to harvest halibut or rockfish in the past, but where they had had no recent success. One respondent, an eighty-year-old elder, said he used to catch a lot of “red snapper” and other rockfish when fishing for halibut from a rock pile on the seaward side of the new Thompson Harbor breakwater. He said rockfish could not be found there now because it was “cleaned out” by commercial fishers.

## **Nanwalek and Port Graham**

During their interviews, key respondents often discussed changes in the marine environment which they thought had an effect on subsistence activities, including the harvest of rockfish. For example, when locals tried to harvest rockfish by using a longline they caught too many “sand sharks” and had to pull their gear. This led one Nanwalek resident to observe that sand sharks seem to appear in late July at the same time pink salmon *O. gorbuscha* arrived. In addition, a Nanwalek resident said that in recent years the plankton bloom seemed more intense, there were many more jellyfish and skates, and “sea snakes” had even appeared. In addition, there were many more lingcod in recent years; these were juvenile lingcod because they were not the large mature lingcod found in deep waters. He also observed that in the last few years, halibut have had soft or mushy flesh, like jelly.

According to Port Graham respondents, rockfish ate small crabs, small eels, and little fish. Several respondents thought that “black bass” spawned in Port Graham Bay. Large “red snapper” were said to be found around Elizabeth Island in Lower Cook Inlet.

A respondent from Nanwalek thought that the abundance of rockfish populations, specifically “black bass,” was high, and he believed that the population had not changed much over time. He said that he usually caught rockfish when trolling for salmon and that he kept them in order to distribute them to the elders. In Port Graham, on the other hand, a respondent thought that the abundance of “black bass” had declined compared to 10 or 20 years ago. He recalled that when he fished for rockfish at Coal Mine he was able to catch as many fish as he wanted, but there were fewer fish now. He recalled catching 100 “black bass” per day, which he processed for drying. Another Port Graham resident said that although people used to target “black bass”, they no longer did, and now they are caught incidentally when fishing for halibut. According to this respondent, halibut moved into the area in April and May and remained until September, but in the past 30 years the amount of halibut available was cyclical. For a few years, according to this respondent, there would be an abundance of halibut and then for a few years there would be less abundance, but he could not attribute these fluctuations to any particular event.

## **Chenega Bay**

According to the key respondent interviewed for this project, rockfish abundance near Chenega Bay has declined in recent years. One species he was concerned about was yelloweye rockfish, which, in his estimation, had disappeared. He reported that the yelloweye lived in the deep waters of the main route for commercial fishing boats, and that their “drastic” decline was due to the large commercial longliners from Whittier, Seward, and Cordova. He said that during summer, when large commercial fishing boats come through the area they often stopped at the Chenega Bay community dock and gave away yelloweye rockfish that were incidentally caught during the commercial halibut fishery. This respondent also said that he counted some “growth rings” from one of the yelloweye rockfish caught by commercial fishers. He counted 230 rings and then sent the fish to a biologist for verification. In the end, they decided the fish was around 215 years old. Residents understood that rockfish, especially yelloweye rockfish, were slow to mature, and they expressed concerns that rockfish would eventually disappear.

One issue Chenega Bay residents expressed regarding rockfish and halibut was competition from non-local fishers who were fishing from charter boats or private boats. During summer, these boats fished directly in front of the community. Several residents complained that charter boats often anchored close to the community, sometimes right next to their boats, because the charter operators assumed that the “locals” knew where the fish were. The key respondent explained that the residents of Chenega Bay were able to feed themselves by fishing close to their community, and he wondered why, with so much area in Prince William Sound, charter boats had to fish right in front of the village. This respondent estimated that charter boats took twice as many fish as resident boats. He was afraid that because of the commercial fishing boats and the charter boats out of Whittier, residents would eventually have to travel long distances to catch fish.

# THE FEDERAL SUBSISTENCE HALIBUT FISHERY AND ROCKFISH HARVESTS

## Sitka

In Sitka, most harvesters surveyed said they caught rockfish incidental to other fisheries, mostly in the federal subsistence halibut fishery or the state sport fishery. As previously discussed, survey results indicated that the largest reported incidental harvest of rockfish (886 fish) occurred when respondents were targeting halibut during their federal subsistence halibut efforts. Respondents offered reasons for their rockfish catches, which are summarized below.

### *Respondents' Reasons why Rockfish May be Caught*

1. Happenstance; "hit or miss."
2. Although the flats were targeted, the gear was laid closer to the rocks.
3. Shallower, rocky areas produce rockfish.
4. Fresh bait catches more rockfish.
5. Deep sets that end up on a shelf.
6. "Prospecting:" fishing in areas they don't know.

### *Respondents' Reasons Why Rockfish Are Not Caught*

1. Setting longline gear on mud, sand, or gravel flats.
2. Rockfish are "cleaned out" during the season by charter boats or others.
3. Using "large" hooks.
4. Avoiding pinnacles and rock piles.
5. Avoiding areas where rockfish were caught on previous trips.
6. Using "large" bait.
7. Using bait such as sablefish, which rockfish do not like.
8. Making a "bad" set and not catching anything.
9. Avoiding kelp beds, where rockfish congregate.
10. Fishing in shallower water.

During key respondent interviews and the community forum, respondents described a variety of ways to avoid incidental catch of rockfish. Most of these techniques were related to the location of effort or the type of gear used. Respondents said that there were several strategies used to avoid catching rockfish while fishing during their federal subsistence halibut effort. These included:

1. Using size 15 or larger circle hooks, which are difficult for rockfish to swallow.
2. Using large pieces of bait, such as one-half of a salmon head or larger, which are difficult for rockfish to swallow.
3. Spacing hooks a greater distance, at least 6 to 9 feet apart, on longline gear, allows fewer rockfish to be caught.
4. Setting longline gear over sand, gravel or muddy bottoms.
5. Fishing at fewer than 35 fathoms.



Two commercial fishers who attended the community forum said the incidental catch of rockfish during subsistence efforts was not a concern to them as commercial fishers because subsistence harvests are so “limited.” There was, however, intense concern about the charter fleets’ harvests of halibut and rockfish, which was considered to be excessive. One commercial fisher who attended the rockfish forum said this project was “flawed, because it presumes that the subsistence incidental catch of rockfish is significant.” He wanted to know why the incidental catch of rockfish in subsistence fisheries was important to study when it was insignificant compared to the rockfish harvest during sport charter or commercial efforts.

### **Nanwalek and Port Graham**

SHARC annual surveys and the rockfish surveys that were a part of this project indicated that fishers in Nanwalek and Port Graham did make incidental catches of rockfish during their federal subsistence halibut fishing efforts. Nanwalek fishers reported an incidental harvest of 68 rockfish while federal subsistence halibut fishing, which was 40% of their total harvest of rockfish. Likewise, Port Graham fishers also reported an incidental harvest of 68 rockfish while federal subsistence halibut fishing, which was 92% of their total rockfish harvest. In Nanwalek, 74% of the rockfish harvest was taken with rod and reel, while in Port Graham, 100% of the harvest was taken with rod and reel.

### **Chenega Bay**

Chenega Bay residents said that only 22% of their rockfish catch was incidentally caught, because they said they used fish finders to locate habitat that was suitable for catching halibut instead of rockfish. Those rockfish that were caught on longlines were usually quillback rockfish. They reported an incidental harvest of 125 rockfish while federal subsistence halibut fishing.

## **CHANGES IN ROCKFISH HARVESTS SINCE FEDERAL SUBSISTENCE HALIBUT REGULATIONS WENT INTO EFFECT**

### **Sitka**

Respondents agreed that since the implementation of the 2003 federal subsistence halibut regulations, more multi-hook longline gear has been used in Sitka Sound than prior to the regulatory change. However, they related that weather and time, not regulations, were the primary factors in deciding when to use longline or rod and reel for subsistence groundfish. In order to effectively use longline gear, fishers preferred at least 12 hours of good weather to set, soak, and retrieve their gear. If the weather forecast was not good, or the fisher did not have time to use a longline, he or she used a rod and reel for subsistence groundfish. In order to avoid entangling their gear on rocks, longline fishers were more likely to avoid rock piles, especially if they were pulling gear manually rather than if they were using power to pull their gear. Fishers said they set halibut longline gear over sandy or muddy bottoms, on the edges of rock piles, or over depressions in the sea floor. Commercial halibut fishers said that they targeted the edges of rock piles because that was where they caught large halibut. Currents and tides also influenced set gear location. Depth sounders were often used by fishers to help determine the best location.

### **Nanwalek and Port Graham**

When asked if rockfish or halibut harvests had changed, respondents tended to emphasize the halibut harvests. One person said there had been no change since the federal subsistence halibut regulations went into effect; local harvest quantities had not changed, but residents could now fish without being concerned about law enforcement. The rockfish household survey results as well as the annual SHARC survey showed that in 2006, rockfish catches in both Nanwalek and Port Graham were lower than average. In 2006, Nanwalek residents reported a harvest of 170 fish, compared to the 8-year average for rockfish of 289 fish (Table 1).

## Chenega Bay

According to respondents, there was no change in the rockfish harvest since the federal subsistence halibut regulations allowed the use of multiple hooks.

## CHAPTER 4: CONCLUSIONS

The goal of this project was to provide information about the subsistence harvests of rockfish in 4 communities: Sitka in Southeast Alaska, and Chenega Bay, Port Graham and Nanwalek in Southcentral Alaska. Rockfish have been used for subsistence purposes in Alaska for centuries, but changes in federal regulations governing the use of halibut longlines raised concerns that the incidental catch of rockfish was increasing, and that local populations of rockfish were being depleted. As stated in the research proposal, we expected to find that local fishers would apply their knowledge to reduce the incidental rockfish harvest in the subsistence halibut fishery. We focused the research on 5 questions:

1. What are local observations about rockfish populations and trends?
2. What are the contemporary subsistence harvest strategies for subsistence rockfish: gear, species selection, harvest locations?
3. What is the relationship between the subsistence halibut fishery and rockfish harvests?
4. What, if any, changes have occurred in rockfish harvests since the 2003 federal subsistence halibut rules went into effect?
5. What is the species composition of contemporary subsistence rockfish harvests?

Three methods were used to investigate these questions: 1) interviews with subsistence rockfish and halibut fishers, 2) participant observation by the researchers, 3) and household surveys.

Historical data from annual halibut SHARC survey established that most of the incidental harvest of rockfish occurred in Southeast (Area 2C) and Southcentral (Area 3A) Alaska (Table 3). These data showed that SHARC holders in Southeast Alaska have consistently harvested between 62% and 67% of the incidental rockfish harvest between 2003 and 2006, while SHARC holders in Southcentral harvested between 23% and 29%. The data also showed that the 3 study communities in Southcentral Alaska, Chenega Bay, Nanwalek, and Port Graham, contributed between 6% and 21% of the Southcentral rockfish harvest between 2003 and 2006, while Sitka contributed between 32% and 44% of the Southeast harvest (Table 4).

Household surveys conducted by the Division of Subsistence beginning in the late 1980s showed a consistent pattern of rockfish harvests in 3 of the 4 study communities (Table 2). Harvest data collected in 2006 from SHARC holders (Table 3) and the rockfish harvest survey showed rockfish harvests to be within the range of harvests documented in household surveys conducted during the late 1980s and the 1990s. The 2006 rockfish survey did not show any major increase in the harvest of rockfish in any of the study communities.

Data from the supplemental rockfish survey conducted in 2006 showed that in Sitka, Nanwalek, and Port Graham, most of the incidental harvest of rockfish occurred while fishers were fishing for halibut under federal subsistence halibut regulations.

Sitka fishers reported that almost one-half (45%) of their total rockfish harvest was taken incidentally when fishers were federal subsistence halibut fishing, another 36% was taken incidentally when fishers were fishing for other fish under sport or personal use regulations, and only 13% was caught by directed effort. Nanwalek fishers reported that 40% of their total harvest was taken incidentally while federal subsistence halibut fishing and about 32% was caught in directed harvests. Port Graham fishers reported that almost all, 92%, of their rockfish harvest was incidental, taken while federal subsistence halibut

fishing. Chenega Bay was the only community to report that a majority (78%) of its rockfish harvest was taken through directed harvests. Only 21% of the Chenega Bay rockfish harvest was taken incidentally.

Table 28 summarizes data from the 2006 rockfish survey by location, gear type, percentage of species harvested, and percentage of total harvest discarded. In the Southcentral communities, rod and reel was the preferred gear for harvesting rockfish. In Sitka, harvests were more evenly divided between longline and rod and reel. Quillback rockfish were the main species harvested in Chenega Bay; 20% of the harvest. In Nanwalek (74%), and Port Graham (74%), “black bass” were most frequently caught. In Sitka, quillback rockfish (30%) and “black bass” (28%) were most common.

Table 28.–Rockfish catch by gear type, species, and percentage discarded.

<b>Chenega Bay</b>		
Gear type		
Longline		5.0% of total catch
Rod and reel		95.0% of total catch
Species retained		
Pelagic		66.0% of total catch
Non-pelagic		34.0% of total catch
Discarded		26.0% of total catch
<b>Nanwalek</b>		
Gear type		
Longline		16.0% of total catch
Setnet		11.0% of total catch
Rod and reel		74.0% of total catch
Species retained		
Pelagic		74.0% of total catch
Non-pelagic		0.0% of total catch
Discarded		0.0% of total catch
<b>Port Graham</b>		
Gear type		
Rod and reel		100.0% of total catch
Species retained		
Pelagic		74.0% of total catch
Non-pelagic		26.0% of total catch
Discarded		4.0% of total catch
<b>Sitka</b>		
Gear type		
Longline		46.0% of total catch
Rod and reel		54.0% of total catch
Species retained		
Pelagic		58.0% of total catch
Non-pelagic		40.0% of total catch
Discarded		39.0% of total catch

Source ADF&G Division of Subsistence, 2007.

The amount of rockfish discarded varied from zero in Nanwalek to 39% in Sitka. We did not learn why there were differences in the discard rates between the different communities. One reason for the difference may simply be that Sitka fishers caught more rockfish than fishers in Nanwalek and therefore discarded more fish.

Chenega Bay fishers harvested a majority of rockfish by jigging with a lure. Most Nanwalek fishers used herring or jigged with a lure, while most Port Graham fishers used herring. Sitka fishers use more diverse gear. Of those who used rod and reel to catch rockfish, 23% jigged with a lure, and 31% used herring. No

one reported using salmon as bait while fishing with rod and reel. When fishing with longlines, 23% used herring, 15% used salmon, and 8% used another type of bait.

Researchers conducted key respondent interviews and observed participants in the fisheries. Rockfish provided fresh meat at those times of year when other more productive resources, such as salmon and halibut, were less available. Historically, rockfish were caught while jigging with a lure. Today, while a majority of rockfish were harvested with rod and reel, some were also caught on longlines. Fishers in Sitka described various methods for avoiding rockfish while using longline gear to catch halibut. First, respondents said they set their gear on sandy or muddy bottoms away from rocks or pinnacles that were prime rockfish habitat. They did this not only to avoid rockfish but also to avoid tangling their lines. Second, respondents said they used larger bait, such as chunks of salmon, or larger hooks, to deter rockfish. One person said the hooks were spaced at specific intervals so as to catch fewer rockfish. In Nanwalek, Port Graham and Chenega Bay, respondents said they avoided harvesting rockfish on their longline gear by setting their hooks in habitat preferred by halibut. In Nanwalek, for example, one respondent said he laid his gear over sandy areas, while another said he laid his gear close to shore, in relatively shallow water, where it was safer and easier to pull by hand. In Chenega Bay, longlines were used to harvest halibut, and fishers used depth finders to locate suitable habitat, so they did not set their lines over rocky terrain.

When asked about local rockfish populations, most respondents said they thought there had been a decline. In Sitka, most respondents agreed that rockfish were depleted in Sitka Sound. According to respondents, the sport charter fleet and commercial fishing was to blame for much of the decline and 2 respondents thought there should be a moratorium on rockfish harvests for all user groups. In Nanwalek, one respondent thought there was no change in rockfish populations and that the abundance of “black bass,” in particular, was high. Respondents in Port Graham, however, thought “black bass” abundance was in decline. In Chenega Bay, the single key respondent interviewed characterized the abundance of yelloweye rockfish as in drastic decline, which he attributed to commercial fishers.

Harvest estimates collected through the annual SHARC survey and the 2006 supplemental rockfish survey were within the ranges documented by Division of Subsistence household surveys conducted in the late 1980s and the 1990s. The data from the supplemental rockfish survey showed that most of the incidental harvest of rockfish was taken with rod and reel, not with longlines. Respondents said they knew how to set longline gear in order to avoid harvesting rockfish, but, as they pointed out, rockfish move and were not found only in rough, rocky terrain. Rockfish could also be found in habitat thought to be most suitable for halibut, respondents said, so it was challenging to entirely avoid catching rockfish when fishing for halibut.

## **RECOMMENDATIONS**

Although respondents for this study contributed significant information about their targeted and incidental harvests of rockfish, a few questions arose that could be addressed with further study. The first is that there was an unexpected difference between Sitka and the 3 Southcentral communities in the numbers of discarded rockfish. The number discarded in Sitka was much higher than previously thought. It is also not clear whether Sitka fishers were targeting rockfish while using rod and reel under federal halibut subsistence regulations, as they might while fishing under state sport regulations.

Further study in other communities with high incidental subsistence catches, such as Petersburg, Alaska, for example, could be conducted in order to gather more detail about subsistence catches; results of such a study may be useful in the management process.

The Alaska Board of Fisheries also raised a concern that SHARC holders who did not reside in the communities closest to the fisheries could cause higher incidental catches of rockfish, because they may lack the local traditional knowledge needed to avoid those catches. Further study could investigate this concern.

As Sitka fishers discussed rockfish avoidance strategies, this could be investigated with more specificity among subsistence and commercial fishers. Recommendations for local and non-locals alike could be developed for bait and hook size, and gear spread.

## **PUBLICATIONS**

### **POSTERS**

ADF&G (Alaska Department of Fish and Game). 2007. Alaska rockfish: subsistence harvests and local knowledge. Poster presented at the 2007 Alaska Marine Science Symposium, Anchorage.

ADF&G (Alaska Department of Fish and Game.) 2008. Subsistence harvests and local knowledge: Alaska Rockfish (genus *Sebastes*). Poster presented at the 2008 Alaska Marine Science Symposium, Anchorage.

### **PUBLICATIONS**

ADF&G (Alaska Department of Fish and Game). 2008. Rockfish through the ages: local traditional knowledge of rockfish. April 2008 article [In] R. Woodford, editor. Alaska Fish and Wildlife News. Juneau. [http://www.wildlifeneews.alaska.gov/index.cfm?adfg=wildlife\\_news.view\\_article&articles\\_id=366&issue\\_id=61](http://www.wildlifeneews.alaska.gov/index.cfm?adfg=wildlife_news.view_article&articles_id=366&issue_id=61)

ADF&G (Alaska Department of Fish and Game). 2008. Subsistence harvests and local knowledge: Alaska rockfish (genus *Sebastes*). February 2008 progress report to the North Pacific Research Board, Anchorage. [http://doc.nprb.org/web/06\\_prjs/645\\_handout.pdf](http://doc.nprb.org/web/06_prjs/645_handout.pdf)

Turek, M., N. Ratner, W.E. Simeone, and D.L. Holen. *In prep.* Subsistence harvests and local knowledge of rockfish *Sebastes* in 4 Alaskan communities. Draft manuscript for submission to Arctic and/or Arctic Anthropology.

## **OUTREACH AND EDUCATION**

### **PRESENTATIONS IN SCHOOLS**

October 2007. Evergreen State College, Olympia, Washington. Presentation of findings to natural resources management and planning seminar.

November 2007. University of Alaska, Anchorage, Mat-Su College Campus. Presentation of findings to Anthropology 200, Natives of Alaska.

February 2008. University of Alaska, Southeast, Juneau. Presentation of findings to Anthropology 354, Culture and Ecology.

April 2008. University of Alaska, Southeast, Juneau. Presentation of findings to Anthropology 493 Special Topics: Ethnobiology.

### **CONFERENCE PRESENTATIONS**

October 2008. American Fisheries Society, Alaska Chapter Annual Meeting, Anchorage. Presentation of report.

January 2009. 2009 Alaska Marine Science Symposium, Anchorage. Presentation of report.

## REFERENCES CITED

- ADLWD. 2008. Research and analysis homepage: population. State of Alaska Department of Labor and Workforce Development, Juneau <http://almis.labor.state.ak.us/?PAGEID=67&SUBID=115>
- AFSC. 2008. AFSC guide to rockfishes. Adapted from Orr, J.W., M.A. Brown, and D.C. Baker. 1998. Guide to Rockfishes (Scorpaenidae) of the Genera *Sebastes*, *Sebastolobus*, and *Adelosebastes* of the Northeast Pacific Ocean. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Alaska Fisheries Science Center, Technical Memo MNFS-AFSC-95, Alaska Fisheries Science Center, Seattle. <http://www.afsc.noaa.gov/groundfish/rockfishguide/rockfishtoc.htm>
- Alaska Board of Fisheries. 2001. Alaska Board of Fisheries findings for recommendations on subsistence halibut regulations. 2001-206-FB, Anchorage. <http://www.boards.adfg.state.ak.us/fishinfo/regs/ff01206x.pdf>
- Association of Canadian Universities for Northern Studies. 2003. Ethical principles for the conduct of research in the North. Association of Canadian Universities for Northern Studies, Ottawa. <http://www.acuns.ca/EthicsEnglishmarch2003.pdf>
- Birket-Smith, K. 1953. The Chugach Eskimo, volume 6. Nationalmuseets publikationsfond, Kobenhavn.
- Code of Federal Regulations. 2008. Title 50 wildlife and fisheries; Part 300 international fisheries regulations; subpart E Pacific halibut fisheries. U.S. Government Printing Office, Washington, D.C.
- De Laguna, F. 1956. Chugach prehistory: The archaeology of Prince William Sound, Alaska. University of Washington Press, Seattle.
- De Laguna, F. 1960. The story of a Tlingit community: A problem in the relationship between archeological, ethnological, and historical methods. U.S. Government Printing Office, Washington, D.C.
- Emmons, G. T. 1991. The Tlingit Indians. Edited with additions by F. de Laguna. The University of Washington Press, Seattle, and The American Museum of Natural History, New York.
- Fall, J. A., M. George, and B. Easley. 2005. Subsistence harvests of Pacific halibut in Alaska, 2004. Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 304, Juneau. <http://www.subsistence.adfg.state.ak.us/TechPap/tp304.pdf>
- Fall, J. A., M. Kerlin, B. Easley, and R. J. Walker. 2004. Subsistence harvests of Pacific halibut in Alaska, 2003. Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 288, Anchorage and Juneau. <http://www.subsistence.adfg.state.ak.us/TechPap/tp288.pdf>
- Fall, J. A., D. Koster, and B. Davis. 2006. Subsistence harvests of Pacific halibut in Alaska, 2005. Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 320, Juneau. <http://www.subsistence.adfg.state.ak.us/TechPap/tp320.pdf>
- Fall, J. A., D. Koster, and M. Turek. 2007. Subsistence harvests of Pacific halibut in Alaska, 2006. Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 333, Juneau. <http://www.subsistence.adfg.state.ak.us/TechPap/TP333.pdf>
- Fall, J. A., R. Miraglia, W. Simeone, C. J. Utermohle, and R. J. Wolfe. 2001. Long-term consequences of the *Exxon Valdez* oil spill for coastal communities of Southcentral Alaska. Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 264, Juneau. <http://www.subsistence.adfg.state.ak.us/TechPap/tp264.pdf>
- Gmelch, G., and S. B. Gmelch. 1985. Resource use in a small Alaskan city—Sitka. Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 90, Juneau. <http://www.subsistence.adfg.state.ak.us/TechPap/tp090.pdf>
- Goldschmidt, W. R., and T. H. Haas. 1998. *Haa Aani*, Our Land: Tlingit and Haida land rights and use. Editor, T. F. Thornton. University of Washington Press, Seattle; and Sealaska Heritage Foundation, Juneau.
- IPHC (International Pacific Halibut Commission). 2008. Pacific halibut fishery regulations 2008. International Pacific Halibut Commission, Seattle. <http://www.iphc.washington.edu/halcom/pubs/regs/2008iphcregs.pdf>
- ISER (Institute of Social and Economic Research). 2008. Alaskool. University of Alaska Institute of Social and Economic Research, Anchorage.
- Jennings, G. B., K. Sundet, and A. E. Bingham. *In prep.* Participation, catch, and harvest in Alaska sport fisheries during 2006. Alaska Department of Fish and Game, Anchorage.
- Kramer, D. E., and V. M. O'Connell. 2003. Guide to Northeast Pacific rockfishes: genera *Sebastes* and *Sebastolobus*, 2003 Edition. University of Alaska Fairbanks, Alaska Sea Grant College Program, Fairbanks.
- Lamb, A., and P. Edgell. 1986. Coastal fishes of the Pacific Northwest. Harbour Publishing Comapny, Madeira Park, B.C.

- Langdon, S. 1979. Comparative Tlingit and Haida adaptation to the west coast of the Prince of Wales Archipelago. *Ethnology* 18(2):101-119.
- Love, M. S., M. Yoklavich, and L. Thorsteinson. 2002. *The rockfishes of the Northeast Pacific*. University of California Press, Berkeley.
- Meyer, S. C. 2000. Composition and biomass of the recreational rockfish *Sebastes* harvest in Southcentral Alaska, 1992-1995. Alaska Department of Fish and Game Fishery Data Series No. 00-6, Anchorage. <http://www.sf.adfg.state.ak.us/FedAidPDFs/fds00-06.pdf>
- Newton, R. G., and M. L. Moss. 2005. *Haa atxaayi haa kusteeyix satee*, our food is our Tlingit way of life: excerpts from oral interviews. U. S. Department of Agriculture, Forest Service, Alaska Region, R10-MR-30.
- NMFS (National Marine Fisheries Service). 2004. DRAFT regulatory impact review for a regulatory amendment to amend subsistence halibut fishery regulations in Convention waters. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Juneau. [http://www.fakr.noaa.gov/npfmc/current\\_issues/halibut\\_issues/SubsistenceIII\\_1104.pdf](http://www.fakr.noaa.gov/npfmc/current_issues/halibut_issues/SubsistenceIII_1104.pdf)
- Parker, S. J., S. A. Berkeley, J. T. Golden, D. R. Gunderson, J. Heifetz, M. A. Hixon, R. Larson, B. M. Leaman, M. S. Love, J. A. Musick, V. M. O'Connell, S. Ralston, H. J. Weeks, and M. M. Yoklavich. 2000. Management of Pacific rockfish. AFS policy statement. *Fisheries* 25(3): 22-30.
- Preiksot, D., and J. Leer. [n.d.] Alutiiq dictionary. An annotated list of Alutiiq words relevant to modeling the Prince William Sound ecosystem. University of British Columbia Fisheries Centre, Vancouver, Canada, and the Alaska Native Language Center, Fairbanks, AK <http://www.fisheries.ubc.ca/Projects/PWSound/AlaskaEco/Alutiiq.html>
- Singleton Jr., R. A., B. C. Straits, and M. M. Straits. 1993. *Approaches to social research*. 2nd Edition. Oxford University Press, New York.
- Stanek, R. T. 1982. Natural resource harvests at Port Graham and English Bay, 1982: An interim report. Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 32, Anchorage. <http://www.subsistence.adfg.state.ak.us/TechPap/tp032.pdf>
- Stanek, R. T. 1985. Patterns of wild resource use in English Bay and Port Graham, Alaska. Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 104, Anchorage. <http://www.subsistence.adfg.state.ak.us/TechPap/tp104.pdf>
- State of Alaska. 2006. *Alaska fish and game laws and regulations annotated*. 2005-2006 Edition. LexisNexis Publishing, Charlottesville, VA.
- Stratton, L. 1990. Resource harvest and use in Tatitlek, Alaska. Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 181, Anchorage. <http://www.subsistence.adfg.state.ak.us/TechPap/tp181.pdf>
- Stratton, L., and E. B. Chisum. 1986. Resource use patterns in Chenega, Western Prince William Sound: Chenega in the 1960s and Chenega Bay 1984-1986. Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 139, Anchorage. <http://www.subsistence.adfg.state.ak.us/TechPap/tp139.pdf>
- Thornton, T. F., and H. Kitka. 1996. Herman Kitka's recordings. Midgett, A., and T. F. Thornton, editors. *Anthropology 354 Culture and Ecology*. Alaska Native Knowledge Network <http://www.ankn.uaf.edu:8080/resources/mod/glossary/view.php?id=50>

**APPENDIX A. FEDERAL AND STATE REGULATIONS  
PERTAINING TO THE HARVEST OF ROCKFISH**



Appendix A1.–Federal and state regulations for the noncommercial groundfish fisheries in the Sitka waters of Area 2C, 2007.

Regulation	Federal subsistence halibut regulations	State subsistence halibut regulations	State subsistence rockfish regulations	State sport regulations for rockfish	State personal use regulations for rockfish
Open season	Entire year.	Entire year.	Entire year.	Entire year.	Entire year.
Legal gear	Setline and hand-held gear of not more than 30 hooks, including longline, handline, rod and reel, spear, jig and hand-troll gear, and must not exceed 3 times per person hook limit per vessel (CFR.300.65) (h)(1).	Halibut may be taken only with a single line which is operated by hand with not more than two hooks attached to it; no person may operate more than one line (5 AAC. 01.720 (3)).	Gear listed in 5 AAC 01.010(a) (5 AAC 01.720) <sup>a</sup> .	A single line having attached to it not more than one plug, spoon, spinner, or series of spinners, or two flies, or two hooks. The line must be closely attended (5 AAC 75.020 (a)).	Bottomfish may be taken only by longline or hand-held line; unattended gear must be marked (5 AAC 77.674 (2)).
Limits	20 fish (CFR 300.65) (h) (2); 25 when fishing for ceremonial or educational permit (CFR 300.65) (h) (2) (iii).	Daily bag limit is two fish and the possession limit is two daily bag limits. No person may possess sport-taken and subsistence-taken halibut on the same day (5 AAC 01.745 (a)).	No limit.	Pelagic rockfish: bag limit, five fish, possession limit ten fish, no annual limit; no size limit. Non-pelagic rockfish: bag limit five fish, possession limit ten fish, of which only two per day and four in possession may be yelloweye rockfish; no annual limit; no size limit (5 AAC 47.020 (8)) <sup>b</sup> .	No daily bag or possession limits except for the Sitka Sound Special Use Area: the daily possession limit for rockfish is three fish, of which no more than one may be a yelloweye rockfish (5 AAC 77.674 (3) (A) (i)).
Open waters	Entire area.	Waters of District 12; Section B-9; District 2; Section 3-B; Section 3-A; District 5; District 13; and Districts 7 and 8 (5 AAC 01.716 (6, 9, 12,14,17,20, 21, and 23).	Entire area.	All waters open except the “Pinnacles” (5 AAC 47.021 (g) (2)).	All waters open except the “Pinnacles” (5 AAC 47.021 (g) (2)).
If C&T finding, amount necessary for subsistence <sup>c</sup>	N/A	No finding.	No finding.	N/A	N/A

Sources NMFS 2004; Code of Federal Regulations 2008; State of Alaska 2006.

<sup>a</sup> Allowable gear includes nets, spears, pots, longlines and handlines; however, rod and reel is expressly prohibited (5 AAC 01.010 (g)).

<sup>b</sup> Exception is Sitka Sound Special Use Area, in which the bag and possession limit for non-pelagic rockfish is three fish, of which no more than one may be a yelloweye (5 AAC 47.021 (g) (1) (B)).

<sup>c</sup> Under the Alaska subsistence law (AS 16.05.258(a)), the Alaska Board of Game and the Alaska Board of Fisheries are required to identify the game and fish stocks, or portions of stocks, that are customarily and traditionally taken or used for subsistence (a “C&T finding”).

Appendix A2.—Federal and state noncommercial groundfish regulations in the Cook Inlet waters of Area 3A, 2007.

Regulation	Federal subsistence halibut regulations	State subsistence halibut regulations	State subsistence rockfish regulations	State sport regulations for rockfish	State personal use regulations for rockfish
Open season	Entire year.	Entire year.	Entire year.	Entire year.	Closed year-round.
Legal gear	Setline and handheld gear of not more than 30 hooks, including longline, handline, rod and reel, spear, jig and hand-troll gear, and must not exceed 3 times per person hook limit per vessel (CFR.300.65 (h)(1).	Halibut may be taken only by single hand-held line with not more than two hooks attached to it (5 AAC 01.570 (h)).	Rockfish may be taken only by a single hand troll, single hand-held line, or single longline, none of which many have more than five hooks attached to it (5 AAC 01.570 (n)).	A single line having attached to it not more than one plug, spoon, spinner, or series of spinners, or two flies, or two hooks. The line must be closely attended (5 AAC 75.020 (a)).	N/A
Limits	20 fish (CFR 300.65) (h) (2); 25 when fishing for ceremonial or educational permit (CFR 300.65) (h) (2) (iii).	Daily bag limit is two fish and the possession limit is two daily bag limits. No person may possess sport-taken and subsistence-taken halibut on the same day (5 AAC 01.595 (b)).	Daily bag limit is five fish and the possession limit is ten fish, of which only one per day and two in possession may be non-pelagic rockfish. A person may not take or possess rockfish under sport fishing regulations and under subsistence regulations on the same day (5 AAC 01.595 (d)).	Daily limit is five fish and 10 in possession, of which only one per day and two in possession may be non-pelagic rockfish; no size limit (5 AAC 58.022 (a)(6)).	N/A
Open waters	Waters of Cook Inlet as far south as Seldovia and waters of Resurrection Bay and off the outer end of the Kenai Peninsula	Bottomfish, halibut, and herring may be taken in the waters of the Cook Inlet Area that are outside the boundaries of the nonsubsistence area described in 5 AAC 99.015 (a)(3) and that are south of 59°30' N. lat. and west of 151°20' W. long. (5 AAC 01.575 (a) (9)).		All waters of Alaska, excluding freshwater drainages, enclosed by a line extending south from Cape Puget, and a line extending east from Cape Douglas (5 AAC 58.005).	N/A
If C&T finding, amount necessary for subsistence <sup>b</sup>	N/A	C&T finding, but no amount determined (5 AAC 01.566 (a) (4)).	750-1,350 fish (5 AAC 01.570 (c))	N/A	N/A

Sources NMFS 2004; Code of Federal Regulations 2008; State of Alaska 2006.

<sup>a</sup> There are no federal regulations for subsistence rockfish in Cook Inlet.

<sup>b</sup> Under the Alaska subsistence law (AS 16.05.258(a)), the Alaska Board of Game and the Alaska Board of Fisheries are required to identify the game and fish stocks, or portions of stocks, that are customarily and traditionally taken or used for subsistence (a “C&T finding”).

Appendix A3.—Federal and state noncommercial groundfish regulations in the Prince William Sound waters of Area 3A, 2007.

Regulation	Federal subsistence halibut regulations <sup>a</sup>	State subsistence halibut regulations	State subsistence rockfish regulations	State sport regulations for rockfish	State personal use regulations for rockfish
Season	Entire year.	Entire year except closed year-round in the nonsubsistence area described in 5 AAC 99.015 (a)(5) (5 AAC 01.610 (a)).		Entire year.	Closed year-round.
Legal gear	Setline and handheld gear of not more than 30 hooks, including longline, handline, rod and reel, spear, jig and hand-troll gear, and must not exceed 3 times per person hook limit per vessel (CFR.300.65 (h)(1).	Halibut may be taken only by single hand-held line with not more than two hooks attached to it (5 AAC 01.620 (d)).	Groundfish may be taken only by a single hand troll, single hand-held line, or a single longline, none of which many have more than five hooks attached to it (5 AAC 01.620 (h)).	A single line having attached to it not more than one plug, spoon, spinner, or series of spinners, or two flies, or two hooks. The line must be closely attended (5 AAC 75.020 (a)).	N/A
Limits	0 fish (CFR 300.65 (h) (2); 25 when fishing for ceremonial or educational permit (CFR 300.65) (h) (2) (iii).	Daily bag limit is two fish and the possession limit is four fish. No person may take or posses halibut under sport fishing regulations and under subsistence regulations on the same day (5 AAC 01.645 (c)).	From May 1–September 15, the daily bag limit is five fish and the possession limit is ten fish, of which only two per day and two in possession may be non-pelagic rockfish. From September 16–April 30, the daily bag and possession limit is ten fish, of which only two per day and two in possession may be non-pelagic rockfish. A person may not take or possess rockfish under sport fishing regulations and under subsistence regulations on the same day. (5 AAC 01.645 (e)(1-2)).	From May 1–September 15, the daily bag limit is five fish and possession limit is ten fish, of which only two per day and in possession may be non-pelagic rockfish. From September 16–April 30, the daily bag and possession limit is ten fish, of which only two per day and in possession may be non-pelagic rockfish. The first two non-pelagic rockfish caught must be retained. No size limit (5 AAC 55.022 (a)(8)(A-B)).	
Open waters	Entire area	Entire area.	Entire area.	Entire area.	N/A
If C&T finding, amount necessary for subsistence <sup>b</sup>	N/A	N/A	7,500 - 12,000 rockfish (5 AAC 01.616)	N/A	N/A

Sources NMFS 2004; Code of Federal Regulations 2008; State of Alaska 2006.

<sup>a</sup> There are no federal regulations for subsistence rockfish in Prince William Sound.

<sup>b</sup> Under the Alaska subsistence law (AS 16.05.258(a)), the Alaska Board of Game and the Alaska Board of Fisheries are required to identify the game and fish stocks, or portions of stocks, that are customarily and traditionally taken or used for subsistence (a “C&T finding”).

**APPENDIX B. KEY RESPONDENT INTERVIEW FORM**

## Appendix B.–Rockfish key respondent interview questions, 2006 and 2007.

### Background

1. Length of residency?
2. Did the respondent harvest rockfish while halibut fishing?
3. What is the relationship between the subsistence halibut fishery and rockfish harvests?

### Cultural importance of Rockfish

1. Where or from whom did the respondent learn to fish for subsistence halibut and rockfish?
2. Are there stories (folklore) about rockfish that the respondent can recall and relate?
3. What if any expectations are associated with subsistence harvest of rockfish? Sharing? With whom?  
Processing techniques?

### Conflicts with other Users and Uses

1. Please describe conflicts, if any, associated with subsistence harvest of rockfish.

### Regulations and management

1. Have any changes occurred in the respondent's (or others') rockfish harvests since SHARC rules went into effect (2003)? If yes, please describe.
2. What, if any, suggestions does the respondent have for improving the regulations regarding the subsistence halibut and rockfish fishery?

### Local Knowledge & Biology

1. What are the respondent's local observations about rockfish populations and trends? Habitat?
2. What are the respondent's contemporary harvest strategies for subsistence rockfish: gear, seasonality, species selection, sex selection, harvest locations?
3. Timing of fishery?
4. Do rockfish eat juveniles?
5. While fishing for halibut are rockfish being lured out of preferred habitat?
6. Do halibut and rockfish occur in the same areas?
7. Do halibut foraging styles (active hunting or lying in wait) matter when targeting either halibut or rockfish?
8. Does the respondent examine stomach contents of Halibut and/or Rockfish?

### Means and Methods

1. Do the respondent target rockfish while subsistence halibut fishing? Or, does the respondent try to avoid catching rockfish?
2. Describe how rockfish are targeted or avoided (for example, areas fished, gear, technique, etc.).
3. Does the respondent release rockfish taken while subsistence halibut fishing? If so which species of rockfish are released?
4. Bait: Salmon, Black Cod, other? Why?
5. Gear: conventional, snap-on, other? Why?
6. Hook type: J hooks, circle hooks; does hook size matter? Why?
7. Where are longlines set? Sandy bottom, deep holes, pinnacles? Why?
8. How deep are lines fished? Why?

Is there anything the respondent would like to add?

## **APPENDIX C. ROCKFISH HARVEST SURVEY FORMS**

Appendix C.–Rockfish harvest survey instrument, 2006.

**2006 ROCKFISH HARVEST SURVEY**

IN 2006, DID YOU CATCH ROCKFISH WHILE FISHING FOR FISH IN ONE OF THESE WAYS?

Subsistence Halibut Fishing, Subsistence Rockfish Fishing, Fishing for Other Fish? YES: \_\_\_\_\_ NO: \_\_\_\_\_ (include harvest and discard)

IF YES, HOW MANY ROCKFISH DID YOU CATCH? List below, the number of rockfish caught by type of fish and gear used.

TYPE OF FISHING Subs. Halibut, Subs. Rockfish, Other Fish	TYPE OF ROCKFISH <sup>1</sup>	NUMBER OF ROCKFISH HARVESTED	NUMBER OF ROCKFISH DISCARDED	TYPE OF GEAR <sup>2</sup>	NUMBER OF HOOKS <sup>3</sup>	TYPE OF BAIT <sup>4</sup>	LOCATION FISHED

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NUMBER OF SUBSISTENCE HALIBUT FISHING TRIPS IN WHICH ROCKFISH WERE CAUGHT

NUMBER OF SUBSISTENCE FISHING TRIPS SPECIFICALLY FOR ROCKFISH

NUMBER OF OTHER SUBSISTENCE FISHING TRIPS IN WHICH ROCKFISH WERE CAUGHT

**ADD NOTES ON THE REVERSE  
SIDE OF THIS PAGE**

<sup>1</sup> Be as precise as possible. Record local names if offered. Use categories "red" and "black" if further detail not available. Write "Unknown rockfish" if more detail not available.  
 RED ROCKFISH = YELLOWEYE (RED SNAPPER), ROUGHEYE, PACIFIC OCEAN PERCH, DARK BLOTCHED, HARLEQUIN, NORTH, COPPER, QUILLBACK, ROSETHORN,  
 REDSTRIPE, CANARY, SHORTRAKER, BLACKQUILL, RED BANDED, TIGER, AND "IDIOTFISH" OR "SHORTSPINE THORNYHEAD".  
 BLACK ROCKFISH = DARK DUSKY, BLACK, LIGHT DUSKY, SILVERGRAY, WIDOW, YELLOWTAIL, "BLACK BASS" OR "SEA BASS".

<sup>2</sup> Gear = longline (skate); handline; rod and reel; other gear (specify)      <sup>3</sup> Number of hooks usually fished.      <sup>4</sup> Type of bait usually used.

NOTES

OPTIONAL CONTINUATION PAGE

TYPE OF FISHING			GEAR AND EQUIPMENT							HABITAT AND LOCATION			ROCKFISH CATCH		
Target Species	Under What Regs?	Type of Gear Used	Mech. Puller ?	Num. of Hooks	Type of Hook	Hook Size	Hook Spacing (ft.)	Type of Long line	Type of Bait	Depth	Habitat Targeted	Location fished	SPECIES	Num. of Rockfish Harv.	Num. of Rockfish Discard.
<i>Halibut? Rockfish? Salmon? Other?</i>	<i>Subs.? Sport? Other?</i>	<i>Longline? Rod &amp; reel? Traditional gear?</i>	<i>Yes/ No</i>	<i>Record number usually fished</i>	<i>J-hook Circle Treble Tlingit</i>		<i>If using longline</i>	<i>Snap-on or stuck?</i>	<i>Species &amp; part or size usually used</i>	<i>Indicate feet or fathom</i>	<i>Rock piles, Drop-offs, Ledges, Flats (sand, mud, gravel); Trenches; Edge of rocks, Depressions</i>		<i>Use a separate line for each rockfish species caught</i>		

<sup>1</sup> Be as precise as possible. Record local names if offered but ask if the name refers to one particular species or a group of similar species. Record the color group if they don't know the name.

Write "Unknown rockfish" if more detail is not available.  
 RED, ORANGE or YELLOW ROCK *Demersal shelf*: Canary; China; Copper; Quillback; Rosethorn; Tiger; Yelloweye;  
 Slope: Blackquill; Dark blotched; Harlequin; North; Pacific Ocean perch; Redbanded; Redstrip; Rougheye; Shortraker

BLACK, BROWN, BLUE or GREY *Pelagic shelf*: Black; Blue; Dark Dusky; Light Dusky (overall greenish brown, tinged with orange); Widow;  
 Slope : Silvergray (greenish to silver gray tinged with orange ventrally), Yellowtail (olive brown, tinged with orange);