



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

National Marine Fisheries Service

P.O. Box 21668

Juneau, Alaska 99802-1668

Agenda Item C-5(2)

December 2010

November 17, 2010

MEMORANDUM FOR: William W. Stelle, Jr.
Administrator, Northwest Region

FROM: James W. Balsiger, Ph.D. *Robert Meeum*
Administrator, Alaska Region

SUBJECT: Reinitiation of Endangered Species Act (ESA) Section 7 Consultation
on Incidental Catches of Chinook Salmon in the Gulf of Alaska
(GOA) Groundfish Fisheries

We are requesting reinitiation of formal consultation pursuant to Section 7 of the Endangered Species Act (ESA) for the Gulf of Alaska (GOA) groundfish fisheries and ESA listed Chinook salmon. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if the amount or extent of incidental take is exceeded. Because the amount of incidental take of Chinook salmon in the 2010 GOA groundfish fisheries exceeded the amount authorized in the incidental take statement in the January 11, 2007, supplement to the November 30, 2000, Biological Opinion regarding the authorization of Bering Sea/Aleutian Islands groundfish fisheries (supplemental BiOp), the Alaska Region requests immediate reinitiation of formal consultation. If, during the course of the groundfish fisheries, the level of take specified in the incidental take statement is exceeded, the additional level of take would represent new information requiring reinitiation of consultation and review of the reasonable and prudent measures (RPMs) identified in the supplemental BiOp. The RPM language specific to the GOA groundfish fisheries is as follows:

1. The NMFS, Alaska Region shall ensure there is sufficient NMFS-certified observer coverage such that the bycatch of Chinook salmon and "other" salmon in the GOA groundfish fisheries can be monitored on an inseason basis. Monitoring will include analysis of all Coded-Wire Tags (CWTs) from salmonids collected in the fisheries.
2. The NMFS, Alaska Region shall monitor bycatch reports in season to evaluate whether the bycatch of Chinook is likely to exceed 40,000 fish per year in the GOA fisheries.

We are providing you the best available information on Chinook salmon incidental catch in the GOA groundfish fisheries.



Chinook Salmon Incidental Catch in the GOA Groundfish Fisheries

In the GOA, Chinook salmon bycatch primarily occurs in the western and central regulatory areas. Figure 1 shows the total number of observed Chinook salmon per 20 km grid in the GOA groundfish fisheries between 2006 and 2010 (Attachment 1). Attachment 2 provides Chinook salmon incidental catch occurrence in the GOA groundfish fisheries. Table 1 provides Chinook salmon incidental catch numbers in the GOA groundfish fisheries for the years 2000 through 2010 (through November 8, 2010). Table 2 provides the rate of Chinook salmon incidental catch in the GOA trawl fisheries during this time period.

As of November 8, 2010, Chinook salmon incidental catch in the GOA groundfish fisheries was 51,736 fish. This number is not final and is likely to change until the observer data are finalized after the fishing year is completed. This is the highest number of Chinook salmon incidentally taken in these fisheries since monitoring began in 1990 and it exceeds the 40,000 Chinook salmon incidental take statement for the GOA groundfish fisheries. The majority of the 2010 Chinook salmon incidental catch occurred between October 1, 2010, and October 18, 2010, with 72% of the fish taken during this time period. Approximately 82% (42,206 Chinook salmon) were caught by vessels using trawl gear in directed pollock fisheries. Of that number 72% (30,560 Chinook salmon) were caught in the final pollock fishery season that opened on October 1. Three pollock fisheries opened on October 1: Area 610, Area 620, and Area 630. Chinook salmon was encountered in every pollock fishery, and observers monitored several trips in each fishery. As of noon on November 1, 2010, all directed fishing for pollock in the GOA was closed for the remainder of the year.

Historically, GOA Chinook salmon incidental catch amounts have been below the amount in the incidental take statement, except for the incidence in 2007 of bycatch as explained in the memorandum to the NMFS Northwest Region dated January 14, 2008. Bycatch of Chinook salmon between 2003 and 2009 (average of 20,723 salmon) is similar to the time series average between 1990 and 2009 (average of 20,395 salmon).

The incidental catch of prohibited species such as salmon are managed in the groundfish fisheries by a variety of measures, which may include prohibited species catch limits and closure areas. To date, no salmon bycatch control measures have been implemented in the GOA groundfish fisheries.

Fisheries Monitoring and Analysis Groundfish Observer Program Bycatch Sampling

The Fisheries Monitoring and Analysis (FMA) Observer Program (Observer Program) collects catch data used for management and inseason monitoring of groundfish fisheries. The majority of the GOA groundfish fleet is subject to approximately 30% observer coverage. Data from the observed vessels provides an indication of the relative numbers and species of salmon incidentally taken in the Alaska groundfish fisheries. Chinook salmon are the dominant species taken in the GOA followed by chum salmon. Very small numbers of sockeye salmon, coho salmon, pink salmon, and steelhead are taken in the GOA groundfish fisheries.

Sampling for salmon on observed pollock catcher vessels in the GOA is conducted as follows: (1) samples are taken from each tow while the vessel is at-sea, and (2) the entire observed offload is followed into the shoreside processing plant as the catch is delivered and a census (a total count of every salmon) of salmon is completed. Salmon censused at the plant are added to the number of any salmon discarded at sea to obtain a final census of all salmon in each observed delivery. In rare circumstances where the off-load census is not completed, NMFS Alaska Region uses the at-sea samples and extrapolates that sample to the entire delivery. The census of the salmon in observed pollock catcher vessel deliveries is then extrapolated to all unobserved pollock catcher vessel deliveries for an overall estimate of salmon bycatch.

Observers are deployed in the field for up to three months at a time, and debrief with FMA Division staff following their deployment. The 2010 data will not be finalized until all observers have returned from the field, are debriefed, and quality control on data is completed. Generally, the observer data are finalized in late February to early March of the year following the fishery. Any catch information provided on 2010 is preliminary until the observer data are finalized after the fishing year is completed.

Sample Collection and Genetic Analysis of Salmon Bycatch

Genetic samples (pelvic axillary processes), maturity information, and scales were collected from Chinook salmon in the 2010 GOA pollock fishery. All vessel observers collect a genetic sample, length, sex, and maturity information from every Chinook salmon in the species composition samples. Plant and floating processor observers collect genetic samples, length, sex, and maturity information from randomly selected Chinook salmon using a temporal sampling frame. These sampling procedures will continue in the 2011 GOA pollock fishery. Genetic analysis of Chinook salmon is an ongoing coordinated effort among the Alaska Department of Fish and Game, Alaska Fisheries Science Center Auke Bay Laboratories (Auke Bay Lab), and the University of Washington. We will continue to coordinate with Auke Bay Lab on the analysis and dissemination of genetic samples collected from Chinook salmon in the GOA groundfish fisheries.

ESA-Listed Chinook Salmon Evolutionarily Significant Units and Coded-Wire Tag Results

The primary source of information for the stock-specific ocean distribution of Chinook salmon incidentally caught in the groundfish fisheries is from CWTs. In 2010, the North Pacific Fishery Management Council (Council) contracted with Cramer Fish Sciences to compile a database of CWT release groups of ESA-listed west coast salmonids.

Total estimated contributions for CWT recoveries can be calculated in a two-step process involving a sampling expansion factor and a marking expansion factor (see Attachment 3 on Recovery Estimation Technique). We are using the mark expansion factor because insufficient data exists on whether the CWTs were collected from inside or outside the sample. A sampling expansion factor can only be calculated from CWTs recovered from inside a sample where the total number of fish sampled is known. Marking expansions can be calculated for each CWT recovery from the mark expansion factors for each tag code. Because not all fish in a tag release group are actually tagged with CWTs, marking expansion factors account for the fraction of each release group that is tagged. Without being able to calculate total estimated contributions

because of an unknown sampling expansion factors, mark expansions offer the closest approximation to the contribution of ESA-listed Evolutionarily Significant Units (ESUs) in the GOA. Mark expansions should be considered a minimum estimate for the actual total contribution of ESA-listed ESUs in the GOA.

Tables 3 and 4 in Attachment 4 provide the latest actual and estimated CWT recoveries for the GOA groundfish fisheries. Chinook salmon from the Lower Columbia River (LCR), Upper Willamette River (UWR), and Upper Columbia River (UCR) Spring ESUs have been recovered in the GOA trawl fishery. Since 1984, CWTs have been recovered from 23 LCR, 98 UWR, and 1 UCR Chinook salmon in the GOA trawl fishery, both pre- and post-listing (Attachment 4, Tables 3 and 4). By applying mark expansion factors, the estimated numbers increase to 112 LCR, 282 UWR, and 1 UCR Chinook salmon.

These numbers should be considered as minimum estimates of the number of ESA-listed ESUs in the GOA groundfish fisheries. Until adequate numbers of CWTs are recovered from inside the observers' samples, where the total number of fish sampled is known, an estimate of total contribution of ESA-listed ESUs in the GOA groundfish fisheries will remain unknown and indeterminable. Please note that the most recent CWT recoveries in these tables occurred in February 2010. The Auke Bay Lab recently obtained 90+ snouts from the Observer Program; these tables will be updated when those snouts are processed and the information is entered into the database by next Fall (Adrian Celewycz, NMFS Auke Bay Lab, personal communication, 2010).

NMFS Auke Bay Lab will continue to monitor CWT recoveries for the GOA groundfish fisheries, maintain a historical database of CWT recoveries on the high seas, and provide an updated summary of CWT recoveries from ESA-listed ESUs in the GOA fisheries on an annual basis within ten months after the end of each fishing year.

North Pacific Fishery Management Council Salmon Management Measures

Since the implementation of the groundfish fishery management plans (FMPs) for Alaska, the Council has adopted measures intended to control the bycatch of species taken incidentally in groundfish fisheries. The Council is in the process of evaluating management options to reduce Chinook salmon bycatch in the GOA. These management options include trigger bycatch limits for salmon, seasonal closure to all fishing in areas with high bycatch or high bycatch rates, and a voluntary bycatch cooperative for hotspot management. In December 2010, the Council will review a discussion paper on GOA Chinook salmon bycatch in the GOA groundfish fisheries.

In October 2010, the Council took final action to restructure the Observer Program for vessels and processors that are determined to need less than 100% observer coverage in the federal fisheries including previously uncovered sectors such as the commercial halibut sector and <60' groundfish sector. The Council emphasized that under the status quo, NMFS cannot determine when and where to deploy observers in the sectors with less than 100% coverage requirements, coverage levels are fixed in regulation, and data gaps exist for sectors without any coverage. The restructured program is intended to provide NMFS with the flexibility to deploy

observers in response to fishery management needs and to reduce the bias inherent in the existing program, to the benefit of the overall data quality.

On November 10, 2010, NMFS issued a final rule to amend regulations implementing the Observer Program, as well as to improve the catch, bycatch, and biological data collected by observers for conservation and management of the North Pacific groundfish fisheries, including those data collected through scientific research activities. This final rule revises the regulatory definition of "fishing day" to clarify that an observer must be on board a vessel for all gear retrievals during the 24-hour period to count as a day of observer coverage. This revision is intended to prevent vessel operators from making fishing trips that do not reflect their normal fishing patterns as this non-representative behavior biases the observer-collected information.

Industry Efforts to Reduce Salmon Bycatch

Based on information from an industry representative, it may be possible to use the salmon excluder device developed for the Bering Sea pollock fishery on GOA pollock trawl vessels. This would require design and testing of the device under GOA pollock fishing conditions, which is a lower catch-per-unit effort fishery compared to the Bering Sea pollock fishery. NMFS has not been approached at this time to issue an Exempted Fishing Permit for this potential work in the GOA.

Annual Report for the Alaska Groundfish Fisheries Salmon Incidental Catch

The conditions of the supplemental BiOp require NMFS' Division of Sustainable Fisheries (Alaska Region) to provide an annual report to the NMFS Division of Sustainable Fisheries (Northwest Region) that details the results of its monitoring of salmon bycatch in the GOA fisheries. This report will be submitted in writing within one month of the new fishing year (February 1, 2011), and will summarize all statistical information based on the January 1 through December 31, 2010, fishing year. This report will also include the latest available information on CWT recoveries of ESA-listed ESUs.

Reducing salmon incidental catch continues to be an important issue for the Council, Alaska Region, Western Alaska communities, and the fishing industry. If you have any questions, please contact Melanie Brown at melanie.brown@noaa.gov or 907-586-7006.

Attachments

Cc: Chris Oliver, NPFMC
Peter Dygert, NMFS NW Region, SF Division

Attachment 1. Observed Chinook Salmon Incidental Catch in the Gulf of Alaska Groundfish Fisheries, 2006–2010

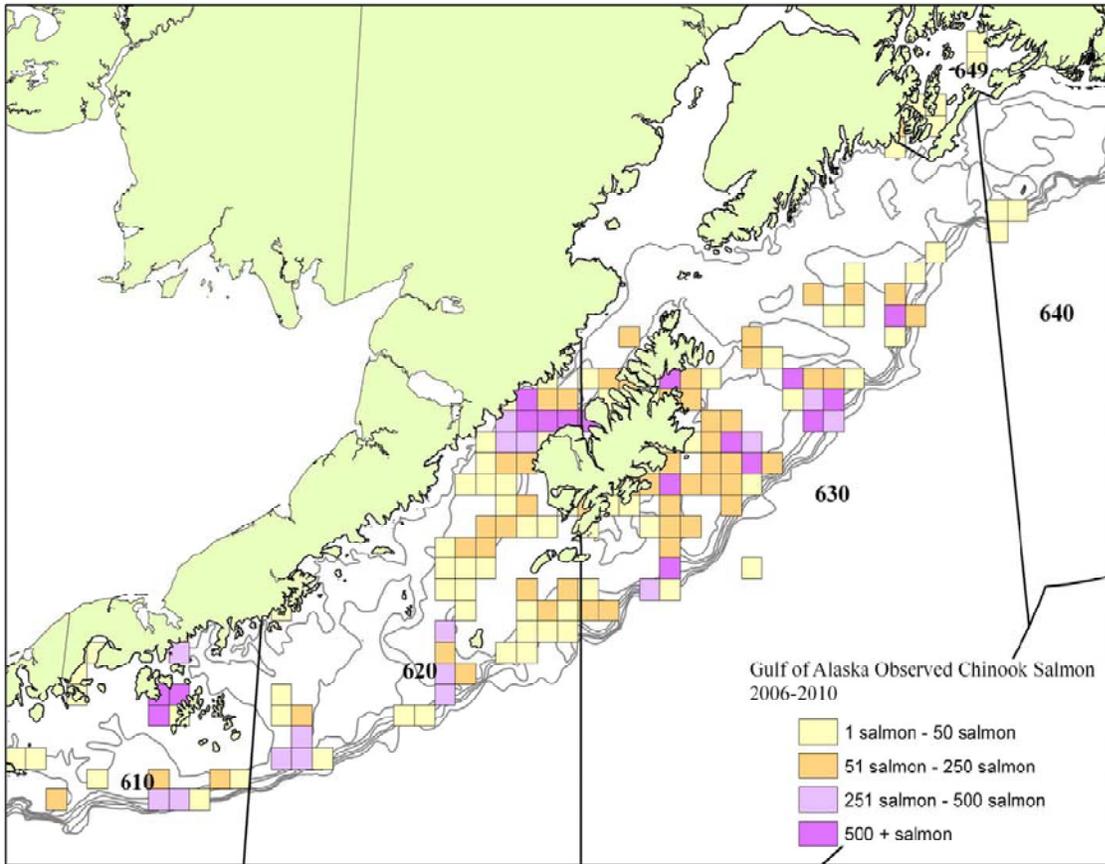


Figure 1. Total number of observed Chinook salmon per 20 km grid in the GOA groundfish fisheries between 2006 and 2010

Source: Observer haul records via NMFS Alaska Region Catch Accounting System, 11/10/2010

Attachment 2. Chinook Salmon Incidental Catch in Gulf of Alaska Groundfish Fisheries

Table 1. Chinook Salmon Incidental Catch in Gulf of Alaska Groundfish Fisheries

	Target	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010*
Trawl Gear	Pollock	9,531	18,413	5,161	4,400	13,152	27,927	15,944	35,040	10,427	2,620	42,206
	Pacific Cod	2,747	2,830	4,066	3,167	908	418	886	24	433	111	461
	Rockfish	445	1,153	1,250	919	885	450	263	2,038	2,280	1,432	1,627
	Flatfish	2,297	2,443	4,392	6,909	2,800	2,853	1,909	2,654	2,822	3,787	7,442
Non-trawl	All	25	0	0	0	32	0	0	39	0	0	0
Total	All	15,045	24,839	14,869	15,396	17,777	31,270	19,004	40,395	15,962	7,951	51,736

*2010 data are preliminary

Source: NMFS Alaska Region Catch Accounting System, 11/8/2010

Table 2. Rate of Chinook Salmon Catch in Gulf of Alaska Trawl Fisheries

Target	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010*	Avg			
Pollock	0.13	0.25	0.10		0.09	0.20	0.33		0.21	0.66	0.21		0.07	0.55	0.25
Pacific Cod	0.11	0.10	0.27		0.20	0.05	0.00		0.08	0.04	0.02		0.01	0.03	0.08
Rockfish	0.02	0.05	0.05		0.04	0.03	0.02		0.01	0.09	0.09		0.06	0.06	0.05
Flatfish	0.06	0.10	0.11		0.15	0.13	0.10		0.05	0.06	0.06		0.07	0.18	0.10

*2010 data are preliminary

Source: NMFS Alaska Region Catch Accounting System, 11/8/2010

Attachment 3. Recovery Estimation Technique

The total estimated contributions of ESA-listed salmon ESUs caught in the Gulf of Alaska and Bering Sea-Aleutian Islands fisheries for each year can be estimated in a two-step process (Nandor et al. 2010). The first step is to calculate a sampling expansion factor (a) for each fishery in each year (Johnson 2004):

$$a = (\text{total catch of each species by fishery by year}) / (\text{sampled catch of each species by fishery by year}).$$

However, a sampling expansion factor can only be calculated from CWTs recovered from *inside* a sample where the number of sampled fish is known. CWT recoveries from *outside* the sample (“select” recoveries where the total number of fish examined is unknown) cannot be used to calculate a sampling expansion factor.

For the sampled catch, the estimated total recoveries of tags for each release group from each ESU by fishery and year are calculated:

$$R_{Ti} = aR_{Oi};$$

R_{Ti} = estimated total recoveries of tags for the i^{th} release group;
 R_{Oi} = observed number of tags for the i^{th} release group;
 a = sampling expansion factor for each fishery in each year.

The second step is to account for the fraction of each release group of interest that was tagged (Johnson 2004):

$$C_T = \sum_{i=1}^n b_i R_{Ti};$$

C_T = the total estimated contribution for a given ESU;
 b_i = a marking expansion factor for the i^{th} release group = (total fish released)/(total fish marked) for the i^{th} release group;
 R_{Ti} = estimated total recoveries of tags for the i^{th} release group.

These are the simplest forms of recovery expansion equations (Nandor et al.2010).

For recoveries in high seas research cruises, because the total catch is usually sampled for tags, the sampling expansion factor (a) typically = 1.

References

Johnson, K.J., 2004, Regional overview of coded wire tagging of anadromous salmon and steelhead in Northwest America: Regional Mark Processing Center, Pacific States Marine Fisheries Commission, Portland, Oregon.

Nandor, G.F., Longwill, J.R., Webb, D.L., 2010. Overview of the coded wire tag program in the Greater Pacific Region of North America, *in* Wolf, K.S. and O'Neal, J.S., eds., PNAMP Special Publication: Tagging, Telemetry and Marking Measures for Monitoring Fish Populations—A compendium of new and recent science for use in informing technique and decision modalities: Pacific Northwest Aquatic Monitoring Partnership Special Publication 2010-002, chap. 2, p. 5–46.

Attachment 4. CWT Recoveries for the Gulf of Alaska Groundfish Fisheries

Table 3. Observed Number and Mark Expansion of ESA-listed CWT salmon by ESU captured in the GOA trawl fishery, pre-listing and post-listing, 1984–2010.

Listing Status	ESU Name	GOA Observed Number	GOA Mark Expansion
Pre-listing	Lower Columbia River Chinook	12	82.1
	Upper Willamette River Chinook	43	143.8
Post-listing	Lower Columbia River Chinook	11	29.7
	Upper Columbia River spring Chinook	1	1.0
	Upper Willamette River Chinook	55	138.1

*2010 data are preliminary

Source: NMFS Alaska Fisheries Science Center Auke Bay Lab, Adrian Celewycz, 11/8/2010

Table 4. Observed Number and Mark Expansion of ESA-listed CWT salmon by ESU by year captured in the GOA trawl fishery, 1984–2010.

A. Lower Columbia River Chinook ESU			GOA Observed Number	GOA Mark Expansion
Listing Status	ESU Name	Run Year	GOA Observed Number	GOA Mark Expansion
Pre-listing	Lower Columbia River Chinook	1984	5	14.1
		1985	1	1.0
		1986	0	0.0
		1987	1	1.3
		1988	0	0.0
		1989	0	0.0
		1990	1	1.0
		1991	0	0.0
		1992	1	1.6
		1993	1	60.3
		1994	2	2.8
		1995	0	0.0
		1996	0	0.0
Post-listing	Lower Columbia River Chinook	1997	0	0.0
		1998	2	18.8
		1999	4	5.9
		2000	2	2.0
		2001	2	2.0
		2002	0	0.0
		2003	0	0.0
		2004	1	1.0
		2005	0	0.0
		2006	0	0.0
		2007	0	0.0
		2008	0	0.0
		2009	0	0.0
		2010*	0	0.0

Table 4 (continued). Observed Number and Mark Expansion of ESA-listed CWT salmon by ESU by year captured in the GOA trawl fishery, 1984-2010.

B. Upper Willamette River Chinook ESU			GOA Observed Number	GOA Mark Expansion
Listing Status	ESU Name	Run Year		
Pre-listing	Upper Willamette River Chinook	1984	11	16.9
		1985	0	0.0
		1986	0	0.0
		1987	0	0.0
		1988	0	0.0
		1989	0	0.0
		1990	4	4.0
		1991	1	13.3
		1992	4	28.5
		1993	14	52.1
		1994	3	8.8
		1995	2	4.9
		1996	1	1.3
Post-listing	Upper Willamette River Chinook	1997	1	7.5
		1998	4	30.7
		1999	20	49.3
		2000	16	16.6
		2001	7	7.1
		2002	1	1.0
		2003	1	5.3
		2004	1	5.8
		2005	0	0.0
		2006	1	1.1
		2007	0	0.0
		2008	1	6.5
		2009	1	1.8
		2010*	1	5.4

C. Upper Columbia River spring Chinook ESU			GOA Observed Number	GOA Mark Expansion
Listing Status	ESU Name	Run Year		
Pre-listing	Upper Columbia River spring Chinook	1984	0	0.0
		1985	0	0.0
		1986	0	0.0
		1987	0	0.0
		1988	0	0.0
		1989	0	0.0
		1990	0	0.0
		1991	0	0.0
		1992	0	0.0
		1993	0	0.0
		1994	0	0.0
		1995	0	0.0
		1996	0	0.0

Table 4 (continued). Observed Number and Mark Expansion of ESA-listed CWT salmon by ESU by year captured in the GOA trawl fishery, 1984-2010.

C. Upper Columbia River spring Chinook ESU			GOA Observed Number	GOA Mark Expansion
Listing Status	ESU Name	Run Year		
Post-listing	Upper Columbia River spring Chinook	1997	0	0.0
		1998	1	1.0
		1999	0	0.0
		2000	0	0.0
		2001	0	0.0
		2002	0	0.0
		2003	0	0.0
		2004	0	0.0
		2005	0	0.0
		2006	0	0.0
		2007	0	0.0
		2008	0	0.0
		2009	0	0.0
		2010*	0	0.0

*2010 data are preliminary

Source: NMFS Alaska Fisheries Science Center Auke Bay Lab, Adrian Celewycz, 11/8/2010