only 1 year info

STATE OF ALASKA

SARAH PALIN, GOVERNOR

P.O. BOX 115526
JUNEAU, AK 99811-5526
PHONE (CF): (907) 465-4210
PHONE (SF): (907) 465-4180

DEPARTMENT OF FISH AND GAME

DIVISION OF COMMERCIAL FISHERIES
DIVISION OF SPORT FISH

May 28, 2008

The Honorable Thomas Wagoner
Alaska State Senate
145 Main Street Loop, Suite 226
Kenai, AK 99611

Dear Senator Wagoner:

This letter is in response to your request for information on total salmon run size in Upper Cook Inlet (UCI), harvest by user group, and Susitna River sockeye salmon. This information is the best available, however in some cases the data is limited and not of the highest accuracy. Also, please recognize that there may be tremendous natural variation in run strength, harvest, and escapement from year to year. In other instances, such as the 2002 tagging study referenced under question 2, information is fairly accurate but projects of such magnitude rarely occur due to a lack of funding. Hopefully the information below will answer your questions.

1) ***Would you please prepare for me tables showing what percentage of these stocks (coho, pink, chum, and Chinook salmon) enter the Northern District streams based on the data collected to date from the tagging studies and other pieces of information that you may have.***

and

2) ***What is the sport fish harvest on these stocks relative to their average run size?***

The text below is cited from the abstract in the report *Willette, M. T, R. DeCino, R. and N. Gove. 2003. Mark recapture population estimates of coho, chum, and pink salmon runs into Upper Cook Inlet, 2002. Alaska Department of Fish and Game, Regional Information Report no. 2A03-20.* Tables 1 and 2 reflect salmon run information provided from this report.

"Total population sizes for each species were estimated from recoveries of passive integrated transponder (PIT) tags in commercial fishery harvests. Recoveries of radio telemetry tags were used to estimate the total escapement of coho salmon into all UCI streams for comparison to the

estimate derived from PIT tags. Radio telemetry tag data were also used to estimate coho salmon escapements into 33 streams and 5 areas around UCI. Our best PIT tag estimate of the total population size of coho salmon returning to UCI was 2.52 million (95% CI: 2.16-2.87 million). Given a commercial harvest of 0.25 million, the total escapement of coho salmon into all UCI streams was 2.27 million (95% CI: 1.91-2.62 million), and the harvest rate in the commercial fishery was about 10%. Our radio tag estimate of the total escapement of coho salmon into all UCI streams was 1.36 million (95% CI: 0.98-1.96 million). Thus, our PIT tagging experiment estimated a population size for coho salmon entering UCI streams that was higher than the estimate obtained from radio tagging. Although, the 95% confidence intervals around the two estimates overlapped slightly, the z-test statistic indicated the two estimates were significantly different. Of the total coho salmon escapement into all UCI streams, 56% (0.76 million) returned to the Susitna and Little Susitna River drainages, 19% (0.26 million) returned to streams along the west side of UCI, 17% (0.24 million) returned to streams along Knik Arm, 5% (0.07 million) returned to streams along Turnagain Arm, and 3% (0.04 million) returned to streams on the Kenai Peninsula. However, these estimates for Turnagain Arm and Kenai Peninsula streams do not include the entire escapement because we stopped tagging before the runs to these areas were complete.

Our PIT tag estimate of the total population size of pink salmon returning to UCI was 21.28 million (95% CI: 1.60-40.96 million). However, this estimate was of questionable value due to its very low precision resulting from problems with tag recovery. Therefore, we estimated a maximum exploitation rate on pink salmon in the commercial fishery by simply summing escapements that were actually enumerated in 3 streams. Given a commercial harvest of 0.45 million, the maximum exploitation rate in the commercial fishery was about 12%. However, the actual exploitation rate must have been much lower, because we did not include escapements into numerous other streams around UCI.

Our PIT tag estimate of the total population size of chum salmon returning to UCI was 3.88 million (95% CI: 3.30-4.47 million). Given a commercial harvest of 0.24 million, the total escapement of chum salmon into all UCI streams was 3.64 million (95% CI: 3.06-4.23 million), and the exploitation rate in the commercial fishery was about 6%."

Table 1. Mark-Recapture population estimates of coho, pink, and chum salmon runs into the Upper Cook Inlet in 2002.

Species	Estimated Run Size	Commercial Harvest	Estimated UCI Sport Fish Harvest	Estimated Escapement	Estimated Commercial Harvest Rate	Estimated Sport Harvest Rate
Coho	2,520,000	246,000	174,000	2,100,000	9.8%	6.9%
Pink	21,300,000	450,000	34,000	20,816,000	2.1%	0.2%
Chum	3,880,000	240,000	5,000	3,635,000	6.2%	0.1%

Never tagged After Aug 10

Coho, chum, Pinks

SWHS

Table 2. Mark-Recapture population estimates of the coho salmon run into the Northern District in 2002.

Species	Estimated Northern District. Run Size [a]	Estimated Commercial Harvest [b]	Estimated Northern District Sport Fish Harvest	Estimated Escapement	Estimated Commercial Harvest Rate	Estimated Northern District Sport Harvest Rate
Coho	997,000	138,000	99,000	760,000	13.8%	9.9%

[a] Run size based upon radio telemetry escapement estimate plus estimated harvests

[b] Northern District harvest estimated using escapement distribution determined by radio tagged coho salmon.

Table 3 represents the average Northern District king salmon run size for the years 1981 to 2003. Assumptions concerning these escapement estimates are described in the report: *Delaney, K. and D, Vincent-Lang. Unpublished. Current status and recommendations for the future management of the Chinook salmon stocks of Northern Cook Inlet. A report to the Alaska Board of Fisheries, Anchorage, Alaska, November 1992.*

Table 3. Average Northern District king salmon run size and harvest estimates from 1981-2003.

Estimated Northern Dist. Run Size	Estimated Commercial Harvest	Estimated Northern Dist. Sport Fish Harvest	Tyonek Subsistence Harvest	Estimated Escapement
134,000	4,700	28,000	1,300	100,000
Harvest Rates	3.5%	20.9%	1.0%	

3) How many sockeye salmon does ADF&G actually want to have spawned in the Yentna River drainage and the Northern District total? Prior to the 2008 Board of Fisheries meetings ADF&G testified that the Yentna escapements were about 25% of the total Northern District escapements and the number of spawners desired was 90,000 to 160,000 actual fish spawning.

The current sustainable escapement goal for the Yentna River sockeye salmon is 90,000 to 160,000 fish. There is an optimal escapement goal of 75,000 to 180,000 when sockeye salmon runs into the Kenai River exceed 4 million. These escapement goals were presented to the Board of Fisheries, and even given the current information, will be the goals for the 2008 season.

Evaluation of the current goal is further discussed in the answer to question 4. The sustainable escapement goal will be re-evaluated following the 2008 field season.

4) ***How does ADF&G plan to count the number of fish to meet the goal established in question 3? If you use a counting method that is an index of escapement, please provide the factual data to establish that relationship. For example, sonar counts to weir counts. Is that relationship significant?***

ADF&G will be using the Bendix Sonar to estimate the fish passage into the Yentna River for 2008. However, ADF&G will continue research concerning the various methods of estimating escapement in 2008. This will include mark–recapture and radio telemetry studies. Such abundance estimates will allow: (1) estimation of the total annual run of Susitna River sockeye salmon when abundance estimates and genetics-based harvest allocation estimates are combined, (2) evaluation of the accuracy of the Yentna River sonar estimate, and (3) the proportion of Yentna River sockeye salmon in the entire Susitna River sockeye salmon escapement. Additionally, ADF&G is evaluating the current sockeye salmon escapement assessment tool, a Bendix single beam sonar system, with a more advanced and proven hydroacoustic system known as DIDSON (**D**ual frequency **ID**entification **SON**ar). Preliminary spawning abundance estimates based on mark–recapture and DIDSON studies suggest that traditional Bendix estimates are much lower than the actual escapements. As shown in the table below, the high variability that we have observed between the various methods has added considerably greater uncertainty to our previous assessments.

Tables 4 and 5 below provide information that was presented at the 2008 BOF meeting (Yanusz and Willette oral report, RC 4 Tab 7). A detailed written report on the 2006 results is published (Yanusz, R., R. Merizon, D. Evans, M. Willette, T. Spencer, and S. Raborn. 2007. Inriver abundance and distribution of spawning Susitna River sockeye salmon Oncorhynchus nerka, 2006. Alaska Department of Fish and Game, Fishery Data Series No. 07-83, Anchorage; http://www.sf.adfg.state.ak.us/FedAidPDFs/fds07-83.pdf) and a draft report describing 2007 results is in preparation.

Table 4. Estimates of sockeye salmon escapement in the Susitna River drainage, 2006.

2006			
System Mark–Recapture	Weirs [a]	Bendix	DIDSON
Yentna Unknown [a]	126,000	93,000	160,000
Susitna 107,000 (95% CI 49,000 - 165,000)	60,000		
Sum	186,000		

[a] Because of difficulties with the project, a PIT tag estimate of escapement to the Yentna River for the period July 29, 2006 through August 18, 2006 (418,000 with 95% CI of 262,000 to 574,000) was not deemed accurate enough to present to the BOF.

Table 5. Estimates of sockeye salmon escapement in the Susitna River drainage, 2007.

2007 [b] System Mark–Recapture	Weirs	Bendix	DIDSON
Yentna 247,000	97,000	80,000	130,000
Susitna 85,000	60,000		
Sum	157,000		

[a] Weirs monitored escapement at a few select lakes and do not represent total river escapement.

[b] The 2007 estimates are preliminary.

ADF&G recognizes the need to re-evaluate the Yentna River sockeye salmon escapement goal in light of the new information available. This goal was originally developed in 1979 based on our understanding of sockeye salmon production in the Susitna drainage at that time and assumptions about the likely spawner-recruit relationship. During the 1980s the goal was changed to a Yentna River goal based on the distribution of spawners between the mainstem Susitna River and the Yentna River at that time. In the early 2000s, the goal was again amended to its current range by applying a percentile algorithm to the historical Yentna River Bendix sonar counts. A reassessment of the goal must take into account not only the changes in estimates of abundance, but also problems with species apportionment, the apparent change in distribution of fish between the mainstem Susitna and the Yentna, and a reassessment of the spawner recruit relationship. This will require a complex analysis that will take time to complete.

ADF&G is currently devising a timeline for when the critical pieces of information necessary for this re-evaluation of the Yentna River sockeye salmon escapement goal will be available. Essential information for this re-evaluation includes information from weirs, Bendix sonar, DIDSON, radio telemetry, limnology, mark-recapture, and genetic catch composition data through 2008. With these relevant sources of information in hand, ADF&G will meet to update and evaluate various alternative Yentna River sockeye salmon escapement goals.

Sincerely,

John Hilsinger
Director, Division of Commercial Fisheries

and

Charlie Swanton
Director, Division of Sport Fish