

**General responses to Alaska Department of Fish and Game, 2005
Yukon River Chinook Salmon *Ichthyophonus* Update presented to the
Yukon River Panel on December 7-8 2005**

**Responses written by Dr. Richard Kocan on January 28, 2006 for
YR DFA Board**

General: Much of the data is labeled as: “preliminary results”. Does this mean that the data is expected to change in the future, or that some of the data hasn’t been analyzed yet; and if so, when will it be analyzed?

Objectives (pgs 3 & 4). How can an estimate of pre-spawn mortality in the Chena/Salcha be made when the data from 2004 showed more infected fish in the Chena than in the Tanana, and in 2005 no Tanana River data was collected? What “environmental factors” were studied and what are the “correlations”? Was there any Ich found in juvenile salmon? What about chum and coho adults? What was the “historic presence” of Ich, and how was it determined?

Pg. 6: The map shows sample sites at both the lower and upper Chena/Salcha Rivers. Were the lower river samples combined with upper river samples in the final spawning success and infection prevalence calculations?

Pg. 7: The chart shows that “Culture Heart” (Tanana) and “PCR Muscle” (Tanana Radio) both produce the same infection prevalence. If this is correct, why is it concluded that PCR is unreliable? (pg. 18. Preliminary (?) Conclusions). Also, the infection prevalence at Emmo for 2004 derived from PCR samples is 24%, while in 2005 it is 22% but obtained from heart culture (pg 13). Since there is no prevalence difference between these two sample years, why would PCR be considered “not reliable”? Was PCR and culture done on the same fish in the same year for comparison of “reliability”? This chart shows that 109 fish from the radio tagging study in 2004 were sampled for Ich. On Pg 9 the summary of recovered radio tags was Chena (6), Salcha (10) and “other tributaries” 24. Assuming that “other tributaries” refers to Tanana tributaries, then only 40 of 109 tagged fish were recovered. What happened to the other 63% of the radio tagged Tanana fish?

Pg. 7: Explain how the 2004 prevalence of Chena fish could be significantly higher than both Emmonak fish ($P < 0.03$) and Tanana River fish ($P < 0.0001$)? If this were correct it would mean that Chena River fish were becoming infected after entering the Tanana, but that Salcha River fish were not. (This question goes directly to the validity of the data).

Pg. 10: The pie chart shows 10% of the radio tags were unaccounted for and 5% moved “downstream”. Could this 15% be interpreted as fish dying before reaching their spawning streams? Do migrating salmon normally turn around in midstream and head back to the sea?

Pg. 12: What was the scientific basis for selecting “gill color” as a sampling criterion? How does it relate to *Ichthyophonus* survival in dead fish? What was the gill color in fish classified as “criteria #2 (e.g. firm heart)? Is color change different if the fish is submerged vs. beached?

Pg 14 & 15: These charts show that in 2005 significantly fewer infected fish spawned in both the Chena ($P < 0.004$) and Salcha ($P < 0.008$) rivers when compared with the number of infected fish sampled at Emmonak (calculated from “criteria #1 data). How does this relate to the conclusion on pg. 18 that infected fish successfully spawn? It would be more accurate to say that “SOME” infected fish successfully spawn. In this case ~ 12-15 % of infected fish did NOT spawn.

Pg. 16: This chart shows that 40% of Chena and 50% of Salcha River females (infected and uninfected) successfully spawned. By logical extension, 60% of Chena and 50% of Salcha females DID NOT successfully spawn. Why did so many fish fail to spawn successfully?

Pgs 18 & 19: If 50% of the infected fish entering the Yukon at Emmonak fail to appear in either the Chena or Salcha (pg 13 chart), how can it be concluded that “...infected fish are successfully spawning”, and “...mortality does not affect escapement goals”?

Pg. 19: Shouldn't conclusion # 1 read: “The % of infected fish that successfully spawn is significantly less than the total number of infected fish entering the Yukon River”?

2005 Yukon River Chinook Salmon *Ichthyophonus* Update can be read or downloaded at:

<http://www.rapidsresearch.com/resources/ICH+ADFG+Panel+2006.pdf>