



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
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PORTLAND, OREGON 97232-1274

August 25, 2011

Paula J. Wilson  
Hearing Coordinator  
Department of Environmental Quality  
1410 N. Hilton  
Boise, ID 83706-1255

Re: Docket no. 58-0102-1102 - Notice of Rulemaking – Site-specific water temperature criteria for the Hells Canyon reach of the Snake River

By notice, issued August 3, 2011 the Idaho Department of Environmental Quality (IDEQ) requested that interested parties provide information relevant to the site-specific water temperature criteria change being proposed by Idaho Power Company. National Marine Fisheries Service (NMFS) provides the following biological information relevant to Snake River fall Chinook salmon to help inform the Idaho Department of Environmental Quality decision whether to adopt a site-specific standard for water temperature in the Snake River downstream from Hells Canyon Dam. NMFS' interest in this proceeding stems from our responsibility to protect and recover anadromous fish species listed under the Endangered Species Act (ESA). The Snake River downstream from Hells Canyon Dam supports the primary population of Snake River fall Chinook. NMFS does not believe that the proposed rule would negatively affect fall Chinook or their habitat for the following reasons:

- There is no direct evidence that the current water temperature regime, which does not meet the current IDEQ water temperature criteria, has negatively affected Snake River fall Chinook salmon. Since 2000 the population has grown substantially under the existing thermal regime.
- A comparison of current Hells Canyon and Hanford Reach spawning timing and temperatures indicates there is little difference between the reaches with regards to thermal conditions when fall Chinook are spawning. The Hanford Reach also supports a robust population of fall Chinook.

We elaborate on these comments in greater detail in the attached document.



NMFS respectfully encourages IDEQ to adopt the proposed regulation in Docket 58-0102-1102.

Sincerely,

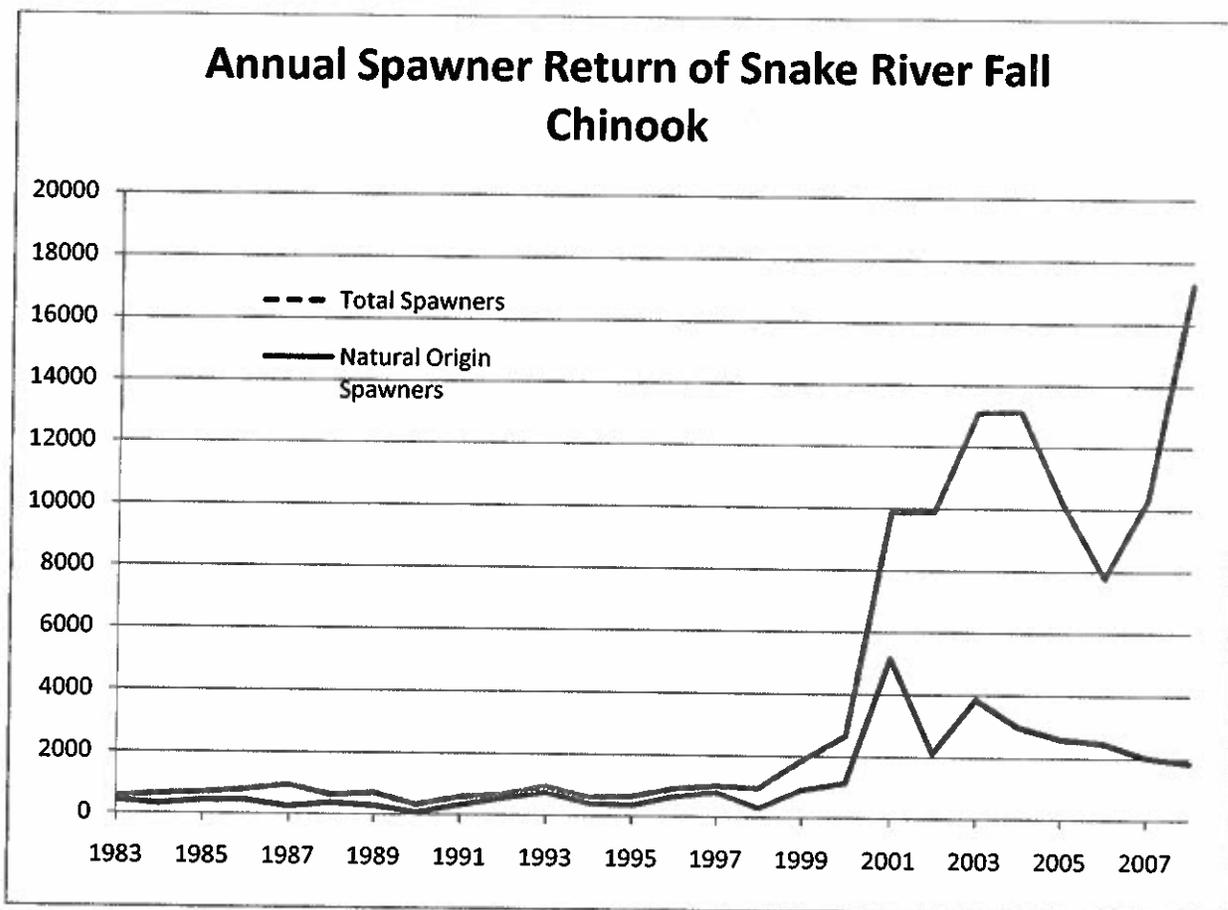
A handwritten signature in blue ink, appearing to read "Bruce K. Suzumoto". The signature is fluid and cursive, with a large, sweeping final stroke.

**Bruce Suzumoto**  
**Assistant Regional Administrator**  
**Hydropower Division**

**Comments of the National Marine Fisheries Service  
in Support of  
Site Specific Water Temperature Criteria for the Snake River  
Downstream from Hells Canyon Dam**

**Status of the Hells Canyon population of Snake River fall Chinook (SRFC)**

Since the mid 1990s the total run of SRFC has been increasing and most are spawning in the Hells Canyon reach of the Snake River.



Adult returns have increased substantially under the current thermal regime since 2000. NMFS believes this is evidence that the current thermal regime in the Hells Canyon reach is not limiting the productivity or abundance of the population. If the water temperature regime downstream from Hells Canyon were negatively affecting salmon reproduction in any substantial way, then this increase would not be expected.

We note the number of naturally produced spawners reached a high in 2001 and has declined slightly since. If water temperature conditions are not responsible for this decline, what is?

One potential limitation on the growth of natural origin spawners is intraspecific competition or density dependence. That is, the total number of juvenile fall Chinook in the natal habitat, including both naturally-produced fish and hatchery-origin fish, may be so high that juvenile survival is declining due to competition for food, space, and cover. Although there is no direct measure of juvenile survival in the Hells Canyon reach of the Snake River, there is evidence that juvenile growth is declining. Connor and Tiffan (2010) found that juvenile growth rates have declined as much as 0.6 to 0.7 mm per day since hatchery supplementation in natal areas was dramatically increased in the late 1990s (this is a substantial reduction as historical growth was about 1.0 to 1.5 mm per day). While this reduction in growth rates is not direct evidence of density-dependent reduction in SRFC juvenile survival, they are indicative of such a mechanism. In any event, the total SRFC population has been increasing since 2000 and the majority of this population rears in the Hells Canyon reach of the Snake River. As documented in Idaho Power Company's petition, the water temperatures downstream from Hells Canyon Dam generally exceed the current 13°C criterion early in the spawning season.

NMFS believes that the SRFC population is improving due to enhancements since the mid-1990s in juvenile passage survival at downstream hydroelectric projects, including water temperature improvement during the juvenile outmigration (Dworshak Dam is operated to avoid water temperatures in excess of 20 °C at the downstream Lower Granite Dam project during July and August), generally improving ocean conditions, improved Hells Canyon operations to protect incubating eggs and fry, and hatchery supplementation.

**Under what water temperature conditions does the Hells Canyon population of SRFC currently spawn?**

Based on weekly spawning surveys conducted from 2000 through 2009, the majority of SRFC in the Hells Canyon reach spawn from around October 22 through November 20 at water temperatures ranging from about 16°C to 12 °C. About half of total spawning has taken place at water temperatures in excess of 13 °C (Figure 1).

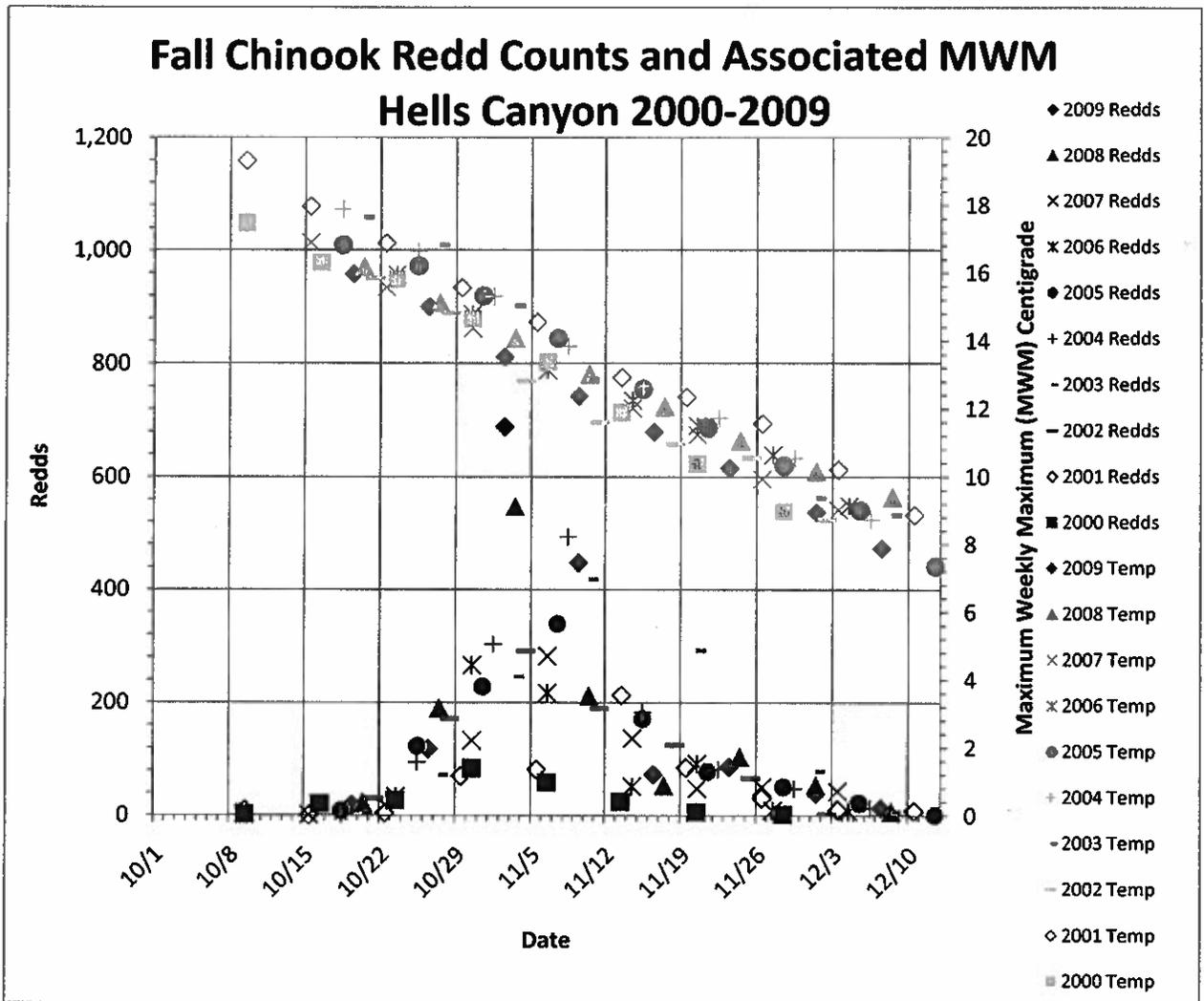


Figure 1. Weekly maximum water temperatures ( $^{\circ}\text{C}$ ) downstream from Hells Canyon Dam and Snake River fall Chinook spawning surveys from 2000 through 2009, October 1 through December 15.

### How does the Hells Canyon population of SRFC compare to the middle Columbia River fall Chinook population?

Fall Chinook that spawn in the Hanford reach of the Columbia River have one of the strongest populations in the region and are not listed under the Endangered Species Act. Although SRFC and middle Columbia River fall Chinook are separate Evolutionarily Significant Units (ESUs), they are very similar genetically and display similar habitat needs. Similar to the Hells Canyon reach of the Snake River, upstream dams cause thermal inertia and the water temperature regime in this stream reach displays higher than natural water temperatures during fall Chinook immigration and spawning. Under what conditions do middle Columbia fall Chinook spawn (Figure 2)?

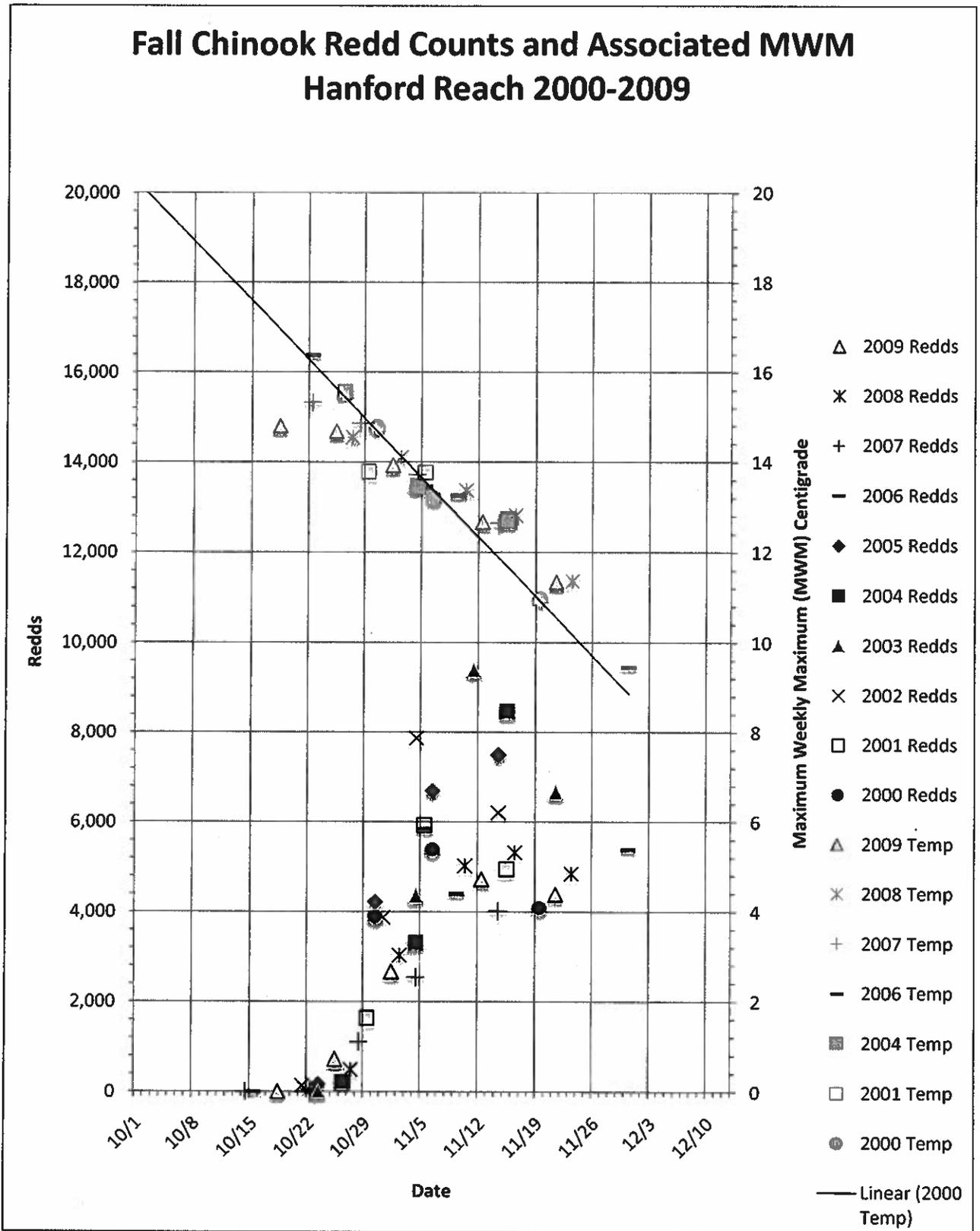


Figure 2. Columbia River weekly maximum water temperatures ( $^{\circ}\text{C}$ ) downstream from Priest Rapids Dam and fall Chinook spawning surveys from 2000 through 2009, October 1 through December 15.

It is notable that the majority of fall Chinook spawning in the Hanford reach took place at water temperatures in excess 13 °C (Figure 2). Given that the Hanford reach population of fall Chinook supports a substantial fishery and remains healthy with only limited hatchery supplementation, it is unlikely that the dam-modified water temperature regime is limiting the population. The fact that these fish are successfully spawning at water temperatures in excess of 13 °C suggests that the species, which is closely related to Snake River fall Chinook, is being fully supported by the existing temperature conditions. If water temperatures above 13 °C were substantially impacting successful reproduction, one would expect that the population would either be declining, or adult spawners would delay spawning until suitable temperatures were achieved. Neither population declines nor spawning delays have been observed.

#### **Adoption of site-specific criteria is appropriate**

The 13 °C criterion adopted by IDEQ and supported by NMFS to protect spawning and incubating salmon was developed to protect all populations of salmon exposed to thermal effects for which specific information was not available. This is not the case with SRFC inhabiting Hells Canyon. They have been intensively studied and available information shows that the population is growing and generally spawns at temperatures in excess of 13 °C.

It is known that Chinook that enter freshwater in the summer and fall tolerate and spawn in warmer water than do fish that enter freshwater in the spring (comparing Chambers, 1956 (spring Chinook) to Seymour , 1956 (fall Chinook) *in* Ralieggh, et al., 1986). It is also known that fall Chinook eggs do not survive at water temperatures in excess of 16 °C (*ibid*); which is about the temperature at which spawning for both Snake River and Hanford Reach fall Chinook is first observed. Habitat needs and tolerances vary between species and populations. Available information shows that fall Chinook demonstrate a tolerance for water temperatures higher than 13° C. Given this new information, it is appropriate to adopt site specific criteria for the Hells Canyon reach of the Snake River that are fully protective of SRFC. The proposed rule meets this objective.

#### **References:**

- Raleigh, R. F., W.U. Miller, and P.C. Nelson. 1986. Habitat suitability index models and instream flow suitability curves: Chinook salmon. U.S. Fish and Wildlife Service Biological Report 82(10.122). 64pp.
- Connor W.P. and K.F. Tiffan. 2010. Research, monitoring, and evaluation of emerging issues and measures to recover Snake River fall Chinook salmon ESU – Annual Report 2008. Chapter 2.