MAY 1 5 2000

Chatman, Cheryl A NWW

From: Pat Larson [thermochick@oregontrail.net]
Sent: Friday, March 31, 2000 4:03 PM
To: USAC WallaWalla; John Hays; Glen Stonebrink; Bob Skinner; Sharon Livingston
Subject: Oregon Cattlemen Comments, USAC Snake River Feasibility Study

Walla Walla District, Corps of Engineers
Attn: Lower Snake River Study
201 North Third Avenue
Walla Walla, Washington 99362-1876
salmonstudy@usace.army.mil

COMMENTS FOR Snake River Feasibility Study
FAVOR ALTERNATIVE 1 AND/OR 2
OPPOSE ALTERNATIVE 4

March 31, 2000

Below are comments for the Public Hearing process.

Submitted: March, 31,2000
On behalf of Oregon Cattlemen¹s Association
³The Voice of the Cattle Industry in Oregon²

John Hays, President
3415 Commercial SE Suite E
Salem, OR 97302

Glen Stonebrink, Executive Vice President
Bob Skinner, President elect
Sharon Livingston, Endangered Speicies Committee Chair

Patricia A. Larson & Susie Hammond
Chair, OCA Water Committee

Prepared by Patricia Larson, Science and Natural Resource Advisor
61931 Cottonwood Rd.
La Grande, OR 97850

To the Army Corp of Engineers regarding the Snake River Salmon Feasibility Study:

***Oregon Cattlemen¹s Association has adopted by resolution the following definition of science. This definition originated at the American Physical Society (APS News Online, January 2000 Edition) Panel on Public Affairs (POPA),out of concern about the growing influence of pseudoscientific claims. The succinct statement was adapted from E.O. Wilson's book Consilience, and was shared with the APS membership via APS News, and also with other scientific societies, in hopes that it would initiate a dialogue within the scientific community about the best way of dealing with the problem. The text of the statement follows.

DEFINITION OF SCIENCE
Science is the systematic enterprise of gathering knowledge about the universe and organizing and condensing that knowledge into testable laws and theories. The success and credibility of science are anchored in the willingness of scientists to:

1. Expose their ideas and results to independent testing and replication by other scientists. This requires the complete and open exchange of data, procedures and materials.
2. Abandon or modify accepted conclusions when confronted with more complete or reliable or observational evidence.

Adherence to these principles provides a mechanism for self-correction that is the foundation of the credibility of science.

Fish Survival

The survival of fish in the system are excellent. To suggest that there are endangered populations, one would expect to see survival below 50%.

The study reports:
What is understood less is the indirect or delayed mortality of juvenile fish that may occur after they have passed Bonneville Dam. That mortality may have been caused by passing in-river through the hydrosystem, the series of eight dams and reservoirs from Lower Granite Dam to Bonneville Dam or from transportation of fish.

The answer to these questions should be investigated. A two or three year study on this Œless understood² survival question must be answered through data collection and analysis as described above. Without answers to this question, the impact of upland restoration as well as predator controls cannot be fully understood. Alternative 1 should be addressed with this specific project. After this question is answered other alternatives may be available. This would be a conservative and cautious approach in order to mitigate the impacts of the results of Alternatives 3 or 4 which are completely untested and unknown.

The study reports:
The Corps, as part of its ongoing development plans and in response to changes in agency requirements, plans to improve technology at the dams to promote fish passage. The Corps¹ current plan calls for turbine improvements, structural modifications to fish facilities at Lower Granite Dam, new fish barges, adult fish attraction modifications, a new trash boom at Little Goose Dam, modifications to fish separators, added cylindrical dewatering screens, and more or improved spillway flow deflectors.

1. This Alternative is the baseline, and is a progressive choice. Considering the numerous programs focused on Salmonid restoration in each of the states as well as throughout the states, it is difficult to consider adding any other major change to any of the systems until enough time has passed to allow for analysis of the projects that are on-going. Without careful consideration of the outcome of the projects in the uplands as well as the issues of predator controls, it is likely that making any major changes to the current direction of the Corps we are likely to experience chaos. It is unknown if any one action can affect the Salmonid populations and it is equally unknown if any one action can cause further decline. Oregon Cattlemen favor a cautious approach that is well thought out, logical, economically feasible, and does not favor the Salmonid species over and above all else including the human species and the quality of life in the region.

2. The use of the Behavior Structures is excellent as well as the improvement of turbine and reduction of dissolved gases. Oregon Cattlemen consider the costs for implementing these actions currently and continued improvements of this kind to be favorable.

3. Apparently the the survival of the fish species depends entirely on increasing the survival past the 4 dams in the study somewhere between 1 and 10% in most cases. We find it difficult to comprehend the idea that the Salmonid species is near extinction due to the operation of the 4 dams in the study. We fell rather than causing those reaches of the river to become sites that will require decades of work to recover to a ³natural² condition (they will never meet the conditions of pre-European settlement) the region and Corp should continue to work in a cooperative manner to operate the facilities while documenting some of the research and science investigations that we describe in Part II.

4. Oregon Cattlemen favor the following Action and Effects that describe Alternative 1 and/or Alternative 2.

ACTION
No reservoir drawdowns
Maximization of juvenile fish transport with current systems
Optimized voluntary spill

EFFECTS
Slight reduction in extinction risks for listed stocks (CRI)
Continued hydropower generation
Continued navigational activity
Continued irrigation and water supply
No major economic impacts

Oregon Cattlemen favor having a progressive approach to the Salmonid issues with benefits to society as well as all wildlife in the region. We are actively pursuing the issues that surround the agriculture communities and supporting research investigations that meet the criteria as described above in our introduction. We encourage the Corps to define science, use the standard science methodologies to further study where and how improvements can be made and need to be made to increase Salmonid populations 1-10% above the 80 and 90 % survival already measured on those river reaches.

PATH and CRI General NMFS Conclusions:

1. These models are not science studies. The assumptions used to formulate the hypothesis were flawed. Oregon Cattlemen do not favor the use of a model as a substitute for experimental data. The models cannot be verified and

therefore have little use as far as making a decision as grave as breaching dams.

MAY 15 2000

2. We suggest that the hypothesis be field tested after careful consideration of what needs to measured and how to quantify the aspects of a study. NMFS only addresses numbers of fish and fish physiology in their ³vast² available scientific studies. We know this is short sighted and a narrow view of the Salmonid issue. We offer the following suggestion for further investigations while using Alternative 1 and/or Alternative 2.

a. Establish a definition of science.
b. Adhere to the standard methodologies for scientific investigations.
c. Do not use science journal publications that do not establish data collections, analysis of data, and firm conclusions that only state what the data established. To incorporate publications into a study that lack data, analysis and good conclusions from the data, creates an impression of science but does not establish any facts. Publications without experimental data are usually speculative in nature and filled with opinions that sound good, but do not keep the studies on track.
d. Continue studying Salmonid physiology.
e. ALSO STUDY THE WATER, and do not study the water in relation to how fish survive. Just study the water and establish the facts about the heating and cooling cycles of the water. From Appendix C, we make the following suggestions:

3.2.4.1 Water Temperature and
C3-19
The Study reports:

However, peak water temperatures also appear to be influenced by other factors including ambient air temperatures, solar radiation, and percentage of total discharge contributed from Dworshak Reservoir. The influence of air temperature on peak water temperature is notable for 1995, when water temperatures reached a peak value that was lower than those observed in both 1994 (when relatively large releases from Dworshak Reservoir were initiated) and 1997 (a high flow rate year). This lower peak temperature observed in 1995 is likely attributable to the cooler-than-normal mean monthly air temperatures observed between June and late September (see Figure 3-5).

Flow rates also seem to affect the duration of elevated water temperatures. The slower flow rates and increased surface area of water within the impoundments can cause surface waters to reach higher maximum temperatures and then cool down more slowly in the fall (BPA, 1995). In reviewing the data, 1977 and 1994 clearly stand out as having two to three months with surface
temperatures above 20ƒC (68ƒF), as compared to less than two months observed in other years. In addition, it took at least a week longer in 1994 for the water temperatures at SNR-108 to drop back
1 below 20ƒC (68ƒF). This longer period of elevated temperatures or the delay in cooling would be expected to adversely affect fish migration patterns.

COMMENTS: This observation should be the subject of a research project. We offer the following citations:

Publications on this topic:

Larson, L. and S.L. Larson. 1996. Riparian shade and stream temperature: a perspective. Rangelands 18:149-152.

Larson, L. and P.A. Larson. 1997. The natural heating and cooling of water. Rangelands 19:6-8.

Natural Heating and Cooling of Water Summary

From a global perspective the Earth's atmosphere gains energy from the ocean and land masses. Differential heating of these surfaces by the Sun creates pressure systems, climatic patterns, and ocean currents that circulate over the globe redistributing energy and water. As a result, the rise of average surface-air temperatures typically lag 4-8 weeks behind the period of maximum solar radiation (summer solstice), shifting the period of maximum summer heating from June into July and August (Trewartha, 1968).

On a watershed scale, both air and soil serve as large thermal reservoirs that are directly influenced by these global patterns of heating and cooling. These reservoirs are large in comparison to flowing streams.

Air temperature can be used as an indicator of the thermal environment that naturally surrounds the layer of water. If the difference between the air temperature and the water temperature is large we can expect the rate of water heating to be more rapid than when the difference is small. Throughout the day, water increases at a rate that is influenced by the increase in air temperature. This phenomenon occurs on all streams at all elevations. The size of the difference between air temperature and water temperature (the gradient) determines how fast water will heat and cool.

The daily temperature range of a stream is influenced by the environment through which it flows. As water travels down in elevation it travels through areas of warming temperatures. This is commonly described as the adiabatic rate of heating. Adiabatic cooling refers to the rate of air mass cooling associated with increasing elevation. This rate of air temperature change typically ranges between 3.5 °F and 5.5 °F per 1000 feet of elevation (Satterlund and Adams, 1992).

Adiabatic processes of heating and cooling are influenced by atmospheric pressure and the amount of water vapor in the air mass. The condensation that may occur in an air mass as adiabatic cooling occurs can cause some warming. The effect on humid air being pushed up over a mountain peak is an average cooling of 3.2° F per 1000 feet. As the air begins to descend it warms and the condensation stops. Warming of this air then resumes the normal rate of 5.5° F for each 1000 feet of elevation loss.

When all these processes are combined (elevation, adiabatic rates of heating and cooling, and the difference between air temperature and water temperature) the framework of the thermal environment in which a stream is flowing is described. However, as recognized in the principles of thermodynamics modification of one or more of the thermal sources will result in a different rate of heating or cooling. These results bring us to 7 observations:

1. Climates produce weather systems that determine the patterns of heating and cooling within a watershed environment.

2. Water temperatures are influenced by the thermal reservoir that surrounds the water body. Air temperature can be used as an index of that thermal environment. Air and stream temperatures, at a minimum, must be monitored at each data collection site to establish the relationship between the stream and its environment. A minimum of two sites should be selected to describe the effects of the thermal environment on the moving water over time.

3. A portion of the water temperature increase can be accounted for using the adiabatic processes. The lower elevations not only have warmer water, but they have warmer air temperatures on a daily basis. The adiabatic influence can be determined by monitoring stream temperature at different elevations at dawn. Watershed temperatures will increase through the summer, but a 3.2°F to 5.5°F difference for each 1000 feet of elevation change is maintained.

4. The difference between the air temperature and the water temperature determines the rate at which the water will warm or cool.

1 cont.

5. The smaller the differences are between air and water temperature the longer it will take for the water to heat or cool. By volume water stores energy better than air or soil (it has a high specific heat). It takes more energy to heat 1 unit volume of water than it does to heat the same volume of air or soil.

6. The velocity of a stream must be determined to understand the entire process of how a stream heats and cools. For example, in early spring a river can flow fast enough to travel 12 miles in 4 hours. In late summer its flow might only travel that same 12 miles every 12 hours. Velocity determines how long a body of water is influenced by a particular air temperature. Downstream air temperatures are warmer than upstream because of lower elevations. Velocity must be monitored during each sample period, between each monitoring site to establish how long the water is exposed to a thermal environment.

7. Two measurements are required to determine the thermal evolution of a stream: 1) the velocity and, 2) the gradient between air and water temperature. The velocity determines how long the water is exposed to a particular air mass (at a specific temperature). The gradient determines the rate at which heat energy is transferred between the air and water.

COMMENTS CONTINUED:

Larson, L. and P.A. Larson. 2000. Topographic Classification of stream temperature patterns. SRM. 53rd Annual Meeting.

Conclusions:

Water temperature is expected to change and increase during a day, because temperature is governed by the thermal gradients that are established between the air mass and body of water.

Determination of the temperature rate of change during a day for air and water, provides a description of the natural heating and cooling cycles expected in a watershed.

Once the natural heating and cooling are described, the influence of other factors can then be determined.

Application of thermodynamic principles to temperature sampling data will enable land managers to identify natural environmental limitations and the feasibility of water quality improvements.

Establishing the thermal patterns relevant to specific watershed locations gives a more realistic picture of the influence of anthropogenic activities on stream temperatures.

Figure 3-15 through the discussions below: we can see that the Corps has considered the water temperature issues, but perhaps have not been able to determine how to approach the entire water issue. You wrote:

2 Experimental Transportation from McNary Dam after 1998: The NMFS has determined that the moratorium on spring collection and transportation from McNary Dam, adopted during 1995, should be continued and that the spill levels described in Table III-2 should be provided at this project. The NMFS has further determined that future research is

needed on transport from McNary Dam, specifically on the response of Upper Columbia steelhead to transportation. Development and implementation of such research were considered for 1998, but were determined to be infeasible. The Action Agencies propose to work with the federal, state, and tribal salmon managers to jointly develop a transportation evaluation study plan by the end of 1998 so that approved research can begin in 1999. By 1999, or at such time as a research plan is approved through the Regional Forum process, spring transport from McNary may occur for research purposes. Experimental transportation from McNary Dam, beginning in 1999, would
2 constitute a modification of 1995 RPA Measure 4.

Comment:
ont This approach is logical and considering the unknowns of dam breaching which could be devastating with complete chaos, or brilliant and an excellent idea, Oregon Cattlemen believe the research and study proposed should be continued. As in all science, investigations cannot come to conclusions with short term case studies. Solid research investigations must be repeated through time and place. We do not favor Alternative 4 at this time. If Alternative 4 were to become an options the region would need to know much much more than it does now about water, about fish, and then about how the fish survive in the water. It is unlikely that science will be unable to determine that the water and fish have an interaction, but we will never discover that interaction without further study. It is not known at this time.

The study states:
Once any existing problem has been identified and corrected, the goal of the interim program will be to transport a proportion of Upper Columbia River steelhead from McNary Dam. At that time, further adjustments to the collection of fish at Snake River projects may be considered through
the Regional Forum process and, as appropriate, formally modified through consultation (i.e., the 1995 RPA Measure 26 Framework or some similar process) to avoid placing too high a proportion of Snake River fish into the transportation program.

Comment:
Solid research investigations repeated through time and place will identify the problems of transportation. Also, investigate the water in the river without a model. Instead use scientific methodologies to address the physical water attributes in stream. This has not been done. USAC and NMFS as well as other agencies have only considered the requirements of the fish. The body of work may be sufficient to make statements of Salmonid responses to different
3 conditions. However, there is not an equal amount of literature available that describes the water in stream. It is being assumed that if Salmonid are weakened in any way due to water conditions then those conditions must be controlled. This requires a leap of faith simply because there is no supporting data that concludes that the water temperature can be controlled, nor DO, pH, nor are there answers yet about what causes runs to vary in their time of arrival at the mouth of the Columbia and ultimately other drainages. It appears some years they arrive late having held up at one site or another due to weather conditions. Do we know the conditions that delay runs or cause runs to occur early?

At this time we lack fundamental studies to help us determine Salmonid survival within the Columbia and Snake River systems because we know nothing about the years spent in the ocean habitat. Are there predator populations that have increased, thus causing a ³natural² decline in Salmonid populations while they live in the ocean habitat? What literature is available that reports where the fish live during the absence from the natal streams and what the survival rates are in the ocean habitat? There are other predator concerns other than Sea Lions and terns to be considered. What are the temperature tolerances of the Salmonid in the ocean habitat and at what depth do they live? What do they eat while in the salt water habitats, how do they adjust their diets as they move from the salt water to fresh water? How long must they remain at the mouth of rivers spilling fresh water before they can enter it due to the sudden change in salinity? Do Salmonids always return to the stream to spawn that they were hatched in? How often do they move to another stream? What percent of a returning population are ³strays²?

What affect does the climate have on the dam waters? What affect does climate have on the fish while in the ocean and what is that affect when they are inland?

In conclusion, Oregon Cattlemen do not support in any way Alternative 4. We do support Alternative 1 and/or 2. These are intelligent, conservative, and economically feasible for the present time. We must stay focused on the existing plans and projects, give them time to improve the uplands, make continued progress in the dam operations, and allow people and economics to direct us for future decisions. We also believe NMFS and USFWS need to establish the recovery number for Salmonids before anymore actions are taken. We do not know how many more fish must reach the dams in question for survival of Salmonids to be declared a victory. At this time it is quite possible that we are chasing an elusive dream.

ALTERNATIVE 1 AND 2 ARE POSITIVE AND PROGRESSIVE FOR FISH AND HUMANS

1. Oregon Cattlemen favor the focus of maintaining hydropower at an economical level
2. We favor the continued economic prosperity of the region through the use of the ports and bargin traffic over truck transportation and deteriorated highway systems.
3. We favor the irrigation systems provided for citizens who are agriculture producers throughout the states.
4. We favor the cooperative working relationships established under the existing program for Salmonid restoration both in the uplands and within the dam system and below.
5. Oregon Cattlemen do not support Alternative 4 due to many factors as stated above. This by far is a reckless approach to solving the issue of Salmonid population declines if the declines are truley do to dam activities. Oregon Cattlemen do not support Alternative 4 and do not see that further progress can be made to address the Salmonid if 140 miles of the habitat is destroyed between the upper dam and the lower dam of the study.