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October 5, 2004

MEMORANDUM

TO: Fish and Wildlife Committee

FROM: Doug Marker and Bruce Suzumoto

SUBJECT: Update on mainstem amendment implementation

We will brief the Committee on our work of the last month to address implementation of measures in the Council's Mainstem Amendments. Recent actions include:

Expansion of the regional forum on mainstem operations

The Committee and Council supported a concept implementing the Mainstem Amendment's measure for reinstituting an executive forum of the federal action agencies, the states, tribes and the Council to allow effective participation in mainstem decision making. Since the last Council meeting staff has met with the Implementation Team and the Federal Caucus to discuss the concept. We will brief you on those discussions. The draft revised Biological Opinion for the federal hydro system did not address specifically changes to the current regional forum.

Reservoir Operations/Flow-Survival Symposium

Staff has continued discussions with NOAA and other parties on the possibility of convening a symposium on reservoir operations and flow-survival issues. The symposium will focus on how the proposed summer operational changes at Libby and Hungry Horse dams as outlined in the Council's mainstem amendments may effect juvenile survival in the lower river. In a letter to the Council (attached) Bob Lohn suggested convening a symposium jointly sponsored by the Council, NOAA and interested tribes on the relationship between river flow and juvenile survival. His hope was that a symposium could help update regional understanding on the science underlying juvenile survival and flow issues and help determine whether or not an experiment in the lower river is feasible. Council staff will discuss progress toward organizing the symposium including ideas on its format, objectives, scope, timing and participation.

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Summer spill evaluation:

The staff is continuing to explore whether more work can be done this year to develop an experimental approach for alternative spill operations. As a reminder of the technical issues involved, we are attaching a memo about the feasibility of a summer spill evaluation from last year's discussions.

Attachments:

1. Letter from Bob Lohn to Judi Danielson; July 19, 2004

2. Memo from Bruce Suzumoto and Doug Marker; December 9, 2003

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

July 19, 2004

Ms. Judi Danielson
Chair, Northwest Power and Conservation Council
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Dear Judi:

Thank you for your letter of July 14, 2004, clarifying the Council's intentions regarding proposed operational changes at Libby and Hungry Horse Dams. The letter was a helpful part of our consideration of the recent System Operations Request filed by the State of Montana (2004-MT-2).

The Council's Fish and Wildlife Program, as a result of the recent Mainstem Amendments, proposes as a hypothesis that certain modifications to current operations at Libby and Hungry Horse Dams would significantly benefit resident fish without discernible adverse effects on the survival of juvenile and adult anadromous fish. These modifications in operations would have the effect of slightly slowing and stabilizing the rate of summer reservoir withdrawals for salmon flow augmentation and potentially could increase the productivity of the aquatic community in those reservoirs and the river reaches immediately below them.

Your letter indicates that the Council also finds that the Montana System Operations Request "is not inconsistent" with this provision of the Program, but asks that NOAA Fisheries provide written assurance that this operation "is not expected to have a discernible adverse effect on listed salmon and steelhead and that adequate monitoring is in place."

I support the Council's efforts to assure that measures taken to protect listed and non-listed stocks of salmon do not unnecessarily compromise other ecosystems, especially those in areas beyond the usual range of salmon and steelhead. I also agree that this is a matter that merits further examination and deserves careful application of the best available science.

As I understand these provisions, the Council's program anticipates that this hypothesis will be tested in an experimental manner, by taking an action and measuring its effects. Therein lies the problem. Although Montana is prepared to conduct research to measure the extent of the anticipated changes in productivity in the Kootenai and Flathead Rivers, there is not now in place a research program adequate to measure the kinds of changes in

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juvenile salmon survival in the Lower Columbia River that might be expected to result from the proposed operation, especially if such changes have a small or even negligible effect.

While a major survival failure ---- for example, loss of 50% of the migrants ---- should be detectable with the monitoring now in place, a more subtle change --- for example, a 1% decrease in survival ---- would likely not be observed by the monitoring systems in place for this year's juvenile Fall Chinook migration. Further, given the small changes in flow relative to the total lower Columbia River flow that are proposed in this experiment, it may prove difficult if not impossible to design a future research program that will provide statistically significant measurements of the resulting changes in juvenile salmon survival in the lower Columbia River.

For this reason, I cannot give the assurance the Council has requested prior to the implementation of this experiment, that "adequate monitoring" is in place. For similar reasons, NOAA Fisheries is unable at this time to support full implementation this year of Montana's System Operations Request 2004-MT-2.

However, I also note that it would still be useful and appropriate for the State of Montana to conduct baseline studies of productivity under this year's conditions. In particular, the current outflow of 12.5kcfs in the Kootenai River below Libby Dam offers an opportunity to measure productivity at a river level within the bounds of historic flows. Based on current forecasts, NOAA Fisheries will support maintaining this outflow at a constant level for the remainder of this operational season. In the event that subsequent forecasts show decreased runoff, NOAA will work with Montana in the regional forum process to adjust flows so that the expected reservoir drawdown limit is not exceeded.

Finally, in the event that the current outflows do not cause the reservoir to reach its anticipated 20 foot draft limit as expected by the end of August, we would support continuing those flows or a somewhat lesser flow into September on an experimental basis to provide some data on resident fish benefits from increased flows in September. The information gained from this experimental operation could be very helpful in determining whether Montana's proposal for such extended flows is operationally practicable.

For Hungry Horse dam, I recommend that the current level of flow also be maintained for as long as possible this summer, consistent with drawdown limits. As with Libby, in the event that subsequent forecasts show decreased runoff, NOAA Fisheries will work with Montana in the regional forum process to adjust flows so that the expected reservoir drawdown limit is not exceeded. This operation should provide the drawdown space needed for planned maintenance by the Bureau in early September but NOAA will work with Montana and the Bureau within the in-season management process if unanticipated water conditions occur.

I want to provide the Council and the State of Montana with assurance that I understand the importance of the biological objectives that you are trying to achieve in the reservoirs and rivers above and below Libby and Hungry Horse dams. I believe that the steps we are describing here are an important part of the implementation of the Council's Mainstem Amendments.

We will continue to work with you and others who are interested in finding better ways to operate the hydropower system and in understanding the impacts and benefits on both resident and anadromous fish from reservoir drafting strategies during July, August and September.

With that goal in mind, I would propose that we work together to identify the present bounds of the science regarding flows and survival and to determine how we can help advance that science and our application of it.

The body of scientific information on the nature and extent of the relationship between flow and the survival of migrating juvenile salmon continues to grow. Here are a few recent examples, among many: In 2003, the Independent Scientific Advisory Board, which is jointly appointed by the Council, the Columbia River Intertribal Fish Commission, and NOAA Fisheries, issued a report, which called into question the benefits of flow augmentation in some instances. Earlier this year, as part of Washington's Columbia River Initiative program, the National Research Council of the National Academy of Sciences prepared a report which included consideration of the affects on juvenile salmon of flows in the lower Columbia River. In preparation for the next biological opinion on the operations of the FCRPS, our Northwest Fisheries Science Center has recently compiled additional information and analysis on flow and survival. US Fish and Wildlife Service researcher William Conner has developed an important model for the Lower Snake River that predicts the relative impacts of flow and temperature on the survival of migrating juvenile Fall Chinook.

I would therefore propose that the Council and NOAA Fisheries, together with those Columbia River tribes or tribal organizations that might be interested in participating, sponsor a one or two day scientific symposium or similar workshop to address the following points regarding the relationship between flows and juvenile survival:

1. What is the "state of the science"? What information is available and applicable to this question? On which points is there consensus, and on which is there widespread disagreement?

2. Which of the attributes that are currently unknown or in general dispute are most important to decision making about hydro operations? What kinds of further research would be needed to resolve them?

3. Is there an experimental design practical and feasible for implementation in the next water year that would allow meaningful testing of the Council's hypothesis? If so, how would the experiment best be structured?

4. In modeling projected effects of flow operations on listed and non-listed fish --- especially in instances where empirical measurements are not available or not practical or feasible --- what are the relative strengths and weaknesses of the available models? Is there credible scientific information indicating that certain models (and modeling assumptions) are likely to be more reliable than others?

Answering these four questions will allow us to determine whether the Council's hypothesis can be tested by running an actual experiment, or, whether it is better to analyze the effects by using a model.

The Council or other participants may have additional points to be addressed, and I certainly do not intend that the above list be exhaustive. However, it would be our desire to keep the symposium sharply focused on identifying what is known, what is not known, which unknowns are most important, and how we might best resolve the uncertainty. It is not our intent that the symposium attempt to resolve issues where there is not an adequate scientific foundation to support that resolution.

I would suggest that the symposium be held as soon as practicable. While I know that organizing and preparing for a thorough and orderly discussion of these questions requires more than a few weeks of lead time, I am hopeful, with the Council's support, that it might be completed no later than this fall.

The scheduling is important not only to further resolution of the Montana SOR and related requests involving other upstream operations, but also to the revisions to the FCRPS biological opinion now underway. While the symposium is not likely to be completed soon enough to impact the draft biological opinion promised at the end of August, our intention would be incorporate adaptive management provisions that will allow these results to be considered in making operational management decisions under the biological opinion.

My thanks again to the Council for its willingness to take up this difficult but important issue, for your determination to resolve these issues using scientific methods, and for your interest in fashioning a solution that carries broad regional support.

Sincerely,

D. Robert Lohn
Regional Administrator

cc: Governor Dirk Kempthorne, ID
Governor Judy Martz, MT
Governor Ted Kulongoski, OR
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December 9, 2003

MEMORANDUM

TO: Council Members

FROM: Doug Marker and Bruce Suzumoto

SUBJECT: Studies to test changes in spill and reservoir operations in 2004

Over the past several weeks a workgroup of action agencies, NOAA, fish and wildlife managers and Council staff have held technical discussions on the feasibility of implementing 2004 summer spill and reservoir tests called for in the Council's mainstem amendments. Issues discussed during these work sessions have included such things as test design, study logistics, performance measures, levels of precision and study costs. Thus far, discussions have focused primarily on summer spill tests in the lower river. Discussions on studies to evaluate changes in reservoir operations are continuing and will be expanded in the coming weeks. This memo attempts to briefly summarize what has been considered and currently concluded regarding possible 2004 summer spill and reservoir studies.

Summer Spill Tests

Currently there are five summer spill test options being considered. General spill levels and proposed studies for the options are summarized in the table below:

Option	Spill Level	Studies Proposed
1	Current summer spill (Status quo)	Current planned project-level spill studies. No additional studies
2A	Reduced summer spill	Maintain planned spill studies.
2B	Reduced summer spill	Modify planned spill studies. Perform additional summer spill studies/monitoring
3	Current summer spill (Status quo)	Maintain planned spill studies plus perform additional system-level summer spill/transport studies/monitoring
4	Additional summer spill	Discontinue planned spill studies. Perform additional summer spill/transport studies/monitoring

The workgroup has come to the following conclusions:

- A major constraint in conducting summer spill studies is the difficulty of tagging fish later in the season. Warmer water temperatures increase stress on fish that are handled and tagged so tagging fish after early July increases mortality risk and sample bias. Also, as the season progresses fewer and fewer fall chinook juveniles are found in the river making it more difficult to capture sufficient numbers of fish. Summer studies that require handling and tagging juveniles usually ends about July 20 of each year. Thus for 2004 it was assumed that no summer spill studies can be conducted in August.

- Proposed studies for Option 4 have not been submitted. How this option will be evaluated must be determined at a later time. For Option 3, two types of survival studies were considered for 2004 summer spill tests-- 1) systemwide studies and 2) project specific studies (as currently planned for options 1 and 2). Systemwide studies attempt to estimate juvenile survival through the entire hydrosystem or a particular stretch of hydroprojects. Project specific studies attempt to estimate survival past an individual hydroproject.

- After lengthy discussions and analysis it was established that a systemwide survival study is probably <u>not</u> feasible in 2004. To meet the needed statistical confidence limits, a systemwide study would require many years of study and millions of tagged fish. On the other hand, project specific studies using radio tags are probably doable and could provide project specific survival information.

- While doable, project specific studies carry uncertainties. These uncertainties include: 1) whether or not there are indirect or delayed effects on fish passing through the hydrosystem; 2) whether or not July survivals can fairly represent August survival; 3) whether or not the juvenile sampling bias is significant (radio tags need larger fish); 4) whether or not project specific survivals can reasonably estimate system survival; 5) whether or not radio tags affect fish survival.

- The Corps of Engineers is developing a scoping document to help clarify the assumptions and uncertainties surrounding project specific studies. The scoping document will be soon submitted to and considered in the regional technical forum process.

<u>What this means for possible 2004 summer spill tests</u>

- Under Option 1, the status quo, summer spill studies in 2004 are planned for Ice Harbor, The Dalles and Bonneville dams. These are project specific studies evaluating survival past an individual project.

- Based on the proposed alternatives and study constraints outlined above, a project survival study at Bonneville Dam under Option 2B is the only other study that can be reasonably implemented in 2004. This is a modified project survival study from the one that is currently being proposed at Bonneville.

- For Option 2A and Option 3 no additional studies to the status quo would be implemented in 2004. Again, study plans have not been submitted for Option 4.

- An alternative to conducting new spill studies could be to update existing passage survival models with the most current project survival information and proceed with the planned 2004 spill studies. Once new survival information becomes available it would also be incorporated into the models. Any change in spill from Bi-Op operations in summer 2004 could be evaluated using models to estimate the effects of the operation on juvenile survival. This could be done with both Option 2A and Option 2B.

- In order to implement new studies in 2004, tags must be ordered by early January 2004. A decision must be made soon as to whether or not new spill studies will be undertaken so studies can be developed and tags ordered.

- The approximate cost for each new project survival study would be approximately $2 to $3 million.

- How the tests will be funded should be clarified.

Reservoir Operation Studies

Montana Fish, Wildlife and Parks (MFWP) believes that an evaluation of the biological effects of a modified summer draft at Libby and Hungry Horse can be conducted in 2004. Studies to evaluate the effects of changes in reservoir operations on resident are well developed. In general, MFWP proposes to study resident fish populations above and below Libby and Hungry Horse dams by collecting needed physical and biological information and utilizing reservoir and riverine habitat modeling techniques. A proposal to assess biological and physical responses to a modified summer draft has been submitted to the workgroups for consideration. The CBFWA resident fish committee is preparing to review the proposal. Likewise, Council staff is working with MFWP to facilitate a review of the proposal by the ISRP.

While upriver studies are fairly well developed, lower river evaluations for a modified summer draft operation have only been briefly discussed. There are several problems with attempting to determine the affects of flow changes on outmigrating fall chinook and it is unclear how these problems will be overcome:

- A system-wide study to estimate changes in survival is probably not feasible.

- The proposed flow changes are so small relative to the total river flow any change in survival may not be measurable.

- If both summer spill and reservoir operations were modified in 2004 it would not be possible to separate the survival effects of each operation.