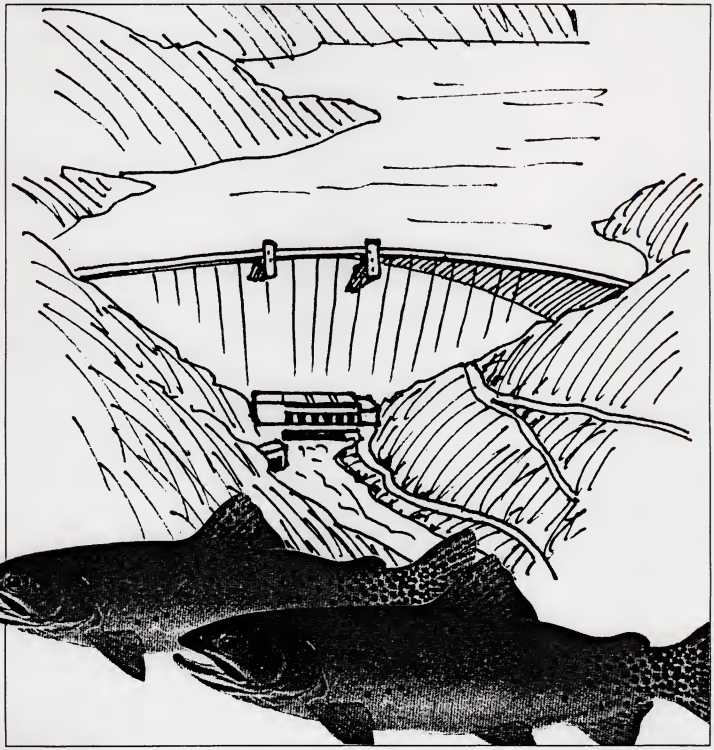
ROUND PAPER:
PROPOSED HUNGRY HORSE DAM RESIDENT FISH AMENDMENTS

91–03



NORTHWEST POWER PLANNING COUNCIL
July 11, 1991

NORTHWEST POWER PLANNING COUNCIL

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July 10, 1991

Dear Interested Party:

The Northwest Power Planning Council is seeking public comment on the proposed Hungry Horse Dam resident fish amendments to the Council's Columbia River Basin Fish and Wildlife Program.

The program calls on the Montana Department of Fish, Wildlife and Parks and the Confederated Salish and Kootenai Tribes to compile a mitigation plan that addresses the effects of construction and operation of Hungry Horse Dam on fish in the reservoir, Flathead Lake and the Flathead River system. During the last two years, Montana and the tribes developed a fisheries mitigation plan that was submitted to the Council earlier this year.

The proposed amendments are discussed in the attached background paper. The mitigation work would be in two phases. The proposed first phase could include habitat improvement, passage improvement in tributaries, hatchery production and construction of a temperature control structure at the dam. The proposed second phase would cover analysis of potential changes in operation of Hungry Horse Dam to benefit resident fish, including reservoir level control, maintenance of a minimum flow of 3,500 cubic feet per second in the Flathead River and 700 cubic feet per second in the South Fork Flathead River, assessment of a re-regulating dam to control discharges from Hungry Horse Dam, and ramping rates to moderate discharges until a re-regulating dam is built, if feasible.

The Council entered rulemaking on the proposed amendments on July 10, 1991. Public hearings are scheduled July 24 in Spokane, Washington; August 1 in Kalispell, Montana; August 14 in Lincoln City, Oregon; and September 11 in Coeur d'Alene, Idaho. The public comment period will close on September 13. The Council tentatively is scheduled to make a decision on the proposed amendments at its October 9 meeting in Richland, Washington.

The proposed Hungry Horse Dam resident fish amendments are the result of several years of work by Montana and the tribes and incorporates the views of a large number of citizens, agencies, tribes and other interests. On page 2 of the attached document are instructions on how to submit written comments. You are an important part of this process, and the Council wants to hear what you think about these proposals.

Sincerely,

Jim Goller

Jim Goller
Chairman

enclosure

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BACKGROUND FOR PROPOSED HUNGRY HORSE DAM RESIDENT FISH AMENDMENTS

The Council's fish and wildlife program calls on the Montana Department of Fish, Wildlife and Parks and the Confederated Salish and Kootenai Tribes to develop a mitigation plan that addresses the effects of Hungry Horse Dam on resident fish. This plan has been submitted to the Council for consideration. Copies of the plan are available from the Council's Public Affairs Division at the Portland office upon request. To receive a copy, please phone 503-222-5161 or toll-free 1-800-222-3355 and ask for the "Fisheries Mitigation Plan for Losses Attributable to the Construction and Operation of Hungry Horse Dam" *(request publication 91-21).*

In response to submittal of the mitigation plan, the Council has entered rulemaking to consider amending the Columbia River Basin Fish and Wildlife Program. The rulemaking process starts deliberations on the agency and tribes' recommendations contained in the plan. The schedule for deliberations follows:

July 10-11	Rulemaking initiated to consider amending program in West Yellowstone, Montana
July 24-25	Hearing in Spokane, Washington
August 1	Hearing in Kalispell, Montana
August 14-15	Hearing in Lincoln City, Oregon
September 11-12	Hearing in Coeur d'Alene, Idaho
September 13	Public comment closes
October 9-10	Consider decision to amend program

This paper first provides background on Hungry Horse Dam, the relevant provisions of the Columbia River Basin Fish and Wildlife Program language, and the agency and tribes' mitigation proposals. It then identifies issue areas and associated questions. Attached to the paper are existing program measures that pertain to Hungry Horse Dam (Attachment A) and a summary of the agency and tribes' recommendations for specific projects to mitigate for adverse effects of the dam (Attachment B).

During rulemaking, the Council will consider a number of potential options, including:

1. approve the plan as proposed (In this event, Phases I and II of the plan could proceed as recommended by the agency and tribes without further Council deliberations);

2. approve Phase I of the plan as proposed and defer action on Phase II until proposed analyses are finalized (In this event, Phase I of the plan could proceed as recommended by the agency and tribes, without further deliberation by the Council);

3. approve a modified version of Phase I of the plan (Modifications could be developed during rulemaking);

4. approve Phase I of the plan, provide for Council review of the implementation plan when it is prepared, and provide for Council review of the Phase II proposal when it is complete; and

5. disapprove the plan.

Comments are requested on these potential actions and on the questions identified in the issue areas section of this paper. Attachment B may also be helpful in regard to the latter. Comment will be taken at the hearings listed above. In addition, written comments that are submitted to the Council's Portland office (851 S.W. Sixth Ave., Suite 1100, Portland, Oregon 97204) by 5 p.m., September 13, 1991, will become part of the record for the Council's decision.

Proposed Hungry Horse Dam Resident Fish Mitigation Plan: Background

Hungry Horse Dam is located on the South Fork Flathead River in the vicinity of Kalispell, Montana. It was completed in 1952 and is operated by the U.S. Bureau of Reclamation.

The construction and operation of Hungry Horse Dam has caused extensive losses and impacts to resident fish populations. Construction of the dam blocked access to over 360 miles of spawning and rearing habitat in tributary streams. The dam also blocked access to 85 miles of the South Fork Flathead River and inundated almost 80 miles of resident fish spawning and rearing habitat. It is estimated that this eliminated at least 40 percent of the bull trout and westslope cutthroat spawning runs from Flathead Lake (see Figure 1).

Operation of Hungry Horse Dam causes large fluctuations in its reservoir, as well as rapid daily fluctuations in discharge to the South Fork and mainstem of the Flathead River. In addition, operation of the dam has dramatically changed seasonal flow patterns. These operations have resulted in significant losses of kokanee spawning areas. As a consequence of reduced kokanee populations in Flathead Lake, the amount of forage available for lake trout has been reduced and, therefore, the size and abundance of this dependent species have declined.

Further, features of the dam require that water is released from deep layers of the reservoir that are very cold. This cold water reduces trout growth in the South Fork and mainstem Flathead rivers to a fraction of pre-dam levels.

The Council's fish and wildlife program contains several measures relevant to Hungry Horse Dam and states that important measures concerning resident fish should include the development of new operating procedures and mitigation projects to offset hydropower-related fisheries losses for Hungry Horse reservoir and in the Flathead River System downstream from Hungry Horse reservoir. The program notes that these procedures will be designed to resolve potential conflicts among power generation; needed flows for salmon, steelhead and resident fish; and a stable reservoir environment for resident fish (see Attachment A for specific program language).

Over the last two years, the Montana Department of Fish, Wildlife and Parks and the Confederated Salish and Kootenai Tribes have worked to develop a cooperative fisheries mitigation plan for losses attributable to the construction and operation of Hungry Horse Dam. The agency and tribes work has been to:

1. quantify hydropower-related fisheries losses;

2. develop operating procedures to protect resident fish in Hungry Horse Reservoir and the Flathead River;

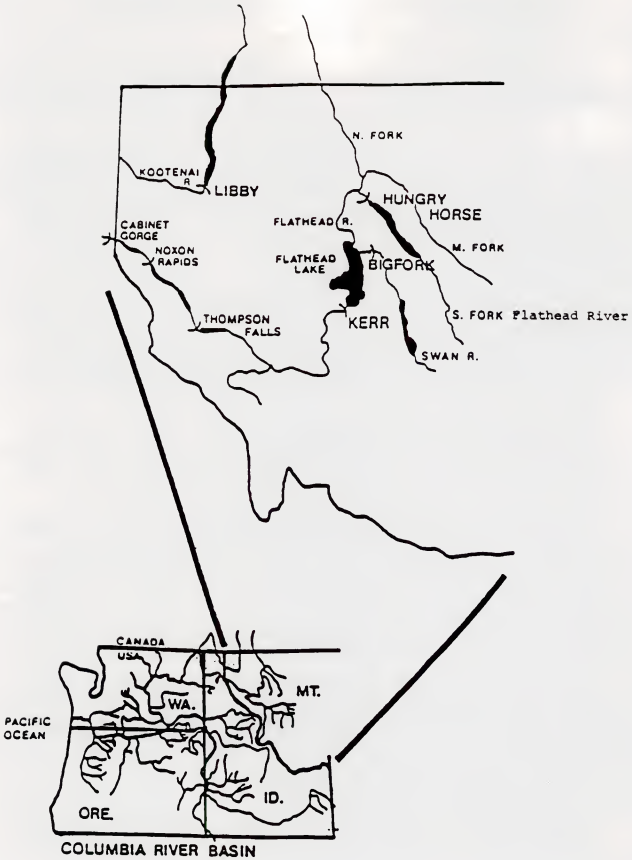

Figure 1. The Upper Columbia River System in Western Montana.

3. recommend non-operational mitigation measures to counter of habitat loss caused by the effects of Hungry Horse Dam;

The mitigation report was submitted to the Council earlier this year. It documents fisheries losses caused by the construction and operation of Hungry Horse Dam; presents a plan to mitigate for these losses; and incorporates the views of a broad range of citizens, agencies, tribes, and other interests.

Based on their consultation process, the agency and tribes recommend a two-phase mitigation program. The first phase would entail immediate implementation of non-operational mitigation, as well as construction of facilities to allow selective withdrawal of water from different levels of the reservoir. General features of Phase I (see Attachment B for specific information on proposed mitigation measures) would include:

1. habitat improvement;

2. passage improvement in tributaries;

3. increased hatchery production;

4. off-site mitigation; and

5. temperature control for Hungry Horse Dam water releases.

It is estimated that the annual cost for these recommendations (exclusive of temperature control) would approach $500,000 per year. The duration of this expenditure remains to be defined. Hatchery upgrades would consist of one-time capital costs of about $5 million. Temperature control is estimated by the Bureau of Reclamation to cost approximately $12.5 million for construction and somewhat less than $9,000 for annual operation. Cost figures are very preliminary at this time and would be refined with the help of the Bonneville Power Administration upon Council approval of the mitigation plan.

The second phase of mitigation would address operational recommendations and would call for consideration of these recommendations over the next several years in the Columbia River System Operation Review Environmental Impact Statement process. The systemwide Environmental Impact Statement will be prepared by Bonneville Power Administration, Corps of Engineers and Bureau of Reclamation in consultation with the Council and other parties. Phase II actions (see Attachment B for specific information on proposed mitigation measures) could include:

1. reservoir level control;

2. maintenance of minimum flows;

3. feasibility assessment of a re-regulatory dam; and

4. flow ramping rates until a re-regulatory dam is built, if feasible.

These potential mitigation actions carry costs to the power system, but the costs cannot be estimated at this time and would be calculated by the Bonneville Power Administration and others during the System Operation Review.

In addition, the agency and tribes recognize that monitoring and evaluation are critical. They recommend an annual monitoring and evaluation program that would cost approximately $150,000 per year over the period of mitigation. They note that this evaluation and feedback process is essential to the success of mitigation efforts.

The agency and tribes also recommend that a trust fund be explored for funding mitigation activities at Hungry Horse Dam. They note that this could meet the desires of the utilities for establishing a spending cap for mitigation, as well as meeting the agency and tribes' goal of a reliable, annual investment in the resource.

Proposed Hungry Horse Dam Resident Fish Mitigation Plan: Major Issue Areas

The mitigation plan submitted by the agency and tribes estimates losses and identifies mitigation alternatives based on an extensive database, agency reports, nationally and internationally peer-reviewed scientific articles, and a biological model. The agency and tribes conducted an extensive, 14-month scoping and consultation process with representative agencies, citizens groups and the general public.

As part of this process, the agency and tribes formed a consultation group in January 1990 that met periodically to guide preparation of the mitigation plan. The consultation group was made up of representatives from 24 groups and agencies. Informal meetings were held with individual group members in addition to the formal consultation group meetings. An extensive Appendix Report that summarizes the public involvement process was also prepared. In addition, a scoping document, prepared by the scoping group, was mailed to more than 500 addresses in Montana.

Returns on the scoping document indicated several areas of seemingly widespread agreement. These included support for fitting Hungry Horse Dam with a selective withdrawal structure to control river temperatures; aquatic habitat improvement and fish passage improvements; and reservoir water level and river flow changes. Comments received during the consultation process also identified major issue areas including, but are not limited to, the following:

1. Estimates of losses.

Losses of migratory westslope cutthroat in the Flathead system caused by the construction of Hungry Horse Dam were estimated using a habitat-based approach. These estimates assumed streams with gradients of 6% or less were migratory cutthroat habitat; tributaries with gradients greater than 6% were assumed to be resident cutthroat habitat. Using this methodology, it was calculated that at least 65,500 migratory cutthroat adults were lost annually from Flathead Lake populations.

Estimates of losses of migratory bull trout caused by construction of Hungry Horse Dam are based on the portion of drainage area blocked, compared to the portion of habitat not blocked. By examining historic spawning runs, therefore, it was possible to estimate how much of the run was eliminated by the construction of Hungry Horse Dam. Losses of approximately 2,000 bull trout spawners were estimated.

Losses of kokanee are based on reductions in reproduction caused by increased egg and fry mortality due to operation of Hungry Horse Dam. Estimates of losses of adult kokanee, which occurred between 1973 and 1980, amount to about 100,000 fish annually.

The agency and tribes indicate their belief that all losses estimates are conservative because of the methodologies used.

The consultation process carried out by the agency and tribes raised several questions in this issue area:

- Are the methods that were used to estimate losses appropriate?
- Are the mitigation goals too high considering they do not directly account for increases in fish populations attributable to Hungry Horse Reservoir? Are the mitigation goals too conservative because they are based on the lower end of the range of estimated losses?
- What has been the effect of mysis shrimp verses construction of Hungry Horse Dam on the decline of kokanee?
- What was the loss of lake trout caused by the reduction in kokanee that are used by lake trout as a major food source?

2. Relationship of mitigation to the identified hydropower-related losses.

The fisheries mitigation plan identifies estimated losses caused by the construction and operation of Hungry Horse Dam. Mitigation alternatives were evaluated for consistency with the Northwest Power Planning Act and Montana's policies that guide mitigation for resident fish.

Questions related to this issue area include the following:

- If non-operational mitigation recommendations go forward for implementation before all operational solutions have been fully explored and evaluated for effectiveness, what is the risk of over mitigating?
- Are there sufficient opportunities for in-kind, in-place mitigation to avoid off-site mitigation? Should off-site mitigation be necessary, will it occur in close enough proximity and be of a kind that will allow fishery opportunities to those who suffered the losses caused by construction and operation of Hungry Horse Dam?

3. Probable success of proposed hatchery supplementation including genetic considerations.

The agency and tribes propose expanding Somers State Hatchery and Creston National Fish Hatchery to supply eggs and fish for mitigation efforts. Initially, hatchery efforts would focus on kokanee. Kokanee would be raised in net pens in Flathead Lake up to a size of two inches. Approximately 10 to 20 million fish would be released per year. Cutthroat trout juveniles and eggs would be outplanted experimentally. In addition, the hatcheries would be used to evaluate culture techniques and for disease research on bull trout.

The following questions are related to this issue area:

- What are the genetic risks of supplementing hatchery-produced fish on existing, self-sustaining populations of cutthroat trout and bull trout?

- Would there be increased risk of disease problems caused by the proposed hatchery supplementation?

- Would increased harvest of supplemented fish decrease native populations?

- Is there enough feed in Flathead Lake to support kokanee releases of up to 20 million fish annually?

- If the experimental supplementation program proposed in the mitigation plan is unsuccessful, what will the expanded hatchery space be used for?

4. Coordination of Hungry Horse Dam and Kerr Dam mitigation programs.

The Flathead Basin contains two major dams that control storage (see Figure 1). Kerr Dam is at the outlet of Flathead Lake and, therefore, controls the elevation of the lake. Hungry Horse Dam is located on the South Fork of the Flathead River, which is a major tributary to the Flathead River that feeds into Flathead Lake. Hungry Horse Dam controls flows from the South Fork Flathead River. Operation of these two dams, because of their strategic points in the system, greatly affects the fishery resources found in the Flathead Basin.

Kerr Dam is owned and operated by a private utility, Montana Power Company, and is licensed by the Federal Energy Regulatory Commission. Hungry Horse Dam is a federal project operated by the Bureau of Reclamation. To date, mitigation programs for the construction and operation of these two dams have been addressed in separate forums because of their ownership. Regardless, the agency and tribes have made efforts to coordinate the mitigation plans for both projects.

Questions related to this issue area include the following:

- Because Hungry Horse and Kerr dams are operated jointly as part of a system, and their operations jointly affect the fisheries resource, should the mitigation programs for these dams be consolidated?

- Is it possible to develop separate mitigation programs for Kerr and Hungry Horse Dam that address the fisheries losses caused jointly by these dams?

- Should the mitigation programs for these dams be addressed in the System Operation Review?

5. Effect of Hungry Horse Dam operations on salmon and steelhead populations that originate lower in the Columbia River Basin.

Flows in the mainstem of the Columbia River are critical to the survival of salmon and steelhead. Operation of headwater storage projects, such as Hungry Horse Dam, can potentially affect the availability and size of flows at

times of the year when these fish are migrating to the ocean. At this time, the effects of changed operations at Hungry Horse Dam on salmon and steelhead flows are not known.

The following questions are related to this issue area:

- What would be the effect of operational changes at Hungry Horse Dam called for by mitigation of resident fish on flows for salmon and steelhead lower in the system?

- Should the effects of operational changes be determined during the System Operation Review?

6. Funding options for potential mitigation features.

The agency and tribes recommend establishment of a trust fund similar to the Montana Wildlife Trust to fund proposed non-operational mitigation features. Other identified funding options include: 1) annual contract negotiations with the Bonneville Power Administration, and 2) annual investments at an agreed to dollar amount by the Bonneville Power Administration. The latter option has been selected by Montana Power to fund mitigation for Kerr Dam. The agency and tribes note that the trust fund option would allow for annual expenditures, lower overhead rates, and less time and effort for negotiation and administrative matters.

This issue area has the following related questions:

- Should a trust fund be used to fund resident fish mitigation for Hungry Horse Dam?

- If a trust fund is used to fund mitigation, what process will be used to identify projects for annual implementation? Will the public have input to this process including discussions on topics such as monitoring and evaluation results, allocation of funds, and selection criteria?

- Can a trust fund be established that would fully mitigate for the effects of Hungry Horse Dam on resident fish populations?

7. Costs and the effect of mitigation on power rates and generation capacity.

Non-operational measures called for by the agency and tribes could cost up to $500,000 per year. Hatchery upgrades would consist of one-time capitol costs of $5 million. Temperature control is estimated to cost over $12 million for construction and somewhat less than $9,000 for annual operation. These cost figures are very preliminary and would have to be refined with the help of the Bonneville Power Administration upon approval of the mitigation plan. Costs of operational features of the mitigation plan have not been estimated.

While cost estimates for the proposed mitigation plan are either preliminary or not completed at this time, it can be expected that these costs will amount to millions of dollars. It also can be postulated that ratepayers

will pay a substantial portion of these costs. Power revenues foregone may also be part of the mitigation package if generation capacity is reduced in the system because of operational changes at Hungry Horse Dam.

The following questions are part of this issue area:

- Can the probable effect of the proposed mitigation on power rates be estimated? If so, are these effects acceptable?

- Should the Council make a decision on the operational features of the mitigation plan before costs are better defined?

8. Phasing mitigation measures.

The agency and tribes recommend that mitigation proceed in two phases. Phase I would include development of an implementation plan for non-operational mitigation features. The implementation plan would include specifics on projects and timelines. It would also identify costs. Phase II would include further evaluation of all operational mitigation features during the System Operation Review. This would allow determination of the effects of recommendations on the power system as a whole and on operations at other projects such as Kerr Dam. Results of this analysis would be expected to provide estimated costs associated with operational recommendations such as power foregone.

Questions related to this issue area include:

- Should development of an implementation plan for non-operational mitigation features proceed at this time? If it should, who should develop, review and decide on the plan's acceptability?

- Should the Council call for analysis of Phase II recommendations in the System Operation Review?

- Who will review the results of the analysis and decide on operational changes that should occur to mitigate for the effects of Hungry Horse Dam on resident fish?

9. Temperature control structure

Presently, Hungry Horse Dam is fitted with a single outlet located 75 meters below the dam crest. Water discharged from this depth remains about 40 degrees Fahrenheit during all months of the year. Installation of a selective withdrawal structure on Hungry Horse Dam would allow managers to release warmer water from different depths of the reservoir during the May through October period. It is estimated this would increase trout growth in the South Fork Flathead River by a factor of 10 and trout growth in the mainstem Flathead River by a factor of 2 to 5. The following questions address this issue area:

- Should installation of the temperature control structure proceed during Phase I of the implementation of the mitigation plan?

- Would the temperature control structure be necessary if a reregulatory dam was installed below Hungry Horse Dam?

- Should the Council reaffirm the interim operational guidelines for protection of resident fish in the Flathead Basin outlined in the 1987 Fish and Wildlife Program until the completion of the System Operation Review?

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