SYSTEM OPERATIONAL REQUEST: #2002-3

- ***The following State and Federal Salmon Managers have participated in the preparation and support this SOR: Oregon Department of Fish & Wildlife, U.S. Fish & Wildlife Service, Columbia River Inter-tribal Fish Commission, Washington Department of Fish and Wildlife, Idaho Department of Fish and Game and The National Marine Fisheries Service.***

TO:	**BG Fastabend**	**COE-NWD**
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FROM: **Ron Boyce, Chairperson, Salmon Managers**

DATE: **May 14, 2002**

SUBJECT: Implementation of the NMFS Biological Opinion

SPECIFICATIONS: Provide at least the minimum juvenile fish migration flows specified in the NMFS 2000 Biological Opinion at McNary and Lower Granite Dams, utilizing Grand Coulee, Dworshak and Brownlee operations.

- Meet Biological Opinion flow objectives through drafting of Grand Coulee Reservoir and utilizing the options of reshaping outflows from other storage reservoirs to provide higher flows at Lower Granite Dam and McNary Dams.

JUSTIFICATION:
The re-shaping of outflows and drafting of reservoirs is needed to meet Biological Opinion flow objectives. Presently, flows are below the NMFS Biological Opinion flow objectives and objectives have not been met for most of the spring migration period in the Snake and Columbia rivers. Several discussions have occurred relative to the need to improve migration conditions. However, to-date reservoir operators have declined to reshape runoff volumes to provide migration flows for juvenile steelhead and chinook salmon. Migration flow conditions have resulted in lower flows in the Mid Columbia and Snake Rivers at this time of the year than in the last five years, except for the extremely low flows of 2001 (Figures 1 and 2). The chinook and steelhead migration is underway and has demonstrated delayed timing and passage distributions. Spring migrating juvenile chinook and steelhead experienced the poorest migration conditions in recent history in 2001, which resulted in the lowest in-river juvenile survivals in recent record. Because juvenile salmon outmigrants from a particular year return in several year classes, two subsequent years of poor outmigration conditions will seriously impact adult returns for several years.

An abundance of smolt monitoring travel time data exists. There is regional agreement that there is a flow/travel time relation for spring migrating steelhead and chinook salmon. Smolt monitoring data for 2002 shows that the low flows which have occurred in the Snake River are delaying the arrival of yearling chinook and steelhead at Lower Granite Dam and together with lower river flows have lengthened the travel time of smolts from Lower Granite Dam to the mouth of the Columbia River. Based on the historic cumulative passage timing plot, the number of yearling chinook and steelhead appears to be less than half of what is expected, through May 12. Historically, the current proportion of the run of yearling chinook would have occurred 15 days ago, and that of steelhead 10 days ago. Smolts have been currently migrating at flows averaging 67 kcfs since the historic 10% passage dates at Lower Granite Dam when Biological Opinion flows should have been 97 kcfs. At present flows the additional travel time expected based on the flow-travel time relation presented in the FPC 2001 annual report, is on average, approximately 5 days for yearling chinook and 6 days for steelhead. Together the delayed arrival into the hydro system and longer travel time of in-river migrating smolts through the hydro system will cause these in-river migrating smolts to reach the mouth of the Columbia River about 20 days later for yearling chinook and 16 days later for steelhead than their average ocean entry period (Figures 3 and 4).

In addition smolt-monitoring personnel at the Lewiston trap have reported a decrease in spring migrant steelhead condition. Past data has shown that steelhead are particularly sensitive to flow conditions and may residualize if migration is delayed.

The attached Memorandum (Attachment 1) of discussions held on May 7, illustrate that a more flexible approach to the operation of Grand Coulee project is possible, with a draft below elevation 1240 feet, which would increase flows at McNary Dam while protecting cultural resources of the Spokane and Colville Tribes. This operation is consistent with anticipated operations in the NMFS Biological Opinion, which states "meeting the spring flow objectives occasionally requires reservoir drafting."

Options exist for managing outflows and drafting reservoirs to increase flows at Lower Granite Dam. Review of the information available for the Dworshak project (Attachment 2) indicates that flexibility exists to improve the migration conditions in the Snake River for most of May. Project inflows and run off volume information indicates that Dworshak could operate at a flow level of at least 10 Kcfs through most of May, and then reduce outflow in June to minimum while still meeting refill requirements of the Biological Opinion. (CRITFC and the Nez Perce Tribe support the operation of Dworshak in this manner if a high degree of certainty of refill by June 30th can be maintained.)

The Brownlee reservoir is currently (5-13-02, midnight) only 8.6 feet from its full pool elevation. Brownlee outflows over the past week have averaged several Kcfs below inflows: therefore, if Brownlee were to simply pass inflows or provide a moderate draft, several Kcfs of water could be added to Lower Snake and Columbia River flows.

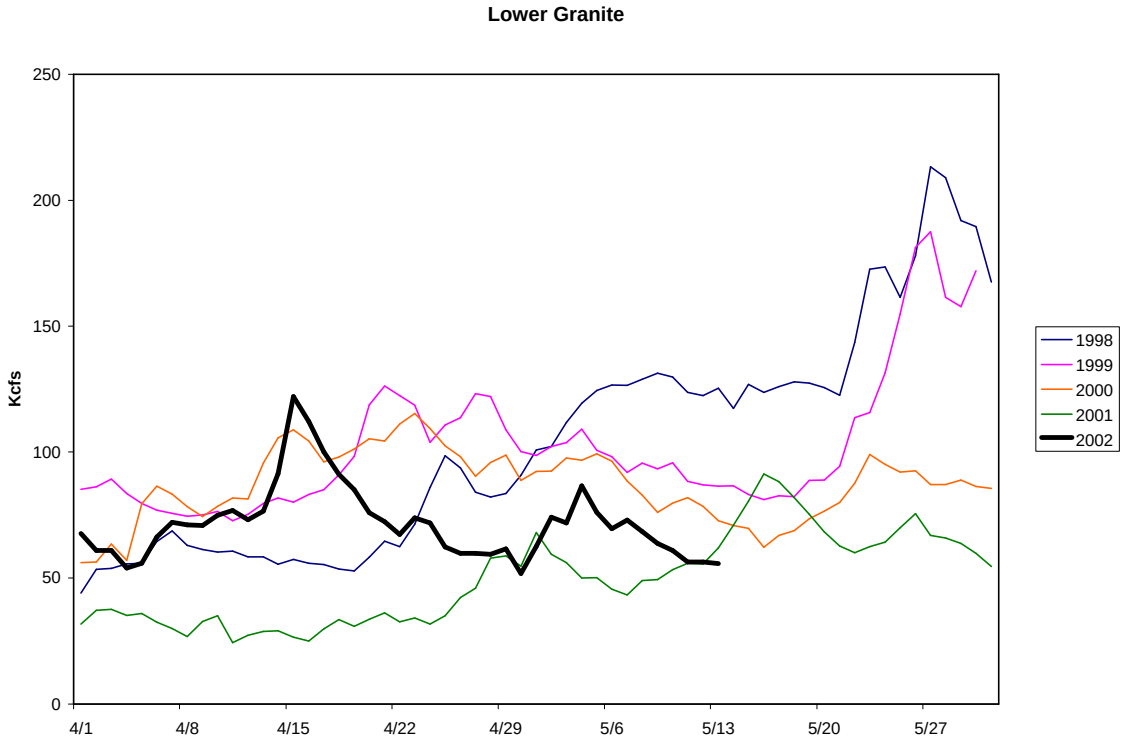


Figure 1. Lower Granite Flows over the last five years.

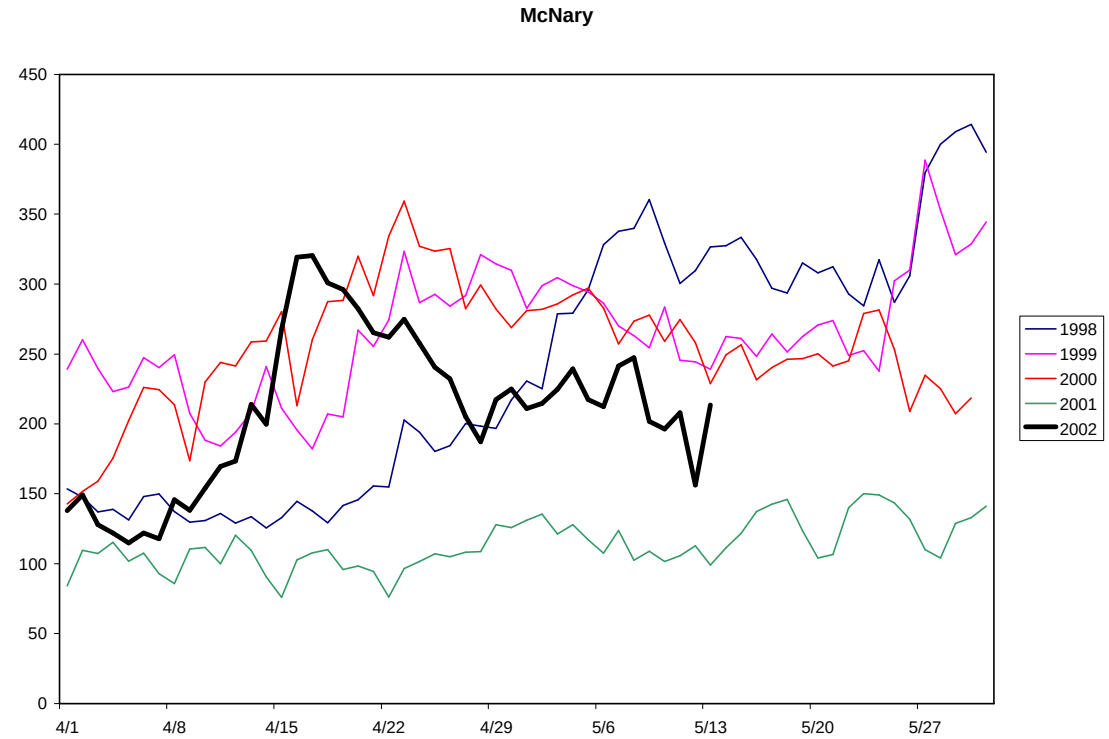
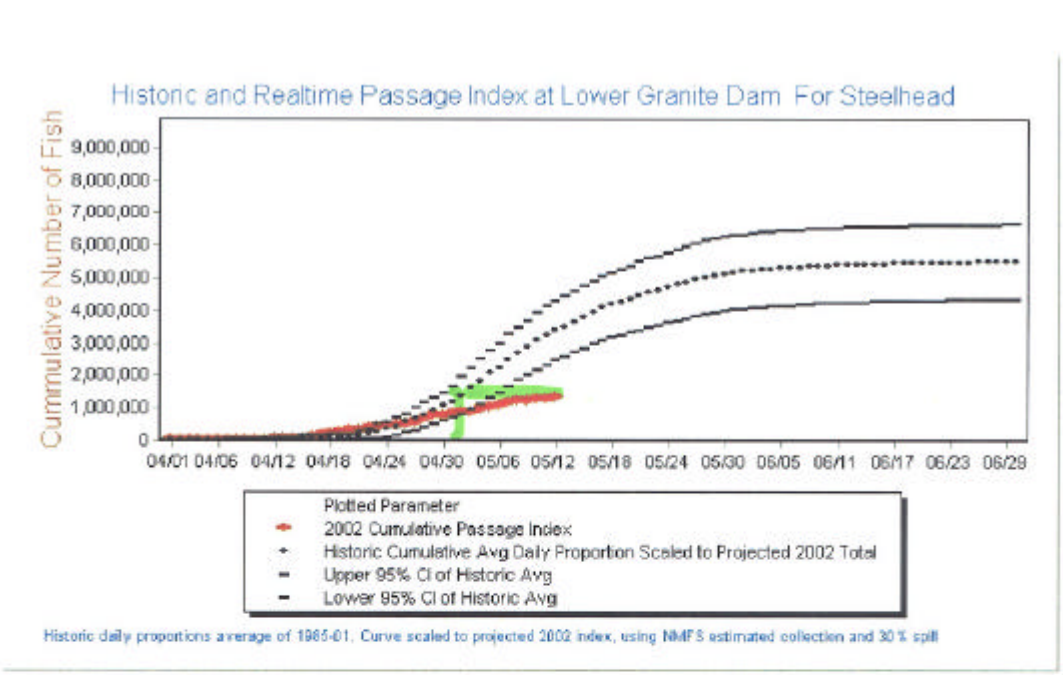


Figure 2. McNary Flows over the last five years.



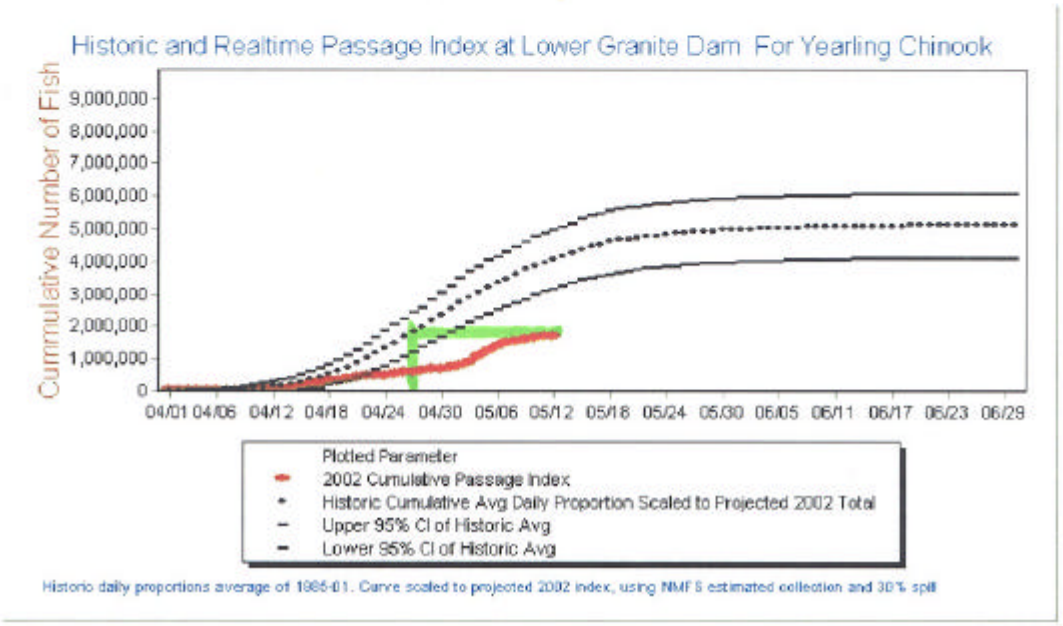


Figure 3. Projected migration delay for Snake River chinook and steelhead.

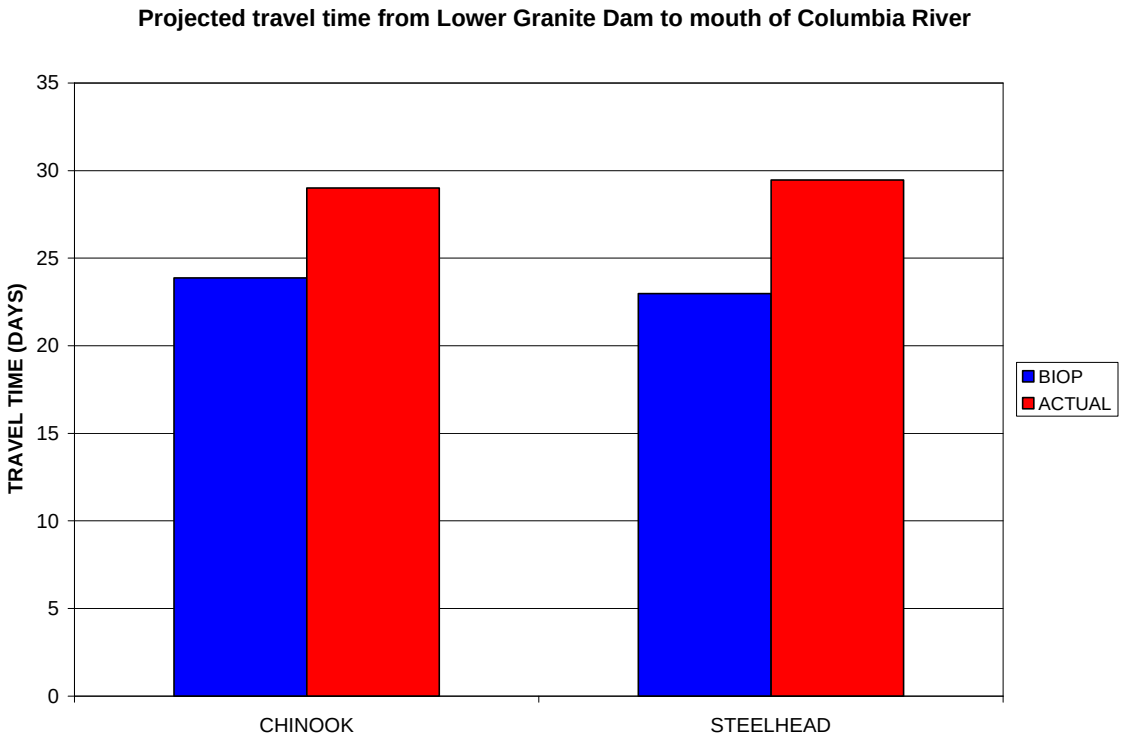


Figure 4. Increase in salmonid travel time at lower flows.

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MEMORANDUM

TO: Jim Fodrea, USBR

FROM: Fish Passage Advisory Committee

DATE: May 10, 2002

RE: Operations of Grand Coulee Reservoir

On May 7, 2002 a joint FPAC and CBFWA Members Management group meeting was held to discuss the current and proposed operations of Grand Coulee project, reservoir elevations and operations. An attendance list is attached.

The group discussed potential solutions to the 1240-foot draft limitation being maintained by the USBR. Because of the cooler than normal weather causing a delay in runoff, the migration flows at McNary Dam have been much lower than the NMFS 2000 Biological Opinion flow target. The USBR has taken and maintained the position that the reservoir should not be drawn down below elevation 1240 feet, even though the runoff volume forecast is large enough to project refill by June 30 with a high degree of certainty. Concern has been heightened since the reservoir actually filled slightly over the past week, while flows at McNary were far below the flow target (see attached memo to FPAC).

Tribal cultural resources representatives from the Colville and Spokane tribes addressed the issue of protection and survey of tribal burial and cultural sites. The tribal representatives explained that they had contracts with the USBR to implement archeological and security surveys of the sites exposed as the reservoir is drafted. The contract that is in place at the present time is limited to surveys that would take place as the reservoir is drafted to elevation 1240 feet. Tribal representatives explained that contract modifications would be required to cover additional costs, of surveys and security patrols if the reservoir is drafted below elevation 1240 feet.

After discussion the state, federal and tribal representatives present agreed to support additional USBR funding through contract modifications to continue to conduct additional archeological surveys and security patrols. The group agreed that the additional funding should be provided to allow the reservoir to draft to elevation 1240 feet through this week and then to elevation 1235 to support fish migration flows at Priest Rapids and McNary dams, although the group recognized that this would likely not provide the flow target flows. The purpose of this operation is to improve migration flows through the mid-Columbia Reach and at McNary Dam by reshaping the timing of flows through the spring migration. The proposed shaping operation would also reduce the likelihood of a high flow event in the Columbia River later in May or early June that could result in high forced spill conditions and exceedence of the state water quality gas variances throughout the river.

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MEMORANDUM

TO: Michele DeHart/Margaret Filardo

FROM: David A. Benner

DATE: May 14, 2002

RE: Dworshak Flow Augmentation

The USACE has provided a volume forecast for the Dworshak reservoir, updated on May 13th, 2002, available on the TMT web page (see attachment). According to this forecast, three April-June water supply forecast scenarios are possible, each with varying degrees of confidence (30, 50, and 70). According to this plot, a water supply of 2965 Kaf has a 70% confidence of occurring; this is the "worst case" scenario that USACE provides on their plot. From USACE calculations, 267 Kaf of water would be available to augment flows (assuming the WSF was 2965 Kaf) from May 13th to June 30th. The 267 Kaf of available water assumes that the entire period would contain a minimum outflow of 1.5 Kcfs and Dworshak would fill. Based on this flow augmentation volume, the following operations scenario has been developed:

Minimum outflows = 2 kcfs from May 13th to June 30th
All extra available water used in last 14 days of May

To bring minimum outflows to 2 Kcfs, the following volume of water would be needed:

Need an additional 0.5 kcfs (above the 1.5 Kcfs) to reach 2.0 Kcfs
May 14th to June 30th = 48 days

0.5 Kcfs = 500 cfs = 43200000 cfd * 48 days = 47603 acre-feet = 47.6 Kaf

267 Kaf (augmentation volume) – 47.6 Kaf (volume to bring outflows to 2.0 Kcfs) =

= 219.4 Kaf
(Available for last two weeks in May)

219.4 Kaf / 14 days =
= 15.67 Kaf/d = 15671 acre-feet/day = 682647429 cfd =

7901 cfs =
7.9 Kcfs

Therefore, if the above scenario were implemented, a continuous outflow of 9.9 Kcfs (7.9 Kcfs + minimum outflow of 2.0 Kcfs) would be available at Dworshak for the last two weeks in May. It should be pointed out that this is the worst-case water supply scenario that USACE presented in their volume forecast plot. If the best-case scenario were used, 20.2 Kcfs of additional water, beyond the minimum flow of 2.0 Kcfs, would be available in the last two weeks of May.