

**Bighorn River System Working Group  
Meeting Summary  
Lovell, Wyoming  
April 8, 2010**

**Welcome and Introductions**

Participants introduced themselves. Facilitator Beck gave a quick review of the agenda. The group has been meeting for three years and has made significant progress. Lenny Duberstein pointed out the river is a natural system that has been modified, still everything is inter-related (fisheries, operations, sediment, etc.) He challenged everyone to keep the big picture on inter-relationships in mind during the study reports and other discussion.

**Implementation of Modified Criteria and Rule Curve Projections (Aycock)**

Gordon stated that the purpose of modifying the criteria is to benefit all functions. The modification began on a trial basis last fall. Forecasted inflows in November 2009 were used to establish winter release rates with the goal of drawing the reservoir down to 3620 feet by March 31. The Bureau's forecasting the past three years has been accurate within 97%. At the beginning of April the Bureau looks at the rule curves. The rule curves are a roadmap of how the reservoir is operated.

Currently, BOR is releasing 2000 CFS to the river, the reservoir is high right now (releases were cut back in mid-February) which is appropriate for the present situation and the forecast. BOR recognizes that 2000 cfs is not optimal for the river fishery. In a dry year such as this one, the inflows are low and it is a challenge to meet the desired flow releases. The April-July 2010 forecast is for 56% of average inflow. Storage is good now with 726,000 acre feet available to both fill the reservoir and release to the river. If the forecast bears out, the reservoir will be filled to 3640 feet and releases to the river will bump up to 2250-2270 cfs this fall. High spring run-off doesn't usually start until the last week of May. Between now and then storage can be evacuated as conditions develop.

Montana Fish, Wildlife and Parks (FWP) raised a concern about whether the new rule curve drafts the reservoir low enough in the spring to avoid large releases later. The target elevation is set in November without knowledge of winter moisture, but at a level that can handle both high and low run-off. Then the reservoir level is adjusted by March 31 based on the forecasts. The new interim reservoir target is 3620 feet (it was previously 3610.) The additional storage can help augment flows to the river in the summer during years with low inflow. Comparing new vs. old rule curves puts the March 31 target up by 10 feet with higher releases in April and May. There is not much change in operations the rest of the year. FWP is also concerned with significant flow increases in late May and June corresponding with their sampling period.

In dry years a flow of 2500 cfs can't be maintained because inflows can drop below 1000 cfs. Matching the drop of inflows to releases could cause a situation where only 500 cfs would be released to the river—not an acceptable situation for the fishery. Reclamation wants to protect against this happening even if drought occurs more than one year in a row.

### **Assessment Report (Duberstein)**

The report will document Gordon's work with the rule curves and operating criteria. In 2008, the Commissioner of Reclamation was asked about whether analysis under the National Environmental Policy Act (NEPA) had been conducted on Yellowtail operations. The original project pre-dates this legislation. The Commissioner of Reclamation made a commitment to prepare an assessment report that would answer the question of "Is Reclamation operating Yellowtail as planned?" Lenny intends to prepare the report to answer this question and also the question of "How can we operate the project better?"

The new rule curves have been in use on an interim basis since last fall. Documentation of this is being reviewed internally and will be released to the public through the website in the coming weeks. Reclamation is expecting to continue monitoring the results under the interim rule curves. The draft assessment report should be available in two months for review and comment. The group can discuss the report at the fall meeting.

### **What We Have Learned (Aycock)**

Gordon ran through a comparison of power generation, irrigated acres, municipal and industrial water uses, flood control, flood damage prevention, river releases, reservoir minimum operating levels, average reservoir levels on March 31, and sediment accumulation against five documented benchmarks or periods. These benchmarks were the 1922 Flood Control Act/Senate Document 191 (the authorizing legislation), the 1962 Definite Planning Report (DPR), 1966 as constructed, 1988-2008 as operated, and applying the modified operating criteria to the period 1988-2008. Some highlights of the results were:

- Power generation is significantly higher than early projections,
- Flood control is significantly higher than projected,
- The flood benefit (damage prevention) is higher than projected,
- The modified criteria is providing more flows for the river fishery,
- The reservoir minimum operating level is unchanged,
- The average March 31 reservoir level is up from the 1962 DPR, and
- Sediment accumulation is less than predicted by the DPR.

## **Update on Special Studies (Duberstein, Hellekson)**

(To obtain copies of the studies contact Stephanie Hellekson with USBR.)

### Flood Pool Reallocation (Duberstein using Yonts report)

Reclamation proposed raising the top of the joint use flood pool from 3640 to 3645 feet. The Corp of Engineers (COE) gathered and analyzed flood data, then evaluated the flood benefits at the new level. Flood damages would increase slightly in Hardin and Miles City and dam safety is a concern due to both water levels so closely approaching the top of the dam and capacity of the afterbay to handle higher outflows. Flood damage curves need to be updated, a determination made about whether an Environmental Assessment is needed, and then if there is a decision to proceed with raising the top of the joint use flood pool, the flood control manual and working agreement need to be updated.

### Bighorn Lake Sediment Management Study (Duberstein using Pridal report)

Six alternatives to manage sediment were evaluated. These included such approaches as preventing sedimentation, flushing sediment, diking, and dredging. Dan Pridal from the COE used a model to predict a baseline sediment condition for the next 40 years. He then compared the alternatives to that baseline. The rate of deposition in Horseshoe Bend (HSB) has slowed recently, but with no action, HSB may not be functional for recreation in 20-40 years.

The alternatives were evaluated for costs and ranged from no additional cost to dredging with an initial cost of \$145 million and ongoing costs to continue periodic dredging. There are trade-offs associated with all of the alternatives. Constructing a dike in HSB would be the most effective alternative solely for sediment management in HSB.

### Bighorn River Channel Study (Hellekson using Godaire report)

Jeannie Godaire from BOR studied the problem of progressive side channel abandonment and loss of side channel habitat in the river. She looked at vertical changes, lateral changes, and the risk of losing more side channels. The data show that the bed is stable vertically, there has been little lateral migration since 1980 but side channels are being lost, that 7 or 8 side channels may be savable, and that the higher flows in June 2009 had some flushing effects on side channels. The next phase of this study is hydraulic modeling to see what flushing will be necessary to wet and inundate side channels to specific depths and velocities. The end goal is to determine what peak flows are needed to move sediments and keep side channels open. Moss continues to impact flows at various points downstream, more information is needed about this situation.

## **Wrap-up**

The group will meet again in the fall.