

Libby Refill

Page 12-13 of the October 1, 2009 Draft 2010 Water Management Plan states that the refill probability of Libby Reservoir (Koochanusa) is impacted by the variable flow flood control strategy (VARQ) and “tiered flows” released for endangered Kootenai white sturgeon; the estimated refill probability to within one foot of full was reported at 12 percent. The Corps analysis of refill probability tends to overstate refill problems because refill probability simulations should treat the volumes released for sturgeon and VARQ as one. It is also customary to report failing to fill to within 5 feet from full as a refill failure, not the within one foot reported in the WMP. These changes should provide a more accurate estimate of refill probability and reduce the impact on reservoir refill reported in the WMP.

VARQ was originally designed, in part, to offset the refill impact caused by the sturgeon pulse. The volume released for sturgeon should offset a portion of the mandatory discharge volume required by VARQ. Volumes released for sturgeon are set annually based on the May 1 inflow forecast (April through August inflows). The final release volume and shape of the sturgeon pulse are further refined during in-season planning by the Kootenai white sturgeon Recovery Team (USFWS), Libby operations protocol team (Corps) and TMT. For planning purposes, sturgeon volumes can be estimated using monthly inflow forecasts beginning in January, and refined each month. Similarly, the VARQ discharge protocol defines minimum dam discharges to assure that a specified volume is released prior to spring runoff, to avoid overfilling the pool or spilling during spring runoff. Although operation planning is confounded by inflow forecasting error and variability in the timing of spring runoff, simulations should account for the release volumes for sturgeon and VARQ (combined, not additively) and the operation can be shaped in real-time for the greatest benefit for sturgeon and to control the reservoir refill rate. This strategy will improve reservoir refill probability.

Variable January flood control draft

During 2009, monthly inflow forecasts at Libby Dam generally reduced after January. Koochanusa Reservoir was drafted to elevation 2411 by January 1 based on initial inflow forecasts, which we now know were overestimates. As a result, even though dam operators rapidly reduced dam discharges to conserve reservoir storage and maintain the minimum Kootenai River flow (4 kcfs), pool elevations remained below the draft and refill targets, and the reservoir failed to refill. Unfortunately, inflow forecasting error will continue to influence actual operations, despite our use of sophisticated model predictions. Still, modeling should be able to solve for a portion of inflow variability and allow refinement of the variable flood control draft. We recommend that this relationship be revisited this year to see if it is possible to minimize negative impacts of drafting Libby too much in December thus making it impossible to meet the sturgeon flow volumes and refill the reservoir.