

SYSTEM OPERATIONAL REQUEST: #2007-MT-1

The following State, Federal, and Tribal Salmon Managers have participated in the preparation and support this SOR: Montana Fish Wildlife & Parks & Kootenai Tribe of Idaho

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SUBJECT: Libby & Hungry Horse Operations for July through September

Biological Objectives

The objective of this SOR is to implement an operation at Libby and Hungry Horse dams from July through September that will provide ecological conditions that are similar to last summer. The proposed operation will provide habitat for ESA listed bull trout and provide improved environmental conditions for other resident fish that inhabit the reservoirs and the rivers above and below Libby and Horse dams.

This SOR proposes to continue implementation an evaluation of the physical and biological effects of the proposed operational changes for Libby and Hungry Horse. Experiments have been designed and are being implemented in Montana to evaluate the biological changes that result from implementation of this SOR.

Specifications

Hungry Horse

- a. Attempt to refill by June 30 while also avoiding the risk of filling too quickly resulting in uncontrolled spill. Even small amounts of spill will likely exceed Montana's water quality regulations for 110% dissolved gas. Therefore, the refill date and outflows should be managed to avoid, if possible, uncontrolled spill.

- b. Assuming that Hungry Horse refills in late June or early July it will be necessary for Reclamation to pass inflows until they drop below the desired flat flow of 4.0 kcfs¹. For the remainder of July, August and September target a flat flow of 4.0 kcfs.
- c. Maintain minimum in stream flows for bull trout at Columbia Falls and in the river below Hungry Horse dam.
- d. Attempt to provide stable or, if necessary, gradually declining flows at Columbia Falls.

Libby

- a. Following the May-June flow operation for sturgeon, continue the flat flow target of 15.0 kcfs¹ through July 21st or until the core sampling in the Bonners Ferry area is complete. Based on recent runoff volume forecasts it appears that it will be necessary to reduce flows to 12 kcfs for the remainder of July and August.
- b. Montana the Kootenai Tribe of Idaho and the Corps will review this operation, actual runoff volumes and resulting reservoir elevations. By the middle of July this SOR's flow request for the remainder of July, August and September may need to be modified. If modification is necessary, a recommendation will be brought to TMT for discussion and resolution.
- c. Water conditions this year make it unlikely that the Corps will be able to refill Libby therefore; refill is lower priority than providing flat flows in the most productive summer months.
- d. Operate to provide at least minimum bull trout flows through September (USFWS BiOp).

Biological Evaluations

Montana Fish Wildlife & Parks has a range of field experiments that will provide useful information on the changes in survival and productivity of trout below Libby and Horse reservoirs. These experiments will be continued and to the extent possible provide additional biological information on the benefits of the proposed operation for resident fish.

Radio tracking and PIT tag methods will continue in the Flathead and Kootenai Rivers to detect movements and potential downstream displacement of fish. This will allow a comparison of changes in fish movement and response to flow fluctuations caused by the dam operations called for in this SOR.

IFIM river models, benthic biomass models and reservoir modeling will compare previous operations with modified operations. Field observations will be conducted to see how fish respond to new operations to determine any changes from previous measurements.

Using the existing biological models the proposed operations will be evaluated to determine changes in river and reservoir productivity and these simulations will be validated with field sampling.

Justification

Biological Justification for Libby & Hungry Horse Operations

Biological conditions for resident fish in Montana are dramatically improved by gradually ramping down river discharge, after the spring freshet, toward stable or gradually declining summer flows through September (extended into October if possible). Stable or gradually declining flows are especially important during the biologically productive summer/fall months. Montana's growing season is short; rivers become productive in late June, after the spring freshet, and remain productive until water temperature drops to 6 degrees C in October. Peak production occurs in three months, July through September.

River flows must remain above bull trout minimums to protect fish from the impacts of dewatering areas of critical habitat. Most productive riffle habitat is inundated when flows are 9 kcfs in the Kootenai and about 5.5 kcfs in the Flathead mainstem. Higher flows are slightly more productive but with diminished returns due to the channel morphology.

It is important to avoid short-term flow reductions. Short-term flow reductions dewater river substrate. When it is hot and dry (or freezing) the benthos (algae, insects etc.) dry out (or freeze) and die in just a few hours or days. It takes about a month and a half to become productive once a dewatered zone becomes wet again.

To preserve productive aquatic habitat it is important to minimize flow fluctuations caused by hydropower operations. For this reason it is important to remain within allowable ramping rates when changing outflows from either Libby or Hungry Horse. River morphology causes ramp rates to be more restrictive as flows approach minimum flow and less restrictive as stage approaches bank full.

This is because the wetted perimeter changes rapidly at low flows, but at higher flows, wetted perimeter changes less rapidly as flows increase.

The operation proposed in this SOR are designed to enhance the productivity of resident fish because the resulting summer/fall outflows from Libby and Hungry Horse dams will improve aquatic productivity during the critical summer months of July through September.

The proposed flow of 4.0 kcfs at Hungry Horse is similar to last summer's operation. Based on analysis by the Bureau of Reclamation this flow will produce an ending reservoir elevation on September 30 of approximately 3540.