

## **SYSTEM OPERATIONAL REQUEST: FWS #1**

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**FROM:** Susan Martin, Supervisor, U.S. Fish and Wildlife Service, Upper Columbia Fish and Wildlife Office, on behalf of the Libby BiOp Policy Group

**DATE:** May, 11 2007

**SUBJECT:** 2007 Libby Dam Releases for Sturgeon and Bull Trout Augmentation Flows

### **SPECIFICATIONS:**

Based on the May final April-August volume runoff forecast of 6.990 million acre-feet we are within a tier 4 operations year for Kootenai River white sturgeon as defined in the Fish and Wildlife Service's February 2006 Biological Opinion (2006 BO) on operations of Libby Dam. The minimum recommended release volume for sturgeon conservation under these circumstances is 1,170 thousand acre-feet, and we now recommend the following procedures for discharge of at least this minimum volume from Libby Dam:

Ascending limb of hydrograph: Once Kootenai River temperatures at Bonners Ferry reach 8° C, and Kooconusa Reservoir warms such that 20-25 thousand cubic feet per second can be released through the turbines without decreasing Kootenai River temperatures by more than 1.5° C, increase flow at Libby Dam to 20 thousand cubic feet per second (according to ramping rates in the 2006 BO); the ramp up should begin at 6:00 AM on the initial day.

Peak of hydrograph: Ninety six hours (4 days) after the start of the above flow increases, at about 6:00 AM, increase flow at Libby Dam to 25 thousand cubic feet per second. No load following should occur during this period of peak flows. Maintain 25 thousand cubic feet per second flow out of Libby Dam for 14 days.

Descending Limb of the Hydrograph: At about 6:00 AM following 14 days at full discharge, discharge from Libby Dam can be reduced (following prescribed ramping rates) to 20 thousand cubic feet per second. However, this discharge rate may be continued if necessary to reduce the rate of reservoir refill to avoid a double peak following the spring freshet. Note: The intent is to delay reservoir refill until inflows decline below turbine capacity.

At about 6:00 am after three days at 20 thousand cubic feet per second, ramp Libby Dam discharge downward to a minimum of 15K cfs.

Use the remainder of the tiered volume of 1,170 thousand acre-feet to assure a gradual decline from the spring freshet and avoid a double peak. However, this discharge rate may be continued for additional days if you elect to provide sturgeon flow in addition to the minimum recommended.

Provide stable or gradually declining discharge through the end of September.

Additional recommendations may be provided as water supply forecasts are updated. However in the absence of this clarification, beginning approximately June 15, 2007 we recommend that at least the tiered bull trout minimum flow of 9,000 cfs from the 2006 BO be maintained through September.

**JUSTIFICATION:**

A continued effort is needed to provide spawning and incubation flows to meet habitat attributes for depth, velocity and temperature in the Kootenai River as defined in the 2006 BO RPA for Kootenai River white sturgeon (Table 1). At this time, depth and velocity attributes are assumed to be met by maximizing river stage at Bonners Ferry without exceeding flood level. This will be refined when USGS data from 2006 are available to give more direct information on depth and velocity achieved in 2006. Temperature is known to be very important in sturgeon spawning behavior in conjunction with flows, and will be paramount if low-elevation runoff does not occur in a manner that allows us to maximize stage at Bonners Ferry.

Table 1. Kootenai Sturgeon Habitat Attributes from 2006 Libby Dam BiOp.

| Attribute                    | Measure   | Objective  |
|------------------------------|---|--|
| Area: RM 141.4 to RM 159.7   |   |  |
| Timing of Augmentation Flows | May into July (triggered by sturgeon spawning condition), in all years except for Tier 1. | Provide conditions for normal migration and spawning behavior. |

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| Duration of Peak Augmentation Flows for Adult Migration and Spawning | Maximize peak augmentation flows with available water for as many days as possible, up to 14 days during the peak of the spawning period with pulses <sup>1</sup> , in all years except for Tier 1. | Through inseason management, provide peak augmentation flows that lead to a biological benefit for sturgeon to maximize migration and spawning behavior via a normalized hydrograph.                                 |
| Duration of PostPeak Augmentation Flows for Incubation and Rearing   | Maximize postpeak augmentation flows with available water for as many days as possible, up to 21 days, in all years except for Tier 1.  | Through inseason management, provide postpeak augmentation flows that lead to a biological benefit for sturgeon to maximize embryo/freeembryo incubation and rearing via descending limb of a normalized hydrograph. |
| Minimum Flow Velocity <sup>2</sup>                                   | 3.3 ft/s and greater in approximately 60% of the area of rocky substrate in the area of RM 152 to RM 157 during postpeak augmentation flows.  | Provide conditions for spawning and embryo/freeembryo incubation and rearing.  |
| Temperature Fluctuation  | Optimize temperature releases at Libby Dam to maintain 50 degrees F with no more than a 3.6 degree F drop.  | Provide conditions for normal migration and spawning behavior via a normalized thermograph.  |
| Depth at Spawning Sites  | Intermittent depths of 16.5 to 23 ft or greater in 60% of the area of rocky substrate from RM 152 to RM 157 during peak augmentation flows.   | Provide conditions for normal migration and spawning behavior.   |
| Substrate Extent/Spawning Structures                                 | Approximately 5 miles of continuous rocky substrate; create conditions/features that improve the likelihood   | Provide habitat for embryo/freeembryo incubation and rearing.  |

<sup>1</sup> Kootenai sturgeon spawn on the descending limb of the hydrograph. “Pulses” refer to slight reductions in flow during this two week period to initiate spawning.

<sup>2</sup> In order to develop an agreed upon estimate and measurement of the areal extent of the velocity and depth attributes, the Action Agencies shall, together with the Service and in collaboration with other involved parties as needed, develop appropriate assessment tools (e.g., hydrologic models) of the braided reach.

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|                                 | of recruitment success.   |   |
| Minimum Frequency of Occurrence | <p><b><u>To facilitate meeting the attributes via:</u></b><br/> Powerhouse plus 10,000 cfs flow test: the flow test will occur 3 or more times during the next 10 years; 3 times within the next 4 years if conditions allow, and other options are not available to meet this measure.</p> <p><b><u>Habitat improvement projects and other options:</u></b> through adaptive management, as noted in RPA Action 6, implement the habitat projects and other available options no later than 2010 and continuing through the term of the proposed action.</p> | Maximize the probability that habitat attributes necessary for successful inriver sturgeon spawning and recruitment will be provided multiple times during the term of the proposed action. |

The operations described in this document are intended to provide the best opportunity to achieve the attributes listed in Table 1, given the water supply conditions predicted in 2007. We recognize that no firm start date is given in this request. This is due to the desire of sturgeon managers and dam operators to allow for in-season management of dam operations in response to evolving conditions. Previous years' operations have shown that conditions at Libby Dam and the Kootenai River can change rapidly. Therefore allowing for flexibility in operations should aid in achieving the sturgeon habitat attributes.