

## **Revised FCRPS Proposed Actions**

### **I. Additional Flow Capacity at Libby.**

a. The Action Agencies shall, in consultation with the FWS, conduct a spill test by July 2001, which will be designed to evaluate dissolved gas concentrations and mixing downstream from Libby Dam. The Action Agencies shall evaluate spillway maintenance needs associated with spilling water more frequently than under operations of the past 15 years. The Action Agencies shall determine the channel capacity downstream from Libby Dam. The Action Agencies shall submit the results of the spill test, spillway evaluation and channel capacity study with recommendations for any changes to the FWS by December 30, 2001. These recommendations may include specific ideas concerning a formal planning study, if appropriate.

b. By 2002, the Action Agencies shall implement any recommendation of the spill test, spillway evaluation and channel capacity study. If 5,000 cfs cannot be routinely passed over the spillway without water quality impacts, and if channel capacity allows for it, BPA shall fund the Corps of Engineers to prepare a report on alternatives to increase the capacity of releases from Libby for sturgeon flows. Alternatives for consideration include modifications to the spillway and installation of an additional turbine at Libby Dam to increase probability of storage for sturgeon augmentation flows and reduce the risk of spill and harm through dissolved gas supersaturation to bull trout. The report shall be completed by 2003 and include appropriate NEPA documentation. If the findings of the report recommended additional action, the Action Agencies shall seek funding utilizing the report as the justification for such action, with an implementation goal of spring 2004 or as soon as possible thereafter. By spring 2007, the Action Agencies will seek means and provide an additional 5,000 cfs of release capacity at Libby Dam. If either of the two 5,000 cfs increased release increments is determined to be unachievable, the Action Agencies will reinitiate consultation with the FWS.

c. Following implementation of the recommendations identified above in paragraph 1.b., the Action Agencies will seek funding to conduct biological studies, in consultation with the FWS, to determine the effectiveness of the additional flow capacity in improving conditions for sturgeon and in protecting resident bull trout downstream from the dam from potentially harmful effects of dissolved gas supersaturation.

### **II. Ramping rates and flows to moderate impacts on bull trout.**

#### **a. Libby Operations**

1. Libby VARQ Implementation: The Action Agencies will complete appropriate NEPA compliance and coordination with Canada to implement VARQ at Libby as soon as possible but no later than October 2002. If VARQ is not implemented until October

2002, the Action Agencies will reinitiate consultation with the FWS to determine necessary operations in absence of VARQ. By February 2001, the Corps shall develop a schedule to complete all disclosures, NEPA compliance, and Canadian coordination necessary to implement VARQ flood control at Libby.

2. Libby Minimum Flows: The Action Agencies will adopt the following minimum flows from Libby Dam (measured at USGS gauge on the Kootenai River below Libby Dam):

- Year-round instantaneous minimum flow of 4,000 cfs (already in the proposed action).
- Minimum flows between Kootenai River white sturgeon flows and salmon augmentation flows are shown in Table 1 using traditional flood control at Libby and in Table 2 using VARQ flood control at Libby.
- Action Agencies will work with the NMFS to reduce and minimize the second peak for salmon operations.

3. Libby Ramp Rates: The Action Agencies will adopt the following ramp rates:

Note: The following are daily flow changes, not daily averages (measured at USGS Gauge on the Kootenai River below Libby Dam). Daily flow changes are restricted by the hourly rates shown in the following tables.

Note: The recommended ramp rates will be followed except if the recommended ramp rate causes a unit(s) to operate in the rough zone, a zone of chaotic flow in which all parts of a unit are subject to increased vibration and cavitation that could result in premature wear or failure of the units. In this case the project will utilize a ramp rate which allows all units to operate outside the rough zone. The Action Agencies will provide additional information to the FWS describing operations that avoid the "rough zone."

Ramp Up Rates - Libby Dam			
Flow Range	Ramp Up Unit (Daily max)	Ramp Up (Hourly max) 1 Oct – 30 Apr	Ramp Up (Hourly max) 1 May – 30 Sep
4,000 - 6,000 cfs	Limit ramp up to one unit per day (approx. 5,000 cfs per day)	2,000 cfs/hr	1,000 cfs/hr
6,000 - 9,000 cfs	Limit ramp up to one unit per day (approx. 5,000 cfs per day)	2,000 cfs/hr	1,000 cfs/hr
>9,000 - 17,000 cfs	Limit ramp up to two units per day (approx. 10,000 cfs per day)	3,500 cfs/hr	2,000 cfs/hr
> 17,000 cfs	No limit	7,000 cfs/hr	3,500 cfs/hour

Ramp Down Rates - Libby Dam			
Flow Range	Ramp Down Unit	Ramp Down (Hourly max) 1 Oct – 30 Apr	Ramp Down (Hourly max) 1 May – 30 Sep
4,000 - 6,000 cfs	Limit ramp down to 500 cfs per day	500 cfs/hr	500 cfs/hr
>6,000 - 9,000 cfs	Limit ramp down to 1,000 cfs per day	500 cfs/hr	500 cfs/hr
> 9,000 - 17,000 cfs	Limit ramp down to 2,000 cfs per day	1,000 cfs/hr	1,000 cfs/hr
> 17,000 cfs	Limit ramp down to one unit per day (approx. 5,000 cfs per day)	5,000 cfs/hr	3,500 cfs/hr

Daily and hourly ramping rates may be exceeded during flood emergencies to protect health and public safety and in association with power or transmission emergencies.

Variances to ramping rates during years where runoff forecasting or storage shortfalls occur, or variances are necessary to provide augmentation water for other listed species, will be negotiated through the TMT process. This is expected in only the lowest 20<sup>th</sup> percentile of water years.

The feasibility of these ramp rates will be explored through the agreed upon ramping rate studies.

The Action Agencies, in consultation with the FWS, shall develop and initiate a site-specific 10-year ramping rate study beginning in 2001. The first two-year phase of the study (2001-2002) shall evaluate the ramping rates described in this letter and include specifically an assessment of the effectiveness of those ramping rates on improving some aspects of the physical habitat for bull trout in the Kootenai River downstream from Libby Dam. The first phase of the study shall also document and quantify selected biological parameters in the affected area, for example the benthic macroinvertebrate food base of bull trout prey, in the Kootenai River downstream from Libby Dam, to establish a biological baseline. The Action Agencies will provide information to the FWS annually summarizing the previous year's ramping rate operation. Within six months following completion of the first phase of the study, the Action Agencies shall submit to the FWS a report with analysis and recommendations. If the scientific analysis of the first phase of the study suggests that ramping rates other than those described in this letter should be investigated, the Action Agencies shall submit proposed revisions in ramping rates to the FWS for approval to evaluate for effectiveness in improving physical habitat for bull trout.

The second phase of the 10-year study beginning in 2003 shall focus on the biological response in the affected river zone to the ramping rates described in this letter. The second phase of the study will document and quantify selected biological parameters and compare them to the biological baseline established in the first phase of the study. If, however, revised ramping rates are investigated, the second phase of the study will include an assessment of the effectiveness of those ramping rates on improving aspects of physical habitat for bull trout in the Kootenai River downstream from Libby Dam. In either case, the biological response to ramping rates will be quantified and documented. At the end of the 10-year ramping rate study, the Action Agencies shall submit to the FWS a report with analysis and recommendations, incorporating the results of the biological response phase of the study and the effects of various ramping rates on the physical habitat of bull trout. The Action Agencies shall operate consistent with the ramping rates described in this letter, or as they may be revised through agreement with the FWS.

b. Hungry Horse Operations:

1. VARQ Implementation: The Action Agencies will implement VARQ at Hungry Horse starting in the water year that begins October 1, 2000. If VARQ can not be implemented during this water year, the Action Agencies will reinitiate consultation with the FWS to determine necessary operations in the absence of VARQ.

2. Minimum Flows: The Action Agencies will adopt a sliding scale for minimum flows in the South Fork and mainstem Flathead rivers, as measured at the Columbia Falls gauge.

Hungry Horse: The minimum flow measured below Hungry Horse Dam shall be determined based on the March final runoff forecast for Hungry Horse Reservoir for the

period of April 1 to August 31.

- April through August forecast is > 1,790 KAF then the minimum flow is 900 cfs.
- April through August forecast is < 1,190 KAF then the minimum flow is 400 cfs.
- April through August forecast is between 1,190 and 1,790 KAF then the minimum flow shall be linearly interpolated between 400 and 900 cfs.
- The minimum flow in the South Fork can be lowered to 145 cfs when the river reaches flood stage at Columbia Falls (13 feet).

Columbia Falls: The minimum flow measured at the USGS gauge at Columbia Falls will be determined monthly starting with the January forecast, with final flows based on the March final runoff forecast for Hungry Horse Reservoir for the period of April 1 to August 31.

- April through August forecast is > 1,790 KAF then the minimum flow is 3,500 cfs.
- April through August forecast is < 1,190 KAF then the minimum flow is 3,200 cfs.
- April through August forecast is between 1,190 and 1,790 KAF then the minimum flow shall be linearly interpolated between 3,200 and 3,500 cfs.

The Action Agencies will work with the FWS and NMFS to reduce and minimize the second peak for salmon operations. Reduction of the second peak can be achieved by starting discharges of salmon augmentation water when flood control operations are completed and setting releases so that flows at Columbia Falls follow a more normal recession hydrograph and all augmentation water is released by August 31.

3. Ramp Rates: The Action Agencies will adopt the following ramp rates:

Note: The following are instantaneous flow measurements, not daily averages. Daily flow changes are restricted by the hourly rates shown in the following tables.

Note: The recommended ramp rates will be followed except if the recommended ramp rate causes a unit(s) to operate in the rough zone, a zone of chaotic flow in which all parts of a unit are subject to increased vibration and cavitation that could result in premature wear or failure of the unit. In this case the project will utilize a ramp rate that allows all units to operate outside the rough zone.

Ramp Up Rates - Hungry Horse Dam		
Flow Range (measured at Columbia Falls)	Ramp Up Unit	Ramp Up (Hourly max)
3,500 - 6,000 cfs	Limit ramp up 1,800 cfs per day	1,000 cfs/hour
>6,000 - 8,000 cfs	Limit ramp up 1,800 cfs per day	1,000 cfs/hour
>8,000 - 10,000 cfs	Limit ramp up 3,600 cfs per day	1,800 cfs/hour
> 10,000 cfs	No limit	1,800 cfs/hour

Ramp Down Rates - Hungry Horse Dam		
Flow Range (measured at Columbia Falls)	Ramp Down Unit	Ramp Down (Hourly max)
3,500 - 6,000 cfs	Limit ramp down to 600 cfs per day	600 cfs/hour
>6,000 - 8,000 cfs	Limit ramp down to 1,000 cfs per day	600 cfs/hour
> 8,000 - 12,000 cfs	Limit ramp down to 2,000 cfs per day	1,000 cfs/hour
> 12,000 cfs	Limit ramp down to 5,000 cfs per day	1,800 cfs/hour

Daily and hourly ramping rates may be exceeded during flood emergencies to protect health and public safety and in association with power or transmission emergencies.

Variations to ramping rates during years where runoff forecasting or storage shortfalls occur, or variations are necessary to provide augmentation water for other listed species, will be negotiated through the TMT process. This is expected in only the lowest 20<sup>th</sup> percentile of water years.

The feasibility of these ramp rates will be explored through the agreed upon ramping rate studies.

The Action Agencies, in consultation with the FWS, shall develop and initiate a site-specific 10-year ramping rate study beginning in 2001. The first two-year phase of the study (2001-2002) shall evaluate the ramping rates described in this letter and include specifically an assessment of the effectiveness of those ramping rates on improving some aspects of the physical habitat for bull trout in the Flathead River downstream from Hungry Horse Dam. The first phase of the study shall also document and quantify selected biological parameters in the affected area, for example the benthic macroinvertebrate food base of bull trout prey, in the Flathead River downstream from

Hungry Horse Dam, to establish a biological baseline. The Action Agencies will provide information to the FWS annually summarizing the previous year's ramping rate operation. Within six months following completion of the first phase of the study, the Action Agencies shall submit to the FWS a report with analysis and recommendations. If the scientific analysis of the first phase of the study suggests that ramping rates other than those described in this letter should be investigated, the Action Agencies shall submit proposed revisions in ramping rates to the FWS for approval to evaluate for effectiveness in improving physical habitat for bull trout.

The second phase of the 10-year study beginning in 2003 shall focus on the biological response in the affected river zone to the ramping rates described in this letter. The second phase of the study will document and quantify selected biological parameters and compare them to the biological baseline established in the first phase of the study. If revised ramping rates are investigated the second phase of the study will include an assessment of the effectiveness of those ramping rates on improving aspects of physical habitat for bull trout in the Kootenai River downstream from Libby Dam. In either case, the biological response to ramping rates will be quantified and documented. At the end of the 10-year ramping rate study, the Action Agencies shall submit to the FWS a report with analysis and recommendations, incorporating the results of the biological response phase of the study and the effects of various ramping rates on the physical habitat of bull trout. The Action Agencies shall operate consistent with the ramping rates described in this letter, or as they may be revised through agreement with the FWS.

### **III. Kootenai River White Sturgeon Flows**

The Action Agencies will store and supply, at a minimum, water volumes based upon a water availability or "tiered" approach as defined in the table below. This water is available for use in May and June, and is measured as a volume out of Libby Dam above minimum flow of 4,000 cfs. Accounting of these total tiered volumes shall begin when the FWS determines benefits to conservation of sturgeon are most likely to occur. This will generally occur between mid-May and mid-June. Use of this water is subject to the usual constraints of flood control (flood stage is 1764 ft msl at Bonners Ferry, Idaho) and water quality, specifically dissolved gas supersaturation. These flows assume minimum flow for bull trout in July: 6,000 cfs in the tier 1; 7,000 cfs in tier 2; 8,000 cfs in tier 3; and 9,000 cfs in the tiers 4, 5, and 6. These tiers were developed assuming traditional flood control rule curves are used at Libby. Actual flow releases would be shaped based on seasonal requests from the FWS and coordination with Technical Management Team.

Table 1. "Tiered" volumes of water for sturgeon flow enhancement to be provided from Libby Dam according to the April - August volume runoff forecast at Libby. Actual flow releases would be shaped according to seasonal requests by the FWS and in-season management of water actually available.

Forecast runoff Volume (maf*) at Libby	Sturgeon flow volume (maf) from Libby Dam on May-June	Min bull trout flows between sturgeon and salmon flows
0.00 < forecast < 4.80	Sturgeon flows not requested	6 kcfs
4.80 < forecast < 6.00	0.4	7 kcfs
6.00 < forecast < 6.70	0.5	8 kcfs
6.70 < forecast < 8.10	0.7	9 kcfs
8.10 < forecast < 8.90	1.2	9 kcfs
8.90 < forecast	1.6	9 kcfs

\*maf = million acre-feet

When VARQ or similar flood control rule curves are implemented at Libby Dam, the volume of water from Libby Dam can be increased in several tiers. The following volumes are used for modeling purposes. Final volumes will be based on further studies and NEPA compliance for implementing VARQ at Libby.

Table 2. VARQ “tiered” volumes of water for sturgeon flow enhancement to be provided from Libby Dam according to the April - August volume runoff forecast at Libby. Actual flow releases would be shaped according to seasonal requests for the FWS and in-season management of water actually available.

Forecast runoff Volume (maf*) at Libby	Sturgeon flow volume (maf) from Libby Dam	Min bull trout flows between sturgeon and salmon flows
0.00 < forecast < 4.80	Sturgeon flows not requested	6 kcfs
4.80 < forecast < 6.00	0.8	7 kcfs
6.00 < forecast < 6.70	1.0	8 kcfs
6.70 < forecast < 8.10	1.1	9 kcfs
8.10 < forecast < 8.90	1.2	9 kcfs
8.90 < forecast	1.6	9 kcfs

#### IV. Annual Operating Plan

a. Action: The Action Agencies, coordinating with NMFS and FWS, will annually develop 1- and 5-year plans to implement the measures described in their proposed action.

b. Discussion: The NMFS biological opinion on FCRPS operations and configuration

will call for the Action Agencies to annually develop 1- and 5-year plans to implement the various measures described in that biological opinion (See July 27, 2000, public draft NMFS biological opinion § 9.1.4, p. 9-3, and § 9.5, p. 9-25, et seq.) The plans will cover all operations for the FCRPS, including those affecting species of concern to the FWS. Id. Consequently, they will encompass the proposed action described in this FWS biological opinion, and the Action Agencies will submit their plans to FWS as well as to NMFS.

As expressed in the NMFS biological opinion, the 1-year plan will describe measures that will be funded or carried out during the coming fiscal year. The first 1-year plan will be completed by September 1, 2001, and annually thereafter on a date agreed upon by the Action Agencies, NMFS, and FWS. See July 27, 2000, public draft NMFS biological opinion § 9.5, p.9-27. The plan will include a water management plan for FCRPS operation. Id. at 9-29.

FWS will review the 1-year plan for consistency with the FWS biological opinion and issue a finding as to whether the plan is adequate to provide consistency.

## **V. Allowance for Emergency Situations**

Action: To ensure the reliability of power supply and transmission service, the annual plans shall allow power system operators limited exceptions to providing the flow, spill, and project operations measures specified in this proposal. An emergency may be declared by the power system operators when a circumstance exists that threatens firm loads or voltage and transmission stability. Communication and response to emergency situations shall be handled in accordance with the September 22, 2000, "Protocols for Emergency Operations in Response to Generation or Transmission Emergencies" or as revised. In the event that Federal project operators or the Regional Forum consider the power emergency to be of either exceptional magnitude or extended duration, the emergency must be elevated by one of these entities to the regional agency executives or directors, for discussion and consideration of appropriate actions. Curtailing fish and wildlife operations should be viewed as a last resort action and should not be used in lieu of maintaining an adequate and reliable power system. If curtailments to fish and wildlife operations exceed this standard, the power system should be reevaluated and upgraded to the extent needed to meet the standard.

It should be understood that the emergency concept includes taking actions to prevent realization of pending emergency situations. Interruptions or adjustments in water management actions may also occur due to unforeseeable flood control or other emergencies. The Action Agencies would view these actions similarly to the power emergencies as noted above and respond accordingly.

## **VI. Annual Report About Transmission Stability at Libby and Hungry Horse.**

By February 1, 2002, and February 1, 2003, the BPA will submit to FWS an annual

report describing the frequency and duration of flow changes at Hungry Horse and Libby Dams needed to provide voltage stability.

## **VII. Transmission and Voltage Stability Studies**

The action agencies will conduct the following studies:

Libby. The Action Agencies, in consultation with the FWS, shall develop a study investigating the costs and feasibility of options that will preclude the use of Libby Dam, as currently proposed, to ensure voltage and transmission stability, including consideration of additional transmission line(s) and other technical or operational options.

Hungry Horse. The Action Agencies, in consultation with the FWS, shall develop a study investigating the costs and feasibility of options that will preclude the use of Hungry Horse Dam, as currently proposed, to ensure voltage stability to the Flathead Valley. The study would consider, among other options, construction of an additional transmission line(s), as well as consideration of whether the presence of a re-regulation dam downstream from Hungry Horse would affect voltage stability in the Flathead Valley.

The Action Agencies shall complete these studies on transmission stability, except for consideration of the re-regulation dam, within three years after the final FWS biological opinion. The Action Agencies will initiate a feasibility study of the re-regulation dam if the voltage stability studies show that a re-regulation dam is necessary and if Congress appropriates funds for this purpose. In the latter case a feasibility report with recommendations shall be completed within four years of study initiation.