



## U.S. Fish & Wildlife Service - Pacific Region

### *Biological Opinion on Federal Columbia River Power System Operations*

*California   Nevada   Idaho   Oregon   Washington   Hawaii   Pacific Islands*

The U.S. Fish and Wildlife Service's Biological Opinion assesses impacts of Federal Columbia River Power System Operations on Kootenai River white sturgeon and bull trout, both threatened species protected under the Endangered Species Act. To open these files, see directions below.

- [Biological Opinion \(pdf file 226KB\) Biop.pdf](#)
- [Appendix A: Letter](#)
- [Appendix A: Attachment](#)
- [Appendix B - Bull Trout Effects Table](#)
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Fish Management Office

Ms. Anne Badgley  
Regional Director  
U.S. Fish and Wildlife Service  
911 NE Eleventh Avenue  
Portland, Oregon 97232-4181

Dear Ms. Badgley:

I am writing this letter on behalf of the Bonneville Power Administration, Army Corps of Engineers, and Bureau of Reclamation (collectively, the Action Agencies). In December 1999, these Action Agencies submitted to the U.S. Fish and Wildlife Service (FWS) a biological assessment on the effects of operation and configuration of the Federal Columbia River Power System (FCRPS) on threatened and endangered species and their critical habitat and requested formal consultation. Since December, the FWS and Action Agencies have discussed and analyzed ways to reduce adverse impacts on listed species of concern to FWS.

A major purpose of the proposed action is to maintain flexibility to operate the FCRPS, within defined parameters, to adjust operations in a timely manner to serve the FCRPS project's multiple functions under constantly changing conditions. In consideration of our interagency discussions and exchanges of views and biological information, the Action Agencies have chosen to further modify and clarify the parameters in the December 1999 biological assessment, subject to appropriate analysis pursuant to the National Environmental Policy Act (NEPA) and other pertinent Federal statutes, if needed. The following items summarize the modifications and clarifications to the originally proposed actions. A detailed description is included as an attachment to this letter.

a. Kootenai River White Sturgeon Flows: In an attempt to better clarify yearly operations for sturgeon flows at Libby Dam, we are proposing that a specific volume of water be identified for sturgeon flows that could be shaped in-season within existing project requirements through the Technical Management Team (Attached table 1). Until VARQ at Libby can be implemented, the volumes range from 0 to 1.6 MAF from the lowest runoff years to the highest runoff years. These volumes will be revised when VARQ is implemented.

b. Additional Capacity at Libby: The Action Agencies will seek appropriations to increase the hydraulic capacity of the project so that additional water can be released to aid sturgeon spawning without increasing total dissolved gas.

c. Ramping Rates: Year-round ramping rates at Libby and Hungry Horse Dams are proposed based on discussions with and comments from the FWS and State of Montana. These ramping restrictions are intended to provide additional protection of listed bull trout in the rivers below these projects.

d. Emergency Procedures: In order to accommodate reliability of power supply and transmission service, and flood control, there may be instances where operations for listed species may need to be modified. We proposed procedures to ensure that appropriate coordination and examination of alternatives are conducted, if possible, prior to any changes in ESA operations.

e. Annual Operating Plans: In order to maintain consistency with the National Marine Fisheries Service (NMFS) consultation discussions, we are proposing to include in the 1-year and 5-year planning process those actions and operations included in the FWS biological opinion.

f. Transmission studies and annual reports: Libby and Hungry Horse Dams are operated to provide system transmission reliability. Such operations can involve rapid increases in powerhouse discharges, which potentially impact downstream bull trout. In order to better understand and determine potential remedial measures, by February 1, 2002, and February 1, 2003, BPA will provide annual reports on the frequency and duration of the increases in discharge. BPA will also conduct studies to determine the feasibility of alternatives that would reduce the use of these projects for transmission reliability.

We believe the above measures would reduce adverse impacts to federally listed sturgeon and bull trout. In addition to consultations with FWS, the Action Agencies have also submitted a biological assessment to and engaged in consultation with the NMFS on endangered and threatened species of concern to them. The Action Agencies understand that FWS and NMFS are coordinating their reviews of FCRPS operations and configuration so that FWS is aware of the measures described in the July 2000 NMFS draft biological opinion, plus any subsequent revisions that may appear in the final NMFS biological opinion.

Please consider these changes as you prepare your biological opinion.

Sincerely,

Carl A. Strock  
Brigadier General, U.S. Army  
Division Engineer

Enclosure

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## **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.

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 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.

Appendix B. Summary Table of Bull Trout Subpopulations Effects from FCRPS facilities.

Basin	Subpopulation	Count	Affected By FCRPS Operation	Partial or Complete Migration Barrier	Lost Productivity due to Restriction or loss of	Entrainment FCRPS Facility	Status	Trend	Risk of stochastic extirpation
Lewis	Yale	1	Y	BD	N/A	N/A	D	U	N
	Swift	1	Y	BD	N/A	N/A	D	S	N
Willamette	McKenzie	1	Y	BD	N/A	N/A	D	U	Y
	Lower McKenzie	1	Y	BD	N/A	N/A	D	I	N
	South Fork McKenzie	1	Y	BD	N/A	N/A	D	D	Y
Hood River	Laurance Lake	1	Y	BD	BD	BD	D	U	Y
	Middle Fork	1	Y	BD	BD	BD	D	U	N
Klickitat	Klickitat	1	Y	BD,TD	BD	BD	D	U	U
White Salmon	White Salmon River	1	Y	BD	BD	BD	D	U	U
Deschutes	Odell Lake	1	N	N/A	N/A	N/A	D	U	Y



	Metolius River-Lake	1	Y	TD, JD	BD, TD	BD	S	I	N
	Lower Deschutes	1	Y	TD, JD	BD, TD	BD	U	U	N
John Day	Upper John	1	Y	JD	BD, TD, JD	JD	D	U	N
	Middle Fork	1	Y	JD	BD, TD, JD	JD	D	U	N
	North Fork	1	Y	JD	BD, TD, JD	JD	D	U	N
Umatilla	Meacham	1	Y	JD,MN	BD, TD,	JD	D	U	Y
	North and South Forks	1	Y	JD,MN	BD, TD, JD, MN	JD	D	U	N
Walla Walla River	North and South Forks Walla Walla	1	Y	MN, IH	BD, TD, JD, MN	MN	D	U	N
	Mill Creek	1	Y	MN, JD	BD, TD,	MN	D	U	N
	Touchet River	1	Y	MN, JD	BD, TD,	MN	D	U	N
Yakima	Ahtanum	1	Y	MN	BD, TD,	MN	D	D	Y
	Naches River	1	Y	MN	BD, TD,	MN	D	U	N
	Rimrock	1	Y	MN	BD, TD,	MN	S	I	N

	Bumping	1	Y	MN	BD, TD,	MN	D	D	Y
	North Fork	1	Y	MN	BD, TD,	MN	D	D	Y
	Cle Elum	1	Y	MN	BD, TD,	MN	D	D	Y
	Kachess	1	Y	MN	BD, TD,	MN	D	D	Y
	Keechelus	1	Y	MN	BD, TD,	MN	D	D	Y
Wenatchee	Lake	1	Y	MN, CJ	BD, TD,	MN	S	S	N
	Icicle Creek	1	Y	MN, CJ	BD, TD,	MN	D	U	Y
	Ingalls Creek	1	Y	MN, CJ	BD, TD,	MN	D	U	Y
Entiat River	Entiat River	1	Y	MN, CJ	BD, TD,	MN	D	D	N
Methow	Methow	1	Y	CJ	BD, TD,	MN	D	U	N
	Lost River	1	Y	CJ	BD, TD,	MN	D	U	N
	Goat Creek	1	Y	CJ	BD, TD,	MN	D	U	Y
	Upper Early	1	Y	CJ	BD, TD,	MN	D	U	Y
Spokane	Spokane	1	N	N/A	N/A	N/A	D	D	N
Pend Oreille	Pend Oreille River	1	Y	AF	N/A	AF	D	D	N

	Priest Lake	1	Y	AF	N/A	AF	D	D	N
	Pend Oreille	1	Y	AF	N/A	AF	D	D	N
Kootenai	Upper	1	Y	LD	N/A	LD	U	U	N
	Sophie Lake	1	N	LD	N/A	N/A	U	U	Y
	Middle	1	Y	LD	N/A	N/A	U	U	N
	Lower	1	Y	LD	N/A	N/A	U	U	N
	Bull Lake	1	Y	LD	N/A	N/A	U	U	N
Flathead	Flathead	1	Y	HH	N/A	N/A	D	D	N
	Whitefish	1	Y	HH	N/A	N/A	D	D	N
	Upper Whitefish	1	N	N/A	N/A	N/A	U	U	Y
	Tally Lake	1	Y	HH	N/A	N/A	D-E	D-E	Y
	Upper	1	Y	HH	N/A	N/A	D	D	N
	Lower	1	Y	HH	N/A	N/A	D-E	E	N
	Cyclone Lake	1	N	N/A	N/A	N/A	U	U	Y
	Frozen Lake	1	N	N/A	N/A	N/A	U	U	Y
	Kintla Lake	1	N	N/A	N/A	N/A	D	D	Y

	Upper Kintla	1	N	N/A	N/A	N/A	U	U	Y
	Cerulean	1	N	N/A	N/A	N/A	U	U	Y
	Upper Quartz	1	N	N/A	N/A	N/A	U	U	N
	Middle	1	N	N/A	N/A	N/A	U	U	N
	Lower Quartz	1	N	N/A	N/A	N/A	U	U	Y
	Akokala	1	N	N/A	N/A	N/A	U	U	Y
	Logging Lake	1	N	N/A	N/A	N/A	U	U	Y
	Bowman	1	N	N/A	N/A	N/A	D	D	Y
	Arrow Lake	1	N	N/A	N/A	N/A	E	E	Y
	Trout Lake	1	N	N/A	N/A	N/A	U	U	Y
	Lower Isabel	1	N	N/A	N/A	N/A	U	U	Y
	Upper Isabel	1	N	N/A	N/A	N/A	U	U	Y
	Harrison	1	N	N/A	N/A	N/A	U	U	Y
	Lake	1	Y	HH	N/A	N/A	D	D	Y
	Lincoln Lake	1	N	N/A	N/A	N/A	D	D	Y

South Fork Flathead	Hungry Horse Reservoir	1	Y	HH	N/A	HH	S	S	N
	Big Salmon	1	Y	HH	N/A	HH	D	U	Y
	Doctor Lake	1	Y	HH	N/A	HH	U	U	Y
Swan River	Swan Lake	1	Y	HH	N/A	N/A	S	I	N
	Lindbergh	1	Y	HH	N/A	N/A	D	U	Y
	Holland Lake	1	Y	HH	N/A	N/A	D	U	Y
Clark Fork	Cabinet	1	Y	AF	N/A	N/A	D	U	N
	Noxon	1	Y	AF	N/A	N/A	D	U	N
	Middle Clark	1	Y	AF	N/A	N/A	U	U	N
	Upper Clark	1	Y	AF	N/A	N/A	U	U	N
Bitterroot	Bass Creek	1	Y	AF	N/A	N/A	D	U	Y
	Bear Creek	1	Y	AF	N/A	N/A	D	U	Y
	Big Creek	1	Y	AF	N/A	N/A	D	U	Y
	Burnt Fork Bitterroot	1	Y	AF	N/A	N/A	D	U	Y
	Fred Burr	1	Y	AF	N/A	N/A	D	U	Y

	Gold Creek	1	Y	AF	N/A	N/A	D	U	Y
	Kootenai	1	Y	AF	N/A	N/A	D	U	Y
	Lost Horse	1	Y	AF	N/A	N/A	D	U	Y
	Mill Creek	1	Y	AF	N/A	N/A	D	U	Y
	One Horse	1	Y	AF	N/A	N/A	D	U	Y
	Railroad	1	Y	AF	N/A	N/A	D	U	Y
	Reimel Creek	1	Y	AF	N/A	N/A	D	U	Y
	Roaring Lion	1	Y	AF	N/A	N/A	D	U	Y
	Sawtooth	1	Y	AF	N/A	N/A	D	U	Y
	Sleeping	1	Y	AF	N/A	N/A	D	U	Y
	South Fork	1	Y	AF	N/A	N/A	D	U	Y
	Sweathouse	1	Y	AF	N/A	N/A	D	U	Y
	Sweeney	1	Y	AF	N/A	N/A	D	U	Y
	Tincup Creek	1	Y	AF	N/A	N/A	D	U	Y
	Tolan Creek	1	Y	AF	N/A	N/A	D	U	Y

	Warm	1	Y	AF	N/A	N/A	D	U	Y
	Watchtower	1	Y	AF	N/A	N/A	D	U	Y
	West Fork	1	Y	AF	N/A	N/A	D	U	Y
	Willow Creek	1	Y	AF	N/A	N/A	D	U	Y
	Skalkaho	1	Y	AF	N/A	N/A	D	U	N
	East Fork Bitterroot	1	Y	AF	N/A	N/A	D	U	N
	West Fork Bitterroot	1	Y	AF	N/A	N/A	D	U	N
Blackfoot	Blackfoot	1	Y	AF	N/A	N/A	D	U	N
Tucannon	Tucannon	1	Y	LM, LG	BD, TD,	LM	U	U	N
	Pataha Creek	1	Y	LM, LG	BD, TD,	LM	D	U	Y
Clearwater River	North Fork Clearwater River	1	Y	DW, LN	BD, TD, JD, MN, IH, LM,	DW	U	U	N
	Upper Clearwater River	1	Y	DW, LN	BD, TD, JD, MN, IH, LM,	LN	U	U	N

	Shotgun Creek	1	N	N/A	N/A	N/A	U	U	Y
Asotin Creek	North Fork Asotin Creek	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	D	U	N
	Charlie Creek	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	D	U	Y
Grande Ronde	Grande Ronde	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	U	U	N
Imnaha River	McCully Creek	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	D	U	N
	Big Sheep Creek	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	D	U	N
	Little Sheep Creek	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	U	U	Y
	Imnaha River	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	U	U	N



Salmon River	Salmon River	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	U	D	N
	Little Salmon-Rapid River	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	D	D	N
Pine Creek	Meadow-Clear creeks	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	D	U	U
	Upper Pine Creek	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	D	U	U
	East Pine Creek	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	D	U	U
	Elk Creek	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	D	U	U
Powder River	Powder River	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	D	U	N
	North Powder River	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	D	U	N

	Big Muddy Creek	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	D	U	Y
Malheur River	Middle Fork Malheur River	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	D	U	N
	North Fork Malheur River	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	D	U	N
Weiser River	Little Weiser River	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	D	U	N
	East Fork Weiser River	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	D	U	Y
Payette	Black Canyon Reservoir	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	U	U	N
	South-Middle forks Payette River	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	U	U	N
	Deadwood Reservoir	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	U	U	N

	North Fork Payette River	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	U	U	Y
Boise River	Arrowrock Reservoir	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	U	U	N
	Anderson Ranch Reservoir	1	Y	LN	BD, TD, JD, MN, IH, LM,	LN	U	U	N
Little Lost	Wet Creek	1	N	N/A	N/A	N/A	D	U	Y
	Williams	1	N	N/A	N/A	N/A	D	U	Y
	Little Lost	1	N	N/A	N/A	N/A	U	U	N

*Questions and Answers about*  
**Fish and Wildlife Service Biological Opinion on  
Effects to Listed Species from Operation of the  
Federal Columbia River Power System**

December 21, 2000

***1. Why did the Fish and Wildlife Service (Service) develop this biological opinion?***

Under the Endangered Species Act, Federal agencies are required to consult with the Service and/or the National Marine Fisheries Service (NMFS) (depending on the species affected) for actions which may affect listed species. The Service, in turn, is required to produce a biological opinion analyzing the effects of the proposed actions on the listed species it is responsible for, and prescribing appropriate alternatives or measures to minimize such effects.

***2. What species are addressed in the Service biological opinion?***

The current biological opinion addresses operation of the Federal Columbia River Power System (FCRPS) and its effects on bull trout, a threatened species, and Kootenai River white sturgeon, which is listed as endangered. Effects to bald eagles were addressed in the March 1, 1995 biological opinion on FCRPS operations. Since FCRPS operations will not change in such a way as to substantially alter the effects or conclusions of that opinion, bald eagles were not considered further in the current opinion.

***3. What dams and activities are addressed in the current biological opinion?***

The Service's biological opinion was developed after consultations with the U.S. Army Corps of Engineers and the Bureau of Reclamation, which operate the Federal dams, and the Bonneville Power Administration, which sells the electricity generated at the dams. The dams included in the Service's biological opinion are: Bonneville, The Dalles, John Day and McNary dams (Lower Columbia River facilities); Ice Harbor, Lower Monumental, Little Goose, Lower Granite and Dworshak dams (Lower Snake River and Clearwater facilities); Grand Coulee, Albeni Falls, Libby, Hungry Horse, and Chief Joseph dams and Banks Lake Pump Storage (Upper Columbia River facilities). These projects are located in the states of Oregon, Washington, Idaho, and Montana. The proposed action is the operation and maintenance of these projects which comprise the FCRPS.

***4. Does the Service analysis result in a "jeopardy" conclusion for bull trout or sturgeon?***

Through the consultation process, the action agencies have agreed to implement additional measures, and clarified their proposed action. These measures address many of the concerns with effects of FCRPS operations to bull trout. Therefore, the Service concluded that operation of the FCRPS would not jeopardize the survival and recovery of bull trout.

The Service is issuing a jeopardy opinion for sturgeon. The most significant concern is the current status

of the species, because sturgeon populations have not significantly improved since a jeopardy opinion was first issued on FCRPS operations in 1995. Reasonable and prudent measures to avoid jeopardy address four main areas: water storage, increased release capacity at Libby Dam, flood stage constraints, and a conservation aquaculture program.

***5. Has the Service issued biological opinions prior to the current opinion on operation of the Federal Columbia River Power System (FCRPS), and what species were addressed?***

Several biological opinions and conference opinions have been issued by the Service on FCRPS operations. Species addressed through formal consultation in the past include: Kootenai River white sturgeon; Snake River snails, including Idaho spring snail, Snake River physa, Utah valvata snail, Bliss Rapids snail; and bald eagle. In addition, to date, the Service has concurred with the action agencies' determination that FCRPS operations were not likely to adversely affect gray wolf, grizzly bear, peregrine falcon, or any listed plants. Since these initial consultations were completed, peregrine falcon has been de-listed by the Service.

***6. What about dams and activities on the Snake River upstream of Lower Granite Dam?***

This opinion does not include those federal facilities on the Snake River upstream of Lower Granite Dam, since they were addressed in a separate opinion issued in October, 1999. (*Note: Dworshak Dam, which is on the Clearwater River upstream of Lower Granite Dam, is included in the current Opinion.*) That opinion covered listed snails and bull trout. Those species are, however, considered in the "all-H strategy" for the conservation of aquatic species in the Columbia River Basin.

***7. Has the Service developed biological opinions on the effects on listed resident fish and wildlife of other Federal dams in the Columbia River basin that are not part of the FCRPS?***

Other Columbia River basin consultations separately are addressing or have addressed operations of Federal dams and related activities in tributaries including the Yakima River Basin, Willamette River Basin, and the Umatilla River Basin, and, as noted above, in the Snake River upstream of Lower Granite reservoir.

***8. Does this biological opinion address breaching of Snake River dams?***

This opinion does not analyze the effects of the possible breaching of the four lower Snake River dams because that action is not being proposed at this time. If a decision is made in the future to pursue breaching the dams, consultation will be conducted at that time on the effects of that action on listed resident fish and wildlife.

***9. Will this opinion affect the operation of the main stem dams in the lower Snake River and the lower Columbia River?***

Impacts to bull trout and Kootenai River white sturgeon occur mostly in the upper reaches of the basin,

hence, recommended changes in operations focus on the Upper Columbia River dams. Bull trout are known to occur in the main stem Columbia and lower Snake rivers but their use of these areas is not well known. Therefore, the primary requirements of the opinion for facilities in these areas are to: 1) require monitoring to better determine presence of bull trout; 2) ensure that upstream and downstream passage for bull trout is not impeded; 3) determine the effect of flow fluctuations on stranding or entrapment of bull trout; and 4) minimize uncontrolled spill and the effects of total dissolved gas on the species.

***10. How will this opinion affect operation of dams in the Upper Columbia River?***

The focus of consultations on operations at Libby and Hungry Horse dams and their effects to bull trout has been on: 1) ramping rates; 2) minimum flows; 3) seasonal water management; 4) total dissolved gas concerns; and 5) fish passage and entrainment. The action agencies and the Service have agreed on the need for ramping rates and minimum flows. Operations at Albeni Falls Dam to benefit kokanee salmon, a key food source for bull trout in Lake Pend Oreille, are also addressed in this opinion. With regard to Kootenai River white sturgeon, requirements in the opinion focus on operations of Libby Dam to provide late spring flows to help “trigger” spawning, and to provide for rearing habitat for the fish.

***11. Has critical habitat for sturgeon been designated?***

A court decision in August, 2000, ordered the Service to propose the designation of critical habitat for Kootenai River white sturgeon. The Service was expected to publish the proposed designation on December 21, 2000, and public hearings on the proposal are scheduled for January 2001. A final rule designating critical habitat will not be made until August 2001. Adverse modification to critical habitat was not a factor considered in the current jeopardy opinion on FCRPS operations.

***12. What efforts have you made to meet with affected States and Tribes to discuss the opinion, and incorporate their concerns into the document?***

Meetings were held with affected States and Tribes in the winter, spring and summer of 2000 to discuss the FCRPS section 7 consultation process. In those meetings, the action agencies, the Service and NMFS discussed some of the issues being addressed in the consultation, and sought input from the States and Tribes as to issues they wanted considered. The Service's draft opinion was also provided to the States and Tribes for technical review and comment in summer 2000. That input was used in developing this final biological opinion.

***13. What efforts have you made to assure the requirements of the Service's opinion do not conflict with those of the NMFS opinion on salmon?***

Coordination between the NMFS and the Service has been ongoing during the preparation of the draft and final biological opinions. Both agencies have addressed issues where conflict might arise, and collaborated on solutions to meet both the needs of the listed salmon and steelhead, and the bull trout

and sturgeon. Specifically, the NMFS and Service have agreed to operations (ramping rates and minimum flows) at Hungry Horse and Libby dams that will benefit all species, and implementation of modified flood control operations at both dams to store additional water for resident fish and salmon. In low water years, the agencies have agreed to work out details of operation through the Technical Management Team (TMT) process to balance the needs of listed species.

***14. What efforts have you made in the opinion to address concerns of the State of Montana with regard to Hungry Horse Reservoir issues?***

The Service has been coordinating with the Montana Department of Fish, Wildlife and Parks (MFWP) to better address listed species and reservoir management issues. Specifically, the Service, NMFS and the action agencies, in coordination with MFWP, have slightly revised the minimum flows and ramping rates provided by MFWP in their comments on the draft opinion. Those revised requirements have been adopted in the opinion.

***15. What efforts have you made in the opinion to address concerns of the State of Idaho with regard to Lake Pend Oreille/Albeni Falls Dam issues?***

Since their introduction into Lake Pend Oreille 60 to 70 years ago, kokanee salmon have grown into a well established food base for bull trout and other resident species. Kokanee numbers in the lake have declined greatly in recent years, a concern of the Idaho Department of Fish and Game (IDFG). In the biological opinion, the Service recommends continuation of the IDFG kokanee survival study for at least another 6 years. Pend Oreille Lake winter elevations would be lowered in 2001 to 2051 feet, and would be maintained at 2055 feet in 2002. Prior to winter operations in 2003, peer review of the existing study will take place. The review will lead to a recommendation about the frequency of varying the lake winter elevation between maintenance at 2055 feet, and lowering to 2051 feet. Until the peer review is completed, the Service recommendation is for 3 years at the higher elevation, and 1 year at the lower elevation.

***16. What efforts have you made in the opinion to address concerns with regard to flooding at Bonners Ferry, Idaho from high flows from Libby Dam?***

In the 1995 biological opinion on Libby operations and effects on sturgeon, the Service recommended a survey of the condition of the levees constructed by the Corps of Engineers in 1961. There was concern that the condition of the local levees may represent a constraint to future sturgeon recruitment flow recommendations. The Corps has recently initiated a study to evaluate the condition of the levees, and to determine if higher water tables in the Bonners Ferry area also lead to ground water seepage and localized flooding. The Service will be an active participant in the study with the Corps and local citizens. Until results of these studies are available (likely within five years), the Service will not request sturgeon spawning flows that would result in water elevations at levees in Bonners Ferry exceeding 1764 feet.

***17. What will be the impact of the opinion on reservoir re-fill in low water years?***

The action agencies propose to implement the flood control procedures, known as VARQ, in the Columbia River basin. They propose to conduct a NEPA analysis prior to adoption of VARQ. The VARQ procedures increase the probability of refill of Lake Koochanusa above Libby Dam, and of Hungry Horse reservoir. The Service has adopted a tiered approach to provide flows for sturgeon in proportion to the water supply actually available in any given year. Further, to assure reservoir refill, the Service does not plan to recommend sturgeon spawning flows during the lowest 20<sup>th</sup> percentile of water years.

***18. What impacts are sturgeon or bull trout water storage recommendations in Lake Koochanusa and Hungry Horse Reservoir expected to have on Lake Roosevelt levels, or on flood control thresholds in the lower Columbia River?***

Very little impact is expected. The recommendation to adopt VARQ may result in about a 2 foot average drop in winter levels of Lake Roosevelt. If no adjustment is made at Lake Roosevelt for VARQ at Libby and Hungry Horse Dams, the flows at The Dalles Dam may increase between 2,000 and 4,000 cubic feet per second. The Service supports implementation of measures to off-set impacts to cultural resources and resident fish populations that may occur in Lake Roosevelt as a result of implementation of VARQ.



U.S. Fish and Wildlife Service  
Biological Opinion on  
Federal Columbia River Power System Operations  
December 20, 2000

The Fish and Wildlife Service developed its biological opinion as part of consultations with the U.S. Army Corps of Engineers and the Bureau of Reclamation, which operate the Federal dams, and the Bonneville Power Administration, which sells the electricity generated at the dams. The dams included in the Service's biological opinion are: Bonneville, The Dalles, John Day and McNary dams (Lower Columbia River facilities); Ice Harbor, Lower Monumental, Little Goose, Lower Granite and Dworshak dams (Lower Snake River and Clearwater facilities); Grand Coulee, Albeni Falls, Libby, Hungry Horse, and Chief Joseph dams and Banks Lake Pump Storage (Upper Columbia River facilities). These projects are located in Oregon, Washington, Idaho, and Montana.

The proposed action analyzed by the biological opinion is the operation and maintenance of these projects which comprise the Federal Columbia River Power System. At issue are the effects of operating the Federal Columbia River Power System (FCRPS) on the endangered Kootenai River white sturgeon (sturgeon), and threatened bull trout.

The Service's opinion concludes that the proposed action will jeopardize the continued existence of the Kootenai River white sturgeon but will not jeopardize the continued existence of bull trout. The Service has worked with the action agencies to develop a comprehensive list of activities known as reasonable and prudent alternatives and conservation measures to avoid jeopardy and minimize impacts to the species.

The Service worked closely with the action agencies and the National Marine Fisheries Service (NMFS) to complete this consultation and several coordination meetings were held between representatives of the action agencies, the Service, and NMFS. We shared a preliminary draft biological opinion with these agencies in May 2000. Comments on the preliminary draft opinion were received in June 2000. A revised draft was distributed to action agencies and the affected states and Indian Tribes on July 27, 2000 for review and comment and many of the comments received have been incorporated into the final biological opinion.

Impacts to bull trout and Kootenai River white sturgeon occur mostly in the upper reaches of the basin, hence, recommended changes in operations in the biological opinion to minimize adverse effects focus on the Upper Columbia River FCRPS dams (i.e., Hungry Horse, Libby and Albeni Falls dams). The Service and the action agencies reached agreement on changes in operations that will minimize the adverse effects of those facilities on bull trout. For example, we reached agreement on the need for minimum flows and summer and winter ramping rates at Libby and Hungry Horse dams. The opinion also includes implementation of a modified flood control operation (VAR Q) at Hungry Horse Dam that

will provide more water for listed resident fish and salmon. Operations at Albeni Falls Dam to benefit kokanee salmon, a key food source for bull trout in Lake Pend Oreille, are also addressed in the opinion. With regard to Kootenai River white sturgeon, requirements in the biological opinion focus on operations of Libby Dam to provide late spring flows to help “trigger” spawning, and to provide for rearing habitat for the fish. Implementation of VAR Q at Libby Dam, which is a reasonable and prudent alternative, provides additional flows that are critical for sturgeon.

Bull trout occur in the main stem Columbia and lower Snake rivers but their use of these areas is not well known. Therefore, the primary requirements of the biological opinion for facilities in these areas are to: 1) require monitoring to better determine presence of bull trout; 2) ensure that upstream and downstream passage for bull trout is not impeded; 3) determine the effect of flow fluctuations on stranding or entrapment of bull trout; and 4) minimize uncontrolled spill and the effects of total dissolved gas on the species.

Coordination between NMFS and the Service has been ongoing during the preparation of the draft biological opinions. Both agencies have addressed issues where conflict might arise and collaborated on solutions to meet both the needs of the listed salmon and steelhead and the bull trout and sturgeon. Specifically, NMFS and the Service have agreed to normal water year operations (ramping rates and minimum flows) at Hungry Horse and Libby dams that will benefit all species and implementation of modified flood control operations at both dams to store additional water for resident fish and salmon. In low water years, the agencies have agreed to work out details of operation through the Technical Management Team (TMT) process to balance the needs of listed species.

SUMMARY POINTS/INDEX TO  
U.S. FISH AND WILDLIFE SERVICE  
BIOLOGICAL OPINION ON  
FEDERAL COLUMBIA RIVER POWER SYSTEM OPERATIONS

Species addressed:

Bull Trout (listed threatened)

Kootenai River White Sturgeon (listed endangered)

Development coordinated with National Marine Fisheries Service (NMFS), to eliminate conflicts between requirements for Fish and Wildlife Service (FWS) and NMFS listed species (salmon and steelhead).

Facilities addressed

**Lower Columbia River facilities**

*Bonneville, The Dalles, John Day, McNary Dams*

**Lower Snake River/Clearwater River facilities**

*Ice Harbor, Lower Monumental, Little Goose, Lower Granite, Dworshak Dams*

**Upper Columbia River facilities**

*Grand Coulee, Albeni Falls, Libby, Hungry Horse and Chief Joseph Dams, and Banks Lake Pump Storage*

Primary issues in the biological opinion are for bull trout and Kootenai River white sturgeon (sturgeon) in the Upper Columbia River Basin, particularly operations of Libby and Hungry Horse facilities. Through the consultation process, the action agencies clarified the proposed action to address many of the issues of concern for bull trout and sturgeon. These measures are included in the proposed action.

Overall Measures to Address Needs of Bull Trout and Sturgeon

- Action agencies will provide annual operating plan (1 and 5 year plans) to describe how actions will be implemented.
- Action agencies describe an approach for dealing with/reporting on emergency operations in response to generation or transmission emergencies.
- Action agencies will provide an annual report describing the frequency and duration of flow changes at Hungry Horse and Libby dams needed to provide voltage stability.
- Action agencies will conduct studies of costs and feasibility of options that will preclude the use of Libby and Hungry Horse dams to ensure voltage and transmission stability.

**Operations of Libby Dam**

*(Section 3, proposed action)*

Goal: Increase flow capacity so additional volume can be delivered (while avoiding other impacts to resident fish, and to flood control)

- conduct spill test and spillway evaluation

- consider installation of a flow deflector, based on results of spill test
- determine channel capacity downstream of Libby Dam
- seek funds for installation of an additional turbine
- conduct biological studies to determine effectiveness of additional flow capacity to meet needs of sturgeon and bull trout

### Bull Trout

#### **Operations of Libby Dam**

*(Section 3, proposed action; section 11.A.1, terms and conditions 1 and 2)*

- Implement modified flood control approach (VARQ)
- Operate to meet minimum flows
- Meet ramping rates and conduct studies to include:
  - maximum change in daily and hourly flows
  - ramping rate (up and down)
- Reduce or minimize “second peak” between flows for sturgeon and anadromous fish

#### **Operations of Hungry Horse Dam**

*(Section 3, proposed action; section 11.A.1, term and condition 2)*

- Operate to meet minimum flows
  - sliding scale, based on available flows, at SF and mainstem Flathead River (measured at Columbia Falls)
- Meet ramping rates and conduct studies to include:
  - maximum change in daily and hourly flows
  - ramping rate (up and down)
- Reduce or minimize “second peak” between flows for sturgeon and anadromous fish
- Implement modified flood control approach (VARQ) beginning 10/00

#### **Operations of Albeni Falls Dam**

*(section 11.A.1, terms and conditions 3 and 4)*

- Study feasibility of fish passage at Albeni Falls
- Study dissolved gas at Albeni Falls
- Continue to operate Dam for Lake Pend Oreille kokanee study

### Kootenai River White Sturgeon Issues

#### **Operations of Libby Dam**

*(section 3, proposed action, section 8, reasonable and prudent alternatives)*

Requirements in BO based on Sturgeon Recovery Plan. Focus is on 4 primary issues: increased storage, increased release capacity, flood stage constraints, stocking program

- Implement “tiered” flows; accounting at Libby Dam (vs. Bonners Ferry)
- Provide for greater release capacity at Libby
- Conduct spill test/channel capacity study (follow state water quality standards)
- Evaluate load following effects on levees

curtail load following to limit degradation of levees

- Consider establishment of rocky substrate
- Implement modified flood control approach (VARQ)
- Evaluate flood levels and public safety concerns
- Seek means to restore levees to 1770 feet mean sea level (msl) at Bonners Ferry  
in the interim, do not exceed 1764 feet msl
- Conduct groundwater seepage study
- Improve volume forecast
- Continue work/funding for Kootenai Tribe efforts

# Embedded Secure Document

The file <http://pacific.fws.gov/finalbiop/amend.PDF> is a secure document that has been embedded in this document. Double click the pushpin to view.

