

## Environmental Assessment

### Upper Columbia Basin Alternative Flood Control and Fish Operations

1. Background. Operational actions for Libby, Hungry Horse, and Grand Coulee Dams have been identified by the National Marine Fisheries Service (NMFS) and US Fish and Wildlife Service (USFWS) as reasonable and prudent alternatives in their Biological Opinions (BiOps) both dated December 21, 2000. These BiOps call for the Corps of Engineers and Bureau of Reclamation to undertake various actions at their 14 main Federal Columbia River Power System (FCRPS) dams to assist in recovery of fish species listed under the Endangered Species Act in the Columbia River basin. Among those actions is implementation of an alternative flood control strategy, called variable discharge (variable Q or VARQ), required at Libby and Hungry Horse Dams. This strategy has potential impacts in other parts of the Columbia System, and results in different operation at Grand Coulee Dam.

The no-action alternative, BASE-CRT63, consists of the existing flood control operation. In addition, the NMFS BiOp calls for summer flow augmentation from Grand Coulee Dam for juvenile salmon out-migration, as well as provision for fall flows for lower Columbia chum salmon spawning and incubation. The USFWS BiOp calls for reduction of adverse effects of flow fluctuations on bull trout below Hungry Horse and Libby dams, and for maintenance of minimum year-round flows for bull trout. Other required operations include reduction of adverse effects on agricultural lands and levees resulting from flow augmentation for Kootenai River white sturgeon, lower Columbia salmon from Libby Dam, and salmon from Hungry Horse Dam.

All three reservoirs are storage reservoirs, and Libby and Hungry Horse are on headwater tributaries to the Columbia River, the Kootenai and South Fork of the Flathead River, respectively, while Grand Coulee is on the mainstem Columbia. Libby is a Corps project, and Hungry Horse and Grand Coulee are Bureau of Reclamation projects. VARQ is a flood control operation that reduces wintertime reservoir drawdown at Libby and Hungry Horse for floodwater storage compared to existing operations, and provides better assurance of reservoir refill in summer to meet multiple water uses.

2. Major Project Features. The FCRPS comprises 14 major dams and a number of smaller ones. Libby, Hungry Horse and Grand Coulee dams are among the 14 large projects. Libby and Hungry Horse dams store water primarily for hydropower and flood control, as well as for other purposes such as fish and wildlife and recreation. Libby Dam is located at river mile 222 on the Kootenai River in Montana. When full, the reservoir (Lake Koocanusa) backs into southern British Columbia, Canada. As there could be significant impacts to the Lake Koocanusa region, as well as at Kootenay Lake, downstream in British Columbia, it will be important to coordinate with Canadian governmental agencies and discuss these impacts in the EIS. Hungry Horse Dam is at river mile 5 on the South Fork Flathead River, part of the Flathead/Clark Fork/Pend Oreille

system. The two systems are adjacent to each other. Grand Coulee Dam is at river mile 597 on the Columbia River.

In general, flood control using reservoirs involves maintaining the reservoir low enough to impound inflow from high-runoff events such as sudden snowmelts. In multipurpose storage reservoirs, it means drawing down the reservoir beginning in early fall through March or April to a surface elevation appropriate for the runoff forecast for the coming spring and summer. Then refill begins, and the reservoir is generally full by the end of July. For Libby, Hungry Horse, and Grand Coulee, water passed through the dam is used for power generation, and lowering the reservoir elevation serves to meet increased power needs of the region in fall and winter.

VARQ is an alternative flood control strategy intended to meet other needs by better assuring reservoir refill and higher spring flows, to come closer to natural snowmelt runoff conditions in the rivers. That runoff is impounded by Libby and Hungry Horse dams, which under previous operations released only minimum flows during that period. In the Kootenai River, starting in the 1990s, drawing down the reservoirs for power generation below the required flood control elevation has been curtailed in winter to allow water storage for flow augmentation in spring. In addition to benefiting sturgeon, it also benefits juvenile salmon outmigration in the lower Columbia River. Furthermore, August flow augmentation for Columbia salmon outmigration has also been provided from Libby in response to 1995 NMFS BiOp requirements.

As called for by the USFWS and NMFS BiOps, the Corps and Bureau are to implement VARQ at Libby and Hungry Horse dams, as well as other actions for benefit of listed fish stocks in the Columbia basin. If remaining studies of system flood control prove VARQ feasible and significant impacts can be mitigated, it would be implemented the winter following completion of NEPA documentation (EIS, Record of Decision), scheduled for completion in early 2004.

Other operations to provide water in summer and fall for salmon outmigration, spawning and incubation are also part of the proposed action, as are reduction of adverse effects of flow fluctuation below Libby and Hungry Horse dams, and provision of minimum flows for bull trout.

3. Project Alternatives. Alternatives to be evaluated include:

- a. No action, including current flood control operation with flow augmentation in spring and summer for white sturgeon, bull trout and salmon.
- b. VARQ, with spring and summer flow augmentation for fish.
- c. Increased summertime drawdown of Lake Roosevelt to meet summer flow objectives for salmon.
- d. Fall flow augmentation for salmon spawning and incubation in the lower Columbia.

4. Environmental Assessment/Key Issues. Alternative flood control strategies would have several environmental impacts, including the following:

- a. flood control impacts on a local and system-wide basis;
- b. fisheries and other aquatic ecosystem impacts and benefits in affected reservoirs and downstream in the Kootenai and Flathead systems and on the mainstem Columbia;
- c. effects of potential increase in frequency of spill and impacts from dissolved gas on aquatic organisms;
- d. groundwater seepage in lands from prolonged high spring flows along the Kootenai River in Idaho;
- e. levee integrity concerns from prolonged high spring flows along the Kootenai River in Idaho and British Columbia;
- f. potential for increased suspension of sediments due to drawdown of Lake Roosevelt;
- g. potential aerial transport of heavy metals from exposed Lake Roosevelt sediments;
- h. exposure, looting and vandalism of prehistoric artifacts and human remains along Lake Roosevelt;
- i. recreational impacts on affected reservoirs;
- j. Columbia system power generation impacts;
- k. power generation impacts at Canadian projects downstream of Libby Dam, a treaty issue.
- l. fish stocks listed under the Endangered Species Act would be directly affected by the proposed action, including Kootenai River white sturgeon, bull trout, chinook salmon, chum salmon, sockeye salmon, and steelhead.

5. Conclusion. Implementation of alternative flood control measures in the upper Columbia Basin, in response to NMFS and USFWS BiOps, will significantly affect the quality of the human environment as defined by Council on Environmental Quality rules and Corps of Engineers implementing regulations, and will require preparation of a Federal Environmental Impact Statement (EIS).

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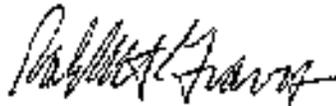
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Commander, CENWS

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Based on the above memorandum and EA, and on my knowledge of the project, I have made the determination that the proposed alternative flood control and fish operations would significantly affect the quality of the human environment. A formal EIS in accordance with NEPA is required for this work. I concur with staff and support the preparation of a Federal EIS as joint Federal lead with the U.S. Bureau of Reclamation.



RALPH GRAVES  
Colonel, Corps of Engineers  
Commanding