

## SYSTEM OPERATIONAL REQUEST #2001-01

TO: General. Fastabend COE-NPD  
William Branch COE-Water Management  
Cindy Henricksen COE-RCC  
Doug Arndt COE-P  
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Last  
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FROM: Susan Martin, Supervisor, Upper Columbia Fish and Wildlife Office, U. S. Fish and Wildlife Service, on behalf to the following cooperating agencies and tribes: ( A complete list of agencies/tribes who are in concurrence with this request and indicate they would like to be identified on the final request as cooperators in the conservation of burbot in the Kootenai River. See possible list of cooperators on the fax cover memo.)

IDAHO FISH AND GAME WISHES TO BE A PARTICIPANT  
DATE: January 9, 2002 IN THIS REQUEST

SUBJECT: Request for releases from Libby Dam for migration, spawning, incubation and larval development of burbot in the Kootenai River.

SPECIFICATIONS: Beginning as soon as practical, and continuing through February 8, 2002, please maintain releases from Libby Dam within the range of 6,000 to 10,000 cfs, and maintaining established ramping rates. We acknowledge that unforeseen circumstances such as local or system flood control or power emergencies may supersede this recommendation. If subsequent to this request it becomes necessary to release more than 10,000 cfs, it is recommended that the new release rate be the lowest stable flow which is believed to be sustainable through February 8. Secondly, beginning as soon as possible and continuing through March 15, please operate the selective withdrawal system at Libby Dam to release the coldest available water if a temperature gradient exists within the reservoir. This is not to include operations within 30 feet of the surface which may cause cavitation of the turbines.

JUSTIFICATION: The burbot (*Lota lota*) population in the lower Kootenai River in Idaho and in Kootenay Lake, British Columbia, is very depressed. Harvest has been discontinued, but the burbot population has not responded as expected based on the exceptional fecundity characteristic of this species (Becker 1983; Jakob Kjellman, University of Helsinki, pers. com. in The Kootenai River Burbot Recovery Committee 2001). Available information suggests that the most significant remaining environmental stressor is the altered flow regime during the late fall and winter. Researchers have suggested that these unnaturally high flows, associated changes in water temperature, and rapid fluctuations in flow resulting from hydroelectric load following may be altering normal burbot migration and or spawning behavior (The Kootenai River Burbot Committee 2001).

Last winter agreement was reached to curtail load following for conservation of bull trout and

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sturgeon. In addition, flows were generally low in response to the drought and the need to retain water high in the system for a possible extended power emergency. With a couple of exceptions, releases from Libby Dam last year during the fall/winter migration and spawning period remained below 10,000 cfs, with the lowest flows in the 4,000 to 6,000 cfs range. Last year under these low flow conditions, some burbot did migrate to the Bonners Ferry area, and for the first time in recent years, there was evidence that spawning occurred there. Successful recruitment has yet to be verified (Vaughn Paragamian, IDFG. 2001, Pers. Com.).

Last year's results are encouraging, and this request is viewed as adaptive management to begin defining the needs of this species in the Kootenai River. We would like to define the upper flow threshold where normal burbot migration and spawning behavior may occur.

Secondly, burbot historically were believed to have spawned when water temperatures were near 1.0 °C. Prior to operations of Libby Dam, spawning may have occurred some years beneath the ice that commonly covered the Kootenai River in Kootenai Flats during the winter. Last year during the third week of January when burbot were believed to have spawned in the Kootenai River water temperatures at Bonners Ferry ranged from slightly below freezing to 3.3°C. Since Libby Dam, typical winter river water temperatures have been increased from about 1.0 °C to about 4.0 °C (Partridge 1983). Burbot would be expected to spawn when water is only about 1.5 °C (Becker 1983; MacKay 1963). It is not known whether change of this magnitude in river water temperature is affecting burbot migration, spawning behavior, egg development, larval development, the timing of any of these events, or possibly the efficiency of egg or larval predators.

We believe that the river has not frozen over in any major way since Libby Dam became operational. This is a result of seasonally high releases from Libby Dam with unnaturally high water temperatures, warmed through heat retention and delayed release from the reservoir, and additional energy released from increased velocity and friction of these unseasonally high flows. We believe that these effects on water temperature will be diminished when releases are within the flow range recommended above. However, there may be opportunity to slightly lower water temperatures through operations at Libby Dam. Typically, winter water temperature in Lake Koocanusa is nearly isothermal. However, the selective withdrawal structure in place at the Libby Project may be used to a limited extent to manage winter water temperature in the Kootenai River with relatively little cost. As of last Friday there was a 1°F gradient to select from. The intent here is to reduce temperature as a variable to the extent possible within constraints of the Libby Project.

## REFERENCES:

Becker, G. 1983. Fishes of Wisconsin. The University of Wisconsin Press. Madison, Wisconsin.

MacKay, M. A. 1963. Fishes of Ontario. the Bryant Press limited. Toronto

Partridge, F. 1983. Kootenai River fisheries investigations. Idaho Department of Fish and Game.

Federal Aid in Sport Fish Restoration. Project F-73-R-5, Completion Report. Boise, Idaho.

The Kootenai River Burbot Recovery Committee. 2001. Draft Transboundary Recovery Strategy for the Kootenai River and Kootenay Lake Burbot *Lota lota* in Idaho and British Columbia. 25pp.

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