

**U.S. Fish and Wildlife Service**  
**SYSTEM OPERATIONAL REQUEST: #2005-FWS 3**

<b>TO:</b>	Colonel (P) Gregg Martin	COE-NWD
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	Mick Shea	Project manager- Libby Dam

**FROM:** Susan Martin, Supervisor, Upper Columbia Fish and Wildlife Office, U.S. Fish and Wildlife Service, on behalf of the Kootenai Valley Resource Initiative – Burbot Recovery sub-committee.

**DATE:** 9/20/05

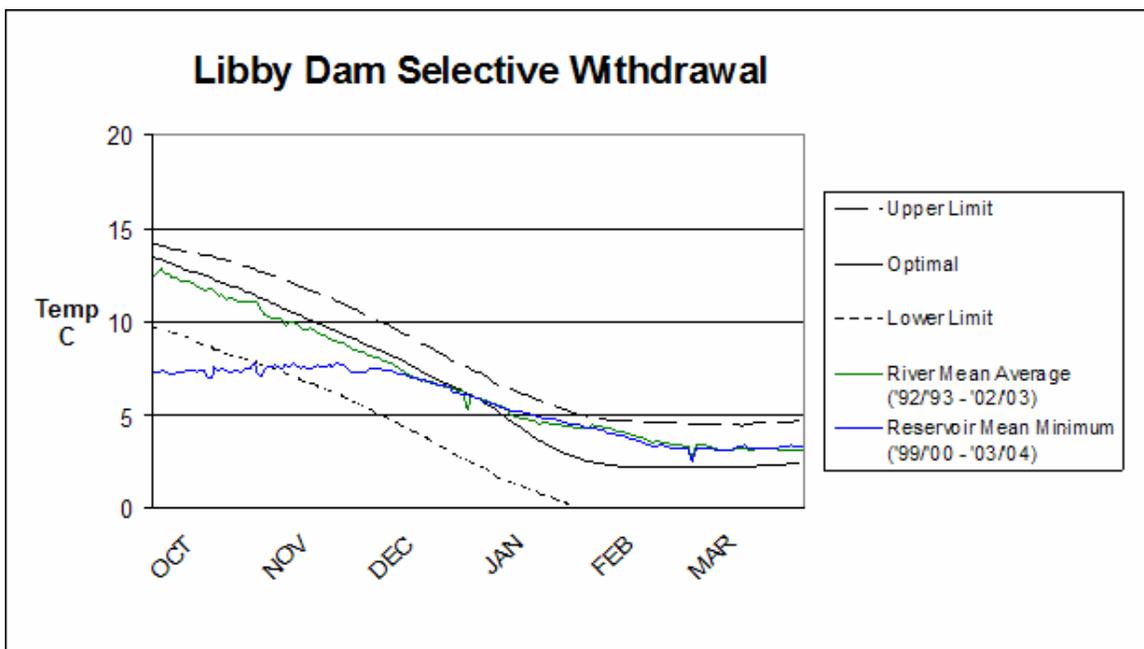
**SUBJECT:** Winter Temperature Operation of Libby Dam for burbot

**SPECIFICATIONS:**

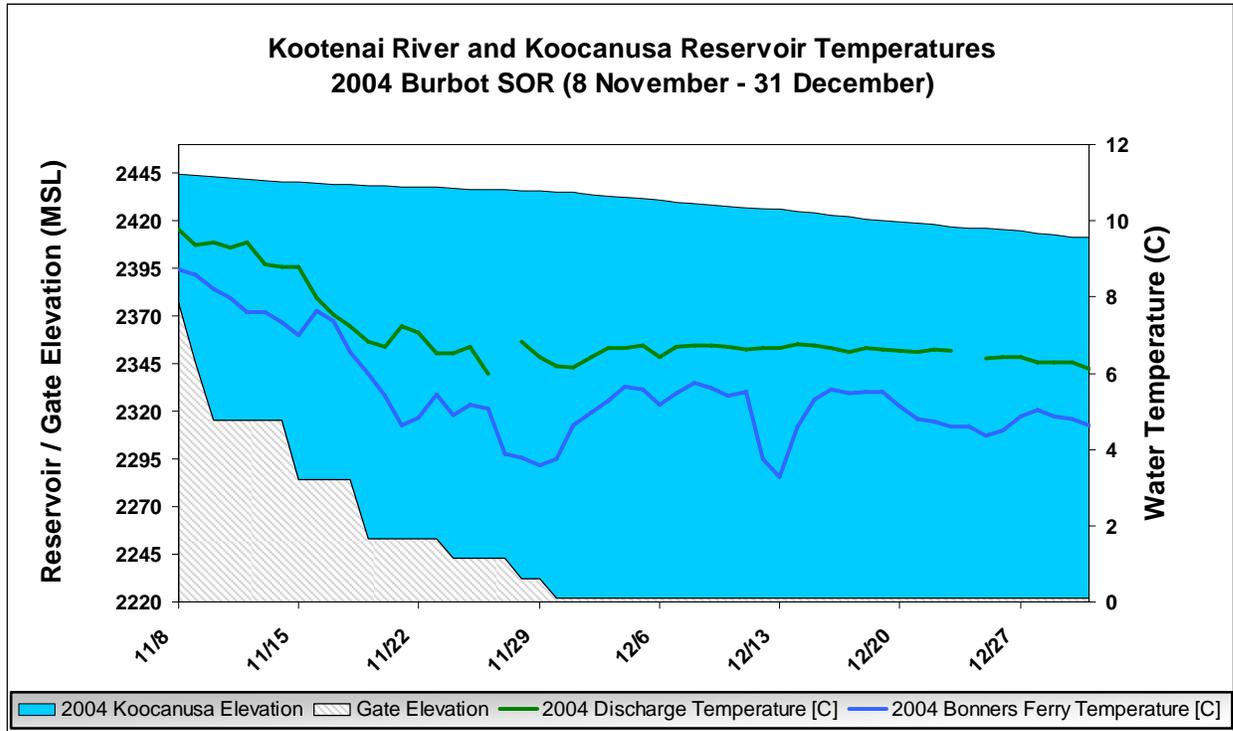
U.S. Fish and Wildlife Service staff and others, as members of the Kootenai Valley Resource Initiative (KVRI) burbot sub-committee, request that the Corps of Engineers use the selective withdrawal system at Libby Dam to release the coolest water possible in November and December, 2005 before temperature stratification limits the temperature control capability. The purpose of this operation is to determine if cooler releases result in cooler river temperatures downstream of Bonners Ferry, and also to determine how radio-tagged burbot in the Kootenai River respond to these temperatures. This will likely result in November and December temperatures slightly cooler than the existing selective withdrawal temperature rule curve (Figure 1). This deviation from the temperature rule curve has been coordinated with Montana Fish, Wildlife & Parks (MFWP). MFWP asked that the selective withdrawal gates be removed incrementally to assure that daily temperature change remains within 2 degrees F per day; gates should be removed systematically during the last 2 weeks of October (17<sup>th</sup> through 31<sup>st</sup>) to slowly lower river temperature to the minimum by November 1 (on average, a span of about 5 degrees C, or 9 degrees F; Figure 1).

**JUSTIFICATION:**

The request is designed to determine if the lower river (Bonners Ferry vicinity) can be cooled during the burbot migrational period (November to mid-December) and during spawning season (Dec 15 – end of Feb), when temperatures of 1 to 4° C are preferable. The 2004 SOR FWS-2 specified a similar request, but was not submitted and approved until November 8; well past the desired commencement date for this type of experiment (selective withdrawal gate removal may take up to 10 days in order to avoid rapid temperature reduction); the gates were not fully removed until December 1 (Figure 2). Although the operation likely had an effect on ambient river temperature (Figure 2), burbot spawning migrations may be affected by water temperature conditions much earlier in the winter/late autumn (Paragamian 2005, pers. comm.), particularly when combined with higher flows.

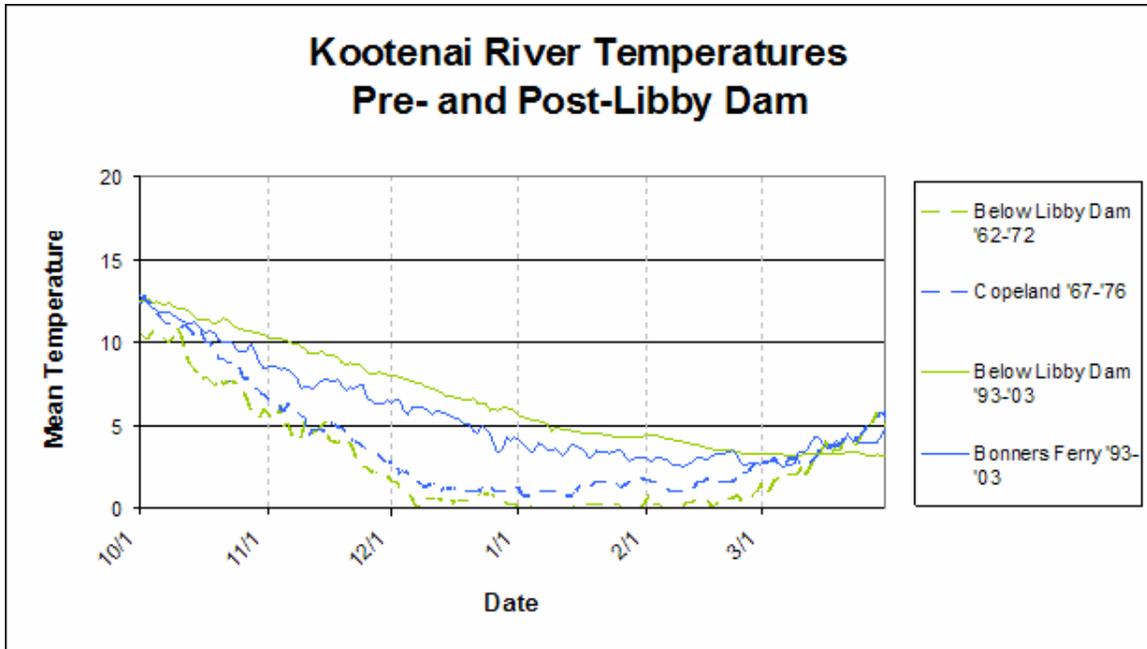


**Figure 1. Selective withdrawal temperature guidelines for the Kootenai River below Libby Dam.** The mean average release temperature was within the guidelines for the period displayed, with means slightly less than optimal early in the winter, and slightly higher than optimal later in the winter. There is water much cooler than optimal available for release during the early winter period until the reservoir becomes isothermic about mid-December.



**Figure 2. 2004 Burbot SOR operation at Libby Dam.** Selective withdrawal gates were entirely removed by the first week in December. Resultant river temperatures at Libby and at Bonners Ferry follow gate removal.

Prior to Libby Dam, winter water temperature both below the current Libby Dam site and near Bonners Ferry was substantially cooler than post-Dam temperatures. The Kootenai River gradually warmed slightly as it flowed downstream, whereas current conditions allow atmospheric cooling of the river, though still not to pre-dam levels (Figure 3). The committee would like to investigate the possibility of influencing ambient river temperatures during the late fall and early winter migrational period, as there is water available for release during this time that is substantially cooler than previous, post-dam release temperatures, and also cooler than the minimum temperature specified by the selective withdrawal temperature curve (Figure 1).



**Figure 3.** The thermograph in the Kootenai River before and after installation of Libby Dam is reversed to the point of the now-warmer river cooling with ambient air conditions as it reaches the Bonners Ferry vicinity, rather than warming.

The committee will continue to review future forecasts and issue additional SOR's related to flow should this season's conditions warrant. The committee is also pursuing methods for reintroducing burbot into the Kootenai River, and anticipates that in future years flow requests may be made to enhance spawning conditions for these fish, should they survive and persist. The committee hopes that results of seasonal temperature experiments carried out in the interim would enable the Action Agencies to implement discharge-related SOR's in future years, with less regard to seasonal conditions, should population numbers increase to a point where temperature and flow optimization would benefit the resultant migratory spawning population.