

WYOMING GAME AND FISH DEPARTMENT

FISH DIVISION

ADMINISTRATIVE REPORT

TITLE: Final East Fork Smith's Fork Instream Flow Report

PROJECT: IF-4490-07-9001

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INTRODUCTION

As part of the Stateline Reservoir project, an instream flow agreement for maintaining the East Fork Smith's Fork River (East Fork) fishery was provided. This agreement called for the reservation of up to 1,000 acre-feet of storage to enhance natural winter stream flows up to 10 cfs. When this storage water is unavailable, only natural winter inflow is released. In 1989 the 1,000 acre-feet allocated to supplement natural streamflows was depleted by February. At this time releases were reduced to the natural inflow of 5 cfs. In 1990, only 435 acre-feet were allocated to supplement natural streamflows since the reservoir only stored 43% of its total allocation.

Because of these recent stream flow conditions and related reservoir management considerations, the Bridger Valley Water Conservancy District (District) has proposed modifying the existing instream flow agreement. The District has proposed simplifying the agreement by releasing a constant 7 cfs at all times during the winter (approximately October 1 through April 15). This agreement was tentatively agreed to by the Wyoming Game and Fish Department (WGFD), Utah Department of Wildlife Resources (UDWR), U.S. Fish and Wildlife Service (USFWS), the U.S. Forest Service (USFS) and the District pending further analysis.

The following analyses were designed to assess potential impacts of the proposed instream flow modification on the East Fork fishery. Specifically, the objectives of this study were to 1) determine the relationship between discharge and physical habitat for adult and juvenile rainbow trout and 2) quantify the potential impact of the proposal on trout productivity (as expressed in habitat units) in the stream.

Figure 1. Location of study area on the East Fork Smith's Fork.

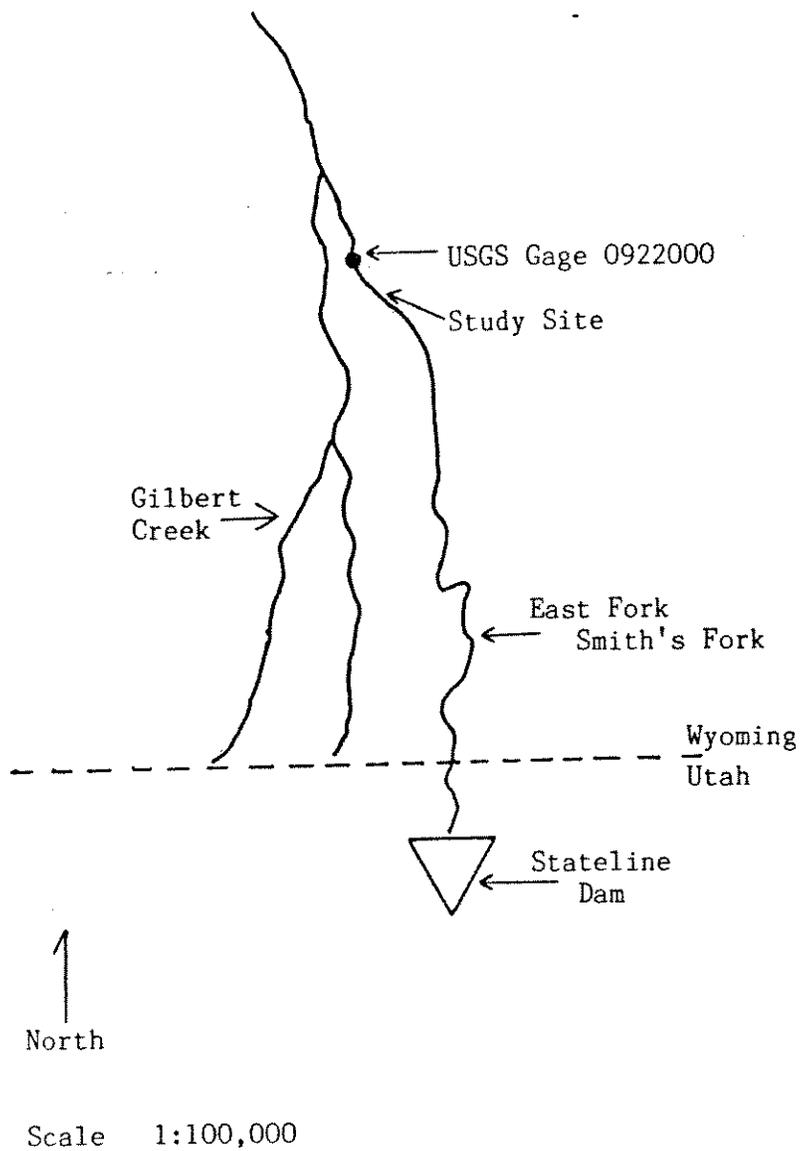


Table 2. Relationship between minimum winter stream flow and trout habitat quality as expressed in trout habitat units in the East Fork Smith's Fork.

Discharge (cfs)	Trout Habitat Units
10 (Existing)	13.0
7	13.0
5	10.6

Though not a part of the initial scope of this analysis, an evaluation was also done of the relationship between average summer (July 1 to September 30) releases and trout habitat units using the HQI model. This analysis revealed that reducing average summer discharges from 90 cfs to 64 cfs or less would almost triple the number of habitat units that the stream could support (Table 3). This increase would result from decreasing channel velocities to a more desirable level for trout. Additional reductions in flow to 28 cfs or less would further increase trout productivity to 131.8 habitat units. This increase would be caused by further improving channel velocities as well as improving cover for trout.

Table 3. Relationship between average summer (July 1 to September 30) stream flow and trout habitat quality as expressed in trout habitat units in the East Fork Smith's Fork.

Discharge (cfs)	Trout Habitat Units
90 (Existing)	13.0
64	38.2
28	131.8

This trend was generally supported by results from the PHABSIM model for both adult and juvenile rainbow trout (Figure 2). The relationship for both life stages was nearly identical over the range of flows between 5 and 10 cfs. Although no distinct inflection was noted over this range, the observed trend of reduced physical habitat at lower stream flows provides support for maintaining stream flow at the highest flow possible during the winter.

#### REFERENCES

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