STATE OF MONTANA

DEPARTMENT OF FISH AND GAME

Helena, MT 59601
May 29, 1980

Mr. Mike Wittington
Bureau of Land Management
P.O. Box 30157
Billings, MT 59107

Dear Mike:

Enclosed is a revised proposal for cooperative instream flow efforts on two sections of the main stem Missouri (Holter Dam-Smith River and the Wild & Scenic reach) and for selected headwater tributaries to the Beaverhead, Ruby and Big Hole rivers. The total budget is $26,000. If there are any questions, do not hesitate to call.

Sincerely,

Larry G. Peterman

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Water Resources Supervisor
Ecological Services Division

LGP/mac

Encl.

cc: Jim Posewitz
Rod Berg
Ron Marcoux
Fred Nelson

COOPERATIVE INSTREAM FLOW PROPOSAL

Excellent opportunity exists, in the next several years, to afford substantial instream flow protection for several sections of the Missouri River in Montana. Two sections of interest and concern to both the BLM and the DFWP are the Wild and Scenic reach (Fort Benton to Fort Peck) and the Holter Dam to Smith River section. These areas are discussed in detail later.

The headwater tributaries of the Missouri offer an additional area of mutual concern for cooperative instream flow efforts. Priority tributaries to the Beaverhead, Ruby and Big Hole rivers are discussed further in the section entitled Upper Missouri Instream Flow Determinations.

HOLTER DAM TO SMITH RIVER

Under provisions of an earlier act (Section 89-801 passed by the 1969 Montana Legislature), the so-called Murphy's Law, the Department of Fish, Wildlife & Parks was able to file for instream water rights on 12 high-quality trout streams. As the result of a decision concerning a contested water right on one of these streams, it was determined that the Department of Fish, Wildife & Parks did indeed have an instream right, but it is unquantified at the present time. Consequently, the instream flow numbers must be quantified for all our "Murphy's" streams before they can become effective.

The passage of Senate Bill 76 by the 1979 Montana Legislature lends a certain urgency to the quantification of our filed rights on the 12 streams. Senate Bill 76 is entitled "An Act to Adjudicate Claims of Existing Water Rights in Montana". The quantification of the Department's existing instream rights on the 12 streams has been given high priority since the deadline for refiling to confirm existing rights is January 1, 1982.

The Missouri River between Holter Dam and the mouth of the Smith River is 63 miles in length and has an average channel width of about 400 feet. The average gradient is 3 ft per mile and the most common substrate type is sand and gravel.

Major tributaries entering the Missouri River in this reach include Sheep Creek, Dearborn River, Stickney Creek and Little Prickly Pear Creek (Figure 1). These streams add considerable flow to the Missouri during spring runoff but late summer and winter flow is largely insignificant to the river system.

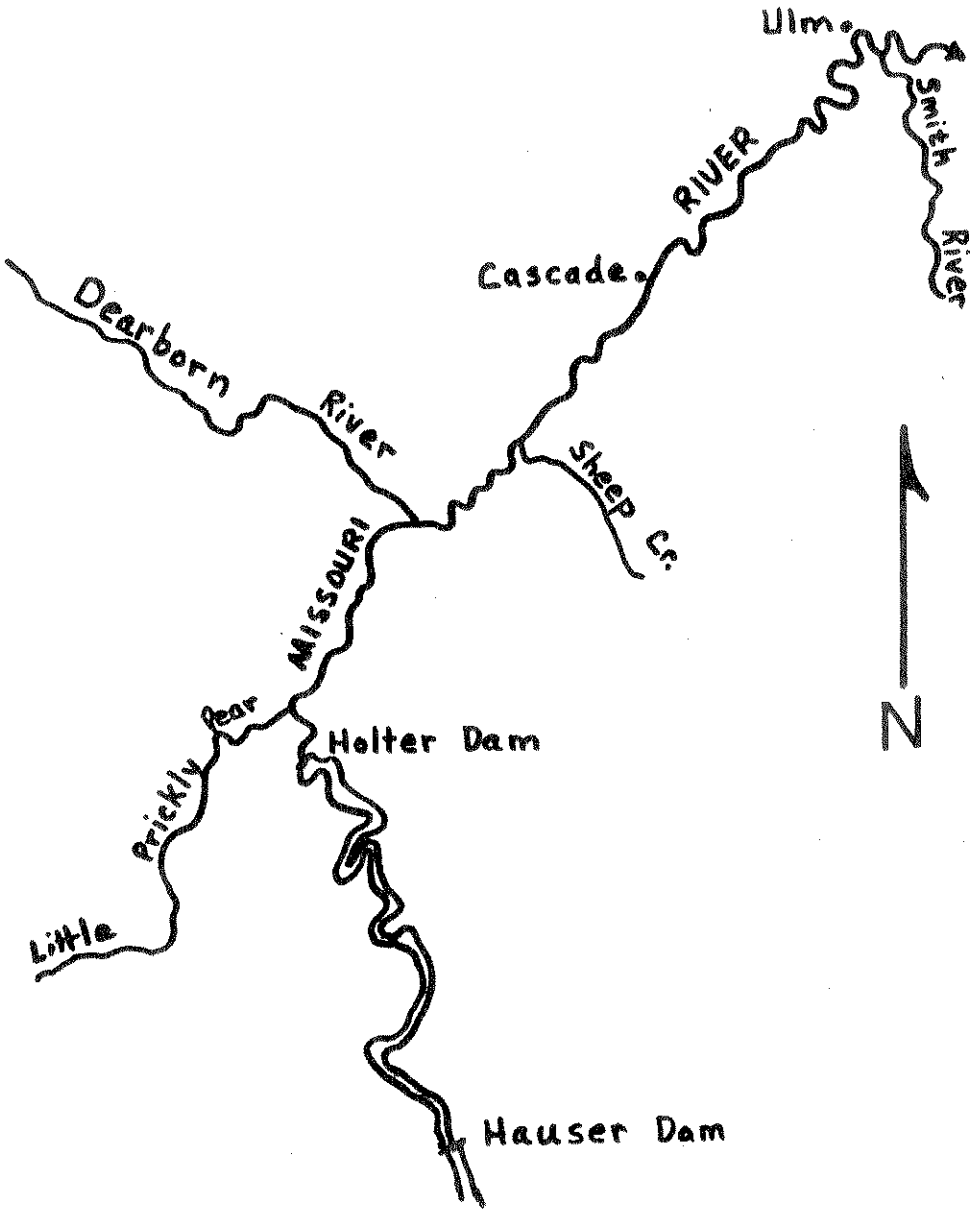

Figure 1. Map of Missouri River and tributaries between Holter Dam and confluence of Smith River.

This section of river flows through two distinct geologic zones. From Holter Dam to Sheep Creek, a distance of about 25 miles, the river flows through a mountain canyon having an average width of about 3,000 feet. A narrow band of riparian vegetation consisting primarily of willow and some cottonwood generally lines the riverbanks. Several brushy islands are periodically found in this area. Below the confluence of Sheep Creek, the river abruptly leaves the mountain area and meanders through a wide and generally flat prairie zone. Several old oxbows have created shallow sloughs and backwater areas. Extensive growths of riparian vegetation consisting of a willow/cottonwood overstory accompany the river floodplain through most of this area. Several brushy islands are also found throughout this portion of the river.

Flow is largely controlled by Canyon Ferry Reservoir, the largest of three consecutive upstream reservoirs. Canyon Ferry Dam was completed in 1953 by the Bureau of Reclamation for irrigation, power, flood control and recreation. Canyon Ferry has a full surface area of 35,200 acres and a storage capacity of 2,051,000 acre-feet. Hauser and Holter reservoirs lie downstream of Canyon Ferry Dam and provide storage head for power generation. They are owned and operated by Montana Power Company.

This section of the Missouri River supports substantial coldwater fish populations and provides an excellent recreational fishery. Mountain whitefish, rainbow trout and brown trout are the most common sport fish. Many trophy trout from 5 to 10 pounds are taken each year. Mountain whitefish are very abundant and comprise an important winter fishery. A summary of catch statistics from anglers reporting their fishing trips through the Department's fisherman log program reveals excellent success. In 1977, 301 angler days yielded 875 rainbow trout, 113 brown trout and 515 mountain whitefish while in 1977, 299 days reported 831 rainbow trout, 180 brown trout and 1,085 mountain whitefish. Other fish species taken included brook trout, cutthroat trout, walleye, yellow perch, bullhead, burbot, longnose sucker, white sucker and carp.

An estimate of total fishing pressure on Montana waters was conducted for the 1975-76 fishing season. The survey revealed about 69,500 angler days were expended on this 63-mile section of river.

Access to the river is good. There are several public access areas along the upper half of this reach. Old U.S. Highway 91, now designated as a recreation road, parallels considerable portions of the river and also provides easy access. River flow is always good for floating and many recreationists take advantage of this sport. The outstanding scenery and fishing add to the enjoyment of this activity.

Many species of waterfowl are seasonally associated with the river. Mallards, mergansers, Canadian geese and teal nest along the river on islands, backwater areas and sloughs. Some mallards, goldeneyes and geese spend the winter along ice-free areas. During spring migration, the river is often an important resting area for thousands of pintails, mallards and other waterfowl enroute to northern nesting areas. Several species of shore birds such as killdeer, snipe, phalarope and gulls are also seasonally associated with the river.

The extensive riparian vegetation along the lower half of this section provides excellent habitat for many important wildlife species. Large numbers of white-tailed deer, mule deer and ring-necked pheasant are found the year-round. Small patches of riparian vegetation along the river in the mountain canyon area also provide habitat for a few deer. Mink, muskrat, beaver, raccoon and a few river otter are found throughout this reach. Bald eagles are often observed along the river corridor during the winter.

This reach of Missouri River is located a short distance upstream from the Wild and Scenic portion and it is the principal source of water supply. As such, it is vital to secure flows in this reach for benefit to downstream areas.

To quantify instream flows in the Holter Dam-Smith River reach by January 1, 1982, the fisheries portion of the Middle Missouri Planning and Inventory project was moved upstream and will be located there. The principal investigator on that project will still retain supervisory control over the BLM-funded Middle Missouri Instream Flow project and allocate approximately one-half of his time to that project. Because of his supervisory responsibilities over two projects, it will be necessary to supplement the field efforts on the Holter Dam-Smith River reach with a field crew leader position.

Supplemental Budget for Missouri River (Holter Dam-Smith River)

1980

A.	Salary and Benefits Fisheries Field Worker II (Grade 10/1 for 6 mos.)	$ 6,700
B.	Travel Mileage and Per Diem	300
	Total Costs	$ 7,000

MISSOURI RIVER - WILD & SCENIC

Under legislation signed by President Ford in October 1976, a 149-mile reach of the Missouri River in northcentral Montana was incorporated into the National Wild and Scenic Rivers System. A portion of this legislation requires that the Bureau of Land Management determine instream flows required to maintain the river, commensurate with the purposes of the Act. This determination will be based, in part, on instream flow requirements needed to maintain the fishery resource and its associated aquatic habitat.

The Montana Department of Fish, Wildlife & Parks is currently conducting a fisheries inventory and planning study in the 149-mile reach of the Missouri River included in the aforementioned legislation. The Department's study efforts, initiated on October 1, 1975, parallel to some extent the effort to be made by the Bureau of Land Management on instream flow quantification. In view of the difficulty of quantifying instream flow needs for fisheries in a river such as the Missouri, it was deemed beneficial for the Bureau of Land Management and the Montana Department of Fish, Wildlife & Parks to cooperate in developing a suitable methodology to provide consistent results.

The BLM instream flow study began April 1, 1979 and is scheduled to run for 3 years. Refer to Contract No. YA-512-CT9-51 for a detailed description of the objectives and design of the project. The project was originally designed to operate on a $50,000 yearly budget; however, funding is committed on an annual basis.

In the second year of the study (March 1, 1980 - February 28, 1981) the funding was reduced to $28,000. To accomplish the original objectives, we feel it is imperative to maintain the initial level of funding. This is even more crucial because of a proposed major dam at or above Fort Benton which could severely impact the Wild and Scenic section.

The Department of Fish, Wildlife & Parks is attempting to supplement the BLM instream flow study with assistance from the Missouri River Planning and Inventory study. It is apparent, however, that at least an additional $10,000 will be required to fulfill the objectives for the second year of the study. A budget supplement for the second year of the BLM instream flow study is presented below.

Budget Supplement - BLM Instream Flow Study

Salaries and Benefits	$ 6,360
Equipment	2,000
Travel	820
Supplies & Materials	240
Repair & Maintenance	400
Communication	120
Other	60
Total Costs	$10,000

UPPER MISSOURI INSTREAM FLOW DETERMINATIONS

Section 85-2-316 of the Montana Water Use Act outlines a procedure for the reservation of waters of the state for instream uses. In anticipation of the reservation process being applied to the Missouri River drainage upstream of Canyon Ferry Reservoir, the Montana Department of Fish, Wildlife & Parks began in 1979 to collect biological, cross-sectional, stream flow and recreational data in the drainage in order to quantify and support the instream flow needs. The instream flow program for the Upper Missouri drainage is scheduled for completion in 1983.

The BLM has the opportunity to participate in this reservation process and obtain instream flow reservations for many of the streams on BLM lands. In addition, the BLM may also choose to file for federal instream rights on many of these streams. The deadline for filing to confirm existing rights as established by Senate Bill 76 passed by the 1979 Montana Legislature, is January 1, 1982. If this approach is taken, the collection of the field data that are needed to quantify and justify instream flow needs must essentially be completed during the 1980 field season in order to allow for sufficient time for analysis and preparation of the filings.

The Montana Department of Fish, Wildlife & Parks began in 1979 to collect instream flow data on tributaries of the Gallatin and Big Hole rivers. Tributaries of the Beaverhead and Red Rock rivers are scheduled for completion in 1980. The BLM had initially expressed interest in quantifying instream flow needs on 25 streams in the Big Hole, Beaverhead and Red Rock drainage. This list was later revised by Lew Myers of the BLM, Dillon, Montana and Jerry Wells of the MDFWP, Dillon, Montana. At present, the MDFWP will be providing the BLM with the information needed to quantify the instream flow needs for about 18 streams (Table 1). Supplementary funding will be needed in order for the MDFWP to incorporate all of these streams into its present instream flow program for the Beaverhead, Red Rock and Big Hole drainages and to provide the BLM with the information needed to quantify the instream flow needs for these streams.

Table 1. Streams in the Beaverhead, Red Rock and Big Hole drainages in which instream flow information will be provided to the BLM.

1) Canyon Cr.
2) Deep Cr.
3) Camp Cr.
4) Moose Cr.
5) Big Hole River
6) Grasshopper Cr.
7) Bloody Dick Cr.
8) Medicine Lodge Cr.
9) Big Sheep Cr.
10) Deadman Cr.
11) W. Fork Blacktail Cr.
12) E. Fork Blacktail Cr.
13) West Cr.
14) Long Cr.
15) Corral Cr.
16) Hellroaring Cr.
17) Tom Cr.
18) Odell Cr.

Methods

The following procedures will be used to obtain the data needed to derive and support instream flow needs.

I. The status of existing fish populations will be determined by estimating numbers and biomass in selected stream reaches during

the summer and fall months when flows are lowest. The Peterson mark-recapture method will be used. On streams where the numbers of trout are too low to obtain accurate estimates, only survey data can be provided.

II. The instream flow needs for selected streams will be quantified using a method employing a plot of wetted perimeter versus discharge for selected cross-sections within each reach. Wetted perimeter is the distance along the bottom and sides of a channel cross-section in contact with water. As the discharge in a cross-sections of a stream channel decreases, the wetted perimeter also decreases, but the rate of loss of wetted perimeter is not constant over a given range of discharges. Starting at zero discharge, wetted perimeter increases rapidly for small increases in discharge up to the point where the stream channel nears its maximum width. Beyond this inflection point, the increase of wetted perimeter is less rapid as discharge increases. Data collected by the Monana Department of Fish, Wildlife & Parks indicate that the discharge at which the inflection point occurs is a valid estimate of the discharge needed to maintain desirable standing crops of game fish (Nelson, 1980).

The relationships between wetted perimeter and discharge for the stream reaches will be derived using a predictive wetted perimeter computer program developed for the Montana Department of Fish, Wildlife & Parks (Nelson, 1980a). Field survey data will be collected for at least four cross-sections within a stream reach at two-three different flows. The program uses this data to predict the wetted perimeter for each cross-section at discharges selected by the investigator. Instream flow recommendations will be obtained from the plots of wetted perimeter versus discharge.

Budget

Supplementary funds would be used for travel and to hire additional field personnel. The collection of field data will be completed during the 1980 field season and a final report submitted by June 1981. The cost of providing this information follows:

Salaries and Benefits	
Fishery Assistant (Grade 7/3 for 4 mos.)	$4,024
Fishery Assistant (Grade 7/3 for 4 mos.)	4,024
	$8,048
Travel and Per Diem	952
Grand Total Cost	$9,000

LITERATURE CITED

Nelson, F. A. 1980. Evaluation of four instream flow methods applied to four trout rivers in southwest Montana. Montana Department of Fish, Widlife & Parks, Bozeman. 105pp.

Nelson, F. A. 1980a. Guidelines for using the wetted perimeter (WETP) computer program of the Montana Department of Fish, Wildlife and Parks. Montana Department of Fish, Wildife and Parks, Helena. 23pp.

Nelson, F. and L. Peterman. 1979. Determination of instream flows in Montana: an action plan. Montana Department of Fish, Wildlife & Parks, Helena. 64pp.