MONTANA FISH AND GAME DEPARTMENT
Helena, Montana

REPORT ON THE EFFECTS OF BEARMOUTH EAST AND WEST INTERSTATE HIGHWAY PROJECT ON THE SPORT FISHERY OF THE CLARK FORK RIVER

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Previous Construction Projects

The Northern Pacific Railroad grade was completed in the Bearmouth area in 1883, eighty years ago. The Chicago, Milwaukee, St. Paul and Pacific Railroad grade was completed in the area in 1909, fifty-four years ago. The present line and grade of U. S. Highway 10 and 12 between Nimrod and Drummond was completed between 1927 to 1937, over twenty-five years ago. Most of the past channel relocations in the area were made by the railroads.

The Fishery - Presently and in the Past

Few game fish were found in the Clark Fork River above Missoula prior to installation of waste treatment facilities in the upper Clark Fork about 1956. By 1961 two-pound brown trout were commonly taken by the angler, and this year, brown trout larger than six pounds have entered the fisherman's creel from the Clark Fork above Missoula. This is a good sport fishery that is being used more and more by people of nearby cities. They consider it the "Madison River" of the area.

The angler was not subsidized by planting hatchery fish in the Clark Fork. Rather, brown trout in the river initially came from tributary streams such as Flint Creek and the Little Blackfoot River. From this wild stock a natural self-sustaining fishery has developed.

Good Citizenship - Waste Treatment Facilities Developed

From 1951 to 1961, the Anaconda Company spent over $12,000,000.00 to develop a complex waste treatment process for its mine and smelter wastes at Butte and Anaconda (1). This cost includes the expenditure for waste treatment operation and construction of the settling and scalping facilities to clean the water prior to its discharge into the Clark Fork River. The plant also treats municipal and industrial wastes from the cities of Butte and Anaconda at no cost to the city and county governments involved.

The following cities and towns in the Clark Fork watershed above Bonner have spent or will spend for waste treatment facilities (2):

Deer Lodge	$229,284.00
Drummond	35,505.00
Warm Springs	129,584.00
Philipsburg	90,000.00 (not completed)

The construction of facilities for the treatment of industrial or municipal wastes is expensive. Yearly operation and maintenance is also expensive, depending on the type of treatment and the treatment facilities.

A large corporation and the four cited towns and cities have shown good citizenship. They have spent large sums to protect the Clark Fork River. The direct benefits from waste treatment are not to the participants, but rather to their downstream neighbors. The sportsmen throughout the state benefit directly from this good citizenship.

What is the Sport Fishery of the River Worth?

This area of the Clark Fork River, based on its potential productivity, could support 3,000 annual fishermen days per mile. This is an average of 10 fishermen per day per mile over a 300-day fishing season. Using a daily expenditure of $9.33 (3), the average annual expenditure per stream mile is $27,990.00. The capital needed to produce this amount at 4% interest per annum is about $700,000.00. On this basis the present sport fishery of this section of the Clark Fork River has a capital value of $700,000.00 per mile.

Pennsylvania has already reported fishing pressures on small streams equal to those mentioned above (4). If tourism continues to grow at its predicted rate and the Montana resident population increases according to estimates; a stream with the flow, scenic value, trout production and availability of the Clark Fork could easily attract 3,000 annual fishermen days per mile.

In our judgment, the preceding economic appraisal comprises only a portion of the true value of this segment of the Clark Fork River. It's chief worth is in the aesthetic and recreational benefits it provides its users - benefits, both direct and indirect, upon which it is impossible to attach the urgency of a dollar sign.

Economist, Dr. R. J. McConnen in his paper "Economic Importance of Hunting and Fishing in Montana" (3) pointed out that recreational opportunities "offer people the opportunity to release physical and mental energy, foster broader interests and knowledge, develop better citizenship and individual responsibility, and relieve themselves of the stress and strain of modern life. Ideally, as a result of a more contented, energetic and forward-looking outlook developed in our citizens, the benefits of such areas are reflected in the national economy through increased production. The degree of this effect, however, in dollars and cents, is impossible to evaluate".

In addition, such areas may well stimulate vacation travel, offer opportunities for the development or continuation of business activities within, adjacent to, or enroute to the areas, as well as providing increased miscellaneous-tax revenue.

The Clark Fork then has at least two distinct types of values. One is concerned with the expenditures that industry and municipalities have been willing to pay to protect the river and what consumers are willing to pay to fish. The dollar values attached to these activities converts a nebulous benefit into terms that most people can understand.

The other, the intangible benefits that defy economic evaluation, are actually more important.

Discussion

It is recognized much of the channel alteration will be in areas that were altered during previous railroad and highway construction. Probably game fish populations in areas altered for the second time would recover to their present level

(although not to their original level) if the stream channel were not shortened. However, if "Route 1" is chosen for the entire Bearmouth Project, the stream will be shortened by at least 2,420 feet. Not only would this 2,420 feet itself be entirely lost, but shortening the stream by this amount would markedly and permanently lower the trout producing ability of the channel-change sections.

In other words, where original natural channels are affected trout production would be greatly reduced. Where previously worked sections are involved, trout production would be even further reduced from their original unaltered state; and then there is the 2,420 feet that would be lost entirely.

Trout production in this instance would involve not only pounds of fish, but to an even greater extent, the size of the fish. It is the two- to four-pound and larger "lunkers", such as are presently caught from this section of the Clark Fork, that make Montana unique - a place to come for real trout fishing. These are the fish that attract tourist business from other states - even from "trout states" such as Colorado. There are too few streams left across the country with the potential for large trout. Gradually most of them are being lost due to man's activities.

Then there is the time involved. The trout populations in the new artificial channels will probably take 30 to 60 years or up to three generations of fishermen to recover to the extent that they will. At this rate it is of little consolation to a fisherman to know there will be any recovery at all.

Effects of Construction on the River and Recommendations

The Interstate 90 route from Gold Creek to Clinton in the Clark Fork valley is about 40 miles long. Within this length of interstate highway, only the Bearmouth Project (about 16 miles of highway) involves channel changes. Two contracts will be let for this project, the first is Bearmouth East, which involves about 7.7 miles of highway construction.

Tables I and II (see Appendix) describe the amount and type of changes by sections to the river from Montana Highway Department's proposed Bearmouth East routing. The channel will be shortened by 1420 feet, about 4,600 feet of natural meandering main channel will be replaced with artificial channel, and 10,450 feet of previously altered channel will be reworked with this routing. Also 2,900 feet of natural meandering side channel will be lost. This routing for Bearmouth East is described as "Route 1" by Meissner (5).

If "Route 1" is accepted for the Bearmouth East routing, it undoubtedly will be continued for the Bearmouth West routing. In Bearmouth West "Route 1" will encroach on the channel in four areas. An estimated 9,500 feet of channel will be reworked and the channel will be shortened by at least 1,000 feet.

"Route 2" described by Meissner would have much less impact on the Clark Fork River than "Route 1". It influences about 2,500 feet of previously changed channel. From the fisheries standpoint, "Route 2" would be much more desirable.

With full recognition of the fact that the Montana Fish and Game Commission has been charged with the responsibility of perpetuating the fishing resources of this state and with knowledge that the organized sportsmen of the area have expressed their desire that fishing in the Clark Fork be preserved, it is therefore recommended that "Route 2" be selected.

References

1. MULTILITH REPORT. 1961. Anaconda Company, Butte, "The Anaconda Waste Treatment Plant for the Butte Mines and Anaconda Reduction Works." 3 pp.

2. These costs were obtained from the State Board of Health, Helena, Montana. They include the costs of land purchases, lines, engineering, etc., but not yearly operation and maintenance expenditures.

3. Fishermen expenditures given in:
   MCCONNEN, RICHARD J. 1960. "Economic Importance of Hunting and Fishing in Montana." Multilith Report. 13 pp.
   were adapted for this section of Clark Fork River.

4. STROUD, R. H.
   1963. Pennsylvania fishing and highways. Sport Fishing Institute Bulletin No. 137, April 1963, Pg. 2.

5. MEISSNER'S ENGINEERS, INCORPORATED. "Interstate 90 Reconnaissance Study Bearmouth East and West, Montana." A report to the Montana Highway Commission. 32 pp. plus figures.

Appendix

TABLE I. Amount of channel change, by station, Bearmouth East "Route 1"

From Station	To Station	Present channel length (feet)	Length after construction (feet)	Reduction in length (feet)
470+00	500+00	6,000	5,480	520
500+00	560+00	6,300	6,150	150
560+00	620+00	6,600	6,300	300
620+00	680+00	6,900	6,700	200
680+00	740+00	8,600	8,350	250
740+00	851+40	17,500	17,500	0
Total:		51,900	50,480	1,420

TABLE II. Type of channel change, by station, Bearmouth East "Route 1"

From Station	To Station	Length of Natural meandering channel lost (feet)	Length of Previously relocated channel reworked (feet)	Length of new channel cut (feet)
470+00	500+00	2,120	0	1,600
500+00	560+00	350	3,450	3,650
560+00	620+00	350	3,600	3,650
620+00	680+00	1,100	1,900	2,800
680+00	740+00	700 1/	1,500	1,950
740+00	851+40	0	0	0
		4,620	10,450	13,650

1/ 2,900 feet of side channel eliminated. This side channel is about 40 feet wide.

Figures in these tables were obtained from the Plan and Profile of Proposed Federal Aid Project 1-1G 90 3(4) 132 prepared by Rader & Associates, Helena, Montana, received July 29, 1963.