JOB COMPLETION REPORT

INVESTIGATIONS PROJECTS

State of Montana

Title of Job Preliminary survey of the waters in Hill, Chouteau, and Blaine Counties.*

Objectives:

Little is on record with regard to the waters and the character of the waters in northeastern Montana. Since the entire northeastern area is to be surveyed in the future, the western boundary of the district was selected to begin investigations.

Techniques Used:

Streams were located on county maps. Some history of the area was furnished by local residents and sportsmen. Mr. Al Lucke of Havre was extremely helpful in taking the investigator to various streams in the area surveyed, and in furnishing history of the streams.

Stream lengths were obtained from county maps with a map measure. Areas of ponds were taken from Soil Conservation Service fish application forms and estimates were made on others at the dam-site.

Fish samples were taken in impoundments with gill nets and through angling. Fish samples from the streams were taken entirely by angling.

Chemical analysis of the waters were not made at this time since a chemical kit was not available. The analysis will be made in 1953.

Some information on the Beaver Creek Rearing Station was obtained from old records which were left at the Station following its abandonment.

Streams Investigated:

Tributaries and sub-tributaries of the Milk River.

Peoples Creek
Clear Creek
  Wind Creek
  Henderson Creek
  West Fork of Clear Creek (John Anderson Creek)
Box Elder Creek
Beaver Creek
  Sucker Creek
Big Sandy Creek
  Little Box Elder Creek (Rocky Boy Creek)

* This project was accomplished entirely by funds of the Fish and Game Department. This report is, however, included in this bulletin that the information obtained may be made most available for management.

Tributaries and sub tributaries of the Missouri River.

Cow Creek
Birch Creek
Eagle Creek
Little Sandy Creek

Impoundments Investigated:

Name	Location S	T	R	Est. Area	Accessibility	Date
Fresno Lake		33N	12E		Roads	
Schoenborn Res.	33	33N	14E	7 A.	Road	7-31-52
Murvin Hanson Res.	3	32N	11E	5 A.	Road	8-1-52
Giles Gregoire Res.	13	31N	15E	2 A.	Road	8-4-52
Justus Anderson Res.	9	33N	15E	5 A.	Road	8-4-52
Paul Davis Res.	7	34N	17E	8 A.	Road	8-5-52
Jay Pasma Res.	22	32N	14E	10 A.	Road	8-7-52
M. H. Clawitter Res				1 A.	Cross Ctry.	8-15-52
J. P. Phelan Res.	23	28N	17E	½ A.	Road	8-30-52
James Davies Res.	35	32N	17E	4 A.	Road	9-11-52
Arthur Davies Res.	6	31N	17E	1 A.	Road	9-12-52
Floyd (Swede) Hanson Res.	6	35N	17E	8 A.	Road	9-29-52
W. Kuhr Res.	16	31N	20E	10 A.	Road	8-12-52

Findings:

All of the streams investigated head in the Bear Paw Mountains; these mountains are of volcanic origin, and the igneous exposures consist largely of ancient trap rocks. Elevations range from 5000 to 7000 feet above sea level.

The spring of the year run-off is comparatively rapid, and summer flows are mainly dependent upon the many springs and seepages in the drainage area. Late spring and early summer rains also contribute to the stream flows. The lower reaches of the streams usually go dry each year in the late summer. This drying, in some instances, is caused by the underlying geological structure - streams flow underground for varying distances, reappearing at a lower level in some cases. During dry years, the water taken for irrigation purposes draws heavily on the small streams.

Beaver are quite active on all of the streams investigated, especially along the upper reaches. Both old and new beaver dams were observed, some of the older dams being quite heavily silted in. While the dams are a definite obstruction to fish movement, and slow down and expose rather large surfaces of water to warming; they do furnish a habitat in which the fish may survive during the low water periods. The warming effect of the dams is largely compensated for by the entrance of colder spring flows into the streams.

The immediate shorelines of the streams are heavily covered with brush (largely willow) on the upper reaches. The lower reaches have grass cover alternating with the brush. Aquatic vegetation consists largely of patches of Ranunculus. Good shelter and a desirable food habitat is furnished by the stream vegetation.

Aquatic organisms available as fish food are generally abundant. Caddis are found in the greatest numbers, followed by snails and ephemerids. Freshwater shrimp were found in stomachs taken from trout caught in one of the beaver pools.

The streams of the area are small - flows probably ranging from less than 1 cu. ft./sec. up to 3 or 4 cu. ft./sec. Temperatures taken during July, August, and September of 1952 would average between 60 and 65 degrees Fahrenheit. An estimation of pool and riffle distribution would be 50 percent to 50 percent. Suitable gravel for spawning was observed in the riffles.

Specific information on the streams and ponds investigated is compiled on survey summary cards.

A possible dam-site was investigated on Beaver Creek in the Beaver Creek State Park in the canyon above Rotary Hill, T. 30N, R. 16E, S. 28-33. This site is listed on the Hill County map as Havre Reservoir Site. The stream valley, at this point, narrows down to an abrupt rocky canyon. A minimum amount of fill and labor would be required to construct the dam, and a spillway could be built by a short cut in the rocky hillside just above the dam. With a hand level it was estimated that a dam 40 ft. in height would back water up for approximately ½ mile, and would create an impoundment with a surface area of 50-60 acres and a storage capacity of some 1400 acre feet. Should the dam be constructed, impounded water could be used to maintain the stream flow during the dry period. The impoundment itself could furnish a limited recreational and fishing area.

Following petition by local residents in 1935, the State Water Conservation Board drew up plans and specifications for a water storage project at a location further down stream than that mentioned above. A 70 ft. dam with 3100 acre feet storage capacity was proposed on Beaver Creek in Hill County, Sections 25, 26, and 36 of T31N, R15E. This area is about 6 miles southeast of Fort Assiniboine. Estimated costs of this dam in 1940 were $189,091. These costs were revised in 1949 to $270,139. This project was to furnish water to irrigate some 2500 acres. In 1937, a request for PWA funds to assist this project received unfavorable reports; the charge per acre foot of water was considered excessive. The plans of the Water Conservation Board showed the following flows:

Mean monthly discharge A/ft, Beaver Creek

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sep	Year per.
1917-18								4-31	1-20			22-30	
								1120	409			32.7	1561.7
1918-19						25-31			1-28				
	220	456	449			619	910	390	143				3187
1919-20						29-31							
						115	1920	2990	786	1130	38.1	19.6	6998.7
1920-21							12-30						
							976	2440	994	2100	456	359	7325
Mean	220	456	449				1415	1940	890	1615	247	189	
Estimate				400	300	800							

Total mean - Oct to Apr inclusive - 4040 A./ft. Drainage area approx. 94 sq. mi.

Old records which were left at the abandoned Beaver Creek Rearing Station were examined. These records were somewhat sketchy, but they did show that losses from disease mounted when water temperatures rose into the seventies. One instance of losses caused by flash floods washing out installations was recorded.

Scale samples from Beaver Creek in 1952 show the following results:

	I	II	III	IV
Sample: 33 Eb (5.4 to 10.3 in. TL)				
No. of calculated lengths averaged:	33	14	2	1
Summation of calculated lengths:	128.3	89.7	15.7	9.4
Average of calculated lengths:	3.9	6.4	7.8	9.4
Sample: 5 RbXCt (5.2 to 12.8 in. TL)				
No. of calculated lengths averaged:	5	3	1	
Summation of calculated lengths:	16.0	18.3	10.5	
Average of calculated lengths:	3.2	6.1	10.5	
Sample: 2Rb (8.4 and 9.6 in. TL)				
No. of calculated lengths averaged:	2	2		
Summation of calculated lengths:	7.8	15.2		
Average of calculated lengths:	3.9	7.6		

Samples from other small creeks in the area showed a similar growth rate pattern.

In June of 1952, 1000 rainbow trout which averaged 4 to the pound were liberated in Fresno Lake at the Boat Club dock, just above the dam. These fish were identified by clipping the right pelvic fin. Between June 25, 1952, and October 19, 1952, volunteer information accounted for 34 of these trout. Lengths of the trout varied from 11.0 inches to 14.0 inches, and weights of from 1.0 to 1.5 lb. were reported. Fewer trout were caught near the point of liberation than were caught further up the lake. The furthest records of catches were from Fresno Bay, a bay about 4 miles up the lake. There may have been further movement up the lake, however this would be difficult to check since very little fishing is done beyond the Fresno Bay area. Two of the marked trout were caught below the dam after going through the tunnel outlet.

Scales were obtained from 14 rainbow trout taken from Fresno Lake, and the following results were shown.

	I	II	III	IV
No. of calculated lengths averaged:	14	14	10	2
Summation of calculated lengths:	43.8	98.8	131.6	32.6
Average of calculated lengths:	3.1	7.1	13.2	16.3

Analysis and Recommendations:

Many of the smaller streams investigated are fairly inaccessible in places and are fished by only a few fishermen who know the area. Natural reproduction should maintain the population in these more inaccessible areas since suitable spawning areas were observed, as were desirable habitats. In any case, the standing population would not be large since the streams themselves are quite small and the water limited.

Beaver Creek, within the limits of the State Park, receives considerable fishing pressure. To check the contribution of hatchery fish to the anglers creel, 2500 eastern brook fingerlings (4-5 inches TL) were liberated in the pressure areas. These fish were fin-clipped for identification. Creel checks will be made and volunteer information will be solicited on these fish during the 1953 season; the two sources of information to be separately treated.

A dam, such as at the site investigated on Beaver Creek just above Rotary Hill, would do much to improve sport fishing in the area. The impoundment could be created at a relatively low cost due to nearly ideal conditions for dam construction at the site. A flow could be maintained downstream from the dam to create a year-round fish habitat in an area which usually goes dry in the late summer. Before serious consideration is given the construction of this dam, a detailed survey should be made by one well versed in water development projects.

Trout fishing in Fresno Lake is entirely dependent upon hatchery planting. The silt and fine sand of the lake bottom is not conducive to natural trout spawning. It is believed that some trout fishing could be maintained in the lake by planting since growth is quite rapid and there are a number of anglers who enjoy the type of trout fishing that the Lake offers. A greater number of fishermen would benefit, however, by the establishment of a desirable species of warm-water fish, such as walleye pike or northern pike. The warm water fish should, to a large extent, maintain themselves once established.

Additional work will be necessary in the area to complete the cataloging of the waters and to develop management procedures.

Farm ponds in the area will be checked to find suitable species combinations and pond conditions best suited to the area.

Aerial survey will be used in 1953 to supplement the ground survey made during 1952.

Summary:

During the period from the first of July through September, 1952, a preliminary survey of the waters of Chouteau, Hill, and Blaine Counties was conducted. The area lists many small streams, but few of them proved suitable for fish, mainly because of the short water supply, especially in the late summer.

Farm ponds are increasing in number in the area and should, with proper management, absorb some of the pressure which has been concentrated on the small streams.

Data and Reports:

The original data is with the project leader at Fort Peck, Montana

Prepared by William Alvord Approved by _____

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