

## MONTANA FISH AND GAME DEPARTMENT

Helena, Montana

## A PRE-IMPOUNDMENT BOTTOM-FAUNA STUDY OF THE BIG HOLE RIVER, MONTANA

A pre-impoundment bottom-fauna study was conducted on the Big Hole River during late August 1960. This study was designed to give some insight into the bottom-fauna population prior to the construction of Reichle Reservoir by the U. S. Bureau of Reclamation.

The techniques used in this study are similar to those used in the Beaverhead River study, and will not be repeated here.

One sampling area was located above the proposed Reichle Reservoir, and the other below. The Location Map, Page 5 shows the location of the two sampling areas.

LOCATION OF SAMPLING AREAS

Upper Area: The upper sampling area is located in Township 2 South, Range 9 West, Section 35. The sampling area is located about one-half mile west of Melrose, Montana, just above the bridge crossing on the Canyon Creek - Hecla Road. Figure 1 shows the sampling area and the location of sampling stations. Bottom material at this sampling area is rubble up to 6 inches in diameter. Some algae was noticed on the rubble in mid-stream.. Data concerning the sampling area is found on Figure 1.

Lower Area: The lower sampling area is located in Township 4 South, Range 7 West, Section 29. This sampling area is located immediately adjacent to the old Ziegler Hot Springs Resort. This resort is now owned and operated by a Mr. Stanovich. The new name is the Biltmore Hot Springs Recreation Area. Bottom material in the river at this area consisted of rubble about 8 inches in diameter. Small amounts of algae were found in midstream and near the south banks. Figure 2, shows the sampling area and presents supporting data.

FINDINGS

The results of the bottom-fauna sampling are presented on Table 1 for the upper sampling area, and Table 2, for the lower sampling area.

A consolidated tabulation of the results for the upper sampling area are as follows:

	Series "W"		Series "X"	
	<u>No.</u>	<u>Percent</u>	<u>No.</u>	<u>Percent</u>
Trichoptera	80	31	51	17
Plecoptera	26	10	44	15
Diptera	102	40	63	21
Ephemeroptera	28	11	78	27
Coleoptera	20	8	27	8
Lepidoptera	1	-	4	2
Hemiptera	-	-	26	9
Gastropoda	-	-	2	1

The total volume for the series "W" samples was 7.0 cubic centimeters. For the series "X" samples the total volume was 10.5 cubic centimeters.

A consolidated tabulation of the results for the lower sampling area are as follows:

	Series "Y"		Series "Z"	
	<u>No.</u>	<u>Percent</u>	<u>No.</u>	<u>Percent</u>
Trichoptera	169	57	149	54
Plecoptera	7	2	17	6
Diptera	31	11	66	24
Ephemeroptera	69	24	35	12
Coleoptera	12	4	2	1
Lepidoptera	7	2	6	3

The total volume for the series "Y" samples was 3.0 cubic centimeters. For the series "Z" samples the total volume was 8.8 cubic centimeters.

Robert C. Averett  
May 1961

Authors Note: Mr. J. M. Stubbs, now with the Tennessee Game and Fish Commission, assisted with the collection of samples.

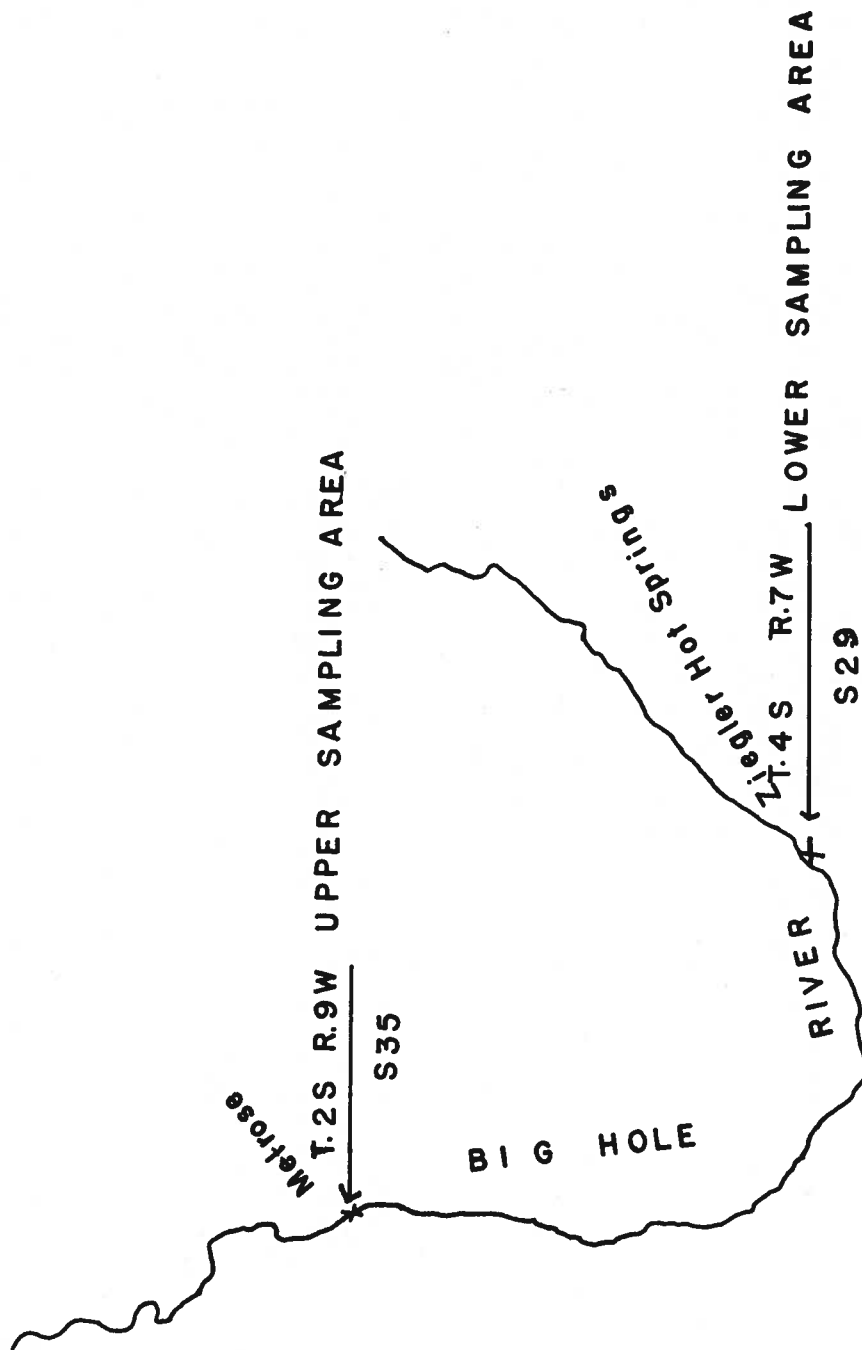
TABLE 1. Bottom-Fauna Collected at Upper Big Hole River Sampling Area.  
 Number in ( ) refers to percent of sample. August 25, 1960.  
 One square foot sample per sample location.

Sample Location	Feet From Shore	Hydropsychidae	Leptoceridae	Pteronarcidae	Perlidae	Nemouridae	Simuliidae	Chironomidae	Tipulidae	Tanyderidae	Bactidae	Ephemeridae	Elmidae	Corixidae	Pyralidae	Gastropoda	Total Number	Total Volume (c.c.)
SERIES "W"																		
1-W	5	14 (28)	9 (18)					12 (24)	1 (2)		11 (22)		3 (6)				50	1.0
2-W	10	16 (33)	11 (23)					10 (21)	2 (4)	1 (2)	2 (4)		6 (13)				48	2.7
3-W	30	14 (30)	2 (4)					19 (41)	1 (2)		8 (17)		3 (6)				47	2.3
4-W	50	9 (50)	3 (17)					6 (33)									18	0.6
5-W	80	12 (75)						3 (19)							1 (6)		16	0.1
6-W	100	3 (12)	4 (17)					5 (21)	1 (4)		4 (17)		7 (29)				24	0.1
7-W	115	1 (14)	2 (29)	1 (14)				3 (43)									7	0.1
8-W	130	4 (9)	1 (2)				38 (81)				3 (6)		1 (2)				47	0.1
SERIES "X"																		
1-X	10	17 (20)	9 (11)					10 (12)			18 (22)		5 (6)	24 (29)			83	3.1
2-X	20	8 (14)	9 (16)					19 (34)	1 (2)		9 (16)	1 (2)	5 (8)	2 (4)		2 (4)	56	2.1
3-X	40	3 (7)	5 (11)	9 (21)				5 (11)			15 (34)		7 (16)				44	1.3
4-X	45	5 (15)	2 (6)			5 (15)		8 (23)			11 (32)		3 (9)				34	0.5
5-X	50		3 (16)					3 (16)	2 (11)		6 (31)		4 (21)		1 (5)		19	0.1
6-X	60	5 (31)		3 (19)				3 (19)	1 (6)		4 (25)						16	1.7
7-X	75	2 (9)	1 (4)	5 (21)				3 (13)			8 (35)		2 (9)		2 (9)		23	1.5
8-X	95			4 (20)				8 (40)			6 (30)		1 (5)		1 (5)		20	0.2

TABLE 2. Bottom-Fauna Collected at Lower Big Hole Sampling Area.  
Number in ( ) refers to sample size. August 23, 1960.  
One Square Foot Sample per sample location.

Sample Location	Feet From Shore	Brachycentridae	Hydropsychidae	Leptoceridae	Pteronarcidae	Perlidae	Chironomidae	Rhagionidae	Tipulidae	Baetidae	Ephemeridae	Elmidae	Pyralidae	Total Number	Total Volume (c.c.)
SERIES "Y"															
1-Y	10	2 (8)	7 (28)	2 (8)			4 (16)			7 (28)		3 (12)		25	0.1
2-Y	20		15 (44)			1 (3)		2 (6)	2 (6)	10 (29)		4 (12)		34	0.2
3-Y	35		41 (64)	1 (2)		2 (3)	3 (5)		2 (3)	11 (17)		2 (3)	2 (3)	64	0.6
4-Y	50		26 (68)	1 (3)			2 (5)			7 (19)		2 (5)		38	0.2
5-Y	70		13 (46)				4 (14)		5 (18)	5 (18)		1 (4)		28	0.6
6-Y	90		14 (70)			2 (10)	2 (10)			2 (10)				20	0.1
7-Y	105	2 (6)	27 (75)			1 (2)	4 (11)			2 (6)				36	0.6
8-Y	125		18 (36)			1 (2)	1 (2)			16 (32)	9 (18)		5 (10)	50	0.6
SERIES "Z"															
1-Z	10		2 (12)							10 (63)	3 (19)		1 (6)	16	0.05
2-Z	25		6 (67)			1 (11)	2 (22)							9	0.05
3-Z	35	4 (14)	16 (57)			2 (7)	4 (14)			1 (4)			1 (4)	28	1.1
4-Z	50		18 (38)			1 (2)	24 (51)			3 (7)		1 (2)		47	1.0
5-Z	70	1 (2)	39 (68)			1 (2)	8 (14)		2 (3)	5 (9)		1 (2)		57	0.4
6-Z	85		24 (47)	3 (6)	2 (4)	2 (4)	16 (31)			3 (6)			1 (2)	51	3.0
7-Z	120		13 (62)			1 (4)	3 (14)			2 (10)			2 (10)	21	1.1
8-Z	140	4 (9)	19 (41)			7 (15)	7 (15)			8 (18)			1 (2)	46	2.1

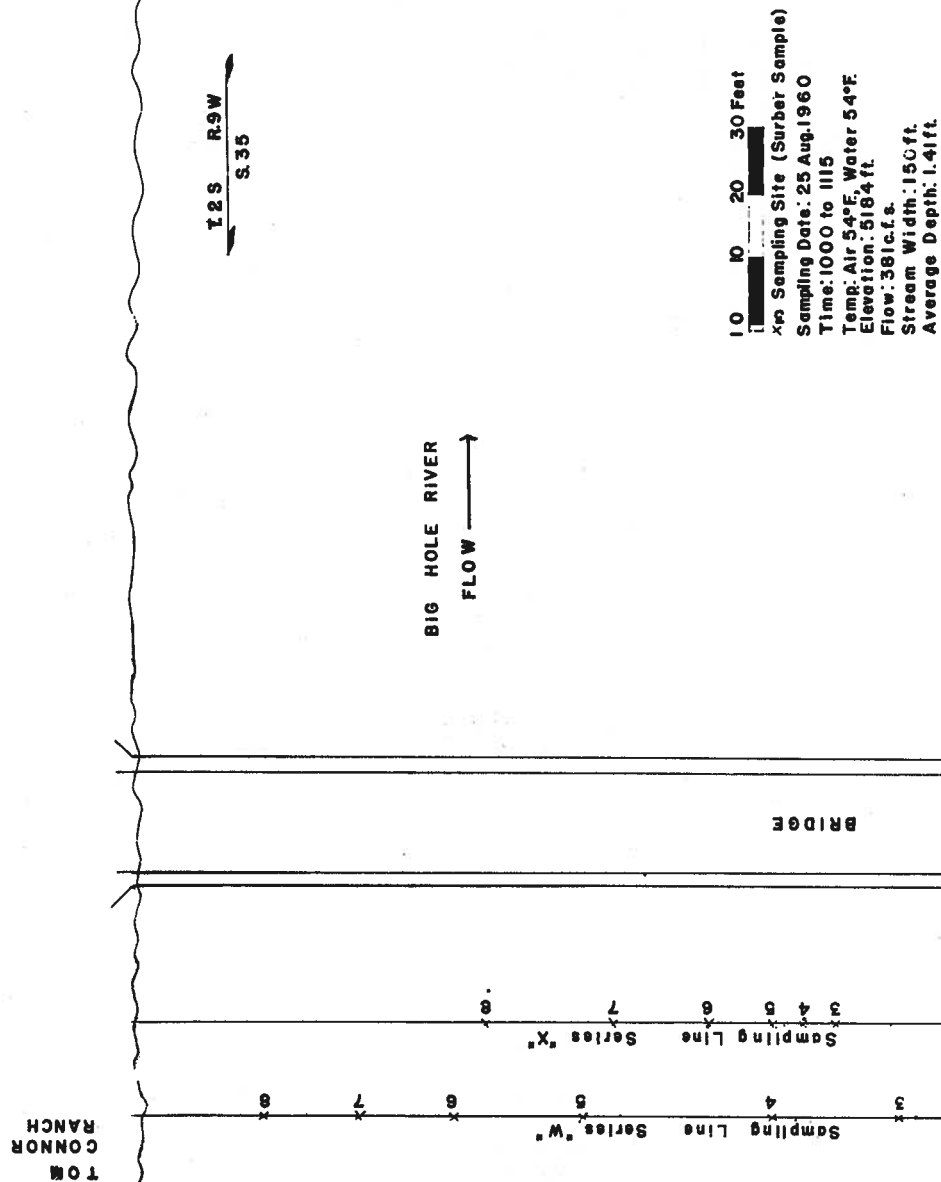
# LOCATION MAP



1 0 2 4 Miles



FIGURE 1. Upper sampling area, Big Hole River



**FIGURE 2. Lower sampling area, Big Hole River**

