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 midstream. 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:

	Ser	ies "W"	Series "				
	No.	Percent	No.	Percent			
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:

		Ser	ies "Y"	Series "Z"					
		No.	Percent	No.	Percent				
Trichoptera		169	57	149	54				
Plecoptera		7	2	17	6				
Diptera		31	11	66	24				
Ephemeroptera	14	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

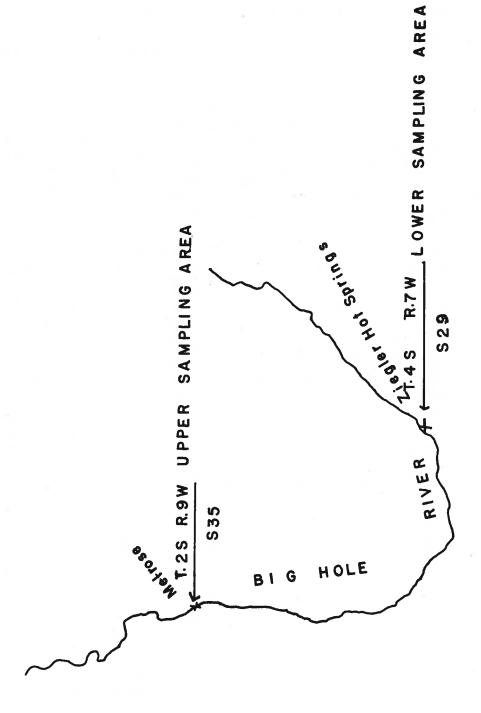
Authors Note: Mr. J. M. Stubbs, now with the Tennessee Game and Fish Commission, assisted with the collection of samples.

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.

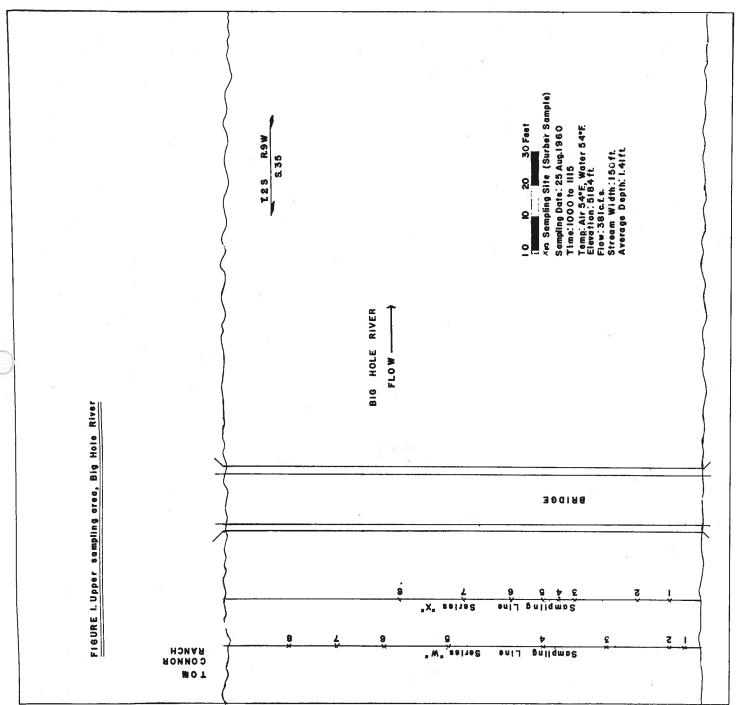
		ø,																
Sample Location	Feet From Shore	Hydropsychidae	Leptoceridae	Pteronarcidae	Perlidae	Nemouridae	Simulidae	Chironomidae	Tipulidae	Tanyderidae	Bactidae	Ephemeridae	Elmidae	Corixidae	Pyralidae	Gastropoda	Total Number	Total Volume (c.c.)
				350			\$	ERIE	es "T	N. ? ?								
l-W	5		14 (28)	9 (18)				12 (24)			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
							S	ERIE	S "2	Zu)								
1-X	10		17 (20)	9 (11)				10 (12)			18 (22)		5 (6)	24 (29)			83	3.1
2-X	20	ĺ	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)	1		15 (34)		7 (16)				44	1.3
4-X		5 (15)			(5 (15)		8 (23)			11 (32)		3 (9)				34	0.5
5-X	50	(3 (16)			×		3 (16)	(II)		6 (31)		4 (21)		1 (5)		19	0.1
6 - x	60	5 (31)		(]	3 L9)			3 (19)	1 (6)		4 (25)						16	1.7
7-X	75	2 (9)	1 (4)					3 (13)			8 (35)		<u>2</u> (9)		2 (9)		23	1.5
8 -x	95			4 (20)				8 (40)			6 (30)		1 (5)		1 (5)		20	0.2

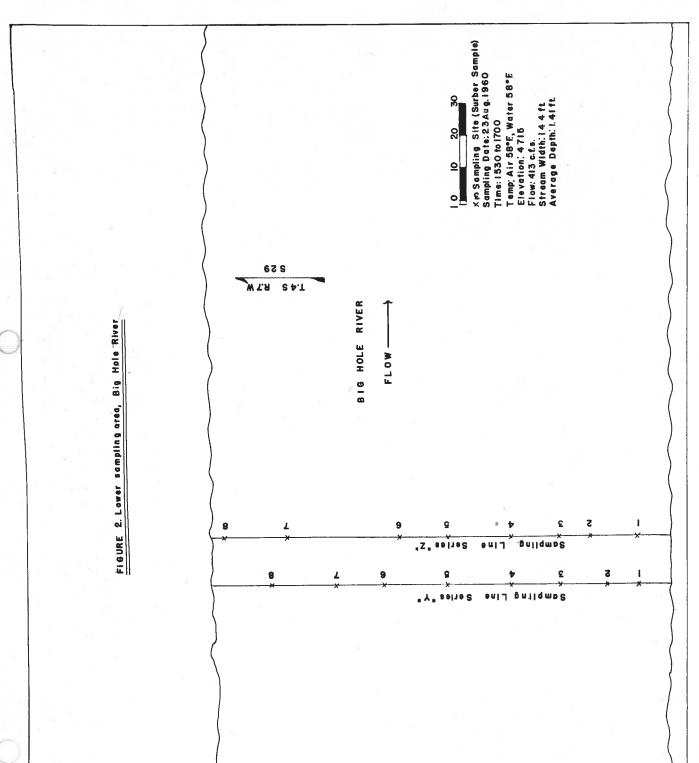
TABLE 2. Bottom-Fauna Collected at Lower Big Hole Sampling Area. Number in () refers to sample size. August 23, 1960. One Square Foot Sample per sample location.

Sample Location	Feet From Shore	Brachycentridae	Hydropsychidae	Leptoceridae	Pteronarcidae Perlidae	Chironomidae	Rhagionidae	Tipulidae	Baetidae	Ephemeridae	Elmidae	Pyralidae	Total Number	Total Volume (c.c.)
						SER	IES	нХи						
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 - ¥	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 - ¥	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 - ¥	105	2 (6)	27 (75)		1 (2)	4 (11)			2 (6)				36	0.6
8 - ¥	125		18 (36)		1 (2)	1 (2)			16 (32)	9 (18)		5 (10)	50	0.6
						SER	IES	μZn						
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								1 (4)			1 (4)	28	1.1
4-Z	50		18 (38)						3 (7)		1 (2)		47	1.0
5 - Z	70	1 (2)	39 (68)								1 (2)		57	0.4
6 -z	85								3 (6)			1 (2)	51	3.0
7-Z	120		13 (62))						2 (10)			2 (10)	21	1.1
8-Z	140								8 (18)			1 (2)	46	2.1
	uoines 1-Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	1-Y 10 2-Y 20 3-Y 35 4-Y 50 5-Y 70 6-Y 90 7-Y 105 8-Y 125 1-Z 10 2-Z 25 3-Z 35 4-Z 50 5-Z 70 6-Z 85 7-Z 120	1-Y 10 2 (8) 2-Y 20 3-Y 35 4-Y 50 5-Y 70 6-Y 90 7-Y 105 2 (6) 8-Y 125 1-Z 10 2-Z 25 3-Z 35 (4) 4-Z 50 5-Z 70 1 (2) 6-Z 85 7-Z 120 8-Z 140 4	1-Y 10 2 7 (8)(28) 2-Y 20 15 (44) 3-Y 35 41 (64) 4-Y 50 26 (68) 5-Y 70 13 (46) 6-Y 90 14 (70) 7-Y 105 2 27 (6)(75) 8-Y 125 18 (36) 1-Z 10 2 (12) 2-Z 25 6 (67) 3-Z 35 4 16 (14)(57) 4-Z 50 18 (38) 5-Z 70 1 39 (2)(68) 6-Z 85 24 (47) 7-Z 120 13 (62) 8-Z 140 4 19	1-Y 10 2 7 2 (8)(28)(8) 2-Y 20 15 (44) 3-Y 35 41 1 (64)(2) 4-Y 50 26 1 (68)(3) 5-Y 70 13 (46) 6-Y 90 14 (70) 7-Y 105 2 27 (6)(75) 8-Y 125 18 (36) 1-Z 10 2 (12) 2-Z 25 6 (67) 3-Z 35 4 16 (14)(57) 4-Z 50 18 (38) 5-Z 70 1 39 (2)(68) 6-Z 85 24 3 2 (47)(6)(47) 7-Z 120 13 (62)	1-Y 10 2 7 2 (8)(28)(8) 2-Y 20 15 1 (44) (3) 3-Y 35 41 1 2 (64)(2) (3) 4-Y 50 26 1 (68)(3) 5-Y 70 13 (46) 6-Y 90 14 2 (70) (10) 7-Y 105 2 27 1 (6)(75) (2) 8-Y 125 18 1 (2) 1-Z 10 2 (12) 2-Z 25 6 1 (67) (11) 3-Z 35 4 16 2 (2) 1-Z 10 2 (12) 2-Z 25 (67) (11) 3-Z 35 4 16 2 (14)(57) (7) 4-Z 50 18 1 (2) 5-Z 70 1 39 1 (2) 6-Z 85 24 3 2 (47)(6)(4) (4) 7-Z 120 13 (62) (4) 8-Z 140 4 19 7	SER. 1-Y 10 2 7 2 4 (8)(28)(8) (16) 2-Y 20 15 1 (44) (3) 3-Y 35 41 1 2 3 (64)(2) (3) (5) 4-Y 50 26 1 (68)(3) (5) 5-Y 70 13 (46) (14) 6-Y 90 14 2 2 (70) (10)(10) 7-Y 105 2 27 1 4 (6)(75) (2)(11) 8-Y 125 18 1 1 (36) (2) (2) SER. 1-Z 10 2 (12) 2-Z 25 6 1 2 (67) (11)(22) 3-Z 35 4 16 2 4 (14)(57) (7)(14) 4-Z 50 18 1 24 (38) (2)(51) 5-Z 70 1 39 1 8 (38) (2)(51) 5-Z 70 1 39 1 8 (2)(68) 6-Z 85 24 3 2 2 16 (47)(6)(4) (4)(31) 7-Z 120 13 (62) (4)(14) 8-Z 140 4 19 7 7	SERIES 1-Y 10 2 7 2 4 (8)(28)(8) (16) 2-Y 20 15 1 2 (44) (3) (6) 3-Y 35 41 1 2 3 (64)(2) (3) (5) 4-Y 50 26 1 2 (68)(3) (5) 5-Y 70 13 4 (14) 6-Y 90 14 2 2 (70) (10)(10) 7-Y 105 2 27 1 4 (6)(75) (2)(11) 8-Y 125 18 1 1 (36) (2) (2) SERIES 1-Z 10 2 (12) 2-Z 25 6 1 2 (14)(57) (7)(14) 4-Z 50 18 1 24 (38) (2)(51) 5-Z 70 1 39 1 8 (2)(68) (2)(14) 6-Z 85 24 3 2 2 16 (47)(6)(4) (4)(31) 7-Z 120 13 1 3 (62) (4)(14) 8-Z 140 4 19 7 7	SERIES "Y" 1-Y 10 2 7 2 4	SERIES "Y" 1-Y 10 2 7 2 4 7 7 (8)(28)(8) (16) (28) 2-Y 20 15 1 2 2 10 (44) (3) (5) (6)(6)(29) 3-Y 35 41 1 2 3 2 11 (64)(2) (3) (5) (3)(17) 4-Y 50 26 1 2 7 (68)(3) (5) (19) 5-Y 70 13 4 5 5 (46) (14) (18)(18) 6-Y 90 14 2 2 2 2 (70) (10)(10) (10) 7-Y 105 2 27 1 4 2 (6)(75) (2)(11) (6) 8-Y 125 18 1 1 16 (36) (2)(2) (32) SERIES "Z" 1-Z 10 2 10 (63) 2-Z 25 6 1 2 (67) (11)(22) 3-Z 35 4 16 2 4 1 (14)(57) (7)(14) (4) 4-Z 50 18 1 24 3 (38) (2)(51) (7) 5-Z 70 1 39 1 8 2 5 (2)(68) (2)(14) (3)(9) 6-Z 85 24 3 2 2 16 (47)(6)(4) (4)(31) (6) 7-Z 120 13 (62) (4)(14) (5) 8-Z 140 4 19 7 7 8	SERIES "Y" 1-Y 10 2 7 2 4 7 (8)(28)(8) (16) (28) 2-Y 20 15 1 2 2 10 (44) (3) (6) (6)(29) 3-Y 35 41 1 2 3 2 11 (64)(2) (3) (5) (3)(17) 4-Y 50 26 1 2 7 (68)(3) (5) (19) 5-Y 70 13 4 5 5 (46) (14) (18)(18) 6-Y 90 14 2 2 2 (70) (10)(10) (10) 7-Y 105 2 27 1 4 2 (6)(75) (2)(11) (6) 8-Y 125 18 1 1 16 9 (36) (2) (2) (32) (18) SERIES "Z" 1-Z 10 2 10 3 (63) (19) 2-Z 25 6 1 2 (67) (11)(22) 3-Z 35 4 16 2 4 1 (14)(57) (7)(14) (4) 4-Z 50 18 1 24 3 (38) (2)(51) (7) 5-Z 70 1 39 1 8 2 5 (2)(68) (2)(14) (3)(9) 6-Z 85 24 3 2 2 16 3 (47)(6)(4) (4)(31) (6) 7-Z 120 13 1 3 2 (62) (4)(14) (10) 8-Z 140 4 19 7 7 8	SERIES "Y" 1-Y 10 2 7 2 4 7 3	SERIES TY 1-Y 10 2 7 2 4 7 3 4 7 3 4 7 4 7 3 4 7 4 7 7 7 7 7 7 7	SERIES "Y" 1-Y 10 2 7 2 4 7 7 3 25 2-Y 20 15 1 2 2 10 4 34 3-Y 35 (44) 2 (3) (5) (3) (17) (3) (3) 4-Y 50 26 1 2 7 2 2 6 (68)(3) (5) (19) (5) 5-Y 70 13 4 5 5 1 28 (60)(75) (2)(11) (6) 8-Y 125 18 1 1 16 9 5 (36) (2) (2) (32) (18) (10) SERIES "Z" 1-Z 10 2 10 2 10 3 16 2-Z 25 6 1 2 4 1 16 (67) (11)(22) 3-Z 35 4 16 2 4 1 16 4-Z 50 18 1 24 3 16 4-Z 50 18 1 24 3 16 4-Z 50 18 1 24 3 16 (38) (2)(51) (7) (2) 5-Z 70 1 39 1 8 2 5 1 (38) (2)(51) (7) (2) 5-Z 70 1 39 1 8 2 5 5 (47)(6)(4) (4) (4)(31) (6) 6-Z 85 24 3 2 2 16 (47)(6)(4) (4) (4)(14) 8-Z 140 4 19 7 7 8 1 46 1 46 1 46 1 46 1 51 1 66 2 2 1 2 2 1 3 3 25 1 62 2 3 3 2 1 3 4 7 7 7 8 1 46 3 5 7 7 7 8 1 46 4 7 7 7 7 8 1 46 1 62 1 62 1 62 1 63 1 61 1 61 1 7-Z 120 13 1 3 2 2 2 2 2 2 16 (47)(6)(4) (4)(14) (10) (10) 8-Z 140 4 19 7 7 8 1 46



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