Ref ID: 71055

MONTANA DEPARTMENT OF FISH AND GAME
FEDERAL AID IN FISH RESTORATION SECTION

Helena, Montana

JOB COMPLETION REPORT
INVESTIGATIONS PROJECTS

State of Montana

Name Fishery Investigation Laboratory

Project No. F-23-R-3

Title Age & Growth Studies & Analysis of Bottom Samples in Connection with Pollution Studies

Job No. I & II

Period Covered: May 1, 1959 to April 30, 1960

Abstract:

Age growth studies were made on over 5,000 scale samples. The age-growth data were summarized and the data placed on cards for easy access. A total of 206 drift and bottom samples from the Bitterroot Drainage were sorted. Work is in progress on a series of bottom samples from the Madison River.

Objectives:

Age and growth of the fishes in the lakes and streams is used as a basis for management. Montana is still in the process of inventorying the fishery resource in some areas and age-growth studies are part of this inventory. In other situations a knowledge of the age of the fish and the rate of growth are a necessary part of evaluating management techniques. The tedious analysis of bottom samples collected in connection with pollution can best be accomplished in a laboratory where temporary help, with the necessary training, is available. Results of these analyses are sent to leaders of the specific projects on which the data was collected for inclusion in pertinent completion reports.

Techniques and Findings

During 1959-60 age and growth determinations were made on approximately 5,000 specimens. These collections represent initial survey information (Big Hole River Drainage, Sun River and mountain lakes)as well as follow up survey to evaluate management measures (Kipp Lake, Blackfoot River) and as a part of special studies (Madison River, Rock Creek, Beartooth Lakes). A summary of the significant collections, aged in the laboratory, is shown in Table I. In addition to these, several large collections were mounted by the laboratory and were aged as a part of other special studies.

Past years scale collections were summarized and the significant samples (over 10 of a species) were placed on cards for easy reference.

A series of 205 bottom and drift samples from the Bitterroot Drainage were separated to order, counted and volumes determined. These samples were collected as a part of a DDT spray program in the drainage. These data are included in the supplemental completion report for F-12-R-6.

During the low water following the August earthquake, samples of bottom fauna were taken from several sites on the Madison River. These data are summarized in Table II.

Recommendations:

Collection and analysis of fish scales for age and growth should continue with emphasis on securing adequate samples from the major waters. Work on organizing and tabulating these data should be completed and a summary prepared for the use of management biologists.

Prepared by John R. Heaton

Date September 27, 1960

Approved by George D. Holton
George D. Holton

Table I - Summary of Age and Growth Studies For 1959-60.

Eastern Brook Trout

	I	II	III	IV	V
Holiday Lake (1960)	5.0(33)	8.7(18)	10.8(2)		
Holiday Lake (1954-58)	4.3(71)	8.8(57)	12.1(13)		
Miner Creek (upper)	2.1(11)	4.3(11)	7.3(2)		
Miner Creek (lower)					
Joseph Creek	2.7(36)	5.0(16)			
N. Fk. Big Hole	3.6(19)	6.6(8)	9.6(2)	12.6(1)	
Browne Lake	2.4(32)	5.2(32)	7.8(17)	9.5(2)	
Trail Creek (upper)	2.9(52)	5.6(32)	7.3(10)	9.4(2)	
Trail Creek (middle)	3.5(16)	6.0(2)			
Steel Creek	4.0(17)	7.8(7)	11.1(1)		
Ruby Creek	3.0(30)	5.9(14)	8.6(3)		
Pattengail Creek	3.7(16)	4.6(3)			
LaMarche Creek	2.7(23)	4.9(15)	7.9(6)		
Twin Lake	3.2(16)	6.5(16)	9.0(7)		
Miner Lake	3.2(25)	7.1(25)	9.8(10)		
Deep Creek	3.2(19)	5.9(17)	8.7(2)	11.6(1)	
Mossigbrod Lake	2.7(8)	6.4(8)	9.6(5)	12.7(2)	
Wise River	3.1(12)	5.7(3)	8.6(1)		
Reservoir Lake	4.3(58)	7.2(41)	8.9(4)		
Pintlar Lake	3.1(12)	6.2(12)	8.0(5)		
Willow Creek	4.5(15)	6.6(6)			
Tin Cup Creek	3.6(15)	5.9(2)			
Lost Creek	3.0(21)	5.7(13)	7.2(1)		
Mill Creek	3.3(23)	5.4(6)			
Warm Spring Creek	3.1(10)	5.2(6)			
Rock Creek Sec. I	4.0(62)	6.8(26)	10.2(5)		
Little Blackfoot River	2.1(26)	3.7(10)	8.0(1)		
Bloody Dick Creek	2.3(38)	4.3(27)	5.8(9)		
Big Hole River	2.9(48)	5.4(25)	7.7(10)	9.4(2)	
Big Hole River	2.2(58)	4.2(38)	6.8(17)		

Rainbow Trout

Holiday Lake (1960)	3.7(12)	9.6(12)	13.7(6)		
Rock Island #1	3.7(19)	7.4(12)	9.7(5)	11.6(4)	
Holiday Lake (1954-58)	3.7(10)	9.8(7)	14.7(3)	18.6(2)	
Pattengail Creek	2.9(23)	5.9(2)	10.0(1)		
LaMarche Creek	2.2(11)	4.7(8)	6.6(2)		
Rock Creek	3.6(37)	5.1(33)	6.7(7)	8.9(2)	
Deep Creek	2.3(12)	5.0(10)	7.1(2)		
Wise River	2.8(17)	5.3(1)	8.7(1)	11.9(1)	
Sun River	3.3(94)	6.8(89)	8.7(29)	11.2(10)	
Willow Cr. Res.	3.5(56)	6.2(56)	9.1(45)	11.1(14)	
Nilan Reservoir	9.1(34)	14.1(9)			
Kipp Lake	4.7(46)	14.5(32)	21.0(27)	22.0(3)	

Table I - Cont'd.

	I	II	III	IV	V	VI
Willow Creek Res.	3.5(56)	6.2(56)	9.1(45)	11.1(14)		
Rock Creek Sec. I	3.0(166)	6.9(138)	11.0(74)	14.1(42)		
Rock Creek Sec. II	3.0(47)	6.6(41)	10.2(21)	13.4(8)		
Tongue River	8.8(15)					
Cutthroat Trout						
Holiday Lake (1954-58)	3.1(13)	10.0(13)	14.2(2)	15.1(1)		
Miller Creek	2.8(53)	5.5(33)	7.3(4)			
Foster Creek	3.7(26)	5.6(15)	8.4(4)	9.5(1)		
Webb Lake	3.3(31)	7.6(31)	10.0(16)	13.5(7)		
Parker Lake	3.0(58)	6.7(57)	10.2(39)	12.7(11)	17.2(1)	
Upper Elliot	2.7(49)	4.9(49)	6.6(25)	8.8(2)		
Ranch Creek	3.4(60)	5.8(40)	8.2(16)	10.8(2)		
Lower Elliot	2.8(23)	5.1(23)	6.8(16)	8.5(3)		
Rock Cr. Sec. I	2.7(72)	5.7(70)	8.9(30)	12.6(2)	15.7(1)	
Rock Cr. Sec. II	2.9(32)	5.8(28)	7.8(6)	11.8(1)		
Little Blackfoot Sec. 9-7	3.1(102)	5.0(41)	6.9(5)			
Dolly Varden						
Ranch Creek	2.6(12)	4.9(12)	7.8(6)	13.1(2)		
Rock Creek Sec. I	4.1(23)	7.3(23)	10.7(17)	14.7(3)		
Rock Creek Sec. II	3.5(31)	6.1(17)	9.2(9)	13.6(3)	16.6(1)	
Rainbow & Cutthroat Hybrids						
Holiday (1954-58)	3.6(25)	9.5(25)	14.0(4)	16.1(1)		
Brown Trout						
Rock Creek Sec. I	4.3(115)	9.9(93)	13.0(43)	15.6(16)	17.1(4)	17.9(1)
Little Blackfoot Sec. 1-8	3.6(99)	7.9(31)	10.5(14)	12.7(1)		
Little Blackfoot Sec. 9-17	2.8(117)	5.7(91)	8.7(39)	11.0(16)	12.8(1)	
Walleye						
Westrope Lake	4.3(45)	9.1(45)	13.4(45)	15.4(45)		
Lake Trout						
Twin Lake	2.8(15)	5.8(15)	10.4(12)	13.9(5)	19.9(2)	25.2(1)
Greyling						
Mussigbrod	3.5(9)	8.0(8)	10.3(8)			

Whitefish

	I	II	III	IV	V	VI	VII
Steel Creek	3.1(45)	6.7(43)	9.6(31)	11.5(20)	13.2(12)	14.8(4)	15.4(2)
Big Hole (lower)	4.4(19)	8.9(19)	11.1(14)	12.9(2)			
Rock Creek Sec. I	3.7(101)	7.3(76)	9.9(34)	12.3(14)	14.2(6)	17.1(1)	19.0(1)
Rock Creek Sec. II	2.5(13)	5.6(13)	8.1(13)	10.3(5)	11.2(5)	12.4(1)	
Rock Creek Sec. 1 1960	3.7(46)	7.8(22)	9.4(22)	10.7(7)	11.9(2)		
Little Blackfoot R. Sec. 4-8	3.1(67)	6.3(36)	8.6(20)	10.0(12)	11.0(10)	12.3(2)	14.4(1)
Little Blackfoot R. Sec. 9-17	2.3(151)	5.1(63)	8.0(94)	9.7(75)	10.9(59)	11.5(22)	13.1(3)

Table II - Summary of Bottom Samples Collected In The Madison River On August 24-25, 1959. Ten One Square Foot Samples Were Collected On A Transect Across The Stream At Each Station.

Location Of Sample	Diptera	Trichoptera	Plecoptera	Ephemeroptera	Coleoptera	Lepidoptera	Polychaeta	Turbellaria	Hirudinea	Malacostraca	Gastropoda	Acari	Cottus
Hutchins Bridge	90	92	29	161	111	-	2	-	-	-	-	3	-
Sheldon Bridge	488	6	27	20	3	-	-	-	-	-	-	-	1
Varney Bridge	516	360	32	112	30	-	1	-	-	-	-	1	1
Below Meadow Lake	286	531	2	293	16	19	-	-	2	125	195	-	-
R.R. Bridge at Three Forks	73	313	7	17	60	1	-	58	-	-	1	-	-