

Attached are early records of Grayling Propagation in Montana

Bozeman Fish Hatchery 1898 to 1907

BOZEMAN, MONTANA, STATION AND STATIONS.

Cost of Station.

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Preliminary investigation-----	611.95
Land-----	5,628.00
Improvements, including buildings and ponds-----	29,994.54
Equipment-----	1,524.29
Total.	<u>\$37,758.78</u>

Annual Output and Cost of Operating.

Fiscal year	Species	Eggs	Fry	Fingerlings: yearlings and adults	Cost of Operating
1898	Brook trout:			6,000:	\$ 6,537.88
	Steelhead				
	trout			45,000:	
	Grayling		<u>1,500,000:</u>		
1899	Brook trout:			19,000:	5,541.09
	Steelhead				
	trout			20,000:	
	Blk. spotted:				
	trout *	25,000:	106,325:	58,000:	
	Grayling	75,000:	<u>4,475,000:</u>		
	*Transferred 305,000 grayling eggs to other stations and 10,000 to the Omaha Exposition.				
	*Transferred 10,000 blackspotted trout eggs to Omaha Exposition not accounted for in tabulation.				
1900	Brook trout:			43,500:	5,392.07
	Rainbow "			13,000:	
	Steelhead "			10,000:	
	Blk. spotted:				
	trout *	10,000:	120,000:	277,000:	
	Grayling	372,000:	<u>2,242,100:</u>	10,000:	
	*Transferred 442,000 grayling eggs to other stations.				

BOZEMAN, MONTANA, STATIONS AND EXPENDITURES.
(Continued)

Fiscal year :	Species :	Eggs :	Fry :	:Fingerlings: : yearlings : :and adults :	Cost of Operating
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1901	:Brook trout:			29,400:	\$ 5,083.90
	:Steelhead":			36,000:	
	:Blk.spotted:				
	: trout *	150,000:	115,000:	566,000:	
	:Grayling :	270,000:	<u>1,362,300:</u>	<u>7,000:</u>	

*Transferred 100,000 grayling eggs to other stations.
* " 20,000 blackspotted trout eggs, 13000 steelhead trout
eggs and 20,000 grayling eggs to the Pan American Exposition
Buffalo

1902	:Brook trout:			24,000:	\$ 5,127.58
	:Steelhead":			10,000:	
	:Blk.spotted:				
	: trout *	135,000:	100,000:	262,500:	
	:Grayling *	655,000:	<u>525,000:</u>	<u>18,000:</u>	

*Transferred 800,000 grayling eggs to other stations.

1903	:Brook trout:			97,500:	\$ 5,380.28
	:Rainbow " :			28,500:	
	:Steelhead":			17,500:	
	:Blk.spotted:*				
	: trout*		120,000:	345,000:	
	:Lake trout *			14,000:	
	:Grayling* :	445,000:	<u>687,000:</u>		
	:Whitefish :		<u>600,000:</u>		

*Transferred 200,000 grayling eggs, 20,000 blackspotted trout eggs
to other stations.

1904	:Brook trout:			94,800:	\$ 5,530.94
	:Steelhead " :			55,000:	
	:Rainbow " :			40,500:	
	:Blk.spotted:				
	: trout *	40,000:		548,000:	
	:Lake trout :			2,000:	
	:Grayling *	384,000:	<u>2,553,650</u>	<u>225:</u>	

*Transferred to other stations 20,000 blackspotted trout eggs
and 160,000 grayling eggs.

BOZEMAN, MONTANA, STATION AND SUBSTATIONS.
(Continued)

Fiscal year :	Species :	Eggs :	Fry :	Fingerlings : yearlings : and adults :	Cost of operating :
1905 :	Brook trout :			120,000 :	\$ 5,044.75
	Rainbow " :			20,200 :	
	Steelhead " :			25,000 :	
	Blk. spotted :				
	trout :	100,000 :		777,500 :	
	Lake trout :			2,000 :	
	Grayling :	400,000 :	450,000 :		
	Whitefish :		800,000 :		
1906 :	Brook trout :			91,600 :	5,943.70
	Rainbow " :			62,000 :	
	Steelhead " :			24,000 :	
	Blk. spotted :				
	trout :			908,000 :	
	Grayling * :	592,000 :	400,000 :		

*Transferred 50,000 grayling eggs to other stations.

1907 :	Brook trout :	75,000 :		164,400 :	5,532.76
	Rainbow " :			82,600 :	
	Steelhead " :			71,500 :	
	Blk. spotted :				
	trout :			821,000 :	
	Grayling * :	200,000 :	1,776,200 :		

*Transferred to other stations 50,000 grayling eggs.

$n = 14$ 16, 206, 475 grayling from 1896
1, 136, 551 less than listed by B. Deford 1916

BOULEMAN, 1902-11, FISH AND SUBSTATIONS.

Fiscal year	Species	Eggs collected	Eggs received	Eggs shipped	Fry hatched from eggs retained	Percent-age
1903	Blk. spotted trout	912,854		20,000	788,000	88.5
	Brook trout	100,000	200,000		200,450	66.8
	Rainbow "	15,000	50,000		53,800	82.7
	Steelhead "	70,000	50,000		110,000	91.6
	Grayling	3,045,000		645,000	2,207,000	93.4
	Whitefish	1,000,000			900,000	90.0
	Totals	4,142,850	200,000	665,000	4,259,250	
1904	Blk. spotted trout	975,000		60,000	800,000	88.2
	Brook trout	122,500	100,000		160,000	71.9
	Rainbow tr.	47,000	50,000		38,000	54.0
	Steelhead "	38,000			37,000	97.3
	Grayling	3,247,800		494,000	2,452,000	90.7
	Totals	4,430,300	150,000	554,000	5,483,000	
1905	Blk. spotted trout	1,022,000		100,000	934,000	99.9
	Brook trout	122,500	100,000		202,000	90.7
	Rainbow "	151,000	31,000		148,000	81.5
	Steelhead trout	75,000			41,000	54.6
	Grayling	1,010,000		400,000	400,000	79.2
	Totals	2,393,500	131,000	500,000	1,725,000	
1906	Blk. spotted trout	2,000	1,000,000		830,000	82.8
	Brook trout	325,000	50,000		229,000	61.0
	Rainbow "	61,000	50,000		90,000	81.0
	Steelhead "	15,000	105,000		98,000	85.0
	Grayling	1,650,000		642,000	833,000	87.3
	Totals	2,051,000	1,205,000	642,000	2,047,000	

BOZEMAN, MONTANA, COLLECTION AND SUBSTATIONS.
(Continued)

Fiscal year	Species	Eggs collected	Eggs received	Eggs shipped	Fry hatched from eggs retained	Percent age
1907	Blk. spotted trout		934,800		530,000	57.7
	Brook trout	1,580,000		75,000	* 220,000	21.3
	Rainbow "	60,000	98,400		104,000	65.6
	Steelhead "	21,000			18,000	85.7
	Grayling	2,570,000		250,000	1,626,000	79.1
	P.L. salmon		10,000		9,000	90.0
	Golden tr.	600			500	83.3
	Totals	3,851,600	1,045,200	325,000	2,507,500	

* At Valgore substation 975,000 eggs were frozen.

The percentages relating to the foregoing are approximate.



MONTANA WILD LIFE



had for years declined to thrive elsewhere than in Montana, Alaska and parts of Michigan, has, with each succeeding year, shown a marked decrease in numbers. But "Thym," otherwise known as the Montana grayling, has during the last season demonstrated his willingness to cooperate with the department and during the last biennium 15,077,290 grayling eggs were artificially taken, hatched and distributed in Montana waters. Millions of these fingerlings were placed in Georgetown Lake, near Anaconda. It has been the first planting of grayling fingerlings necessitated in this prolific body of water since 1921, yet millions of game fish eggs have been taken at the mouth of Flint Creek, flowing into the lake.

Georgetown Lake for years has been the supply station from which grayling eggs have been taken. The eggs have been placed in hatcheries after the fish have been trapped and stripped artificially, while running up Flint Creek to spawn.

Records of the Fish and Game Department show that in 1921 Georgetown Lake was so choked with grayling that it was necessary to strip but a small fraction of the spawning fish to secure number of eggs wanted. At that time the restocking was stopped until normalcy was restored. Constant inroads being made on game fish in streams of the state is likewise reflected in the growth of fish on Georgetown Lake, until there are more than 200 boats on the lake, boats of Butte and Anaconda anglers are daily taking heavy toll and marked shortage of grayling is noted. During the 1929 spawning season experts of the department took 10,646,290 eggs and in 1930 this figure dropped to 5,000,000 because of the decreased supply.

These facts are but further demonstration of the manner in which Montana's lakes and streams are being whipped and trolled and stress the necessity for a continuation of the conservation program in which the state department is now engaged.

Figures compiled by the department show that during the last biennium, 1929-1930, a total of 72,953,334 game fish have been distributed in Montana streams, or 135 fish for every man, woman and child listed among the 537,606 in the federal census of 1930. During the last seven years the records show that 380,741,777 game fish have been produced in the state hatcheries and distributed in Montana waters. If all of these fish had survived attacks of natural enemies and escaped the lure of anglers, the figure means 708 fish for each of the persons listed in the 1930 census.

History of the propagation and distribution of the famed Montana grayling dates back to 1898—some 33 years ago—according to records of the department as compiled by Charles Healea of Butte, the first superintendent of fisheries employed in that work in Montana.

The first grayling eggs taken artificially in Montana were secured in Elk Springs Creek on the Jbn Blair

How Many Eggs In a Fish?

PISCATORIAL experts of the Montana State Fish and Game Department have found the answer to the question: "How many eggs are produced annually by a game fish?" Sportsmen have asked the question countless times. To settle the argument scientific tests were made at the spawn-taking station at the mouth of Flint Creek on Georgetown Lake, the largest of its kind in the world. From 539 female native cutthroat trout a total of 984,312 eggs was taken in the test. This is an average of 1,830 eggs per trout. A similar test was made on the famed Montana grayling. Sixteen females were stripped and produced a total of 203,088 eggs, or an average of 12,683 to the grayling. Grayling eggs average 750 to 850 to the fluid ounce while the average trout eggs number 260 to 300 to the fluid ounce.

ranch in 1898 under the supervision of Dr. James Henshall of the Bozeman station, according to Mr. Healea. Elk Springs Creek is a tributary of the Red Rock Lake. Little success accompanied the operations, according to Mr. Healea, until 1901, when a lot of eggs was collected and shipped to the federal hatchery at Leadville, Colo. Tests with the grayling were constantly being made but because of the peculiar habits of *Thymallus montanus* the state piscatorial experts were constantly learning something new of his idiosyncrasies. Eastern states were constantly calling for grayling eggs with which to attempt transplanting. Meanwhile the artificial egg-taking in Montana was increasing, streams and lakes were being stocked and the hatcheries were running full blast producing the fingerlings.

In 1902 shipments of Montana grayling eggs were made to 19 hatcheries throughout the nation. Only two hatcheries reported success. They were at Paris, Michigan, and Wytheville, Florida. Water conditions in other states caused experiments to flunk.

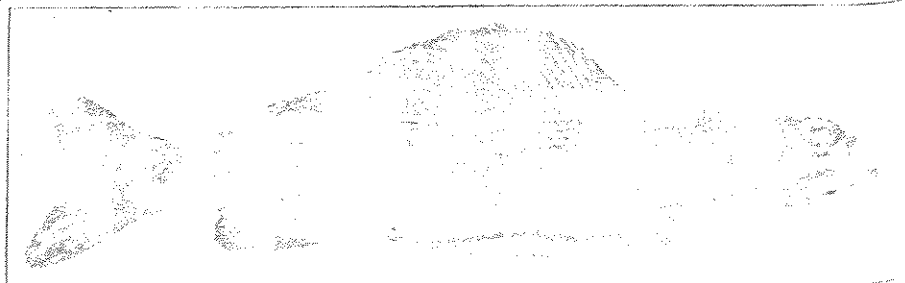
Between 1902 and 1907 operations in artificial egg taking of the grayling and propagation in hatcheries were continued in Montana under the supervision of department experts with varying degrees of success and in the spring of 1908 Superintendent Healea collected approximately 1,000,000 grayling eggs

at the mouth of Meadow Creek, placing them in glass jars used for white eggs, with water constantly running in and out of the jars, churning the eggs and preventing them from settling in a compact lump. These operations were conducted under the old Montana Power flume. The eggs were shipped to an Anaconda hatchery when eyed. They were hatched and 500,000 fingerlings were planted in Georgetown Lake, the first on record planted in the waters. The first eggs from this planting of fish were taken in 1911.

The first native trout planted in Georgetown Lake were from eggs secured through the federal hatchery at Bozeman, from Henry's Lake in Idaho, according to Mr. Healea. That was back in 1907—about 24 years ago. Late plantings were secured from Yellowstone Lake and distributed from the Bozeman station. Mr. Healea asserts that Georgetown waters have always been a natural habitat for the native trout and declares that there were thousands of them in Flint Creek before the dam was erected which formed Georgetown Lake.

When Lewis and Clark made their famous exploration trip to the Pacific Northwest through Montana they found the grayling in its native habitat in this state and mentioned the fact in their journal. They alluded to it as a new variety of white trout or silver trout. In 1872 James W. Milner of the United States Fish Commission found the species in a creek tributary to the Missouri near Camp Baker, Montana and after describing the fish, named *Thymallus montanus*. While the grayling of Montana is closely related to the Arctic grayling there is enough difference to award each a scientific ranking of its own. Scientists assert that it is probable that the Arctic grayling was the parent stock from which came the Montana and Michigan grayling and from the widely separated habitat the three it is assumed that they were transported to their varied domain during the glacial period. This theory is strengthened by the fact that Elk Lake, one-half mile from the Montana grayling station, is abundantly inhabited both grayling and lake trout—the lake bearing the scientific moniker of *Critomer namaycush*—the lake trout that variety being found in no other waters west of Lake Michigan.

Grayling eggs can not be handled in the same manner as trout eggs, during the incubating period. When first taken



The Montana Grayling

1908 apparently first grayling planting by State

1915 - No Record

16 - No Record

17 - 1,300,000 ✓

18 - 2,965,000 ✓

19 - 3,340,000 ✓

20 - 9,513,500 ✓

21 - 18,850,000 ✓

22 - 8,950,000 ✓

1923 - 7,043,000 ✓

24 - 8,254,000 ✓

25 - 12,577,000 ✓

1926 - 15,647,000 ✓

1927 - 12,495,000 ✓

1928 - 9,950,000 ✓

1929 - 10,646,200 ✓

1930 - 4,431,000 ✓

1931 - 1,115,290 ✓

32-33 - 6,561,828 ✓

33-34 - 3,188,140 ✓

34-35 - 10,995,044 ✓

35-36 - 10,955,044 ✓

36-37 - 17,702,900 ✓

37-38 - 5,499,270 ✓

38-39 - 7,863,838 ✓

39 - 40 - 2,388,350 ✓

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Plants & Seedling in
Montana from
1915 thru 1940

from Biennial Reports

43 mil

Bygone

1903 1 1/2 years planted

1904 2 1/2 " "

← Biennial report

1912 - 2 1/3 million

1913 2.4 million

1914 -

1915 -

1916 -

1917 - 1,300,000

1918 - 2,965,000

1919 - 3 1/3 million

1920 -

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ARCTIC GRAYLING WATERS

Northwestern Montana

Elizabeth Lake &
 Kintla Lake. Glacier Park
 Fishtrap Lake Near Thompson Falls
 LaSalle Ponds Near Kalispell
 Sylvia Lake, Lone Lake
 & Lake Monroe. West of Kalispell
 Handkerchief Lake &
 Graves Creek *Spotted Bear* Near Bigfork
 Half Moon Lake. *Rehabbed* Near Coram
 Lake Five *Rehabbed* Near Coram
 Red Meadow Lake Near Olney
 Cyclone Lake. Near Whitefish
 Hungry Horse Reservoir. Near Hungry Horse
 Heart Lake. Near Lincoln
 Harper Lake Near Seeley Lake
 Southwestern Montana
 Fuse Lake Near Philipsburg
 Grebe Lake, Ice Lake &
 Wolf Lake. Yellowstone Park

Rogers Lake Near Kalispell

Georgetown Lake (sparse population)
 Near Anaconda

(Flattop and Cooper Lakes (recent
 introductions) *Prove*

Flattop Lake. Near Babb

Cooper Lake. Near Heart Butte

Elk Lake. Near West Yellowstone
*(according to Wipperfurth 16" grayling ascended this in Sep. 1968)
 probably largest in state.*

Big Hole River &
 tributaries Near Wisdom

Hyalite Reservoir Near Bozeman

Belly River below Elizabeth L. Glacier
 Park

Big Spring Cr. (Sparse pop): . Near Lewistown

Park Lake *may be reproduced* (occasionally planted). . Near Helena

Pishkun Reservoir (reproducing pop.) fair
 grayling fishing in outlet canal

Emerald Lake (Hyalite Drainage)

Silver Creek (recent introduction - success *not determined*)

Mitchell Gulch

Red Rock Lakes (upper &
 probably lower. Red Rocks Refuge
 Red Rock River Red Rocks Refuge
 Ennis Lake & Madison River
 just above & below lake. Near Ennis
 Lake Agnes Near Glen
 Bobcat Lake, *02375* Near Wise River
 Mussigbrod Lake. Near Wisdom
 Odell Lake *Wise River* Near Wisdom
 Pintlar Lake & other lakes
 in vicinity - *Please specify* Near Wisdom
 Hamby Lake Near Jackson
 Schweingar Lake. Near Jackson
 Southcentral Montana
 Froze-to-Death Lake. Near Cooke City
 Rough Lake Near Cooke City
 Sky Top Lakes (3 lakes). Near Cooke City
 Turgulse Lake. Near Cooke City

*Belly River in Glacier Park
 (Runs N. from Elzy Lake) - excellent
 grayling R. according to Bill Binning
 (also see Let from Bob Wason 27 Apr 68)*