

Original: Fish Division

cc: Mr. J. G. Marks

Mr. Hans Peterson

Mr. Ruhl

INSTITUTE FOR FISHERIES RESEARCH Dr. Leonard

DIVISION OF FISHERIES

MICHIGAN DEPARTMENT OF CONSERVATION

COOPERATING WITH THE

UNIVERSITY OF MICHIGAN

April 26, 1940

ADDRESS  
UNIVERSITY MUSEUMS  
ANN ARBOR, MICHIGAN

ALBERT S. HAZZARD, PH.D.  
DIRECTOR

REPORT NO. 598

INTRODUCTION OF MONTANA GRAYLING FINGERLINGS IN

FULLER CREEK, HUNT CREEK EXPERIMENTAL AREA

by

Justin W. Leonard  
Hunt Creek Experiment Station

On the afternoon of April 10, 1940, a telephone call from Dr. A. S. Hazzard in Ann Arbor advised that it had been decided to make an experimental planting of 5,000 fingerling Montana grayling (Thymallus montanus) in Fuller Creek, above the fish counting weir on this tributary of Hunt Creek in the Hunt Creek Experimental Area.

The planting unit, carrying 5,000 grayling fingerlings and 2,500 cut-throat trout fingerlings from the Wolf Lake Hatchery, arrived at the station at 4:00 p.m., April 11. Access to desired stocking locations was complicated by snow-blocked trails, but the weather was favorable, the sky being overcast and the air temperature about 22° F. Temperature shock for the fish must have been negligible. The water temperature in the unit tanks was 39°, that of Fuller Creek 38° F.

The following data concerning the grayling were taken from the "Report of Fish or Eggs Shipped or Planted" submitted by Mr. J. G. Marks, District Supervisor of Fisheries Operations:

Name of hatchery where fish were produced - Wolf Lake Hatchery .  
Total number, age and kind of fish -  
5,000 Montana grayling, age 9 mos., wt. 1# to the 100 fish.

Date supplied - 4/11/40  
Planting unit #1455  
Operators - Hatt and Rhodes  
Weight of total planting - 50#

A representative sample of 20 grayling from the lot were preserved for comparison with later recoveries. Measurements were also made of grayling which were picked up dead at the screen. Individual lengths are given in Table III. The average lengths of these 95 fish were 75 mm. (2.9 inches) standard length and 89.6 mm. (3.5 inches) total length.

Grayling were stocked at the points indicated on the accompanying sketch map. One thousand were planted on either side of the bridge of the road crossing the stream nearest its head. Here the current is of moderate speed, the stream bottom sandy with silty edges and occasional bars of fine gravel. There is dense cedar shade, and numerous small pools occur beneath fallen and submerged logs. At this and subsequent points the distance over which the fish were distributed was determined largely by their behavior in the pails. It was usually possible to scatter them through from 100 to 250 yards of stream.

One thousand grayling were placed in the large beaver pond on Fuller Creek, introductions being made from the dam itself and from marginal points along the accessible southeastern shore line. Fifteen hundred fish were planted in the creek below the dam. Owing to the long walk from the road to this location, the fish showed distress upon arrival, and only about fifty yards of stream were covered.

Another 1,000 fingerlings were scattered in various pools along the outlet of East Fish Lake, beginning at a point about fifty yards below the bridge. There are numerous well-protected pools and fine gravel bars in this section, and the flow is moderate to slow. It was felt that this might prove to be more favorable to success of the grayling than any other section covered.

The remaining grayling fingerlings, about 500 in number, were returned to the vicinity of the station. All but 100 were carried upstream from the bridge north of the station, and placed in the pools, which are rather deep and protected by a veritable tangle of fallen and submerged logs and debris. One hundred were planted in pools below the bridge, less ten preserved as a sample (actual count).

By this time darkness had fallen. The unit operators returned to the Grayling Hatchery to place the cut-throat trout in live-screens overnight. These fish were planted in O'Brien Lake, Alcona County, by H. L. Peterson, Verne Dockham and the writer the following morning.

As soon as word arrived that the grayling were on their way to the station, all other work was dropped and every effort made to reinforce the Fuller Creek weir and the adjacent stream banks to an extent which, it is sincerely hoped, will prove adequate to hold the grayling population in Fuller Creek, and prevent escape of strays into Hunt Creek proper. Some "leakage" must be expected, however, for the screen of this weir is of half-inch mesh, finer meshes having proven impracticable for the purpose; and grayling of the size planted could pass such a screen if they chanced to hit an opening squarely head-on. The weir in its present condition is adequate for normal water levels. Placement of sand bags and reinforced earth-and-gravel dikes is believed to have blocked the low-lying adjacent banks to a height sufficient to withstand some flooding, which may occur if the next few weeks are quite rainy. Introduction of this grayling population has suddenly rendered crucial the previously-existing need for a self-cleaning screen, probably of the rotary type, on Fuller Creek, a project for which neither man-power nor materials are at present available.

Since the grayling were introduced, on the evening of April 11, the stream has been kept under almost constant observation during daylight hours. As <sup>was</sup> stated previously, ninety individuals were planted in various pools below the bridge across the creek north of the station. The flow in this section, apart from the pools, is quite rapid, a fact which may at least partially explain subsequent developments, which are tabulated as follows:

TABLE I

Montana Grayling Fingerlings Taken at Fuller Creek Weir, April 12, 7:30 a.m. to April 15, 6:45 a.m., 1940. Water temperature range 35° - 41°F.

Date	Fish Dead Against Screen	Fish Dead in Trap	Fish Alive in Trap
4/12/40 a.m.	14	2	4
4/12/40 p.m.	33	0	17
4/13/40 a.m.	20	6	4
4/13/40 p.m.	6	0	12
4/14/40 a.m.	2	0	6
4/14/40 p.m.	0	0	11
4/15/40 a.m.	4	1	3
4/15/40 p.m.	2	0	3
4/16/40 a.m.	2	0	2
4/16/40 p.m.	0	0	1
4/17/40 a.m.	1	0	2
4/17/40 p.m.	2	0	0
4/18/40 a.m.	2	0	0
4/18/40 p.m.	4	0	0
4/19/40 a.m.	0	1	1
4/19/40 p.m.	0	0	0
4/20/40 a.m.	2	0	0
4/20/40 p.m.	2	0	0
4/21/40 a.m.	0	0	0
4/21/40 p.m.	1	0	0
4/22/40 a.m.	0	0	2
4/22/40 p.m.	0	0	0
4/23/40 a.m.	2	0	0
Totals	99	10	68

Repeated observations indicate that a great majority of the dead fish came from the lowest section planted, that immediately below the bridge north of the station. If the grayling, exploring their new quarters, left the holes in which they were placed and were caught by the current, they may well have been swept down against the screen, where the pressure of the flow would overpower their efforts at escape. However, it is not safe to conclude that they would have lived had they failed to encounter the screen. On several occasions, individuals were observed drifting with the current and making but feeble efforts of resistance. Also, livelier specimens were seen, more than once, to touch the screen, then dart away, successfully combating the current pressure. Living fish removed from the trap were carried above the bridge before being released.

In order to determine whether or not grayling might have been washed against the screen through weakness occasioned by lack of ability to find natural food, stomachs of ten of the twenty-four individuals found dead on the morning of April 13 were examined. Results are shown in Table II:

TABLE II

Stomach Analyses of Montana Grayling Fingerlings Found Dead Against the Fuller Creek Screen, April 13, 1940, 8:00 a.m. Total and Standard Lengths Given in Millimeters

S. L.	T. L.	Condition of Stomach
60	72	Trace of hatchery food.
68	80	16 midge pupae, 5 midge larvae.
73	85	Empty.
76	90	Empty.
78	91	Empty.
79	95	35 midge pupae, 20 midge larvae.
86	102	19 midge pupae, 10 midge larvae.
91	108	7 midge pupae.
93	109	15 midge pupae, 12 midge larvae, 1 mayfly nymph ( <u>Baetis</u> ).
94	112	30 midge pupae, 23 midge larvae, 1 caddis larva ( <u>Rhyacophila</u> )

The above tabulation demonstrates that a majority of the dead fish had been able to find suitable food in considerable quantity, and that their failure to resist the current could hardly be explained on the basis of starvation. A more likely suggestion is that the instinctive reaction to current had had little opportunity to develop in this lot of fish prior to planting. It should be borne in mind as a possibility, however, that many of the stranded specimens would have succumbed, even had the screen been absent, due to operation of factors whose identities must be a subject for speculation.

There is another occurrence to be recorded, which is of interest because it may be either a coincidence or an actual result of the introduction of the grayling. From April 1 to 12, only two trout, both under four inches, had entered the downstream trap of the Fuller Creek weir. Prior to that time, throughout the winter, in fact, very little movement had been detected in the resident fish population. On the morning of April 12, one small trout appeared in the trap. The following morning there were two small trout and three sticklebacks. No stickleback had been taken in the weir since the late summer of 1939. On the evening of April 13, two small trout were taken, and on the morning of April 15, one five-inch trout and two sticklebacks appeared in the trap. One is led to wonder whether or not this sudden inception of movement on the part of the permanent stream population may have been motivated by the sudden influx of a very large number of invaders.

The upstream planting stations were last cruised on the morning of April 15. The sky was overcast, and a close approach to the stream could be made without frightening exposed fish. Grayling appeared to be quite abundant in the vicinity of each planting location, except that none could be seen in the beaver pond. Here the fish had doubtless moved away from

the shore line, thus removing themselves from detection by an observer on shore or on the face of the dam. Only three dead grayling were found in an intensive examination of the shore line and the face of the dam, and no mortalities were noticed elsewhere along the stream.

Pending further observations, the writer considers it probable that the grayling will attain their greatest success in the headwater section of Fuller Creek and in the outlet (tributary to Fuller Creek) of East Fish Lake. When this lake is poisoned, it will be of interest to discover whether or not any grayling found their way up the beaver-dam-obstructed channel to the lake.

INSTITUTE FOR FISHERIES RESEARCH

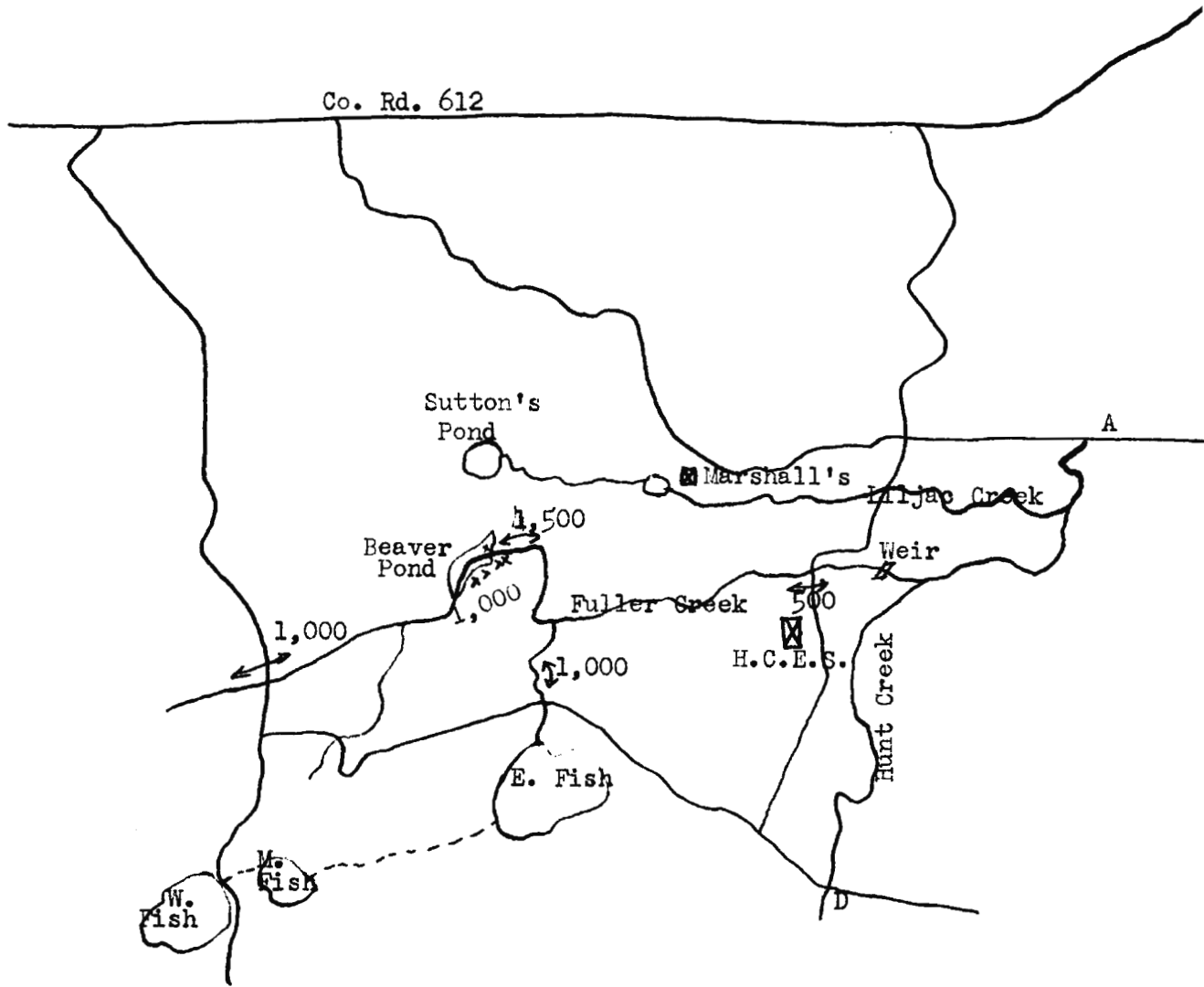
TABLE III

GRAYLING PLANTED IN FULLER CREEK APRIL 11, 1940

Measurements based on preserved sample and subsequent fatalities in the stream -- total of 95 fish measured.

<u>Standard Length</u>	<u>Total Length</u>	<u>Standard Length</u>	<u>Total Length</u>
75 mm.	90 mm.	80	97
87	104	74	89
98	116	57	70
86	102	71	85
87	104	65	78
87	104	78	85
87	104	88	105
75	90	95	102
78	95	67	81
84	103	79	95
74	89	74	90
79	93	90	109
74	89	70	85
74	88	70	83
90	108	68	80
62	75	95	115
95	105	75	92
92	106	72	87
80	96	68	80
80	96	56	68
71	84	60	72
89	107	68	80
78	91	79	92
87	106	70	83
79	95	67	81
79	95	83	100
61	76	61	76
73	88	75	85
73	89	64	77
83	97	77	93
72	87	71	86
70	83	55	69
73	89	65	80
73	87	56	69
74	89	60	74
77	95	74	89
92	110	68	83
78	93	80	95
78	93	83	100
59	67	70	85
61	75	81	97
57	66	81	97
74	89	56	67
80	95	54	66
89	106	63	76
82	98	<u>74.97 mm.</u>	<u>89.6 mm. (3.5 inches)</u>
83	100	Median	89
79	96	Max.	116
72	88	Min.	66
69	73		





- Roads
- Streams

Free-hand copy (not tracing) of lower Hunt Creek drainage as shown in air-photo.