

copy to Schoenmann

April 17, 1933

Report 204 (Revised)

SUGGESTED PROGRAM FOR THE USE OF UNEMPLOYED MEN IN LAKE AND STREAM IMPROVEMENT WORK IN MICHIGAN, IN CONNECTION WITH THE FEDERAL "RE-FORESTATION" PROJECT

Prepared for the Michigan Department of Conservation by the Institute for Fisheries Research, University of Michigan

Lake and stream improvement work is to a very large degree a matter of labor. The expense in the way of equipment and such supplies as wire and staples is small, and most of the supplies are to be had locally and free of charge. This is therefore a field of conservation activity which fits well into the federal unemployment plan, as we understand it.

Lake and stream improvement is the bettering of conditions for fish life. Its especial end is the upbuilding of the north country, through the increase in fish life and the bettering of fishing. This activity therefore fits into the general plan for the economic rehabilitation of the cut-over region. Lake and stream improvement is intimately related to reforestation and other activities designed to utilize again the "idle land." Since fishing like other forms of recreation is vital to the economic welfare of that land area, it is clear that an improvement in fishing there will be of material value.

The improvement of Michigan lakes and streams involves one or more of the following items:

(1) Preventing the erosion of the sand and clay banks, by means of planting trees or other vegetation, or by means of log or stone constructions along the water edge, or by deflecting the current away from eroding shores. Silting is a prime reason for depletion of fish life.

(2) Planting trees along the shores. For trout streams this is important because the shade helps to keep the water cool, and makes better conditions for the fish in other ways. For all waters the trees add to the beauty of the landscape and hence to the recreational value.

(3) Improving the conditions for fish life: bettering the spawning facilities; increasing the production of food for the fish; constructing shelter enabling the young fish to survive, and making the water more habitable for a larger number of fish.

(4) Removal of log jams and otherwise making the streams fishable and open for boating; opening channels between lakes, or between lakes and adjacent lagoons having fine conditions for the fish, in the way of spawning, shelter or food.

(5) Improving or constructing roads into or along the fishing waters, so as to permit access for fishing.

That the conditions for fish life can be improved, and that the fish yield can thereby be increased, has now largely passed from theory and probability into demonstrated fact. The methods and technique of this worthwhile activity have been rather well worked out and tested. A small group of staff-members and part time workers of the Institute for Fisheries Research is available to serve as a nucleus for the superintendence of the work if the project herein outlined is accepted.

The types of constructions which better the conditions for fish life in trout streams are described in Bulletin No. 1 of the Institute for Fisheries Research, entitled "Methods for the Improvement of Michigan Trout Streams." Similar methods have been developed for lake improvements, to increase the yield of lake fish. The Bulletin, with its discussion of the theory and practicability of increasing fish production by means of environmental control, should be attached to and should be considered an integral part of the present proposal.

There are hundreds of miles of unimproved trout streams on National and State forests and other public lands in northern Michigan. The riparian rights on dozens of lakes are in part or entirely owned by the public. On additional hundreds of miles of streams, and on dozens of other lakes, public fishing rights could presumably be obtained or confirmed in exchange for lake and stream improvement. But even without these quasi-public waters, there is plenty of room for a very large amount of lake and stream improvement work this year. There is no reason to expect that there would be any lack in places to work advantageously.

Lake and stream improvement is a new field of conservation activity. The methods are fairly simple, but we find that untrained efforts along this line are usually inadequate and non-permanent. If extensive lake and stream work be decided upon, it should by all means be superintended by selected experienced men.

On request, we have drawn up a schedule of operations which we consider to be workable. For the first half of the season the amount of scheduled work is limited, because it would be important to give both the general supervisors and the foremen of the crews some intensive training before the operations become too large. If the work is not so limited at first, until competent and adequate supervision is trained, the results are quite certain to be inefficient and unsatisfactory.

It should be practicable to expand the work farther than indicated on our proposed schedule, during the latter part of the season. We have limited the number of men scheduled for lake work and for stream work to what we consider a reasonable share of the total number which we understand is apt to be employed for the conservation work. Fewer could be used with a slight increase in efficiency in superintendence, etc., while more could be allotted this work with some reduction in efficiency.

The season for efficient operation in this work, which will for the most

part be done by men working in the cold water, would be limited to 14 weeks, beginning June 1. Earlier or later work could be carried on, but to do so would demand that the crew be completely supplied with waders. This would very materially increase the expense.

The attached schedules for lake improvement and for stream improvement are made on the assumption that the Institute for Fisheries Research would take over the general supervision of the work. This supervision would include the training of the assistant supervisors and foremen and the designation of the types and locations of constructions to be built. The Institute has specialized in this type of work, and is prepared to undertake this supervision provided necessary funds are made available.

As scheduled the Institute would select the general director of this work, and also the supervisor, associate supervisor and assistant supervisors of each unit (lake unit and stream unit). In the lake work the associate supervisor would be in charge of planting weed beds wherever the lake work is carried on. In the stream unit, the supervisor would be assigned to the Upper Peninsula, leaving the general direction of the work below the Straits to the associate supervisor. The assistant supervisors in each unit would be in advisory charge of the operations of three crews (lake work) or of five crews (stream work).

The foremen would be selected from the experienced laborers, on the basis of intelligence, industry and ability to handle men. The Institute would expect to select the first 10 foremen from men who have had one or more seasons' previous experience in work under our direction. Practically all of these men are candidates for welfare, though they might not be recruited because of age or marriage. It is important that they be employed.

We estimate that efficient crews would number 15 men, each under a foreman. In the lake work, 3 crews (45 men) could work to good advantage on one lake, with one supervisor planning the operations for all three crews. On the

streams, we consider that 5 crews could operate effectively on one stream, under one supervisor.

The stream work calls for one teamster with team for each crew, and 1 truck for each group of 5 crews. These would be needed for gathering the needed materials and for transporting the men to and from camp.

Our cost estimates are based on the assumption that the workers will be camped quite close to the field of operations. If they should be quartered at concentration camps at a distance of 5 or more miles from the stream or lake being worked, either more transportation would need to be provided than has been scheduled or the work would lose in efficiency.

The estimates do not include salary or travel expenses for the general director of the work, nor for the man who would contact land owners if any of the work should be done on private land.

The cost estimates do not include living costs for the men, as the method of handling this item is unknown to us. No estimate is made for the cost of cars or trucks, as we do not know whether army trucks will be available or how transportation will be provided. The stream work if carried to the scheduled point would call for 9 cars and 7 trucks. The lake work would call for 2 cars and 6 trucks. The operation cost for these motor vehicles is included in the schedule. For the lake work, the initial as well as operating expense for the needed outboard motors is figured in.

The total cost of the proposed lake and stream improvement work, excluding initial cost or rent of any motor vehicles that could not be borrowed, and excluding living costs for the men, is \$114323.88. We have of course not considered the distribution of the expenses between different agencies. Approximately three-fourths (74%) of the cost as estimated on our schedule would go for labor, and almost all would be welfare labor.

SCHEDULE FOR STREAM IMPROVEMENT

1. Men employable to good advantage each week

Week	Super-visor	Assoc. superv.*	Ass't. superv.*	Fore-men	Team-sters	Truck drivers	Laborers (additional)	Total men
1	1	(1)	(7)	5	5	1	75	95
2	1	(1)	(7)	5	5	1	75	95
3	1	1	3 -(4)	15	15	3	225	267
4	1	1	4 -(3)	20	20	4	300	353
5	1	1	5 -(2)	25	25	5	375	439
6	1	1	6 -(1)	30	30	6	450	525
7	1	1	7	35	35	7	525	611
8	1	1	7	"	"	"	"	"
9	1	1	7	"	"	"	"	"
10	1	1	7	"	"	"	"	"
11	1	1	7	"	"	"	"	"
12	1	1	7	"	"	"	"	"
13	1	1	7	"	"	"	"	"
14	1	1	7	"	"	"	"	"

II. Estimate of cost

(The following estimates are made without any definite knowledge as to what wages will be paid. They are merely estimates designed to give an approximate figure, and to provide a basis for recomputation when the wages are fixed).

14 supervisor - weeks	at \$35.	\$490.
14 associate-supervisor - weeks	at 30.	420.
98 assistant-supervisor - weeks	at 25.	2450.
380 foremen - weeks	at 10.	3800.
76 truck-driver - weeks	at 10.	760.
380 teamster - weeks (includes rent and care of team)	at 25.	9500.
5700 laborer - weeks	at 7.	39900.
Total for labor		<u>\$57320.</u>
38000 truck-miles (76 weeks, 500 miles per week) at \$.10		3800.
39600 car-miles (2800 each for 7 ass't supervisors, 8000 for associate supervisors, 12000 for supervisor) at .06		2376.
Total for transportation		<u>\$6176.</u>
Supplies per week per crew		
#9 wire, 500 lbs.	at \$ 3.00 cwt.	15.
2" staples, 70 lbs.	at 3.50 cwt.	2.45
80 penny spikes, 20 lbs.	at 3.00 cwt.	.60
Gloves, 15 pairs	at .10	1.50
Additional		3.00
Total for material for 380 crew-weeks		<u>22.55</u>
Cost of the general equipment for each unit of five crews, \$57.09-7 units-		\$399.63
Cost of the equipment for each crew, \$139.55, 35 crews		4884.25
A detailed list of equipment items with estimated costs will be found in the appendix.		
Totals:	Total cost of equipment	\$5283.88
	Labor	57320.00
	Transportation	6176.00
	Supplies	8569.00
	Equipment	<u>5283.88</u>
Grand Total		<u>\$77348.88</u>

SCHEDULE FOR LAKE IMPROVEMENT

I. Men employable to good advantage each week

Week	Super-visor	Assoc. superv.*	Ass't. superv.*	Fore-men	Truck drivers	Laborers (additional)	Total men
1	1	1	(6)	-	1	45	54
2	1	1	2 - (4)	6	2	90	106
3	1	1	3 - (3)	9	3	135	155
4	1	1	4 - (2)	12	4	180	204
5	1	1	5 - (1)	15	5	225	248
6	1	1	6	18	6	270	302
7	1	1	6	"	"	"	"
8	1	1	6	"	"	"	"
9	1	1	6	"	"	"	"
10	1	1	6	"	"	"	"
11	1	1	6	"	"	"	"
12	1	1	6	"	"	"	"
13	1	1	6	"	"	"	"
14	1	1	6	"	"	"	"

II. Estimate of cost

The following estimates are made without any definite knowledge as to what wages will be paid. They are merely estimates designed to give an approximate figure, and to provide a basis for recomputation when the wages are fixed).

14	supervisor - weeks	at \$35.	\$490.
14	associate-supervisor - weeks	at 30.	420.
84	assistant-supervisor - weeks	at 25.	2100.
204	foremen - weeks	at 10.	2040.
69	truck-driver - weeks	at 10.	690.
3105	laborer - weeks	at 7.	21735.
Total for labor			\$27475.
34500	truck-miles (69 truck-weeks, 500 miles per week at \$.10		3450.
9800	outboard motor-miles (7 outboard motors, 14 weeks		
	100 miles per week) at .05		490.
15000	car-miles (supervisor and associate supervisor) at .06		900.
Total for transportation			4840.
Materials			
15000	sacks	at \$0.08	1200.
4000	lbs. staples	at 0.045	180.
6000	lbs. spikes	at 0.03	180.
20000	lbs. wire	at 0.03	600.
	Additional		340
			2500.
			2160.
Total			\$36975.

Cost of equipment, 18 crews at \$120.00
(A detailed list of equipment items has been drawn up, with estimated costs.)

* Numbers in parenthesis represent supervisors in training, and not yet in actual charge of groups of crews.

APPENDIX FOR STREAM EQUIPMENT

Detailed list of equipment and supplies

General equipment for each river unit of 5 crews each

2 Hand Saws (Rip saws 26 in.long) at \$1.85.....	\$3.70
5 saws should be purchased at the time then 2 can be kept and three passed on to the next unit of crews formed so there shall always be 5 saws available at the beginning of the work on each river when they are needed the most.	
1 Hand Saw Set.....	.95
2 Cross Cut Saw at \$.2958
Include cross cut saw filer, jointer, raker gauge, side filer, anvil and two set gauges.	
2 Saw Filing Vises at .75	1.50
1 Saw Filing Guide at \$1.55	1.55
1 Brace85
7 Bits, 1/4 - 3/8 - 1/2 - 5/8 - 3/4 - 7/8 - and 1 inch	2.00
2 Grindstones at \$5.25	10.50
Assorted Bolts	1.00
10 Clevisis 2 1/2 by 6 inches at \$.13	1.30
100 feet, 1 1/4 inch rope	5.98
30 lbs. of 10 penny nails at \$2.65 cwt.....	.78
10 lbs. 60 penny spikes at \$2.50 cwt.....	.25
5 lbs 20 penny spikes at \$2.50 cwt.....	.15
The above three articles whould be bought in 100 lbs. kegs and then they could be distributed to the various crews.	
Lumber for platforms.....	15.00
30 platforms of various heights.	
Planking for stone boats.....	10.00
	<u>\$57.09</u>

Equipment for each crew of 15 man

5 Railroad picks with handles (25 inch heads) at \$1.24.....	\$6.20
5 Long handle round point shovels (solid shank) at \$1.15.....	5.75

2 6-ft cross cut saws at \$4.75.....	\$9.50
4 (4 1/2 or 5ft) cedar saws at \$2.20	8.80
1 Carpenter Adze.....	1.85
5 Carpenters Hammers (Ripping Hammers) at \$.65.....	3.25
3 4-lb. Blacksmith Hammers at \$1.10.....	3.30
6 Cant Hooks at \$2.00.....	12.00
8 Double-bit Axes 3 1/2 and 4 1/2 lb. heads at \$1.98.....	15.60
6 pair of Wire Cutters, 10 inches long at \$.85	5.10
2 Logging Chains 1/2 inch (long chain) at \$3.60.....	7.20
3 13-lb. Post Mauls at \$1.00.....	3.00
4 18-lb. Post Mauls at \$1.40.....	5.60
2 Pike Poles at \$1.00.....	2.00
3 Crow Bars at \$.90.....	2.70
2 Boats at \$12.50.....	25.00
3 Flat Files 8,10 and 12 inches long50
3 Slim Taper Saw Files, 8 in. long.....	.45
1 Abrasive Fire or Corundum Stone.....	.75
50 feet Wire Cable.....	1.00
Additional.....	<u>20.00</u>
Total per crew	\$ 139.55

APPENDIX FOR LAKE EQUIPMENT

Detailed list of equipment and supplies

General equipment for each lake unit of 3 crews each

1 Grindstone at \$5.25.....	\$ 5.25
1 Outboard motor at \$90.....	90.00

General equipment (for each crew)

30 lbs. 1/2" rope at \$.20.....	\$ 6.00
8 Double-bit axes at \$1.65.....	13.00
8 Carpenter hammers at \$.35.....	2.80
5 pliers at \$1.20.....	6.00
2 Boats at \$12.00.....	24.00
4 Long handled shovels at \$.80.....	2.40
2 Brush snags and brush hooks at \$2.40.....	4.80
Additional.....	<u>20.00</u>
Total per crew	\$ 79.00

This report is accompanied by two specific project proposals, one for the improvement of a trout stream (Pigeon River) and the other for the improvement of two lakes, one in the northern and one in southern Michigan. If these projects are approved, we stand ready to prepare other detailed projects in line with the general proposals made in the present report.

INSTITUTE FOR FISHERIES RESEARCH
UNIVERSITY MUSEUMS
UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN

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April 10, 1933

Report 204

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Submitted by the Institute for Fisheries Research, University of
Michigan

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The stream work calls for one teamster with team for each crew, and 1 truck for each group of 5 crews. These would be needed for gathering the needed materials and for transporting the men to and from camp.

Our cost estimates are based on the assumption that the workers will be camped quite close to the field of operations. If they should be quartered at concentration camps at a considerable distance from the lake or stream being worked, either more transportation would need be provided than has been scheduled or the work would lose in efficiency.

The estimates do not include salary or travel expenses for the general director of the work, nor for the man who would contact land owners if any of the work should be done on private land.

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The total cost of the proposed lake and stream improvement work, excluding initial cost or rent of any motor vehicles that could not be borrowed, and excluding living costs for the men, is \$112,605. We have of course not considered the distribution of the expenses between different agencies. Approximately three-fourths (74%) of the cost as estimated on our schedule would go for labor, and almost all of it could be welfare labor.

SCHEDULE FOR STREAM IMPROVEMENT

I. Men employable to good advantage each week

Week	Super-visor	Assoc. superv.*	Ass't. superv.*	Fore-men	Team-sters	Truck drivers	Laborers (additional)	Total men
1	1	(1)	(7)	5	5	1	75	95
2	1	(1)	2 + (5)	10	10	2	150	181
3	1	1	3 + (4)	15	15	3	225	267
4	1	1	4 + (3)	20	20	4	300	353
5	1	1	5 + (2)	25	25	5	375	439
6	1	1	6 + (1)	30	30	6	450	525
7	1	1	7	35	35	7	525	611
8	1	1	7	"	"	"	"	"
9	1	1	7	"	"	"	"	"
10	1	1	7	"	"	"	"	"
11	1	1	7	"	"	"	"	"
12	1	1	7	"	"	"	"	"
13	1	1	7	"	"	"	"	"
14	1	1	7	"	"	"	"	"

II. Estimate of cost

(The following estimates are made without any definite knowledge as to what wages will be paid. They are merely estimates designed to give an approximate figure, and to provide a basis for recomputation when the wages are fixed).

14	supervisor - weeks	at \$35.	\$490.	
14	associate-supervisor - weeks	at 30.	420.	
98	assistant-supervisor - weeks	at 25.	2450.	
385	foreman - weeks	at 10.	3850.	
77	truck-driver - weeks	at 10.	770.	
385	teamster - weeks (includes rent and care of team)	at 20.	7700.	
5775	laborer - weeks	at 7.	40425.	
Total for labor				\$56105.
38500	truck-miles (77 truck weeks, 500 miles per week)	at \$.10	\$3850.	
32000	car-miles (2000 each for 7 ass't supervisors, 8000 for associate supervisor, 10000 for supervisor)	at .06	1920.	
Total for transportation				5770.
Materials per week per crew				
	#9 wire, 500 lbs.	at \$.03	15.00	
	2" staples, 70 lbs.	at .045	3.15	
	80 lbs. spikes, 20 lbs.	at .03	.60	
	Extras		4.25	
Total for materials for 385 crew-weeks at			27.00	\$8855.
Cost of equipment, \$140, per crew, 35 crews (A detailed list of equipment items has been drawn up, with estimated costs.)				4900.
TOTAL				\$75630.

*Numbers in parenthesis represent supervisors in training, and not yet in actual charge of groups of crews.

4,000 man days

SCHEDULE FOR LAKE IMPROVEMENT

I. Men employable to good advantage each week

Week	Super- visor	Assoc. superv.	Ass't. superv.*	Fore- men	Truck drivers	Laborers (additional)	Total men
1	1	1	(6)	-	1	45	54
2	1	1	2 + (4)	6	2	90	106
3	1	1	3 + (3)	9	3	135	155
4	1	1	4 + (2)	12	4	180	204
5	1	1	5 + (1)	15	5	225	248
6	1	1	6	18	6	270	302
7	1	1	6	"	"	"	"
8	1	1	6	"	"	"	"
9	1	1	6	"	"	"	"
10	1	1	6	"	"	"	"
11	1	1	6	"	"	"	"
12	1	1	6	"	"	"	"
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84	assistant-supervisor - weeks	at 25.	2100.
204	foremen - weeks	at 10.	2040.
69	truck-driver - weeks	at 10.	690.
3105	laborer - weeks	at 7.	21735.
Total for labor			\$27475.
18,250	truck-miles (69 truck-weeks, 500 miles per week at .10		3450.
9800	outboard motor - miles (7 outboard motors, 14 weeks		
	100 miles per week) at .05		490.
15000	car-miles (supervisor and associate supervisor) at .06		900.
Total for transportation			4840.

Materials

15000	sacks	at \$0.08	\$1200.
4000	lbs. staples	at 0.045	180.
6000	lbs. spikes	at 0.03	180.
20000	lbs. wire	at 0.03	600.
	Additional		340.
			2500.

Cost of equipment, 18 crews at \$120.00
(A detailed list of equipment items has been drawn up, with estimated costs.)

TOTAL

2160.
\$36975.

*Numbers in parenthesis represent supervisors in training, and not yet infactual charge of groups of crews.

INSTITUTE FOR FISHERIES RESEARCH
UNIVERSITY MUSEUMS
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ANN ARBOR, MICHIGAN

April 10, 1933

FISH DIVISION

APR 11 1933

RECEIVED

Mr. Fred A. Westerman
Fish Division
Department of Conservation
Lansing, Michigan

Dear Mr. Westerman:

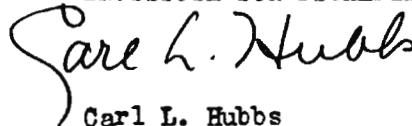
The accompanying Report 204, "Suggested Program for the Use of Unemployed Men in Lake and Stream Improvement Work in Michigan, in Connection with the Federal "Reforestation" Project", has been drawn up at the request of the Secretary, made by telephone through Mr. Lovejoy.

We would appreciate your consideration of this proposal, and ask that you bring it to the attention of the Director.

The report is sent in duplicate.

Sincerely yours,

INSTITUTE FOR FISHERIES RESEARCH



Carl L. Hubbs
Director.