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INSTITUTE FOR FISHERIES RESEARCH

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NOTES ON CERTAIN STREAMS OF NORTHERN MICHIGAN

(Peshekee River System, Spruce River, Spruce  
Meadow Creek, Escanaba River System, Lake  
Superior Drainage North of Marquette, Huron  
Bay Drainage)

The following pages are concerned with the results of a reconnaissance of certain streams of Marquette and Paraga counties, made during the late summer of 1937 by A. S. Hazzard, J. W. Leonard, and F. V. Ames. Some streams, owing to public interest and inherent possibilities, received considerably more attention than others. In most instances, collections of fish were made, by seining, angling, or both, and bottom samples were taken to give a clue to food production. The results of these collections will be reported on at greater length as soon as they can be studied. The purpose of the present report is to place on record some of the more salient observations made on the physical nature of the various streams, and especially to note the high temperatures attained by several streams which otherwise appear to meet the requirements of good trout water. In some instances, suggestions, general in nature, are offered for the possible improvement of certain streams. In the main, it may be said that the improvement needs of the waters here discussed are largely for lowering of summer temperatures, and effective handling of low summer water levels in channels scoured out to accommodate heavy spring floods. Unlike many lower peninsula streams, food production was considered to be uniformly quite satisfactory.

The headwaters of many streams, especially those of the Peshekee and Escanaba systems are obviously seriously affected by beaver dams. It is

believed that these structures must be cleared out before intelligent management plans can be drawn up.

#### PESHEKKEE RIVER SYSTEM

East Branch. This stream was checked in considerable detail from Section 36 of T 50 N, R 31 W, to its union with the West Branch. At the first point, the stream was about thirty feet wide and two or three feet in depth, flowing over a bottom of mixed mud and sand which supported a growth of eelgrass, horse-tail, water lilies and pond weeds. The current was very sluggish, owing to the influence of an abandoned logging dam (known locally as the "Haypress"), located about two miles downstream. Throughout this ponded section the stream flows through marshgrass flats which are kept free of larger vegetation, such as tag alder, by periodic flooding. This undesirable absence of shade from the stream undoubtedly is an important contributing factor in the high temperatures attained by the water.

The "Haypress Dam," located in Section 1 of T 49 N, R 31 W, is thrown across a narrow, rocky gorge. Only the bed timbers of this dam remain in place, but the channel is effectively blocked by a large boulder, estimated to weigh 1000 pounds, which is wedged at the top of the spillway. Below this boulder, the overflow rushes over a rocky cascade which makes a drop of about twenty feet in a linear distance of some twenty yards. Except for the blockading boulder, it is not unlikely that rainbow trout could surpass this cascade in time of high water. Below this point the stream is similar in character to its lower reaches.

In Section 6 of T 49 N, R 30 W, there is another abandoned logging dam known as the "Brown Dam." This structure is now a jumbled mass of huge timbers lying across another natural rock cut. So tangled were these timbers

that it could not be determined certainly whether or not fish would be stopped there. The gorge itself should not offer serious obstacles to trout during high water periods.

From this point downstream, the East Branch was examined at frequent intervals, it being paralleled by a motor road constructed along an old railroad grade. The general character of the stream appeared to be quite uniform from this point. It flows over a bottom of coarse gravel, rubble and boulders, with very little sand, silt or organic debris in evidence. The channel, scoured by heavy springtime floods, is four or five times as wide as the low-water flow. The banks were very densely grown with tag alders. Back of this the river valley, 1/8 to 1/2 mile in width, supported a mixed stand of aspen and spruce, usually rather open. Ponds and riffles alternate, some of the pools being as much as four feet deep at the time of examination. Most of the cover and shelter in the stream appeared to be that afforded by large boulders and by the fringing alders. Stumps, logs and drift were not seen in significant amounts.

Tributaries. Baraga Creek, outlet of the Baraga Lakes, joins the East Branch in Section 15 of T 49 N, R 30 W. As its source would lead one to expect, this stream attains very high temperatures in summer, exceeding those reached by the East Branch. The warming effect of this stream upon the remainder of the system must be considered in planning future management. At the time it was examined, the flow from Baraga Creek was about fifteen feet wide, averaging six inches in depth.

Immediately below the mouth of Baraga Creek are two small springs, one on either side of the East Branch. The one on the west side, whose flow was estimated at two gallons per minute, harbored a four-inch brook trout in its basin. The flow of the other spring could not well be estimated, since it seeped out over a large weed bed.

Dishmo Creek, which joins the East Branch in Section 1 of T 49 N, R 30 W, is still capable of supporting trout, although its cooler water is not of sufficient volume to show a significant effect upon the larger stream. Near its juncture with the East Branch it flows over a series of low cascades and rapids through a narrow, deep-cut, rocky gorge. It was not seen further upstream, but it was reported that considerable spring seepage enters it through an alder meadow section near the head. An eight-inch brook trout was seen, which had been taken by an angler in the rapids section near the mouth.

A few other small streams and seepages enter the East Branch, but none are of sufficient size to be worthy of consideration.

The West Branch merges with the East Branch on the line between sections 12 and 13 of T 48 N, R 30 W. Below this point it is improbable that a permanent trout population could be established, owing to the high water temperatures attained in summer, and to the presence of warm water game fish.

West Branch. Numerous obstructions in the form of beaver dams and abandoned logging dams, and a naturally sluggish flow due to low stream bed gradient, combine to produce very high water temperatures on this stream. It would appear impractical to attempt any environmental control with a view to trout production. A small tributary, Goodenow Creek, still affords a limited amount of trout fishing. It was seen at a point about one and one-half miles above its mouth. Its width averaged eighteen inches, its depth six inches. It was almost completely concealed by dense growths of tag alder and marsh grass, and could be fished only with bait.

Food Supply. The character of the stream beds of the East Branch and of Dishmo Creek is such as to insure a food supply adequate to support a sizeable population of adult trout, production averaging about 3 cc. per

square foot. Typical gravel stream forms such as caddisflies and mayflies were common to abundant. Midge larvae were rare, this probably being due to the very small amounts of silt and organic debris present in the streams.

Need for Improvement. The one factor most evidently responsible for absence of trout in summer from the greater part of the Peshekee system is, undoubtedly, the high water temperatures attained. The paucity of springs, coupled with extensive openings, especially behind dams, allow the water temperature to fluctuate almost as rapidly and freely as that of the air.

Flooding is a serious problem. So abrupt is the spring break-up that the streams of this system have scoured out wide, deep beds, thus allowing the meager summer flow to spread out in extensive shallows where added exposure to direct sunlight results in very warm water.

It would appear that the most needful form of improvement would be the installation of structures designed to restrict the channel during low water periods, so as to deepen and accelerate the flow, without offering much resistance to flood waters. Additional cover and shade would aid in further lowering temperatures. Above all else obstructions, such as beaver and old logging dams, should be removed from the upper reaches of the East Branch. Rock is available in profusion, in all sizes from pea gravel to large boulders. It is believed that construction, at frequent intervals, of broad, low, stone deflectors would restrict and accelerate the summer flow, and at the same time withstand the spring floods and floating ice, which would flow over them.

In addition to lowering temperatures, such a restriction of channel should increase the food supply by saving from desiccation forms exposed by rapid fluctuations in stream level.

East Branch Peshekee River and Tributaries  
T. 49 N., R. 30 W.

Temperature series working downstream from end of motor road

Station	Aug. 26, 4:30-5 P.M.		Aug. 27, 9-10:30 A.M.	
	Air	Water	Air	Water
Sec. 6. Bridge at end of motor road near Baraga County line	80.75°	79°	67°	63°
Sec. 9. Small tributary from ponded meadow, scarcely any flow	80.75°	78°	67°	59°
Sec. 10. Old logging dam (sheltered from sun in afternoon)	80.75°	74°	70°	65°
Sec. 15. Just below mouth of Baraga Creek	80.75°	78°	70°	65°
Sec. 15. Baraga Creek just above mouth	81°	80°	70°	68°
Sec. 15. Small springs just below mouth of Baraga Creek			70°	46°
			70°	50°
Sec. 22. Small tributary, 24 inches wide, 6 inches deep	81°	77°	70°	65°
Sec. 26. Bridge across East Branch	81.5°	75°	71°	68°
Sec. 35. "Rock Dam"	81.5°	76.75°	71°	68°

Station	Sept. 5, 9-11 A.M.	
	Air	Water
Starting Sec. 6 and working upstream		
Sec. 6. Bridge at end of motor road near Baraga County line	51°	55°
Sec. 1, T 49 N, R 31 W., Haypress Dam	54°	56°
Sec. 36, T 50 N., R. 31 W., abandoned railway trestle	56°	56.5°

SPRUCE RIVER

The Spruce River was first checked at a point about two and a half miles below its source, near Kaskela's farm. Here the stream flowed over a bottom predominantly formed of smooth sandstone ledges. The stream bed was about thirty feet wide, the banks thickly grown with spruce. The stream flow was almost arrested, forming a chain of small pools connected by shallow riffles. Average depth of water four inches, average width thirty inches. At 10:30 A.M. the air temperature was 74°, that of the water 68°F. The owner of the farm stated that there were seven or eight beaver dams between this point and the source (Spruce Lake), about two and a half miles distant.

The river was observed again at a point about five miles downstream. Here the stream averaged fifteen feet in width and ten inches in depth. The current was almost at a standstill, the channel being almost completely choked with a thick growth of Equisetum (horsetail). For a half-mile downstream (as far as examination extended), this rank growth persisted.

Little can be recommended in the way of possible improvements until the channel has been cleared of obstructions, especially by beaver dams. Since the stream rises from a lake, it may be that even dam removal will not lower summer water temperatures sufficiently to allow trout to survive.

SPRUCE MEADOW CREEK

This stream, which is an important tributary of the Spruce River, was examined at three points. The first of these, near Anderson's logging camp south of Imperial, is quite near the head of the stream. Here the width of flow averaged thirty inches, depth four inches. The bottom was composed of moderate gravel with some admixture of coarse sand. White water buttercup and watercress grew along the edges of the water. A rather

open growth of tag alder fringed the stream. About two miles further downstream, west of Koivila's farm, the stream was found to flow through a long, wide marsh, probably the result of years of beaver occupancy. The banks of the stream were composed of mat-forming sedges, producing a quaking mat similar to that encountered around a bog lake. Owing to slight gradient and to numerous beaver dams some distance downstream, the current was quite sluggish. Measurements showed the average width to be ten feet, average depth thirty inches. No true pools were located but the bottom, surprisingly, was found to be composed of gravel, overlain with a shallow layer of silt and organic debris. By probing with a pole, it was found that water extends back under the mat to a distance of at least twenty feet from the open channel. Such a condition must be of great value in arresting high water temperatures, as well as in providing much-needed cover and protection for fish which can, apparently, withdraw at will under the edge of the mat. Several trout were seen jumping in this section, and one 6-inch brook trout was picked up dead.

About three-quarters of a mile further downstream, numerous beaver dams were encountered. Although all of these which were observed appeared to be abandoned, they remained sufficiently solid to impede the water, and to cause its break-up into a network of small channels. The original channel apparently had been rather heavily shaded by large clumps of tag alders. These are now being drowned out. After their death, the stream will have very little shade in this section. Here, as in the meadow section, a good layer of gravel exists immediately under the rather shallow layer of muck and debris accumulated by the beaver dams.

Need for Improvement. It is believed that the Spruce Meadow Creek is worthy of consideration for improvement. It has been regarded, locally, as a good trout stream for many years, and has been stocked with trout for at least fifteen years. Of late, there have been complaints of small trout.



Removal of beaver dams should be the first step. Once the channel is cleared, installation of deflectors would hasten the process of exposing gravel. Through the meadow section adequate cover is afforded by the undercut banks. Through the beaver dam section, renewed growth of tag alder would offer considerable shade, but some floating covers would probably be needed, at least until more trees and shrubs secure a footing in the ponded areas.

On August 31, 1937, at 10 A.M., the air temperature was 66°, water 62°F. The morning was cloudy, with occasional light showers.

#### ESCANABA RIVER SYSTEM

A rapid reconnaissance of the Escanaba and tributaries in the Republic region was made, chiefly with a view to determining maximum water temperatures. One survey station was run on the main stream in Sec. 28 of T 47 N, R 28 W. The following notes on various tributary streams were taken on August 27, 1937.

West Branch Creek. This stream was checked in Sec. 27 of T 46 N, R 28 W. At 2 p.m. the air temperature was 79°, the water 63°F. The stream had an average width of 5 feet, of depth 18 inches. The straight-cut banks are thickly fringed with willow and alder, but trees are almost totally wanting from the vicinity of the stream. The current flowed at a speed of 0.75 feet per second over a bottom composed of coarse sand and gravel. It is probable that this stream remains cool enough for trout throughout the summer.

In Section 22 of the same township a small spring feeder was examined. The flow was 2 feet wide, averaging 4 inches in depth, and, in spite of supporting a dense growth of watercress, maintained a speed of a trifle less than 1 foot per second. No bottom samples were taken here, but it was observed that black fly larvae and pupae were abundant on the submerged

vegetation. The water temperature at 2:30 P.M. was 55°F.

Green Creek, where crossed by Marquette County road number 581, averaged 2 feet in width and 6 inches in depth. The temperature, at 2:45 P.M., was 64°F. The owner of an adjoining farm stated that a few trout could still be found in this stream, although its small carrying capacity did not enable it to withstand much angling. The bottom, composed almost entirely of fine to moderate gravel, appeared to harbor a considerable number of food organisms.

West Branch Escanaba. In Section 1 of T 47 N, R 29 W, this stream averaged 20 feet in width and 8 inches in depth, and flowed at the rate of 0.5 foot per second. At 4 P.M. the air temperature was 73°, that of the water 66°F. Profuse growths of eel grass (Vallisneria) and pond weed (Potamogeton), indicated that high water temperatures are reached. Like many streams in this region, the channel is scoured out to accommodate spring floods, with the result that the scanty summer flow is allowed to spread out in extensive, unprotected shallows. Good pools are few, and cover and shade inadequate.

Escanaba River. In Section 11 of T 46 N, R 28 W, this stream had an average width of 45 feet and depth of 6 inches. The current, at the rate of 1 foot per second, flowed over a bed of coarse sand and gravel. At 3 P.M. the water temperature was 67°F. The usual gravel-inhabiting forms of stream insects were encountered.

On September 1, 1937, <sup>a station</sup> /was run on this stream in Section 28 of T 47 N, R 28 W. At 11 A.M. the air temperature was 83°, that of the water 70°F. The stream, averaging 44 feet in width and 11.6 inches in depth, flowed between sand banks thickly grown with tag alder, backed up at a distance of about 50 yards by ridges grown with aspen and spruce. Very few pools

were observed, and of these none had sufficient cover. The bottom, composed of coarse sand with very little gravel, did not appear to be productive of food organisms. One bottom sample revealed less than 1 cc. of food organisms per square foot. In shallow areas near shore, where the current was sluggish, beds of eel grass and pond weed occurred.

This stream, like the West Branch, suffers from lack of cover and shade, in the section examined, and from extensive shallows exposed to the sun. Any contemplated improvement should be directed at restricting and deepening the low water flow, and at providing additional shade and cover.

#### LAKE SUPERIOR DRAINAGE NORTH OF MARQUETTE

On September 6, 1937, various streams were examined where crossed by M 35 between Marquette and Big Bay. First encountered was a small stream, 18 inches wide and about 4 inches deep, tributary to the Little Pup Creek. The immediate banks are thickly grown with tag alder, backed up by hardwood forest. The bottom, of uniform moderate gravel, appeared to harbor a rich supply of food organisms. Large numbers of brook trout fry were observed at this point. The air temperature at about 11 A.M. was 60°, that of the water 49.5°F., indicating a spring-fed origin. The Little Pup Creek, at the bridge, appeared to be very like the stream just described, in physical characteristics. The water temperature here was 48°F. At the points examined, these small streams did not appear to require the installation of any improvement devices.

The Yellow Dog River was examined for some distance above and below the M 35 bridge. The stream averaged 18 feet in width, 18 inches in depth. The swift current flowed over a bottom composed of coarse sand, gravel and rubble, between banks grown with tag alder, backed up by small aspens and hardwoods. A number of excellent pools were observed, sometimes as

much as 48 inches in depth. Considerable quantities of drift timber offer good shelter for trout. Although this stream obviously sustains spring floods, the channel does not allow undesirable spreading out of the summer flow.

Some improvement devices have been installed in the stream for a short distance below the bridge. Although these evidently did good work at first, they are now so badly in need of repair as to be of little use to the stream. Rock and deadheads are available in or immediately adjoining the stream.

At noon, the air temperature was 60°, that of the water 56°F. The stream is obviously spring-fed, and although sticks peeled by beaver were observed, no beaver dams were seen.

#### HURON BAY DRAINAGE

On September 4, 1937, stations were run on the Huron, Silver, and Slate rivers. The two last-named streams were checked near the bridges on M 35.

Silver River. This stream at the point of examination averaged 60 feet in width, and ranged from 0 to 4 feet in depth. The current was rapid, in the main, growing sluggish through the deep, long pools below rapid riffle areas. The bottom, composed of coarse sand gravel with rubble and boulders appearing in the riffles, was scoured out to form a number of good pools. The banks supported a heavy growth of tag alder, with some cedar and hardwood. The surrounding country is gently rolling, grown with hardwood forest. The natural food supply appeared to be good, comprising the usual gravel stream forms of aquatic insects. At 4 P.M. the air temperature was 54°, that of the water 61°F.

Slate River. In the vicinity of the M 35 crossing the Slate flows rapidly over a bottom composed of slate ledges, with numerous low cascades and rapids. Average width at this time was 25 feet, depth 5 inches. Ample shade is afforded by the heavy forest, composed chiefly of hardwood with some hemlock and balsam. Stream cover is afforded by overhanging ledges of slate. The food supply appeared to be good. It is not believed that improvement work would be necessary in this section. At 1 P.M. the air temperature was 55°, water 58°F.

Huron River. Access to this stream was gained over a logging road which touches the Huron in Section 14 of T 52 N, R 30 W. Here the stream, averaging 25 feet in width and ranging from 0 to 3 feet in depth, flows over a bottom of sand and gravel, with sand predominating to an estimated 70%. The banks support a rather open growth of alder, backed up by hardwood ridges. Drift jams indicated that this stream undergoes very heavy flooding. Some cover is available for the numerous pools, in the form of drift logs. A bottom sample taken in a representative section indicated a very poor food supply, this probably being due not only to the large amount of sand in the stream, but also to the scouring action of the spring floods. At 11 A.M. the air temperature was 55°, the water 60°F. Beds of eel grass and pond weed in sheltered sections indicate that high water temperatures are attained in summer.

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