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MICHIGAN STREAMS--

THEIR LENGTHS, DISTRIBUTION AND DRAINAGE AREAS

by

C. J. D. Brown

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No area of significant size in Michigan is without streams. The shore lines of the Great Lakes are cut at irregular intervals by rivers which extend inland, dividing as they go into ever smaller and smaller streams which finally reach their source in every lake, valley and hill-side of the state.

The lengths of the major streams have been determined many times because they offer power, navigation and water supply to the community. There seems to have been no previous attempt, however, at lineal measurements of all the permanent streams in the state. The project was undertaken at this time because of the need for reliable figures upon which to base a post-war program of stream fisheries surveys with a breakdown of the work by counties.

Of course the accuracy of such measurements depends first of all upon the quality of maps used and unfortunately our best maps are still far from ultimate in accuracy and completeness. However the present available maps, many of which are based on aerial photographs, are accurate enough to justify careful measurements at this time. Master plan county maps of the Department of Conservation were used for all counties which are covered

by such maps i.e., most of the northern counties north of the Muskegon, Bay City line, while polyprojection maps of the State Highway Department were used for the remaining counties.

Stream lengths were determined by following their entire courses with a map measurer. Some difficulties arose in measuring the more convoluted parts of streams because at a scale of one inch to a mile it was impossible to follow the stream course in detail. However, the difference in length was estimated and corrections made. We are certain that our figures are very conservative on the lengths of such streams because the nature of our instruments always tended to cut out the small convolutions.

Our categories of main stream and tributaries cannot easily be defined. On a basis of our knowledge of the streams and the nature of tributary arrangement we more or less arbitrarily made this division. There is little doubt that in some instances waters have been assigned to our category of "main stream" which might better have been called tributaries and conversely. Unless some such standard as volume or width is used, and this is not possible at the present time, any system for dividing the main stream from the tributaries would be more or less arbitrary.

The category of "coastal streams" includes all those small streams emptying directly into the Great Lakes and which do not fall into any of the recognized drainages given below. There is no difference between a large so-called coastal stream and a small river and our assignments of course again had to be arbitrary. Only those parts of streams and their drainages found within or on the boundaries of Michigan were included in this report. Drainage areas were estimated by counting the sections or square miles within the boundaries of each river system.

The findings of this report are given in the two tables at the end. Table I shows the stream mileages by drainages for each county, while

Table II gives the stream mileages by river drainage systems. The counties are shown for each system and the total drainage area estimated in this table.

I wish to acknowledge the assistance of Grace Wood and Madeline Klaphaak in the measurements and tabulations of this report.

Marquette County, which has the largest area of any county in the state, has the greatest mileage of streams with a total of 1906. Ontonagon, Gogebic and Sanilac each has more than a 1000 miles of stream. A good share of the streams in the southern or more prosperous agricultural parts of the state are drains. Some are of artificial origin but a great many are simply dredged out creeks.

Bay, Leelanau and Emmet are the only counties with less than 100 miles of stream each. There is an average of 438 miles of stream for each county in Michigan

A larger number of river drainages (14 in number) are found in Marquette County than any other county of Michigan. Chippewa, Ontonagon and Alger each have 10 or more. Several counties fall entirely within the drainage of one river system.

The Saginaw River Drainage is the largest for the state having approximately 6500 square miles. The next five in the order of size are as follows: Grand (5544), St. Joseph (3132), Muskegon (2611), Au Sable (2126), and Menominee (2087).

INSTITUTE FOR FISHERIES RESEARCH

by C. J. D. Brown

Approved by: A. S. Hazzard

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TABLE I

THE DISTRIBUTION AND LENGTHS OF MICHIGAN STREAMS BY COUNTIES

28-8/12

County	Drainage System	Miles of Main Stream	Miles of Tributaries	Total Miles of Stream
<u>Alcona</u>	Au Sable	21	175	196
	Black	10	28	38
	Thunder Bay	...	125	125
	2 Coastal Streams	...	<u>3</u>	<u>3</u>
	Total	31	331	362
<u>Alger</u>	Anna	6	18	24
	Au Train	11	90	101
	Laughing Whitefish	11	23	34
	Manistique	...	48	48
	Miner's	8	14	22
	Mosquito	3	15	18
	Rock	8	37	45
	Sand	1	8	9
	Sturgeon	8	21	29
	Sucker	24	60	84
	Whitefish	21	128	149
	56 Coastal Streams	...	<u>146</u>	<u>146</u>
Total	101	608	709	
<u>Allegan</u>	Black (Ottawa Co.)	...	63	63
	Black (Van Buren Co.)	18	50	68
	Kalamazoo	54	316	370
	7 Coastal Streams	...	<u>16</u>	<u>16</u>
	Total	72	445	517

County	Drainage System	Miles of Main Stream	Miles of Tributaries	Total Miles of Stream
<u>Alpena</u>	Devil's	5	37	42
	Thunder Bay	71	179	250
	4 Coastal Streams	...	<u>9</u>	<u>9</u>
	Total	76	225	301
<u>Antrim</u>	Charlevoix	13	59	72
	Elk	15	165	180
	Manistee	...	2	2
	7 Coastal Streams	...	<u>10</u>	<u>10</u>
	Total	28	236	264
<u>Arenac</u>	Au Gres	11	24	35
	Pine	15	23	38
	Rifle	14	47	61
	2 Coastal Streams	...	<u>22</u>	<u>22</u>
	Total	40	116	156
<u>Baraga</u>	Big Huron	16	47	63
	Falls	3	35	38
	Iron	...	11	11
	Michigamme → Menominee	...	84	84
	Paint → Brule → Menominee	...	47	47
	Ravine	7	26	33
	Silver	6	49	55
	Slate	5	16	21
	Sturgeon → Portage	64	223	287
	21 Coastal Streams	...	<u>57</u>	<u>57</u>
	Total	101	595	696

<u>County</u>	<u>Drainage System</u>	<u>Miles of Main Stream</u>	<u>Miles of Tributaries</u>	<u>Total Miles of Stream</u>
<u>Barry</u>	Grand	34	178	212
	Kalamazoo	<u>...</u>	<u>60</u>	<u>60</u>
	Total	34	238	272
<u>Bay</u>	Kawkawlin	9	3	12
	Saginaw	19	8	27
	3 Coastal Streams	<u>...</u>	<u>11</u>	<u>11</u>
	Total	28	22	50
<u>Benzie</u>	Betsie	32	22	54
	Platte	21	24	45
	2 Coastal Streams	<u>...</u>	<u>5</u>	<u>5</u>
	Total	53	51	104
<u>Berrien</u>	Galien	16	114	130
	St. Joseph	67	273	340
	5 Coastal Streams	<u>...</u>	<u>30</u>	<u>30</u>
	Total	83	417	500
<u>Branch</u>	St. Joseph	<u>45</u>	<u>280</u>	<u>325</u>
	Total	45	280	325
<u>Calhoun</u>	Kalamazoo	61	219	280
	St. Joseph	<u>23</u>	<u>237</u>	<u>260</u>
	Total	84	456	540
<u>Cass</u>	St. Joseph	<u>18</u>	<u>211</u>	<u>229</u>
	Total	18	211	229
<u>Charlevoix</u>	Bear	3	46	49
	Charlevoix	17	99	116

County	Drainage System	Miles of Main Stream	Miles of Tributaries	Total Miles of Stream
(continued)				
<u>Charlevoix</u>	Cheboygan	...	7	7
	Elk	...	18	18
	6 Coastal Streams	...	<u>25</u>	<u>25</u>
	Total	20	195	215
<u>Cheboygan</u>	Carp	...	6	6
	Cheboygan	63	320	383
	8 Coastal Streams	...	<u>31</u>	<u>31</u>
	Total	63	357	420
<u>Chippewa</u>	Betsy	19	21	40
	Big Munuscong	9	72	81
	Carp	...	4	4
	Charlotte	7	18	25
	Gogomain	3	24	27
	Little Munuscong	7	20	27
	Pine	17	115	132
	St. Mary's	9	5	14
	Tahquamenon	18	179	197
	Waiska	8	90	98
	47 Coastal Streams	...	<u>155</u>	<u>155</u>
	Total	97	703	800
<u>Clare</u>	Muskegon	29	108	137
	Tittabawassee → Saginaw	...	<u>194</u>	<u>194</u>
	Total	29	302	331
<u>Clinton</u>	Grand	<u>62</u>	<u>257</u>	<u>319</u>
	Total	62	257	319

County	Drainage System	Miles of Main Stream	Miles of Tributaries	Total Miles of Stream
<u>Crawford</u>	Au Sable	62	126	188
	Manistee	<u>9</u>	<u>7</u>	<u>16</u>
	Total	71	133	204
<u>Delta</u>	Bark	8	26	34
	Days	16	22	38
	Escanaba	22	38	60
	Fishdam	9	8	17
	Ford	32	44	76
	Manistique	...	10	10
	Ogontz	4	10	14
	Rapid	21	39	60
	Sturgeon	42	21	63
	Tacoosh	9	9	18
	Whitefish	24	57	81
	15 Coastal Streams	<u>...</u>	<u>43</u>	<u>43</u>
	Total	187	327	514
<u>Dickinson</u>	Escanaba	10	54	64
	Ford	41	117	158
	Menominee	24	9	33
	Michigamme → Menominee	8	30	38
	Sturgeon → Menominee	<u>85</u>	<u>267</u>	<u>352</u>
	Total	168	477	645
<u>Eaton</u>	Grand	42	116	158
	Kalamazoo	<u>9</u>	<u>40</u>	<u>49</u>
	Total	51	156	207

County	Drainage System	Miles of Main Stream	Miles of Tributaries	Total Miles of Stream
<u>Emmet</u>	Bear	8	2	10
	Carp	9	3	12
	Cheboygan	14	51	65
	2 Coastal Streams	<u>...</u>	<u>11</u>	<u>11</u>
	Total	31	67	98
<u>Genesee</u>	Cass →			
	Saginaw	...	5	5
	Flint →			
	Saginaw	51	243	294
	Shiawassee →			
Saginaw	<u>8</u>	<u>48</u>	<u>56</u>	
Total	59	296	355	
<u>Gladwin</u>	Kawkawlin	...	24	24
	Tittabawassee →			
	Saginaw	<u>72</u>	<u>377</u>	<u>449</u>
Total	72	401	473	
<u>Gogebic</u>	Black	32	194	226
	Montreal	30	82	112
	Ontonagon	32	326	358
	Paint →			
	Brule → Menominee	...	12	12
	Presque Isle	74	250	324
	64 Coastal Streams	<u>...</u>	<u>172</u>	<u>172</u>
Total	168	1,036	1,204	
<u>Grand Traverse</u>	Betsie	...	11	11
	Boardman	18	74	92
	Elk	...	11	11
	Manistee	...	18	18
	Platte	...	6	6
	5 Coastal Streams	<u>...</u>	<u>30</u>	<u>30</u>
	Total	18	150	168

County	Drainage System	Miles of Main Stream	Miles of Tributaries	Total Miles of Stream	
<u>Gratiot</u>	Grand	13	79	92	
	Shiawassee → Saginaw	6	18	24	
	Tittabawassee → Saginaw	<u>26</u>	<u>99</u>	<u>125</u>	
	Total	45	196	241	
<u>Hillsdale</u>	Grand	1	8	9	
	Kalamazoo	3	23	26	
	Maumee	...	150	150	
	St. Joseph	<u>15</u>	<u>98</u>	<u>113</u>	
	Total	19	279	298	
<u>Houghton</u>	Elm	6	35	41	
	Graveraet	4	17	21	
	Misery	4	27	31	
	Ontonagon	16	93	109	
	Pike → Portage	5	20	25	
	Pilgrim → Portage	5	18	23	
	Portage	20	136	156	
	Salmon Trout	5	33	38	
	Sturgeon → Portage	44	316	360	
	Trap Rock → Portage	7	41	48	
	20 Coastal Streams	<u>...</u>	<u>71</u>	<u>71</u>	
	Total	116	807	923	
	<u>Huron</u>	Cass → Saginaw	...	24	24
		New	6	21	27
		Pigeon	12	122	134
Pinnebog		19	211	230	

County	Drainage System	Miles of Main Stream	Miles of Tributaries	Total Miles of Stream
<u>Huron</u>	Rock Falls Creek	8	28	36
	Sebawaing	3	37	40
	Willow	8	90	98
	51 Coastal Streams	...	<u>353</u>	<u>353</u>
	Total	56	886	942
<u>Ingham</u>	Grand	42	184	226
	Huron	...	<u>8</u>	<u>8</u>
	Total	42	192	234
<u>Ionia</u>	Grand	<u>73</u>	<u>391</u>	<u>464</u>
	Total	73	391	464
<u>Iosco</u>	Au Gres	4	118	122
	Au Sable	19	58	77
	Tawas	2	55	57
	2 Coastal Streams	...	<u>3</u>	<u>3</u>
	Total	25	234	259
<u>Iron</u>	Brule → Menominee	57	90	147
	Menominee	5	5	10
	Michigamme → Menominee	48	248	296
	Ontonagon	...	46	46
	Paint → Brule → Menominee	57	323	380
	Sturgeon → Portage	...	<u>23</u>	<u>23</u>
	Total	167	735	902
	<u>Isabella</u>	Tittabawassee → Saginaw	<u>20</u>	<u>310</u>
Total		20	310	330

County	Drainage System	Miles of Main Stream	Miles of Tributaries	Total Miles of Stream
<u>Jackson</u>	Grand	40	190	230
	Huron	...	1	1
	Kalamazoo	...	63	63
	Raisin	<u>...</u>	<u>30</u>	<u>30</u>
	Total	40	284	324
<u>Kalamazoo</u>	Kalamazoo	33	148	181
	St. Joseph	<u>11</u>	<u>173</u>	<u>184</u>
	Total	44	321	365
<u>Kalkaska</u>	Boardman	11	48	59
	Elk	10	39	49
	Manistee	<u>62</u>	<u>114</u>	<u>176</u>
	Total	83	201	284
<u>Kent</u>	Grand	81	670	751
	Kalamazoo	<u>...</u>	<u>21</u>	<u>21</u>
	Total	81	691	772
<u>Keweenaw</u>	Gratiot	3	18	21
	Montreal	10	35	45
	Tobacco	6	39	45
	Trap Rock → Portage	...	10	10
	26 Coastal Streams	<u>...</u>	<u>150</u>	<u>150</u>
	Total	19	252	271
<u>Lake</u>	Big Sable	6	12	18
	Manistee	40	68	108
	Muskegon	...	2	2
	Pere Marquette	<u>53</u>	<u>69</u>	<u>122</u>
	Total	99	151	250

County	Drainage System	Miles of Main Stream	Miles of Tributaries	Total Miles of Stream
<u>Lapeer</u>	Belle →			
	St. Clair	9	70	79
	Black →			
	St. Clair	1	75	76
	Cass →			
	Saginaw	...	23	23
	Clinton	6	6	12
<u>Leelanau</u>	Flint →			
	Saginaw	<u>28</u>	<u>376</u>	<u>404</u>
	Total	44	550	594
<u>Leelanau</u>	8 Coastal Streams	...	<u>58</u>	<u>58</u>
	Total	...	58	58
<u>Lenawee</u>	Raisin	38	578	616
	1 Coastal Stream	...	<u>6</u>	<u>6</u>
	Total	38	584	622
<u>Livingston</u>	Grand	24	77	101
	Huron	18	181	199
	Shiawassee →			
	Saginaw	<u>12</u>	<u>157</u>	<u>169</u>
	Total	54	415	469
<u>Luce</u>	Little Two Hearted	7	33	40
	Manistique	8	35	43
	Tahquamenon	76	366	442
	Two Hearted	42	73	115
	3 Coastal Streams	...	<u>18</u>	<u>18</u>
	Total	133	525	658

County	Drainage System	Miles of Main Stream	Miles of Tributaries	Total Miles of Stream
<u>Mackinac</u>	Big Munuscong	...	17	17
	Brevoort	9	21	30
	Carp	28	46	74
	Manistique	1	20	21
	Milakokia	...	5	5
	Millecoquins	8	45	53
	Pine	9	22	31
	23 Coastal Streams	...	<u>116</u>	<u>116</u>
	Total	55	292	347
<u>Macomb</u>	Belle → St. Clair	...	12	12
	Clinton	39	209	248
	Salt	5	22	27
	4 Coastal Streams	...	<u>9</u>	<u>9</u>
		Total	44	252
<u>Manistee</u>	Betsie	8	...	8
	Manistee	69	187	256
	2 Coastal Streams	...	<u>12</u>	<u>12</u>
		Total	77	199
<u>Marquette</u>	Big Huron	1	28	29
	Carp	16	65	81
	Chocolay	16	129	145
	Dead	11	218	229
	Escanaba	82	568	650
	Ford	14	44	58
	Garlic	6	41	47

County	Drainage System	Miles of Main Stream	Miles of Tributaries	Total Miles of Stream
<u>Marquette</u> (continued)	Iron	19	109	128
	Michigamme → Menominee	40	160	200
	Pine	3	63	66
	Rapid	...	16	16
	Salmon Trout	10	55	65
	Sand	3	20	23
	Whitefish	...	62	62
	10 Coastal Streams	...	<u>107</u>	<u>107</u>
	Total	221	1,685	1,906
	<u>Mason</u>	Big Sable	28	19
Lincoln		12	49	61
Manistee		2	...	2
Pentwater		...	4	4
Pere Marquette		51	56	107
4 Coastal Streams		...	<u>17</u>	<u>17</u>
Total		93	145	238
<u>Mecosta</u>	Grand	...	20	20
	Muskegon Tittabawassee →	50	164	214
	Saginaw	...	<u>59</u>	<u>59</u>
	Total	50	243	293
<u>Menominee</u>	Big Cedar	60	230	290
	Ford	24	48	72
	Little → Menominee	18	28	46
	Little Cedar → Menominee	35	83	118
	Menominee	85	120	205

County	Drainage System	Miles of Main Stream	Miles of Tributaries	Total Miles of Stream
<u>(continued)</u>				
<u>Menominee</u>	Shaky→			
	Menominee	19	15	34
	Sturgeon→			
	Menominee	...	5	5
	13 Coastal Streams	...	<u>45</u>	<u>45</u>
	Total	241	574	815
<u>Midland</u>	Kawkawlin	...	16	16
	Swan→			
	Saginaw	...	5	5
	Tittabawassee→			
	Saginaw	<u>66</u>	<u>222</u>	<u>288</u>
	Total	66	243	309
<u>Missaukee</u>	Manistee	4	34	38
	Muskegon	<u>17</u>	<u>154</u>	<u>171</u>
	Total	21	188	209
<u>Monroe</u>	Huron	7	4	11
	Raisin	58	150	208
	16 Coastal Streams	...	<u>240</u>	<u>240</u>
	Total	65	394	459
<u>Montcalm</u>	Grand	13	301	314
	Muskegon	...	105	105
	Tittabawassee→			
	Saginaw	<u>2</u>	<u>56</u>	<u>58</u>
	Total	15	462	477
<u>Montmorency</u>	Au Sable	...	2	2
	Cheboygan	15	38	53
	Thunder Bay	<u>35</u>	<u>216</u>	<u>251</u>
	Total	50	256	306

County	Drainage System	Miles of Main Stream	Miles of Tributaries	Total Miles of Stream
<u>Muskegon</u>	Grand	...	111	111
	Muskegon	15	101	116
	White → Muskegon	10	64	74
	6 Coastal Streams	...	<u>93</u>	<u>93</u>
	Total	25	369	394
<u>Newaygo</u>	Grand	...	12	12
	Muskegon	41	201	242
	Pere Marquette	11	94	105
	White → Muskegon	<u>6</u>	<u>119</u>	<u>125</u>
	Total	58	426	484
<u>Oakland</u>	Clinton	21	119	140
	Flint → Saginaw	...	66	66
	Huron	12	80	92
	Rouge → Detroit	13	127	140
	Shiawassee → Saginaw	<u>4</u>	<u>27</u>	<u>31</u>
	Total	50	419	469
<u>Oceana</u>	Pentwater	6	63	69
	Pere Marquette	4	20	24
	White → Muskegon	24	63	87
	3 Coastal Streams	...	<u>111</u>	<u>111</u>
	Total	34	190	224
<u>Ogemaw</u>	Au Gres	6	51	57
	Au Sable	2	38	40
	Rifle	36	194	230
	Tittabawassee → Saginaw	<u>6</u>	<u>48</u>	<u>54</u>
	Total	50	331	381

County	Drainage System	Miles of Main Stream	Miles of Tributaries	Total Miles of Stream	
<u>Ontonagon</u>	Big Iron	16	116	132	
	Fire Steel	10	60	70	
	Misery	4	14	18	
	Ontonagon	106	486	592	
	Presque Isle	2	34	36	
	Sturgeon→ Portage	...	4	4	
	32 Coastal Streams	...	<u>430</u>	<u>430</u>	
	Total	138	1,114	1,282	
<u>Osceola</u>	Manistee	4	39	43	
	Muskegon	37	208	245	
	Tittabawassee→ Saginaw	<u>3</u>	<u>10</u>	<u>13</u>	
		Total	44	257	301
	<u>Oscoda</u>	Au Sable	28	142	170
Thunder Bay		<u>7</u>	<u>42</u>	<u>49</u>	
Total		35	184	219	
<u>Otsego</u>	Au Sable	9	34	43	
	Cheboygan	17	111	128	
	Manistee	...	7	7	
	Thunder Bay	<u>3</u>	<u>17</u>	<u>20</u>	
	Total	29	169	198	
<u>Ottawa</u>	Black	9	63	72	
	Grand	41	178	219	
	2 Coastal Streams	...	<u>16</u>	<u>16</u>	
	Total	50	257	307	

County	Drainage System	Miles of Main Stream	Miles of Tributaries	Total Miles of Stream	
<u>Presque Isle</u>	Cheboygan	13	83	96	
	Ocqueoc	13	76	89	
	Thunder Bay	9	30	39	
	14 Coastal Streams	<u>...</u>	<u>77</u>	<u>77</u>	
	Total	35	266	301	
<u>Roscommon</u>	Au Sable	4	64	68	
	Muskegon	19	78	97	
	Tittabawassee → Saginaw	<u>...</u>	<u>39</u>	<u>39</u>	
	Total	23	181	204	
	<u>Saginaw</u>	Cass → Saginaw	20	6	26
Cheboyganing → Saginaw		10	21	31	
Flint → Saginaw		21	100	121	
Saginaw Shiawassee → Saginaw		18	47	65	
49		180	229		
Swan → Saginaw		11	86	97	
Tittabawassee → Saginaw		<u>18</u>	<u>6</u>	<u>24</u>	
Total		147	446	593	
<u>St. Clair</u>		Belle → St. Clair	46	119	165
		Black → St. Clair	39	220	259
		Pine → St. Clair	10	268	278
		St. Clair	54	55	109
		10 Coastal Streams	<u>...</u>	<u>148</u>	<u>148</u>
	Total	149	810	959	
	<u>St. Joseph</u>	St. Joseph	<u>114</u>	<u>178</u>	<u>292</u>
Total		114	178	292	

County	Drainage System	Miles of Main Stream	Miles of Tributaries	Total Miles of Stream
<u>Sanilac</u>	Black→ St. Clair	22	414	436
	Cass→ Saginaw	8	318	326
	Flint→ Saginaw	...	5	5
	63 Coastal Streams	...	<u>240</u>	<u>240</u>
	Total	30	977	1,007
<u>Schoolcraft</u>	Manistique	159	500	659
	Milakokia	9	15	24
	15 Coastal Streams	...	<u>51</u>	<u>51</u>
	Total	168	566	734
<u>Shiawassee</u>	Flint→ Saginaw	...	64	64
	Grand Shiawassee→ Saginaw	12	106	118
		<u>15</u>	<u>110</u>	<u>125</u>
	Total	27	280	307
<u>Tuscola</u>	Cass→ Saginaw	38	123	161
	Flint→ Saginaw	...	7	7
	2 Coastal Streams	...	<u>16</u>	<u>16</u>
	Total	38	146	184
<u>Van Buren</u>	Black	20	74	94
	Kalamazoo	...	9	9
	St. Joseph	13	191	204
	3 Coastal Streams	...	<u>17</u>	<u>17</u>
	Total	33	291	324

County	Drainage System	Miles of Main Stream	Miles of Tributaries	Total Miles of Stream
<u>Washtenaw</u>	Grand	...	2	2
	Huron	19	182	201
	Raisin	22	99	121
	Rouge → Detroit	...	8	8
	1 Coastal Stream	...	<u>40</u>	<u>40</u>
	Total	<u>41</u>	331	372
<u>Wayne</u>	Detroit	28	88	116
	Huron	16	48	64
	Rouge → Detroit	18	153	171
	1 Coastal Stream	...	<u>40</u>	<u>40</u>
	Total	62	329	391
<u>Wexford</u>	Manistee	33	209	242
	Muskegon	...	<u>12</u>	<u>12</u>
	Total	33	221	254
Grand Total		<u>5,499</u>	<u>30,851</u>	<u>36,350</u>

TABLE II

THE LOCATION, LENGTHS AND DRAINAGE AREA OF MICHIGAN RIVERS

Note— All numbers in parentheses refer to major tributaries of main drainages. The total for the greater drainage is found below each series of such numbers.

* County in which river system has its mouth.

Name of Stream	General Location Counties	Main Stream (Miles)	Tributary Streams (Miles)	Total Miles	Estimated Drainage Area Square Miles
Anna	*Alger	6	18	24	20
Au Gres	*Arenac, Iosco, Ogemaw	21	193	214	403
<u>Au Sable Drainage</u>					
Pine	Alcona, *Iosco	(21)	(164)	(185)	(265)
Au Sable—Total	{ Alcona, Crawford, *Iosco, Montmorency } { Ogemaw, Oscoda, Otsego, Roscommon }	166	803	969	2,126
Au Train	*Alger	11	90	101	125
Bark	*Delta	8	26	34	59
Bear	Charlevoix, *Emmet	11	48	59	136
Betsie	*Benzie, Grand Traverse, Manistee	40	33	73	260
Betsy	*Chippewa	19	21	40	75
Big Cedar	*Menominee	60	230	290	400
Big Huron	Baraga, *Marquette	17	75	92	80
Big Iron	*Ontonagon	16	116	132	104
Big Munuscong	*Chippewa, Mackinac	9	89	98	172
Big Sable	Lake, *Mason	34	31	65	166
Black	*Alcona	10	28	38	65
Black	*Gogebic	32	194	226	235

4

Name of Stream	General Location Counties	Main Stream (Miles)	Tributary Streams (Miles)	Total Miles	Estimated Drainage Area Square Miles
Black	Allegan, *Ottawa	9	126	135	181
Black	(Allegan, Berrien) (*Van Buren)	38	124	162	288
Boardman	(*Grand Traverse) (Kalkaska)	29	122	151	306
Brevoort	*Mackinac	9	21	30	65
Carp	Cheboygan, *Emmet	9	9	18	55
Carp	Chippewa, *Mackinac	28	50	78	132
Carp	*Marquette	16	65	81	60
Charlevoix	Antrim, *Charlevoix	30	158	188	323
Charlotte	*Chippewa	7	18	25	60
<u>Cheboygan Drainage</u>					
Black	* (Cheboygan, Montmorency,) (Otsego, Presque Isle)	(33)	(182)	(215)	(360)
Pigeon	*Cheboygan, Otsego	(21)	(77)	(98)	(118)
Sturgeon	(Charlevoix, *Cheboygan,) (Otsego)	(21)	(88)	(109)	(191)
Cheboygan—Total	(Charlevoix, *Cheboygan,) (Emmet, Montmorency,) (Otsego, Presque Isle)	122	610	732	1,513
Chocolay	* Marquette	16	129	145	159
Clinton	(Lapeer, *Macomb,) (Oakland, Wayne)	66	334	400	790
Days	*Delta	16	22	38	64
Dead	*Marquette	11	218	229	167
<u>Detroit Drainage</u>					
Rouge	(Oakland, *Wayne,) (Washtenaw)	(31)	(286)	(319)	(407)
Detroit—Total	(Oakland, *Wayne,) (Washtenaw)	59	376	435	535
Devils	*Alpena	5	37	42	75

Name of Stream	General Location Counties	Main Stream (Miles)	Tributary Streams (Miles)	Total Miles	Estimated Drainage Area Square Miles
Elk	(*Antrim, Charlevoix, (Grand Traverse, Kalkaska)	25	233	258	425
Elm	*Houghton	6	35	41	26
Escanaba	(*Delta, Dickinson, (Marquette)	114	660	774	923
Falls	*Baraga	3	35	38	49
Firesteel	*Ontonagon	10	60	70	86
Fishdam	*Delta	9	8	17	103
Ford	(*Delta, Dickinson, (Marquette, Menominee)	111	253	364	473
Galien	*Berrien	16	114	130	133
Garlic	*Marquette	6	41	47	31
Gogomain	*Chippewa	3	24	27	34
<u>Grand Drainage</u>					
Flat	(Ionia, *Kent, (Mecosta, Montcalm)	(39)	(354)	(393)	(504)
Looking Glass	(Clinton, *Ionia) (Shiawassee)	(37)	(118)	(155)	(258)
Maple	(Clinton, Gratiot, (*Ionia, Montcalm,) (Shiawassee)	(50)	(556)	(606)	(950)
Red Cedar	*Ingham, Livingston	(24)	(207)	(231)	(520)
Thornapple	Barry, Eaton, *Kent	(64)	(329)	(393)	(757)
Grand-- Total	(Barry, Clinton, Eaton,) (Gratiot, Hillsdale,) (Ingham, Ionia, Jackson,) (Kent, Livingston, Mecosta) (Montcalm, Muskegon,) (Newaygo, *Ottawa,) (Shiawassee, Washtenaw)	478	2,880	3,358	5,544
Gratiot	*Keweenaw	3	18	21	32
Graveraet	*Houghton	4	17	21	25

Name of Stream	General Location Counties	Main Stream (Miles)	Tributary Streams (Miles)	Total Miles	Estimated Drainage Area Square Miles
Huron	(Ingham, Jackson,) (Livingston, *Monroe,) (Oakland, Wayne,) (Washtenaw)	72	504	576	922
Iron	Baraga, *Marquette	19	120	139	99
Kalamazoo	(*Allegan, Barry, Calhoun,) (Eaton, Hillsdale, Jackson,) (Kalamazoo, Kent, Van Buren)	160	899	1,059	1,963
Kawkawlin	(*Bay, Gladwin,) (Midland, Saginaw)	9	43	52	212
Laughing Whitefish	*Alger, Marquette	11	23	34	37
Lincoln	*Mason	12	49	61	112
Little Munuscong	*Chippewa	7	20	27	39
Little Two Hearted	*Luce	7	33	40	55
Manistee	(Antrim, Crawford,) (Grand Traverse, Kalkaska,) (Lake, *Manistee, Mason,) (Missaukee, Otsego, Wexford)	223	685	908	2,048
<u>Manistique Drainage</u>					
Indian	Delta, *Schoolcraft	(27)	(91)	(118)	(197)
Manistique— Total	(Alger, Delta, Lucè) (Mackinaw, *Schoolcraft)	195	704	899	1,641
Maumee	(Hillsdale, *State of) (Ohio)	...	150	150	242
<u>Menominee Drainage</u>					
Brule	*Iron	(57)	(90)	(147)	(190)
Little	*Menominee	(18)	(28)	(46)	(63)
Little Cedar	*Menominee	(35)	(83)	(118)	(133)
Michigamme	(Baraga, Dickinson) (*Iron, Marquette)	(96)	(522)	(618)	(626)
Paint→Brule	Baraga, Gogebic, *Iron	(57)	(382)	(439)	(460)

Name of Stream	General Location Counties	Main Stream (Miles)	Tributary Streams (Miles)	Total Miles	Estimated Drainage Area Square Miles
<u>Menominee Drainage</u> (continued)					
Shaky	*Menominee	(19)	(15)	(34)	(49)
Sturgeon	*Dickinson, Menominee	(85)	(272)	(357)	(402)
Menominee-- Total	(Baraga, Dickinson,) (Gogebic, Iron,) (Marquette, *Menominee)	481	1,526	2,007	2,087
Milakokia	Mackinac, *Schoolcraft	9	20	29	67
Millecoquins	*Mackinac	8	45	53	100
Miner's	*Alger	8	14	22	26
Misery	Houghton, *Ontonagon	8	41	49	47
Montreal	*Gogebic	30	82	112	91
Montreal	*Keweenaw	10	35	45	49
Mosquito	*Alger	3	15	18	26
Muskegon	(Clare, Lake, Mecosta) (Missaukee, Montcalm,) (*Muskegon, Newaygo,) (Osceola, Roscommon,) (Wexford)	208	1,133	1,341	2,611
New	*Huron	6	21	27	18
Ocqueoc	*Presque Isle	13	76	89	160
Ogontz	*Delta	4	10	14	36
Ontonagon	(Gogebic, Houghton,) (Iron, *Ontonagon)	154	951	1,105	1,326
Pentwater	Mason, *Oceana	6	67	73	149
Pere Marquette	(Lake, *Mason,) (Newaygo, Oceana)	119	239	358	792
Pigeon	*Huron	12	122	134	135
Pine	*Arenac	15	23	38	85
Pine	Chippewa, *Mackinac	26	137	163	243
Pine	*Marquette	3	63	66	50

Name of Stream	General Location Counties	Main Stream (Miles)	Tributary Streams (Miles)	Total Miles	Estimated Drainage Area Square Miles
Pinnebog	*Huron	19	211	230	203
Platte	*Benzie, Grand Traverse	21	30	51	187
<u>Portage River and Canal Drainage</u>					
Pike	*Houghton	(5)	(20)	(25)	(16)
Pilgrim	*Houghton	(5)	(18)	(23)	(18)
Sturgeon	(Baraga, *Houghton,) (Iron, Ontonagon)	(108)	(566)	(674)	(808)
Trap Rock	*Houghton, Keweenaw	(7)	(51)	(58)	(38)
Portage River and Canal--Total	(Baraga, *Houghton, Iron,) (Keweenaw, Ontonagon)	145	791	936	1,058
Presque Isle	*Gogebic, Ontonagon	76	284	360	312
Raisin	(Jackson, Lenawee,) (*Monroe, Washtenaw)	118	857	975	1,193
Rapid	*Delta, Marquette	21	55	76	140
Ravine	*Baraga	7	26	33	34
Rifle	*Arenac, Ogemaw	50	241	291	438
Rock	*Alger	8	37	45	39
Rock Falls	*Huron	8	28	36	30
<u>Saginaw Drainage</u>					
Cass	(Genesee, Huron,) (Lapeer, *Saginaw,) (Sanilac, Tuscola)	(66)	(499)	(565)	(1,018)
Cheboyganing	*Bay, Saginaw	(10)	(21)	(31)	(60)
Flint	(Genesee, Lapeer,) (Oakland, *Saginaw,) (Sanilac, Shiawassee,) (Tuscola)	(100)	(861)	(961)	(1,443)
Shiawassee	(Genesee, Gratiot,) (Livingston, Oakland) (*Saginaw, Shiawassee)	(94)	(540)	(634)	(995)

Name of Stream	General Location Counties	Main Stream (Miles)	Tributary Streams (Miles)	Total Miles	Estimated Drainage Area Square Miles
<u>Saginaw Drainage</u> (continued)					
Swan	(Gratiot, Midland,) (*Saginaw)	(11)	(91)	(102)	(173)
Tittabawassee	(Clare, Gladwin,) (Gratiot, Isabella,) (Iosco, Mecosta,) (Midland, Montcalm,) (Ogemaw, Osceola,) (Roscommon, *Saginaw)	(213)	(1,420)	(1,633)	(2,646)
Saginaw--Total	(*Bay, Clare, Genesee,) (Gladwin, Gratiot, Huron,) (Iosco, Isabella, Lapeer,) (Livingston, Mecosta,) (Midland, Montcalm,) (Oakland, Ogemaw, Osceola,) (Roscommon, Saginaw,) (Sanilac, Shiawassee,) (Tuscola)	513	3,487	4,018	6,508
<u>St. Clair Drainage</u>					
Belle	(Lapeer, Macomb,) (*St. Clair)	(55)	(201)	(256)	(239)
Black	(Lapeer, *St. Clair,) (Sanilac)	(62)	(709)	(771)	(651)
Pine	*St. Clair	(10)	(268)	(278)	(180)
St. Clair--Total	(Lapeer, Macomb,) (*St. Clair, Sanilac)	181	1,233	1,414	1,125
St. Joseph	(*Berrien, Branch,) (Calhoun, Cass,) (Hillsdale, Kalamazoo,) (St. Joseph, Van Buren)	306	1,641	1,947	3,132
St. Marys	*Chippewa	9	5	14	10
Salmon Trout	*Houghton	5	33	38	42
Salmon Trout	*Marquette	10	55	65	53
Salt	*Macomb	5	22	27	36
Sand	*Alger, Marquette	4	28	32	30

Name of Stream	General Location Counties	Main Stream (Miles)	Tributary Streams (Miles)	Total Miles	Estimated Drainage Area Square Miles
Sebewaing	*Huron	3	37	40	41
Silver	*Baraga	6	49	55	59
Slate	*Baraga	5	16	21	19
Sturgeon	Alger, *Delta, Menominee	50	42	92	222
Sucker	*Alger, Luce	24	60	84	90
Tacoosh	*Delta	9	9	18	37
Tahquamenon	*Chippewa, Luce	94	545	639	820
Tawas	*Iosco	2	55	57	97
Thunder Bay	(Alcona, *Alpena,) (Montmorency, Oscoda,) (Otsego, Presque Isle)	125	609	734	1,273
Tobacco	*Keweenaw	6	39	45	53
Two Hearted	*Luce	42	73	115	180
Waiska	*Chippewa	8	90	98	147
White	(*Muskegon, Newaygo,) (Oceana)	40	246	286	492
Whitefish	(Alger, *Delta,) (Marquette)	45	247	292	307
Willow	*Huron	8	90	98	92
Small Coastal Streams	Total for 47 counties	...	3,193	3,193	...
Grand Total		5,499	30,851	36,350	...

April 13, 1924

Mr. P. A. Westerman
Fish Division
Department of Conservation
Lansing 13, Michigan

Dear Mr. Westerman:

I am enclosing a carbon copy of Report No. 935
entitled Michigan Streams--Their Lengths, Distribution
and Drainage Areas by C. J. D. Brown. This is in
response to your request of April 11 for a copy of
this report for the Director.

While this is the best copy which we have available, it is not too easily legible. Since we are apt to find considerable use for this report and since it will doubtless be of general interest to a number of organizations in various parts of the state, I wonder if it would not be well to arrange to have it printed, as was done in the case of the lake study made by Dr. Brown. It could either be printed separately or as an article for MICHIGAN CONSERVATION. The tables are rather lengthy but should really be included if the article is to have complete value.

Very truly yours,

INSTITUTE FOR FISHERIES RESEARCH

A. S. Hazzard
Director

ASH:VA
Encl.

MICHIGAN DEPARTMENT OF CONSERVATION

INTEROFFICE COMMUNICATION

April 11, 1944

Dr. A. S. Hazzard, Director
Institute for Fisheries Research
Department of Conservation
University Museums Annex
Ann Arbor, Michigan

Dear Dr. Hazzard:

The Director is interested in having a copy of Institute Report No. 935 entitled Michigan Streams -- Their Lengths, Distribution and Drainage Areas.

I am wondering if you happen to have a copy of this report that could be made available to him.

Very truly yours,

DEPARTMENT OF CONSERVATION



F. A. Westerman
FISH DIVISION

FAW:I