TABLES

This page was intentionally left blank.

Table 1.–Percent of the Tahquamenon River watershed covered by various surficial materials and their permeability rates. Rates of permeability follow values given in Morris and Johnson (1967).

Surficial material	Percent of watershed soils	Permeability (ft/day)·1000
High permeability soils	44.6	
Coarse Glacial till	8.1	98.4
End Moraines of coarse-textured glacial till	23.3	98.4
Glacial Outwash coarse texture	13.2	98.4
Medium permeability soils	12.0	
Lacustrine Sand and Gravel		32.8
Low permeability soils	42.7	
Peat and Muck	37.0	3.3
Lacustrine Clay and Silt	4.9	1.6
Thin to Discontinuous over Bedrock	0.8	0.0
Water	0.6	

Table 2.–Percent composition of surface geology types (Farrand and Bell 1982) for catchments measured at the downstream ends of Tahquamenon River valley segments and major tributaries (MDNR Fisheries Division files).

	Mainstem					Tributaries		
Geology type	Upper	Dollarville	Marsh drainage	Middle	Lower	East Br.	Sage	Hendrie
Water	0.8	0.9	0.6	0.5	0.4	0.9	0.6	0.1
Peat & muck	11.5	31.1	41.7	41.3	39.6	35.3	41.6	53.5
Lacustrine clay & silt	0.0	2.8	2.0	5.3	6.7	5.7	10.2	6.6
Lacustrine sand & gravel	0.0	2.5	4.2	17.3	18.1	0.1	35.9	17.8
Glacial outwash sand & gravel	33.5	22.8	16.2	8.0	7.5	12.4	4.0	1.2
Coarse-textured glacial till	9.4	15.9	13.4	6.9	6.4	1.5	5.1	6.3
End moraines of coarse-textured till	44.9	24.0	21.8	19.9	20.4	44.1	0.0	11.3
Thin till over bedrock	0.0	0.0	0.0	0.9	0.9	0.0	2.5	3.2
Catchment size (mi^2)	39	167	235	744	797	130	110	127

Table 3.–Average monthly Tahquamenon River discharges (cfs) at the USGS gauging stations, upstream of the Upper Falls (1953–2003) and at Newberry (1934–36).

Month	Upper Falls	Newberry
Jan	490	144
Feb	479	119
Mar	762	242
Apr	2,728	480
May	1,639	297
Jun	672	224
Jul	484	108
Aug	420	119
Sep	590	217
Oct	859	195
Nov	1,002	310
Dec	773	254
Average	908	225

Table 4.–Seasonal flow stability attributes for the Tahquamenon River and selected Michigan river catchments of similar size as calculated from USGS streamflow data. Low-flow yield (LFY) is calculated as 90% exceedence flow/mi^2/year, and the 10:90% exceedence flow ratio (10:90 ratio) is calculated as the 10% exceedence flow divided by the 90% exceedence flow. Qualitative ratings for the 10:90 ratio are: Very good–1.0–2.0; good–2.1–5.0; fair–5.1–10.0; and poor >10.0 (P. Seelbach, Michigan Department of Natural Resources, Fisheries Division, personal communication).

Watershed	Location	Size (mi^2)	LFY	10:90 ratio
Cass	Dehmel Road	841	0.06	25.12
Clinton	Moravian Drive	734	0.16	9.99
Huron	Willow Road	807	0.25	6.12
Kalamazoo	Raymond Road	824	0.35	4.30
Tahquamenon	Above Upper Falls	790	0.38	6.34
Manistique	UP–near Blaney	704	0.48	4.60
Manistee	M-37	857	0.95	1.75
Clinton, N. Br.	M59	199	0.04	45.64
Rouge	Spinoza Rd.	187	0.09	16.42
Battle Creek	Bellevue Cemetery	187	0.15	11.89
Black	UP–near Bessemer	200	0.15	19.62
Sturgeon	UP–near Foster City	237	0.18	9.31
St. Joseph	14 Mile Rd.	206	0.22	8.05
Flint, S. Br.	Columbiaville Rd.	221	0.22	7.64
Sturgeon	UP–near Nahma	183	0.36	6.00
Pine	UP–near Rudyard	184	0.38	6.58
Tahquamenon	M-123 (near Newberry)	200	0.58	3.33
Sturgeon	Wolverine	198	0.80	1.86

Table 5.–Sediment data taken with a standard Ponar dredge in the Tahquamenon River between Sage River and Murphy Creek, August 22–23, 2005. The Ponar sampled an area 9 in x 9 in. Samples were taken along a perpendicular transect at each location, generally from north to south or east to west. Sites at each location were determined visually for uniform spacing across the river. The sample from each site was analyzed in a wash bucket before moving to the next site.

Site	Description	Sample A	Sample B	Sample C	Sample D	Sample E	Sample F
1	Downstream from Frenchmans Lake	100% silt	80% clay 15% silt 5% fiber	80% clay 10% sand 10% silt	80% clay 15% sand 3% silt 3% mussels	95% clay 5% mussels	95% silt 5% sand
2	Upstream from Auger River	100% silt	100% silt	95% silt 5% fiber	95% silt 5% fiber	85% peat 10% fiber 5% silt	
3	Downstream from Deadmans Farm	95% silt 5% fiber	90% silt 10% clay	80% silt 10% fibers 5% sand	95% silt 5% peat	90% silt 10% clay	
4	Upstream from Sage River	100% peat	90% peat 10% clay	85% silt 10% clay 5% peat	80% clay 20% sand	90% peat 10% silt	85% silt 15% peat
5	Downstream from Sage River	90% sand 10% silt	100% sand	100% sand	100% sand	100% sand	80% silt 10% sand 10% peat
6	Downstream from Green Knoll cabin	80% clay 10% peat 10% silt	60% sand 30% silt 10% clay	70% clay 20% sand 10% silt	90% sand 10% silt	90% sand 10% silt	80% sand 20% silt
7	Just above the Betty B Landing	70% silt 20% sand 10% mussels	75% silt 20% sand 5% mussels	60% sand 30% silt 10% clay	90% clay 5% silt 5% peat	95% silt 5% peat	80% silt 20% clay
8	Downstream from the Betty B	90% silt 10% peat	10% silt	90% clay 10% silt	80% clay 20% silt	90% clay 10% peat	100% silt

Table 5.–Continued.

Site	Description	Sample A	Sample B	Sample C	Sample D	Sample E	Sample F
9	Crooked Tree Camp	60% silt 40% peat	100% silt	100% peat	100% peat	100% peat	100% peat
10	Upstream from Everglades Camp	80% peat 20% silt	80% silt 20% peat	70% clay 30% silt	70% clay 20% silt 10% sand	60% clay 30% peat 10% silt	
11	Everglades Camp	60% silt 20% peat 20% sand	60% silt 40% clay	60% clay 40% silt	80% silt 20% clay	80% silt 20% clay	
12	Rocky point up from Hendrie River	80% peat 10% sand 10% silt	80% silt 15% clay 5% small stone	80% silt 15% clay 5% small stone	80% silt 20% small mussels	85% gravel 15% 2–6” rock	
13	Hendrie River mouth	100% silt	85% silt 10% sand 5% clay	70% sand 25% silt 5% mussels	100% clay	100% clay	
14	Upstream in the Hendrie River	80% clay 20% sand	70% silt 15% clay 10% peat 5% sand				
15	Downstream from E. Br. Tahquamenon	100% clay	100% clay	60% silt 40% peat	75% coarse woody 25% silt	80% coarse woody 20% silt	100% silt

Table 6.–Critical mean current velocity of clear water required to initiate movement along a stream bed of various types of bottom deposit (Hynes 1972).

Type of bed	Velocity (cm/sec)
Sandy clay	30
Hard clay	60
Fine sand	20
Coarse sand	30–50
Fine gravel	60
Medium gravel	60–80
Coarse gravel	100–140
Angular stones	170

Table 7.–Road crossings in the Tahquamenon River watershed, from headwater to mouth. Missing data indicated by "–". Where a bridge is indicated, there will be no data for number of culverts.

Road name	Stream or river	Bridge (B) or culvert (C)	Number or type of culverts
CR 422	Tahquamenon River, W of Belle Lake area	C	1
CR 421	Tahquamenon River, Eagles Nest	B	
CR 442	Tahquamenon River, N of 421 junction	B	
CR 442	Syphon Creek	C	1
CR 442	East Creek	C	1
CR 413	Kings Creek	C	2 arch 57" x 38"
M-28	Kings Creek	C	box
Soo Line RR	Kings Creek	B	
Soo Line RR	Mud Creek	B	
CR 415	Tahquamenon River, N of McMillan	B	
M-28	East Lake Creek	C	1
M-28	Pete S Creek	C	1
M-28	Carlson Creek	C	box
M-117	McGraw Creek	C	–
M-28	Teaspoon Creek	B	
CR 363	Teaspoon Creek	B	
CR 402 (Foley Hill Rd)	Teaspoon Creek	C	1
Dollarville Rd	Teaspoon Creek	B	
CR 462	39 Creek	C	1
McLoed Truck Trail	W. Br. Sage River T45N, R09W, S29	C	1
McLoed Truck Trail	W. Br. Sage River T45N, R09W, S28	C	1
M-28	W. Br. Sage River	B	
M-28	E. Br. Sage River	B	
Norton Camp Rd	W. Br. Hendrie River	B	
Fibron Quarry Lane	S. Br. Hendrie River	C	1
Fibron Junction Rd	S. Br. Hendrie River	C	1
Fibron Junction Rd	Anguilm Creek	C	1
H-40 (Trout Lake Rd)	S. Br. Hendrie River	C	1
Camp 2 TT (USFS 3145)	Naugle Creek		road gated
Camp 2 TT (USFS 3145)	Hendrie River (Camp Two Creek)		road gated
M-123	Hendrie River	C	1
M-28	E. Br. Tahquamenon River	B	
Soo Line RR	E. Br. Tahquamenon River	B	
M-123	E. Br. Tahquamenon River	B	
M-123	Fourteen Creek	C	1 6 ft cement box
Soo Line RR	Grants Creek	–	
Soo Line RR	Riley S Creek	–	
Soo Line RR	Kleins Creek	–	
N. Hulbert R	E. Br. Tahquamenon River	B	
Soo Line RR	W. Br. Sage River	B	
Soo Line RR	E. Br. Sage River	B	
Soo Line RR	McLoed Ditch	B	
Soo Line RR	Hendrie River	B	
N. Hulbert Rd	Big Beaver Creek	C	1 6 ft corrugated
N. Hulbert Rd	Little Beaver Creek	C	1 6 ft corrugated
N. Hulbert Rd	Hiawatha Creek	C	1

Table 7.–Continued.

Road name	Stream or river	Bridge (B) or culvert (C)	Number or type of culverts
Unnamed Rd	O'Keefe Creek T48N, R08W, S36	C	1
Unnamed Rd	Shouts Creek T48N, R08W, S25	C	1
Unnamed Rd	Rose Creek T48N, R08W, S14	C	1
Unnamed Rd	Bowers Creek T48N, R07W, S23	C	1
Tahqua Rd	Cheney Creek	C	1 6 ft steel
Tahqua Rd	Lynch Creek	C	2 corrugated
M-123	Cheney Creek	C	1 + 1 (snowmobile trail on north side)
M-123	Wolf Creek	C	1 cement
M-123	Gage Creek	C	1 cement
M-123	Callum Creek	C	–
M-123	N. Br. Linton Creek	C	1 larch 72" x 44"
M-123	M. Br. Linton Creek	C	1 cement
M-123	S. Br. Linton Creek	C	1 cement
Halifax Rd	M. Br. Linton Creek T48N, R08W, S16	C	1
Halifax Rd	S. Br. Linton Creek T48N, R08W, S17/20	C	1
Halifax Rd	Linton Creek T48N, R08W, S20, East	C	2
Camp 7 Rd	Linton Creek T48N, R08W, S20, West	C	1
Halifax Rd	Linton Creek	C	1
Charcoal Grade	Baird Creek	C	1
Charcoal Grade	Penny Creek	C	2
Charcoal Grade	Savage Creek	B	
Charcoal Grade	Murphy Creek	B	
Murphy Creek Rd	N. Br. Murphy Creek T47N, R09W, S13	B	
Murphy Creek Rd	W. Br. Murphy Creek T47N, R09W, S15	B	
Charcoal Grade	Gimlet Creek	C	4
Unnamed Rd	Gimlet Creek T46N, R08W, S05 (upstream)		road gated
Unnamed Rd	Gimlet Creek T46N, R08W, S05 (downstream)		road gated
Charcoal Grade	Auger River	B	
Charcoal Grade	Sixteen Creek	B	
M-123	W. Br. Murphy Creek	B	
M-123	Auger River	B	
Silver Creek Rd	Silver Creek	B	
Camp Six Rd	Silver Creek	C	1
Charcoal Grade	Otto Brandt	B	
M-123	Tahquamenon River	B	

Table 8.–Percent composition of land use types for catchments measured at the downstream ends of Tahquamenon River valley segments and major tributaries.

	Mainstem					Tributaries		
Land use type	Upper	Dollarville	Marsh drainage	Middle	Lower	East Br.	Sage	Hendrie
Water	2.7	2.9	2.7	2.4	2.5	2.9	1.4	2.2
Urban	0.0	0.1	0.4	0.1	0.1	0.1	0.1	0.0
Barren	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forest	68.1	53.1	45.6	45.0	46.2	59.2	31.7	38.5
Grassland	2.6	3.3	3.3	1.7	1.7	0.4	3.1	0.8
Agriculture, pasture, and recreational grass	1.0	3.5	3.2	1.5	1.4	0.6	2.0	0.3
Wetland	25.1	36.9	44.7	49.0	47.8	35.9	61.7	58.2

Table 9.–Tributary stream characteristics in the Tahquamenon River watershed, including length (mi), length of designated trout stream (mi), average gradient (ft/mi), source, elevation above Lake Superior level (ft), and mouth description.

Name of stream	Length (mi)	Trout (mi)	Gradient (ft/mi)	Source	Mouth elev. (ft)	Mouth description
39 Creek	2.5	2.5	21.4	Upland spring	704	Tahquamenon River
Anchard Creek	1.2	0	147.5	Upland spring	701	Tahquamenon River
Anguim Creek	1	1	1.0	Previous Fibron Pond	812	S Br. Hendrie River
Atwood Creek	0.9	0	36.7	Upland spring	702	Murphy Creek
Auger River	15	6.1	6.5	Cleveland Cliffs Lake	705	Tahquamenon River
Baird Creek	3.1	3.1	34.5	Marsh	702	Tahquamenon River
Basnau Creek	2.9	2.9	13.4	Marsh	704	Hendrie River
Big Beaver Creek	2.6	2.6	20.0	Marsh	706	E Br Tahquamenon R
Big Ditch	4.5	4.5	4.7	Marsh	705	West Br Sage River
Bowers Creek	1.8	1.8	82.2	Upland spring	602	Tahquamenon River
Callum Creek	1.4	0	31.4	Marsh	701	Tahquamenon River
Carlson Creek	2.6	2.6	3.1	Kaks Lake	717	Teaspoon Creek
Cheney Creek	5.7	5.7	18.4	Marsh	601	Tahquamenon River
Creek #14	4.4	4.4	8.2	Marsh	714	E Br Tahquamenon R
Creek #8	3.2	3.2	22.5	Upland spring	797	E Br Tahquamenon R
E Br. Sage River	13.7	13.7	9.5	Marsh	705	Sage River
E Br. Tahquamenon R	23.5	19.5	8.5	Marsh	702	Tahquamenon River
East Creek	4.6	4.6	21.1	Upland spring	713	Tahquamenon River
East Lake Creek	2.9	2.9	28.3	East Lake, Luce Co	714	Teaspoon Creek
First Creek	3.9	3.9	25.4	Upland spring	716	West Br Sage River
Freeman Creek E	0.8	0	47.5	Upland spring	702	Tahquamenon River
Freeman Creek W	1.9	0	12.6	Marsh	702	Tahquamenon River
Gage Creek	0.5	0	82.0	Upland spring	701	Tahquamenon River
Gimlet Creek	8.4	0	6.3	Marsh	704	Tahquamenon River
Grants Creek	2.9	2.9	29.0	Upland spring	716	E Br Tahquamenon R
Hendrie River	24.5	0	6.4	Upland spring	702	Tahquamenon River
Hiawatha Creek	1.6	1.6	30.0	Upland spring	702	Tahquamenon River
Kings Creek	2.1	2.1	9.0	Marsh	721	Tahquamenon River
Kleins Creek	1.7	1.7	6.5	Marsh	726	Rileys Creek

Table 9.–Continued.

Name of stream	Length (mi)	Trout (mi)	Gradient (ft/mi)	Source	Mouth elev. (ft)	Mouth description
Laketon Slough	1.4	1.4	2.9	Marsh	714	Tahquamenon River
Linton Creek	5.3	5.3	21.9	Marsh	701	Tahquamenon River
Little Beaver Creek	1.9	1.9	22.6	Upland spring	703	E Br. Tahquamenon R
Lynch Creek	1.6	1.6	18.1	Marsh	602	Tahquamenon River
Maye Creek	0.7	0.7	270.0	Big Spring	701	Tahquamenon River
McGraw Creek	1.4	1.4	17.1	Maki Lake	725	Kaks Lake
McLeod Ditch	9.8	6.8	3.4	S. Br. Hendrie	704	Hendrie River
Mid Br. Linton Creek	2.8	2.8	35.4	Marsh	708	N Br. Linton Creek
Murphy Creek	4.7	0	5.1	Confluence, W & N Brs	702	Tahquamenon River
N Br. Linton Creek	2.3	2.3	9.1	Marsh	723	Linton Creek
N Br. Murphy Creek	4.3	0	20.0	Upland spring	726	Murphy Creek
Naugle Creek	5	0	18.8	Marsh	755	Hendrie River
O'Keefe Creek	3.1	3.1	40.6	Upland spring	702	Tahquamenon River
Otto Brandt Creek	1.1	1.1	28.5	Marsh	704	Tahquamenon River
Penny Creek	2.1	0	24.8	Upland spring	701	Savage Creek
Petes Creek	1.2	1.2	20.0	Marsh	716	Carlson Creek
Popps Creek	5.3	5.3	27.9	Upland spring	701	Tahquamenon River
Quinn Creek	3.1	0	19.7	Marsh	741	Hendrie River
Red Creek	3.1	3.1	11.9	Marsh	713	East Creek
Riley Creek	1.4	1.4	12.1	Marsh	709	Big Beaver Creek
Rileys Creek	2	2	22.5	Riley Lake	713	E Br. Tahquamenon R
Rose Creek	1.1	0	136.4	Upland spring	701	Tahquamenon River
S Br. Hendrie River	9.2	9.2	13.8	Marsh	727	Hendrie River
S Br. Linton Creek	2.7	2.7	19.3	Upland spring	731	Linton Creek
Sage River	8.6	4.6	2.0	Marsh	704	Tahquamenon River
Savage Creek	3	3	36.3	Upland springs	701	Tahquamenon River
Schouts Creek	3.4	3.4	52.6	Upland spring	701	Tahquamenon River
Silver Creek	6.2	6.2	16.6	Silver Creek Pond	713	Tahquamenon River
Sixteen Creek	1.9	1.9	16.3	Marsh	705	Tahquamenon River
Syphon Creek	5.6	5.6	23.8	Turnbull Lake	718	Tahquamenon River

Table 9.–Continued.

Name of stream	Length (mi)	Trout (mi)	Gradient (ft/mi)	Source	Mouth elev. (ft)	Mouth description
Tahquamenon River	87.3	17.8	3.2	Middle Tahquamenon Lake	601	Lake Superior
Teaspoon Creek	6.1	4.9	2.0	Confluence, E & W Brs	712	Tahquamenon River
Third Creek	2.5	2.5	36.0	Marsh	713	W Br. Sage River
W Br. Hendrie River	10	10	12.7	Marsh	713	Hendrie River
W Br. Murphy Creek	10.4	0	6.0	Marsh	726	Murphy Creek
W Br. Sage River	7	7	14.3	Marsh	705	Sage River
W Br. Teaspoon Creek	1.1	1.1	0.9	Twin Lakes	724	Teaspoon Creek
Wolf Creek	0.7	0	62.9	Upland spring	701	Tahquamenon River

Table 10.–Dams in the Tahquamenon River watershed (Michigan Department of Environmental Quality, Dam Safety Section, unpublished data), modified to eliminate earth-bermed, isolated ponds, July 2005.

County/dam	River	Town	Range	Sec	Hazard	Owner	Head	Acres	Comment
Luce									
Dollarville Dam	Tahquamenon R	46N	10W	27	Low	State	3	1100	Concrete spillway
Brockies Pond Dam	Tributary to Silver Creek	46N	11W	1	Low	State	17	6	Level control structure
Buckies Pond Dam	Tributary to Silver Creek	46N	11W	1	Low	State	11	7	Level control structure
Silver Creek Pond Dam	Silver Creek	47N	11W	35	Low	State	11	15	Level control structure
Halfway Lake Dam	Tributary to Auger Creek	47N	10W	17	Low	Private	4	61	Lake-level control structure
George Wood Dam	Syphon Creek	46N	12E	01	Low	Private	4	4	Control and fish passage

Table 11.–Water temperatures (°F) for the Tahquamenon River and select tributaries during July 2004–06. Temperatures were generally recorded hourly with Onset Hobo Water Temp Pro temperature loggers. The summer of 2005 was unusually warm.

Sites	Year	Average weekly			
		Maximum	Minimum	Range	Mean
Tahquamenon River at CR 442	2005	66	55	12	61
Tahquamenon River at CR 415	2005	76	64	12	71
Tahquamenon River at Dollarville Dam, upstream side	2005	82	70	12	76
Tahquamenon River at Dollarville Dam, downstream side	2005	81	70	11	76
Tahquamenon River at McPhee's Landing	2005	82	70	13	76
Tahquamenon River downstream from Sage River [a]	2005	87	72	14	78
Tahquamenon River mouth	2005	79	71	8	75
Sage River at M-28	2005	74	57	17	66
E Br Tahquamenon River at N. Hulbert Rd	2005	75	64	12	70
E Br Tahquamenon River at old hatchery	2005	63	54	10	59
E Br Tahquamenon River at Salt Point Rd	2006	65	49	16	56
Sixteen Creek at Charcoal Grade	2004	67	55	12	61
Auger Creek at Charcoal Grade	2004	69	57	11	63
Murphy Creek at M-123	2004	66	57	10	62
Gimlet Creek at Charcoal Grade [b]	2004	76	52	24	64

[a] This temperature logger was potentially out of the water for a few days during the low water period.
[b] Logger was placed just downstream of a shallow beaver pond several acres in size.

Table 12.–Fish consumption advisories listed on the Michigan Department of Community Health website in July 2005 for lakes, impoundments, and streams in the Tahquamenon River watershed due to mercury (Michigan Department of Community Health 2004). No other advisories occur for the watershed and those listed below are subject to future change.

Species	Critical size [a] (inches)	Men (meals)	Women and Children (meals)
black crappie	≥8	1/week	1/month
largemouth bass	≥14	1/week	1/month
muskellunge	≥30	1/week	1/month
northern pike	≥22	1/week	1/month
rock bass	≥8	1/week	1/month
walleye	≥14	1/week	1/month
yellow perch	≥8	1/week	1/month

[a] Critical size means the advisory applies to this size fish or larger

Table 13.–Optimal temperature regimes (Fahrenheit) for several fish species in the Tahquamenon River and select tributaries. Optimal temperature regimes for each species and the calculation of the regimes were described by Wehrly et al. (1999). * = Designated Trout Stream. Opt = within the optimal temperature profile for the species. Marg. = marginal habitat, due either to average July temperature outside of the optimal range or else too great a temperature fluctuation, as defined by Wehrly et al. (1999).

		Brook trout		Brown trout		Northern pike		Smallmouth bass	
	River location	Opt <63	Marg 63–68	Opt <64	Marg 64–68	Opt 66–79	Marg <66	Opt >73	Marg <72
1	Tahquamenon R. at Co. Rd. 422 Bridge *[a]	X							
2	Tahquamenon River at the Co. Rd. 415 Bridge *		X		X	X			X
3	Tahquamenon River at Dollarville Dam, upstream side					X		X	
4	Tahquamenon River at Dollarville Dam, downstream side					X		X	
5	Tahquamenon River at McPhee's Landing					X		X	
6	Tahquamenon River about two miles downstream from the Sage River confluence					X		X	
7	Tahquamenon River at the mouth					X		X	
8	Sage River East Branch at the M-28 Bridge *[b]		X			X			
9	E. Br. Tahquamenon River at the N. Hulbert Road Bridge		X		X	X			X
10	E. Br. Tahquamenon River at the old state hatchery site *	X		X					
11	E. Br. Tahquamenon River about ½ mile upstream from the M-28 Bridge *	X							
12	Sixteen Creek at the Charcoal Grade Bridge *	X		X			X		
13	Auger Creek at the Charcoal Grade Bridge			X		X			
14	Murphy Creek at the M-123 Bridge	X		X			X		
15	Gimlet Creek at the Charcoal Grade culverts								

[a] County Road 415 Bridge is the downstream limit of trout designation in the Tahquamenon River. A "spreads" exists about eight miles upstream, which serves to magnify diurnal temperature fluctuations.
[b] Many beaver dams exist throughout the upstream portion of the East Branch Sage River.

Table 14.–Water temperature vertical profile for the Tahquamenon River, August 19, 2005. The site was located 150 ft upstream from the confluence with the Hendrie River. Maximum depth at the site was 25 ft. Dissolved oxygen was not measured.

Depth (ft.)	°F
Surface (0)	78.7
1	
2	
3	
4	
5	78.6
6	
7	
8	
9	
10	73.4
11	71.6
12	65.5
13	62.1
14	58.7
15	55.4
16	
17	
18	
19	
20	48.1
21	
22	
23	
24	
(Bottom) 25	

Table 15.–Vertical limnological profiles taken September 1, 2006, from six deep holes in the Tahquamenon River, from the Sage River confluence downstream to the Upper Falls.

Depth	Temperature (F)	Specific conductance	Conductivity	Dissolved oxygen (%)	Dissolved oxygen (mg/L)	pH
Site A: About 1 mi downstream from Sage River; river mile 39.0, maximum depth 25 ft						
1	66	182	160	123	11.5	8.4
5	66	198	176	125	11.6	8.1
10	66	198	175	125	11.5	8.1
15	66	198	176	125	11.6	8.0
20	66	198	176	125	11.6	8.0
Site B: Just upstream from the Hendrie River; river mile 34.5; Maximum depth 33 ft						
1	70	202	187	142	12.7	7.9
6	68	202	183	136	12.3	7.9
10	67	208	186	128	11.7	7.9
15	63	215	184	75	7.2	7.9
20	47	192	130	19	2.2	8.2
25	46	189	126	6	0.7	8.2
29	46	196	130	3	0.4	8.3
Site C: Roughly 1/3 the distance downstream from the Hendrie to the E. Branch; river mile 33.5; maximum depth 43 ft						
1	70	205	190	150	13.3	8.2
10	67	213	190	132	12.2	8.2
15	51	176	128	10	1.1	8.4
20	45	177	117	8	1.0	8.5
30	45	180	118	10	1.2	8.5
Site D: About 0.25 mi below E. Branch confluence; river mile 32.5; maximum depth 23 ft						
0	69	208	191	147	13.2	8.1
9	65	205	179	139	13.0	8.2
15	45	255	168	17	2.1	8.3
21	44	283	185	7	0.8	8.2
Site E: About 0.25 mi upstream from Murphy Creek; river mile 31.5; maximum depth 28 ft						
1	69	208	191	154	13.8	8.1
10	63	201	172	126	12.1	8.2
15	61	202	168	84	8.2	8.1
19	61	206	170	23	2.3	8.0
Site F: At the sharp bend just upstream of Joy Island; river mile 26; maximum depth 48 ft						
1	71	207	193	159	14.0	7.8
10	67	209	186	143	13.2	7.9
15	45	139	92	48	5.8	7.8
20	44	140	91	39	4.7	7.9
25	44	138	90	39	4.7	7.9
30	44	138	90	41	5.0	8.1

Table 16.–Tahquamenon River watershed Public Boat Launch Directory. The Ramp Code number tells the type of launch ramp the site user can expect to find at the access site: 1) A hard-surfaced ramp with sufficient water depth and lake size to accommodate most trailerable boats; 2) A hard-surfaced ramp, in areas of limited water depth or lake size, where launching, retrieving, and use of larger boats may be difficult; 3) A gravel surfaced ramp; and 4) No actual ramp, the site is suitable only for carry-in canoes, kayaks and small aluminum boats. Administering codes: PRD = MDNR, Parks and Recreation Division, FMFMD = MDNR, Forest, Mineral and Fire Management Division (Anonymous 1995).

Site no.	Site name and water body	Location	Ramp code	Toilets	Parking	Administering division	Town	Range	Sec
48-3	Silver Creek Trout Pond	8 mi NW of Newberry	4	Yes	15	PRD	47N	11W	35
48-4	Kaks Lake	4 mi SW of Newberry	2	Yes	10	PRD	45N	10W	09
48-5	McPhee's Landing, Tahquamenon River	5 mi ENE of Newberry	2	No	6	PRD	46N	09W	22
48-6	Natalie, Dollarville Flooding	2 mi W of Dollarville	1	Yes	10	PRD	46N	10W	29
48-8	Bass Lake, State Forest Campground	8 mi N of McMillan	1	Yes	5	FMFMD	47N	11W	17
48-9	Twin Lake	3 mi S of Newberry	1	Yes	14	PRD	45N	10W	10
48-14	East Lake	3 mi SE of McMillan	4	No	6	PRD	45N	11W	10
48-26	Brockie's Pond	7 mi NW of Newberry	4	No	6	PRD	46N	11W	01
48-32	Dollarville Flooding above the dam, Tahquamenon River	Dollarville	1	Yes	8	PRD	46N	10W	27
----	Tahquamenon River, Below the Dollarville Dam	Dollarville	2	Yes	8	PRD	46N	10W	27
17-2	Old Eckerman Trout Pond, East Branch Tahquamenon River	Eckerman	4	Yes	10	PRD	46N	06W	22
17-11	Tahquamenon Falls State Park, River Mouth campground site	5 mi S of Paradise	1	Yes	11	PRD	48N	06W	14

Table 17.–Responsibilities of Michigan Department of Environmental Quality (MDEQ) divisions and offices pertinent to the Tahquamenon River watershed. Descriptions are from MDEQ website.

Office or division	Responsibilities
Air Quality Division (AQD)	Works with business and industry air pollution sources and with the general public to help maintain compliance with statutes that minimize adverse impacts on human health and the environment.
Environmental Science and Services Division (ESSD)	Oversees outreach and assistance services leading to the improvement in environmental quality, providing non-regulatory services related to all environmental programs administered by the MDEQ.
Land and Water Management Division (LWMD)	Responsible for land/water interface resources. The mission of the LWMD is to promote the best use of these resources for their social and economic benefits while protecting associated resource values, property rights, the environment, and public health and safety.
Remediation and Redevelopment Division (RRD)	Administers Part 201, Environmental Remediation; Part 213, Leaking Underground Storage Tanks; and portions of Part 215, Michigan Underground storage Tank Financial Assurance, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA).
Waste and Hazardous Materials Division (WHMD)	Administers prevention programs to protect the environment and the public's health through proper management of hazardous products; solid, liquid, medical, and hazardous waste; and radioactive materials.
Water Bureau	Protects and enhances the quality of the state's drinking water, surface water, and groundwater for the benefit of current and future generations.
Office of Civil Enforcement Coordination (OCEC)	Provides for policy development, coordination, and training to improve the MDEQs overall enforcement efforts.
Office of Geological Survey (OGS)	Responsible for geological resources. The mission of the OGS is to promote the best use of these resources for their social and economic benefits while protecting associated resource values, property rights, the environment, and public health and safety.
Office of Great Lakes (OGL)	Lead agency within state government to develop policies and programs to protect, enhance, and manage the Great Lakes ecosystem.

Table 18.–Fish species present in the Tahquamenon River watershed. None are recognized as endangered or threatened. MDNR, Fisheries Division, files, Taylor 1954, Bailey et. al. 2004. Introduction (I) or Native (N) designation is the best origin determination possible by perusing the existing files. Historical records indicate that the threatened lake sturgeon *Acipenser fulvescens* were at one time present in the lower river, but none have been documented in recent times. Two muskellunge forms, Great Lakes and northern, are present below the Lower Falls. Above the Upper Falls, only the northern form is present. Species are listed in taxonomic order. R = rare, C = common, O = occasional, A = abundant.

Common name	Scientific name	Occurrence	Origin
silver lamprey	*Ichthyomyzon unicuspis*	R	N
American brook lamprey	*Lampetra appendix*	C	N
sea lamprey	*Petromyzon marinus*	R	I
common carp	*Cyprinus carpio*	R	I
brassy minnow	*Hybognathus hankinsoni*	O	N
common shiner	*Luxilus cornutus*	A	N
northern pearl dace	*Margariscus nachtriebi*	A	N
golden shiner	*Notemigonus crysoleucas*	C	N
blackchin shiner	*Notropis heterodon*	O	N
blacknose shiner	*Notropis heterolepis*	C	N
spottail shiner	*Notropis hudsonius*	R	N
mimic shiner	*Notropis volucellus*	O	N
northern redbelly dace	*Phoxinus eos*	C	N
finescale dace	*Phoxinus neogaeus*	O	N
bluntnose minnow	*Pimephales notatus*	O	N
fathead minnow	*Pimephales promelas*	O	N
longnose dace	*Rhinichthys cataractae*	R	N
western blacknose dace	*Rhinichthys obtusus*	A	N
creek chub	*Semotilus atromaculatus*	C	N
longnose sucker	*Catostomus catostomus*	R	N
white sucker	*Catostomus commersonii*	A	N
silver redhorse	*Moxostoma anisurum*	R	N
black bullhead	*Ameiurus melas*	R	N
brown bullhead	*Ameiurus nebulosus*	C	N
northern pike	*Esox lucius*	C	N
muskellunge	*Esox masquinongy*	A	N
central mudminnow	*Umbra limi*	A	N
rainbow smelt	*Osmerus mordax*	R	I
cisco	*Coregonus artedi*	R	N
rainbow trout	*Oncorhynchus mykiss*	R	I
Chinook salmon	*Oncorhynchus tshawytscha*	R	I
brown trout	*Salmo trutta*	O	I
brook trout	*Salvelinus fontinalis*	A	N
splake	*Salvelinus fontinalis x S. namaycush*	R	I
lake trout	*Salvelinus namaycush*	R	N
trout-perch	*Percopsis omiscomaycus*	R	N
burbot	*Lota lota*	A	N
western banded killifish	*Fundulus diaphanous menona*	R	N
brook stickleback	*Culaea inconstans*	A	N
mottled sculpin	*Cottus bairdii*	A	N
rock bass	*Ambloplites rupestris*	C	N

Table 18.–Continued.

Common name	Scientific name	Occurrence	Origin
pumpkinseed	*Lepomis gibbosus*	C	N
bluegill	*Lepomis macrochirus*	O	N
smallmouth bass	*Micropterus dolomieu*	C	N
largemouth bass	*Micropterus salmoides*	O	I
black crappie	*Pomoxis nigromaculatus*	R	I
Iowa darter	*Etheostoma exile*	O	N
johnny darter	*Etheostoma nigrum*	C	N
yellow perch	*Perca flavescens*	A	N
northern logperch	*Percina caprodes semifasciata*	R	N
blackside darter	*Percina maculate*	C	N
walleye	*Sander vitreus*	C	N

Table 19.–Fish species above and below the Tahquamenon River Falls. An "*" = Not verified by historical documents but actually seen by MDNR personnel during non-collection surveys. "X" = verified. (MDNR, Fisheries Division, files, and Bailey et. al. 2004).

Species	Above the falls	Below the falls
Species found above and below the falls		
American brook lamprey	X	X
northern pearl dace	X	X
spottail shiner	*	*
mimic shiner	X	X
northern redbelly dace	X	X
finescale dace	X	X
longnose dace	X	X
creek chub	X	X
longnose sucker	X	*
white sucker	X	X
brown bullhead	*	*
northern pike	X	X
northern muskellunge	X	*
central mudminnow	X	X
rainbow smelt	X	*
brown trout	X	X
brook trout	X	X
burbot	X	X
brook stickleback	X	X
mottled sculpin	X	X
rock bass	X	X
smallmouth bass	X	X
johnny darter	X	X
yellow perch	X	X
walleye	X	X
Species found only above the falls		
brassy minnow	X	
common shiner	X	
golden shiner	X	
blackchin shiner	X	
blacknose shiner	X	
bluntnose minnow	X	
fathead minnow	X	
western blacknose dace	X	
black bullhead	X	
lake herring	X	
lake trout	X	
splake	X	
western banded killifish	X	
green sunfish	X	
pumpkinseed	X	
bluegill	X	
largemouth bass	X	

Table 19.–Continued.

Species	Above the falls	Below the falls
Iowa darter	X	
northern logperch	X	
blackside darter	X	
Species found only below the falls		
silver lamprey		X
sea lamprey		X
common carp		*
silver redhorse		*
Great Lakes muskellunge		*
rainbow trout		*
Chinook salmon		*
trout perch		X

Table 20.–Amphibian and reptile species found in the Tahquamenon River watershed. Data from Harding and Holman (1992), Holman et. al. (1989), and Harding and Holman (1990). Status symbol is Special Concern (SC). Species are listed in taxonomic order.

Common name	Scientific name	Status
mudpuppy	*Necturus maculosus maculosus*	
eastern newt (central subspecies)	*Notophthalmus viridescens*	
spotted salamander	*Ambystoma maculatum*	
blue-spotted salamander	*Ambystoma laterale*	
red-backed salamander	*Plethodon cinereus*	
four-toed salamander	*Hemidactylium scutatum*	
eastern American toad	*Bufo americanus americanus*	
northern spring peeper	*Pseudacris crucifer crucifer*	
gray tree frog	*Hyla versicolor*	
green frog	*Rana clamitans melanota*	
bullfrog	*Rana catesbeiana*	
northern leopard frog	*Rana pipiens*	
pickerel frog	*Rana palustris*	
mink frog	*Rana septentrionalis*	
wood frog	*Rana sylvatica*	
snapping turtle	*Chelydra serpentine*	
wood turtle	*Clemmys insculpta*	SC
painted turtle	*Chrysemys picta*	
northern water snake	*Nerodia sipedon sipedon*	
eastern garter snake	*Thamnophis sirtalis sirtalis*	
northern red-bellied snake	*Storeria occipitomaculata occipitomaculata*	
eastern smooth green snake	*Liochlorophis vernalis*	
northern ring-necked snake	*Diadophis punctatus edwardsi*	

Table 21.–Bird species associated with the Tahquamenon River watershed and the Lake Superior shoreline adjacent to the watershed. Data from Anonymous (2000), Brewer et. al. (1991), Spieles (2001) and Spieles (personal communication). Occurrence is delineated as: A = Abundant, species numerous; C = Common, likely to be seen in the correct habitat; U = Uncommon, present but hard to find; O = Occasional, seen only a few times during a season, such as migratory; and R = Rare, seen every 2–5 years. Status is the government listing as follows: Michigan status SC = Special Concern; T = Threatened; E = Endangered; Federal status LT = Listed as Threatened. Species are listed in taxonomic order.

Common name	Scientific name	Occurrence	Status
Common Loon	*Gavia immer*	A	T
Pied-billed Grebe	*Podilymbus podiceps*	A	
Double-crested Cormorant	*Phalacrocorax auritus*	A	
American Bittern	*Botaurus lentiginosus*	A	SC
Great Blue Heron	*Ardea herodias*	A	
Black-crowned Night Heron	*Nyticorax nyticorax*	O	SC
Turkey Vulture	*Cathartes aura*	C	
Canada Goose	*Branta canadensis*	C	
Mute Swan	*Cygnus olor*	O	
Trumpeter Swan	*Cygnus buccinator*	U	T
Tundra Swan	*Cygnus columbianus*	O	
Wood Duck	*Aix sponsa*	A	
Gadwall	*Anas strepera*	O	
American Wigeon	*Anas americana*	C	
Mallard	*Anas platyrhynchos*	A	
Blue-winged Teal	*Anas discors*	C	
Green-winged Teal	*Anas crecca*	C	
Northern Shoveler	*Anas clypeata*	O	
Northern Pintail	*Anas acuta*	U	
Canvasback	*Aythya valisineria*	O	
Red Head	*Aythya americana*	O	
Ring-necked Duck	*Athya Collaris*	A	
Greater Scaup	*Aythya marila*	C	
Lesser Scaup	*Aythya affinis*	C	
Bufflehead	*Bucephala albeola*	C	
Common Goldeneye	*Bucephala clangula*	C	
Hooded Merganser	*Lophodytes cucullatus*	C	
Common Merganser	*Mergus merganser*	C	
Red-breasted Merganser	*Mergus serrator*	C	
Osprey	*Pandion Haliaetus*	C	T
Bald Eagle	*Haliaeetus leucocephalus*	C	T, LT
Golden Eagle	*Aquila chrysaetos*	O	
Northern Harrier	*Circus cyaneus*	C	SC
Sharp-shinned Hawk	*Accipiter striatus*	U	
Cooper’s Hawk	*Accipiter cooperii*	U	SC
Northern Goshawk	*Accipiter gentilis*	O	SC
Red-shouldered Hawk	*Buteo lineatus*	O	T
Broad-winged Hawk	*Buteo platypterus*	C	
Red-tailed Hawk	*Buteo jamaicensis*	C	
Rough-legged Hawk	*Buteo lagopus*	U	

Table 21.–Continued.

Common name	Scientific name	Occurrence	Status
American Kestrel	*Falco sparverius*	C	
Merlin	*Falco columbarius*	C	T
Peregrine Falcon	*Falco peregrinus*	O	
Ruffed Grouse	*Bonasa umbellus*	A	
Spruce Grouse	*Dendragapus Canadensis*	C	T
Sharp-tailed Grouse	*Tympanuchus phaseanellus*	C	SC
Yellow Rail	*Coturnicops noveboracensis*	R	T
Virginia Rail	*Rallus limicola*	C	
Sora	*Porzana carolina*	C	
Sandhill Crane	*Grus canadensis*	A	
Black-bellied Plover	*Pluvialis squatarola*	O	
Lesser Golden Plover	*Pluvialis dominica*	O	
Semipalmated Plover	*Charadrius semiplamatus*	O	
Killdeer	*Charadrius vociferus*	C	
Greater Yellowlegs	*Tringa melanoleuca*	C	
Lesser Yellowlegs	*Tringa flavipes*	C	
Solitary Sandpiper	*Tringa solitaria*	C	
Spotted Sandpiper	*Actitis macularia*	C	
Semipalmated Sandpiper	*Calidris pusilla*	U	
Least Sandpiper	*Calidris minutilla*	U	
Common Snipe	*Gallinago gallinago*	C	
American Woodcock	*Scolopax minor*	C	
Bonaparte's Gull	*Larus Philadelphia*	O	
Ring-billed Gull	*Larus delawarensis*	C	
Herring Gull	*Larus argentatus*	C	
Caspian Tern	*Sterna caspia*	U	T
Common Tern	*Sterna hirundo*	C	T
Rock Dove	*Columba livia*	C	
Mourning Dove	*Zenaida macroura*	C	
Black-billed Cuckoo	*Coccyzus erythropthalmus*	U	
Great-horned Owl	*Bubo virginianus*	U	
Snowy Owl	*Nyctea scandiaca*	R	
Barred Owl	*Strix varia*	U	
Great Gray Owl	*Strix nebulosa*	O	
Long-eared Owl	*Asio otus*	O	T
Short-eared Owl	*Asio flammeus*	R	E
Boreal Owl	*Aegolius funereus*	R	
Northern Saw-whet Owl	*Aegolius acadicus*	U	
Common Nighthawk	*Chordeiles minor*	C	
Whip-poor-will	*Caprimulgus vociferous*	U	
Chimney Swift	*Chaetura pelagica*	C	
Ruby-throated Hummingbird	*Archilochus colubris*	C	
Belted Kingfisher	*Ceryle alcyon*	C	
Red-headed Woodpecker	*Melanerpes erythrocephalus*	O	
Yellow-bellied Sapsucker	*Sphyrapicus varius*	C	
Downy Woodpecker	*Picoides pubescens*	C	
Hairy Woodpecker	*Picoides villosus*	C	

Table 21.–Continued.

Common name	Scientific name	Occurrence	Status
Black-backed Woodpecker	*Picoides arcticus*	U	SC
Northern Flicker	*Colaptes auratus*	C	
Pileated Woodpecker	*Dryocopus pileatus*	C	
Olive-sided Flycatcher	*Contopus borealis*	U	
Eastern Wood Pewee	*Contopus virens*	C	
Yellow-bellied Flycatcher	*Empidonax flaviventris*	O	
Alder Flycatcher	*Empidonax alnorum*	C	
Least Flycatcher	*Empidonax minimus*	C	
Eastern Phoebe	*Sayornis phoebe*	C	
Great Crested Flycatcher	*Myiarchus crinitus*	C	
Eastern Kingbird	*Tyrannus tyrannus*	C	
Northern Shrike	*Lanius excubitor*	O	
Blue-headed Vireo	*Vireo solitarius*	C	
Philadelphia Vireo	*Vireo philadelphicus*	C	
Red-eyed Vireo	*Vireo olivaceus*	C	
Gray Jay	*Perisoreus canadensis*	U	
Blue Jay	*Cyanocitta cristata*	C	
American Crow	*Corvus brachyrhynchos*	C	
Common Raven	*Corvus corax*	C	
Horned Lark	*Eremophila alpestris*	R	
Tree Swallow	*Tachycineta bicolor*	A	
N. Rough-winged Swallow	*Stelgidopteryx serripennis*	C	
Bank Swallow	*Riparia riparia*	U	
Cliff Swallow	*Hirundo pyrrhonota*	C	
Barn Swallow	*Hirundo rustica*	C	
Black-capped Chickadee	*Parus atricapillus*	A	
Boreal Chickadee	*Parus hudsonicus*	O	
Red-breasted Nuthatch	*Sitta canadensis*	C	
White-breasted Nuthatch	*Sitta carolinensis*	C	
Brown Creeper	*Certhia Americana*	C	
Winter Wren	*Troglodytes troglodytes*	C	
Sedge Wren	*Cistothorus pletensis*	C	
Golden-crowned Kinglet	*Regulus satrapa*	C	
Ruby-crowned Kinglet	*Regulus calendula*	U	
Eastern Bluebird	*Sialia sialis*	O	
Veery	*Catharus fuscescens*	C	
Swainson’s Thrush	*Catharus ustulatus*	C	
Gray-cheeked Thrush	*Catharus minimus*	U	
Hermit Thrush	*Catharus guttatus*	C	
Wood Thrush	*Hylocichla mustelina*	C	
American Robin	*Turdus migratorius*	A	
Gray Catbird	*Dumetella carolinensis*	U	
Brown Thrasher	*Toxostoma rufum*	U	
European Starling	*Sturnus vulgaris*	A	
Bohemian Waxwing	*Bombycilla garrulus*	O	
Cedar Waxwing	*Bombycilla cedrorum*	A	
Golden-winged Warbler	*Vermivora chrysoptera*	R	

Table 21.–Continued.

Common name	Scientific name	Occurrence	Status
Tennessee Warbler	*Vermivora peregrina*	R	
Nashville Warbler	*Vermivora ruficapilla*	A	
Northern Parula	*Parula Americana*	C	
Yellow Warbler	*Dendroica petechia*	A	
Chestnut-sided Warbler	*Dendroica pensylvanica*	U	
Magnolia Warbler	*Dendroica magnolia*	C	
Cape May Warbler	*Dendroica tigrina*	O	
Black-throated Blue Warbler	*Dendroica caerulescens*	C	
Black-throated Green Warbler	*Dendroica virens*	C	
Yellow-rumped Warbler	*Dendroica coronata*	C	
Blackburnian Warbler	*Dendroica fusca*	C	
Pine Warbler	*Dendroica pinus*	C	
Palm Warbler	*Dendroica palmarum*	C	
Bay-breasted Warbler	*Dendroica castanea*	U	
Blackpoll Warbler	*Dendroica striata*	U	
Black-and-white Warbler	*Mniotilta varia*	C	
American Redstart	*Setophaga ruticilla*	C	
Ovenbird	*Seiurus aurocapillus*	C	
Northern Waterthrush	*Seiurus noveboracensis*	U	
Connecticut Warbler	*Oporornis formosus*	R	
Mourning Warbler	*Oporornis philadelphia*	O	
Common Yellowthroat	*Geothlypis trichas*	C	
Wilson's Warbler	*Wilsonia pusilla*	O	
Canada Warbler	*Wilsonia Canadensis*	O	
Scarlet Tanager	*Piranga olivacea*	C	
Rufous-sided Towhee	*Pipilo erythrophthalmus*	O	
American Tree Sparrow	*Spizella arborea*	O	
Chipping Sparrow	*Spizella passerine*	C	
Clay-colored Sparrow	*Spizella pallida*	O	
Vesper Sparrow	*Pooecetes gramineus*	U	
Savannah Sparrow	*Passerculus sandwichensis*	C	
Le Conte's Sparrow	*Ammodramus leconteii*	C	
Fox Sparrow	*Passerella iliaca*	O	
Song Sparrow	*Melospiza melodia*	C	
Lincoln's Sparrow	*Melospiza lincolnii*	U	
Swamp Sparrow	*Melospiza georgiana*	C	
White-throated Sparrow	*Zonotrichia albicollis*	C	
White-crowned Sparrow	*Zonotrichia leucophrys*	O	
Dark-eyed Junco	*Junco hyemalis*	C	
Snow Bunting	*Plectrophenax nivalis*	O	
Northern Cardinal	*Cardinalis cardinalis*	O	
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	C	
Indigo Bunting	*Passerina cyanea*	C	
Bobolink	*Dolichonys oryzivorus*	C	
Red-winged Blackbird	*Agelaius phoeniceus*	A	
Eastern Meadowlark	*Sturnella magna*	O	
Rusty Blackbird	*Euphagus carolinus*	O	

Table 21.–Continued.

Common name	Scientific name	Occurrence	Status
Brewer's Blackbird	*Euphagus cyanocephalus*	U	
Common Grackle	*Quiscalus quisula*	A	
Brown-headed Cowbird	*Molothrus ater*	A	
Baltimore Oriole	*Icterus galbula*	U	
Pine Grosbeak	*Pinicola enucleator*	O	
Purple Finch	*Carpodacus purpureus*	O	
Red Crossbill	*Loxia curvirostra*	O	
White-winged Crossbill	*Loxia leucoptera*	O	
Common Redpoll	*Carduelis flammea*	U	
Hoary Redpoll	*Carduelis hornemanni*	R	
Pine Siskin	*Carduelis pinus*	U	
American Goldfinch	*Carduelis tristis*	C	
Evening Grosbeak	*Coccothraustes vespertinus*	C	T
House Sparrow	*Passer domesticus*	C	

Table 22.–Mammals of the Tahquamenon River watershed. Data from Baker (1983), Kristie Sitar, MDNR, Wildlife Division biologist, (personal communication), and Anonymous (2000). Occurrence codes: A = Abundant, species numerous; C = Common, likely to be seen in the suitable habitat; O = Occasional, seen only a few times during a season; and R = Rare, seen only every 2–5 years. State status rank: SC = Special Concern, T = Threatened, E = Endangered. Federal status rank: LE = Listed as Endangered. Species are listed in taxonomic order.

Common name	Scientific name	Occurrence	Status
Arctic shrew	*Sorex arcticus*	C	
masked shrew	*Sorex cinereus*	C	
pigmy shrew	*Sorex hoyi*	C	
water shrew	*Sorex palustris*	C	
northern short-tailed shrew	*Blarina brevicauda*	A	
star-nosed mole	*Condylura noctivagans*	C	
northern long-eared bat	*Myotis septentrionalis*		
little brown bat	*Myotis lucifugus*	C	
silver-haired bat	*Lasionycteris noctivagans*	O	
big brown bat	*Eptesicus fuscus*	C	
eastern red bat	*Lasiurus borealis*	O	
Keen's bat	*Myotis keenii*	O	
hoary bat	*Lasiurus cinereus*	C	
snowshoe hare	*Lepus americanus*	C	
eastern chipmunk	*Tamias striatus*	A	
least chipmunk	*Tamias minimus*	C	
woodchuck	*Marmota monax*	C	
eastern gray squirrel	*Sciurus carolinensis*	C	
red squirrel	*Tamiasciurus hudsonicus*	A	
northern flying squirrel	*Glaucomys sabrinus*	O	
American beaver	*Castor Canadensis*	A	
southern red-backed vole	*Clethrionomys gapperi*	C	
meadow vole	*Microtus pennsylvanicus*	C	
muskrat	*Ondatra zibethicus*	A	
southern bog lemming	*Synaptomys cooperi*	O	
meadow jumping mouse	*Zapus hudsonius*	C	
woodland jumping mouse	*Napaeozapus insignis*	C	
American porcupine	*Erethizon dorsatum*	C	
coyote	*Canis latrans*	A	
gray wolf	*Canis lupus*	O	T, LE
red fox	*Vulpes vulpes*	C	
gray fox	*Urocyon cinereoargenteus*	O	
black bear	*Ursus americanus*	C	
raccoon	*Procyon lotor*	A	
American marten	*Martes martes*	C	
fisher	*Martes pennanti*	C	
ermine	*Mustela erminea*	O	
least weasel	*Mustela nivalis*	O	
long-tailed weasel	*Mustela frenata*	C	
mink	*Mustela vison*	C	
American badger	*Taxidea taxus*	O	

Table 22.–Continued.

Common name	Scientific name	Occurrence	Status
striped skunk	*Mephitis mephitis*	C	
northern river otter	*Lutra canadensis*	C	
bobcat	*Lynx rufus*	C	
white-tailed deer	*Odocoileus virginianus*	C	
moose	*Alces alces*	C	SC

Table 23.–Special features and rare species in the Tahquamenon River watershed. Species locations are: 1) Upper River and Dollarville segments; 2) Sage River; 3) Hendrie River; 4) East Branch Tahquamenon River; 5) Middle River segment; 6) Areas around Upper and Lower Tahquamenon Falls. State status SC = Special Concern, T = Threatened. Federal status LT = Listed as Threatened (Unpublished data from Michigan Natural Features Inventory, 2005).

Common name	Scientific name	Status	1	2	3	4	5	6
Birds								
Bald Eagle	*Haliaeetus leucocephalus*	T, LT	X	X		X		X
Osprey	*Pandion haliaetus*	T	X		X	X	X	X
Common Loon	*Gavial immer*	T	X				X	X
Red-shouldered Hawk	*Buteo lineatus*	T		X	X			
Merlin	*Falco columbarius*	T				X		
Northern Goshawk	*Accipiter gentiles*	SC						X
Spruce Grouse	*Falcipennis canadensis*	SC						X
Black-backed Woodpecker	*Picoides arcticus*	SC						X
Invertebrates								
friggia fritillary	*Borolia frigga*	SC	X				X	
land snail	*Vertigo elatior*	SC			X			
Plants								
goblin moonwort	*Botrychium mormo*	T		X	X			
satiny willow	*Salix pellita*	SC					X	
Farwell's water-milfoil	*Myriophyllum farwellii*	T						
fir clubmoss	*Huperzia selago*	SC			X			
Douglas's hawthorn	*Crataegis douglasii*	SC				X		X
autumnal water-starwort	*Callitriche hermaphroditica*	SC						X
alga pondweed	*Potamogeton confervoides*	SC			X			X
panicled screw-stem	*Bartonia paniculata*	T						X
blue wild-rye	*Elymus glaucus*	SC						X
northern prostrate clubmoss	*Lycopodium appressum*	SC						X
meadow-beauty	*Rhexia virginica*	SC						X
Special features								
great blue heron rookery	population feature		X				X	
mesic northern forest	community				X		X	
muskeg	community						X	
wooded dune / swale complex	community					X		
rich conifer swamp	community					X		X
Primary sedimentary structural feature	geological feature–upper and lower falls, rapids							X

Table 24.–Fish stocked in the Tahquamenon River, 1979 to 2006. Brown trout plants in the Lower River segment all occurred between the Upper and Lower Falls. SF = spring fingerling, FF = fall fingerling, Yr = yearling, Ad = adult.

Segment	Date	Species	Age	Length (in)	Number
Upper River	1979	brook trout	SF	3.8	3,900
	1980	brook trout	SF	2.0	1,900
	1981	brook trout	SF	2.0	3,900
		brook trout	FF	3.7	3,000
	1982	brook trout	SF	1.9	3,900
	1983	brook trout	FF	3.3	3,420
	1984	brook trout	FF	3.6	3,900
	1985	brook trout	SF	2.1	3,900
	1986	brook trout	SF	2.3	3,900
	1987	brook trout	SF	2.3	3,900
	1988	brook trout	Yr	6.5	1,000
	1990	brook trout	SF	1.7	3,900
	1991	brook trout	SF	2.3	3,900
	1992	brook trout	Yr	5.5	2,000
	1993	brook trout	Yr	7.3	2,000
	1994	brook trout	Yr	7.6	1,000
	1995	brook trout	Yr	7.9	2,000
	1996	brook trout	Yr	7.1	2,000
	1997	brook trout	Yr	7.6	1,700
	1998	brook trout	Yr	4.6	2,000
Dollarville	1979	largemouth bass	FF	2.4	15,000
	1980	tiger muskellunge	FF	6.9	1,686
	1981	tiger muskellunge	FF	6.9	1,600
	1982	muskellunge	Fry	0.6	66,710
	1983	tiger muskellunge	FF	7.4	600
	1985	muskellunge	FF	8.1	600
	1987	muskellunge	FF	5.9	1,200
	1988	walleye	SF	1.5	10,069
	1989	muskellunge	FF	9.2	266
		walleye	SF	2.2	2,151
	1990	walleye	SF	1.6	30,224
Marsh Drainage	1987	walleye	SF	1.8	1,632
		yellow perch	Ad	6.4	9,841
	1988	walleye	SF	2.0	12,539
	1990	walleye	SF	1.4	16,021
	1991	walleye	SF	2.3	2,968
	1992	walleye	SF	1.8	28,814
	1994	brook trout	Yr	7.6	1,000

Table 24.–Continued.

Segment	Date	Species	Age	Length (in)	Number
Lower River	1980	brown trout	Yr	6.7	2,850
	1984	brown trout	Yr	6.7	3,500
	1985	brown trout	Yr	7.1	3,200
	1986	brown trout	Yr	7.4	3,640
	1987	brown trout	Yr	7.7	4,132
	1988	brown trout	Yr	6.4	4,260
	1989	brown trout	SF	1.3	5,800
		brown trout	Yr	7.7	4,000
	1990	brown trout	Yr	7.1	5,000
	1991	brown trout	Yr	6.4	4,200
	1992	brown trout	Yr	6.7	5,000
	1993	brown trout	Yr	7.8	3,990
	1994	brown trout	Yr	6.9	4,360
	1995	brown trout	Yr	6.8	5,000
	1996	brown trout	Yr	7.4	3,920
		lake trout	FF	4.8	110,000
		walleye	SF	1.5	39,940
	1997	brown trout	Yr	7.5	3,600
		walleye	SF	2.2	30,457
	1998	brown trout	Yr	7.9	3,500
	1999	brown trout	Yr	3.8	3,990
		lake trout	FF	5.0	150,000
		walleye	SF	1.8	30,400
	2000	brown trout	Yr	4.8	5,000
		lake trout	FF	4.7	150,080
		walleye	SF	1.9	24,952
	2001	brown trout	Yr	4.8	4,160
		walleye	SF	1.6	32,395
	2002	brown trout	Yr	5.0	4,750
	2003	brown trout	Yr	5.1	5,000
		walleye	SF	1.7	28,885
	2004	brown trout	Yr	5.2	4,000
	2005	brown trout	Yr	7.1	3,500
		walleye	SF	1.6	10,772
	2006	brown trout	Yr	7.6	4,500

Table 25.–Electrofishing catch per hour (CPH) from July 2005 boomshocking surveys of the mainstem Tahquamenon River by site and river valley segment. All sites except the Dollarville Dam to M-123 site entailed boomshocking for 1 hour. The sites extended 1 mile, covering both sides of the river upstream and downstream ¼ mile from central site. The Dollarville Dam to M-123 site began at the dam and extended about 3 miles downstream to the M-123 Bridge. Sites with river names were centered at the confluence with the Tahquamenon River. An attempt was made this year to catch all fish observed while the boat was moving through the sample site.

Segment and site	Species	CPH	Lengths (in)
Marsh Drainage Segment			
Dollarville Dam to M-123 [a]	northern pike	35.8	9–26
	walleye	26.3	8–26
	burbot	22.1	5–8
	rock bass	16.3	3–11
	yellow perch	12.6	5–9
	white sucker	12.1	6–18
	creek chub	7.9	4–5
	pumpkinseed	3.2	3–4
	brown bullhead	2.1	6–8
	blackside darter	1.6	2–3
	common shiner	1.6	2–4
	golden shiner	1.6	3–5
	largemouth bass	1.1	12–14
	muskellunge	0.5	31
	smallmouth bass	0.5	8
	tiger muskellunge hybrid	0.5	19
McPhee's Landing	rock bass	32	4–9
	northern pike	31	3–29
	walleye	30	9–25
	pumpkinseed	22	3–6
	yellow perch	17	6–10
	white sucker	11	7–16
	brown bullhead	1	5
Deadman's Farm	northern pike	27	11–24
	walleye	20	9–23
	yellow perch	13	5–17
	white sucker	7	10–17
	rock bass	6	5–7
	muskellunge	1	4
Sage River mouth	walleye	37	6–22
	white sucker	29	7–17
	yellow perch	22	6–11
	rock bass	11	3–8
	northern pike	6	7–22
	muskellunge	2	31–31
	pumpkinseed	2	4–5

Table 25.–Continued.

Segment and site	Species	CPH	Lengths (in)
Middle River Segment			
Hendrie River	walleye	34	4–26
	yellow perch	22	5–10
	rock bass	21	2–10
	pumpkinseed	6	3–4
	golden shiner	1	6
	northern pike	1	6
E Br.Tahquamenon River	walleye	30	10–28
	muskellunge	2	8–41
	northern pike	2	12–19
	yellow perch	2	7–10
Murphy Creek	walleye	16	10–22
	yellow perch	14	5–11
	northern pike	4	14–21
	rock bass	4	5–7
	muskellunge	2	18–29
	trout-perch	1	4
Joy Island	walleye	18	6–23
	yellow perch	17	4–9
	muskellunge	7	18–32
	northern pike	7	11–24
	white sucker	1	15
	pumpkinseed	1	3
	rock bass	1	9
Lower River Segment			
Lower Falls pool	muskellunge	11	14–33
	walleye	9	7–16
	northern pike	8	19–23
	silver redhorse	7	8–24
	smallmouth bass	5	7–11
	yellow perch	5	5–8
Lower Falls Stairs	yellow perch	15	4–11
	smallmouth bass	4	6–11
	northern pike	3	19–24
	muskellunge	2	15–17
	walleye	2	3–10
Whitehouse Landing	muskellunge	4	10–23
	yellow perch	4	4–7
	northern pike	1	14
	walleye	1	14

[a] Dollarville Dam to M-123 Most of the unusual species were captured immediately downstream from the dam.

Table 26.–Walleye and muskellunge radio tracking dates in the Tahquamenon River with water temperature (Fahrenheit), discharge, and survey type. Daily discharge rate was from the USGS gauge near the Upper Falls in cubic feet per second (CFS).

Date	Water temperature	CFS	Survey type
10/21/2004	40	1020	boat
11/09/2004	36	1340	boat
11/10/2004	37	1280	boat
11/22/2004	34	1110	boat
12/15/2004		991	aerial
01/28/2005		471	aerial
03/29/2005		529	aerial
04/07/2005		3720	aerial
04/13/2005	45	3900	aerial
04/14/2005	48	3730	boat
04/18/2005	55.9	2840	boat
04/21/2005	54.3	2180	boat
04/26/2005	40.5	1490	boat
04/29/2005	42.7	1410	boat
05/02/2005	45	1260	boat
05/05/2005	42	1130	boat
05/09/2005	55	847	boat
05/17/2005		1070	aerial
05/26/2005	63.4	614	boat
06/01/2005	65.4	515	boat
06/07/2005	68		boat
06/29/2005	78	236	boat
07/22/2005	76.7	213	boat
09/23/2005	63.2	312	boat
10/06/2005	64		boat
10/08/2005	58		boat
10/18/2005	49.2	558	boat
11/01/2005	44.3	416	boat
11/03/2005	44.4	422	boat

Table 27.–Electrofishing survey results in catch per 1,000 linear feet for seven sampling sites in the East Branch Tahquamenon River, Chippewa County, July 2004 (Bassett 2005).

	Sampling site						
Species	2	3	4	5	6	7	8
brook trout	103	101	84	48	22	30	17
mottled sculpin	25	35	39	25	19	43	26
brook stickleback		10	1			1	2
brown bullhead			1				
northern brook lamprey			4		3	3	
northern redbelly dace			3		1		
central mudminnow			7			1	
blacknose dace				2	1	19	11
creek chub				2		3	1
common shiner					17		
pearl dace						6	
brassy minnow						1	

Table 28.–Brook trout population estimates and standing crop (lbs.) estimates (Station 4) in the East Branch Tahquamenon River at Strongs, Michigan , 1977–83, 1995, and 2004 (Bassett 2005).

Standing crop			Population estimates			
1977–83	1995	2004	Ages	1977–83	1995	2004
58.5	21.2	19.3	0	1426	781	455
			1–2	717	156	93
			3–4	70	0	11

REFERENCES

Aiello, C. 2004. Michigan water chemistry monitoring program, 2002 report. Michigan Department of Environmental Quality, Water Division, report MI/DEQ/WD/04-049, Lansing.

Albert, D.A., S.R. Denton, and B.V. Barnes. 1986. Regional Landscape Ecosystems of Michigan. University of Michigan, School of Natural Resources, Ann Arbor.

Alexander, G.R., and E.A. Hansen. 1983. Effects of sand bedload sediment on a brook trout population. Michigan Department of Natural Resources, Fisheries Research Report 1906, Ann Arbor.

Alexander, G.R., and E.A. Hansen. 1986. Sand bedload in a brook trout stream. North American Journal of Fisheries Management 6:9–23.

Alexander, G.R., J.L. Fenske, and D.W. Smith 1995. A fisheries management guide to stream protection and restoration. Michigan Department of Natural Resources, Fisheries Special Report 15, Ann Arbor.

Anderson, L.R. 1976. Unpublished file data. Michigan Department of Natural Resources, Fisheries Division, Newberry Operations Service Center, 5100 S. M-123, Newberry, MI, 49868.

Anderson, L.R. 1982. Tahquamenon River, a trout stream of Michigan. Page 266 *in* Luce County: A History Commemorating Newberry's Centennial. The Luce County Historical Society, Newberry, Michigan.

Anonymous. 1985. Regulatory Program, EP 1145-2-1. United States Army, Corps of Engineers, Washington, D.C.

Anonymous. 1993. A guide to public rights on Michigan waters. Michigan Department of Natural Resources, Law Enforcement Division, Report 9, Lansing.

Anonymous. 1995. Michigan public boat launch directory 1995 thru 1996. Michigan Department of Natural Resources, Lansing.

Anonymous. 2000a. Michigan stream classification: 1967 system. Chapter 20 *in* Schneider, J.C. (ed.) 2000. Manual of fisheries survey methods II: with periodic updates. Michigan Department of Natural Resources, Fisheries Special Report 25, Ann Arbor.

Anonymous. 2000b. Vertebrate wildlife species of the Upper Peninsula: a tentative list compiled by the Michigan DNR and MSU Extension Service. MSU Upper Peninsula Forestry Extension Office, Michigan State University Cooperative Extension Service, East Lansing.

Anonymous. 2004. Michigan State University climatological page. Michigan State University. Available: http://climate.geo.msu.edu (November 2004).

Anonymous. 2005a. Ordinary High Water Mark. U.S. Army Corps of Engineers, Detroit District. Available: http://www.lre.usace.army.mil/greatlakes (March 2005).

Anonymous. 2005b. Michigan Department of Environmental Quality Vision Statement. Available: http://www.michigan.gov/deq (March 2005).

Anonymous. 2005c. Michigan Natural Features Inventory, by watershed listing. Available: http:/www.msue.msu.edu/mnfi (April 2005).

Bailey, R.M., and G.R. Smith. 1981. Origin and geography of the fish fauna of the Laurentian Great Lakes basin. Canadian Journal of Fish and Aquatic Science 38:1539–1561.

Bailey, R.M., W.C. Latta, and G.R. Smith. 2004. An atlas of Michigan fishes with keys and illustrations for their identification. Museum of Zoology, University of Michigan, Miscellaneous Papers 192, Ann Arbor.

Baker, M.E. 2006. A landscape-based ecological classification system for river valley segments in Michigan's Upper Peninsula. Michigan Department of Natural Resources, Fisheries Research Report 2085, Ann Arbor.

Baker, R.H. 1983. Michigan mammals. Michigan State University Press, Michigan State University, East Lansing.

Barnett, L. 1990. Taming the Tahquamenon. Pages 20–23 *in* Michigan History magazine, Michigan Department of State, Lansing. January/February 1990.

Bassett, C. 2005. East Branch Tahquamenon River fishery status report. Hiawatha National Forest, Escanaba, Michigan, cooperating with MDNR, USFS, Escanaba.

Bay Mills Indian Community, History Department. Available: http://www.baymills.org/history. (November, 2007).

Becker, G.C. 1983. Fishes of Wisconsin. The University of Wisconsin Press, Madison.

Berquist, S.G. 1936. The Pleistocene History of the Tahquamenon and Manistique Drainage Region of the Northern Peninsula of Michigan. Historical Society of Michigan, Lansing.

Blumer, S.P., T.E. Behrendt, C.R. Whited, J.M. Ellis, R.J. Minnerick, and R.L. Leu Voy. 2004. Water resources data, Michigan, water year 2003. United States Geological Survey, Michigan Water Science Center, Water Data Report MI-03-1, Lansing.

Bovee, K.D., T.J. Newcomb, and T.G. Coon. 1994. Relations between habitat variability and population dynamics of bass in the Huron River, Michigan. United States Department of the Interior, National Biological Survey, Biological Report 21, Washington, DC.

Brandt, G.W. 1935. Michigan's beaver-trout management program. American Fisheries Society, Transactions 65:253–257.

Brewer, R., G.A. McPeek, and R.J. Adams, Jr. 1991. The atlas of breeding birds of Michigan. Michigan State University Press, East Lansing.

Coon, T.G. 1987. Responses of benthic riffle fishes to variation in stream discharge and temperature. Pages 77–85 *in* W.J. Mathews and D.C. Heins, editors. Community and evolutionary ecology of North American stream fishes. University of Oklahoma Press, Norman.

Dewberry, T.C. 1992. Protecting the biodiversity of riverine and riparian ecosystems: the national river public land policy development project. Transactions of the 57th North American Wildlife and Natural Resources Conference. pp. 434–4342.

MDEQ–SWQD (Michigan Department of Environmental Quality, Surface Water Quality Division). 1997. Procedure 51. Qualitative biological and habitat survey protocols, wadable streams and rivers. Michigan Department of Environmental Quality, Surface Water Quality Division, Lansing.

Eagle, A.C., E.M. Hay-Chmielewski, K.T. Cleveland, A.L. Derosier, M.E. Herbert, and R.A. Rustem, eds. 2005. Michigan's Wildlife Action Plan. Michigan Department of Natural Resources. Lansing. 1592 pp. Available: http://www.michigan.gov/dnrwildlifeactionplan (March 2006).

Edwards, E.A., D.A. Krieger, M. Bacteller, and O.E. Maughn. 1982. Habitat suitability index models: black crappie. United States Department of the Interior, Fish and Wildlife Service, Biological Report 82 (10.6), Washington, DC.

Edwards, E. A., G. Gebhart, and O.E. Maughan. 1983. Habitat suitability index models: smallmouth bass. United States Department of the Interior, Fish and Wildlife Service, Biological Report 82 (10.6), Washington, DC.

Eschmeyer, P.H. 1946. A preliminary study of the relationship between untreated domestic sewage and condition for fish in the Tahquamenon River. Michigan Department of Natural Resources, Fisheries Research Report 1074, Ann Arbor.

Farrand, W.R. 1988. The Glacial Lakes around Michigan. Michigan Department of Natural Resources, Geological Survey Division, Bulletin 4, Lansing.

Farrand, W.R., and D.L. Bell. 1982. Quaternary geology of Michigan. Lansing, Michigan: Michigan Department of Natural Resources, Geological Survey Division. 2 sheets. Scale 1:500,000.

Fetterolf, C.M., Jr. 1960. Tahquamenon River bottom fauna survey, vicinity of Newberry, Luce County, Michigan. Michigan Department of Environmental Quality, Surface Water Quality, Report 60\000670, Lansing.

Fitting, J.E. 1970. The Archeology of Michigan, A guide to the prehistory of the Great Lakes region. The American Museum of Natural History, The Natural History Press, Garden City, N.Y. pg 146.

Goodwin, K. 2000. A biological survey of the Tahquamenon River and Manistique River watersheds; Luce, Chippewa, Mackinac, Schoolcraft and Alger counties, Michigan; August and September 1999. Michigan Department of Environmental Quality, Surface Water Quality Division, Report MI/DEQ/SWQ-00/107, Lansing.

Groundwater Education in Michigan Center. 1975. Publicly owned water treatment facilities in the Michigan portion of the Lake Superior watershed, Table 4.19b. Available: http://emml.mtu.edu/gem/community/planning/FinalReport/Appendix3Tables/SIT4-19B.pdf (June 2005).

Harding, J.H., and J.A. Holman. 1990. Michigan turtles and lizards. Michigan State University Press, East Lansing.

Harding, J.H., and J.A. Holman. 1992. Michigan frogs, toads, and salamanders. Michigan State University Press, East Lansing.

Heede, B.H. 1980. Stream dynamics: an overview for land managers. U.S. Department of Agriculture, Forest Service General Technical Report RM-72, Fort Collins, Colorado.

Hinsdale, W.B. 1931. Archaeological Atlas of Michigan. University of Ann Arbor Press, Michigan Handbook Series No. 4, Ann Arbor. Map # 20.

Holden, S. 2005. A biological survey of the Tahquamenon River, Two Hearted River, and selected tributaries to Lake Superior located in Alger, Chippewa, and Luce Counties, August 2004. Michigan Department of Environmental Quality, Water Bureau, Report MI/DEQ/WB-05/125, Lansing.

Holman, J.A., J.H. Harding, M.M. Hensley, and G.R. Dudderar. 1989. Michigan Snakes. Michigan State University Press, East Lansing.

Hubbs, C.L. 1932. On condition of lake trout in Hulbert Lake, Chippewa County. Michigan Department of Natural Resources, Fisheries Research Report 145, Ann Arbor.

Hulbert, W.D. 1949. White Pine Days on the Tahquamenon. The Historical Society of Michigan, Lansing.

Hynes, H.B.N. 1972. The Ecology of Running Waters. University of Toronto Press, Toronto.

Inskip, P.D. 1982. Habitat suitability index models: northern pike. United States Department of the Interior, Fish and Wildlife Service, Biological Report 82 (10.17), Washington, DC.

Knighton, D. 1984. Fluvial forms and process. Edward Arnold Ltd., London.

Large, A.R.G., and G.E. Potts. 1994. Rehabilitation of river margins. Pages 401–418 *in* P. Calow and G.E. Pots, editors. The rivers handbook: hydrological and ecological principles, volume 2. Blackwell Scientific Publications, Oxford, England.

Leopold, L.B., and T. Maddock. 1953. The hydraulic geometry of stream channels and some physiographic implications. United States Geological Survey Professional Paper 252, Washington, D.C.

Leopold, L.B., and M.G. Wolman. 1957. River channel patterns: Braided, meandering and straight. United States Geological Survey Professional Paper 282b, pp. 33–85, Washington, D.C.

Loope, W.L., R.J. Goble, T.G. Fisher, H.M. Jol, H.M. Loope, and R.S. Regis. 2004. A dune-building signature of outbursts of glacial Lake Agassiz across eastern Upper Michigan. Annual meeting, Denver, November 7–10, 2004. The Geological Society of America.

Loope, W.L., R.J. Goble, H.M. Jol, T.G. Fisher, H.M. Loope, and G.D. Whitney. 2005. Lake Minong and the Holocene history of the Tahquamenon River, northern Michigan, USA. Annual meeting, Salt Lake City, October 16–19, 2005. The Geological Society of America.

Loope, W.L., H.M. Jol, R.J. Goble, T.G. Fisher. 2006. Geomorphic sedimentological and mineralogical signatures of early Holocene outbursts of glacial Lake Agassiz in eastern Upper Michigan. North-Central Section—40th annual meeting, University of Akron, April 20–21, 2006. The Geological Society of America.

McKee, Russell. 1966. Great Lakes County. Thomas Y. Crowell Company, New York, N.Y. pg 17.

McMahon, T.E. 1982. Habitat suitability index models: creek chub. United States Department of the Interior, Fish and Wildlife Service, Biological Report 82 (10.4), Washington, DC.

McMahon, T.E., and P.C. Nelson. 1984. Habitat suitability index models: walleye. United States Department of the Interior, Fish and Wildlife Service Biological Report 82 (10.56), Washington, DC.

Merrit, R.W., and K.W. Cummins (Eds.). 1996. An introduction to the aquatic insects of North America, 3rd ed. Kendall/Hunt, Dubuque, Iowa.

Michigan Department of Community Health. 2004. Michigan fish advisory. Available: http://www.michigan.gov/mdch/0,1607,7-132-2945_5105-51514--,00.html. (July 2005).

Michigan Society of Planning Officials. 1995. Patterns on the land: our choices — our future. Final report of the MSPO Trend Future Project. Michigan Society of Planning Officials, Rochester.

Morris, D.A., and A.I. Johnson, 1967. Summary of hydrologic and physical properties of rock and soil materials as analyzed by the Hydrologic Laboratory of the U.S. Geological Survey, U.S. Geological Survey Water-Supply Paper 1839-D.

Nakano, S., and M. Murakami. 2001. Reciprocal subsidies: dynamic interdependence between terrestrial and aquatic food webs. National Academy of Sciences. 98(1):166–107.

Nuhfer, A.J., R.D. Clark Jr., and G.R. Alexander. 1994. Recruitment of brown trout in the South Branch of the Au Sable River, Michigan, in relation to stream flow and winter severity. Michigan Department of Natural Resources, Fisheries Research Report 2006, Ann Arbor.

Nute, G.L. 1944. Lake Superior. Page 25 *in* The American lake series, M.M. Quaife, editor. The Bobbs-Merrill Company, Indianapolis – New York.

Poff, N.L., and J.V. Ward. 1989. Implications of streamflow variability and predictability for lotic community structure: a regional analysis of streamflow patterns. Canadian Journal of Fisheries and Aquatic Sciences 46:1805–1818.

Poff, N.L., and J.D. Allan. 1995. Functional organization of stream fish assemblages in relation to hydrologic variability. Ecology 76(2):606–627.

Priegel, G.R. 1970. Reproduction and early life history of the walleye in the Lake Winnebago region. Wisconsin Department of Natural Resources, Technical Bulletin 45, Madison.

Raleigh, R.F. 1982. Habitat suitability index models: brook trout. United States Department of the Interior, Fish and Wildlife Service, Biological Report 82 (10.24), Washington, DC.

Raleigh, R.F., and P.C. Nelson. 1985. Habitat suitability index models and instream flow suitability curves: pink salmon. United States Department of the Interior, Fish and Wildlife Service, Biological Report 82 (10.109), Washington, DC.

Raleigh, R.F., W.J. Miller, and P.C. Nelson. 1986a. Habitat suitability index models and instream flow suitability curves: chinook salmon. United States Department of the Interior, Fish and Wildlife Service, Biological Report 82 (10.122), Washington, DC.

Raleigh, R.F., L.D. Zuckerman, and P.C. Nelson. 1986b. Habitat suitability index models and instream flow suitability curves: brown trout. United States Department of the Interior, Fish and Wildlife Service, Biological Report 82 (10.124), Washington, DC.

Reynolds, D.B. 1948. A further study of the relationship between untreated domestic sewage and conditions for fish in the Tahquamenon River. Michigan Department of Natural Resources, Fisheries Research Report 1153, Ann Arbor.

Richards, R.P. 1990. Measures of flow variability and a new flow based classification of Great Lakes tributaries. Journal of Great Lakes Research 16(1):53–70.

Rumsey, C., and T. LaMarre. 1994. A preliminary report on the effects of F_1 splake plantings on a stunted yellow perch population in a small Precambrian Shield lake. Unpublished report, Sir Sandford Fleming College, Lindsay, Ontario. 7 p.

Schoolcraft, H.R. 1833. Letter book. Outgoing correspondence, Office of Indian Affairs, Sault Ste. Marie, 1822–1833. National Archives, Washington, D.C.

Schneider, J.C. 1983. Significance of acid rain to Michigan lakes and their fisheries. Michigan Department of Natural Resources, Fisheries Technical Report 83-1, Ann Arbor.

Seelbach, P.W. 1986. Population biology of steelhead in the Little Manistee River, Michigan. Doctoral dissertation. University of Michigan, Ann Arbor.

Spieles, J., and J. Spieles. 2001. Birding, Tahquamenon Falls State Park. Michigan Department of Natural Resources pamphlet, Lansing.

Starrett, W.C. 1951. Some factors affecting abundance of minnows in the Des Moines River, Iowa. Ecology 32(1):13–27.

State of Michigan. 2004. Roosevelt's Tree Army. Michigan's Civilian Conservation Corps. Available: http://www.michigan.gov/hal/0,1607,7-160-17451_18670_18793-53515--,00.html. (November 2004).

State of Michigan. 2005. Michigan Spatial Data Library. Available: http://www.michigan.gov/cgi/1,1607,7-158-12693---,00.html. (April 2005).

Strange, E.M., P.B. Moyle, and T.C. Foin. 1992. Interactions between stochastic and deterministic processes in stream fish community assembly. Environmental Biology of Fishes 36:1–5.

Strand, R.M. 1996. Some effects of riparian habitat alteration on lotic invertebrate ecology. Doctoral dissertation. Michigan State University, East Lansing.

Strand, R.M., and R.W. Merritt. 1999. Impacts of livestock grazing activities on stream insect communities and the riverine environment. American Entomologist 45(1):13–29.

Stuber, R.J., G Gebhart, and O.E. Moughan. 1982b. Habitat suitability index models: largemouth bass. United States Department of the Interior, Fish and Wildlife Service, Biological Report 82 (10.16), Washington, DC.

Taft, W.H. 1989. A biological and water chemistry survey of the Tahquamenon River in the vicinity of the Newberry WWTP, Luce County, Michigan. Michigan Department of Natural Resources, Surface Water Quality Division, Report MI/DNR/SWQ-89/163, Lansing.

Taft, W.H. 1990. A biological survey of Carlson Creek at the M-28 crossing in the vicinity of Newberry, Michigan. Michigan Department of Natural Resources, Surface Water Quality Division, Report MI/DNR/SWQ-90/009, Lansing.

Taft, W.H. 1992. A biological survey of Carlson Creek, Luce County, Michigan. Michigan Department of Natural Resources, Surface Water Quality Division, Report MI/DNR/SWQ-92/207, Lansing.

Taft, W.H. 1994. A biological survey of the upper Tahquamenon River, Luce County, Michigan, July 26, 1994. Michigan Department of Natural Resources, Surface Water Quality Division, Report MI/DNR/SWQ-94/095, Lansing.

Taylor, S. 1976. A Brief History of the Tahquamenon Valley, Luce County and Newberry. The Luce County Historical Society, Newberry, Michigan.

Taylor, S. 1991. Tahquamenon Country, A Look at Its Past. Historical Society of Michigan, Ann Arbor.

Taylor, W.R. 1954. Records of fishes in the John N. Lowe collection from the Upper Peninsula of Michigan. University of Michigan, Museum of Zoology, Miscellaneous Publications 87, University of Michigan Press, Ann Arbor.

The Nature Conservancy. 2005. Indicators of Hydrologic Alteration Version 7 User's Manual. Available: http://conserveonline.org/workspaces/IHA (October 2005).

Trautman, M.B. 1942. The fishes of Ohio. Ohio State University Press, Columbus.

Trautman, M.B. 1981. Fishes of Ohio, revised edition. Ohio State University Press, Columbus.

Trial, J.G., J.G. Stanley, M. Batcheller, G. Gebhart, O.E. Maughan, P.C. Nelson, R.F. Raleigh, and J.W. Terrell. 1983. Habitat suitability index models: blacknose dace. United States Department of the Interior, Fish and Wildlife Service, Biological Report 82 (10.41), Washington, DC.

Twomey, K.A., K.L. Williamson, P.C. Nelson, and C. Armour. 1984. Habitat suitability index models: white sucker. United States Department of the Interior, Fish and Wildlife Service, Biological Report 82 (10.64), Washington, DC.

U.S. EPA. 2005a. Region 5 Report. Available: http://www.epa.gov/owm/mab/smcomm/104g/region5.pdf (June 2005).

U.S. EPA. 2005b. Storet Databank, Tahquamenon River sites. Available: http://oaspub.epa.gov/storet/dw-home.html (June 2005).

U.S.G.S. 2005. United States Geological Survey, Michigan NWIS website, Available: http://nwis.waterdata.usgs.gov/mi/nwis (June 2005).

Ward, J.V., and J.A. Stanford. 1983. The serial discontinuity concept of lotic ecosystems. Pages 29–42 *in* Dynamics of lotic environments, T.D. Fontaine, and S.M. Bartell, editors. Ann Arbor Science, Ann Arbor, Michigan.

Waybrant, J.R. In press. Annual movements and associated habitats of walleyes and muskellunge in the Tahquamenon River, Michigan. Michigan Department of Natural Resources, Fisheries Technical Report, Ann Arbor.

Wehrly, K.E., M.J. Wiley, and P.W. Seelbach. 1999. A thermal stratification classification system for lower Michigan rivers. Michigan Department of Natural Resources, Fisheries Research Report 2038, Ann Arbor.

Wesley, J.K., and J.E. Duffy. 1999. St. Joseph River assessment. Michigan Department of Natural Resources, Fisheries Special Report 24, Ann Arbor.

Wiley, M.J., S.L. Kohler, and P.W. Seelbach. 1997. Reconciling landscape and local views of aquatic communities: lessons from Michigan trout streams. Freshwater Biology 37:133–148.

Zorn, T.G., P.W. Seelbach, and M.J. Wiley. 1998. Patterns in the distributions of stream fishes in Michigan's Lower Peninsula. Michigan Department of Natural Resources, Fisheries Research Report 2035, Ann Arbor.

Zorn, T.G., P.W. Seelbach, and M.J. Wiley. 2002. Distributions of stream fishes and their relationship to stream size and hydrology in Michigan's Lower Peninsula. Transactions of the American Fisheries Society 131:70–85.

Zorn, T.G., and S.P. Sendek. 2001. Au Sable River assessment. Michigan Department of Natural Resources, Fisheries Special Report 26, Ann Arbor.

Tammy J. Newcomb, Editor
Alan D. Sutton, Graphics
Ellen S.G. Johnston, Desktop Publishing Approved by E.M. Hay-Chmielewski