

Appendix 2–2. Ancillary riffle cross-section survey data

Tables 2–2–1 through 2–2–22—Ancillary riffle cross-section survey data collected at U.S. Geological Survey streamgage stations:

- 2–2–1. 04033000 Middle Branch Ontonagon River near Paulding, Michigan (riffle cross-section at 493 feet from top of longitudinal profile)
- 2–2–2. 04033000 Middle Branch Ontonagon River near Paulding, Michigan (riffle cross-section at 1,493 feet from top of longitudinal profile)
- 2–2–3. 04046000 Black River near Garnet, Michigan (riffle cross-section at 1 feet from top of longitudinal profile)
- 2–2–4. 04046000 Black River near Garnet, Michigan (riffle cross-section at 73 feet from top of longitudinal profile)
- 2–2–5. 04096015 Galien River near Sawyer, Michigan (riffle cross-section at 542.5 feet from top of longitudinal profile)
- 2–2–6. 04096015 Galien River near Sawyer, Michigan (riffle cross-section at 1,055 feet from top of longitudinal profile)
- 2–2–7. 04096400 St. Joseph River near Burlington, Michigan (riffle cross-section at 915 feet from top of longitudinal profile)
- 2–2–8. 04096400 St. Joseph River near Burlington, Michigan (riffle cross-section at 1,915 feet from top of longitudinal profile)
- 2–2–9. 04096515 South Branch Hog Creek near Allen, Michigan (riffle cross-section at 600 feet from top of longitudinal profile)
- 2–2–10. 04096515 South Branch Hog Creek near Allen, Michigan (riffle cross-section at 962 feet from top of longitudinal profile)
- 2–2–11. 04096600 Coldwater River near Hodunk, Michigan (riffle cross-section at 249 feet from top of longitudinal profile)
- 2–2–12. 04096600 Coldwater River near Hodunk, Michigan (riffle cross-section at 995.5 feet from top of longitudinal profile)
- 2–2–13. 04097170 Portage River at W Avenue near Vicksburg, Michigan (riffle cross-section at 0 feet from top of longitudinal profile)
- 2–2–14. 04097170 Portage River at W Avenue near Vicksburg, Michigan (riffle cross-section at 670 feet from top of longitudinal profile)
- 2–2–15. 04097370 Flowerfield Creek near Flowerfield, Michigan (riffle cross-section at 107 feet from top of longitudinal profile)
- 2–2–16. 04097370 Flowerfield Creek near Flowerfield, Michigan (riffle cross-section at 892 feet from top of longitudinal profile)
- 2–2–17. 04102776 Middle Branch Black River near South Haven, Michigan (riffle cross-section at 9 feet from top of longitudinal profile)
- 2–2–18. 04102776 Middle Branch Black River near South Haven, Michigan (riffle cross-section at 715 feet from top of longitudinal profile)
- 2–2–19. 04114498 Looking Glass River near Eagle, Michigan (riffle cross-section at 468 feet from top of longitudinal profile)
- 2–2–20. 04114498 Looking Glass River near Eagle, Michigan (riffle cross-section at 1,354 feet from top of longitudinal profile)
- 2–2–21. 04129500 Pigeon River at Afton, Michigan (riffle cross-section at 316 feet from top of longitudinal profile)
- 2–2–22. 04129500 Pigeon River at Afton, Michigan (riffle cross-section at 1,048.5 feet from top of longitudinal profile)

Table 2–2–1. 04033000 Middle Branch Ontonagon River near Paulding, Michigan (riffle cross-section at 493 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	111.65	Left-end pin
0	111.39	Ground at left bank pin
1	111.41	
2	111.2	
3	111.1	
4	110.84	Bankfull
5	110.63	
6	110.43	
7	110.35	
8	110.42	
9	110.44	
10	110.43	
11	110.41	
12	110.39	
13	110.26	
14	110.17	
15	110.1	
16	109.97	
17	109.78	
18	109.57	
19	109.36	
20	109.1	
21	108.87	
22.2	108.28	
23	108.03	
24	107.64	
25	107.49	
26	107.09	
27	106.83	
28	106.67	
29	106.36	
30	105.96	
31	105.7	
32	105.5	
33	105.28	
33.5	105.1	Left edge of water
34	105.06	Cobble
35	104.97	Cobble
36	104.91	Cobble
37.2	104.89	Cobble
39	104.69	Cobble/gravel
41	104.64	Sand/gravel/boulder

Table 2–2–1. 04033000 Middle Branch Ontonagon River near Paulding, Michigan (riffle cross-section at 493 feet from top of longitudinal profile).—Continued

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
43	104.71	Sand/gravel
44.5	104.76	Boulder
46.5	104.95	Sand
48	104.84	Sand
50	104.55	Cobble
52	104.25	Cobble
54	104.27	Cobble
56	104.28	Cobble
58	104.31	Cobble
60	104.2	Boulder
62	104.11	Cobble
64	103.92	Cobble
66	103.89	Cobble
68	103.97	Boulder
70	104.27	Cobble
72	104.28	Boulder
74	104.24	Boulder
76	103.88	Cobble
78	103.73	Cobble/sand
80	103.59	Cobble/boulder
82	103.92	Boulder
84	104.05	Sand/boulder
86	105.37	Boulder, out of water
86.5	105	Right edge of water
87	105.27	
88	105.54	
89.5	105.89	
90	106.14	
91	106.59	
92	107.01	
93	107.4	
94	107.73	
95	108.21	
96	109.38	
97	110.16	
97.7	110.98	Ground at right bank pin
97.7	111.33	Right-end pin

Table 2-2-2. 04033000 Middle Branch Ontonagon River near Paulding, Michigan (riffle cross-section at 1,439 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	110.42	Left-end pin
0	110.12	Ground at left bank pin
1	110.14	
2	110.07	
4	109.72	
5	109.61	
6	109.48	
7	109.15	
8	109.01	
9	108.61	
10	108.28	
11	107.85	
12	107.7	
13	107.57	Bankfull, on small flat
14	107.42	
15	107.4	
16	107.34	
17	107.28	
18	107.16	
19	106.94	
20	106.6	
21	105.98	
22	105.26	
23	104.79	
24	104.34	
25	104	
26	103.69	
27	103.32	
29	102.89	Left edge of water
30	102.4	Sand
31	102.4	Sand
33	102.41	Sand
35	101.81	Gravel
37	101.75	Gravel
39	101.46	Gravel
41	101.33	Boulder
43	101.4	Boulder
45	101.47	Boulder
47	100.68	Boulder
49	101.71	Cobble
51	101.56	Cobble
53	101.65	Cobble
55	101.78	Cobble
57	102.12	Cobble/sand
59	102.25	Cobble/sand
61	102.34	Sand/cobble

Table 2–2–2. 04033000 Middle Branch Ontonagon River near Paulding, Michigan (riffle cross-section at 1,439 feet from top of longitudinal profile).—Continued

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
63	102.53	Cobble/sand
64	103.48	Boulder, out of water
68	103.58	
69	104.35	
70	104.88	
71	105.81	
72	106.62	
73	107.06	
74	107.98	
75	109.05	
76	109.59	
77	109.95	
78	110.68	
79	111.09	
80	111.95	
81	112.36	Ground at right bank pin
81	112.6	Right-end pin

Table 2-2-3. 04046000 Black River near Garnet, Michigan (riffle cross-section at 1 foot from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	108.35	Top of left bank pin
0	108.14	Ground at left bank pin
6	108.28	
10	107.94	
13	107.8	
15	107.4	
16	107.21	On foot trail
17	107.09	
18	106.62	
19	105.97	
20	105.31	
21	104.21	
21.5	102.92	Bankfull, on top of root mass on undercut bank
21.75	101.6	
23	101.64	At bank toe
23.4	101.61	Left edge of water
23.5	101.33	Cobble
25.5	101.27	Cobble
28	101.12	Cobble
30	100.95	Cobble
32.5	101.07	Cobble
34	101.12	Cobble
36	101.41	On boulder at water surface
38	101.07	Cobble
39.5	100.99	Cobble
41	101	Cobble
41.5	101.01	Cobble
43	101.03	Cobble
45.5	101.19	Cobble
46.5	101.4	Sand
47.5	101.4	Sand
48.5	101.33	Sand
48.6	101.62	Right edge of water
50	102.95	
52	102.74	
53	103.05	Bankfull, on top of bench
54	103.19	
56	103.46	
59	103.96	
62	104.19	
65	105.33	
70	106.63	
75	107.71	
79	107.95	

Table 2–2–3. 04046000 Black River near Garnet, Michigan (riffle cross-section at 1 foot from top of longitudinal profile).—Continued

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
84	108.76	
88	109.78	
91	110.46	
95	111.29	
98	111.97	
100	112.29	Ground at right bank pin
100	112.49	Top of right bank pin

Table 2-2-4. 04046000 Black River near Garnet, Michigan (riffle cross-section at 73 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	107.91	Top of left bank pin
0	107.7	Ground at left bank pin
2	107.81	
6	107.69	
9	107.98	
11	108.29	
13	108.05	
15	107.75	
18.5	107.43	
21	107	
23	106.72	
25	106.39	
26	106.14	On foot trail
29	106.08	
30	105.77	
31	105.53	
32	104.82	
33	104	
34	102.99	
34.5	102.64	
35	101.74	
36	101.55	
36.8	101.33	Bankfull
38	101.24	
38.8	101.14	Toe of bank on top off fallen tree
39	99.98	Left edge of water
39.2	99.93	Cobble
40	100.12	Boulder
41	100.29	Boulder
42	100.17	Boulder
43	100.31	Boulder
44	100.39	Boulder
46	100.16	Boulder
47	99.98	Cobble
48	100.32	Boulder
50	99.68	Boulder
51	99.54	Boulder
52	99.79	Boulder
53	99.96	Boulder
54	99.58	Boulder
55	99.61	Boulder
56	99.61	Boulder
57	99.53	Boulder
59	99.66	Cobble
60	99.67	Cobble
61	100.18	Cobble

Table 2–2–4. 04046000 Black River near Garnet, Michigan (riffle cross-section at 73 feet from top of longitudinal profile).—Continued

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
61.1	100.3	Right edge of water
62	101.36	Toe of bank
62.5	101.58	Bankfull, no good indicator, at base of cedar/spruce tree pair
63.5	102.07	
65	103.92	On roots of cedar/spruce pair
66	105.08	
68	107.26	
71	108.13	
74	108.72	
76.2	109.05	Ground at right bank pin
76.2	109.19	Top of right bank pin

Table 2–2–5. 04096015 Galien River near Sawyer, Michigan (riffle cross-section at 542.5 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	109.86	Left-end pin
0.1	109.71	Ground at left-end pin
3	109.73	
7	109.72	
12	109.73	
15	109.49	On mowed path
18	109.68	On mowed path
23	109.57	
26	109.55	
29	109.81	
32	109.91	
33	109.91	Field-determined bankfull
35	109.89	Left bank
36	109.39	
36.3	108.89	
37	108.33	
37.2	107.78	
38.3	106.67	
38.5	106.08	Left edge of water
38.9	105.62	Sand
39.7	105.32	Sand
41.2	105.17	Sand
42.8	105.2	Sand
45.1	105.11	Sand
46.5	105.06	Sand
48	105.04	Sand
49.1	105.03	Sand
50.4	104.96	Sand
52.1	104.94	Sand
53.4	104.93	Sand
55.2	104.9	Sand
57.6	104.9	Sand
59.6	104.77	Sand
61.3	104.68	Sand
63.1	104.65	Sand
64.3	104.73	Sand
66.3	104.81	Silt/sand
68.1	105.05	Silt/sand
69.3	105.41	Silt/sand
70.4	105.9	Silt/sand
70.5	106.08	Right edge of water
71.5	107.66	
71.7	108.83	
72.1	109.32	
73	109.55	Bankfull —top of right bank
75	109.48	

Table 2–2–5. 04096015 Galien River near Sawyer, Michigan (riffle cross-section at 542.5 feet from top of longitudinal profile).—Continued

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
77	109.43	
78	109.35	
80	109.31	Ground at right-end pin
80.1	109.44	Right-end pin

Table 2-2-6. 04096015 Galien River near Sawyer, Michigan (riffle cross-section at 1,055 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	108.8	Left-end pin
0.1	108.71	Ground at left-end pin
2	108.64	
4	108.42	
6	107.61	
8	107.03	
10	106.86	
12	108.13	
14	107.96	
16	108.01	
18	108.16	Bankfull (2)
20	107.66	
22	107.37	
24	106.71	
25	105.67	Left edge of water
26	105.18	Sand
27	104.89	Sand
28	104.88	Sand
29	104.82	Sand
30	104.75	Sand
31	104.68	Sand
32	104.65	Sand
33	104.3	Sand
35	104.46	Sand
36	104.46	Sand
37	104.44	Sand
38	104.37	Sand
39	104.35	Sand
40	104.26	Sand
41	104.25	Sand
42	104.31	Sand
43	104.41	Sand
44	104.56	Sand
45	104.62	Sand
46	104.74	Sand
47	104.85	Sand
48	104.91	Sand
49	104.95	Sand
50	104.93	Sand
51	104.94	Sand
52	104.9	Sand
53	104.91	Sand
54	104.87	Sand
55	104.82	Sand
56	104.69	Sand
57	104.52	Sand /clay

Table 2–2–6. 04096015 Galien River near Sawyer, Michigan (riffle cross-section at 1,055 feet from top of longitudinal profile).—Continued

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
58	104.37	Sand /clay
58.5	104.38	Sand /clay
59	104.57	Sand /clay
60	104.98	Sand /clay
60.5	105.72	Right edge of water
61	106.89	
61.5	107.46	
62.2	107.9	
62.6	108.57	Right bank
64	108.53	
66	108.41	
69	108.42	
70	108.39	
72	108.27	Ground at right-end pin
72.1	108.47	Right-end pin

Table 2–2–7. 04096400 St. Joseph River near Burlington, Michigan (riffle cross-section at 915 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	104.66	Left-end pin
0.1	104.6	Ground at left-end pin
6	104.77	
12	104.77	
15	104.67	
17.2	104.57	Bankfull
21	104.64	
23	104.77	
26	105.11	
28	105.14	
29.5	105.13	Field-determined bankfull
31	104.83	
32	104.04	
34	103.48	
35	103.06	Left bank edge of point bar
37	102.78	On silt flat
38.5	102.77	On silt flat
42.1	102.76	On silt flat
44.5	103.25	Top of point bar
47.2	102.72	Left edge of water/water surface elevation— edge of point bar
49	102.54	Silt
51.5	102.37	Silt/sand
55	101.88	Sand/gravel
58	101.66	Sand/gravel
62	101.68	Sand/gravel
67	101.51	Sand/gravel
71	101.43	Sand/gravel
76	101.33	Gravel/cobble
81	101.24	Cobble/gravel
87	101.32	Cobble/gravel
91	101.29	Cobble/gravel
95	101.35	Cobble/gravel
98.4	101.58	Sand/gravel
102	102.1	Sand/gravel
104	102.27	Silt/sand
105.8	102.74	Right edge of water, at base of root wad
106.5	104.43	
108	104.32	Edge of right bank
108.5	105.15	Field-determined bankfull
114	105.91	
118	106.12	Top of right bank
121.5	106.36	Right-end pin
121.6	106.19	Ground at right-end pin

Table 2–2–8. 04096400 St. Joseph River near Burlington, Michigan (riffle cross-section at 1,915 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	104.26	Left-end pin
0.1	104.12	Ground at left-end pin
6	104.13	
9	103.64	
13	103.47	
17.4	102.68	In silt slough
23.4	102.72	In silt slough
28	102.96	In silt slough
32	103.89	
41	103.41	
49	103.45	
56	103.62	
63	103.7	
71	103.84	
76	103.99	
80	104.28	
86	104.31	Field-determined bankfull
89.3	103.72	
91	103.27	
91.8	102.73	
92.2	102.31	Left edge of water
93.2	101.7	Silt
97	101.51	Silt/sand
101	101.52	Sand/gravel
106	101.63	Sand
111	101.51	Gravel
118	101.64	Gravel
128	101.51	Gravel
135	101.27	Gravel
141	101.08	Gravel
145.1	101.05	Sand/gravel interface
150	101.43	Sand
157	101.75	Sand
163	101.67	Sand
167	101.06	Silt/sand interface, added 0.43 because sank in silt
169	101.1	Silt, add 0.05 because sank in silt
171	101.09	Silt/sand
175	101.09	Silt/sand
178	101.16	Silt, add 0.8 because sank in silt
180	102.34	Right edge of water
181	102.71	
184	103.65	
187	104.09	Field-determined bankfull
195	103.95	

Table 2-2-8. 04096400 St. Joseph River near Burlington, Michigan (riffle cross-section at 1,915 feet from top of longitudinal profile).—Continued

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
202	103.58	
217	103.54	Bankfull
230	104.26	Field bankfull
235	104.25	
242	105.33	
247.5	106.27	
251	106.95	
254	108.02	
256	108.71	Ground at right-end pin
256.1	108.82	Right-end pin

Table 2–2–9. 04096515 South Branch Hog Creek near Allen, Michigan (riffle cross-section at 600 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	102.49	Left-end pin
0.1	102.93	Ground at left-end pin
2	103.01	
14	103.12	
28	103.04	
47	102.99	Bankfull
53	102.77	
56.3	102.61	Left bank
58	102.57	L edge of bank on tree root mass
58.1	101.83	Left edge of water
61.5	100.86	Gravel
64	100.69	Gravel
68	100.48	Gravel
72	100.38	Gravel
77	100.37	Gravel
82	100.69	Sand
86	101.16	Silt/sand
89	101.49	Silt
92	101.79	Right edge of water
93.5	102.12	Silt
96.5	102.84	Right bank
98.7	103.58	
100.7	104.08	Field-determined bankfull
105	104.55	
109	105.01	Top of right bank
111	104.81	
113	104.67	
117	104.75	
122	104.63	
131	104.47	
137	104.34	Ground at right-end pin
137.1	104.47	Right-end pin

Table 2-2-10. 04096515 South Branch Hog Creek near Allen, Michigan (riffle cross-section at 962 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	103.18	Left-end pin
0.1	102.93	Ground at left-end pin
6	102.99	
18	102.95	
30	102.92	Bankfull
46	102.03	Small side channel
51.2	101.77	
57	102.38	Edge of left bank
60	102.04	
62.4	101.75	Left edge of water
66	101.25	Silt
70	101.12	Silt
72.5	101.24	Silt/sand
75	101.56	Sand
79	101.5	Sand
82	101.42	Exposed sand bar
84	101.68	Exposed sand bar
86	101.1	Sand
88.9	100.74	Gravel
93	100.62	Gravel
97	100.47	Gravel
99	100.46	Gravel
101.4	100.53	Large rock
102.7	100.64	Sand/gravel
104	101.73	Right edge of water—large root mass
111	102.78	
116	103.14	
118	103.55	
121	104.11	Field-determined bankfull
125	104.52	
129	104.68	
135	104.5	
141	104.24	
143	104.06	Ground at right-end pin

Table 2–2–11. 04096600 Coldwater River near Hodunk, Michigan (riffle cross-section at 249 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	112.03	Top of left end Pin
0.1	111.93	Ground at Left end Pin
1.5	111.21	
4	110	
6	109.4	
9	108.33	
12	107.97	
15	107.6	Left edge of slough
20	106.99	
23	106.38	
28	103.37	
34.5	103.25	
39	103.34	
42.5	107.6	Right-edge of slough
47.8	107.56	Bankfull
49.2	107.52	Bankfull
52.1	106.58	Left edge of bank
52.5	105.97	Left edge of water
55	105.76	Gravel/sand
63	105.3	Gravel/sand
69	105	Cobble/sand/gravel
75	104.95	Cobble/gravel
79	104.78	Cobble/gravel
84	104.8	Cobble/gravel
88	104.81	Cobble/gravel
92	104.7	Cobble/gravel
99	104.57	Cobble/gravel
104	104.67	Cobble/gravel
110	105.01	Cobble/gravel
115	105.18	Cobble/gravel
118	105.34	Gravel
122	105.54	Silt/gravel
123.3	106.01	Right edge of water
124.2	106.14	Right edge of bank
126	107.08	
130.9	107.57	Bankfull
134	107.61	
136.7	108.43	
140	110.1	
145	111.04	
147	111.26	Top of right bank
154	110.92	
161	110.69	
171	110.71	
176.5	110.59	Ground at right-end pin
176.6	110.87	Top of right-end pin

Table 2–2–12. 04096600 Coldwater River near Hodunk, Michigan (riffle cross-section at 995.5 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	111.4	Top of left-end pin
0.1	112.18	Ground at left-end pin
1	111.9	
2	110.79	
3	109.71	
4	107.54	
4.5	107.48	Field-determined bankfull
5.3	105.45	
5.5	104.62	Left edge of water
7	104.31	Gravel/cobble
10	104.16	Gravel/cobble
13	103.84	Cobble
15	103.22	Gravel/cobble
16	103.17	Gravel/cobble
26	103.26	Gravel/cobble
29	103.11	Gravel/cobble
33	103.45	Gravel/cobble
39	103.8	Gravel/cobble
46.3	103.79	Gravel/cobble
52	103.84	Gravel/cobble
58	103.84	Gravel/cobble
64	103.89	Gravel/cobble
69	103.66	Gravel/cobble
70.9	103.77	Gravel/cobble
72	103.85	Sand
73	104.13	Sand bar
74.5	104.14	Sand
77	104.18	Sand
80	104.15	Sand
80.1	104.36	Right edge of water/large log
80.2	105.05	
84	105.03	
86	105.15	
89	105.25	
92	105.19	
94	105.18	
95.8	107.02	
99	107.24	Top of right bank
105	107.09	
109	106.94	
111	106.84	Bankfull
114	106.85	
116	106.79	
118	107	
120	107.26	
122	107.43	
124	107.66	

Table 2–2–12. 04096600 Coldwater River near Hodunk, Michigan (riffle cross-section at 995.5 feet from top of longitudinal profile).—Continued

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
126	107.98	
129	108.07	
134	107.69	
138	107.57	
140.2	107.55	Top of right-end pin
140.3	107.42	Ground at right-end pin

Table 2–2–13. 04097170 Portage River at W Avenue near Vicksburg, Michigan (riffle cross-section at 0 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	105.16	Top of left-end pin
0.1	105.01	Ground at left-end pin
5	105.15	
10	104.93	
15	104.83	
24	104.8	Bankfull
32	104.78	
38	104.77	
43	104.71	
46	104.6	
48.5	104.19	Left bank
48.6	103.79	Left edge of water
48.7	103.33	Silt
49.5	103.32	Silt
52	102.86	Silt
53	102.81	Silt
55.9	102.79	Sand/gravel
59	102.68	Sand/gravel
60.7	102.66	Sand/gravel
62	102.66	Sand/gravel
64	102.56	Sand/gravel
66	102.59	Sand/gravel/vegetation
69	102.73	Sand/gravel/vegetation
72	102.54	Sand/gravel/vegetation
75	102.41	Sand/gravel/vegetation
79	102.34	Cobble/gravel/sand
83	102.36	Gravel/sand
87	102.36	Sand/gravel
91	102.35	Sand/gravel
95	102.81	Silt w/ arrowhead
100	103.08	Silt w/ arrowhead
104	103.58	Silt
104.5	103.71	Right edge of water
105.5	104.22	Right bank
108	104.62	
111	104.69	
114	104.71	
119	104.83	Bankfull
124	104.82	
131	105.01	
135	104.93	Top of right-end pin
135.1	104.8	Ground at right-end pin

Table 2–2–14. 04097170 Portage River at W Avenue near Vicksburg, Michigan (riffle cross-section at 670 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	107.61	Ground at left-end pin—no permanent pin (in landowners backyard)
6	107.36	
13	106.82	
17	106.53	
20	106.1	
24	105.87	
27	105.45	
29.5	105.04	Field-determined bankfull
31.5	104.83	
33	104.27	
34	103.59	Left edge of water
35	103.27	Silt
38	102.87	Silt/sand interface
40	102.63	Sand/gravel
43	102.39	Gravel
45	102.23	Sand/gravel/silt
49	102.11	Sand/gravel/vegetation
52	102.16	Sand/gravel
55	102.29	Sand
59	102.31	Sand/gravel
63	102.37	Sand/gravel
66	102.45	Sand/gravel
69	102.53	Sand
73	102.29	Sand/gravel
76.5	102.34	Silt/sand interface
78	102.35	Silt
79.5	102.77	Silt
79.8	103.57	Right edge of water
81	104.29	
82	104.58	
85	104.66	Field-determined bankfull
96	104.51	
97	104.23	Bankfull
103	104.34	
111	104.42	
118	104.44	
122	104.61	Top of right-end pin
122.1	104.45	Ground at right-end pin

Table 2-2-15. 04097373 Flowerfield Creek near Flowerfield, Michigan (riffle cross-section at 107 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	104.34	Left-end pin
0.1	104.18	Ground at Left-end pin
4	104.31	
9	103.97	
17	103.37	
24	103.02	
31	103.07	
40.2	103.15	
44.1	100.9	Left edge of water
44.2	100.5	Silt/sand
47	100.25	Silt/sand
52	100.12	Sand
55	100	Sand
58	100.01	Sand/gravel
61	99.98	Sand/gravel
63	100.08	Sand
65	100.15	Sand
66.4	100.43	Sand
66.8	100.91	Right edge of water
67	101.21	Bank toe
69.5	101.43	
73	101.88	
79.5	102.14	
85.5	102.13	Ground at right-end pin
85.6	102.3	Right-end pin
86.6	102.16	Start of extension
87.6	102.05	
88.6	101.96	
89.6	101.9	
90.6	101.95	Bankfull
91.6	101.98	
92.6	102.04	
93.6	102	
94.6	101.92	
95.6	101.97	
96.6	102.02	
97.6	101.97	
98.6	102.16	
99.6	102.28	
100.6	102.46	
101.6	102.6	
102.6	102.85	
103.6	103.05	
104.6	103.14	
105.6	103.17	
106.6	103.1	

Table 2–2–15. 04097373 Flowerfield Creek near Flowerfield, Michigan (riffle cross-section at 107 feet from top of longitudinal profile).—Continued

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
107.6	103.2	
108.6	103.22	
109.6	103.14	
110.6	103.05	
111.6	103.02	
112.6	103.04	
113.6	103.08	
113.8	103.12	At candy cane pin at edge of small clearing next to thick shrubs

Table 2–2–16. 04097373 Flowerfield Creek near Flowerfield, Michigan (riffle cross-section at 892 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	100.95	Top of left-end pin
0.5	100.84	Ground at left-end pin
4	100.78	
9	100.44	
11	100.4	
14	100.06	
18	100.01	
21	99.85	Bankfull
24	99.96	
26	99.84	
27.6	99.14	Field-determined bankfull
28.2	98.6	Silt
29	98.5	Silt/sand
31	98.54	Silt
33	98.23	Sand/gravel
37	98.38	Sand-streambed vegetation
40	98.9	Sand-streambed vegetation
43	98.65	Sand/gravel-streambed vegetation
46	98.74	Sand-streambed vegetation
47	98.75	Gravel/sand-streambed vegetation
50	98.84	Sand/gravel-streambed vegetation
53	98.85	Sand/gravel-streambed vegetation
55	98.88	Sand-streambed vegetation
60	98.72	Sand-streambed vegetation
62	98.57	Very fine sand-streambed vegetation
63.6	98.59	Sand
64	98.59	Sand
65.3	99.19	Field-determined bankfull
67	99.97	
68.8	100.43	
70	100.89	
74	101.29	
77.5	100.98	
80	100.9	
82	100.98	Top of right-end pin
82.1	100.89	Ground at right-end pin

Table 2–2–17. 04102776 Middle Branch Black River near South Haven, Michigan (riffle cross-section at 9 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	106.22	Left-end pin
0.1	106.12	Ground at left-end pin
2	106.11	
3	106.08	
5	105.99	
6.1	105.98	Field-determined bankfull
8	105.98	
9	106.06	
10	106.02	
11	105.94	
12	105.61	Left bank
12.4	104.88	
12.9	104.33	
13	103.35	On bank toe
13.5	102.83	On bank toe
13.9	102.64	Left edge of water
14.3	102.29	Silt
15.5	101.82	Silt
17	101.27	Silt
18	100.95	Silt
20	100.75	Silt
22.2	100.62	Fine sand
24.5	101.25	Sand
27	101.2	Sand
29	101.16	Sand
30	101.16	Sand
31	101.11	Sand
32	101.13	Sand
33	101.25	Sand
34	101.37	Sand
35	101.53	Sand
36	101.56	Sand
37	101.76	Sand
38	101.92	Sand
39	102.01	Sand
40	101.96	Sand
41	102.06	Sand
42	102.03	Sand
43	102.03	Sand
44	102.15	Sand
45	102.37	Silt/sand
46.6	102.61	Silt/sand
46.7	102.65	Right edge of water
47	102.77	On silt flat
48	102.9	On silt flat

Table 2-2-17. 04102776 Middle Branch Black River near South Haven, Michigan (riffle cross-section at 9 feet from top of longitudinal profile).—Continued

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
49	103.2	On low terrace
50	103.49	On low terrace
51	103.77	On low terrace
52	104.06	On low terrace
53	104.46	On slope
54	104.68	On slope
55	104.8	On slope
56	105.66	On high terrace
57	105.8	Bankfull
58	105.78	
60	105.69	
62	105.71	
64	105.47	
65	105.46	
67	105.22	
68	105.01	
69	104.88	
69.9	104.76	Ground at right-end pin
70	104.97	Right-end pin

Table 2–2–18. 04102776 Middle Branch Black River near South Haven, Michigan (riffle cross-section at 715 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	105.12	Left-end pin
0.1	105.07	Ground at left-end pin
2	105.13	
5	104.96	
9	104.37	
12	104.1	
15	104.14	
18	104.11	
20	104.07	
22	104.36	
25	104.45	
27	104.66	
28	104.71	
30	104.95	
31	105	Bankfull
32	104.74	
32.6	104.42	Left bank
32.5	103.02	Left edge of water
32.9	104.14	On bank edge
33	101.89	Silt/sand
34	101.53	Sand
35	101.32	Sand
36	101.33	Sand
37.3	101.58	Sand
38	101.71	Sand
40	101.62	Sand
42	101.58	Sand
43	101.68	Sand
44	101.69	Sand
46	101.7	Sand
48	101.88	Sand
50	101.89	Sand
52	101.95	Sand
54	101.92	Sand
56	101.97	Sand
58	102.05	Sand
60	102.07	Sand
62	101.72	Sand
63	101.65	Sand
64	101.75	Sand
65	102.11	Sand
67	102.23	Sand
69	102.78	Silt
69.1	103.04	Right edge of water
69.6	103.26	
70.6	104.06	

Table 2-2-18. 04102776 Middle Branch Black River near South Haven, Michigan (riffle cross-section at 715 feet from top of longitudinal profile).—Continued

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
71.2	104.93	Right bank
72	105.16	Field-determined bankfull
73	105.2	
76	105.25	
78	105.03	
83	104.67	
91	104.69	
95	104.63	
98.4	104.64	Ground at right-end pin
98.5	104.77	Right-end pin

Table 2–2–19. 04114498 Looking Glass River near Eagle, Michigan (riffle cross-section at 468 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	108.55	Left-end pin
0	108.35	Ground at left bank pin
1	108.38	
3	108.23	
5	108.16	
7	107.99	
9	107.68	
11	107.16	Left edge of side slough
13	106.5	
14	106.25	
15	105.9	
16	105.69	
17	105.52	
18	105.32	
19	105.2	
20	105.06	
21	105.02	
22	104.99	
23	104.96	
25	104.94	
26	105.08	
27	105.15	
28	105.25	
30	105.66	Right edge of side slough
31	105.52	
32	105.9	
34	105.52	
36	105.89	
37	105.89	
39	105.81	
42	105.71	
44	105.65	
46	105.59	
48	105.46	
50	105.2	
52	105.08	
54	104.79	
55.1	104.5	
56	103.82	
56.1	103.58	Left edge of water
57	103.37	Silt
58	103.16	Silt/sand interface
59	103.16	Sand/gravel
60	103.15	Sand/gravel
62	103.17	Sand/gravel
64	103.13	Sand/gravel

Table 2–2–19. 04114498 Looking Glass River near Eagle, Michigan (riffle cross-section at 468 feet from top of longitudinal profile).—Continued

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
66	103.06	Sand/gravel
68	103.01	Sand/gravel
70	102.9	Sand/gravel
72	102.81	Sand/gravel
74	102.84	Sand/gravel
76	102.76	Sand/gravel
78	102.8	Sand/gravel
80	102.8	Sand/gravel
82	102.73	Sand/gravel
84	102.8	Sand/gravel/cobble
86	102.74	Sand/gravel/cobble
88	102.83	Sand/gravel/cobble
90	102.72	Sand/gravel/cobble
92	102.65	Sand/gravel/cobble
94	102.7	Cobble/gravel
96	102.74	Cobble/gravel
98	102.87	Cobble/gravel
100	102.86	Cobble/gravel
102	102.85	Cobble/gravel
104	102.8	Cobble/gravel
106	102.82	Cobble/gravel
108	102.77	Cobble/gravel
110	102.73	Cobble/gravel
112	102.81	Cobble/gravel
114	102.96	Cobble/gravel
116	102.94	Cobble/gravel
118	103.05	Cobble/gravel
120	103.2	Cobble/gravel
122	103.2	Cobble/gravel
124	103.18	Cobble/gravel
126	103.18	Cobble/silt
128	103.27	Cobble/silt
132	103.59	Right edge of water
133.2	103.66	On silt flat
135	103.7	On silt flat
137	103.89	On silt flat
140	103.92	On silt flat
141	104.1	On silt flat
143	104.23	On silt flat
144.1	104.36	Right edge of bank
144.8	105.88	
145.5	106.35	
146	106.62	
147	106.92	
148	107.02	Bankfull
151	107.28	

Table 2–2–19. 04114498 Looking Glass River near Eagle, Michigan (riffle cross-section at 468 feet from top of longitudinal profile).—Continued

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
155	107.84	
163	108.06	
166	108.49	Ground at right bank pin
166	108.62	Right-end pin

Table 2–2–20. 04114498 Looking Glass River near Eagle, Michigan (riffle cross-section at 1,354 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	107.01	Left-end pin
0	106.88	Ground at left bank pin
3	106.96	
6	106.58	
9	106.09	
12	105.91	
16	105.62	
19	105.68	
22	105.64	
25	105.73	
29	105.71	Bankfull
30	105.57	
31	105.39	
32	104.62	
33	104.18	
34	103.98	
35	103.83	
36	103.82	Left edge of silt flat
38	103.72	On silt flat
40	103.61	On silt flat
42	103.42	On silt flat
45	103.26	On silt flat
47	103.34	On silt flat
51	102.93	On silt flat
52	102.94	Left edge of water
55	102.93	Silt
57	102.84	Silt
58	102.62	Silt; edge of vegetation
59	102.46	Sand/gravel
60	102.28	Sand/gravel
62	102.14	Sand/gravel
64	102.05	Sand/gravel
66	101.98	Sand/gravel
68	102.08	Sand/gravel
70	102.1	Sand/gravel
72	102.12	Sand/gravel
75	102	Sand/gravel
77	102.03	Sand/gravel
79	102.1	Sand/gravel
81	101.94	Sand/gravel/vegetation
83	102.03	Sand/gravel/vegetation
85	101.98	Sand/gravel/vegetation
87	101.92	Sand/gravel/vegetation
89	101.9	Sand/gravel/vegetation
91	101.85	Sand/gravel/vegetation
93	101.84	Sand/gravel/vegetation

Table 2–2–20. 04114498 Looking Glass River near Eagle, Michigan (riffle cross-section at 1,354 feet from top of longitudinal profile).—Continued

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
95	101.8	Sand/gravel/vegetation
97	101.85	Sand/gravel/vegetation
99	101.92	Sand/gravel/vegetation
101	101.97	Sand/gravel/vegetation
103	102.05	Sand/gravel
105	102.14	Sand/gravel
107	102.14	Sand/gravel
109	102.15	Sand/gravel
111	102.13	Sand/gravel
113	102.19	Sand/gravel
115	102.2	Sand/gravel
117	102.22	Sand/gravel
119	102.26	Sand/gravel
122	102.08	Sand/gravel
123	102.01	Sand
125	102.05	Sand /silt interface
127	101.98	Silt
129	102.25	Silt
130.7	102.37	Silt
131	102.94	Right edge of water
131.9	103.36	
132.5	104.04	
133	104.32	
134	104.59	
135	104.78	
137	104.89	Field-determined bankfull
139	105.17	
141	105.64	
142	105.91	
145	106.32	Streamward side of large log
148	106.56	Landward side of large log
150	106.49	
153	106.42	
154.2	106.3	Ground at right bank pin
154.2	106.43	Right-end pin

Table 2–2–21. 04129500 Pigeon River at Afton, Michigan (riffle cross-section at 316 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	107.24	Left-end pin
0	107.04	Ground at left bank pin
1	106.87	
2	107.27	
3	106.35	
4	105.62	
5	105.31	
6	104.68	
7	104.25	
8	103.68	
9	103.45	Field-determined bankfull
10	103.4	
11	103.28	
12	102.85	
13	102.25	Left edge of water
13.5	100.94	Gravel
14	100.9	Gravel
15	100.79	Gravel
16	100.81	Cobble
17	101.05	Cobble
18	101.13	Cobble
19	101.42	Cobble
20	101.42	Cobble
21	101.35	Cobble
22	101.41	Cobble
23	101.43	Cobble
24	101.43	Cobble
25	101.41	Cobble
26	101.37	Cobble
27	101.45	Cobble
28	101.42	Cobble
29	101.54	Cobble
30	101.63	Cobble
31	101.59	Cobble
32	101.66	Cobble
33	101.71	Cobble
34	101.6	Cobble
35	101.55	Cobble
36	101.62	Cobble
37	101.64	Cobble
38	101.7	Cobble
39	101.6	Cobble
40	101.63	Cobble
41	101.68	Cobble

Table 2–2–21. 04129500 Pigeon River at Afton, Michigan (riffle cross-section at 316 feet from top of longitudinal profile).—Continued

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
42	101.7	Cobble
43	101.63	Cobble
44	101.6	Cobble
45	101.5	Cobble
46	101.48	Cobble
47	101.57	Cobble
48	101.47	Cobble
49	101.5	Cobble
50	101.57	Cobble
51	101.56	Cobble
52	101.62	Cobble
53	101.66	Cobble
54	101.7	Cobble
55	101.74	Cobble/gravel
56	101.69	Gravel
57	101.71	Sand/gravel
58	101.66	Sand/gravel
59	101.71	Sand/gravel
60	101.94	Sand/gravel
60.1	102.32	Right edge of water
61	103.23	
62	103.6	
63	103.81	
64	103.88	
65	103.72	Bankfull
67	103.76	
70	103.79	Ground at right bank pin
70	104.05	Right-end pin

Table 2-2-22. 04129500 Pigeon River at Afton, Michigan (riffle cross-section at 1,048.5 feet from top of longitudinal profile).

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
0	102.02	Left-end pin
0	101.78	
1	101.78	
2	101.84	
3	101.83	
4	101.86	
5	101.93	
6	101.81	
7	101.92	
8	101.96	
9	102.01	
10	101.93	
11	102.02	
12	101.97	
13	101.99	
14	102.01	
15	102.05	Bankfull
16	102.01	
17	101.98	
18	101.68	
18.8	101.17	
18.9	99.91	Left edge of water
18.95	99.61	Sand/gravel
20	99	Sand/gravel
21	98.84	Sand/gravel
22	98.65	Sand/gravel
23	98.55	Sand/gravel
24	98.5	Sand/gravel
25	98.53	Gravel
26	98.55	Gravel
27	98.52	Gravel
28	98.57	Gravel/cobble
29	98.63	Gravel/cobble
30	98.65	Gravel/cobble
31	98.64	Gravel/cobble
32	98.69	Cobble/gravel
33	98.76	Cobble/gravel
34	98.8	Cobble/gravel
35	98.89	Cobble/gravel
36	98.99	Cobble/gravel
37	99.12	Cobble/gravel
38	99.28	Cobble/gravel
39	99.4	Cobble/gravel
40	99.39	Cobble/gravel
41	99.43	Cobble/gravel

Table 2–2–22. 04129500 Pigeon River at Afton, Michigan (riffle cross-section at 1,048.5 feet from top of longitudinal profile).—Continued

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
42	99.51	Cobble/gravel
43	99.6	Cobble/gravel
44	99.64	Cobble/gravel
45	99.66	Cobble/gravel
46	99.73	Cobble/gravel
47	99.82	Cobble/gravel
48	99.73	Cobble/gravel
49	99.67	Cobble/gravel
50	99.65	Cobble/gravel
51	99.56	Cobble/gravel
52	99.56	Cobble/gravel
53	99.57	Cobble/gravel
54	99.39	Cobble/gravel
55	99.35	Sand/gravel
56	99.28	Sand/gravel
57	99.29	Sand/gravel
58	99.06	Sand/gravel
59	98.99	Sand/gravel
60	98.98	Sand/gravel
61	98.97	Sand/gravel
62	98.89	Sand/gravel
63	98.91	Sand/gravel
64	98.74	Sand/gravel
65	98.69	Sand/gravel
66	98.72	Sand/gravel
67	99.85	
67.1	99.87	Right edge of water
68.1	99.99	
69	100.58	
70	100.85	
71	100.88	
72	100.95	
73	101.04	
74	101.09	
76	100.94	
77	100.9	
78	100.9	
79	101.12	
80	101.21	
82	101.28	
84	101.28	
86	101.21	
88	101.18	
90	101.05	
92	101.05	
94	101	

Table 2-2-22. 04129500 Pigeon River at Afton, Michigan (riffle cross-section at 1,048.5 feet from top of longitudinal profile).—Continued

[ft, foot; elevations are relative to streamgage datum]

Distance from left-end pin (ft)	Elevation (ft)	Comment
97	100.92	
99	100.79	
101	100.74	
103	100.82	
105	100.88	
107	100.98	
108	101.17	
108.5	101.29	
109	101.45	
109.5	101.65	
110	101.93	Bankfull
111	102.22	
112	102.5	
113	102.63	
114	102.81	
115	102.97	
116	103.12	
116.5	103.1	Ground at right bank pin
116.5	103.27	Right-end pin

