

Appendix 3–1. Riffle pebble-count data

Tables 3–1–1 through 3–1–59—Riffle pebble-count data collected at U.S. Geological Survey streamgage stations:

- 3–1–1. 04033000 Middle Branch Ontonagon River near Paulding, Michigan (riffle cross-section at 90 feet from top of longitudinal profile)
- 3–1–2. 04033000 Middle Branch Ontonagon River near Paulding, Michigan (riffle cross-section at 493 feet from top of longitudinal profile)
- 3–1–3. 04033000 Middle Branch Ontonagon River near Paulding, Michigan (riffle cross-section at 1,493 feet from top of longitudinal profile)
- 3–1–4. 04046000 Black River near Garnet, Michigan (riffle cross-section at 1 foot from top of longitudinal profile)
- 3–1–5. 04046000 Black River near Garnet, Michigan (riffle cross-section at 73 feet from top of longitudinal profile)
- 3–1–6. 04046000 Black River near Garnet, Michigan (riffle cross-section at 426 feet from top of longitudinal profile)
- 3–1–7. 04096015 Galien River near Sawyer, Michigan (riffle cross-section at 542.5 feet from top of longitudinal profile)
- 3–1–8. 04096015 Galien River near Sawyer, Michigan (riffle cross-section at 741.5 feet from top of longitudinal profile)
- 3–1–9. 04096015 Galien River near Sawyer, Michigan (riffle cross-section at 1,055 feet from top of longitudinal profile)
- 3–1–10. 04096340 St. Joseph River at Clarendon, Michigan (riffle cross-section at 0 feet from top of longitudinal profile)
- 3–1–11. 04096400 St. Joseph River near Burlington, Michigan (riffle cross-section at 915 feet from top of longitudinal profile)
- 3–1–12. 04096400 St. Joseph River near Burlington, Michigan (riffle cross-section at 1,047.5 feet from top of longitudinal profile)
- 3–1–13. 04096400 St. Joseph River near Burlington, Michigan (riffle cross-section at 1,915 feet from top of longitudinal profile)
- 3–1–14. 04096405 St. Joseph River at Burlington, Michigan (riffle cross-section at 412 feet from top of longitudinal profile)
- 3–1–15. 04096515 South Branch Hog Creek near Allen, Michigan (riffle cross-section at 600 feet from top of longitudinal profile)
- 3–1–16. 04096515 South Branch Hog Creek near Allen, Michigan (riffle cross-section at 793 feet from top of longitudinal profile)
- 3–1–17. 04096515 South Branch Hog Creek near Allen, Michigan (riffle cross-section at 962 feet from top of longitudinal profile)
- 3–1–18. 04096600 Coldwater River near Hodunk, Michigan (riffle cross-section at 249 feet from top of longitudinal profile)
- 3–1–19. 04096600 Coldwater River near Hodunk, Michigan (riffle cross-section at 995.5 feet from top of longitudinal profile)
- 3–1–20. 04096600 Coldwater River near Hodunk, Michigan (riffle cross-section at 1,291 feet from top of longitudinal profile)
- 3–1–21. 04097170 Portage River at W Avenue near Vicksburg, Michigan (riffle cross-section at 0 feet from top of longitudinal profile)
- 3–1–22. 04097170 Portage River at W Avenue near Vicksburg, Michigan (riffle cross-section at 670 feet from top of longitudinal profile)
- 3–1–23. 04097170 Portage River at W Avenue near Vicksburg, Michigan (riffle cross-section at 752 feet from top of longitudinal profile)
- 3–1–24. 04097370 Flowerfield Creek near Flowerfield, Michigan (riffle cross-section at 8 feet from top of longitudinal profile)
- 3–1–25. 04097370 Flowerfield Creek near Flowerfield, Michigan (riffle cross-section at 107 feet from top of longitudinal profile)
- 3–1–26. 04097370 Flowerfield Creek near Flowerfield, Michigan (riffle cross-section at 892 feet from top of longitudinal profile)
- 3–1–27. 04097540 Prairie River near Nottawa, Michigan (riffle cross-section at 159.2 feet from top of longitudinal profile)
- 3–1–28. 04102776 Middle Branch Black River near South Haven, Michigan (riffle cross-section at 9 feet from top of longitudinal profile)
- 3–1–29. 04102776 Middle Branch Black River near South Haven, Michigan (riffle cross-section at 347 feet from top of longitudinal profile)
- 3–1–30. 04102776 Middle Branch Black River near South Haven, Michigan (riffle cross-section at 715 feet from top of longitudinal profile)
- 3–1–31. 04103010 Kalamazoo River near Marengo, Michigan (riffle cross-section at 949 feet from top of longitudinal profile)
- 3–1–32. 04104945 Wanadoga Creek near Battle Creek, Michigan (riffle cross-section at 1,551 feet from top of longitudinal profile)
- 3–1–33. 04105700 Augusta Creek near Augusta, Michigan (riffle cross-section at 91 feet from top of longitudinal profile)
- 3–1–34. 04108600 Rabbit River near Hopkins, Michigan (riffle cross-section at 0 feet from top of longitudinal profile)
- 3–1–35. 04111379 Red Cedar River near Williamston, Michigan (riffle cross-section at 539.5 feet from top of longitudinal profile)
- 3–1–36. 04111500 Deer Creek near Dansville, Michigan (riffle cross-section at 106 feet from top of longitudinal profile)
- 3–1–37. 04114498 Looking Glass River near Eagle, Michigan (riffle cross-section at 468 feet from top of longitudinal profile)
- 3–1–38. 04114498 Looking Glass River near Eagle, Michigan (riffle cross-section at 918 feet from top of longitudinal profile)
- 3–1–39. 04114498 Looking Glass River near Eagle, Michigan (riffle cross-section at 1,354 feet from top of longitudinal profile)
- 3–1–40. 04117500 Thornapple River near Hastings (riffle cross-section at 1,567 feet from top of longitudinal profile)

- 3-1-41. 04122230 North Branch Pentwater River near Pentwater, Michigan (riffle cross-section at 447 feet from top of longitudinal profile)
- 3-1-42. 04123000 Big Sable River near Freesoil, Michigan (riffle cross-section at 854 feet from top of longitudinal profile)
- 3-1-43. 04124500 East Branch Pine River near Tustin, Michigan (riffle cross-section at 570 feet from top of longitudinal profile)
- 3-1-44. 04125460 Pine River at High School Bridge near Hoxeyville, Michigan (riffle cross-section at 323 feet from top of longitudinal profile)
- 3-1-45. 04128000 Sturgeon River near Wolverine, Michigan (riffle cross-section at 445 feet from top of longitudinal profile)
- 3-1-46. 04129500 Pigeon River at Afton, Michigan (riffle cross-section at 0 feet from top of longitudinal profile)
- 3-1-47. 04129500 Pigeon River at Afton, Michigan (riffle cross-section at 316 feet from top of longitudinal profile)
- 3-1-48. 04129500 Pigeon River at Afton, Michigan (riffle cross-section at 1,048.5 feet from top of longitudinal profile)
- 3-1-49. 04135700 South Branch Au Sable River near Luzerne, Michigan (riffle cross-section at 732.5 feet from top of longitudinal profile)
- 3-1-50. 04146063 South Branch Flint River near Columbiaville, Michigan (riffle cross-section at 179 feet from top of longitudinal profile)
- 3-1-51. 04150500 Cass River at Cass City, Michigan (riffle cross-section at 0 feet from top of longitudinal profile)
- 3-1-52. 04159900 Mill Creek near Avoca, Michigan (riffle cross-section at 183 feet from top of longitudinal profile)
- 3-1-53. 04160600 Belle River at Memphis, Michigan (riffle cross-section at 580 feet from top of longitudinal profile)
- 3-1-54. 04160800 Sashabaw Creek near Drayton Plains, Michigan (riffle cross-section at 366 feet from top of longitudinal profile)
- 3-1-55. 04161580 Stony Creek near Romeo, Michigan (riffle cross-section at 226 feet from top of longitudinal profile)
- 3-1-56. 04161760 West Branch Stony Creek near Washington, Michigan (riffle cross-section at 15 feet from top of longitudinal profile)
- 3-1-57. 04164050 North Branch Clinton River at 33 Mile Road near Romeo, Michigan (riffle cross-section at 869 feet from top of longitudinal profile)
- 3-1-58. 04164150 North Branch Clinton River near Meade, Michigan (riffle cross-section at 1,405 feet from top of longitudinal profile)
- 3-1-59. 04172500 Portage River at Tiplady Road near Pinckney, Michigan (riffle cross-section at 574 feet from top of longitudinal profile)

Table 3–1–1. 04033000 Middle Branch Ontonagon River near Paulding, Michigan (riffle cross-section at 90 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	17	17	17
0.062 – 0.125	0	0	17
0.125 – 0.25	10	10	27
0.25 – 0.50	6	6	33
0.50 – 1.0	2	2	35
1.0 – 2.0	1	1	36
2.0 – 4.0	4	4	40
4.0 – 5.7	1	1	41
5.7 – 8.0	0	0	41
8.0 – 11.3	3	3	44
11.3 – 16.0	3	3	47
16.0 – 22.6	3	3	50
22.6 – 32.0	11	11	60
32 – 45	7	7	67
45 – 64	7	7	74
64 – 90	3	3	77
90 – 128	1	1	78
128 – 180	4	4	82
180 – 256	4	4	86
256 – 362	2	2	88
362 – 512	0	0	88
512 – 1024	0	0	88
1024 – 2048	12	12	100
Bedrock	0	0	100
Total particles	101		

Table 3–1–2. 04033000 Middle Branch Ontonagon River near Paulding, Michigan (riffle cross-section at 493 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	7	7	7
0.062 – 0.125	0	0	7
0.125 – 0.25	14	14	21
0.25 – 0.50	22	22	43
0.50 – 1.0	3	3	46
1.0 – 2.0	0	0	46
2.0 – 4.0	1	1	47
4.0 – 5.7	0	0	47
5.7 – 8.0	1	1	48
8.0 – 11.3	5	5	54
11.3 – 16.0	1	1	55
16.0 – 22.6	0	0	55
22.6 – 32.0	2	2	57
32 – 45	6	6	63
45 – 64	4	4	67
64 – 90	10	10	77
90 – 128	4	4	81
128 – 180	6	6	87
180 – 256	7	7	94
256 – 362	2	2	96
362 – 512	1	1	97
512 – 1024	0	0	97
1024 – 2048	3	3	100
Bedrock	0	0	100
Total particles	99		

Table 3–1–3. 04033000 Middle Branch Ontonagon River near Paulding, Michigan (riffle cross-section at 1,439 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	9	8	8
0.062 – 0.125	0	0	8
0.125 – 0.25	20	18	27
0.25 – 0.50	17	16	42
0.50 – 1.0	8	7	50
1.0 – 2.0	3	3	52
2.0 – 4.0	1	1	53
4.0 – 5.7	0	0	53
5.7 – 8.0	1	1	54
8.0 – 11.3	7	6	61
11.3 – 16.0	7	6	67
16.0 – 22.6	1	1	68
22.6 – 32.0	4	4	72
32 – 45	11	10	82
45 – 64	7	6	88
64 – 90	6	6	94
90 – 128	2	2	95
128 – 180	1	1	96
180 – 256	3	3	99
256 – 362	0	0	99
362 – 512	0	0	99
512 – 1024	0	0	99
1024 – 2048	1	1	100
Bedrock	0	0	100
Total particles	109		

Table 3–1–4. 04046000 Black River near Garnet, Michigan (riffle cross-section at 1 foot from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	0	0	0
0.062 – 0.125	4	4	4
0.125 – 0.25	11	11	15
0.25 – 0.50	4	4	19
0.50 – 1.0	2	2	21
1.0 – 2.0	1	1	22
2.0 – 4.0	0	0	22
4.0 – 5.7	0	0	22
5.7 – 8.0	1	1	23
8.0 – 11.3	2	2	25
11.3 – 16.0	1	1	26
16.0 – 22.6	2	2	28
22.6 – 32.0	0	0	28
32 – 45	4	4	32
45 – 64	16	16	48
64 – 90	18	18	65
90 – 128	14	14	79
128 – 180	7	7	86
180 – 256	9	9	95
256 – 362	0	0	95
362 – 512	0	0	95
512 – 1024	5	5	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	101		

Table 3–1–5. 04046000 Black River near Garnet, Michigan (riffle cross-section at 73 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	0	0	0
0.062 – 0.125	0	0	0
0.125 – 0.25	1	1	1
0.25 – 0.50	13	13	14
0.50 – 1.0	0	0	14
1.0 – 2.0	0	0	14
2.0 – 4.0	0	0	14
4.0 – 5.7	0	0	14
5.7 – 8.0	0	0	14
8.0 – 11.3	0	0	14
11.3 – 16.0	0	0	14
16.0 – 22.6	0	0	14
22.6 – 32.0	0	0	14
32 – 45	0	0	14
45 – 64	4	4	18
64 – 90	16	16	34
90 – 128	21	21	54
128 – 180	14	14	68
180 – 256	9	9	77
256 – 362	4	4	81
362 – 512	0	0	81
512 – 1024	3	3	84
1024 – 2048	16	16	100
Bedrock	0	0	100
Total particles	101		

Table 3–1–6. 04046000 Black River near Garnet, Michigan (riffle cross-section at 426 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	0	0	0
0.062 – 0.125	0	0	0
0.125 – 0.25	1	1	1
0.25 – 0.50	22	22	23
0.50 – 1.0	1	1	24
1.0 – 2.0	0	0	24
2.0 – 4.0	0	0	24
4.0 – 5.7	0	0	24
5.7 – 8.0	1	1	25
8.0 – 11.3	0	0	25
11.3 – 16.0	2	2	26
16.0 – 22.6	1	1	27
22.6 – 32.0	0	0	27
32 – 45	2	2	29
45 – 64	15	15	44
64 – 90	8	8	52
90 – 128	6	6	58
128 – 180	10	10	68
180 – 256	11	11	78
256 – 362	7	7	85
362 – 512	6	6	91
512 – 1024	9	9	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	102		

Table 3–1–7. 04096015 Galien River near Sawyer, Michigan (riffle cross-section at 542.5 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	27	21	21
0.062 – 0.125	16	13	34
0.125 – 0.25	33	26	60
0.25 – 0.50	21	17	76
0.50 – 1.0	21	17	93
1.0 – 2.0	7	6	98
2.0 – 4.0	0	0	98
4.0 – 5.7	1	1	99
5.7 – 8.0	0	0	99
8.0 – 11.3	1	1	100
11.3 – 16.0	0	0	100
16.0 – 22.6	0	0	100
22.6 – 32.0	0	0	100
32 – 45	0	0	100
45 – 64	0	0	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	127		

Table 3–1–8. 04096015 Galien River near Sawyer, Michigan (riffle cross-section at 741.5 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	25	22	22
0.062 – 0.125	21	19	41
0.125 – 0.25	34	30	71
0.25 – 0.50	9	8	79
0.50 – 1.0	9	8	88
1.0 – 2.0	5	4	92
2.0 – 4.0	2	2	94
4.0 – 5.7	3	3	96
5.7 – 8.0	3	3	99
8.0 – 11.3	1	1	100
11.3 – 16.0	0	0	100
16.0 – 22.6	0	0	100
22.6 – 32.0	0	0	100
32 – 45	0	0	100
45 – 64	0	0	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	112		

Table 3–1–9. 04096015 Galien River near Sawyer, Michigan (riffle cross-section at 1,055 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	14	11	11
0.062 – 0.125	4	3	15
0.125 – 0.25	46	38	52
0.25 – 0.50	29	24	76
0.50 – 1.0	5	4	80
1.0 – 2.0	15	12	93
2.0 – 4.0	3	2	95
4.0 – 5.7	1	1	96
5.7 – 8.0	3	2	98
8.0 – 11.3	1	1	99
11.3 – 16.0	1	1	100
16.0 – 22.6	0	0	100
22.6 – 32.0	0	0	100
32 – 45	0	0	100
45 – 64	0	0	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	122		

Table 3–1–10. 04096340 St. Joseph River at Clarendon, Michigan (riffle cross-section at 0 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	30	29	29
0.062 – 0.125	0	0	29
0.125 – 0.25	6	6	35
0.25 – 0.50	3	3	38
0.50 – 1.0	1	1	39
1.0 – 2.0	0	0	39
2.0 – 4.0	4	4	43
4.0 – 5.7	3	3	46
5.7 – 8.0	6	6	52
8.0 – 11.3	5	5	57
11.3 – 16.0	7	7	64
16.0 – 22.6	7	7	71
22.6 – 32.0	18	18	88
32 – 45	7	7	95
45 – 64	4	4	99
64 – 90	0	0	99
90 – 128	1	1	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	102		

Table 3–1–11. 04096400 St. Joseph River near Burlington, Michigan (riffle cross-section at 915 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	15	12	12
0.062 – 0.125	2	2	14
0.125 – 0.25	5	4	18
0.25 – 0.50	5	4	22
0.50 – 1.0	4	3	25
1.0 – 2.0	17	14	39
2.0 – 4.0	7	6	45
4.0 – 5.7	4	3	48
5.7 – 8.0	11	9	57
8.0 – 11.3	12	10	67
11.3 – 16.0	13	11	77
16.0 – 22.6	12	10	87
22.6 – 32.0	9	7	94
32 – 45	5	4	98
45 – 64	2	2	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	123		

Table 3–1–12. 04096400 St. Joseph River near Burlington, Michigan (riffle cross-section at 1,047.5 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	5	4	4
0.062 – 0.125	1	1	5
0.125 – 0.25	6	5	10
0.25 – 0.50	14	12	22
0.50 – 1.0	26	22	43
1.0 – 2.0	18	15	58
2.0 – 4.0	2	2	60
4.0 – 5.7	3	3	63
5.7 – 8.0	18	15	78
8.0 – 11.3	5	4	82
11.3 – 16.0	8	7	88
16.0 – 22.6	3	3	91
22.6 – 32.0	8	7	98
32 – 45	3	3	100
45 – 64	0	0	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	120		

Table 3–1–13. 04096400 St. Joseph River near Burlington, Michigan (riffle cross-section at 1,915 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	31	26	26
0.062 – 0.125	5	4	30
0.125 – 0.25	4	3	33
0.25 – 0.50	17	14	47
0.50 – 1.0	14	12	59
1.0 – 2.0	11	9	68
2.0 – 4.0	2	2	69
4.0 – 5.7	2	2	71
5.7 – 8.0	19	16	87
8.0 – 11.3	9	7	94
11.3 – 16.0	6	5	99
16.0 – 22.6	0	0	99
22.6 – 32.0	1	1	100
32 – 45	0	0	100
45 – 64	0	0	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	121		

Table 3–1–14. 04096405 St. Joseph River at Burlington, Michigan (riffle cross-section at 412 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	16	16	16
0.062 – 0.125	8	8	24
0.125 – 0.25	3	3	27
0.25 – 0.50	12	12	39
0.50 – 1.0	0	0	39
1.0 – 2.0	9	9	48
2.0 – 4.0	0	0	48
4.0 – 5.7	7	7	55
5.7 – 8.0	5	5	60
8.0 – 11.3	4	4	64
11.3 – 16.0	6	6	70
16.0 – 22.6	10	10	80
22.6 – 32.0	5	5	85
32 – 45	5	5	90
45 – 64	8	8	98
64 – 90	2	2	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–15. 04096515 South Branch Hog Creek near Allen, Michigan (riffle cross-section at 600 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	27	22	22
0.062 – 0.125	0	0	22
0.125 – 0.25	1	1	23
0.25 – 0.50	6	5	28
0.50 – 1.0	16	13	41
1.0 – 2.0	0	0	41
2.0 – 4.0	7	6	47
4.0 – 5.7	5	4	51
5.7 – 8.0	6	5	56
8.0 – 11.3	9	7	64
11.3 – 16.0	18	15	79
16.0 – 22.6	10	8	87
22.6 – 32.0	11	9	96
32 – 45	3	2	98
45 – 64	0	0	98
64 – 90	1	1	99
90 – 128	1	1	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	121		

Table 3–1–16. 04096515 South Branch Hog Creek near Allen, Michigan (riffle cross-section at 793 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	37	31	31
0.062 – 0.125	0	0	31
0.125 – 0.25	0	0	31
0.25 – 0.50	0	0	31
0.50 – 1.0	5	4	35
1.0 – 2.0	1	1	36
2.0 – 4.0	2	2	37
4.0 – 5.7	4	3	41
5.7 – 8.0	14	12	52
8.0 – 11.3	7	6	58
11.3 – 16.0	17	14	72
16.0 – 22.6	16	13	85
22.6 – 32.0	14	12	97
32 – 45	3	2	99
45 – 64	0	0	99
64 – 90	0	0	99
90 – 128	0	0	99
128 – 180	1	1	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	121		

Table 3–1–17. 04096515 South Branch Hog Creek near Allen, Michigan (riffle cross-section at 962 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	31	26	26
0.062 – 0.125	0	0	26
0.125 – 0.25	9	7	33
0.25 – 0.50	25	21	54
0.50 – 1.0	8	7	60
1.0 – 2.0	1	1	61
2.0 – 4.0	1	1	62
4.0 – 5.7	4	3	65
5.7 – 8.0	3	2	68
8.0 – 11.3	4	3	71
11.3 – 16.0	10	8	79
16.0 – 22.6	13	11	90
22.6 – 32.0	10	8	98
32 – 45	1	1	99
45 – 64	1	1	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	121		

Table 3–1–18. 04096600 Coldwater River near Hodunk, Michigan (riffle cross-section at 249 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	0	0	0
0.062 – 0.125	5	5	5
0.125 – 0.25	13	14	19
0.25 – 0.50	3	3	23
0.50 – 1.0	1	1	24
1.0 – 2.0	0	0	24
2.0 – 4.0	0	0	24
4.0 – 5.7	0	0	24
5.7 – 8.0	0	0	24
8.0 – 11.3	1	1	25
11.3 – 16.0	2	2	27
16.0 – 22.6	1	1	28
22.6 – 32.0	13	14	42
32 – 45	11	12	54
45 – 64	20	22	75
64 – 90	18	19	95
90 – 128	3	3	98
128 – 180	1	1	99
180 – 256	0	0	99
256 – 362	1	1	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	93		

Table 3–1–19. 04096600 Coldwater River near Hodunk, Michigan (riffle cross-section at 995.5 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	1	1	1
0.062 – 0.125	0	0	1
0.125 – 0.25	11	11	12
0.25 – 0.50	15	15	27
0.50 – 1.0	3	3	30
1.0 – 2.0	0	0	30
2.0 – 4.0	0	0	30
4.0 – 5.7	0	0	30
5.7 – 8.0	1	1	31
8.0 – 11.3	2	2	33
11.3 – 16.0	0	0	33
16.0 – 22.6	9	9	42
22.6 – 32.0	11	11	53
32 – 45	15	15	68
45 – 64	9	9	77
64 – 90	12	12	89
90 – 128	10	10	99
128 – 180	1	1	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–20. 04096600 Coldwater River near Hodunk, Michigan (riffle cross-section at 1,291 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	4	3	3
0.062 – 0.125	0	0	3
0.125 – 0.25	4	3	7
0.25 – 0.50	9	7	14
0.50 – 1.0	6	5	19
1.0 – 2.0	0	0	19
2.0 – 4.0	0	0	19
4.0 – 5.7	0	0	19
5.7 – 8.0	0	0	19
8.0 – 11.3	3	2	21
11.3 – 16.0	5	4	25
16.0 – 22.6	8	7	32
22.6 – 32.0	17	14	46
32 – 45	30	25	70
45 – 64	16	13	84
64 – 90	14	11	95
90 – 128	6	5	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	122		

Table 3–1–21. 04097170 Portage River at W Avenue near Vicksburg, Michigan (riffle cross-section at 0 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	45	38	38
0.062 – 0.125	0	0	38
0.125 – 0.25	0	0	38
0.25 – 0.50	0	0	38
0.50 – 1.0	10	8	46
1.0 – 2.0	13	11	57
2.0 – 4.0	9	8	64
4.0 – 5.7	7	6	70
5.7 – 8.0	8	7	77
8.0 – 11.3	3	3	79
11.3 – 16.0	6	5	84
16.0 – 22.6	6	5	89
22.6 – 32.0	6	5	94
32 – 45	3	3	97
45 – 64	0	0	97
64 – 90	2	2	98
90 – 128	2	2	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	120		

Table 3–1–22. 04097170 Portage River at W Avenue near Vicksburg, Michigan (riffle cross-section at 670 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	38	31	31
0.062 – 0.125	0	0	31
0.125 – 0.25	1	1	32
0.25 – 0.50	7	6	38
0.50 – 1.0	11	9	47
1.0 – 2.0	6	5	52
2.0 – 4.0	7	6	57
4.0 – 5.7	6	5	62
5.7 – 8.0	12	10	72
8.0 – 11.3	15	12	84
11.3 – 16.0	7	6	90
16.0 – 22.6	4	3	93
22.6 – 32.0	2	2	95
32 – 45	4	3	98
45 – 64	2	2	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	122		

Table 3–1–23. 04097170 Portage River at W Avenue near Vicksburg, Michigan (riffle cross-section at 752 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	30	24.79	24.79
0.062 – 0.125	4	3.31	28.1
0.125 – 0.25	2	1.65	29.75
0.25 – 0.50	20	16.53	46.28
0.50 – 1.0	8	6.61	52.89
1.0 – 2.0	1	0.83	53.72
2.0 – 4.0	0	0	53.72
4.0 – 5.7	0	0	53.72
5.7 – 8.0	6	4.96	58.68
8.0 – 11.3	10	8.26	66.94
11.3 – 16.0	7	5.79	72.73
16.0 – 22.6	5	4.13	76.86
22.6 – 32.0	13	10.74	87.6
32 – 45	9	7.44	95.04
45 – 64	5	4.13	99.17
64 – 90	1	0.83	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	121		

Table 3–1–24. 04097370 Flowerfield Creek near Flowerfield, Michigan (riffle cross-section at 8 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	21	17.5	17.5
0.062 – 0.125	15	12.5	30
0.125 – 0.25	21	17.5	47.5
0.25 – 0.50	20	16.67	64.17
0.50 – 1.0	41	34.17	98.33
1.0 – 2.0	0	0	98.33
2.0 – 4.0	0	0	98.33
4.0 – 5.7	0	0	98.33
5.7 – 8.0	1	0.83	99.17
8.0 – 11.3	0	0	99.17
11.3 – 16.0	1	0.83	100
16.0 – 22.6	0	0	100
22.6 – 32.0	0	0	100
32 – 45	0	0	100
45 – 64	0	0	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	120		

Table 3–1–25. 04097370 Flowerfield Creek near Flowerfield, Michigan (riffle cross-section at 107 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	15	12	12
0.062 – 0.125	12	10	22
0.125 – 0.25	30	25	47
0.25 – 0.50	32	26	73
0.50 – 1.0	16	13	86
1.0 – 2.0	0	0	86
2.0 – 4.0	1	1	87
4.0 – 5.7	0	0	87
5.7 – 8.0	7	6	93
8.0 – 11.3	5	4	97
11.3 – 16.0	1	1	98
16.0 – 22.6	2	2	99
22.6 – 32.0	1	1	100
32 – 45	0	0	100
45 – 64	0	0	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	122		

Table 3–1–26. 04097370 Flowerfield Creek near Flowerfield, Michigan (riffle cross-section at 892 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	23	19	19
0.062 – 0.125	3	3	22
0.125 – 0.25	12	10	32
0.25 – 0.50	40	33	65
0.50 – 1.0	20	17	82
1.0 – 2.0	4	3	85
2.0 – 4.0	1	1	86
4.0 – 5.7	2	2	88
5.7 – 8.0	8	7	94
8.0 – 11.3	1	1	95
11.3 – 16.0	5	4	99
16.0 – 22.6	1	1	100
22.6 – 32.0	0	0	100
32 – 45	0	0	100
45 – 64	0	0	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	120		

Table 3–1–27. 04097540 Prairie River near Nottawa, Michigan (riffle cross-section at 159.2 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	68	68	68
0.062 – 0.125	19	19	87
0.125 – 0.25	1	1	88
0.25 – 0.50	1	1	89
0.50 – 1.0	0	0	89
1.0 – 2.0	2	2	91
2.0 – 4.0	4	4	95
4.0 – 5.7	0	0	95
5.7 – 8.0	2	2	97
8.0 – 11.3	2	2	99
11.3 – 16.0	1	1	100
16.0 – 22.6	0	0	100
22.6 – 32.0	0	0	100
32 – 45	0	0	100
45 – 64	0	0	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–28. 04102776 Middle Branch Black River near South Haven, Michigan (riffle cross-section at 9 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	8	7	7
0.062 – 0.125	26	22	29
0.125 – 0.25	84	71	99
0.25 – 0.50	1	1	100
0.50 – 1.0	0	0	100
1.0 – 2.0	0	0	100
2.0 – 4.0	0	0	100
4.0 – 5.7	0	0	100
5.7 – 8.0	0	0	100
8.0 – 11.3	0	0	100
11.3 – 16.0	0	0	100
16.0 – 22.6	0	0	100
22.6 – 32.0	0	0	100
32 – 45	0	0	100
45 – 64	0	0	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	119		

Table 3–1–29. 04102776 Middle Branch Black River near South Haven, Michigan (riffle cross-section at 347 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	8	6.67	6.67
0.062 – 0.125	34	28.33	35
0.125 – 0.25	62	51.67	86.67
0.25 – 0.50	16	13.33	100
0.50 – 1.0	0	0	100
1.0 – 2.0	0	0	100
2.0 – 4.0	0	0	100
4.0 – 5.7	0	0	100
5.7 – 8.0	0	0	100
8.0 – 11.3	0	0	100
11.3 – 16.0	0	0	100
16.0 – 22.6	0	0	100
22.6 – 32.0	0	0	100
32 – 45	0	0	100
45 – 64	0	0	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	120		

Table 3–1–30. 04102776 Middle Branch Black River near South Haven, Michigan (riffle cross-section at 715 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	16	13	13
0.062 – 0.125	24	20	33
0.125 – 0.25	74	62	95
0.25 – 0.50	6	5	100
0.50 – 1.0	0	0	100
1.0 – 2.0	0	0	100
2.0 – 4.0	0	0	100
4.0 – 5.7	0	0	100
5.7 – 8.0	0	0	100
8.0 – 11.3	0	0	100
11.3 – 16.0	0	0	100
16.0 – 22.6	0	0	100
22.6 – 32.0	0	0	100
32 – 45	0	0	100
45 – 64	0	0	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	120		

Table 3–1–31. 04103010 Kalamazoo River near Marengo, Michigan (riffle cross-section at 949 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	7	7	7
0.062 – 0.125	2	2	9
0.125 – 0.25	4	4	13
0.25 – 0.50	3	3	16
0.50 – 1.0	5	5	21
1.0 – 2.0	7	7	28
2.0 – 4.0	4	4	32
4.0 – 5.7	5	5	37
5.7 – 8.0	6	6	43
8.0 – 11.3	8	8	51
11.3 – 16.0	10	10	61
16.0 – 22.6	7	7	68
22.6 – 32.0	11	11	79
32 – 45	14	14	93
45 – 64	7	7	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–32. 04104945 Wanadoga Creek near Battle Creek, Michigan (riffle cross-section at 1,551 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	76	76	76
0.062 – 0.125	4	4	80
0.125 – 0.25	19	19	99
0.25 – 0.50	1	1	100
0.50 – 1.0	0	0	100
1.0 – 2.0	0	0	100
2.0 – 4.0	0	0	100
4.0 – 5.7	0	0	100
5.7 – 8.0	0	0	100
8.0 – 11.3	0	0	100
11.3 – 16.0	0	0	100
16.0 – 22.6	0	0	100
22.6 – 32.0	0	0	100
32 – 45	0	0	100
45 – 64	0	0	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–33. 04105700 Augusta Creek near Augusta, Michigan (riffle cross-section at 91 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	17	17	17
0.062 – 0.125	1	1	18
0.125 – 0.25	7	7	25
0.25 – 0.50	2	2	27
0.50 – 1.0	0	0	27
1.0 – 2.0	0	0	27
2.0 – 4.0	6	6	33
4.0 – 5.7	1	1	34
5.7 – 8.0	6	6	40
8.0 – 11.3	4	4	44
11.3 – 16.0	12	12	56
16.0 – 22.6	18	18	74
22.6 – 32.0	19	19	93
32 – 45	5	5	98
45 – 64	2	2	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–34. 04108600 Rabbit River near Hopkins, Michigan (riffle cross-section at 0 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	10	10	10
0.062 – 0.125	0	0	10
0.125 – 0.25	24	24	34
0.25 – 0.50	34	34	68
0.50 – 1.0	13	13	81
1.0 – 2.0	0	0	81
2.0 – 4.0	11	11	92
4.0 – 5.7	4	4	96
5.7 – 8.0	1	1	97
8.0 – 11.3	3	3	100
11.3 – 16.0	0	0	100
16.0 – 22.6	0	0	100
22.6 – 32.0	0	0	100
32 – 45	0	0	100
45 – 64	0	0	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–35. 04111379 Red Cedar River near Williamston, Michigan (riffle cross-section at 539.5 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	43	43	43
0.062 – 0.125	6	6	49
0.125 – 0.25	13	13	62
0.25 – 0.50	8	8	70
0.50 – 1.0	6	6	76
1.0 – 2.0	5	5	81
2.0 – 4.0	0	0	81
4.0 – 5.7	0	0	81
5.7 – 8.0	0	0	81
8.0 – 11.3	1	1	82
11.3 – 16.0	1	1	83
16.0 – 22.6	2	2	85
22.6 – 32.0	0	0	85
32 – 45	3	3	88
45 – 64	6	6	94
64 – 90	4	4	98
90 – 128	1	1	99
128 – 180	1	1	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–36. 04111500 Deer Creek near Dansville, Michigan (riffle cross-section at 106 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	3	3	3
0.062 – 0.125	0	0	3
0.125 – 0.25	17	17	20
0.25 – 0.50	37	37	57
0.50 – 1.0	31	31	88
1.0 – 2.0	0	0	88
2.0 – 4.0	1	1	89
4.0 – 5.7	1	1	90
5.7 – 8.0	3	3	93
8.0 – 11.3	0	0	93
11.3 – 16.0	2	2	95
16.0 – 22.6	2	2	97
22.6 – 32.0	1	1	98
32 – 45	1	1	99
45 – 64	1	1	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–37. 04114498 Looking Glass River near Eagle, Michigan (riffle cross-section at 468 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	29	28	28
0.062 – 0.125	0	0	28
0.125 – 0.25	15	15	43
0.25 – 0.50	0	0	43
0.50 – 1.0	1	1	44
1.0 – 2.0	0	0	44
2.0 – 4.0	0	0	44
4.0 – 5.7	0	0	44
5.7 – 8.0	3	3	47
8.0 – 11.3	3	3	50
11.3 – 16.0	6	6	55
16.0 – 22.6	14	14	69
22.6 – 32.0	4	4	73
32 – 45	9	9	82
45 – 64	6	6	87
64 – 90	9	9	96
90 – 128	4	4	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	103		

Table 3–1–38. 04114498 Looking Glass River near Eagle, Michigan (riffle cross-section at 918 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	10	10	10
0.062 – 0.125	0	0	10
0.125 – 0.25	11	11	21
0.25 – 0.50	1	1	22
0.50 – 1.0	0	0	22
1.0 – 2.0	3	3	25
2.0 – 4.0	0	0	25
4.0 – 5.7	0	0	25
5.7 – 8.0	4	4	29
8.0 – 11.3	3	3	32
11.3 – 16.0	9	9	41
16.0 – 22.6	19	19	60
22.6 – 32.0	12	12	72
32 – 45	13	13	85
45 – 64	4	4	89
64 – 90	1	1	90
90 – 128	4	4	94
128 – 180	1	1	95
180 – 256	3	3	98
256 – 362	2	2	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–39. 04114498 Looking Glass River near Eagle, Michigan (riffle cross-section at 1,354 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	28	27	27
0.062 – 0.125	0	0	27
0.125 – 0.25	9	9	36
0.25 – 0.50	7	7	42
0.50 – 1.0	1	1	43
1.0 – 2.0	5	5	48
2.0 – 4.0	1	1	49
4.0 – 5.7	1	1	50
5.7 – 8.0	4	4	54
8.0 – 11.3	13	13	66
11.3 – 16.0	13	13	79
16.0 – 22.6	5	5	84
22.6 – 32.0	6	6	89
32 – 45	3	3	92
45 – 64	3	3	95
64 – 90	2	2	97
90 – 128	0	0	97
128 – 180	3	3	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	104		

Table 3–1–40. 04117500 Thornapple River near Hastings, Michigan (riffle cross-section at 1,567 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	28	27	27
0.062 – 0.125	0	0	27
0.125 – 0.25	9	9	36
0.25 – 0.50	7	7	42
0.50 – 1.0	1	1	43
1.0 – 2.0	5	5	48
2.0 – 4.0	1	1	49
4.0 – 5.7	1	1	50
5.7 – 8.0	4	4	54
8.0 – 11.3	13	13	66
11.3 – 16.0	13	13	79
16.0 – 22.6	5	5	84
22.6 – 32.0	6	6	89
32 – 45	3	3	92
45 – 64	3	3	95
64 – 90	2	2	97
90 – 128	0	0	97
128 – 180	3	3	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	104		

Table 3–1–41. 04122230 North Branch Pentwater River near Pentwater, Michigan (riffle cross-section at 447 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	50	47	47
0.062 – 0.125	20	19	66
0.125 – 0.25	0	0	66
0.25 – 0.50	5	5	71
0.50 – 1.0	31	29	100
1.0 – 2.0	0	0	100
2.0 – 4.0	0	0	100
4.0 – 5.7	0	0	100
5.7 – 8.0	0	0	100
8.0 – 11.3	0	0	100
11.3 – 16.0	0	0	100
16.0 – 22.6	0	0	100
22.6 – 32.0	0	0	100
32 – 45	0	0	100
45 – 64	0	0	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	106		

Table 3–1–42. 04123000 Big Sable River near Freesoil, Michigan (riffle cross-section at 854 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	5	5	5
0.062 – 0.125	14	14	19
0.125 – 0.25	23	23	42
0.25 – 0.50	38	38	80
0.50 – 1.0	14	14	94
1.0 – 2.0	2	2	96
2.0 – 4.0	0	0	96
4.0 – 5.7	0	0	96
5.7 – 8.0	2	2	98
8.0 – 11.3	1	1	99
11.3 – 16.0	0	0	99
16.0 – 22.6	1	1	100
22.6 – 32.0	0	0	100
32 – 45	0	0	100
45 – 64	0	0	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–43. 04124500 East Branch Pine River near Tustin, Michigan (riffle cross-section at 570 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	0	0	0
0.062 – 0.125	0	0	0
0.125 – 0.25	1	1	1
0.25 – 0.50	15	15	16
0.50 – 1.0	5	5	21
1.0 – 2.0	1	1	22
2.0 – 4.0	0	0	22
4.0 – 5.7	0	0	22
5.7 – 8.0	0	0	22
8.0 – 11.3	2	2	24
11.3 – 16.0	5	5	29
16.0 – 22.6	7	7	36
22.6 – 32.0	10	10	46
32 – 45	13	13	59
45 – 64	5	5	64
64 – 90	13	13	77
90 – 128	10	10	87
128 – 180	12	12	99
180 – 256	1	1	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–44. 04125460 Pine River at High School Bridge near Hoxeyville, Michigan (riffle cross-section at 323 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	3	3	3
0.062 – 0.125	12	11	14
0.125 – 0.25	18	17	31
0.25 – 0.50	13	12	43
0.50 – 1.0	0	0	43
1.0 – 2.0	4	4	47
2.0 – 4.0	4	4	51
4.0 – 5.7	3	3	54
5.7 – 8.0	4	4	58
8.0 – 11.3	0	0	58
11.3 – 16.0	3	3	60
16.0 – 22.6	5	5	65
22.6 – 32.0	3	3	68
32 – 45	8	8	75
45 – 64	8	8	83
64 – 90	10	9	92
90 – 128	7	7	99
128 – 180	1	1	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	106		

Table 3–1–45. 04128000 Sturgeon River near Wolverine, Michigan (riffle cross-section at 445 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	3	3	3
0.062 – 0.125	5	5	8
0.125 – 0.25	6	6	14
0.25 – 0.50	6	6	20
0.50 – 1.0	2	2	22
1.0 – 2.0	0	0	22
2.0 – 4.0	4	4	26
4.0 – 5.7	2	2	28
5.7 – 8.0	2	2	30
8.0 – 11.3	6	6	36
11.3 – 16.0	7	7	43
16.0 – 22.6	8	8	51
22.6 – 32.0	9	9	60
32 – 45	11	11	71
45 – 64	3	3	74
64 – 90	10	10	84
90 – 128	8	8	92
128 – 180	1	1	93
180 – 256	0	0	93
256 – 362	1	1	94
362 – 512	5	5	99
512 – 1024	1	1	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–46. 04129500 Pigeon River near Afton, Michigan (riffle cross-section at 0 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	0	0	0
0.062 – 0.125	7	7	7
0.125 – 0.25	8	8	15
0.25 – 0.50	0	0	15
0.50 – 1.0	0	0	15
1.0 – 2.0	4	4	19
2.0 – 4.0	0	0	19
4.0 – 5.7	0	0	19
5.7 – 8.0	1	1	20
8.0 – 11.3	6	6	26
11.3 – 16.0	6	6	32
16.0 – 22.6	12	12	44
22.6 – 32.0	7	7	51
32 – 45	9	9	59
45 – 64	14	14	73
64 – 90	18	18	91
90 – 128	7	7	98
128 – 180	1	1	99
180 – 256	1	1	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	101		

Table 3–1–47. 04129500 Pigeon River near Afton, Michigan (riffle cross-section at 316 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	0	0	0
0.062 – 0.125	9	9	9
0.125 – 0.25	1	1	10
0.25 – 0.50	0	0	10
0.50 – 1.0	3	3	13
1.0 – 2.0	4	4	17
2.0 – 4.0	2	2	19
4.0 – 5.7	1	1	20
5.7 – 8.0	9	9	29
8.0 – 11.3	1	1	30
11.3 – 16.0	8	8	38
16.0 – 22.6	5	5	43
22.6 – 32.0	15	15	58
32 – 45	14	14	72
45 – 64	16	16	88
64 – 90	7	7	95
90 – 128	5	5	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–48. 04129500 Pigeon River near Afton, Michigan (riffle cross-section at 1,048.5 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	21	21	21
0.062 – 0.125	11	11	32
0.125 – 0.25	12	12	44
0.25 – 0.50	2	2	46
0.50 – 1.0	4	4	50
1.0 – 2.0	0	0	50
2.0 – 4.0	2	2	52
4.0 – 5.7	2	2	54
5.7 – 8.0	3	3	57
8.0 – 11.3	1	1	58
11.3 – 16.0	7	7	65
16.0 – 22.6	8	8	73
22.6 – 32.0	6	6	79
32 – 45	12	12	91
45 – 64	3	3	94
64 – 90	4	4	98
90 – 128	2	2	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–49. 04135700 South Branch Au Sable River near Luzerne, Michigan (riffle cross-section at 732.5 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	0	0	0
0.062 – 0.125	1	1	1
0.125 – 0.25	13	13	14
0.25 – 0.50	11	11	25
0.50 – 1.0	4	4	28
1.0 – 2.0	1	1	29
2.0 – 4.0	0	0	29
4.0 – 5.7	0	0	29
5.7 – 8.0	2	2	31
8.0 – 11.3	1	1	32
11.3 – 16.0	4	4	36
16.0 – 22.6	5	5	41
22.6 – 32.0	19	19	60
32 – 45	7	7	67
45 – 64	19	19	85
64 – 90	9	9	94
90 – 128	2	2	96
128 – 180	2	2	98
180 – 256	2	2	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	102		

Table 3–1–50. 04146063 South Branch Flint River near Columbiaville, Michigan (riffle cross-section at 179 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	18	18	18
0.062 – 0.125	2	2	20
0.125 – 0.25	3	3	23
0.25 – 0.50	4	4	27
0.50 – 1.0	0	0	27
1.0 – 2.0	5	5	32
2.0 – 4.0	2	2	34
4.0 – 5.7	1	1	35
5.7 – 8.0	6	6	41
8.0 – 11.3	10	10	51
11.3 – 16.0	10	10	61
16.0 – 22.6	5	5	66
22.6 – 32.0	6	6	72
32 – 45	6	6	78
45 – 64	8	8	86
64 – 90	5	5	91
90 – 128	5	5	96
128 – 180	4	4	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–51. 04150500 Cass River at Cass City, Michigan (riffle cross-section at 0 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	22	22	22
0.062 – 0.125	0	0	22
0.125 – 0.25	0	0	22
0.25 – 0.50	0	0	22
0.50 – 1.0	0	0	22
1.0 – 2.0	5	5	27
2.0 – 4.0	0	0	27
4.0 – 5.7	0	0	27
5.7 – 8.0	3	3	30
8.0 – 11.3	0	0	30
11.3 – 16.0	0	0	30
16.0 – 22.6	5	5	35
22.6 – 32.0	2	2	37
32 – 45	7	7	44
45 – 64	7	7	51
64 – 90	12	12	63
90 – 128	10	10	73
128 – 180	11	11	84
180 – 256	7	7	91
256 – 362	4	4	95
362 – 512	5	5	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–52. 04159900 Mill Creek near Avoca, Michigan (riffle cross-section at 183 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	5	5	5
0.062 – 0.125	10	10	15
0.125 – 0.25	8	8	23
0.25 – 0.50	1	1	24
0.50 – 1.0	0	0	24
1.0 – 2.0	0	0	24
2.0 – 4.0	2	2	26
4.0 – 5.7	2	2	28
5.7 – 8.0	2	2	30
8.0 – 11.3	8	8	38
11.3 – 16.0	4	4	42
16.0 – 22.6	10	10	52
22.6 – 32.0	10	10	62
32 – 45	11	11	73
45 – 64	11	11	84
64 – 90	6	6	90
90 – 128	3	3	93
128 – 180	5	5	98
180 – 256	1	1	99
256 – 362	1	1	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–53. 04160600 Belle River at Memphis, Michigan (riffle cross-section at 580 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	8	8	8
0.062 – 0.125	0	0	8
0.125 – 0.25	21	20	28
0.25 – 0.50	6	6	34
0.50 – 1.0	4	4	38
1.0 – 2.0	0	0	38
2.0 – 4.0	2	2	39
4.0 – 5.7	2	2	41
5.7 – 8.0	2	2	43
8.0 – 11.3	8	8	51
11.3 – 16.0	1	1	52
16.0 – 22.6	0	0	52
22.6 – 32.0	15	14	66
32 – 45	9	9	75
45 – 64	13	13	88
64 – 90	5	5	92
90 – 128	1	1	93
128 – 180	2	2	95
180 – 256	2	2	97
256 – 362	1	1	98
362 – 512	0	0	98
512 – 1024	1	1	99
1024 – 2048	0	0	99
Bedrock	1	1	100
Total particles	104		

Table 3–1–54. 04160800 Sashabaw Creek near Drayton Plains, Michigan (riffle cross-section at 366 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	25	25	25
0.062 – 0.125	0	0	25
0.125 – 0.25	6	6	30
0.25 – 0.50	0	0	30
0.50 – 1.0	15	15	45
1.0 – 2.0	0	0	45
2.0 – 4.0	3	3	48
4.0 – 5.7	12	12	60
5.7 – 8.0	17	17	76
8.0 – 11.3	15	15	91
11.3 – 16.0	8	8	99
16.0 – 22.6	0	0	99
22.6 – 32.0	1	1	100
32 – 45	0	0	100
45 – 64	0	0	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	102		

Table 3–1–55. 04161580 Stony Creek near Romeo, Michigan (riffle cross-section at 226 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	8	8	8
0.062 – 0.125	24	24	32
0.125 – 0.25	1	1	33
0.25 – 0.50	9	9	42
0.50 – 1.0	0	0	42
1.0 – 2.0	0	0	42
2.0 – 4.0	0	0	42
4.0 – 5.7	0	0	42
5.7 – 8.0	1	1	43
8.0 – 11.3	6	6	49
11.3 – 16.0	8	8	57
16.0 – 22.6	12	12	69
22.6 – 32.0	10	10	79
32 – 45	5	5	84
45 – 64	11	11	95
64 – 90	2	2	97
90 – 128	2	2	99
128 – 180	1	1	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–56. 04161760 West Branch Stony Creek near Washington, Michigan (riffle cross-section at 15 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	24	23.08	23.08
0.062 – 0.125	0	0	23.08
0.125 – 0.25	0	0	23.08
0.25 – 0.50	0	0	23.08
0.50 – 1.0	0	0	23.08
1.0 – 2.0	4	3.85	26.92
2.0 – 4.0	1	0.96	27.88
4.0 – 5.7	2	1.92	29.81
5.7 – 8.0	1	0.96	30.77
8.0 – 11.3	3	2.88	33.65
11.3 – 16.0	17	16.35	50
16.0 – 22.6	13	12.5	62.5
22.6 – 32.0	19	18.27	80.77
32 – 45	9	8.65	89.42
45 – 64	3	2.88	92.31
64 – 90	4	3.85	96.15
90 – 128	2	1.92	98.08
128 – 180	1	0.96	99.04
180 – 256	0	0	99.04
256 – 362	1	0.96	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	104		

Table 3–1–57. 04164050 North Branch Clinton River at 33 Mile Road near Romeo, Michigan (riffle cross-section at 869 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	15	15	15
0.062 – 0.125	6	6	21
0.125 – 0.25	0	0	21
0.25 – 0.50	2	2	23
0.50 – 1.0	10	10	33
1.0 – 2.0	0	0	33
2.0 – 4.0	0	0	33
4.0 – 5.7	1	1	34
5.7 – 8.0	0	0	34
8.0 – 11.3	3	3	37
11.3 – 16.0	1	1	38
16.0 – 22.6	5	5	43
22.6 – 32.0	1	1	44
32 – 45	4	4	48
45 – 64	12	12	60
64 – 90	16	16	76
90 – 128	14	14	90
128 – 180	8	8	98
180 – 256	0	0	98
256 – 362	2	2	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–58. 04164150 North Branch Clinton River near Meade, Michigan (riffle cross-section at 1,405 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	10	10	10
0.062 – 0.125	5	5	15
0.125 – 0.25	22	22	37
0.25 – 0.50	0	0	37
0.50 – 1.0	2	2	39
1.0 – 2.0	18	18	57
2.0 – 4.0	3	3	60
4.0 – 5.7	4	4	64
5.7 – 8.0	8	8	72
8.0 – 11.3	10	10	82
11.3 – 16.0	13	13	95
16.0 – 22.6	3	3	98
22.6 – 32.0	1	1	99
32 – 45	0	0	99
45 – 64	0	0	99
64 – 90	0	0	99
90 – 128	0	0	99
128 – 180	1	1	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

Table 3–1–59. 04172500 Portage River at Tiplady Road near Pinckney, Michigan (riffle cross-section at 574 feet from top of longitudinal profile).

[mm, millimeters]

Pebble size (mm)	Number of pebbles in size class	Percent of pebbles in size class	Cumulative percent
0 – 0.062	22	22	22
0.062 – 0.125	1	1	23
0.125 – 0.25	24	24	47
0.25 – 0.50	0	0	47
0.50 – 1.0	13	13	60
1.0 – 2.0	7	7	67
2.0 – 4.0	5	5	72
4.0 – 5.7	4	4	76
5.7 – 8.0	12	12	88
8.0 – 11.3	4	4	92
11.3 – 16.0	6	6	98
16.0 – 22.6	1	1	99
22.6 – 32.0	1	1	100
32 – 45	0	0	100
45 – 64	0	0	100
64 – 90	0	0	100
90 – 128	0	0	100
128 – 180	0	0	100
180 – 256	0	0	100
256 – 362	0	0	100
362 – 512	0	0	100
512 – 1024	0	0	100
1024 – 2048	0	0	100
Bedrock	0	0	100
Total particles	100		

