

APPENDIX B2

Habitat Area versus Flow Relationships and Effective Habitat Analyses

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HABITAT AREA VERSUS FLOW RELATIONSHIPS

Duncan Creek D6.3

Figure 1. Duncan Creek - D6.3 Weighted Usable Area (top) and Percent of Maximum Weighted Usable Area (bottom).

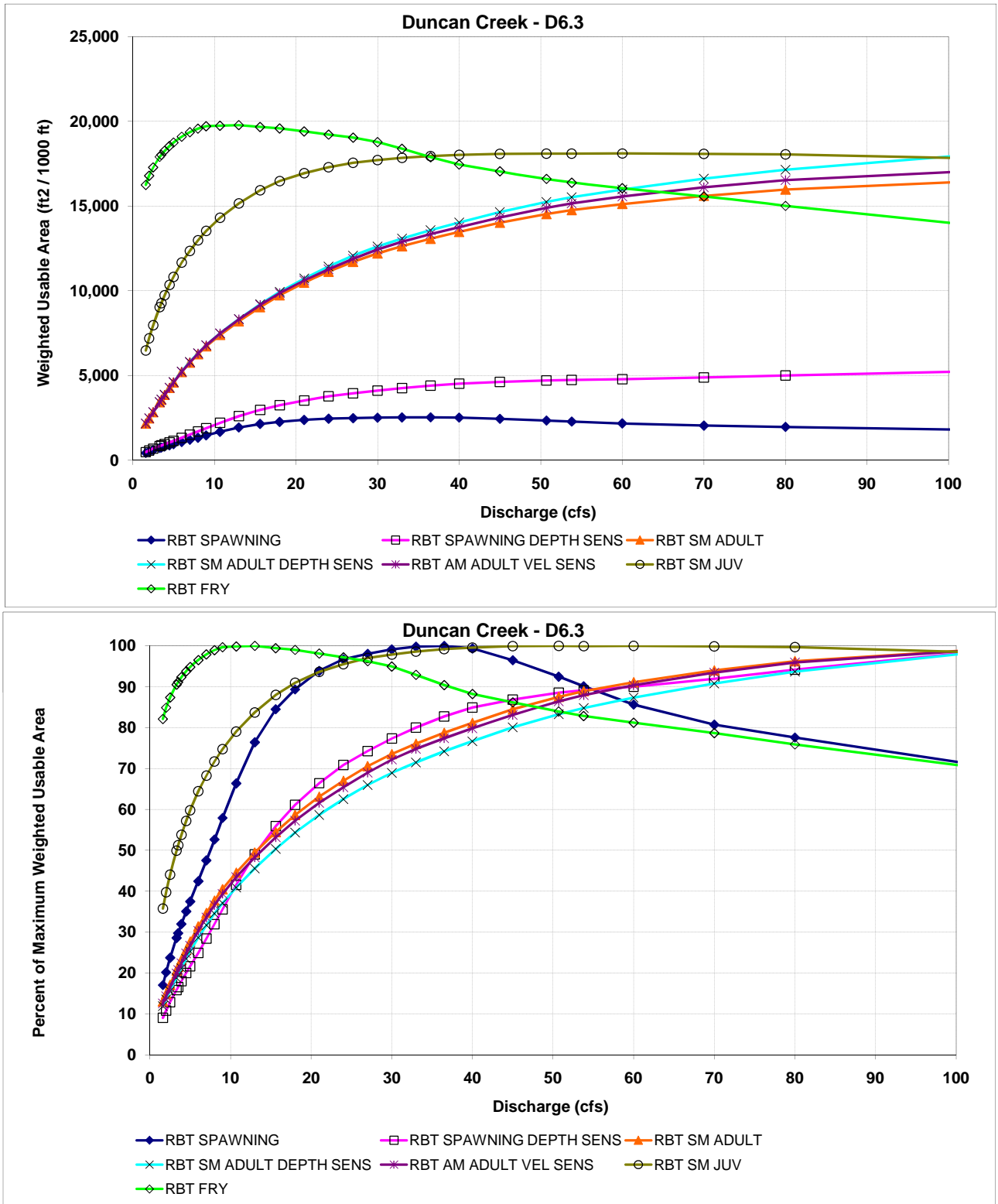


Table 1A. Duncan Creek - D6.3 Weighted Usable Area.

| Discharge (cfs) | Weighted Usable Area (ft ² / 1000 ft) | | | | | | |
|--------------------|--|----------------------------|-----------------|----------------------------|--------------------------|------------|---------|
| | RBT SPAWNING | RBT SPAWNING DEPTH SENS | RBT SM ADULT | RBT SM ADULT DEPTH SENS | RBT AM ADULT VEL SENS | RBT SM JUV | RBT FRY |
| 1.6 | 432 | 479 | 2162 | 2170 | 2162 | 6473 | 16248 |
| 2 | 511 | 574 | 2468 | 2477 | 2468 | 7193 | 16789 |
| 2.5 | 601 | 684 | 2834 | 2845 | 2834 | 7970 | 17283 |
| 3.3 | 725 | 842 | 3423 | 3439 | 3425 | 9036 | 17910 |
| 3.5 | 754 | 880 | 3566 | 3583 | 3568 | 9272 | 18027 |
| 3.9 | 811 | 956 | 3851 | 3871 | 3854 | 9730 | 18263 |
| 4.5 | 890 | 1062 | 4263 | 4287 | 4268 | 10350 | 18552 |
| 5 | 951 | 1149 | 4592 | 4620 | 4598 | 10820 | 18757 |
| 6 | 1076 | 1325 | 5205 | 5242 | 5216 | 11660 | 19096 |
| 7 | 1206 | 1509 | 5757 | 5802 | 5781 | 12359 | 19365 |
| 8 | 1335 | 1697 | 6259 | 6316 | 6303 | 12984 | 19576 |
| 9 | 1469 | 1890 | 6720 | 6790 | 6779 | 13531 | 19716 |
| 10.7 | 1684 | 2210 | 7390 | 7485 | 7481 | 14308 | 19749 |
| 13 | 1939 | 2606 | 8203 | 8335 | 8323 | 15154 | 19783 |
| 15.6 | 2144 | 2971 | 9034 | 9211 | 9165 | 15929 | 19673 |
| 18 | 2267 | 3249 | 9732 | 9947 | 9868 | 16470 | 19589 |
| 21 | 2381 | 3531 | 10472 | 10737 | 10614 | 16945 | 19411 |
| 24 | 2454 | 3769 | 11121 | 11437 | 11274 | 17286 | 19225 |
| 27 | 2488 | 3950 | 11711 | 12077 | 11892 | 17557 | 19040 |
| 30 | 2515 | 4111 | 12201 | 12613 | 12437 | 17718 | 18779 |
| 33 | 2532 | 4256 | 12626 | 13082 | 12889 | 17843 | 18381 |
| 36.5 | 2537 | 4400 | 13070 | 13578 | 13344 | 17956 | 17888 |
| 40 | 2521 | 4515 | 13471 | 14030 | 13757 | 18018 | 17457 |
| 45 | 2448 | 4618 | 14017 | 14652 | 14323 | 18088 | 17051 |
| 50.7 | 2346 | 4709 | 14527 | 15246 | 14891 | 18098 | 16609 |
| 53.8 | 2287 | 4739 | 14758 | 15526 | 15152 | 18092 | 16388 |
| 60 | 2173 | 4787 | 15119 | 15984 | 15573 | 18103 | 16063 |
| 70 | 2048 | 4890 | 15602 | 16621 | 16108 | 18077 | 15562 |
| 80 | 1969 | 5007 | 15974 | 17149 | 16536 | 18048 | 15015 |
| 110 | 1742 | 5319 | 16598 | 18308 | 17237 | 17742 | 13520 |

Table 1B. Duncan Creek - D6.3 Percent of Maximum Weighted Usable Area.

| Discharge (cfs) | Percent of Maximum Weighted Usable Area | | | | | | |
|--------------------|---|----------------------------|-----------------|----------------------------|--------------------------|------------|---------|
| | RBT SPAWNING | RBT SPAWNING DEPTH SENS | RBT SM ADULT | RBT SM ADULT DEPTH SENS | RBT AM ADULT VEL SENS | RBT SM JUV | RBT FRY |
| 1.6 | 17 | 9 | 13 | 12 | 13 | 36 | 82 |
| 2 | 20 | 11 | 15 | 14 | 14 | 40 | 85 |
| 2.5 | 24 | 13 | 17 | 16 | 16 | 44 | 87 |
| 3.3 | 29 | 16 | 21 | 19 | 20 | 50 | 91 |
| 3.5 | 30 | 17 | 21 | 20 | 21 | 51 | 91 |
| 3.9 | 32 | 18 | 23 | 21 | 22 | 54 | 92 |
| 4.5 | 35 | 20 | 26 | 23 | 25 | 57 | 94 |
| 5 | 37 | 22 | 28 | 25 | 27 | 60 | 95 |
| 6 | 42 | 25 | 31 | 29 | 30 | 64 | 97 |
| 7 | 48 | 28 | 35 | 32 | 34 | 68 | 98 |
| 8 | 53 | 32 | 38 | 35 | 37 | 72 | 99 |
| 9 | 58 | 36 | 40 | 37 | 39 | 75 | 100 |
| 10.7 | 66 | 42 | 45 | 41 | 43 | 79 | 100 |
| 13 | 76 | 49 | 49 | 46 | 48 | 84 | 100 |
| 15.6 | 84 | 56 | 54 | 50 | 53 | 88 | 99 |
| 18 | 89 | 61 | 59 | 54 | 57 | 91 | 99 |
| 21 | 94 | 66 | 63 | 59 | 62 | 94 | 98 |
| 24 | 97 | 71 | 67 | 62 | 65 | 95 | 97 |
| 27 | 98 | 74 | 71 | 66 | 69 | 97 | 96 |
| 30 | 99 | 77 | 74 | 69 | 72 | 98 | 95 |
| 33 | 100 | 80 | 76 | 71 | 75 | 99 | 93 |
| 36.5 | 100 | 83 | 79 | 74 | 77 | 99 | 90 |
| 40 | 99 | 85 | 81 | 77 | 80 | 100 | 88 |
| 45 | 96 | 87 | 84 | 80 | 83 | 100 | 86 |
| 50.7 | 92 | 89 | 88 | 83 | 86 | 100 | 84 |
| 53.8 | 90 | 89 | 89 | 85 | 88 | 100 | 83 |
| 60 | 86 | 90 | 91 | 87 | 90 | 100 | 81 |
| 70 | 81 | 92 | 94 | 91 | 93 | 100 | 79 |
| 80 | 78 | 94 | 96 | 94 | 96 | 100 | 76 |
| 110 | 69 | 100 | 100 | 100 | 100 | 98 | 68 |

Figure 2. Duncan Creek - D6.3 Spatial Niche Area by Individual Niche (top) and by Cumulative Area (bottom).

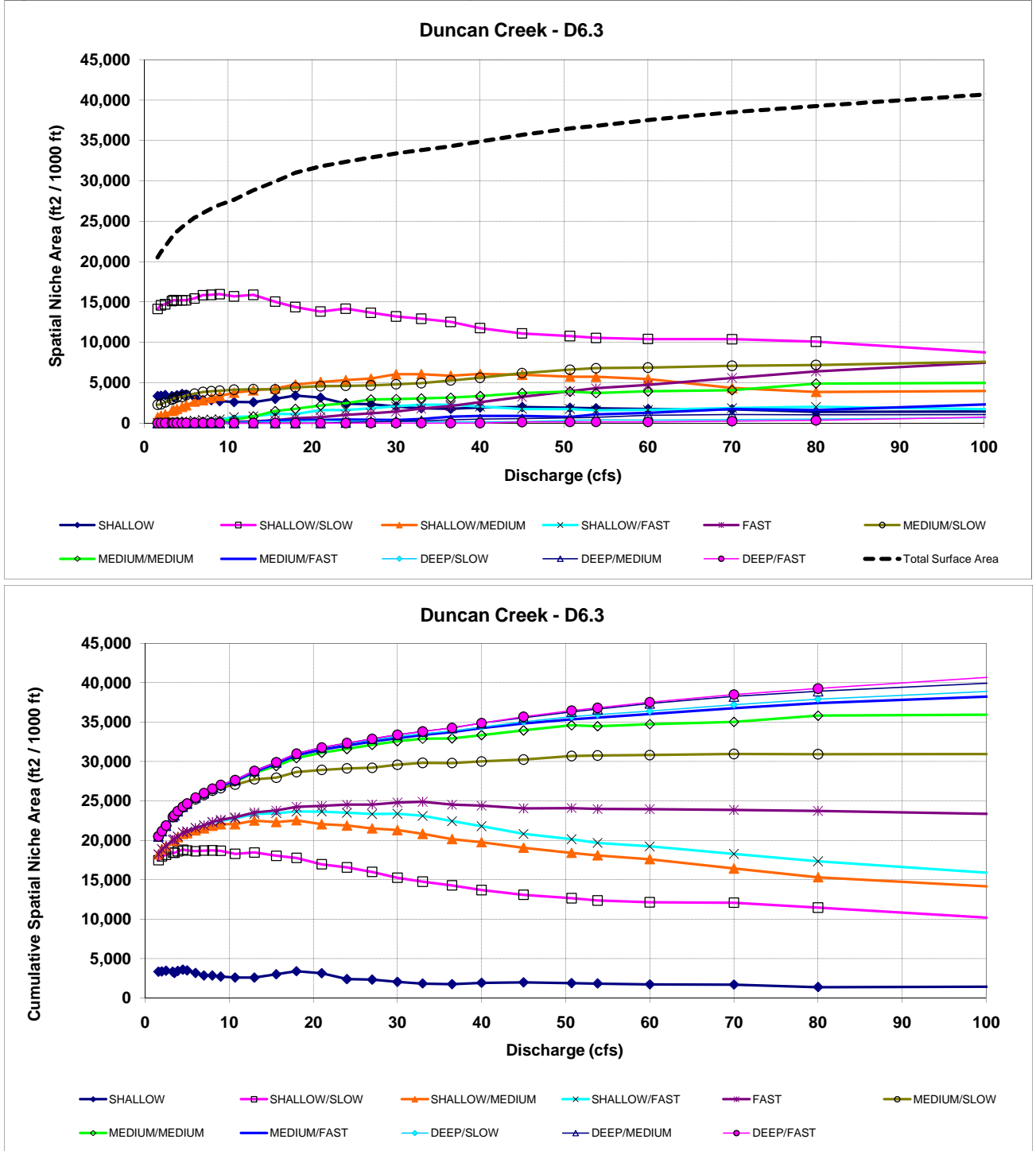
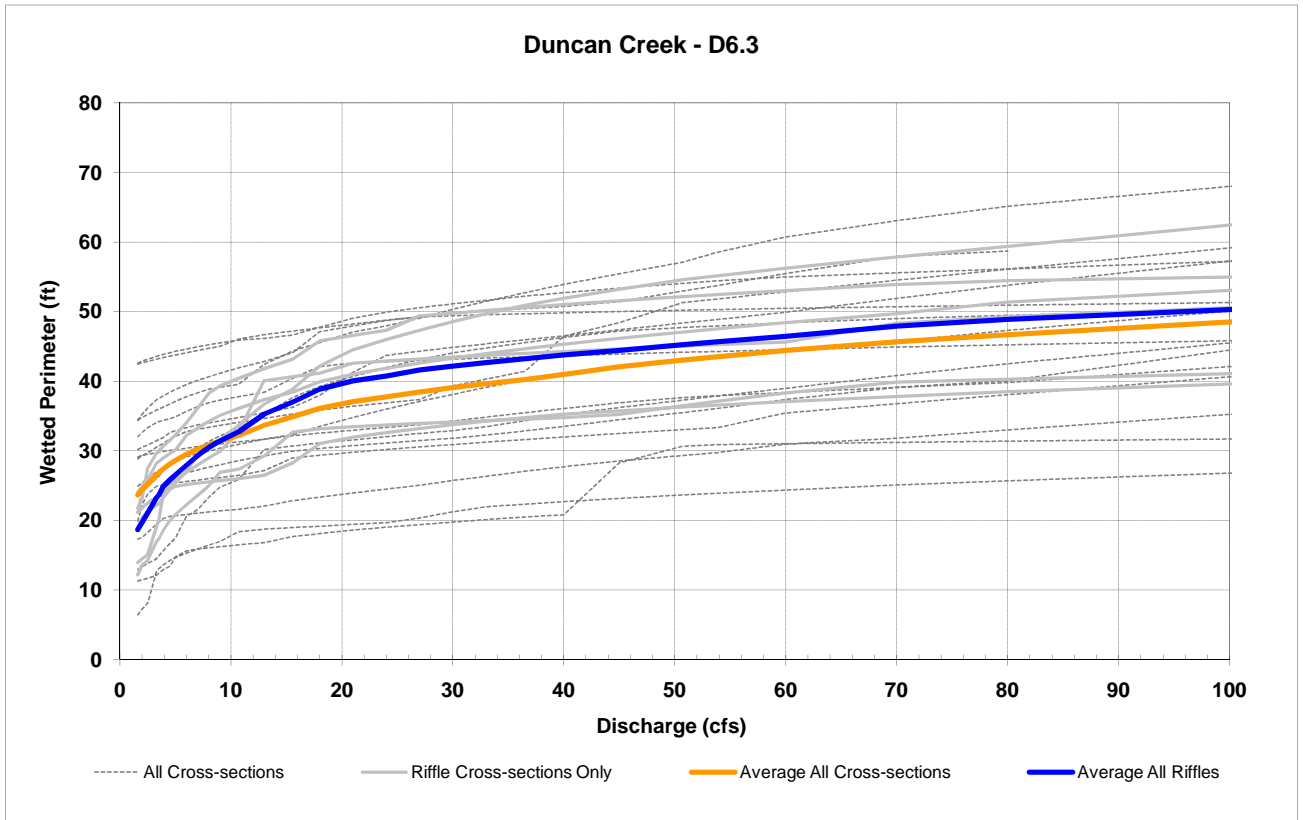


Figure 3. Duncan Creek - D6.3 Wetted Perimeter.



North Fork Long Canyon Creek NFLC1.9

Figure 4. North Fork Long Canyon Creek - NFLC1.9 Weighted Usable Area (top) and Percent of Maximum Weighted Usable Area (bottom).

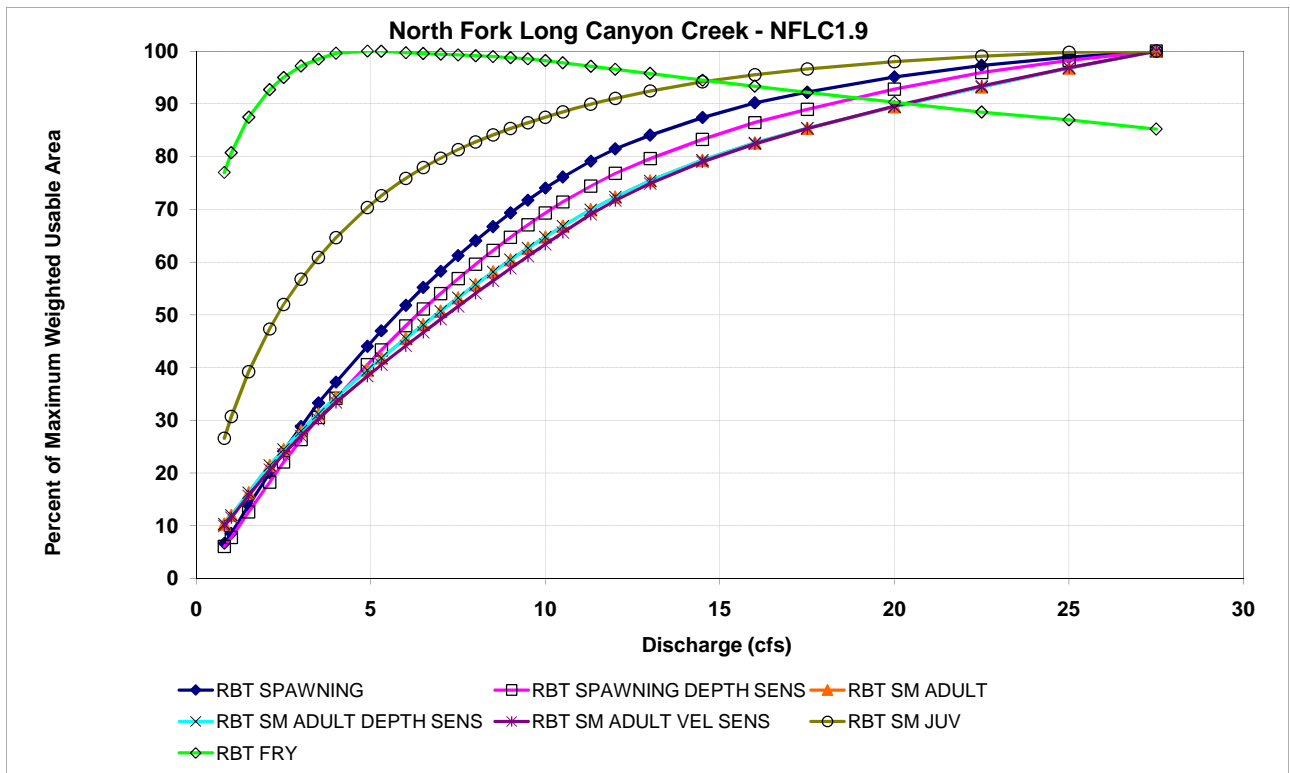
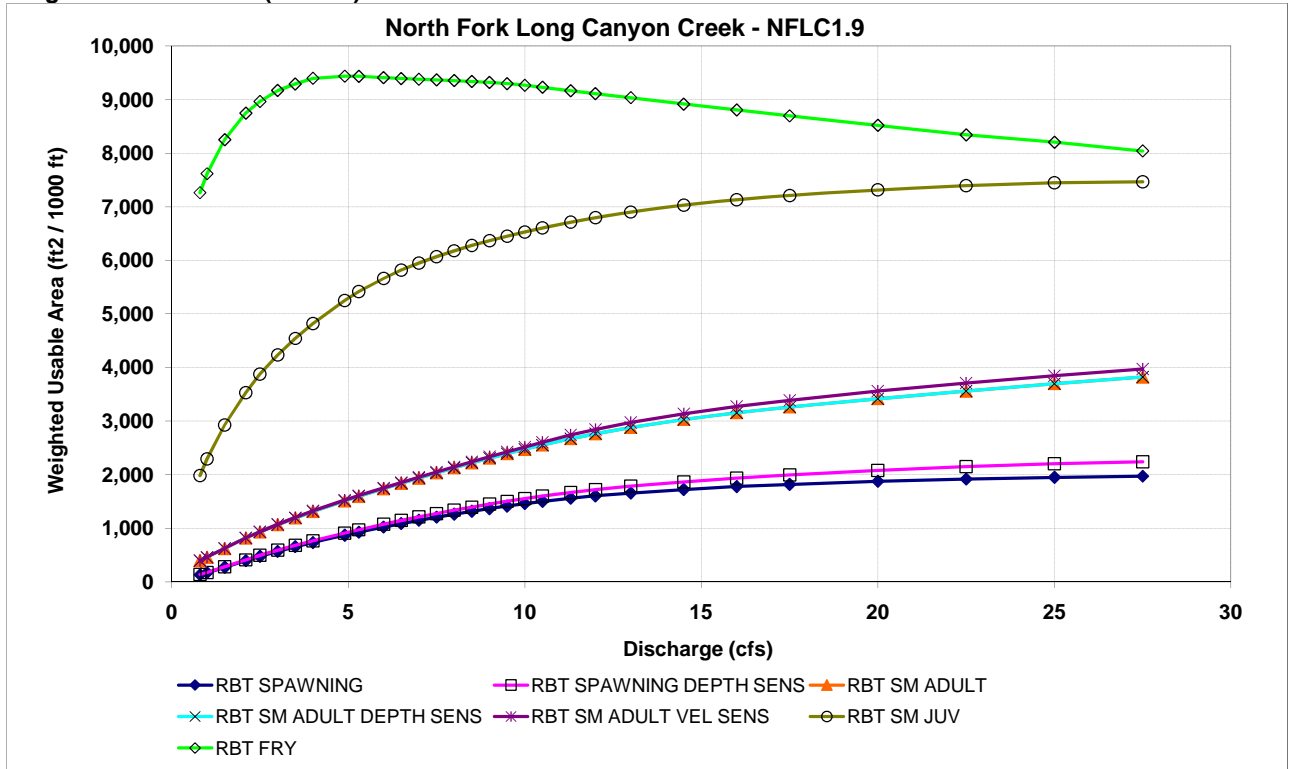


Table 2A. North Fork Long Canyon Creek - NFLC1.9 Weighted Usable Area.

| Discharge (cfs) | Weighted Usable Area (ft ² / 1000 ft) | | | | | | |
|-----------------|--|-------------------------|--------------|-------------------------|-----------------------|------------|---------|
| | RBT SPAWNING | RBT SPAWNING DEPTH SENS | RBT SM ADULT | RBT SM ADULT DEPTH SENS | RBT SM ADULT VEL SENS | RBT SM JUV | RBT FRY |
| 0.8 | 132 | 136 | 395 | 395 | 395 | 1984 | 7264 |
| 1 | 169 | 175 | 459 | 459 | 459 | 2292 | 7617 |
| 1.5 | 273 | 283 | 622 | 622 | 622 | 2926 | 8252 |
| 2.1 | 395 | 411 | 820 | 820 | 820 | 3532 | 8747 |
| 2.5 | 476 | 495 | 935 | 935 | 936 | 3878 | 8964 |
| 3 | 568 | 591 | 1070 | 1070 | 1072 | 4236 | 9169 |
| 3.5 | 657 | 685 | 1193 | 1193 | 1199 | 4543 | 9292 |
| 4 | 734 | 767 | 1313 | 1313 | 1326 | 4823 | 9397 |
| 4.9 | 868 | 910 | 1511 | 1511 | 1524 | 5252 | 9436 |
| 5.3 | 926 | 972 | 1597 | 1597 | 1611 | 5418 | 9434 |
| 6 | 1022 | 1075 | 1740 | 1740 | 1753 | 5665 | 9407 |
| 6.5 | 1089 | 1146 | 1840 | 1840 | 1853 | 5815 | 9392 |
| 7 | 1149 | 1212 | 1937 | 1937 | 1952 | 5948 | 9380 |
| 7.5 | 1208 | 1276 | 2034 | 2034 | 2050 | 6069 | 9367 |
| 8 | 1263 | 1337 | 2130 | 2130 | 2147 | 6179 | 9355 |
| 8.5 | 1316 | 1395 | 2222 | 2222 | 2242 | 6277 | 9338 |
| 9 | 1367 | 1451 | 2309 | 2309 | 2336 | 6368 | 9318 |
| 9.5 | 1415 | 1504 | 2393 | 2393 | 2428 | 6451 | 9298 |
| 10 | 1460 | 1554 | 2474 | 2474 | 2518 | 6530 | 9267 |
| 10.5 | 1502 | 1601 | 2553 | 2553 | 2607 | 6605 | 9228 |
| 11.3 | 1561 | 1669 | 2672 | 2672 | 2743 | 6713 | 9164 |
| 12 | 1606 | 1722 | 2764 | 2764 | 2847 | 6797 | 9110 |
| 13 | 1658 | 1785 | 2881 | 2881 | 2976 | 6902 | 9036 |
| 14.5 | 1724 | 1867 | 3030 | 3030 | 3138 | 7030 | 8914 |
| 16 | 1779 | 1938 | 3156 | 3156 | 3273 | 7130 | 8808 |
| 17.5 | 1819 | 1995 | 3263 | 3263 | 3389 | 7212 | 8696 |
| 20 | 1876 | 2081 | 3419 | 3419 | 3559 | 7317 | 8519 |
| 22.5 | 1919 | 2151 | 3561 | 3561 | 3710 | 7392 | 8342 |
| 25 | 1950 | 2203 | 3699 | 3699 | 3847 | 7448 | 8204 |
| 27.5 | 1972 | 2242 | 3821 | 3821 | 3973 | 7466 | 8042 |

Table 2B. North Fork Long Canyon Creek - NFLC1.9 Percent of Maximum Weighted Usable Area.

| Discharge (cfs) | Percent of Maximum Weighted Usable Area | | | | | | |
|-----------------|---|-------------------------|--------------|-------------------------|-----------------------|------------|---------|
| | RBT SPAWNING | RBT SPAWNING DEPTH SENS | RBT SM ADULT | RBT SM ADULT DEPTH SENS | RBT SM ADULT VEL SENS | RBT SM JUV | RBT FRY |
| 0.8 | 7 | 6 | 10 | 10 | 10 | 27 | 77 |
| 1 | 9 | 8 | 12 | 12 | 12 | 31 | 81 |
| 1.5 | 14 | 13 | 16 | 16 | 16 | 39 | 87 |
| 2.1 | 20 | 18 | 21 | 21 | 21 | 47 | 93 |
| 2.5 | 24 | 22 | 24 | 24 | 24 | 52 | 95 |
| 3 | 29 | 26 | 28 | 28 | 27 | 57 | 97 |
| 3.5 | 33 | 31 | 31 | 31 | 30 | 61 | 98 |
| 4 | 37 | 34 | 34 | 34 | 33 | 65 | 100 |
| 4.9 | 44 | 41 | 40 | 40 | 38 | 70 | 100 |
| 5.3 | 47 | 43 | 42 | 42 | 41 | 73 | 100 |
| 6 | 52 | 48 | 46 | 46 | 44 | 76 | 100 |
| 6.5 | 55 | 51 | 48 | 48 | 47 | 78 | 100 |
| 7 | 58 | 54 | 51 | 51 | 49 | 80 | 99 |
| 7.5 | 61 | 57 | 53 | 53 | 52 | 81 | 99 |
| 8 | 64 | 60 | 56 | 56 | 54 | 83 | 99 |
| 8.5 | 67 | 62 | 58 | 58 | 56 | 84 | 99 |
| 9 | 69 | 65 | 60 | 60 | 59 | 85 | 99 |
| 9.5 | 72 | 67 | 63 | 63 | 61 | 86 | 99 |
| 10 | 74 | 69 | 65 | 65 | 63 | 87 | 98 |
| 10.5 | 76 | 71 | 67 | 67 | 66 | 88 | 98 |
| 11.3 | 79 | 74 | 70 | 70 | 69 | 90 | 97 |
| 12 | 81 | 77 | 72 | 72 | 72 | 91 | 97 |
| 13 | 84 | 80 | 75 | 75 | 75 | 92 | 96 |
| 14.5 | 87 | 83 | 79 | 79 | 79 | 94 | 94 |
| 16 | 90 | 86 | 83 | 83 | 82 | 96 | 93 |
| 17.5 | 92 | 89 | 85 | 85 | 85 | 97 | 92 |
| 20 | 95 | 93 | 89 | 89 | 90 | 98 | 90 |
| 22.5 | 97 | 96 | 93 | 93 | 93 | 99 | 88 |
| 25 | 99 | 98 | 97 | 97 | 97 | 100 | 87 |
| 27.5 | 100 | 100 | 100 | 100 | 100 | 100 | 85 |

Figure 5. North Fork Long Canyon Creek - NFLC1.9 Spatial Niche Area by Individual Niche (top) and by Cumulative Area (bottom).

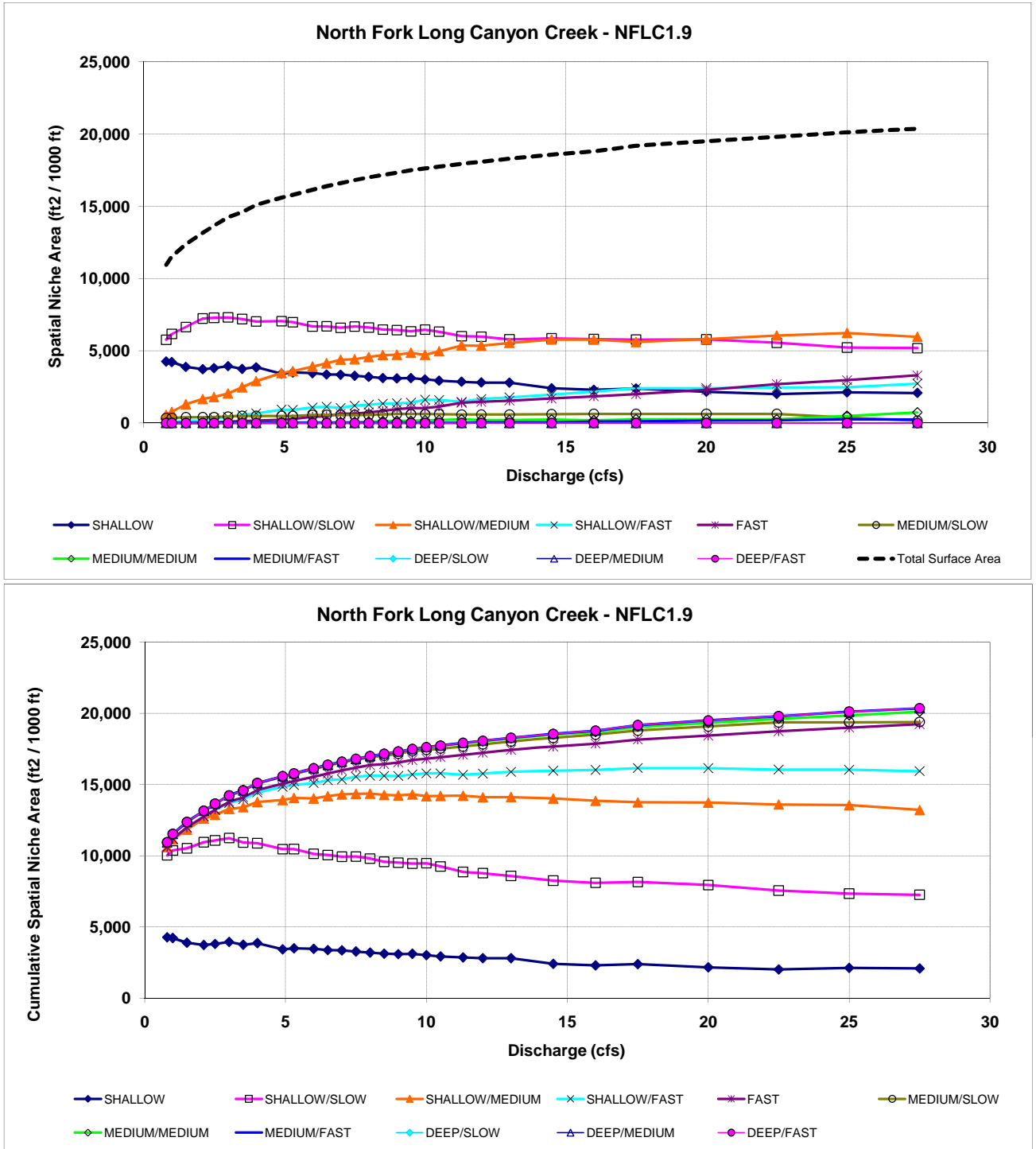
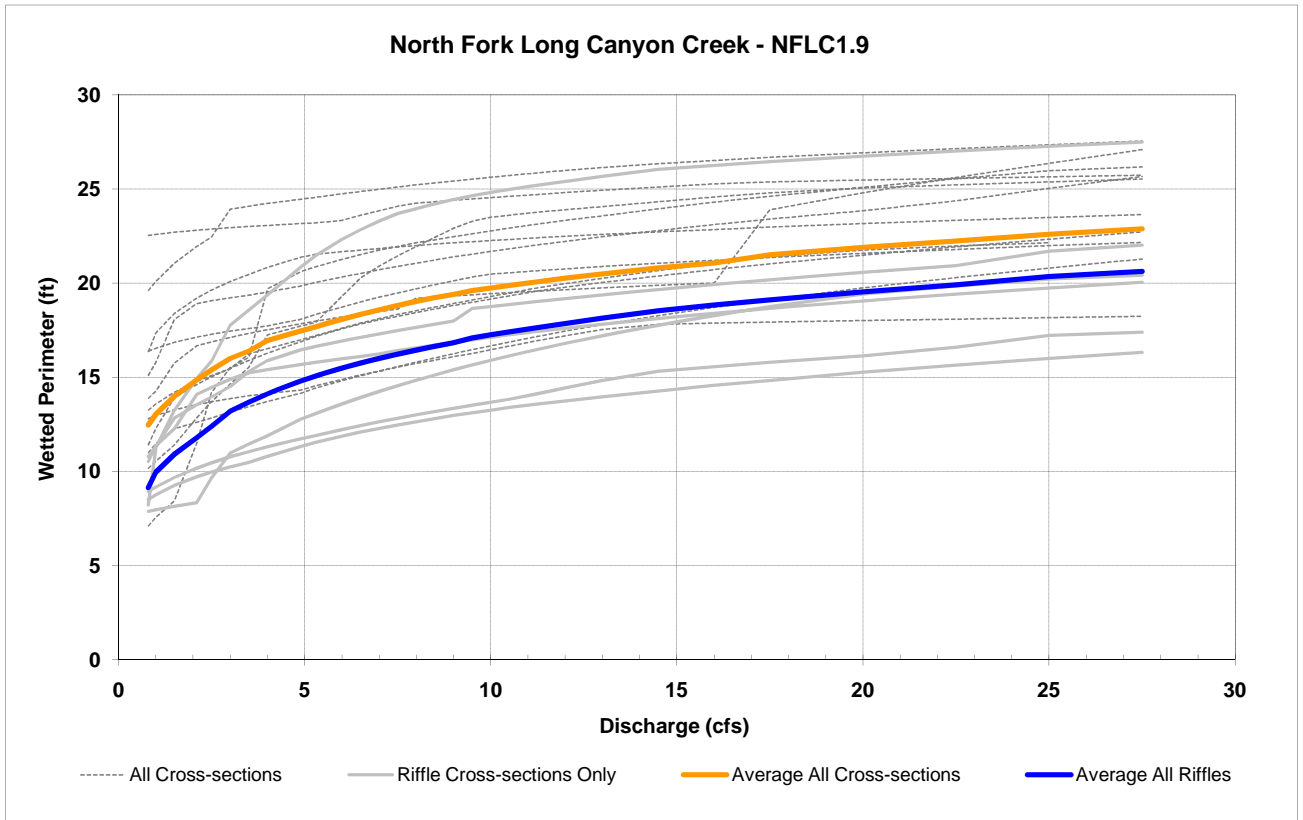


Figure 6. North Fork Long Canyon Creek - NFLC1.9 Wetted Perimeter.



South Fork Long Canyon Creek SFLC2.3

Figure 7. South Fork Long Canyon Creek - SFLC2.3 Weighted Usable Area (top) and Percent of Maximum Weighted Usable Area (bottom).

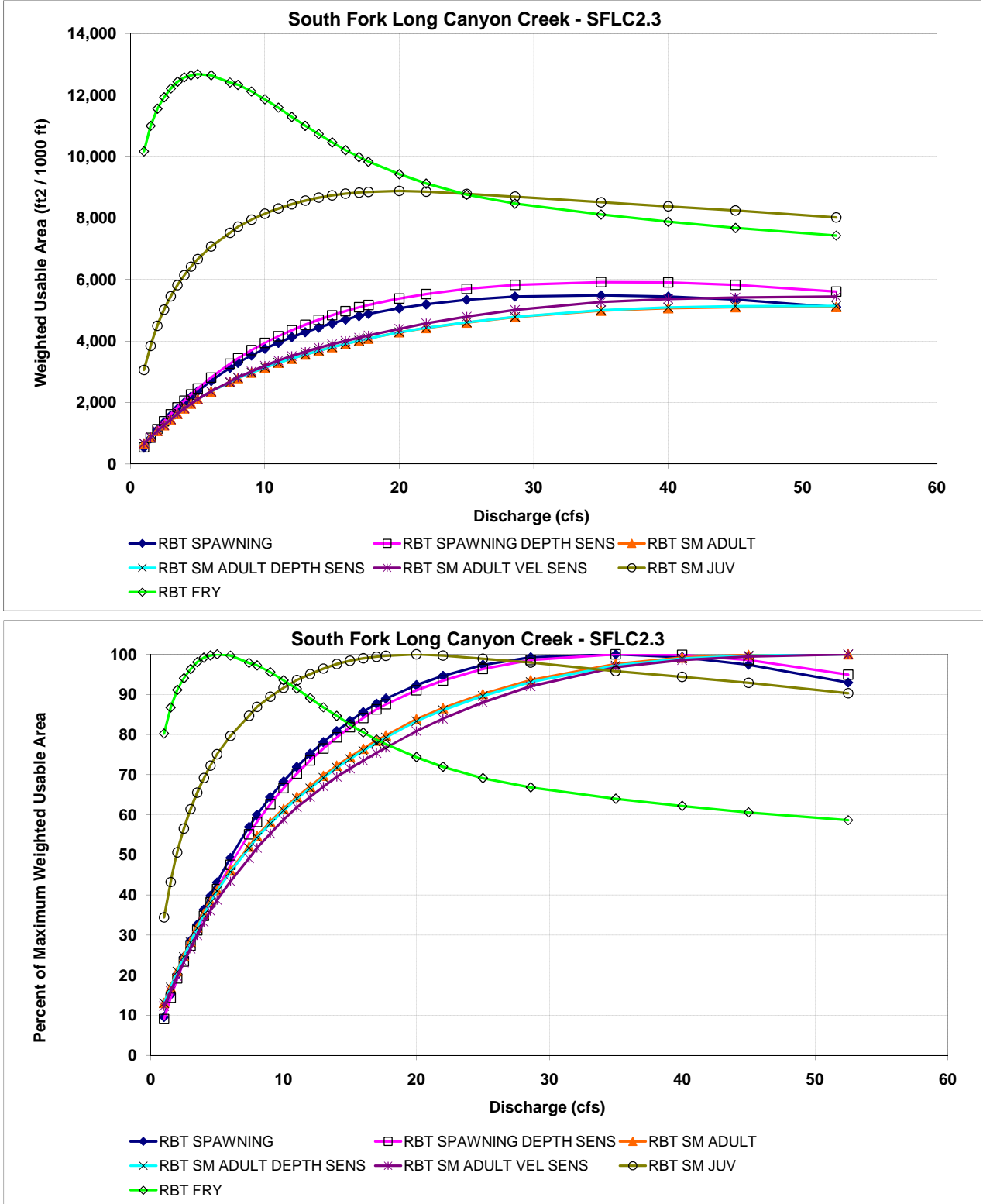


Table 3A. South Fork Long Canyon Creek - SFLC2.3 Weighted Usable Area.

| Discharge (cfs) | Weighted Usable Area (ft ² / 1000 ft) | | | | | | |
|--------------------|--|----------------------------|-----------------|----------------------------|--------------------------|------------|---------|
| | RBT SPAWNING | RBT SPAWNING DEPTH SENS | RBT SM ADULT | RBT SM ADULT DEPTH SENS | RBT SM ADULT VEL SENS | RBT SM JUV | RBT FRY |
| 1 | 526 | 538 | 670 | 670 | 670 | 3058 | 10167 |
| 1.5 | 833 | 852 | 870 | 870 | 870 | 3838 | 10994 |
| 2 | 1108 | 1135 | 1074 | 1074 | 1074 | 4495 | 11550 |
| 2.5 | 1351 | 1385 | 1262 | 1262 | 1262 | 5018 | 11919 |
| 3 | 1574 | 1618 | 1448 | 1448 | 1448 | 5451 | 12207 |
| 3.5 | 1791 | 1844 | 1630 | 1630 | 1630 | 5814 | 12427 |
| 4 | 1994 | 2057 | 1806 | 1806 | 1807 | 6140 | 12570 |
| 4.5 | 2184 | 2257 | 1961 | 1961 | 1962 | 6415 | 12637 |
| 5 | 2367 | 2450 | 2106 | 2106 | 2108 | 6663 | 12675 |
| 6 | 2703 | 2807 | 2355 | 2355 | 2362 | 7070 | 12635 |
| 7.4 | 3125 | 3259 | 2658 | 2658 | 2675 | 7517 | 12401 |
| 8 | 3292 | 3439 | 2794 | 2794 | 2816 | 7714 | 12327 |
| 9 | 3532 | 3701 | 2971 | 2971 | 3011 | 7941 | 12110 |
| 10 | 3746 | 3935 | 3139 | 3139 | 3198 | 8135 | 11854 |
| 11 | 3945 | 4151 | 3290 | 3290 | 3367 | 8307 | 11586 |
| 12 | 4125 | 4347 | 3422 | 3422 | 3506 | 8441 | 11288 |
| 13 | 4286 | 4521 | 3558 | 3558 | 3648 | 8561 | 10997 |
| 14 | 4436 | 4684 | 3688 | 3688 | 3782 | 8662 | 10727 |
| 15 | 4574 | 4835 | 3799 | 3799 | 3893 | 8734 | 10457 |
| 16 | 4696 | 4969 | 3905 | 3905 | 3998 | 8787 | 10204 |
| 17 | 4812 | 5096 | 4006 | 4006 | 4104 | 8823 | 9978 |
| 17.7 | 4882 | 5172 | 4075 | 4075 | 4176 | 8842 | 9828 |
| 20 | 5065 | 5378 | 4280 | 4282 | 4398 | 8877 | 9423 |
| 22 | 5191 | 5521 | 4422 | 4426 | 4569 | 8851 | 9117 |
| 25 | 5342 | 5695 | 4599 | 4606 | 4790 | 8780 | 8757 |
| 28.6 | 5446 | 5824 | 4776 | 4785 | 5008 | 8694 | 8468 |
| 35 | 5487 | 5909 | 4981 | 4998 | 5267 | 8506 | 8109 |
| 40 | 5447 | 5902 | 5065 | 5088 | 5365 | 8377 | 7879 |
| 45 | 5345 | 5825 | 5098 | 5126 | 5413 | 8244 | 7678 |
| 52.5 | 5101 | 5608 | 5105 | 5141 | 5443 | 8014 | 7430 |

Table 3B. South Fork Long Canyon Creek - SFLC2.3 Percent of Maximum Weighted Usable Area.

| Discharge (cfs) | Percent of Maximum Weighted Usable Area | | | | | | |
|--------------------|---|----------------------------|-----------------|----------------------------|--------------------------|------------|---------|
| | RBT SPAWNING | RBT SPAWNING DEPTH SENS | RBT SM ADULT | RBT SM ADULT DEPTH SENS | RBT SM ADULT VEL SENS | RBT SM JUV | RBT FRY |
| 1 | 10 | 9 | 13 | 13 | 12 | 34 | 80 |
| 1.5 | 15 | 14 | 17 | 17 | 16 | 43 | 87 |
| 2 | 20 | 19 | 21 | 21 | 20 | 51 | 91 |
| 2.5 | 25 | 23 | 25 | 25 | 23 | 57 | 94 |
| 3 | 29 | 27 | 28 | 28 | 27 | 61 | 96 |
| 3.5 | 33 | 31 | 32 | 32 | 30 | 65 | 98 |
| 4 | 36 | 35 | 35 | 35 | 33 | 69 | 99 |
| 4.5 | 40 | 38 | 38 | 38 | 36 | 72 | 100 |
| 5 | 43 | 41 | 41 | 41 | 39 | 75 | 100 |
| 6 | 49 | 48 | 46 | 46 | 43 | 80 | 100 |
| 7.4 | 57 | 55 | 52 | 52 | 49 | 85 | 98 |
| 8 | 60 | 58 | 55 | 54 | 52 | 87 | 97 |
| 9 | 64 | 63 | 58 | 58 | 55 | 89 | 96 |
| 10 | 68 | 67 | 61 | 61 | 59 | 92 | 94 |
| 11 | 72 | 70 | 64 | 64 | 62 | 94 | 91 |
| 12 | 75 | 74 | 67 | 67 | 64 | 95 | 89 |
| 13 | 78 | 77 | 70 | 69 | 67 | 96 | 87 |
| 14 | 81 | 79 | 72 | 72 | 69 | 98 | 85 |
| 15 | 83 | 82 | 74 | 74 | 72 | 98 | 83 |
| 16 | 86 | 84 | 76 | 76 | 73 | 99 | 81 |
| 17 | 88 | 86 | 78 | 78 | 75 | 99 | 79 |
| 17.7 | 89 | 88 | 80 | 79 | 77 | 100 | 78 |
| 20 | 92 | 91 | 84 | 83 | 81 | 100 | 74 |
| 22 | 95 | 93 | 87 | 86 | 84 | 100 | 72 |
| 25 | 97 | 96 | 90 | 90 | 88 | 99 | 69 |
| 28.6 | 99 | 99 | 94 | 93 | 92 | 98 | 67 |
| 35 | 100 | 100 | 98 | 97 | 97 | 96 | 64 |
| 40 | 99 | 100 | 99 | 99 | 99 | 94 | 62 |
| 45 | 97 | 99 | 100 | 100 | 99 | 93 | 61 |
| 52.5 | 93 | 95 | 100 | 100 | 100 | 90 | 59 |

Figure 8. South Fork Long Canyon Creek - SFLC2.3 Spatial Niche Area by Individual Niche (top) and by Cumulative Area (bottom).

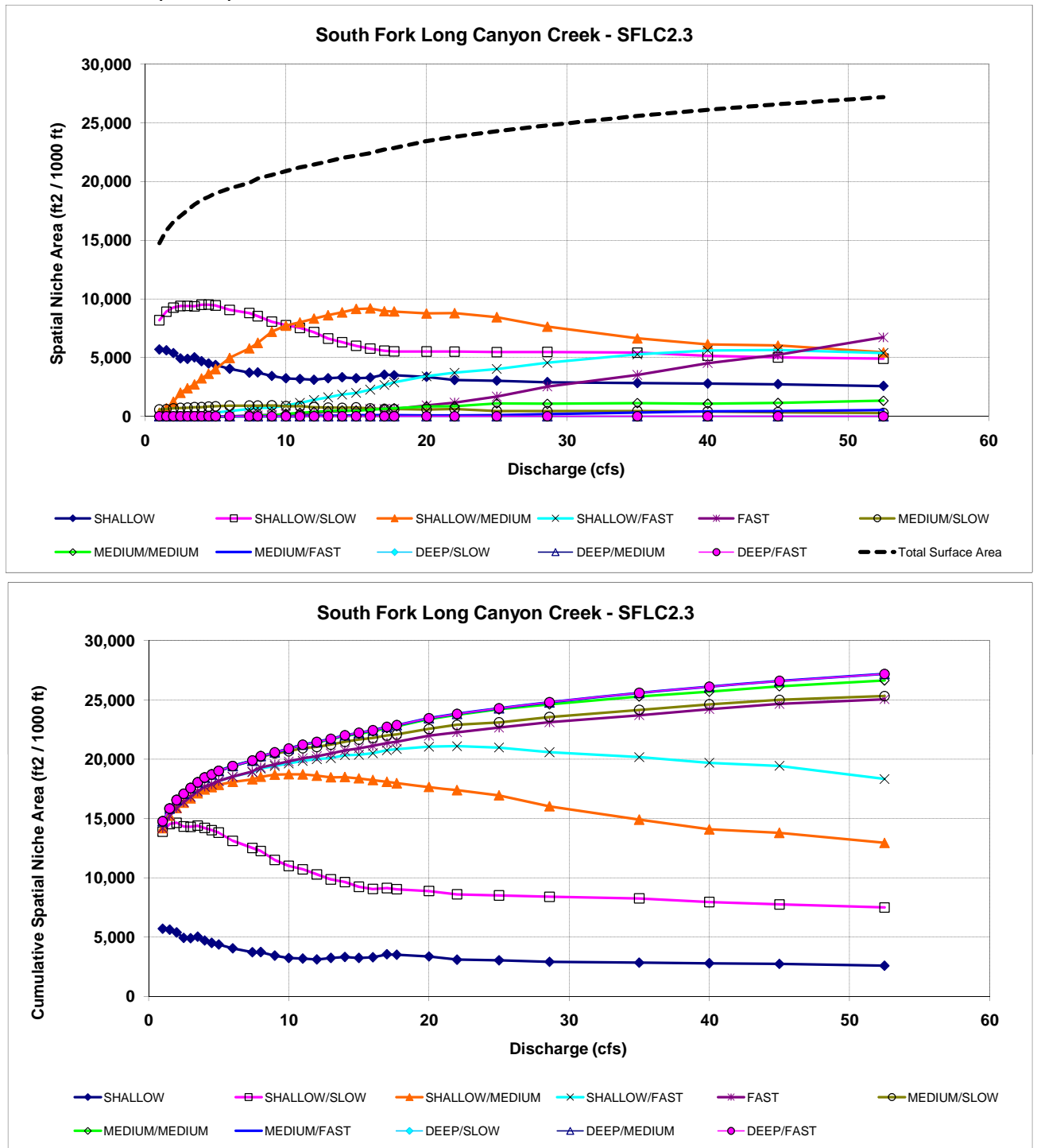
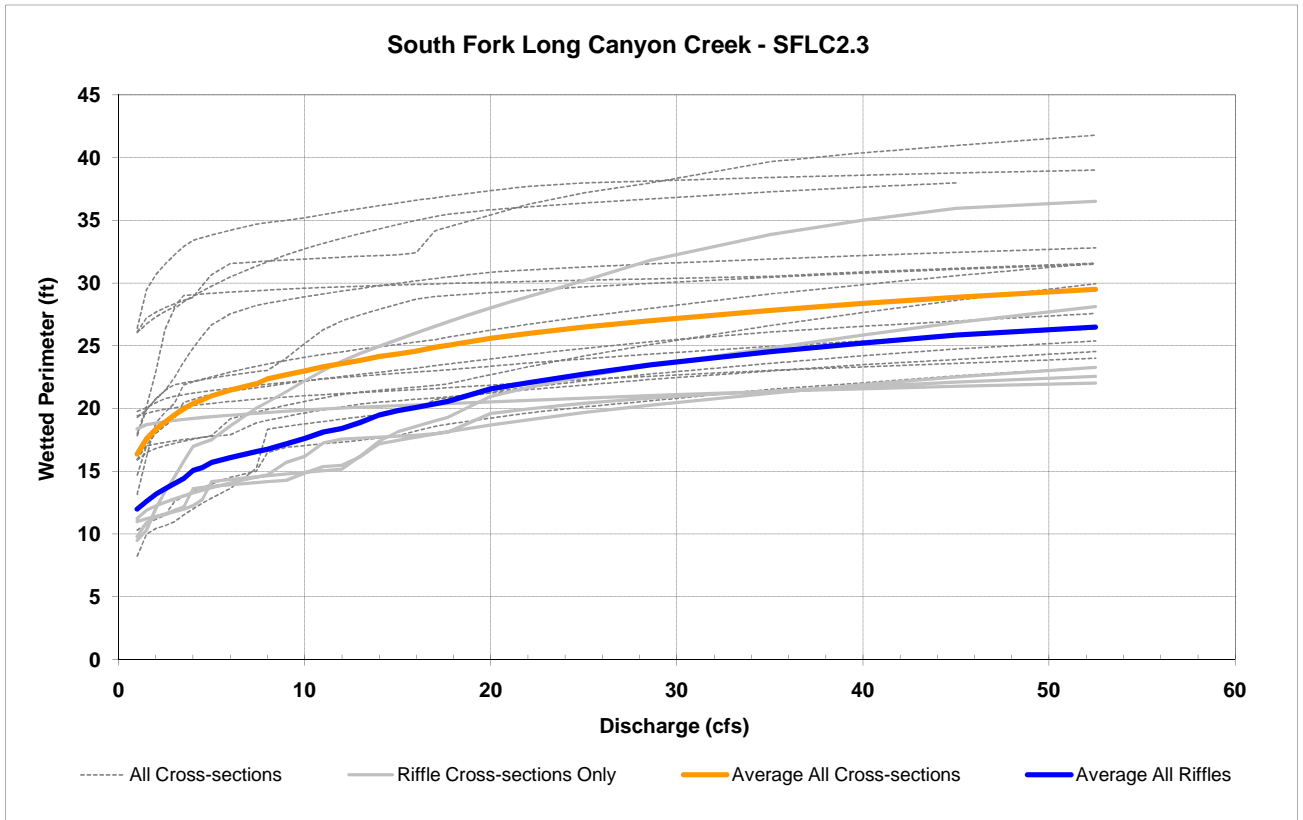


Figure 9. South Fork Long Canyon Creek - SFLC2.3 Wetted Perimeter.



Long Canyon Creek LC9.0

Figure 10. Long Canyon Creek- LC9.0 Weighted Usable Area (top) and Percent of Maximum Weighted Usable Area (bottom).

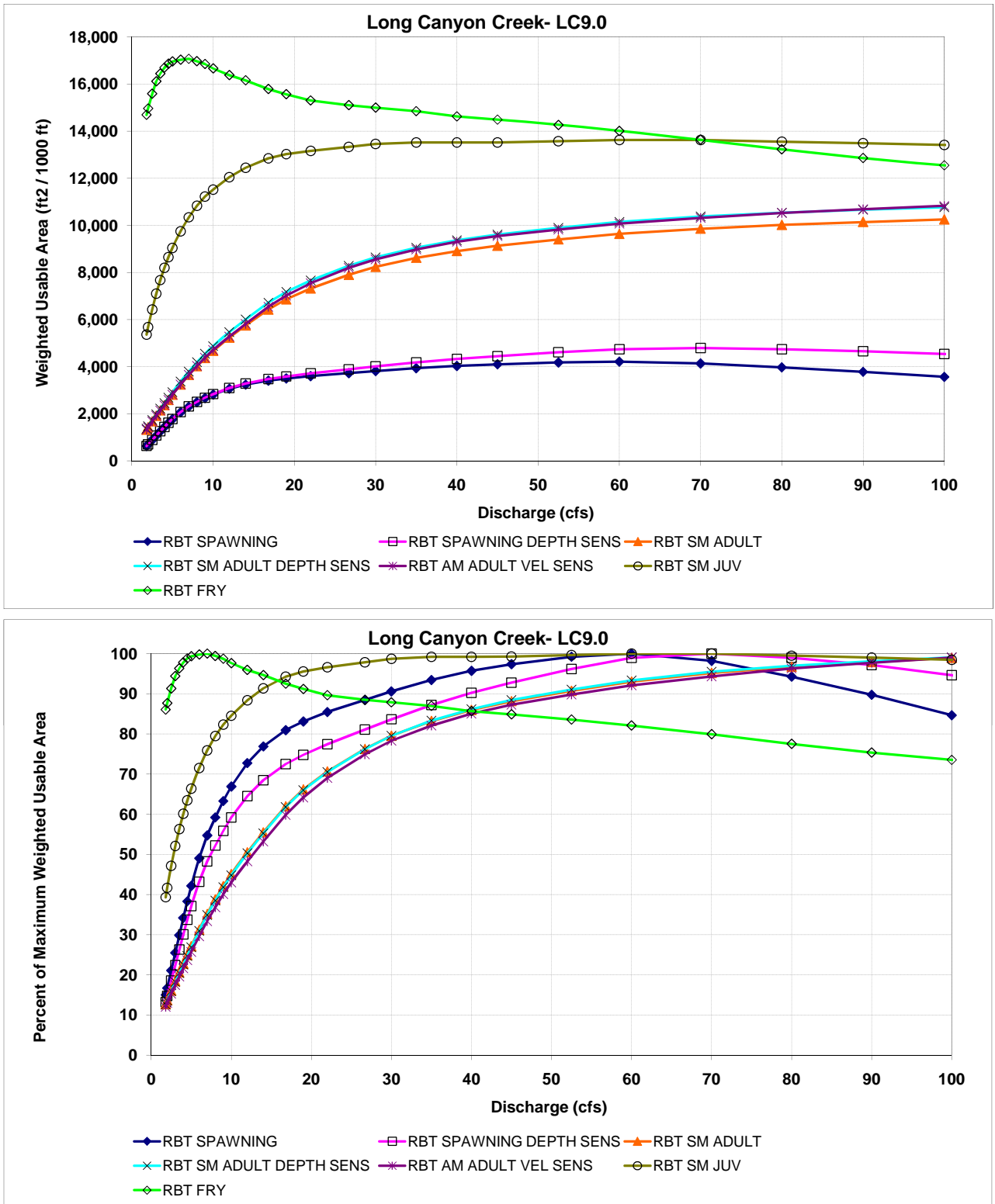


Table 4A. Long Canyon Creek- LC9.0 Weighted Usable Area.

| Discharge (cfs) | Weighted Usable Area (ft ² / 1000 ft) | | | | | | |
|--------------------|--|----------------------------|-----------------|----------------------------|--------------------------|------------|---------|
| | RBT SPAWNING | RBT SPAWNING DEPTH SENS | RBT SM ADULT | RBT SM ADULT DEPTH SENS | RBT AM ADULT VEL SENS | RBT SM JUV | RBT FRY |
| 1.8 | 633 | 634 | 1320 | 1370 | 1320 | 5361 | 14689 |
| 2 | 706 | 707 | 1422 | 1475 | 1423 | 5681 | 14962 |
| 2.5 | 889 | 891 | 1673 | 1735 | 1674 | 6430 | 15586 |
| 3 | 1075 | 1077 | 1912 | 1983 | 1913 | 7104 | 16115 |
| 3.5 | 1259 | 1261 | 2140 | 2220 | 2140 | 7676 | 16442 |
| 4 | 1440 | 1443 | 2363 | 2452 | 2363 | 8194 | 16690 |
| 4.5 | 1614 | 1617 | 2590 | 2689 | 2590 | 8653 | 16866 |
| 5 | 1776 | 1780 | 2810 | 2919 | 2810 | 9043 | 16955 |
| 6 | 2066 | 2071 | 3239 | 3367 | 3240 | 9744 | 17030 |
| 7 | 2306 | 2313 | 3647 | 3795 | 3650 | 10342 | 17068 |
| 8 | 2494 | 2504 | 4021 | 4187 | 4030 | 10829 | 16970 |
| 9 | 2666 | 2679 | 4364 | 4548 | 4386 | 11218 | 16848 |
| 10 | 2819 | 2837 | 4671 | 4872 | 4705 | 11518 | 16665 |
| 12 | 3064 | 3094 | 5235 | 5467 | 5280 | 12046 | 16376 |
| 14 | 3238 | 3283 | 5747 | 6007 | 5819 | 12449 | 16156 |
| 16.8 | 3409 | 3476 | 6422 | 6716 | 6540 | 12848 | 15790 |
| 19 | 3499 | 3586 | 6856 | 7173 | 7016 | 13021 | 15567 |
| 22 | 3599 | 3713 | 7319 | 7663 | 7546 | 13164 | 15300 |
| 26.7 | 3725 | 3887 | 7899 | 8280 | 8194 | 13335 | 15101 |
| 30 | 3815 | 4011 | 8240 | 8644 | 8560 | 13453 | 14998 |
| 35 | 3935 | 4181 | 8621 | 9055 | 8978 | 13522 | 14846 |
| 40 | 4031 | 4326 | 8906 | 9366 | 9301 | 13517 | 14624 |
| 45 | 4100 | 4447 | 9133 | 9612 | 9543 | 13524 | 14488 |
| 52.5 | 4178 | 4612 | 9400 | 9897 | 9822 | 13575 | 14264 |
| 60 | 4212 | 4744 | 9637 | 10146 | 10069 | 13629 | 14012 |
| 70 | 4135 | 4795 | 9857 | 10377 | 10315 | 13627 | 13640 |
| 80 | 3970 | 4744 | 10021 | 10540 | 10528 | 13557 | 13228 |
| 90 | 3779 | 4657 | 10141 | 10661 | 10688 | 13493 | 12858 |
| 100 | 3565 | 4537 | 10249 | 10769 | 10827 | 13416 | 12549 |
| 118.8 | 3155 | 4271 | 10360 | 10869 | 10936 | 13276 | 11994 |

Table 4B. Long Canyon Creek- LC9.0 Percent of Maximum Weighted Usable Area.

| Discharge (cfs) | Percent of Maximum Weighted Usable Area | | | | | | |
|--------------------|---|----------------------------|-----------------|----------------------------|--------------------------|------------|---------|
| | RBT SPAWNING | RBT SPAWNING DEPTH SENS | RBT SM ADULT | RBT SM ADULT DEPTH SENS | RBT AM ADULT VEL SENS | RBT SM JUV | RBT FRY |
| 1.8 | 15 | 13 | 13 | 13 | 12 | 39 | 86 |
| 2 | 17 | 15 | 14 | 14 | 13 | 42 | 88 |
| 2.5 | 21 | 19 | 16 | 16 | 15 | 47 | 91 |
| 3 | 26 | 22 | 18 | 18 | 17 | 52 | 94 |
| 3.5 | 30 | 26 | 21 | 20 | 20 | 56 | 96 |
| 4 | 34 | 30 | 23 | 23 | 22 | 60 | 98 |
| 4.5 | 38 | 34 | 25 | 25 | 24 | 63 | 99 |
| 5 | 42 | 37 | 27 | 27 | 26 | 66 | 99 |
| 6 | 49 | 43 | 31 | 31 | 30 | 71 | 100 |
| 7 | 55 | 48 | 35 | 35 | 33 | 76 | 100 |
| 8 | 59 | 52 | 39 | 39 | 37 | 79 | 99 |
| 9 | 63 | 56 | 42 | 42 | 40 | 82 | 99 |
| 10 | 67 | 59 | 45 | 45 | 43 | 85 | 98 |
| 12 | 73 | 65 | 51 | 50 | 48 | 88 | 96 |
| 14 | 77 | 68 | 55 | 55 | 53 | 91 | 95 |
| 16.8 | 81 | 73 | 62 | 62 | 60 | 94 | 93 |
| 19 | 83 | 75 | 66 | 66 | 64 | 96 | 91 |
| 22 | 85 | 77 | 71 | 70 | 69 | 97 | 90 |
| 26.7 | 88 | 81 | 76 | 76 | 75 | 98 | 88 |
| 30 | 91 | 84 | 80 | 80 | 78 | 99 | 88 |
| 35 | 93 | 87 | 83 | 83 | 82 | 99 | 87 |
| 40 | 96 | 90 | 86 | 86 | 85 | 99 | 86 |
| 45 | 97 | 93 | 88 | 88 | 87 | 99 | 85 |
| 52.5 | 99 | 96 | 91 | 91 | 90 | 100 | 84 |
| 60 | 100 | 99 | 93 | 93 | 92 | 100 | 82 |
| 70 | 98 | 100 | 95 | 95 | 94 | 100 | 80 |
| 80 | 94 | 99 | 97 | 97 | 96 | 99 | 78 |
| 90 | 90 | 97 | 98 | 98 | 98 | 99 | 75 |
| 100 | 85 | 95 | 99 | 99 | 99 | 98 | 74 |
| 118.8 | 75 | 89 | 100 | 100 | 100 | 97 | 70 |

Figure 11. Long Canyon Creek - LC9.0 Spatial Niche Area by Individual Niche (top) and by Cumulative Area (bottom).

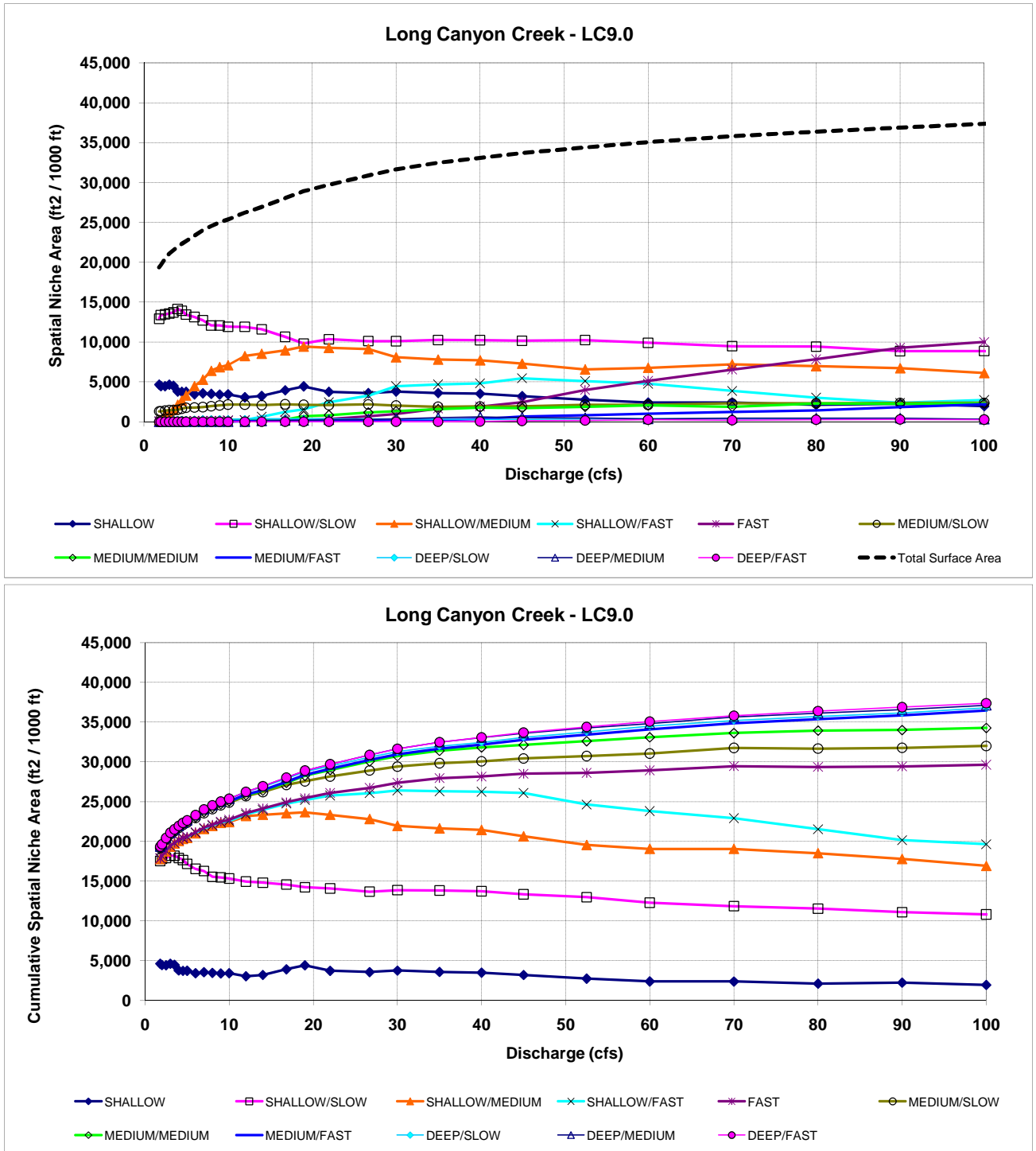
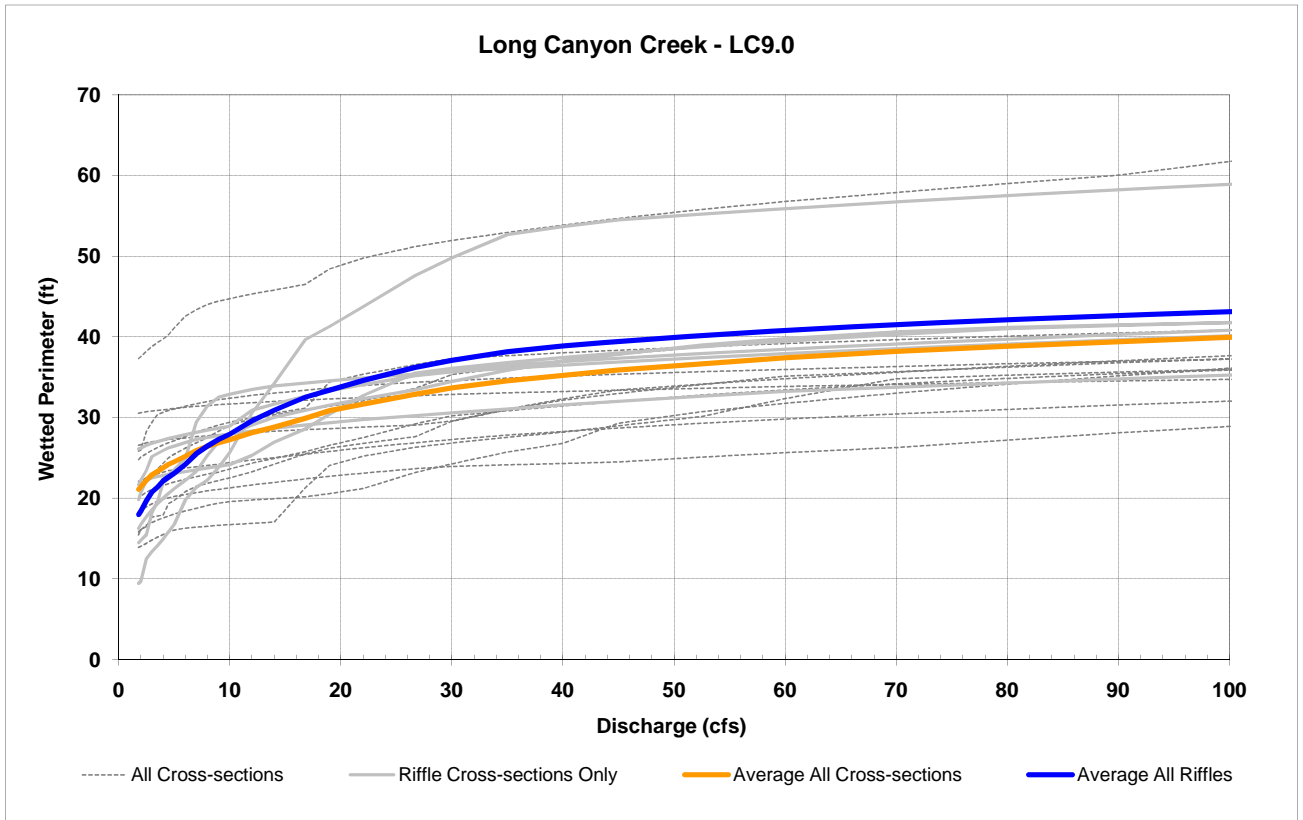


Figure 12. Long Canyon Creek - LC9.0 Wetted Perimeter.



Middle Fork of the American River MF44.7

Figure 13. Middle Fork of the American River - MF44.7 Weighted Usable Area (top) and Percent of Maximum Weighted Usable Area (bottom).

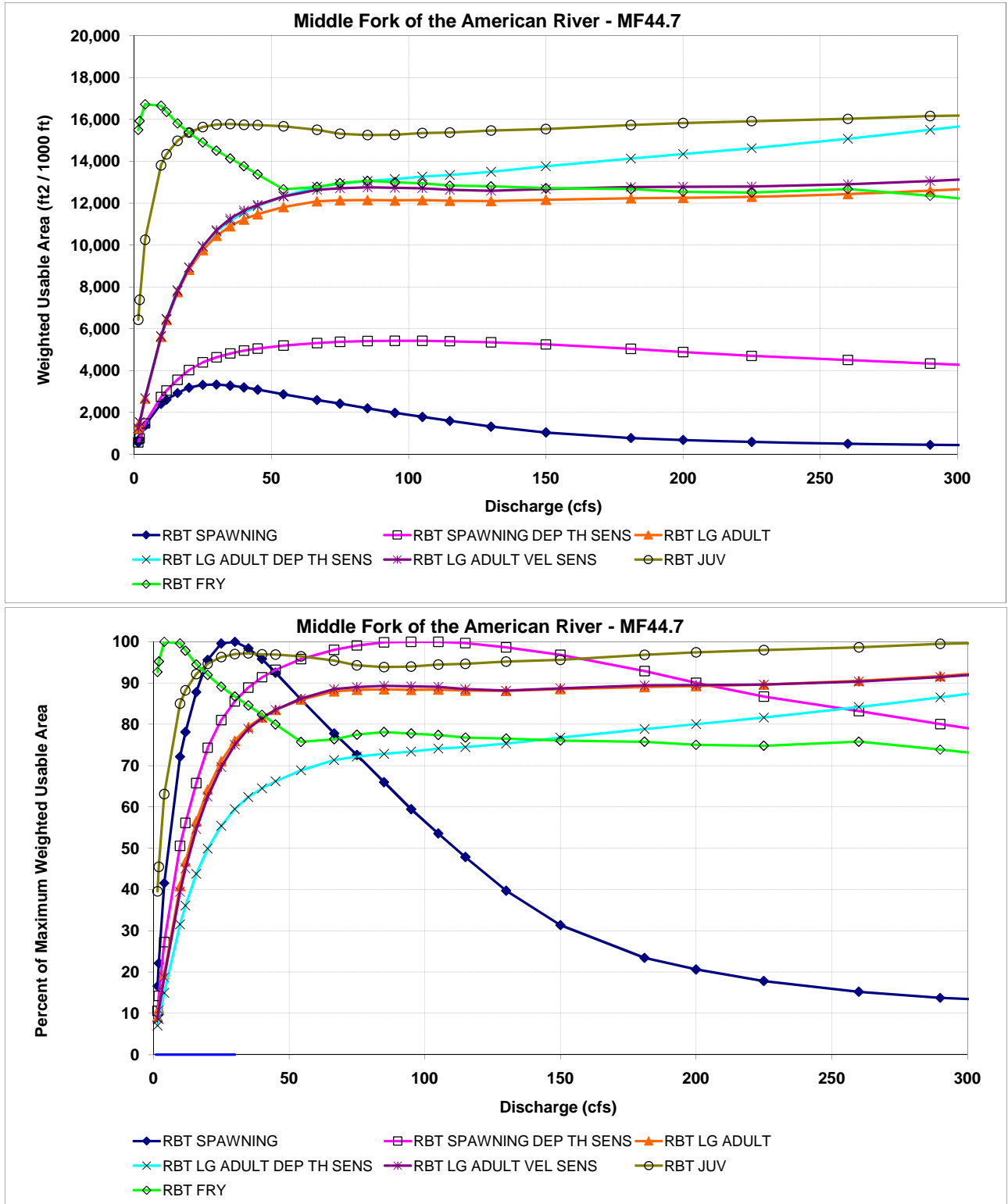


Table 5A. Middle Fork of the American River - MF44.7 Weighted Usable Area.

| Discharge (cfs) | Weighted Usable Area (ft ² / 1000 ft) | | | | | | |
|-----------------|--|--------------------------|--------------|--------------------------|-----------------------|---------|---------|
| | RBT SPAWNING | RBT SPAWNING DEP TH SENS | RBT LG ADULT | RBT LG ADULT DEP TH SENS | RBT LG ADULT VEL SENS | RBT JUV | RBT FRY |
| 1.5 | 554 | 576 | 1255 | 1258 | 1256 | 6423 | 15496 |
| 2 | 739 | 772 | 1538 | 1542 | 1538 | 7389 | 15926 |
| 4 | 1388 | 1478 | 2671 | 2681 | 2676 | 10246 | 16722 |
| 9.8 | 2411 | 2744 | 5611 | 5650 | 5630 | 13807 | 16653 |
| 11.8 | 2610 | 3046 | 6420 | 6471 | 6443 | 14334 | 16360 |
| 15.8 | 2934 | 3568 | 7761 | 7843 | 7801 | 14974 | 15804 |
| 20 | 3193 | 4032 | 8820 | 8937 | 8922 | 15370 | 15376 |
| 25 | 3326 | 4395 | 9761 | 9923 | 9944 | 15642 | 14901 |
| 30 | 3340 | 4642 | 10441 | 10659 | 10715 | 15760 | 14509 |
| 35 | 3287 | 4822 | 10903 | 11174 | 11266 | 15785 | 14139 |
| 40 | 3201 | 4958 | 11225 | 11552 | 11643 | 15748 | 13762 |
| 45 | 3091 | 5054 | 11475 | 11863 | 11921 | 15735 | 13373 |
| 54.4 | 2873 | 5195 | 11816 | 12334 | 12311 | 15669 | 12663 |
| 66.6 | 2599 | 5317 | 12091 | 12779 | 12641 | 15504 | 12772 |
| 75 | 2425 | 5375 | 12141 | 12931 | 12711 | 15319 | 12957 |
| 85 | 2204 | 5417 | 12151 | 13056 | 12755 | 15251 | 13065 |
| 95 | 1986 | 5424 | 12134 | 13148 | 12739 | 15267 | 13003 |
| 105 | 1789 | 5423 | 12148 | 13276 | 12716 | 15345 | 12943 |
| 115 | 1599 | 5407 | 12115 | 13349 | 12643 | 15378 | 12840 |
| 130 | 1326 | 5350 | 12102 | 13495 | 12586 | 15466 | 12801 |
| 150 | 1048 | 5252 | 12164 | 13759 | 12673 | 15536 | 12718 |
| 181 | 783 | 5039 | 12232 | 14127 | 12771 | 15728 | 12670 |
| 200 | 689 | 4884 | 12259 | 14342 | 12778 | 15825 | 12544 |
| 225 | 595 | 4703 | 12309 | 14627 | 12795 | 15917 | 12506 |
| 260 | 509 | 4512 | 12435 | 15080 | 12899 | 16025 | 12673 |
| 290 | 459 | 4343 | 12597 | 15505 | 13060 | 16158 | 12351 |
| 330 | 424 | 4126 | 12864 | 16099 | 13324 | 16244 | 11888 |
| 370 | 400 | 3916 | 13156 | 16689 | 13596 | 16188 | 11472 |
| 420 | 372 | 3688 | 13465 | 17343 | 13947 | 15988 | 10879 |
| 470 | 354 | 3498 | 13739 | 17917 | 14280 | 15745 | 10201 |

Table 5B. Middle Fork of the American River - MF44.7 Percent of Maximum Weighted Usable Area.

| Discharge (cfs) | Percent of Maximum Weighted Usable Area | | | | | | |
|-----------------|---|--------------------------|--------------|--------------------------|-----------------------|---------|---------|
| | RBT SPAWNING | RBT SPAWNING DEP TH SENS | RBT LG ADULT | RBT LG ADULT DEP TH SENS | RBT LG ADULT VEL SENS | RBT JUV | RBT FRY |
| 1.5 | 17 | 11 | 9 | 7 | 9 | 40 | 93 |
| 2 | 22 | 14 | 11 | 9 | 11 | 45 | 95 |
| 4 | 42 | 27 | 19 | 15 | 19 | 63 | 100 |
| 9.8 | 72 | 51 | 41 | 32 | 39 | 85 | 100 |
| 11.8 | 78 | 56 | 47 | 36 | 45 | 88 | 98 |
| 15.8 | 88 | 66 | 56 | 44 | 55 | 92 | 95 |
| 20 | 96 | 74 | 64 | 50 | 62 | 95 | 92 |
| 25 | 100 | 81 | 71 | 55 | 70 | 96 | 89 |
| 30 | 100 | 86 | 76 | 59 | 75 | 97 | 87 |
| 35 | 98 | 89 | 79 | 62 | 79 | 97 | 85 |
| 40 | 96 | 91 | 82 | 64 | 82 | 97 | 82 |
| 45 | 93 | 93 | 84 | 66 | 83 | 97 | 80 |
| 54.4 | 86 | 96 | 86 | 69 | 86 | 96 | 76 |
| 66.6 | 78 | 98 | 88 | 71 | 89 | 95 | 76 |
| 75 | 73 | 99 | 88 | 72 | 89 | 94 | 77 |
| 85 | 66 | 100 | 88 | 73 | 89 | 94 | 78 |
| 95 | 59 | 100 | 88 | 73 | 89 | 94 | 78 |
| 105 | 54 | 100 | 88 | 74 | 89 | 94 | 77 |
| 115 | 48 | 100 | 88 | 75 | 89 | 95 | 77 |
| 130 | 40 | 99 | 88 | 75 | 88 | 95 | 77 |
| 150 | 31 | 97 | 89 | 77 | 89 | 96 | 76 |
| 181 | 23 | 93 | 89 | 79 | 89 | 97 | 76 |
| 200 | 21 | 90 | 89 | 80 | 89 | 97 | 75 |
| 225 | 18 | 87 | 90 | 82 | 90 | 98 | 75 |
| 260 | 15 | 83 | 91 | 84 | 90 | 99 | 76 |
| 290 | 14 | 80 | 92 | 87 | 91 | 99 | 74 |
| 330 | 13 | 76 | 94 | 90 | 93 | 100 | 71 |
| 370 | 12 | 72 | 96 | 93 | 95 | 100 | 69 |
| 420 | 11 | 68 | 98 | 97 | 98 | 98 | 65 |
| 470 | 11 | 65 | 100 | 100 | 100 | 97 | 61 |

Figure 14. Middle Fork of the American River - MF44.7 Spatial Niche Area by Individual Niche (top) and by Cumulative Area (bottom).

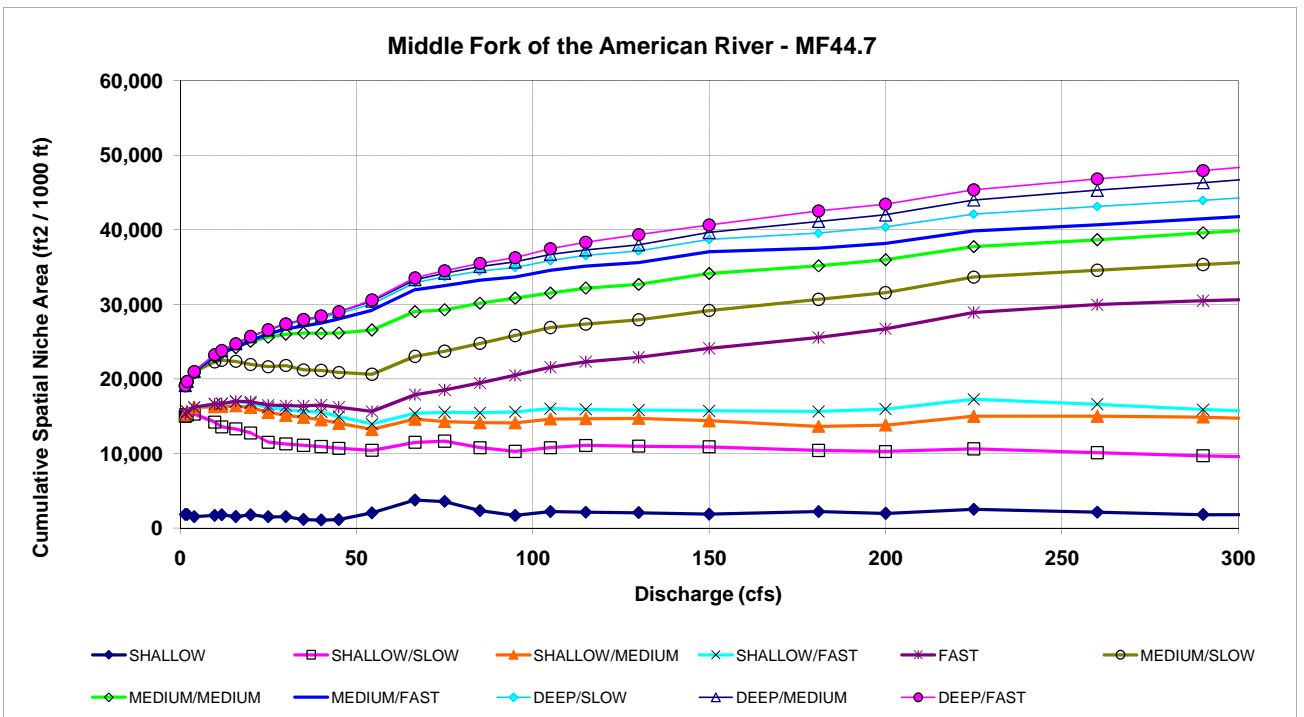
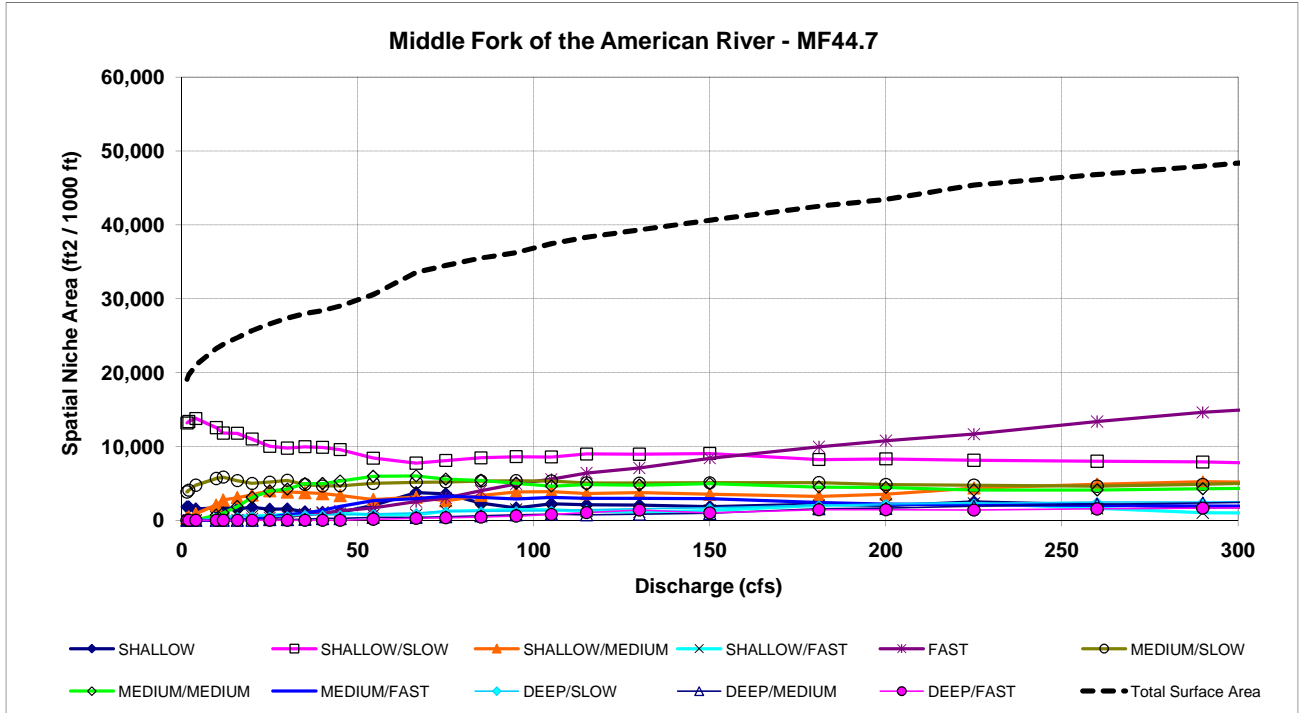
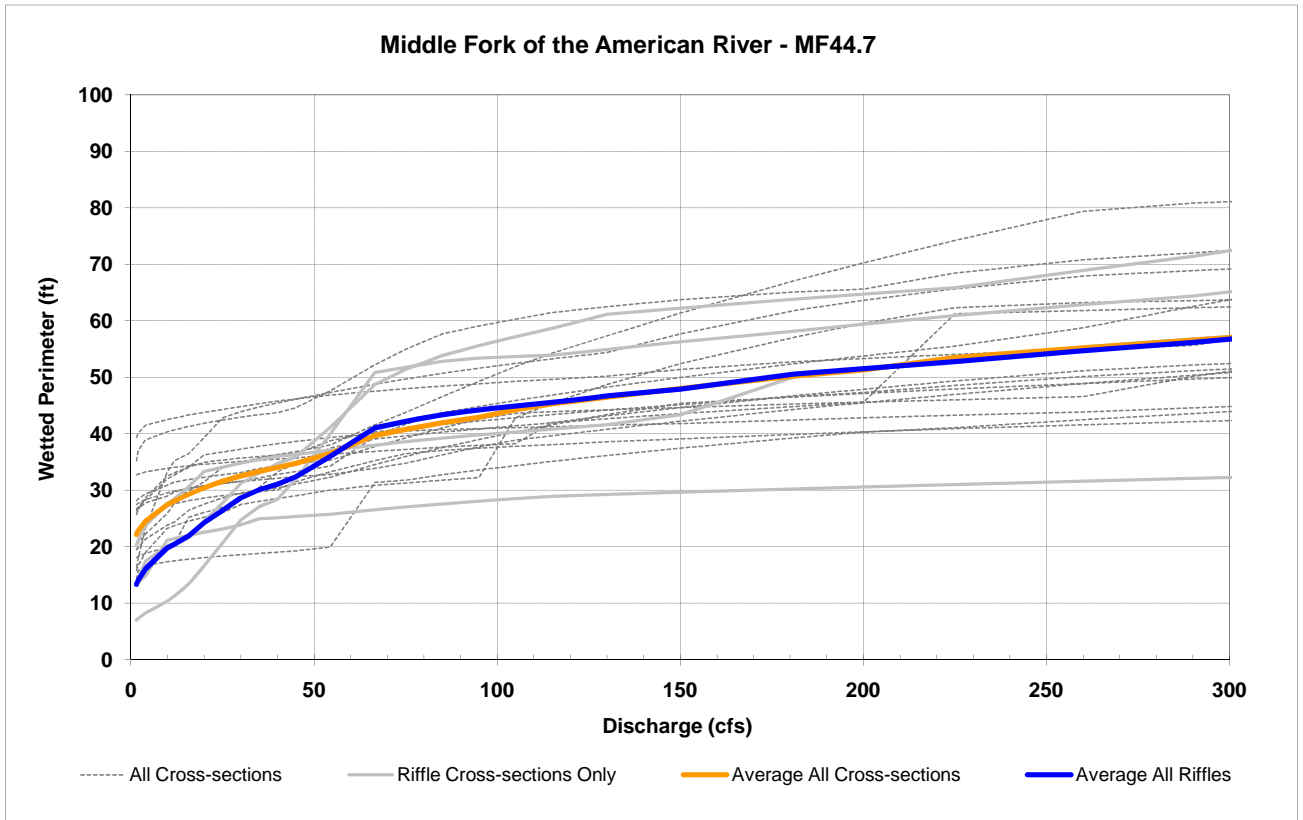


Figure 15. Middle Fork of the American River - MF44.7 Wetted Perimeter.



Middle Fork of the American River MF36.2

Figure 16. Middle Fork of the American River - MF36.2 Weighted Usable Area (top) and Percent of Maximum Weighted Usable Area (bottom).

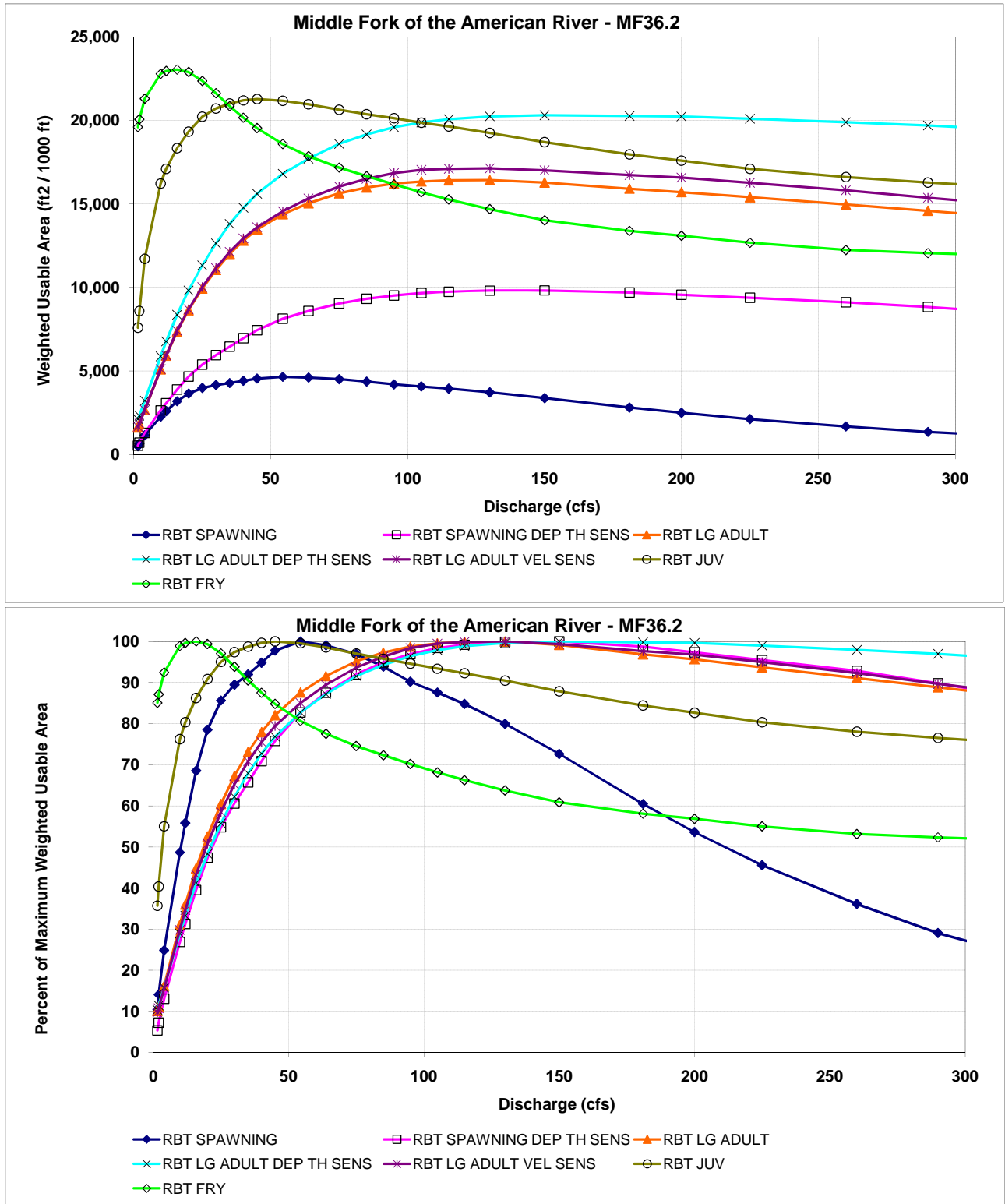


Table 6A. Middle Fork of the American River - MF36.2 Weighted Usable Area.

| Discharge (cfs) | Weighted Usable Area (ft ² / 1000 ft) | | | | | | |
|-----------------|--|--------------------------|--------------|--------------------------|-----------------------|---------|---------|
| | RBT SPAWNING | RBT SPAWNING DEP TH SENS | RBT LG ADULT | RBT LG ADULT DEP TH SENS | RBT LG ADULT VEL SENS | RBT JUW | RBT FRY |
| 1.5 | 485 | 526 | 1662 | 2117 | 1662 | 7591 | 19597 |
| 2 | 654 | 711 | 1845 | 2320 | 1845 | 8583 | 20063 |
| 4 | 1155 | 1283 | 2663 | 3214 | 2663 | 11705 | 21294 |
| 9.8 | 2262 | 2639 | 5099 | 5871 | 5106 | 16218 | 22783 |
| 11.8 | 2594 | 3069 | 5911 | 6761 | 5931 | 17091 | 22951 |
| 15.8 | 3186 | 3882 | 7360 | 8369 | 7403 | 18343 | 23037 |
| 20 | 3650 | 4655 | 8635 | 9815 | 8699 | 19326 | 22889 |
| 25 | 3981 | 5381 | 9926 | 11315 | 10021 | 20214 | 22363 |
| 30 | 4161 | 5950 | 11042 | 12637 | 11159 | 20715 | 21621 |
| 35 | 4276 | 6453 | 12008 | 13799 | 12126 | 21002 | 20851 |
| 40 | 4409 | 6958 | 12799 | 14769 | 12928 | 21196 | 20158 |
| 45 | 4545 | 7445 | 13473 | 15606 | 13606 | 21275 | 19534 |
| 54.4 | 4649 | 8122 | 14384 | 16798 | 14556 | 21178 | 18579 |
| 63.8 | 4605 | 8593 | 15033 | 17707 | 15320 | 20966 | 17860 |
| 75 | 4507 | 9031 | 15628 | 18594 | 16039 | 20640 | 17173 |
| 85 | 4364 | 9319 | 15972 | 19160 | 16494 | 20366 | 16658 |
| 95 | 4193 | 9515 | 16210 | 19588 | 16841 | 20126 | 16167 |
| 105 | 4071 | 9662 | 16340 | 19879 | 17037 | 19862 | 15695 |
| 115 | 3942 | 9739 | 16405 | 20074 | 17100 | 19630 | 15265 |
| 130 | 3716 | 9805 | 16423 | 20239 | 17125 | 19253 | 14686 |
| 150 | 3376 | 9819 | 16279 | 20313 | 17013 | 18695 | 14019 |
| 181 | 2810 | 9693 | 15909 | 20264 | 16717 | 17964 | 13381 |
| 200 | 2492 | 9556 | 15710 | 20236 | 16573 | 17583 | 13096 |
| 225 | 2116 | 9374 | 15390 | 20098 | 16266 | 17093 | 12673 |
| 260 | 1680 | 9116 | 14958 | 19896 | 15810 | 16601 | 12244 |
| 290 | 1350 | 8821 | 14590 | 19699 | 15362 | 16278 | 12053 |
| 330 | 1016 | 8386 | 14098 | 19357 | 14808 | 15903 | 11863 |
| 370 | 798 | 7974 | 13686 | 19052 | 14363 | 15566 | 11759 |
| 420 | 616 | 7499 | 13226 | 18607 | 13901 | 15241 | 11558 |
| 470 | 503 | 7065 | 12902 | 18249 | 13564 | 15091 | 11295 |

Table 6B. Middle Fork of the American River - MF36.2 Percent of Maximum Weighted Usable Area.

| Discharge (cfs) | Percent of Maximum Weighted Usable Area | | | | | | |
|-----------------|---|--------------------------|--------------|--------------------------|-----------------------|---------|---------|
| | RBT SPAWNING | RBT SPAWNING DEP TH SENS | RBT LG ADULT | RBT LG ADULT DEP TH SENS | RBT LG ADULT VEL SENS | RBT JUW | RBT FRY |
| 1.5 | 10 | 5 | 10 | 10 | 10 | 36 | 85 |
| 2 | 14 | 7 | 11 | 11 | 11 | 40 | 87 |
| 4 | 25 | 13 | 16 | 16 | 16 | 55 | 92 |
| 9.8 | 49 | 27 | 31 | 29 | 30 | 76 | 99 |
| 11.8 | 56 | 31 | 36 | 33 | 35 | 80 | 100 |
| 15.8 | 69 | 40 | 45 | 41 | 43 | 86 | 100 |
| 20 | 79 | 47 | 53 | 48 | 51 | 91 | 99 |
| 25 | 86 | 55 | 60 | 56 | 59 | 95 | 97 |
| 30 | 89 | 61 | 67 | 62 | 65 | 97 | 94 |
| 35 | 92 | 66 | 73 | 68 | 71 | 99 | 91 |
| 40 | 95 | 71 | 78 | 73 | 75 | 100 | 87 |
| 45 | 98 | 76 | 82 | 77 | 79 | 100 | 85 |
| 54.4 | 100 | 83 | 88 | 83 | 85 | 100 | 81 |
| 63.8 | 99 | 88 | 92 | 87 | 89 | 99 | 78 |
| 75 | 97 | 92 | 95 | 92 | 94 | 97 | 75 |
| 85 | 94 | 95 | 97 | 94 | 96 | 96 | 72 |
| 95 | 90 | 97 | 99 | 96 | 98 | 95 | 70 |
| 105 | 88 | 98 | 99 | 98 | 99 | 93 | 68 |
| 115 | 85 | 99 | 100 | 99 | 100 | 92 | 66 |
| 130 | 80 | 100 | 100 | 100 | 100 | 90 | 64 |
| 150 | 73 | 100 | 99 | 100 | 99 | 88 | 61 |
| 181 | 60 | 99 | 97 | 100 | 98 | 84 | 58 |
| 200 | 54 | 97 | 96 | 100 | 97 | 83 | 57 |
| 225 | 46 | 95 | 94 | 99 | 95 | 80 | 55 |
| 260 | 36 | 93 | 91 | 98 | 92 | 78 | 53 |
| 290 | 29 | 90 | 89 | 97 | 90 | 77 | 52 |
| 330 | 22 | 85 | 86 | 95 | 86 | 75 | 51 |
| 370 | 17 | 81 | 83 | 94 | 84 | 73 | 51 |
| 420 | 13 | 76 | 81 | 92 | 81 | 72 | 50 |
| 470 | 11 | 72 | 79 | 90 | 79 | 71 | 49 |

Figure 17. Middle Fork of the American River - MF36.2 Spatial Niche Area by Individual Niche (top) and by Cumulative Area (bottom).

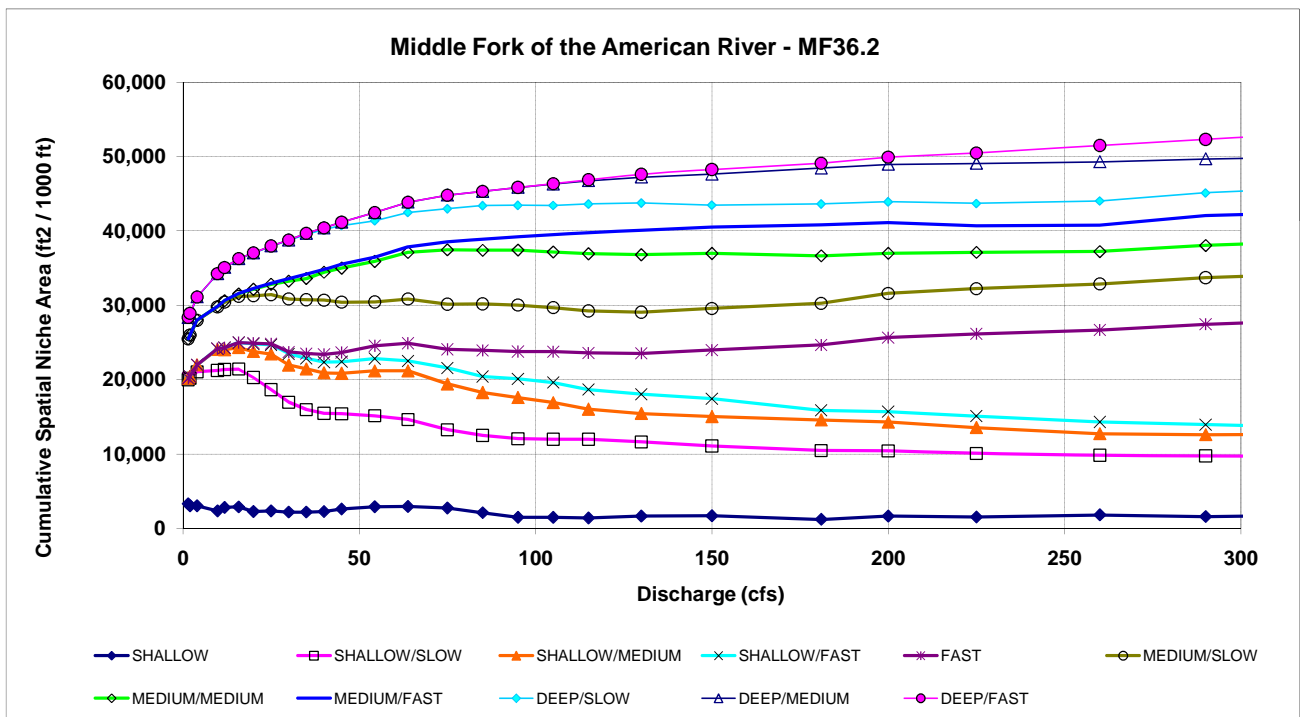
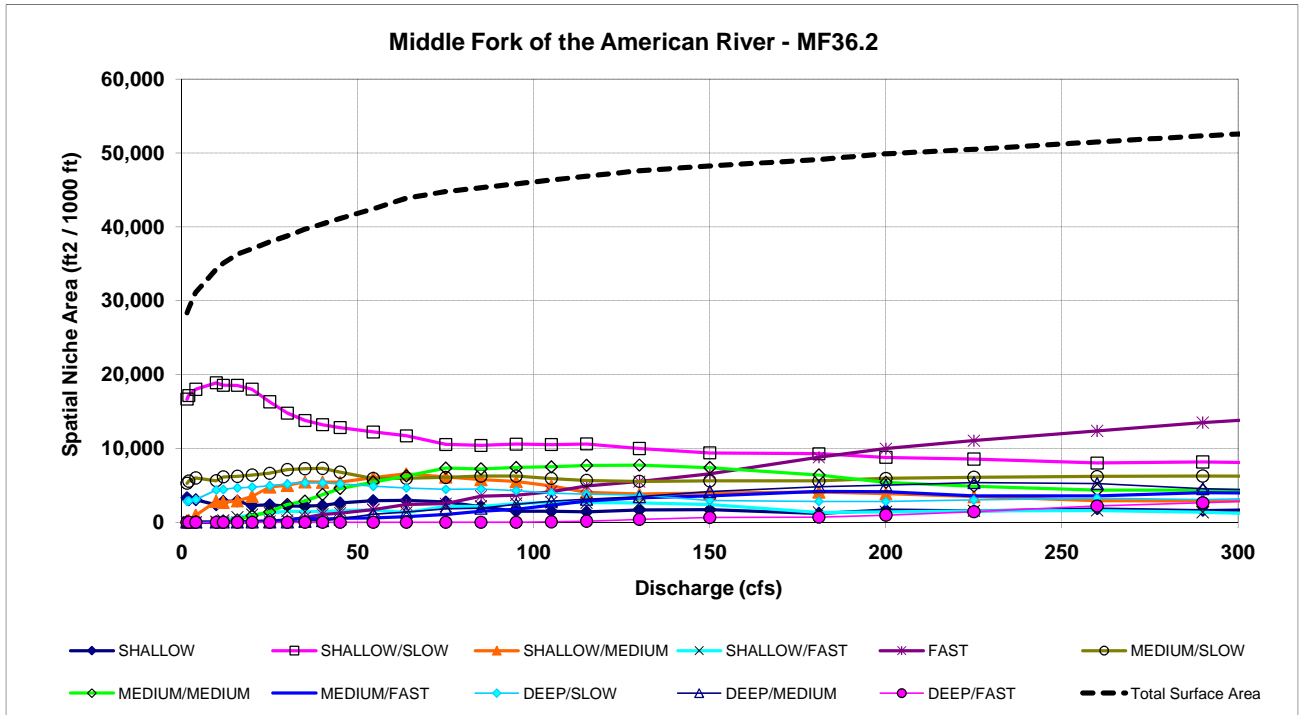
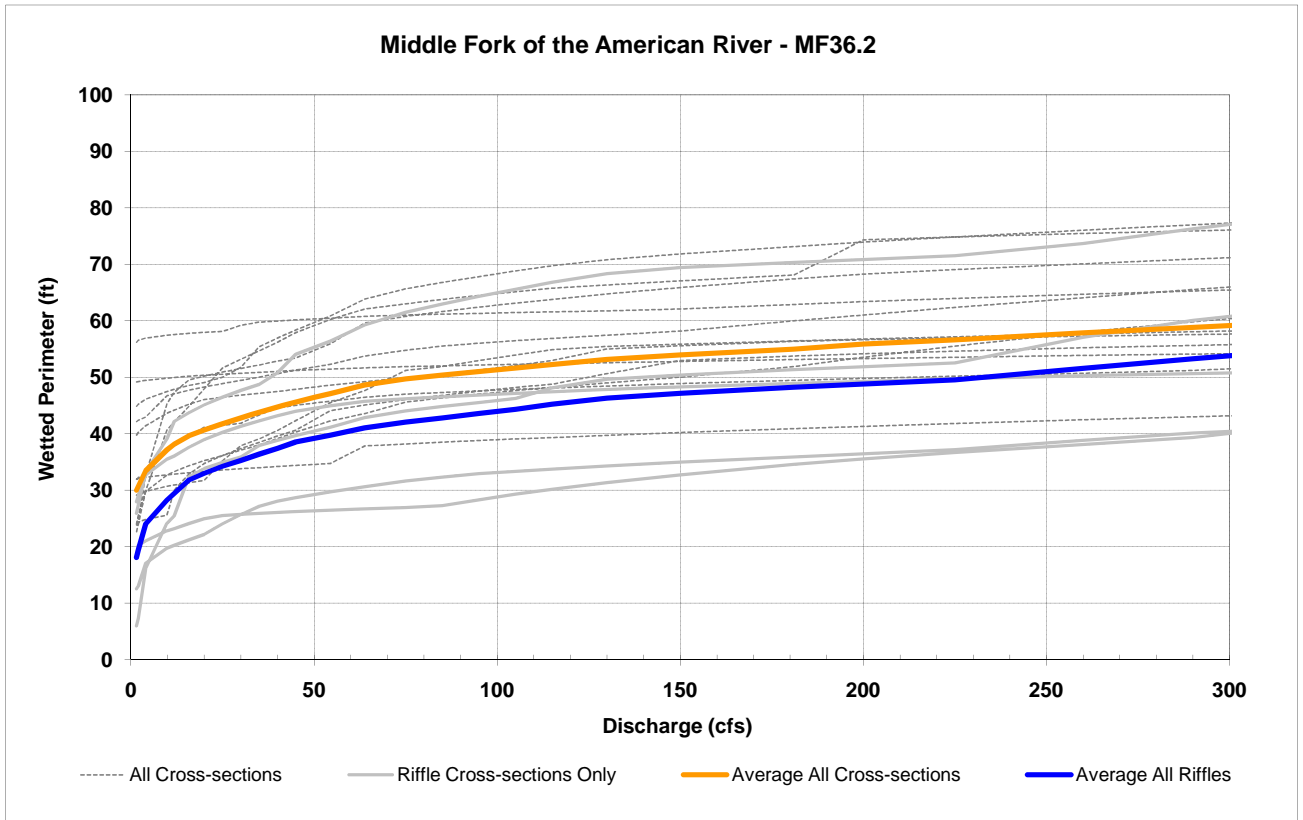


Figure 18. Middle Fork of the American River - MF36.2 Wetted Perimeter.



Middle Fork of the American River 26.2

Figure 19. Middle Fork of the American River- MF26.2 Weighted Usable Area (top) and Percent of Maximum Weighted Usable Area (bottom).

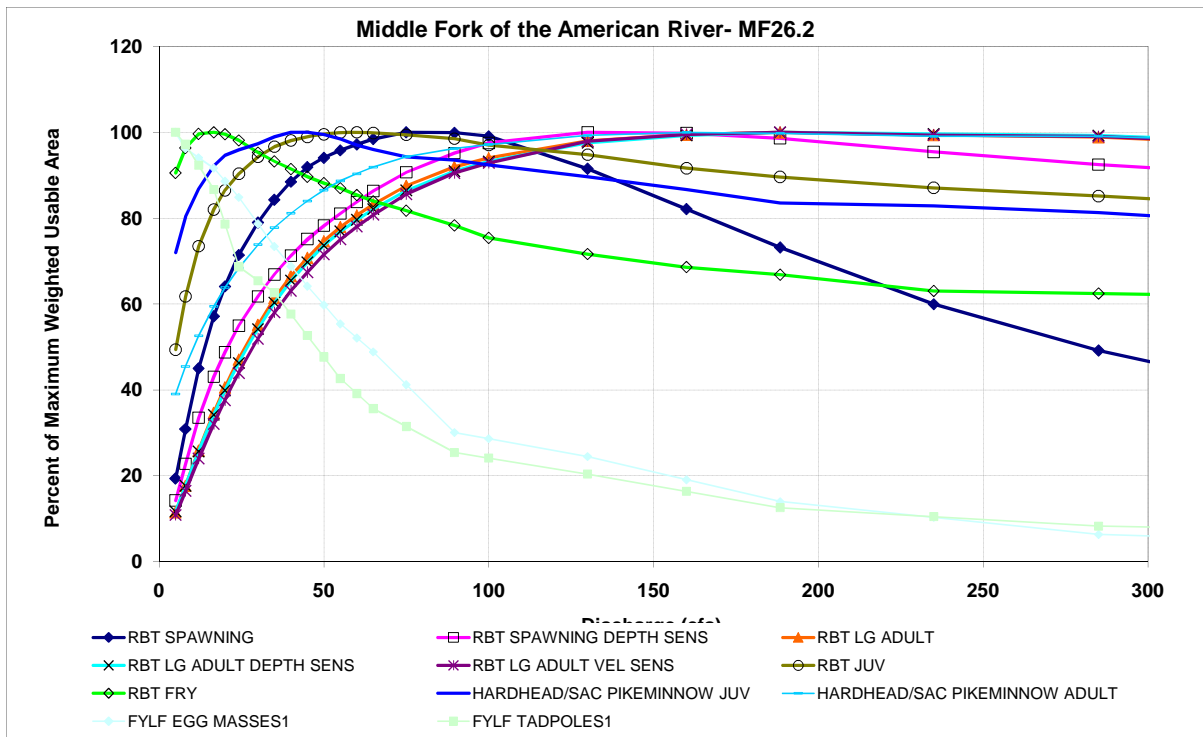
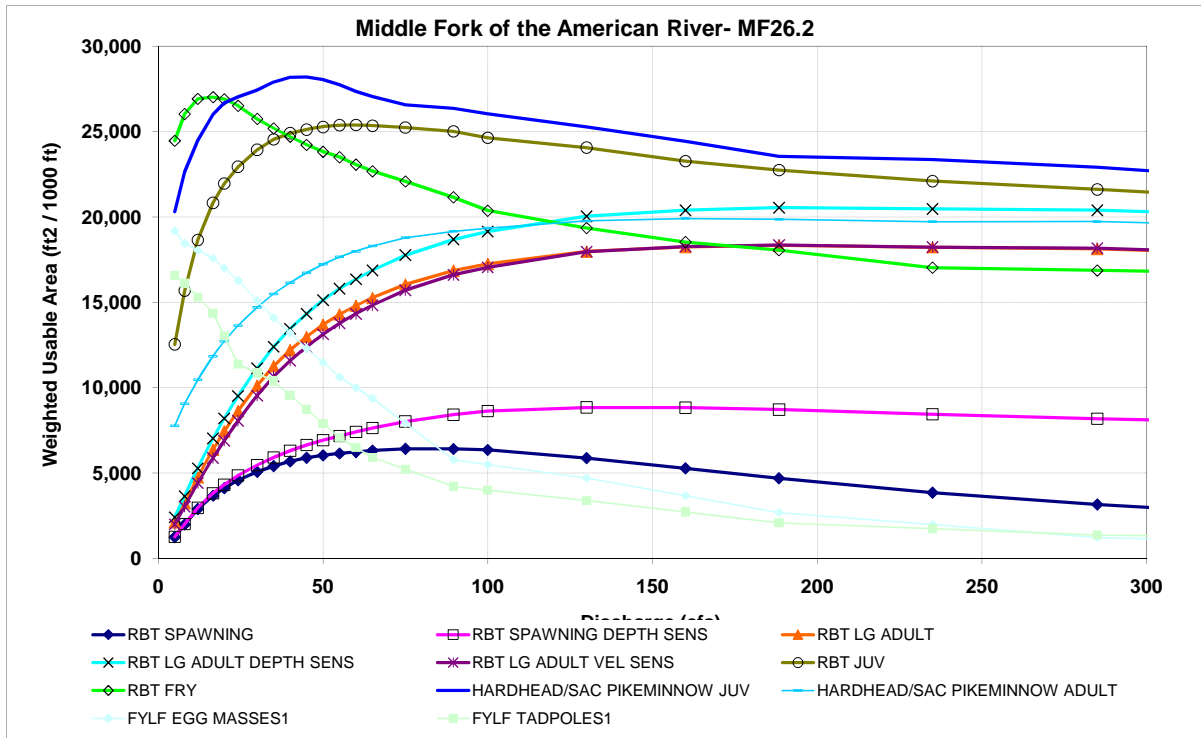


Table 7A. Middle Fork of the American River- MF26.2 Weighted Usable Area.

| Discharge (cfs) | Weighted Usable Area (ft ² / 1000 ft) | | | | | | | | | | |
|-----------------|--|-------------------------|--------------|-------------------------|-----------------------|---------|---------|-----------------------------|-------------------------------|------------------------------|----------------------------|
| | RBT SPAWNING | RBT SPAWNING DEPTH SENS | RBT LG ADULT | RBT LG ADULT DEPTH SENS | RBT LG ADULT VEL SENS | RBT JUV | RBT FRY | HARDHEAD/SAC PIKEMINNOW JUV | HARDHEAD/SAC PIKEMINNOW ADULT | FYLF EGG MASSES ¹ | FYLF TADPOLES ¹ |
| 5 | 1245 | 1261 | 2106 | 2406 | 1997 | 12537 | 24464 | 20302 | 7772 | 19183 | 16582 |
| 8 | 1982 | 2017 | 3239 | 3637 | 3028 | 15684 | 26032 | 22655 | 9054 | 18458 | 16120 |
| 12 | 2889 | 2965 | 4743 | 5271 | 4411 | 18651 | 26919 | 24483 | 10471 | 18050 | 15306 |
| 16.6 | 3669 | 3810 | 6355 | 7026 | 5882 | 20819 | 27017 | 25991 | 11842 | 17580 | 14370 |
| 20 | 4115 | 4314 | 7440 | 8200 | 6897 | 21954 | 26897 | 26674 | 12719 | 16998 | 13036 |
| 24.2 | 4584 | 4862 | 8636 | 9507 | 8062 | 22936 | 26512 | 27027 | 13627 | 16280 | 11387 |
| 30 | 5069 | 5464 | 10116 | 11131 | 9526 | 23928 | 25745 | 27427 | 14699 | 15101 | 10850 |
| 35 | 5411 | 5916 | 11263 | 12397 | 10655 | 24539 | 25191 | 27899 | 15493 | 14084 | 10386 |
| 40 | 5680 | 6303 | 12197 | 13446 | 11577 | 24903 | 24704 | 28187 | 16151 | 13196 | 9560 |
| 45 | 5897 | 6645 | 12978 | 14327 | 12371 | 25116 | 24221 | 28191 | 16719 | 12308 | 8734 |
| 50 | 6038 | 6923 | 13690 | 15126 | 13126 | 25266 | 23823 | 28042 | 17226 | 11465 | 7903 |
| 55 | 6148 | 7171 | 14297 | 15803 | 13774 | 25377 | 23502 | 27742 | 17657 | 10622 | 7071 |
| 60 | 6239 | 7408 | 14796 | 16355 | 14320 | 25386 | 23066 | 27357 | 17988 | 9998 | 6492 |
| 65 | 6319 | 7637 | 15261 | 16869 | 14829 | 25343 | 22679 | 27052 | 18298 | 9374 | 5912 |
| 75 | 6418 | 8020 | 16056 | 17763 | 15706 | 25232 | 22082 | 26571 | 18783 | 7910 | 5222 |
| 89.6 | 6411 | 8417 | 16859 | 18683 | 16609 | 25009 | 21154 | 26368 | 19160 | 5773 | 4213 |
| 100 | 6359 | 8626 | 17244 | 19146 | 17042 | 24634 | 20373 | 26050 | 19346 | 5497 | 4000 |
| 130 | 5874 | 8845 | 17975 | 20038 | 17962 | 24063 | 19352 | 25268 | 19766 | 4701 | 3384 |
| 160 | 5272 | 8827 | 18239 | 20394 | 18260 | 23264 | 18531 | 24432 | 19911 | 3667 | 2716 |
| 188.4 | 4697 | 8718 | 18340 | 20545 | 18350 | 22742 | 18051 | 23548 | 19865 | 2688 | 2084 |
| 235 | 3849 | 8441 | 18230 | 20471 | 18234 | 22101 | 17029 | 23358 | 19722 | 1981 | 1741 |
| 285 | 3157 | 8180 | 18134 | 20392 | 18166 | 21614 | 16869 | 22912 | 19731 | 1223 | 1373 |
| 335 | 2622 | 7974 | 17829 | 20102 | 17875 | 21093 | 16709 | 22258 | 19482 | 987 | 1259 |
| 385 | 2224 | 7750 | 17433 | 19691 | 17459 | 20674 | 16344 | 22313 | 19165 | 752 | 1146 |
| 460 | 1717 | 7312 | 16989 | 19239 | 16910 | 20171 | 15630 | 22104 | 18925 | 622 | 1031 |
| 535 | 1365 | 6836 | 16559 | 18844 | 16447 | 19629 | 14960 | 21660 | 18757 | 492 | 916 |
| 635 | 1044 | 6292 | 16079 | 18436 | 15999 | 18663 | 1449 | 21279 | 18623 | 431 | 838 |
| 735 | 827 | 5862 | 15663 | 18174 | 15570 | 18226 | 14002 | 20776 | 18575 | 371 | 759 |
| 835 | 688 | 5461 | 15188 | 17874 | 15078 | 17776 | 13196 | 20429 | 18418 | 364 | 712 |
| 935 | 582 | 5083 | 14687 | 17586 | 14591 | 17275 | 12422 | 19965 | 18314 | 357 | 665 |

¹Interpolated values in gray.

Table 7B. Middle Fork of the American River- MF26.2 Percent of Maximum Weighted Usable Area.

| Discharge (cfs) | Percent of Maximum Weighted Usable Area | | | | | | | | | | |
|-----------------|---|-------------------------|--------------|-------------------------|-----------------------|---------|---------|-----------------------------|-------------------------------|-----------------|---------------|
| | RBT SPAWNING | RBT SPAWNING DEPTH SENS | RBT LG ADULT | RBT LG ADULT DEPTH SENS | RBT LG ADULT VEL SENS | RBT JUV | RBT FRY | HARDHEAD/SAC PIKEMINNOW JUV | HARDHEAD/SAC PIKEMINNOW ADULT | FYLF EGG MASSES | FYLF TADPOLES |
| 5 | 19 | 14 | 11 | 12 | 11 | 49 | 91 | 72 | 39 | 100 | 100 |
| 8 | 31 | 23 | 18 | 18 | 16 | 62 | 96 | 80 | 45 | 96 | 97 |
| 12 | 45 | 34 | 26 | 26 | 24 | 73 | 100 | 87 | 53 | 94 | 92 |
| 16.6 | 57 | 43 | 35 | 34 | 32 | 82 | 100 | 92 | 59 | 92 | 87 |
| 20 | 64 | 49 | 41 | 40 | 38 | 86 | 100 | 95 | 64 | 89 | 79 |
| 24.2 | 71 | 55 | 47 | 46 | 44 | 90 | 98 | 96 | 68 | 85 | 69 |
| 30 | 79 | 62 | 55 | 54 | 52 | 94 | 95 | 97 | 74 | 79 | 65 |
| 35 | 84 | 67 | 61 | 60 | 58 | 97 | 93 | 99 | 78 | 73 | 63 |
| 40 | 88 | 71 | 67 | 65 | 63 | 98 | 91 | 100 | 81 | 69 | 58 |
| 45 | 92 | 75 | 71 | 70 | 67 | 99 | 90 | 100 | 84 | 64 | 53 |
| 50 | 94 | 78 | 75 | 74 | 72 | 100 | 88 | 99 | 87 | 60 | 48 |
| 55 | 96 | 81 | 78 | 77 | 75 | 100 | 87 | 98 | 89 | 55 | 43 |
| 60 | 97 | 84 | 81 | 80 | 78 | 100 | 85 | 97 | 90 | 52 | 39 |
| 65 | 98 | 86 | 83 | 82 | 81 | 100 | 84 | 96 | 92 | 49 | 36 |
| 75 | 100 | 91 | 88 | 86 | 86 | 99 | 82 | 94 | 94 | 41 | 31 |
| 89.6 | 100 | 95 | 92 | 91 | 91 | 99 | 78 | 94 | 96 | 30 | 25 |
| 100 | 99 | 98 | 94 | 93 | 93 | 97 | 75 | 92 | 97 | 29 | 24 |
| 130 | 92 | 100 | 98 | 98 | 98 | 95 | 72 | 90 | 99 | 25 | 20 |
| 160 | 82 | 100 | 99 | 99 | 100 | 92 | 69 | 87 | 100 | 19 | 16 |
| 188.4 | 73 | 99 | 100 | 100 | 100 | 90 | 67 | 84 | 100 | 14 | 13 |
| 235 | 60 | 95 | 99 | 100 | 99 | 87 | 63 | 83 | 99 | 10 | 11 |
| 285 | 49 | 92 | 99 | 99 | 99 | 85 | 62 | 81 | 99 | 6 | 8 |
| 335 | 41 | 90 | 97 | 98 | 97 | 83 | 62 | 79 | 98 | 5 | 8 |
| 385 | 35 | 88 | 95 | 96 | 95 | 81 | 60 | 79 | 96 | 4 | 7 |
| 460 | 27 | 83 | 93 | 94 | 92 | 79 | 58 | 78 | 95 | 3 | 6 |
| 535 | 21 | 77 | 90 | 92 | 90 | 77 | 55 | 77 | 94 | 3 | 6 |
| 635 | 16 | 71 | 88 | 90 | 87 | 74 | 54 | 75 | 94 | 2 | 5 |
| 735 | 13 | 66 | 85 | 88 | 85 | 72 | 52 | 74 | 93 | 2 | 5 |
| 835 | 11 | 62 | 83 | 87 | 82 | 70 | 49 | 72 | 93 | 2 | 4 |
| 935 | 9 | 57 | 80 | 86 | 80 | 68 | 46 | 71 | 92 | 2 | 4 |

Figure 20. Middle Fork of the American River- MF26.2 Spatial Niche Area by Individual Niche (top) and by Cumulative Area (bottom).

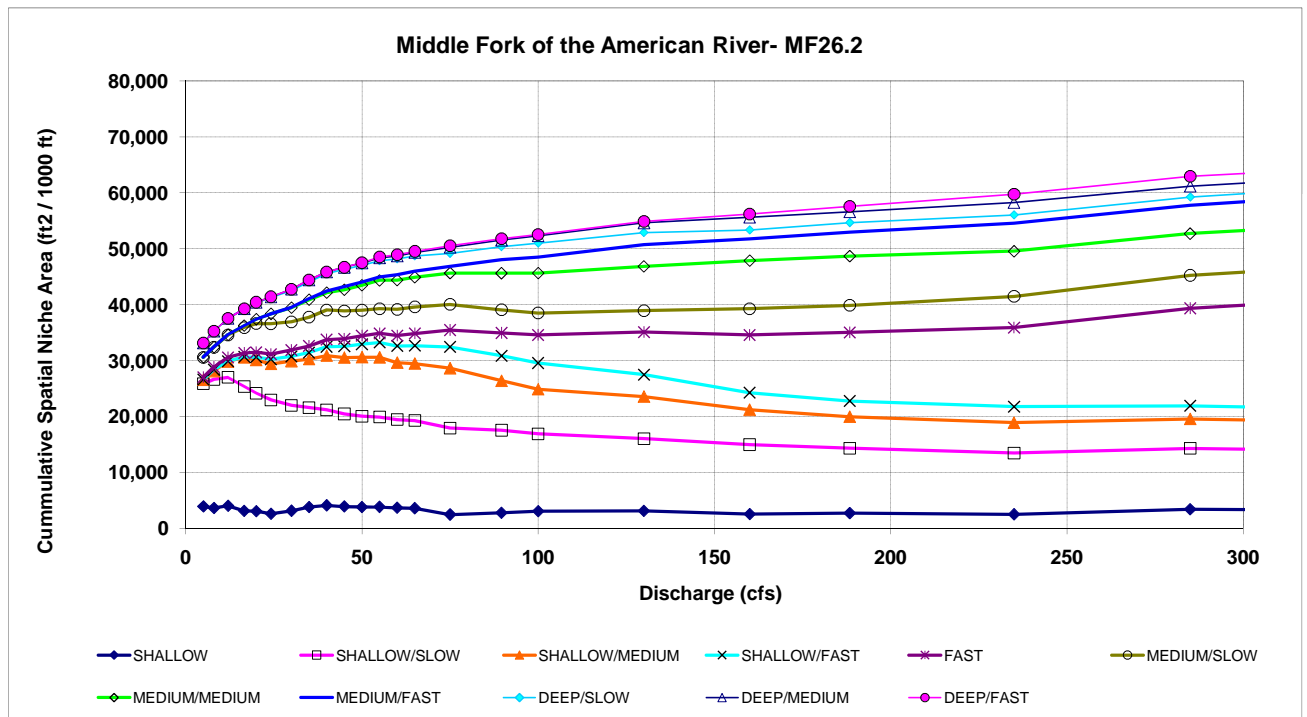
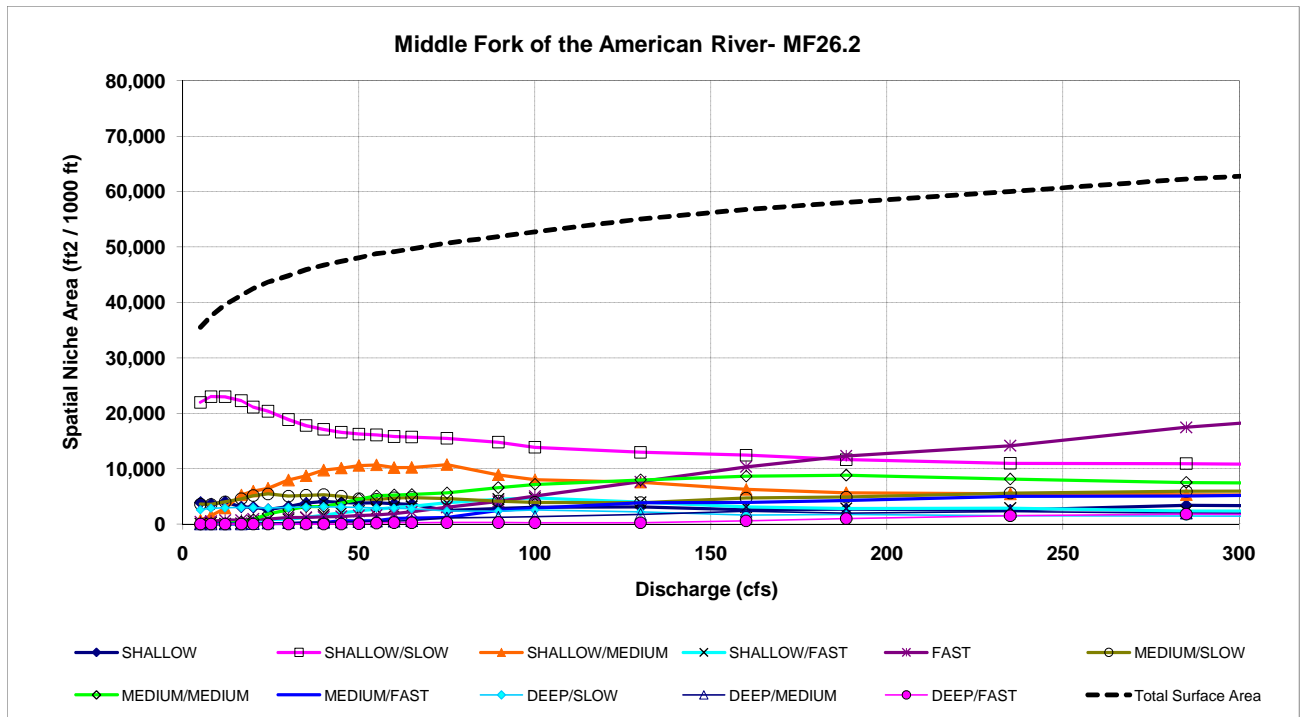
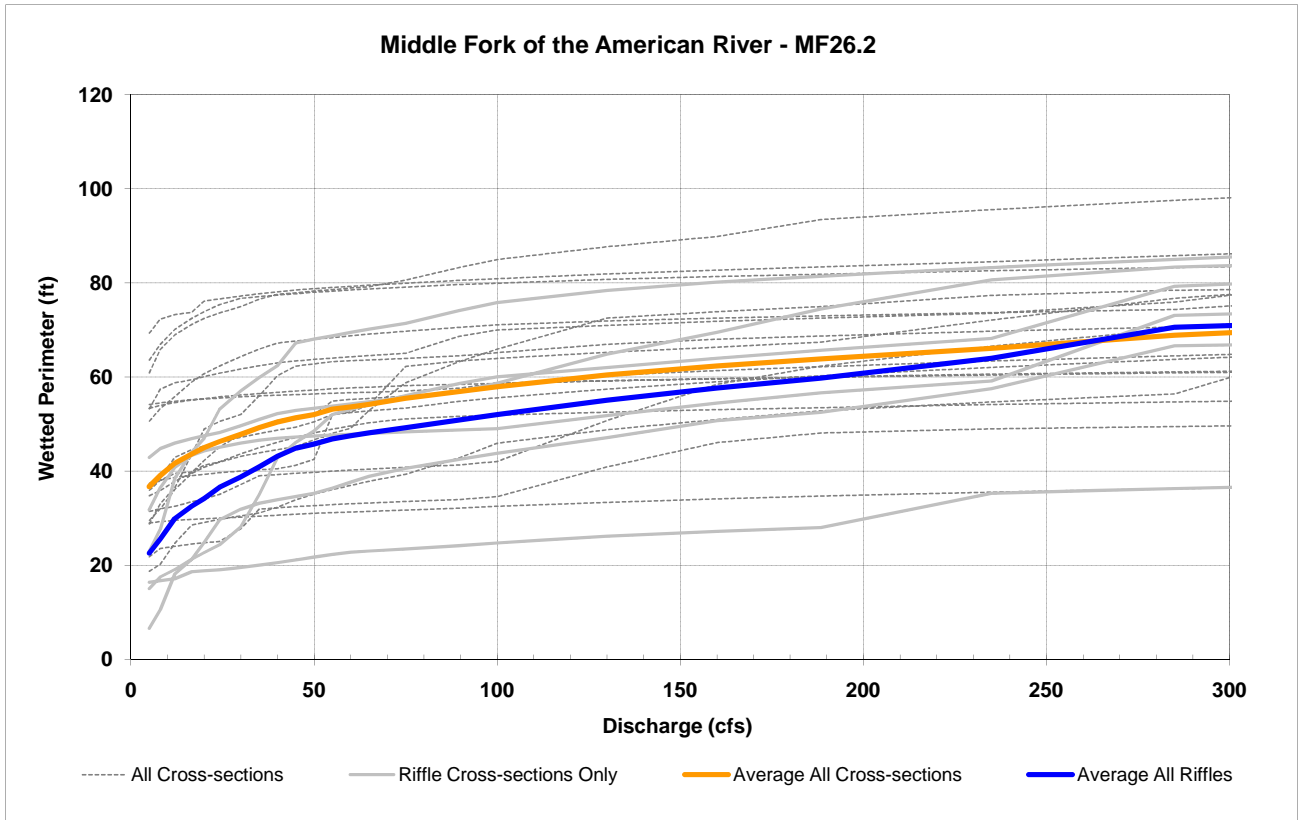


Figure 21. Middle Fork of the American River - MF26.2 Wetted Perimeter.



Rubicon River R25.7

Figure 22. Rubicon River - R25.7 Weighted Usable Area (top) and Percent of Maximum Weighted Usable Area (bottom).

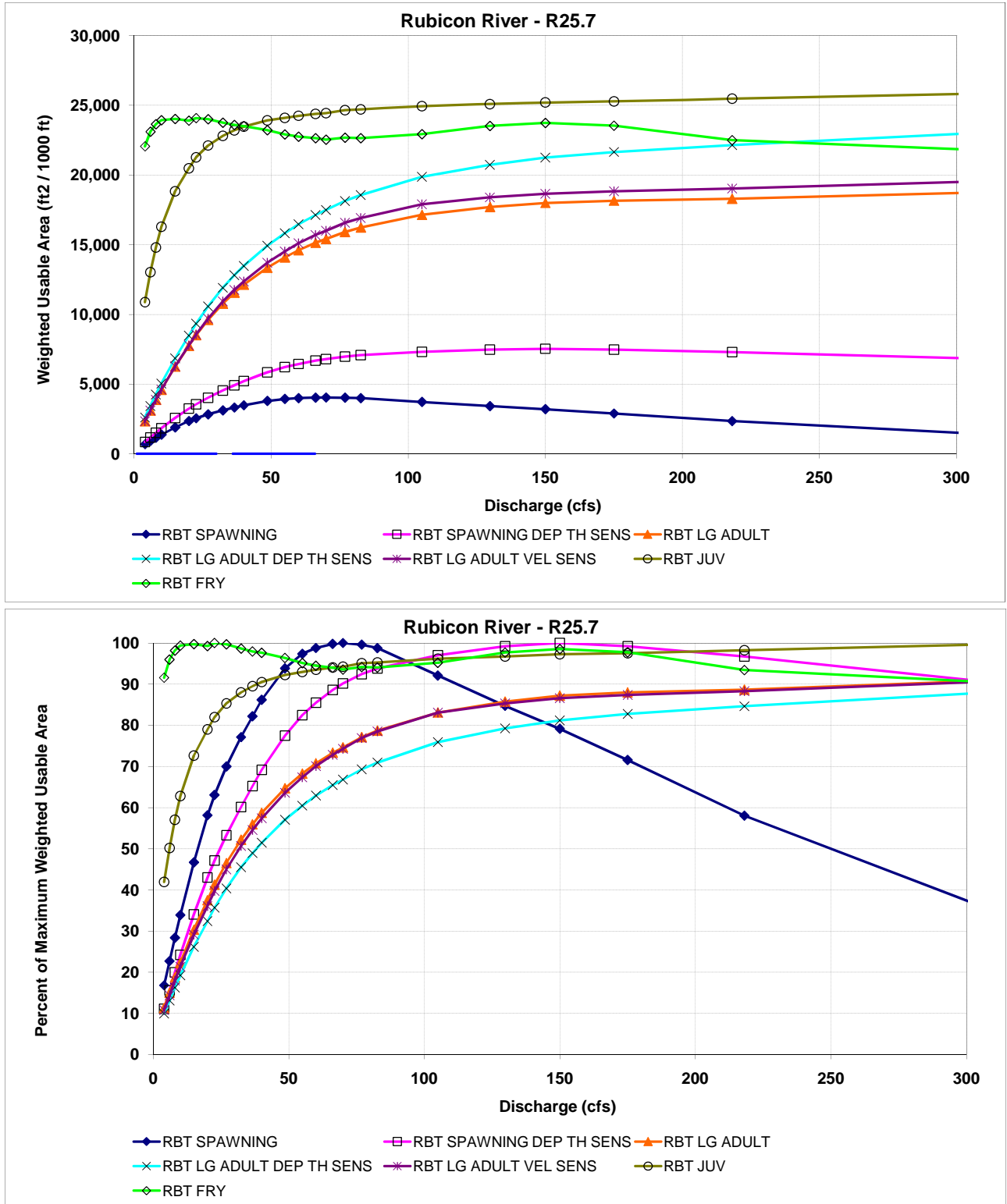


Table 8A. Rubicon River - R25.7 Weighted Usable Area.

| Discharge (cfs) | Weighted Usable Area (ft ² / 1000 ft) | | | | | | |
|--------------------|--|-----------------------------|-----------------|-----------------------------|--------------------------|---------|---------|
| | RBT SPAWNING | RBT SPAWNING DEP TH SENS | RBT LG ADULT | RBT LG ADULT DEP TH SENS | RBT LG ADULT VEL SENS | RBT JUV | RBT FRY |
| 4 | 679 | 841 | 2336 | 2605 | 2336 | 10873 | 22064 |
| 6 | 917 | 1176 | 3104 | 3431 | 3105 | 13020 | 23118 |
| 8 | 1146 | 1504 | 3871 | 4256 | 3871 | 14801 | 23643 |
| 10 | 1369 | 1824 | 4598 | 5041 | 4601 | 16284 | 23941 |
| 15 | 1887 | 2569 | 6262 | 6850 | 6275 | 18836 | 24022 |
| 20 | 2349 | 3244 | 7740 | 8482 | 7774 | 20488 | 23908 |
| 22.6 | 2548 | 3553 | 8517 | 9341 | 8569 | 21262 | 24089 |
| 27 | 2828 | 4018 | 9603 | 10567 | 9696 | 22120 | 24014 |
| 32.4 | 3116 | 4533 | 10776 | 11909 | 10928 | 22815 | 23763 |
| 36.6 | 3321 | 4917 | 11553 | 12808 | 11756 | 23208 | 23592 |
| 40 | 3483 | 5213 | 12126 | 13474 | 12370 | 23470 | 23515 |
| 48.6 | 3792 | 5842 | 13351 | 14927 | 13705 | 23914 | 23215 |
| 55 | 3935 | 6216 | 14085 | 15824 | 14520 | 24103 | 22914 |
| 60 | 3992 | 6444 | 14609 | 16470 | 15108 | 24251 | 22758 |
| 66.2 | 4032 | 6679 | 15135 | 17133 | 15698 | 24387 | 22646 |
| 70 | 4041 | 6795 | 15406 | 17485 | 16005 | 24443 | 22534 |
| 76.9 | 4025 | 6965 | 15913 | 18133 | 16569 | 24655 | 22679 |
| 82.7 | 3991 | 7073 | 16240 | 18570 | 16923 | 24709 | 22650 |
| 105 | 3721 | 7314 | 17149 | 19867 | 17905 | 24948 | 22935 |
| 129.8 | 3424 | 7477 | 17698 | 20735 | 18394 | 25083 | 23529 |
| 150 | 3199 | 7538 | 17998 | 21246 | 18659 | 25217 | 23734 |
| 175 | 2892 | 7480 | 18160 | 21654 | 18831 | 25283 | 23542 |
| 218.1 | 2345 | 7292 | 18294 | 22142 | 19033 | 25475 | 22510 |
| 325 | 1258 | 6739 | 18836 | 23189 | 19632 | 25918 | 21657 |
| 425 | 698 | 6193 | 19263 | 23832 | 20264 | 25919 | 20577 |
| 525 | 394 | 5770 | 19886 | 24602 | 20893 | 25932 | 20373 |
| 625 | 247 | 5437 | 20291 | 25147 | 21349 | 25532 | 19959 |
| 725 | 191 | 5145 | 20556 | 25586 | 21552 | 25225 | 19277 |
| 825 | 166 | 4829 | 20639 | 25907 | 21545 | 24777 | 18088 |
| 925 | 147 | 4537 | 20638 | 26166 | 21476 | 24353 | 16820 |

Table 8B. Rubicon River - R25.7 Percent of Maximum Weighted Usable Area.

| Discharge (cfs) | Percent of Maximum Weighted Usable Area | | | | | | |
|--------------------|---|-----------------------------|-----------------|-----------------------------|--------------------------|---------|---------|
| | RBT SPAWNING | RBT SPAWNING DEP TH SENS | RBT LG ADULT | RBT LG ADULT DEP TH SENS | RBT LG ADULT VEL SENS | RBT JUV | RBT FRY |
| 4 | 17 | 11 | 11 | 10 | 11 | 42 | 92 |
| 6 | 23 | 16 | 15 | 13 | 14 | 50 | 96 |
| 8 | 28 | 20 | 19 | 16 | 18 | 57 | 98 |
| 10 | 34 | 24 | 22 | 19 | 21 | 63 | 99 |
| 15 | 47 | 34 | 30 | 26 | 29 | 73 | 100 |
| 20 | 58 | 43 | 38 | 32 | 36 | 79 | 99 |
| 22.6 | 63 | 47 | 41 | 36 | 40 | 82 | 100 |
| 27 | 70 | 53 | 47 | 40 | 45 | 85 | 100 |
| 32.4 | 77 | 60 | 52 | 46 | 51 | 88 | 99 |
| 36.6 | 82 | 65 | 56 | 49 | 55 | 89 | 98 |
| 40 | 86 | 69 | 59 | 51 | 57 | 91 | 98 |
| 48.6 | 94 | 78 | 65 | 57 | 64 | 92 | 96 |
| 55 | 97 | 82 | 68 | 60 | 67 | 93 | 95 |
| 60 | 99 | 85 | 71 | 63 | 70 | 94 | 94 |
| 66.2 | 100 | 89 | 73 | 65 | 73 | 94 | 94 |
| 70 | 100 | 90 | 75 | 67 | 74 | 94 | 94 |
| 76.9 | 100 | 92 | 77 | 69 | 77 | 95 | 94 |
| 82.7 | 99 | 94 | 79 | 71 | 79 | 95 | 94 |
| 105 | 92 | 97 | 83 | 76 | 83 | 96 | 95 |
| 129.8 | 85 | 99 | 86 | 79 | 85 | 97 | 98 |
| 150 | 79 | 100 | 87 | 81 | 87 | 97 | 99 |
| 175 | 72 | 99 | 88 | 83 | 87 | 97 | 98 |
| 218.1 | 58 | 97 | 89 | 85 | 88 | 98 | 93 |
| 325 | 31 | 89 | 91 | 89 | 91 | 100 | 90 |
| 425 | 17 | 82 | 93 | 91 | 94 | 100 | 85 |
| 525 | 10 | 77 | 96 | 94 | 97 | 100 | 85 |
| 625 | 6 | 72 | 98 | 96 | 99 | 98 | 83 |
| 725 | 5 | 68 | 100 | 98 | 100 | 97 | 80 |
| 825 | 4 | 64 | 100 | 99 | 100 | 96 | 75 |
| 925 | 4 | 60 | 100 | 100 | 100 | 94 | 70 |

Figure 23. Rubicon River - R25.7 Spatial Niche Area by Individual Niche (top) and by Cumulative Area (bottom).

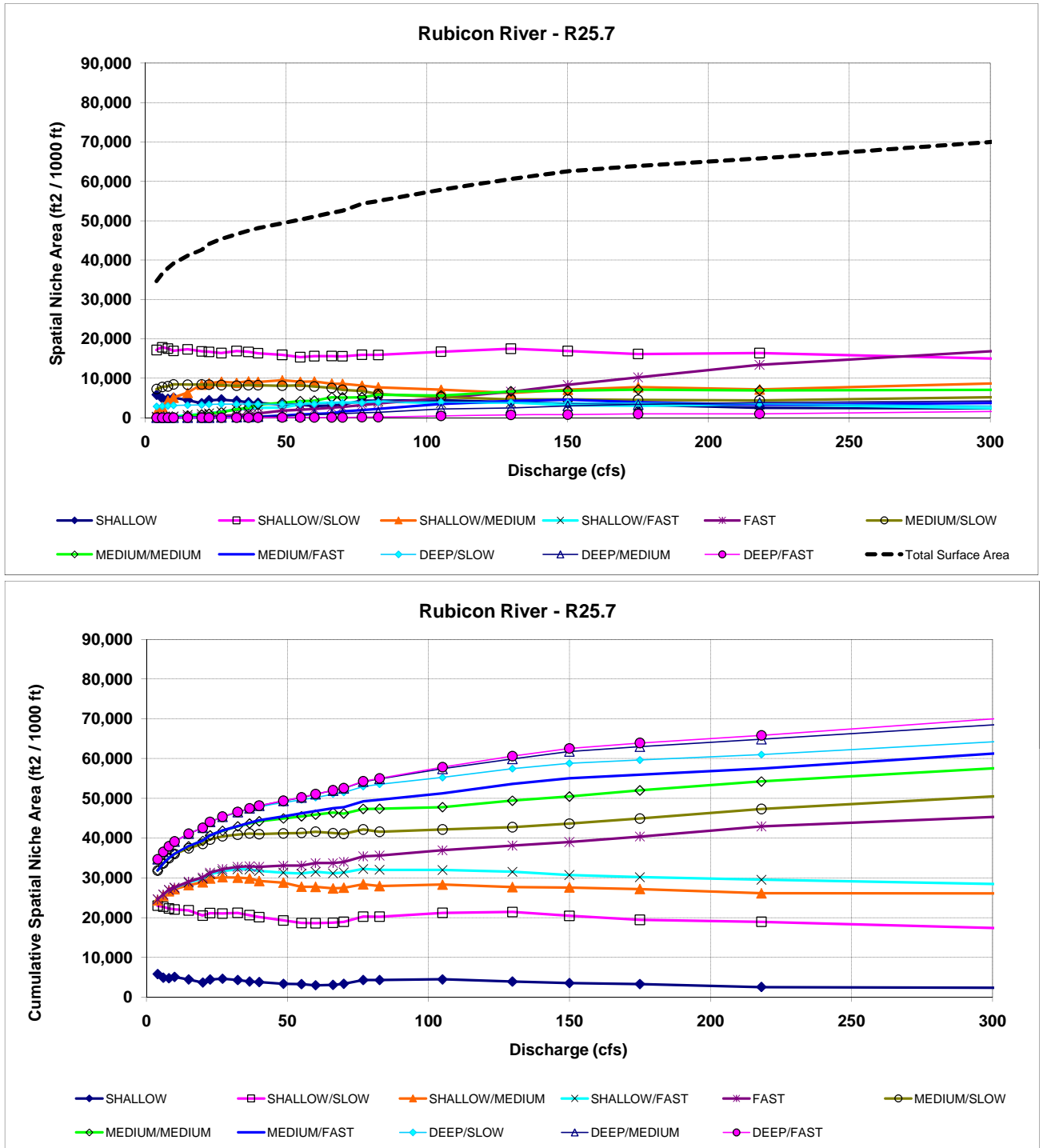
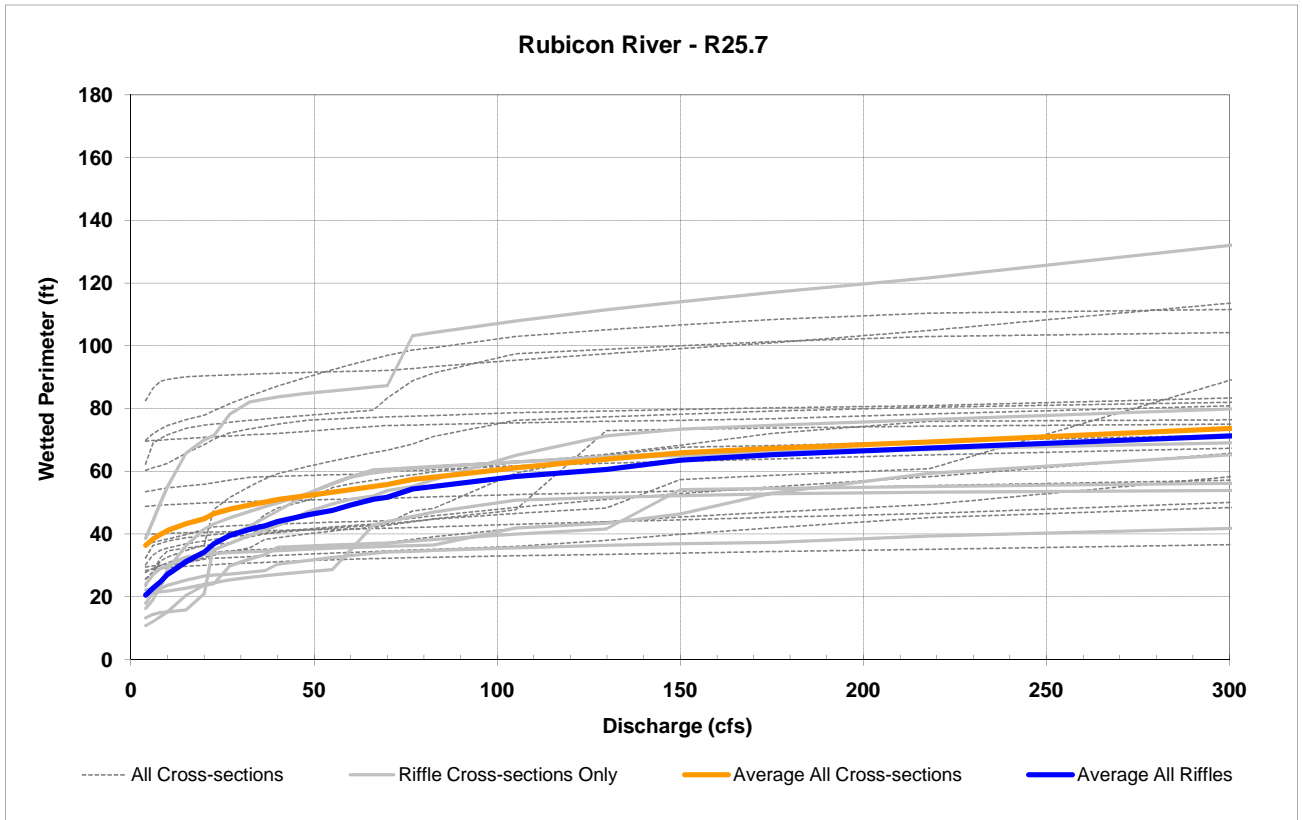


Figure 24. Rubicon River - R25.7 Wetted Perimeter.



Rubicon River R20.9

Figure 25. Rubicon River - R20.9 Weighted Usable Area (top) and Percent of Maximum Weighted Usable Area (bottom).

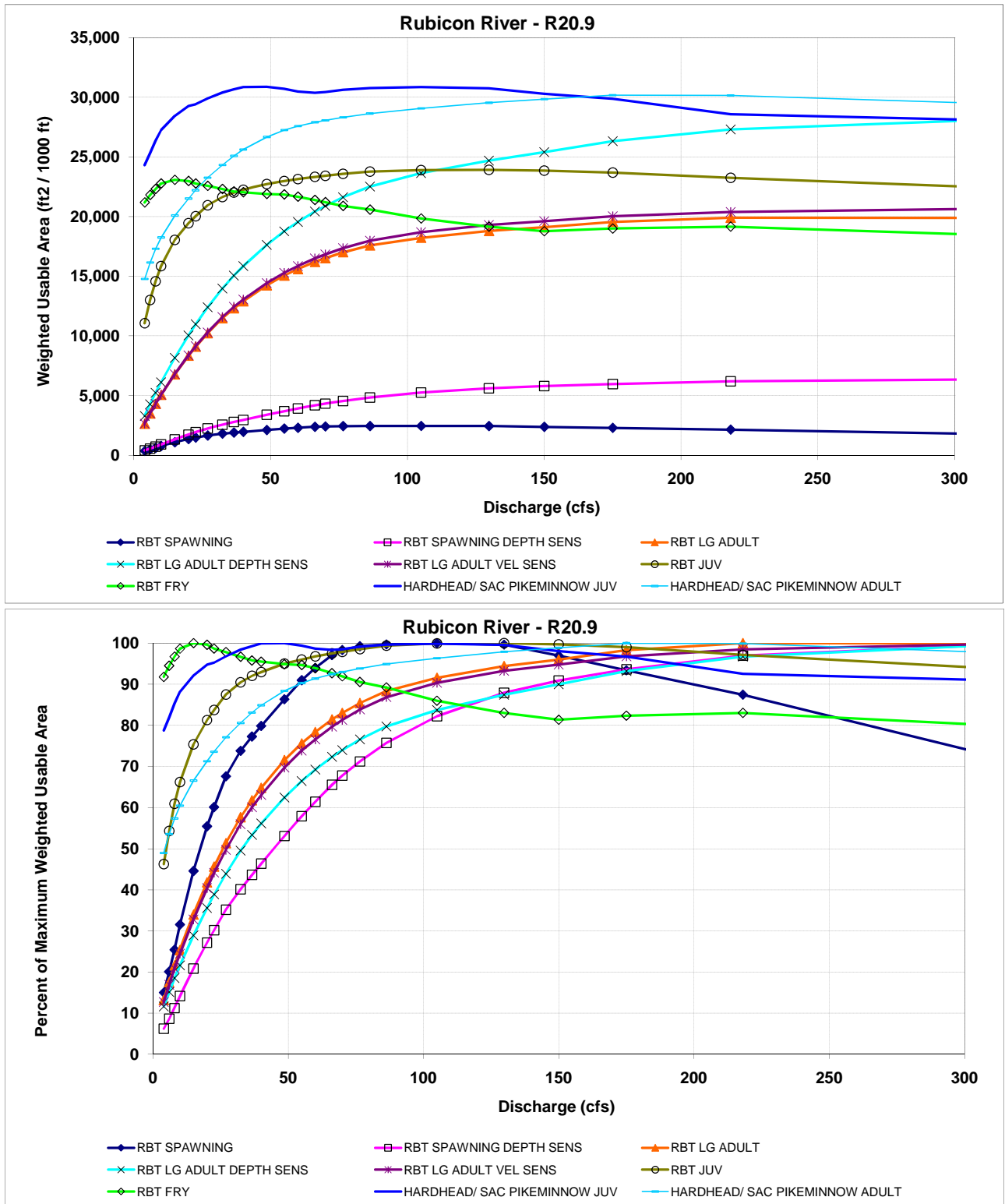


Table 9A. Rubicon River - R20.9 Weighted Usable Area.

| Discharge (cfs) | Weighted Usable Area (ft ² / 1000 ft) | | | | | | | | |
|-----------------|--|-------------------------|--------------|-------------------------|-----------------------|---------|---------|------------------------------|--------------------------------|
| | RBT SPAWNING | RBT SPAWNING DEPTH SENS | RBT LG ADULT | RBT LG ADULT DEPTH SENS | RBT LG ADULT VEL SENS | RBT JUV | RBT FRY | HARDHEAD/ SAC PIKEMINNOW JUV | HARDHEAD/ SAC PIKEMINNOW ADULT |
| 4 | 368 | 398 | 2629 | 3285 | 2631 | 11058 | 21176 | 24319 | 14767 |
| 6 | 492 | 550 | 3484 | 4275 | 3491 | 12997 | 21804 | 25313 | 16157 |
| 8 | 623 | 715 | 4306 | 5235 | 4319 | 14581 | 22313 | 26351 | 17303 |
| 10 | 773 | 903 | 5047 | 6108 | 5065 | 15843 | 22761 | 27230 | 18248 |
| 15 | 1093 | 1330 | 6764 | 8151 | 6788 | 18034 | 23071 | 28439 | 20090 |
| 20 | 1358 | 1730 | 8327 | 10043 | 8369 | 19446 | 22981 | 29270 | 21512 |
| 22.6 | 1473 | 1926 | 9085 | 10975 | 9140 | 20034 | 22763 | 29418 | 22203 |
| 27 | 1656 | 2241 | 10221 | 12391 | 10294 | 20939 | 22567 | 29898 | 23260 |
| 32.4 | 1808 | 2559 | 11472 | 13974 | 11583 | 21639 | 22305 | 30397 | 24320 |
| 36.6 | 1894 | 2783 | 12298 | 15056 | 12436 | 22018 | 22101 | 30659 | 25082 |
| 40 | 1956 | 2958 | 12899 | 15850 | 13051 | 22245 | 22030 | 30856 | 25616 |
| 48.6 | 2115 | 3385 | 14234 | 17630 | 14436 | 22727 | 21890 | 30884 | 26671 |
| 55 | 2229 | 3692 | 15050 | 18764 | 15283 | 22967 | 21841 | 30699 | 27247 |
| 60 | 2302 | 3917 | 15599 | 19546 | 15850 | 23150 | 21666 | 30474 | 27577 |
| 66.2 | 2379 | 4179 | 16204 | 20420 | 16492 | 23331 | 21386 | 30381 | 27904 |
| 70 | 2409 | 4322 | 16518 | 20887 | 16829 | 23421 | 21205 | 30430 | 28062 |
| 76.5 | 2431 | 4542 | 17005 | 21618 | 17361 | 23575 | 20887 | 30625 | 28316 |
| 86.3 | 2442 | 4832 | 17575 | 22517 | 17979 | 23772 | 20583 | 30764 | 28639 |
| 105 | 2450 | 5245 | 18219 | 23637 | 18697 | 23903 | 19835 | 30844 | 29068 |
| 129.8 | 2441 | 5610 | 18786 | 24689 | 19301 | 23923 | 19154 | 30750 | 29541 |
| 150 | 2375 | 5798 | 19104 | 25397 | 19620 | 23851 | 18769 | 30280 | 29836 |
| 175 | 2288 | 5970 | 19558 | 26319 | 20037 | 23693 | 18996 | 29865 | 30176 |
| 218.1 | 2143 | 6185 | 19898 | 27302 | 20382 | 23238 | 19157 | 28581 | 30153 |
| 325 | 1719 | 6378 | 19886 | 28230 | 20697 | 22333 | 18355 | 28013 | 29375 |
| 425 | 1227 | 6355 | 19471 | 28224 | 20369 | 21887 | 17984 | 26854 | 28747 |
| 525 | 836 | 6290 | 19218 | 28192 | 20141 | 21684 | 17072 | 25991 | 28264 |
| 625 | 516 | 6122 | 19060 | 28024 | 20013 | 21600 | 16053 | 25549 | 27923 |
| 725 | 297 | 5867 | 18764 | 27595 | 19686 | 21247 | 15093 | 25091 | 27659 |
| 825 | 161 | 5592 | 18571 | 27301 | 19478 | 20767 | 14288 | 24376 | 27432 |
| 925 | 136 | 5369 | 18450 | 27103 | 19330 | 20289 | 13626 | 23503 | 27149 |

Table 9B. Rubicon River - R20.9 Percent of Maximum Weighted Usable Area.

| Discharge (cfs) | Percent of Maximum Weighted Usable Area | | | | | | | | |
|-----------------|---|-------------------------|--------------|-------------------------|-----------------------|---------|---------|------------------------------|--------------------------------|
| | RBT SPAWNING | RBT SPAWNING DEPTH SENS | RBT LG ADULT | RBT LG ADULT DEPTH SENS | RBT LG ADULT VEL SENS | RBT JUV | RBT FRY | HARDHEAD/ SAC PIKEMINNOW JUV | HARDHEAD/ SAC PIKEMINNOW ADULT |
| 4 | 15 | 6 | 13 | 12 | 13 | 46 | 92 | 79 | 49 |
| 6 | 20 | 9 | 18 | 15 | 17 | 54 | 95 | 82 | 54 |
| 8 | 25 | 11 | 22 | 19 | 21 | 61 | 97 | 85 | 57 |
| 10 | 32 | 14 | 25 | 22 | 24 | 66 | 99 | 88 | 60 |
| 15 | 45 | 21 | 34 | 29 | 33 | 75 | 100 | 92 | 67 |
| 20 | 55 | 27 | 42 | 36 | 40 | 81 | 100 | 95 | 71 |
| 22.6 | 60 | 30 | 46 | 39 | 44 | 84 | 99 | 95 | 74 |
| 27 | 68 | 35 | 51 | 44 | 50 | 88 | 98 | 97 | 77 |
| 32.4 | 74 | 40 | 58 | 50 | 56 | 90 | 97 | 98 | 81 |
| 36.6 | 77 | 44 | 62 | 53 | 60 | 92 | 96 | 99 | 83 |
| 40 | 80 | 46 | 65 | 56 | 63 | 93 | 95 | 100 | 85 |
| 48.6 | 86 | 53 | 72 | 62 | 70 | 95 | 95 | 100 | 88 |
| 55 | 91 | 58 | 76 | 66 | 74 | 96 | 95 | 99 | 90 |
| 60 | 94 | 61 | 78 | 69 | 77 | 97 | 94 | 99 | 91 |
| 66.2 | 97 | 66 | 81 | 72 | 80 | 98 | 93 | 98 | 92 |
| 70 | 98 | 68 | 83 | 74 | 81 | 98 | 92 | 99 | 93 |
| 76.5 | 99 | 71 | 85 | 77 | 84 | 99 | 91 | 99 | 94 |
| 86.3 | 100 | 76 | 88 | 80 | 87 | 99 | 89 | 100 | 95 |
| 105 | 100 | 82 | 92 | 84 | 90 | 100 | 86 | 100 | 96 |
| 129.8 | 100 | 88 | 94 | 87 | 93 | 100 | 83 | 100 | 98 |
| 150 | 97 | 91 | 96 | 90 | 95 | 100 | 81 | 98 | 99 |
| 175 | 93 | 94 | 98 | 93 | 97 | 99 | 82 | 97 | 100 |
| 218.1 | 87 | 97 | 100 | 97 | 98 | 97 | 83 | 93 | 100 |
| 325 | 70 | 100 | 100 | 100 | 100 | 93 | 80 | 91 | 97 |
| 425 | 50 | 100 | 98 | 100 | 98 | 91 | 78 | 87 | 95 |
| 525 | 34 | 99 | 97 | 100 | 97 | 91 | 74 | 84 | 94 |
| 625 | 21 | 96 | 96 | 99 | 97 | 90 | 70 | 83 | 93 |
| 725 | 12 | 92 | 94 | 98 | 95 | 89 | 65 | 81 | 92 |
| 825 | 7 | 88 | 93 | 97 | 94 | 87 | 62 | 79 | 91 |
| 925 | 6 | 84 | 93 | 96 | 93 | 85 | 59 | 76 | 90 |

Figure 26. Rubicon River - R20.9 Spatial Niche Area by Individual Niche (top) and by Cumulative Area (bottom).

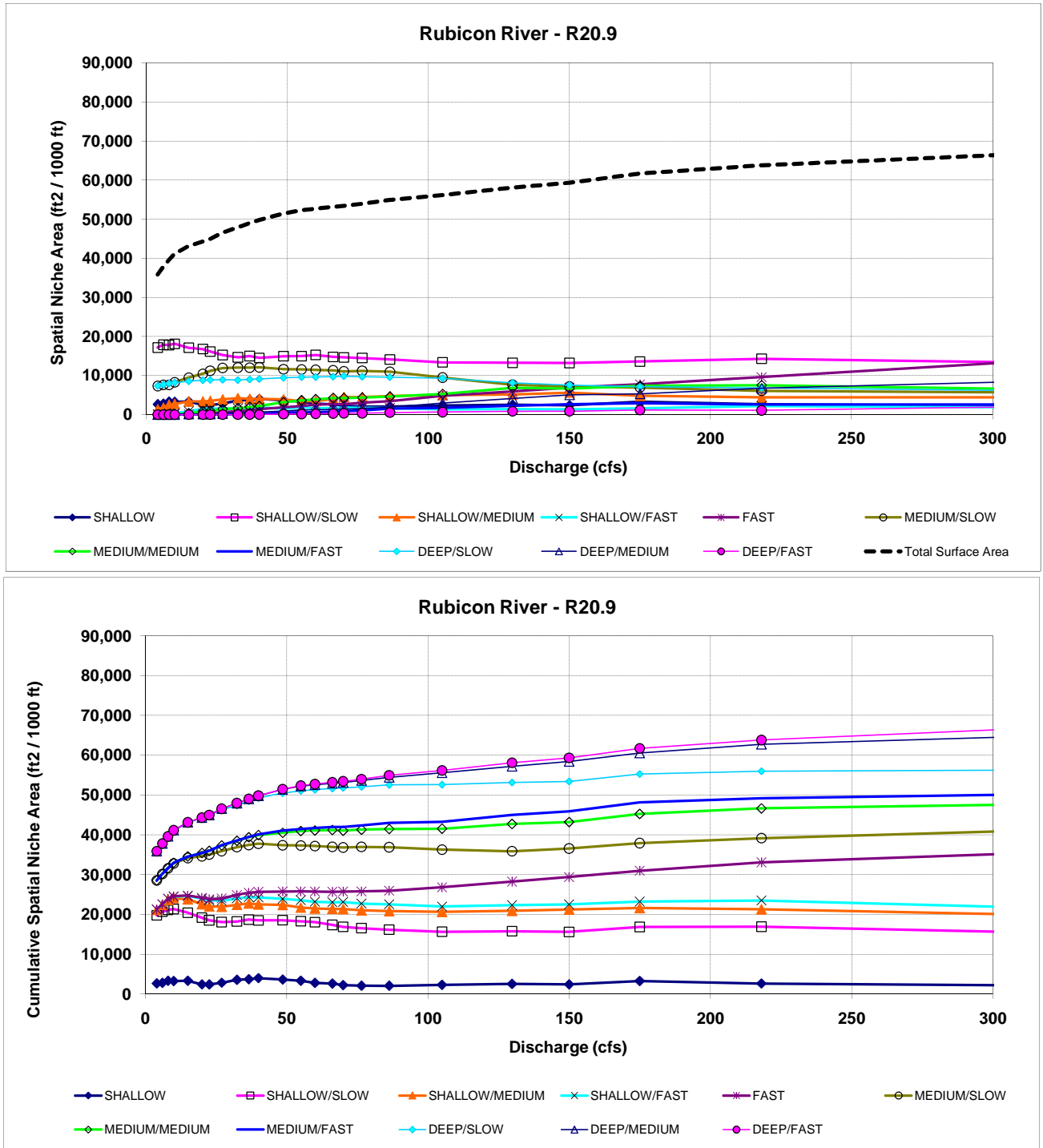
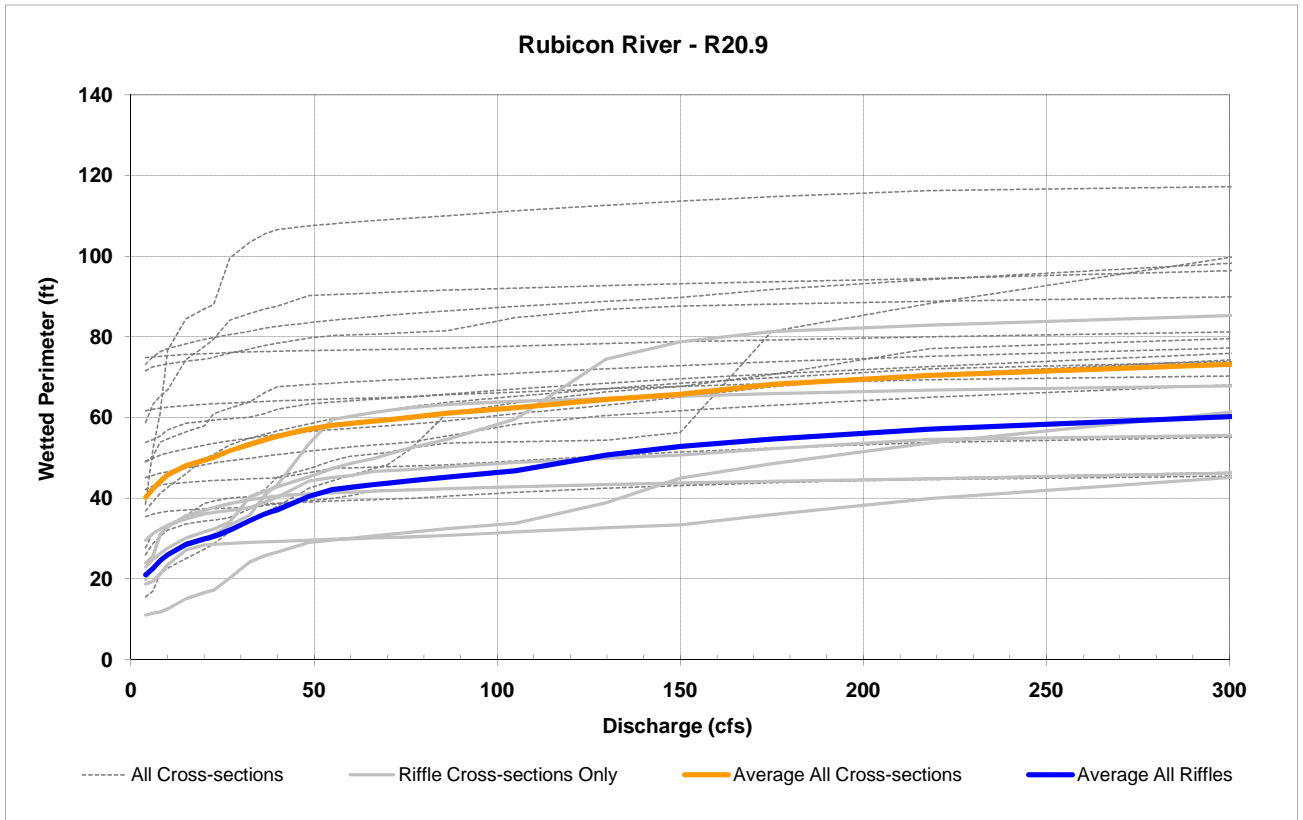


Figure 27. Rubicon River - R20.9 Wetted Perimeter.



Rubicon River R3.5

Figure 28. Rubicon River - R3.5 Weighted Usable Area (top) and Percent of Maximum Weighted Usable Area (bottom).

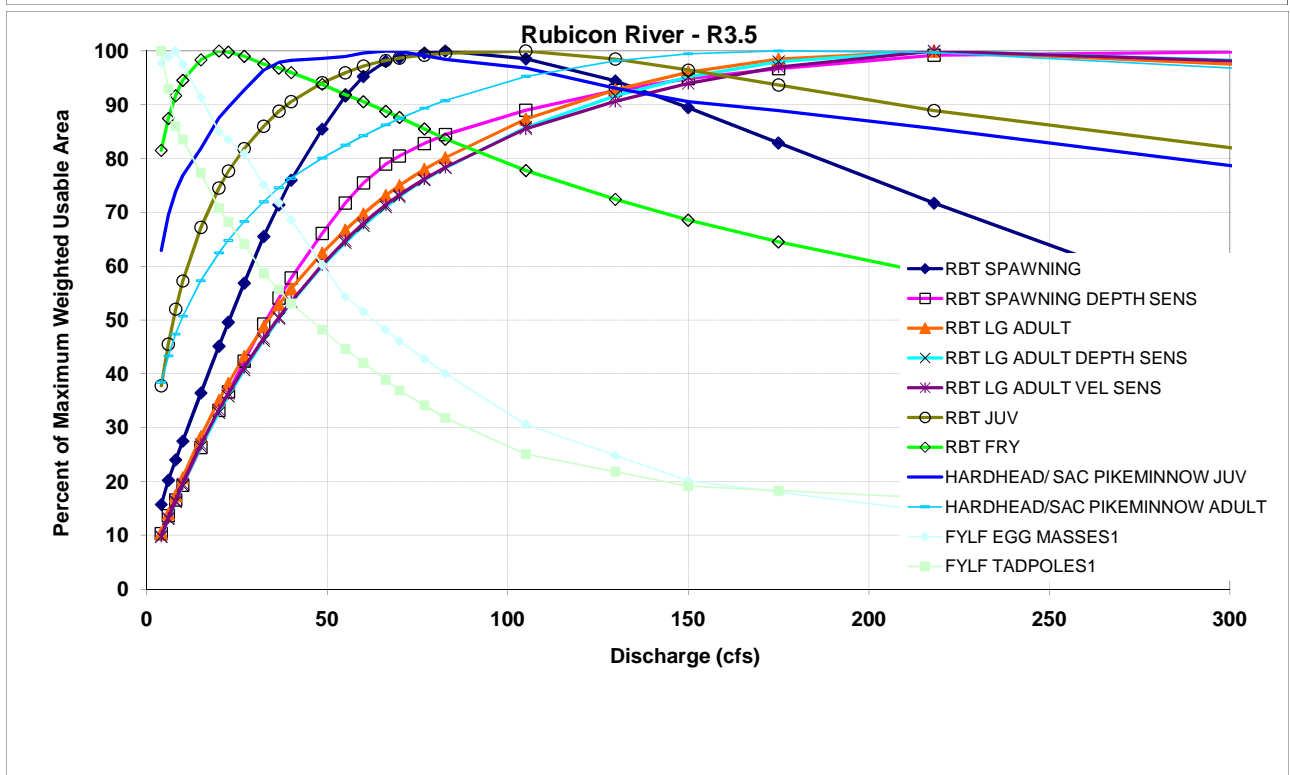
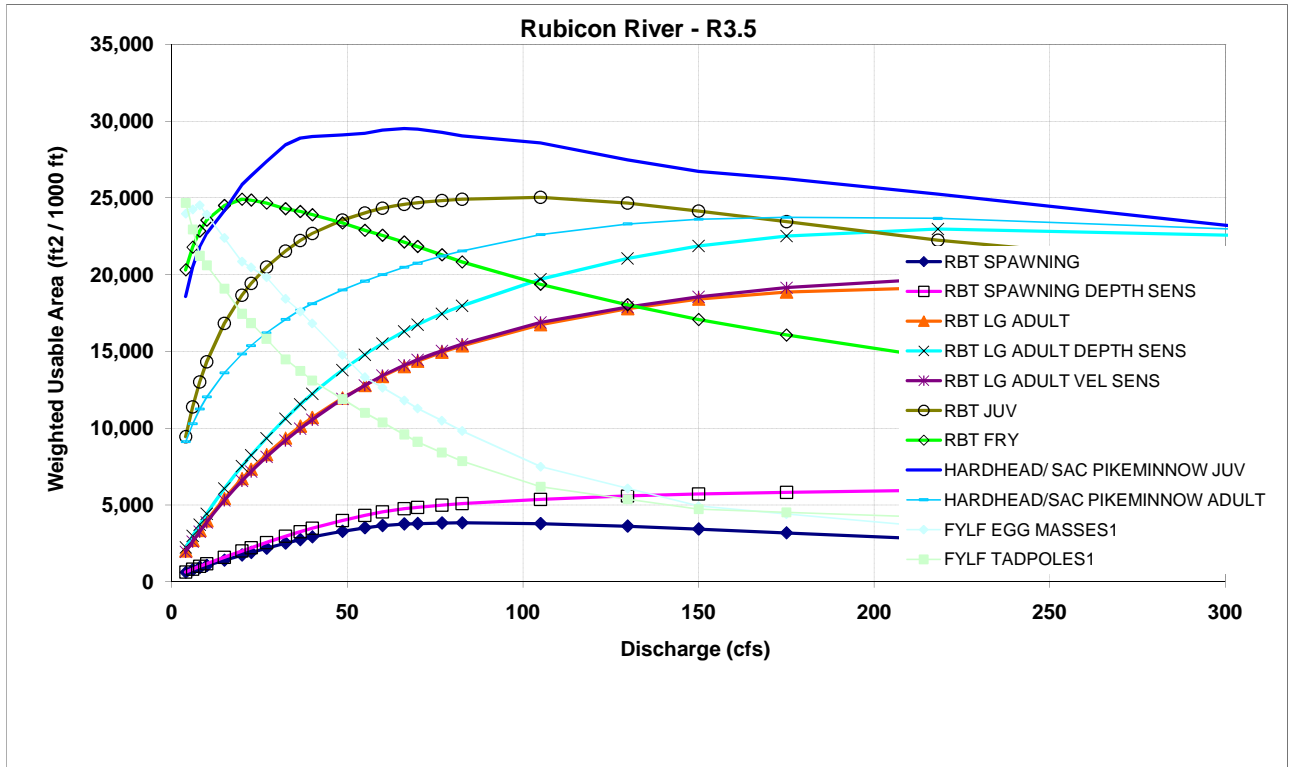


Table 10A. Rubicon River - R3.5 Weighted Usable Area.

| Discharge (cfs) | Weighted Usable Area (ft ² / 1000 ft) | | | | | | | | | | |
|-----------------|--|-------------------------|--------------|-------------------------|-----------------------|---------|---------|------------------------------|-------------------------------|------------------------------|----------------------------|
| | RBT SPAWNING | RBT SPAWNING DEPTH SENS | RBT LG ADULT | RBT LG ADULT DEPTH SENS | RBT LG ADULT VEL SENS | RBT JUV | RBT FRY | HARDHEAD/ SAC PIKEMINNOW JUV | HARDHEAD/SAC PIKEMINNOW ADULT | FYLF EGG MASSES ¹ | FYLF TADPOLES ¹ |
| 4 | 602 | 620 | 2000 | 2229 | 1941 | 9451 | 20310 | 18582 | 9120 | 23967 | 24679 |
| 6 | 775 | 820 | 2685 | 2988 | 2610 | 11389 | 21785 | 20498 | 10298 | 24244 | 22852 |
| 8 | 920 | 995 | 3338 | 3715 | 3247 | 13021 | 22842 | 21806 | 11249 | 24522 | 21226 |
| 10 | 1053 | 1161 | 3968 | 4418 | 3867 | 14331 | 23552 | 22682 | 12038 | 23813 | 20616 |
| 15 | 1395 | 1584 | 5428 | 6067 | 5304 | 16826 | 24501 | 24171 | 13606 | 22390 | 19090 |
| 20 | 1729 | 1996 | 6723 | 7529 | 6574 | 18659 | 24909 | 25849 | 14833 | 20849 | 17453 |
| 22.6 | 1899 | 2206 | 7331 | 8229 | 7175 | 19443 | 24856 | 26432 | 15377 | 20472 | 16849 |
| 27 | 2178 | 2550 | 8289 | 9345 | 8128 | 20492 | 24660 | 27376 | 16212 | 19833 | 15826 |
| 32.4 | 2510 | 2964 | 9356 | 10610 | 9193 | 21530 | 24289 | 28453 | 17085 | 18420 | 14472 |
| 36.6 | 2735 | 3255 | 10137 | 11549 | 9971 | 22227 | 24115 | 28898 | 17707 | 17601 | 13731 |
| 40 | 2912 | 3480 | 10705 | 12237 | 10542 | 22677 | 23907 | 29008 | 18114 | 16817 | 13104 |
| 48.6 | 3274 | 3978 | 11971 | 13792 | 11900 | 23552 | 23366 | 29106 | 19008 | 14781 | 11892 |
| 55 | 3509 | 4319 | 12786 | 14788 | 12793 | 24014 | 22888 | 29203 | 19579 | 13325 | 11007 |
| 60 | 3649 | 4543 | 13371 | 15506 | 13426 | 24333 | 22565 | 29411 | 20003 | 12648 | 10375 |
| 66.2 | 3756 | 4755 | 14026 | 16309 | 14099 | 24590 | 22122 | 29517 | 20482 | 11808 | 9593 |
| 70 | 3783 | 4843 | 14378 | 16749 | 14452 | 24696 | 21837 | 29483 | 20749 | 11294 | 9113 |
| 76.9 | 3816 | 4984 | 14950 | 17456 | 15039 | 24941 | 21297 | 29266 | 21210 | 10491 | 8423 |
| 82.7 | 3830 | 5085 | 15371 | 17975 | 15472 | 24918 | 20830 | 29045 | 21545 | 9817 | 7843 |
| 105 | 3775 | 5357 | 16744 | 19715 | 16884 | 25035 | 19379 | 28580 | 22617 | 7497 | 6181 |
| 129.8 | 3618 | 5580 | 17787 | 21062 | 17892 | 24658 | 18042 | 27475 | 23308 | 6083 | 5375 |
| 150 | 3427 | 5709 | 18417 | 21867 | 18550 | 24143 | 17083 | 26740 | 23612 | 4932 | 4719 |
| 175 | 3175 | 5822 | 18879 | 22514 | 19152 | 23451 | 16069 | 26242 | 23739 | 4416 | 4519 |
| 218.1 | 2747 | 5971 | 19172 | 22975 | 19745 | 22256 | 14584 | 25258 | 23670 | 3527 | 4174 |
| 325 | 1750 | 6020 | 18566 | 22457 | 19274 | 20013 | 12081 | 22611 | 22774 | 3086 | 3952 |
| 425 | 1058 | 5814 | 17819 | 21825 | 18449 | 18222 | 10946 | 20740 | 21901 | 3120 | 3894 |
| 525 | 641 | 5554 | 17055 | 21314 | 17615 | 16971 | 10300 | 19134 | 21262 | 3154 | 3837 |
| 625 | 427 | 5233 | 16393 | 20859 | 16893 | 16116 | 9833 | 18319 | 20701 | 3020 | 3703 |
| 725 | 321 | 4979 | 15806 | 20423 | 16254 | 15474 | 9298 | 17871 | 20175 | 2885 | 3568 |
| 825 | 250 | 4739 | 15271 | 19935 | 15705 | 14950 | 8481 | 17311 | 19730 | 2895 | 3634 |
| 925 | 187 | 4512 | 14859 | 19577 | 15281 | 14523 | 7871 | 17114 | 19341 | 2904 | 3699 |

¹Interpolated values in gray.

Table 10B. Rubicon River - R3.5 Percent of Maximum Weighted Usable Area.

| Discharge (cfs) | Percent of Maximum Weighted Usable Area | | | | | | | | | | |
|-----------------|---|-------------------------|--------------|-------------------------|-----------------------|---------|---------|------------------------------|-------------------------------|-----------------|---------------|
| | RBT SPAWNING | RBT SPAWNING DEPTH SENS | RBT LG ADULT | RBT LG ADULT DEPTH SENS | RBT LG ADULT VEL SENS | RBT JUV | RBT FRY | HARDHEAD/ SAC PIKEMINNOW JUV | HARDHEAD/SAC PIKEMINNOW ADULT | FYLF EGG MASSES | FYLF TADPOLES |
| 4 | 16 | 10 | 10 | 10 | 10 | 38 | 82 | 63 | 38 | 98 | 100 |
| 6 | 20 | 14 | 14 | 13 | 13 | 45 | 87 | 69 | 43 | 99 | 93 |
| 8 | 24 | 17 | 17 | 16 | 16 | 52 | 92 | 74 | 47 | 100 | 86 |
| 10 | 28 | 19 | 21 | 19 | 20 | 57 | 95 | 77 | 51 | 98 | 84 |
| 15 | 36 | 26 | 28 | 26 | 27 | 67 | 98 | 82 | 57 | 91 | 77 |
| 20 | 45 | 33 | 35 | 33 | 33 | 75 | 100 | 88 | 62 | 85 | 71 |
| 22.6 | 50 | 37 | 38 | 36 | 36 | 78 | 100 | 90 | 65 | 83 | 68 |
| 27 | 57 | 42 | 43 | 41 | 41 | 82 | 99 | 93 | 68 | 81 | 64 |
| 32.4 | 66 | 49 | 49 | 46 | 47 | 86 | 98 | 96 | 72 | 75 | 59 |
| 36.6 | 71 | 54 | 53 | 50 | 51 | 89 | 97 | 98 | 75 | 72 | 56 |
| 40 | 76 | 58 | 56 | 53 | 53 | 91 | 96 | 98 | 76 | 69 | 53 |
| 48.6 | 85 | 66 | 62 | 60 | 60 | 94 | 94 | 99 | 80 | 60 | 48 |
| 55 | 92 | 72 | 67 | 64 | 65 | 96 | 92 | 99 | 82 | 54 | 45 |
| 60 | 95 | 75 | 70 | 67 | 68 | 97 | 91 | 100 | 84 | 52 | 42 |
| 66.2 | 98 | 79 | 73 | 71 | 71 | 98 | 89 | 100 | 86 | 48 | 39 |
| 70 | 99 | 80 | 75 | 73 | 73 | 99 | 88 | 100 | 87 | 46 | 37 |
| 76.9 | 100 | 83 | 78 | 76 | 76 | 99 | 86 | 99 | 89 | 43 | 34 |
| 82.7 | 100 | 84 | 80 | 78 | 78 | 100 | 84 | 98 | 91 | 40 | 32 |
| 105 | 99 | 89 | 87 | 86 | 86 | 100 | 78 | 97 | 95 | 31 | 25 |
| 129.8 | 94 | 93 | 93 | 92 | 91 | 98 | 72 | 93 | 98 | 25 | 22 |
| 150 | 89 | 95 | 96 | 95 | 94 | 96 | 69 | 91 | 99 | 20 | 19 |
| 175 | 83 | 97 | 98 | 98 | 97 | 94 | 65 | 89 | 100 | 18 | 18 |
| 218.1 | 72 | 99 | 100 | 100 | 100 | 89 | 59 | 86 | 100 | 14 | 17 |
| 325 | 46 | 100 | 97 | 98 | 98 | 80 | 49 | 77 | 96 | 13 | 16 |
| 425 | 28 | 97 | 93 | 95 | 93 | 73 | 44 | 70 | 92 | 13 | 16 |
| 525 | 17 | 92 | 89 | 93 | 89 | 68 | 41 | 65 | 90 | 13 | 16 |
| 625 | 11 | 87 | 86 | 91 | 86 | 64 | 39 | 62 | 87 | 12 | 15 |
| 725 | 8 | 83 | 82 | 89 | 82 | 62 | 37 | 61 | 85 | 12 | 14 |
| 825 | 7 | 79 | 80 | 87 | 80 | 60 | 34 | 59 | 83 | 12 | 15 |
| 925 | 5 | 75 | 78 | 85 | 77 | 58 | 32 | 58 | 81 | 12 | 15 |

Figure 29. Rubicon River - R3.5 Spatial Niche Area by Individual Niche (top) and by Cumulative Area (bottom).

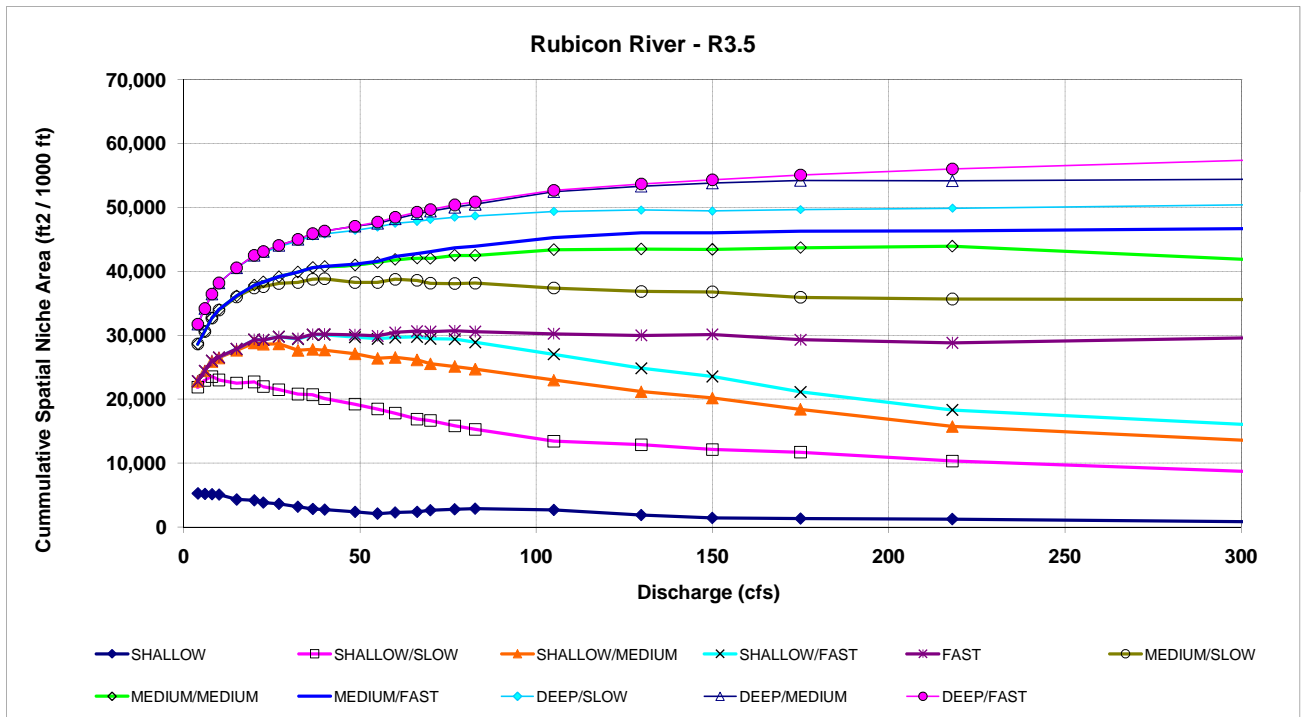
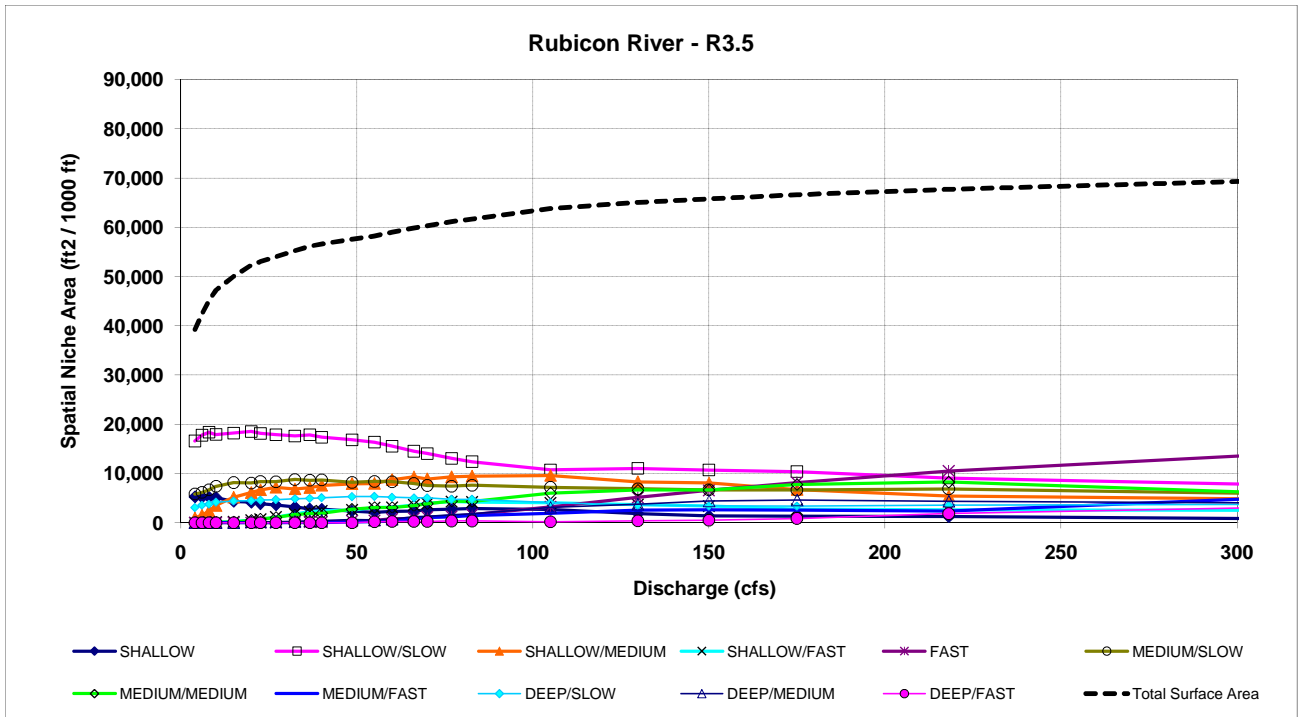
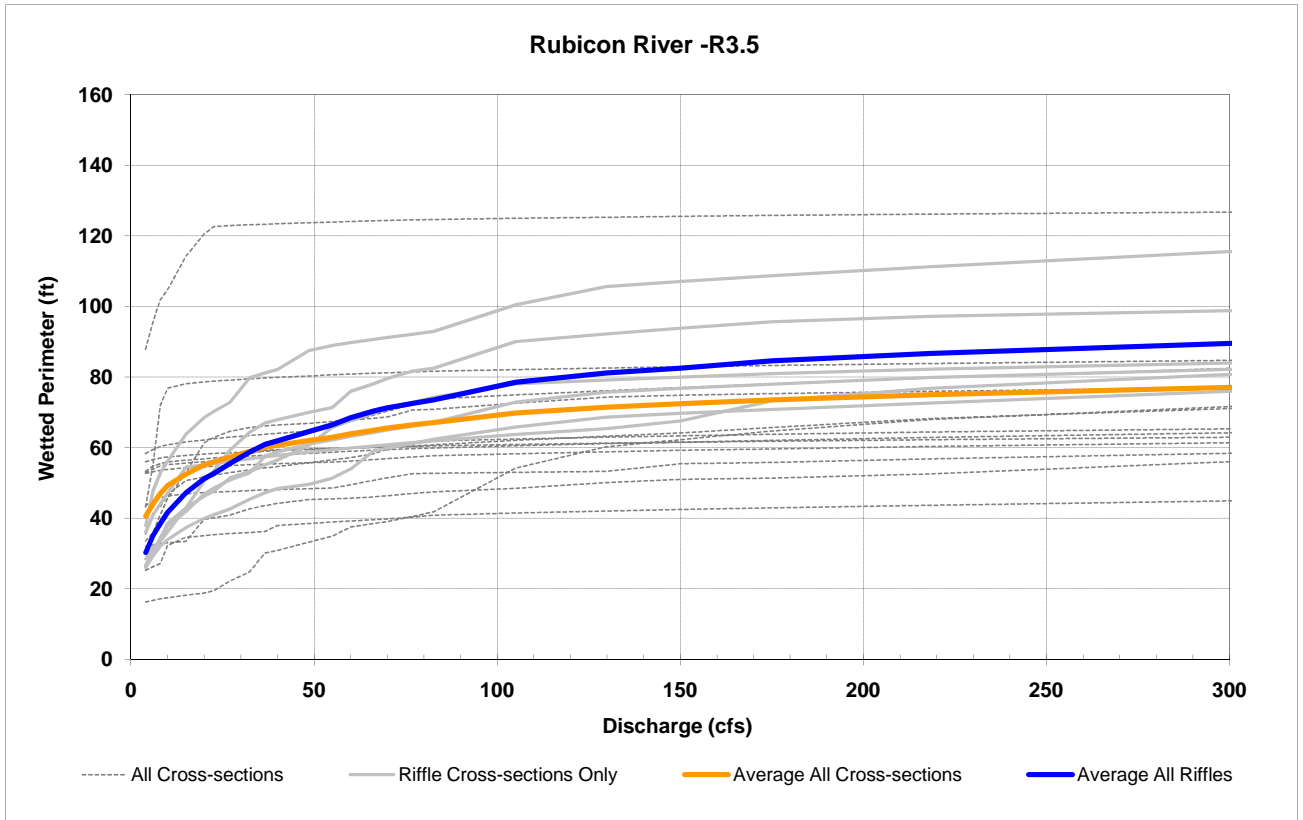


Figure 30. Rubicon River -R3.5 Wetted Perimeter.



Middle Fork American River MF14.1

Figure 31. Middle Fork American River - MF14.1 Weighted Usable Area (top) and Percent of Maximum Weighted Usable Area (bottom).

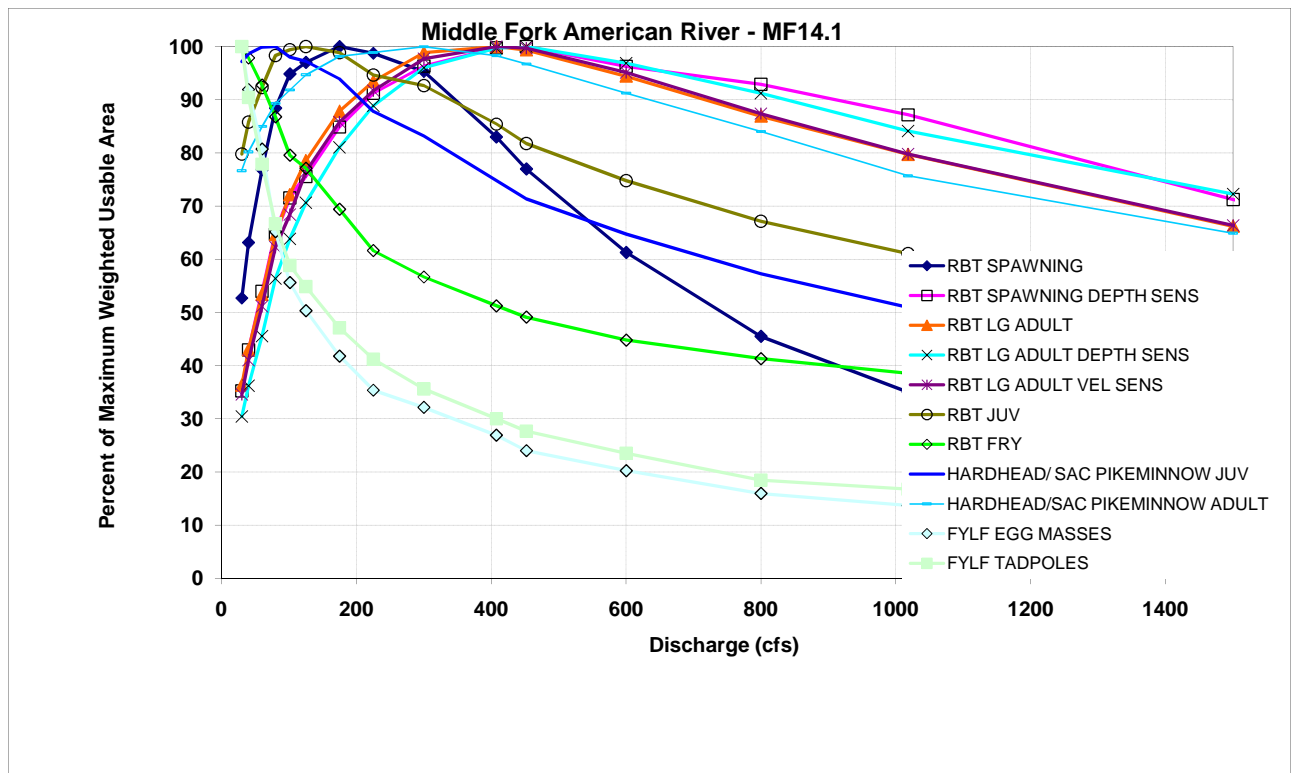
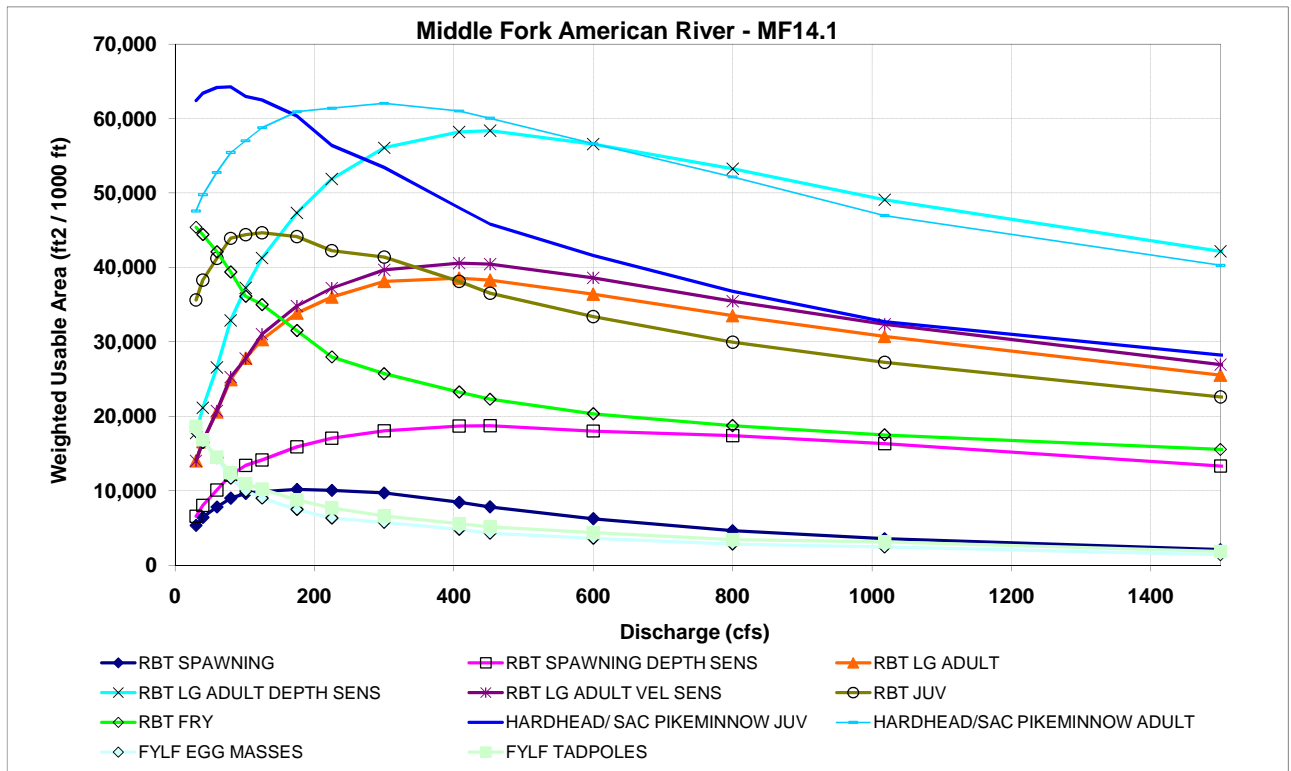


Table 11A. Middle Fork American River - MF14.1 Weighted Usable Area.

| Discharge (cfs) | Weighted Usable Area (ft ² / 1000 ft) | | | | | | | | | | |
|-----------------|--|-------------------------|--------------|-------------------------|-----------------------|---------|---------|------------------------------|-------------------------------|-----------------|---------------|
| | RBT SPAWNING | RBT SPAWNING DEPTH SENS | RBT LG ADULT | RBT LG ADULT DEPTH SENS | RBT LG ADULT VEL SENS | RBT JUV | RBT FRY | HARDHEAD/ SAC PIKEMINNOW JUV | HARDHEAD/SAC PIKEMINNOW ADULT | FYLF EGG MASSES | FYLF TADPOLES |
| 30 | 5367 | 6597 | 13997 | 17763 | 14026 | 35608 | 45390 | 62414 | 47570 | 17926 | 18640 |
| 40 | 6431 | 8039 | 16575 | 21129 | 16637 | 38294 | 44410 | 63367 | 49762 | 16476 | 16857 |
| 60 | 7826 | 10104 | 20578 | 26561 | 20737 | 41214 | 42109 | 64149 | 52741 | 14472 | 14520 |
| 80 | 9006 | 12113 | 24931 | 32885 | 25256 | 43899 | 39391 | 64223 | 55434 | 11687 | 12423 |
| 101 | 9660 | 13396 | 27805 | 37260 | 27757 | 44392 | 36119 | 62965 | 57002 | 9970 | 10972 |
| 125 | 9883 | 14151 | 30278 | 41237 | 31023 | 44636 | 35006 | 62472 | 58766 | 9021 | 10222 |
| 175 | 10186 | 15890 | 33870 | 47297 | 34810 | 44148 | 31505 | 60345 | 60914 | 7491 | 8780 |
| 225 | 10057 | 17077 | 36031 | 51875 | 37205 | 42250 | 27969 | 56391 | 61366 | 6339 | 7682 |
| 300 | 9708 | 18036 | 38121 | 56059 | 39659 | 41371 | 25723 | 53410 | 62043 | 5759 | 6639 |
| 408 | 8453 | 18681 | 38554 | 58200 | 40575 | 38130 | 23257 | 48020 | 61004 | 4820 | 5589 |
| 452 | 7839 | 18720 | 38310 | 58357 | 40452 | 36509 | 22288 | 45821 | 60029 | 4300 | 5153 |
| 600 | 6242 | 18030 | 36414 | 56539 | 38607 | 33379 | 20340 | 41592 | 56625 | 3627 | 4379 |
| 800 | 4632 | 17392 | 33512 | 53253 | 35466 | 29973 | 18741 | 36799 | 52142 | 2857 | 3437 |
| 1018 | 3563 | 16318 | 30732 | 49089 | 32368 | 27262 | 17486 | 32721 | 46967 | 2451 | 3125 |
| 1500 | 2111 | 13332 | 25524 | 42166 | 26932 | 22626 | 15538 | 28256 | 40276 | 1418 | 1858 |
| 2000 | 1499 | 10776 | 22173 | 37488 | 23312 | 20076 | 14903 | 25758 | 36348 | 985 | 1512 |
| 2500 | 1227 | 8801 | 20408 | 34274 | 21349 | 19129 | 14630 | 24429 | 33655 | 668 | 1264 |
| 3000 | 1103 | 7634 | 19416 | 32455 | 20356 | 18416 | 14331 | 23502 | 31892 | 575 | 1374 |
| 4000 | 922 | 5713 | 18404 | 30399 | 19250 | 17779 | 14546 | 22449 | 30336 | 884 | 1757 |
| 6000 | 750 | 4118 | 17940 | 29420 | 18827 | 18128 | 13926 | 21862 | 28779 | 824 | 1416 |

Table 11B. Middle Fork American River - MF14.1 Percent of Maximum Weighted Usable Area.

| Discharge (cfs) | Percent of Maximum Weighted Usable Area | | | | | | | | | | |
|-----------------|---|-------------------------|--------------|-------------------------|-----------------------|---------|---------|------------------------------|-------------------------------|-----------------|---------------|
| | RBT SPAWNING | RBT SPAWNING DEPTH SENS | RBT LG ADULT | RBT LG ADULT DEPTH SENS | RBT LG ADULT VEL SENS | RBT JUV | RBT FRY | HARDHEAD/ SAC PIKEMINNOW JUV | HARDHEAD/SAC PIKEMINNOW ADULT | FYLF EGG MASSES | FYLF TADPOLES |
| 30 | 53 | 35 | 36 | 30 | 35 | 80 | 100 | 97 | 77 | 100 | 100 |
| 40 | 63 | 43 | 43 | 36 | 41 | 86 | 98 | 99 | 80 | 92 | 90 |
| 60 | 77 | 54 | 53 | 46 | 51 | 92 | 93 | 100 | 85 | 81 | 78 |
| 80 | 88 | 65 | 65 | 56 | 62 | 98 | 87 | 100 | 89 | 65 | 67 |
| 101.3 | 95 | 72 | 72 | 64 | 68 | 99 | 80 | 98 | 92 | 56 | 59 |
| 125 | 97 | 76 | 79 | 71 | 76 | 100 | 77 | 97 | 95 | 50 | 55 |
| 175 | 100 | 85 | 88 | 81 | 86 | 99 | 69 | 94 | 98 | 42 | 47 |
| 225 | 99 | 91 | 93 | 89 | 92 | 95 | 62 | 88 | 99 | 35 | 41 |
| 300 | 95 | 96 | 99 | 96 | 98 | 93 | 57 | 83 | 100 | 32 | 36 |
| 407.6 | 83 | 100 | 100 | 100 | 100 | 85 | 51 | 75 | 98 | 27 | 30 |
| 452 | 77 | 100 | 99 | 100 | 100 | 82 | 49 | 71 | 97 | 24 | 28 |
| 600 | 61 | 96 | 94 | 97 | 95 | 75 | 45 | 65 | 91 | 20 | 23 |
| 800 | 45 | 93 | 87 | 91 | 87 | 67 | 41 | 57 | 84 | 16 | 18 |
| 1018 | 35 | 87 | 80 | 84 | 80 | 61 | 39 | 51 | 76 | 14 | 17 |
| 1500 | 21 | 71 | 66 | 72 | 66 | 51 | 34 | 44 | 65 | 8 | 10 |
| 2000 | 15 | 58 | 58 | 64 | 57 | 45 | 33 | 40 | 59 | 5 | 8 |
| 2500 | 12 | 47 | 53 | 59 | 53 | 43 | 32 | 38 | 54 | 4 | 7 |
| 3000 | 11 | 41 | 50 | 56 | 50 | 41 | 32 | 37 | 51 | 3 | 7 |
| 4000 | 9 | 31 | 48 | 52 | 47 | 40 | 32 | 35 | 49 | 5 | 9 |
| 6000 | 7 | 22 | 47 | 50 | 46 | 41 | 31 | 34 | 46 | 5 | 8 |

Figure 32. Middle Fork American River - MF14.1 Spatial Niche Area by Individual Niche (top) and by Cumulative Area (bottom).

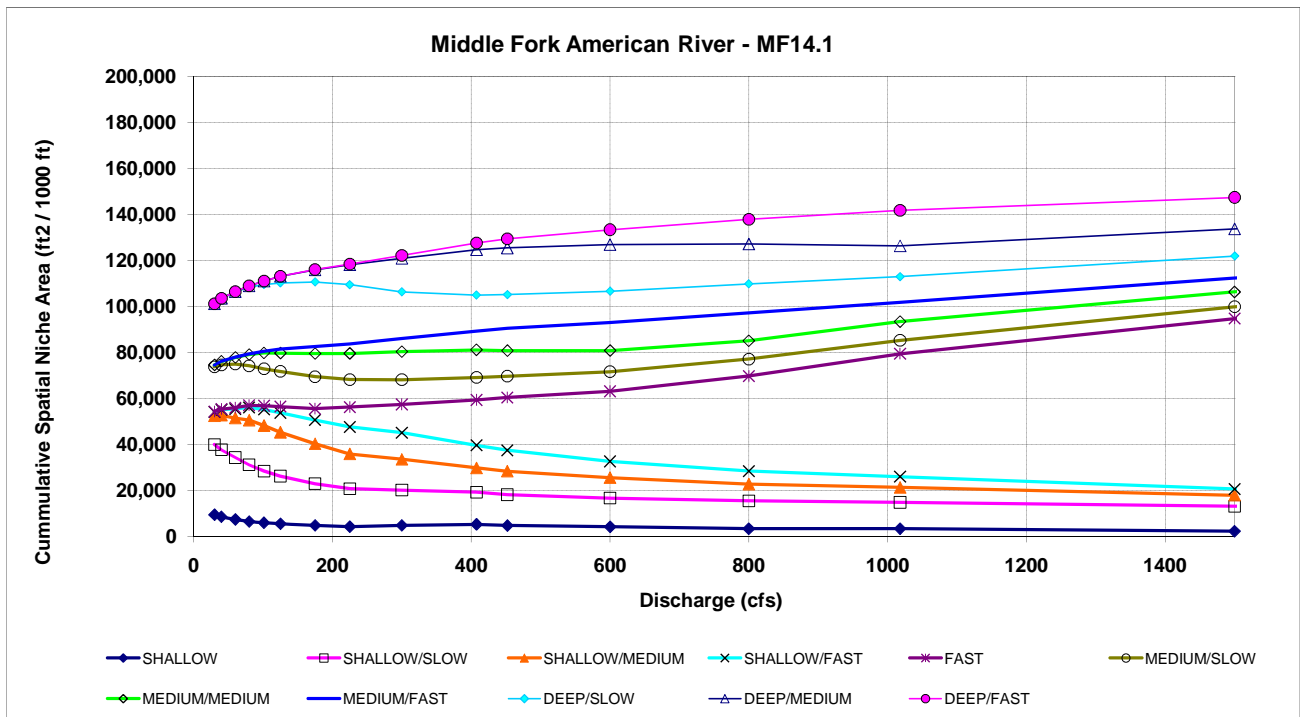
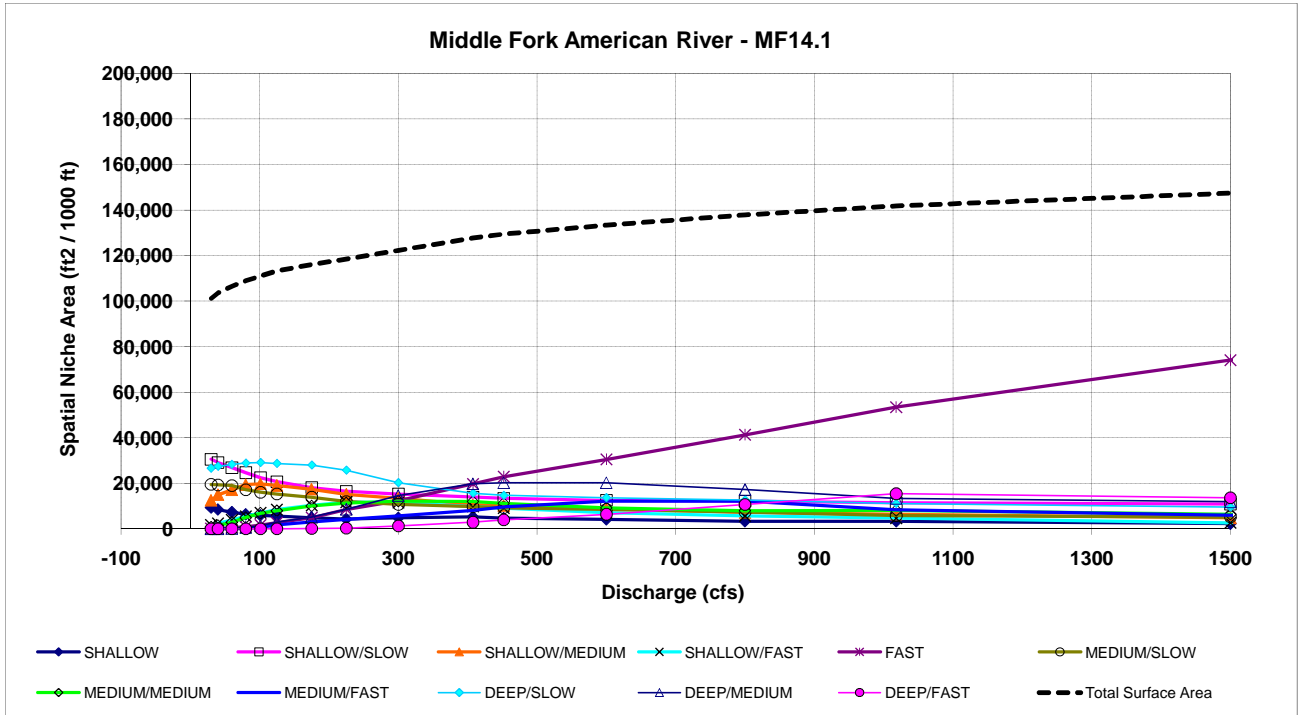
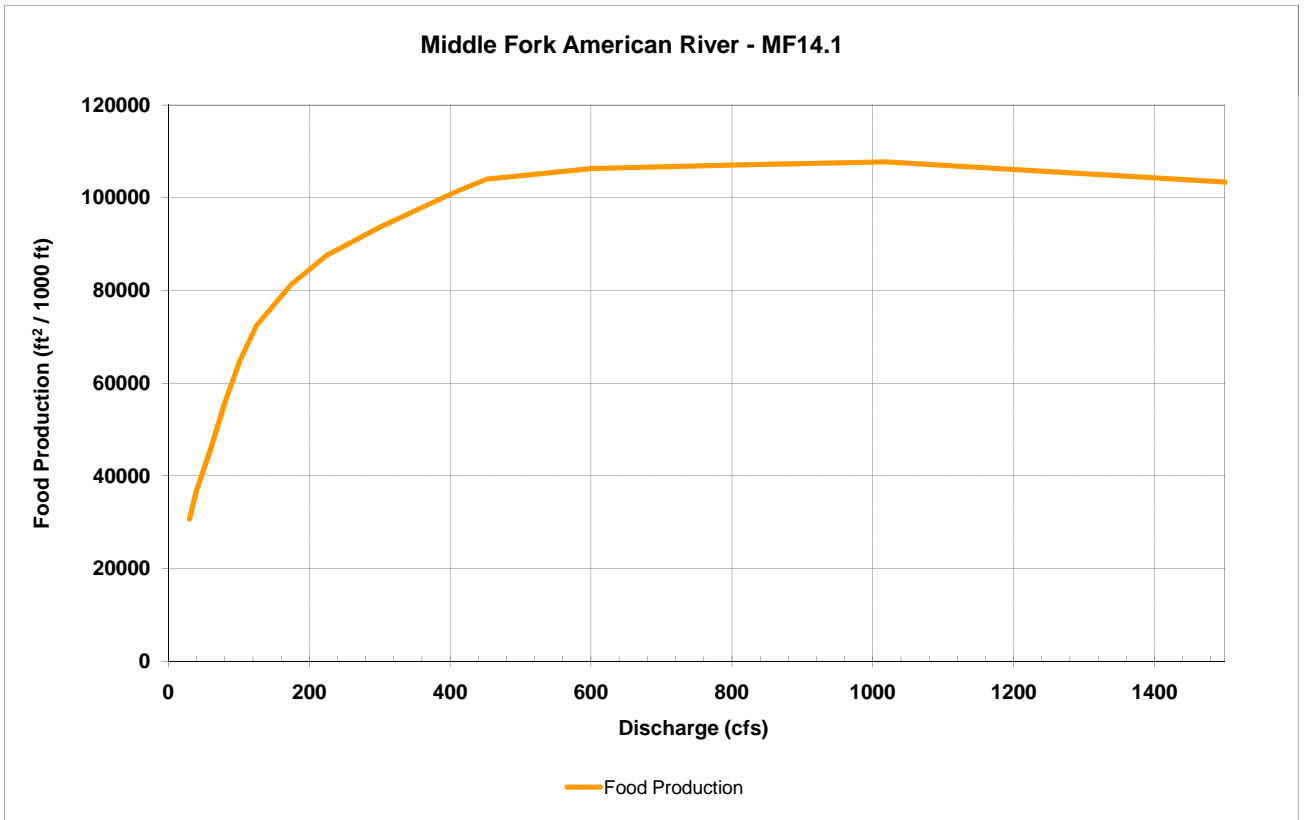
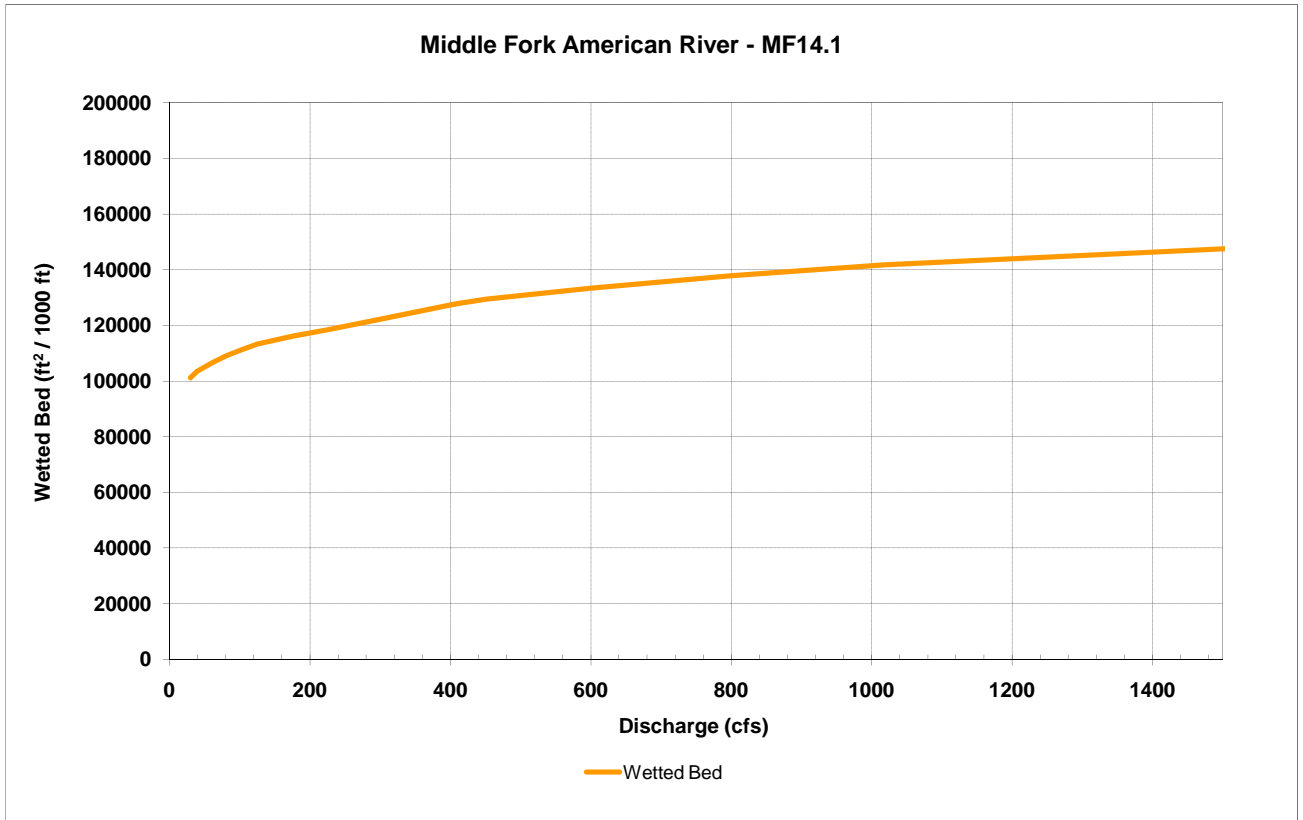


Figure 33. Middle Fork American River - MF14.1 Wetted Bed and Food Production by Flow.



Middle Fork American River MF4.8

Figure 34. Middle Fork American River - MF4.8 Weighted Usable Area (top) and Percent of Maximum Weighted Usable Area (bottom).

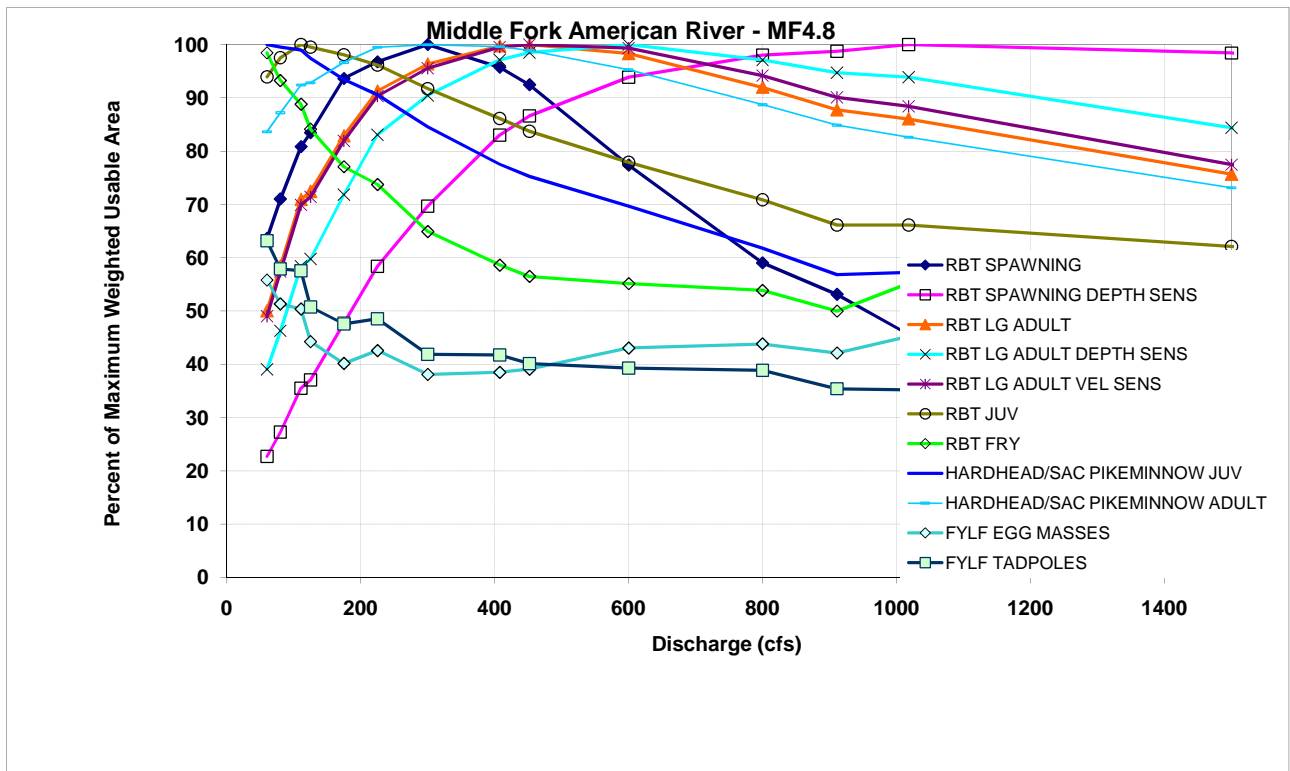
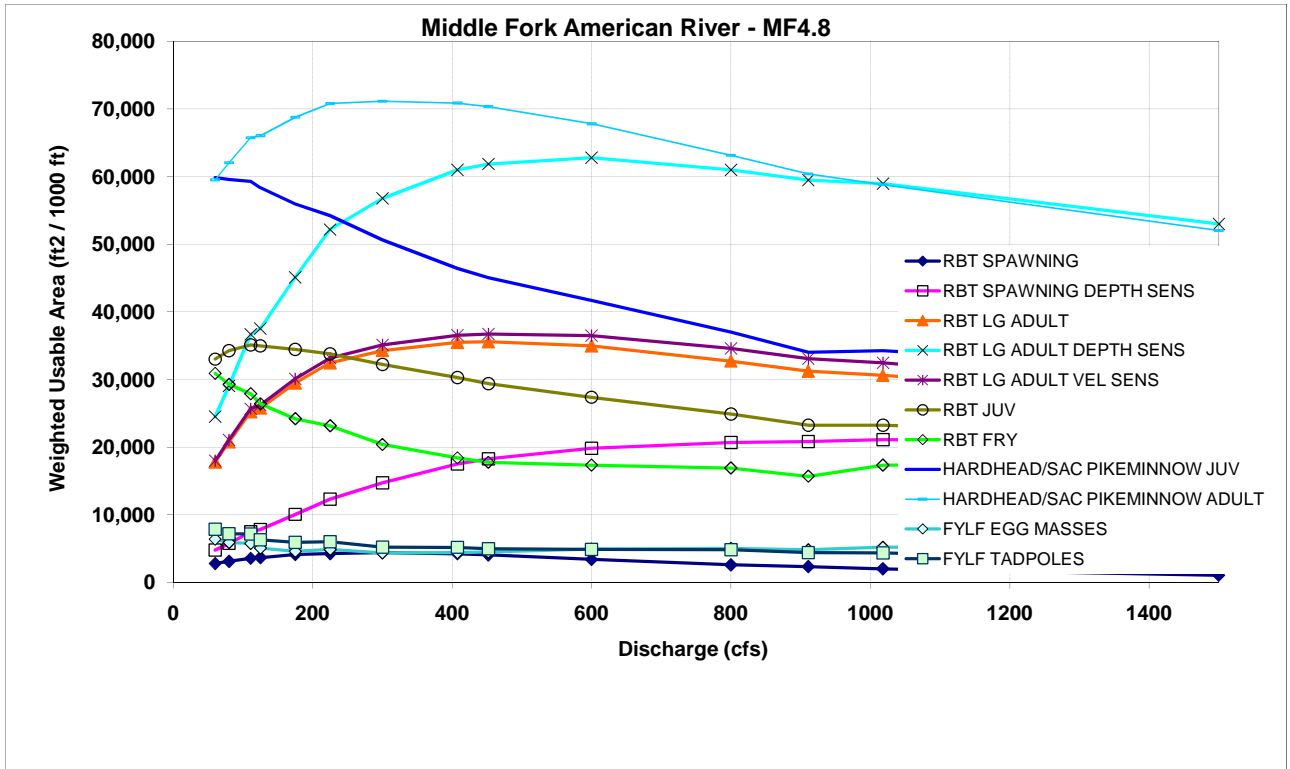


Table 12A. Middle Fork American River - MF4.8 Weighted Usable Area.

| Discharge (cfs) | Weighted Usable Area (ft ² / 1000 ft) | | | | | | | | | | |
|-----------------|--|-------------------------|--------------|-------------------------|-----------------------|---------|---------|-----------------------------|-------------------------------|-----------------|---------------|
| | RBT SPAWNING | RBT SPAWNING DEPTH SENS | RBT LG ADULT | RBT LG ADULT DEPTH SENS | RBT LG ADULT VEL SENS | RBT JUV | RBT FRY | HARDHEAD/SAC PIKEMINNOW JUV | HARDHEAD/SAC PIKEMINNOW ADULT | FYLF EGG MASSES | FYLF TADPOLES |
| 60 | 2805 | 4796 | 17806 | 24517 | 18003 | 33008 | 30902 | 59852 | 59517 | 6413 | 7856 |
| 80 | 3130 | 5758 | 20789 | 29065 | 21083 | 34275 | 29275 | 59576 | 62047 | 5898 | 7200 |
| 111 | 3564 | 7499 | 25242 | 36675 | 25676 | 35128 | 27878 | 59267 | 65752 | 5790 | 7150 |
| 125 | 3678 | 7825 | 25769 | 37538 | 26240 | 34964 | 26403 | 58332 | 66040 | 5088 | 6308 |
| 175 | 4128 | 10063 | 29487 | 45096 | 30086 | 34468 | 24193 | 55944 | 68773 | 4615 | 5915 |
| 225 | 4265 | 12329 | 32467 | 52166 | 33185 | 33788 | 23149 | 54216 | 70796 | 4894 | 6030 |
| 300 | 4409 | 14709 | 34277 | 56795 | 35105 | 32215 | 20383 | 50609 | 71146 | 4380 | 5203 |
| 408 | 4221 | 17522 | 35476 | 61000 | 36554 | 30269 | 18399 | 46400 | 70869 | 4425 | 5191 |
| 452 | 4076 | 18284 | 35568 | 61861 | 36726 | 29408 | 17733 | 45038 | 70352 | 4493 | 4985 |
| 600 | 3411 | 19820 | 34969 | 62789 | 36490 | 27377 | 17313 | 41699 | 67800 | 4951 | 4883 |
| 800 | 2602 | 20688 | 32720 | 61000 | 34598 | 24905 | 16907 | 37005 | 63130 | 5036 | 4831 |
| 911 | 2341 | 20840 | 31218 | 59471 | 33097 | 23226 | 15693 | 34009 | 60391 | 4842 | 4402 |
| 1018 | 2011 | 21107 | 30606 | 58937 | 32480 | 23229 | 17336 | 34275 | 58787 | 5202 | 4380 |
| 1500 | 1067 | 20774 | 26915 | 52986 | 28449 | 21829 | 17984 | 31333 | 52028 | 5145 | 3202 |
| 2000 | 658 | 18998 | 24598 | 47813 | 25851 | 20441 | 17375 | 29805 | 48099 | 4029 | 3211 |
| 2500 | 764 | 16998 | 23048 | 43996 | 24161 | 20043 | 17634 | 29864 | 45787 | 3309 | 2892 |
| 3000 | 1247 | 15624 | 21906 | 41670 | 22892 | 20585 | 22834 | 30718 | 44507 | 5549 | 10552 |
| 4000 | 1784 | 13611 | 22322 | 40493 | 23224 | 26087 | 31390 | 37368 | 44300 | 11492 | 12429 |
| 6000 | 3937 | 14001 | 31592 | 49974 | 33004 | 32592 | 20885 | 33528 | 44149 | 2076 | 3030 |

Table 12B. Middle Fork American River - MF4.8 Percent of Maximum Weighted Usable Area.

| Discharge (cfs) | Percent of Maximum Weighted Usable Area | | | | | | | | | | |
|-----------------|---|-------------------------|--------------|-------------------------|-----------------------|---------|---------|-----------------------------|-------------------------------|-----------------|---------------|
| | RBT SPAWNING | RBT SPAWNING DEPTH SENS | RBT LG ADULT | RBT LG ADULT DEPTH SENS | RBT LG ADULT VEL SENS | RBT JUV | RBT FRY | HARDHEAD/SAC PIKEMINNOW JUV | HARDHEAD/SAC PIKEMINNOW ADULT | FYLF EGG MASSES | FYLF TADPOLES |
| 60 | 64 | 23 | 50 | 39 | 49 | 94 | 98 | 100 | 84 | 56 | 63 |
| 80 | 71 | 27 | 58 | 46 | 57 | 98 | 93 | 100 | 87 | 51 | 58 |
| 111 | 81 | 36 | 71 | 58 | 70 | 100 | 89 | 99 | 92 | 50 | 58 |
| 125 | 83 | 37 | 72 | 60 | 71 | 100 | 84 | 97 | 93 | 44 | 51 |
| 175 | 94 | 48 | 83 | 72 | 82 | 98 | 77 | 93 | 97 | 40 | 48 |
| 225 | 97 | 58 | 91 | 83 | 90 | 96 | 74 | 91 | 100 | 43 | 49 |
| 300 | 100 | 70 | 96 | 90 | 96 | 92 | 65 | 85 | 100 | 38 | 42 |
| 407.6 | 96 | 83 | 100 | 97 | 100 | 86 | 59 | 78 | 100 | 39 | 42 |
| 452 | 92 | 87 | 100 | 99 | 100 | 84 | 56 | 75 | 99 | 39 | 40 |
| 600 | 77 | 94 | 98 | 100 | 99 | 78 | 55 | 70 | 95 | 43 | 39 |
| 800 | 59 | 98 | 92 | 97 | 94 | 71 | 54 | 62 | 89 | 44 | 39 |
| 911 | 53 | 99 | 88 | 95 | 90 | 66 | 50 | 57 | 85 | 42 | 35 |
| 1018 | 46 | 100 | 86 | 94 | 88 | 66 | 55 | 57 | 83 | 45 | 35 |
| 1500 | 24 | 98 | 76 | 84 | 77 | 62 | 57 | 52 | 73 | 45 | 26 |
| 2000 | 15 | 90 | 69 | 76 | 70 | 58 | 55 | 50 | 68 | 35 | 26 |
| 2500 | 17 | 81 | 65 | 70 | 66 | 57 | 56 | 50 | 64 | 29 | 23 |
| 3000 | 28 | 74 | 62 | 66 | 62 | 59 | 73 | 51 | 63 | 48 | 85 |
| 4000 | 40 | 64 | 63 | 64 | 63 | 74 | 100 | 62 | 62 | 100 | 100 |
| 6000 | 89 | 66 | 89 | 80 | 90 | 93 | 67 | 56 | 62 | 18 | 24 |

Figure 35. Middle Fork American River - MF4.8 Spatial Niche Area by Individual Niche (top) and by Cumulative Area (bottom).

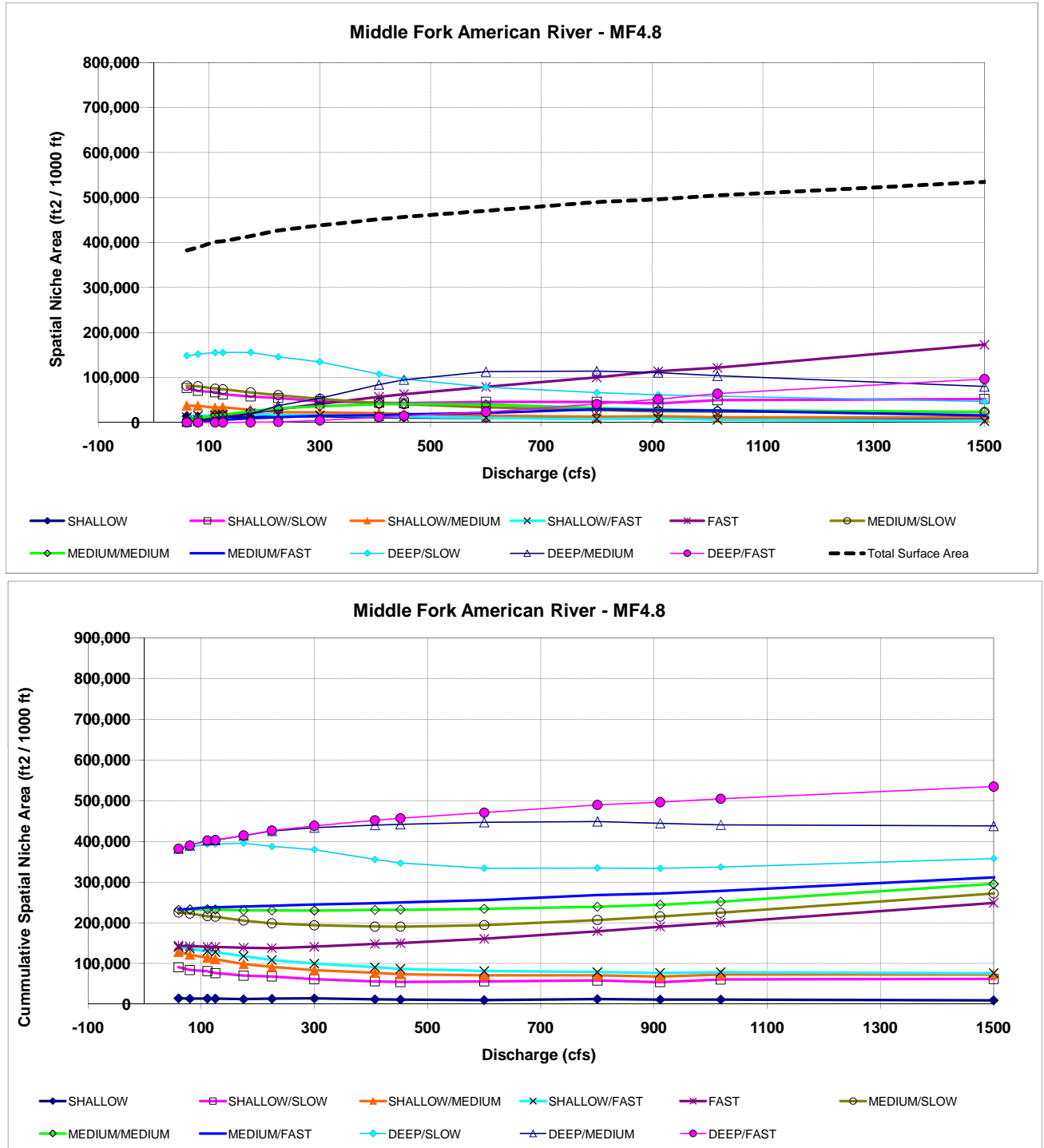
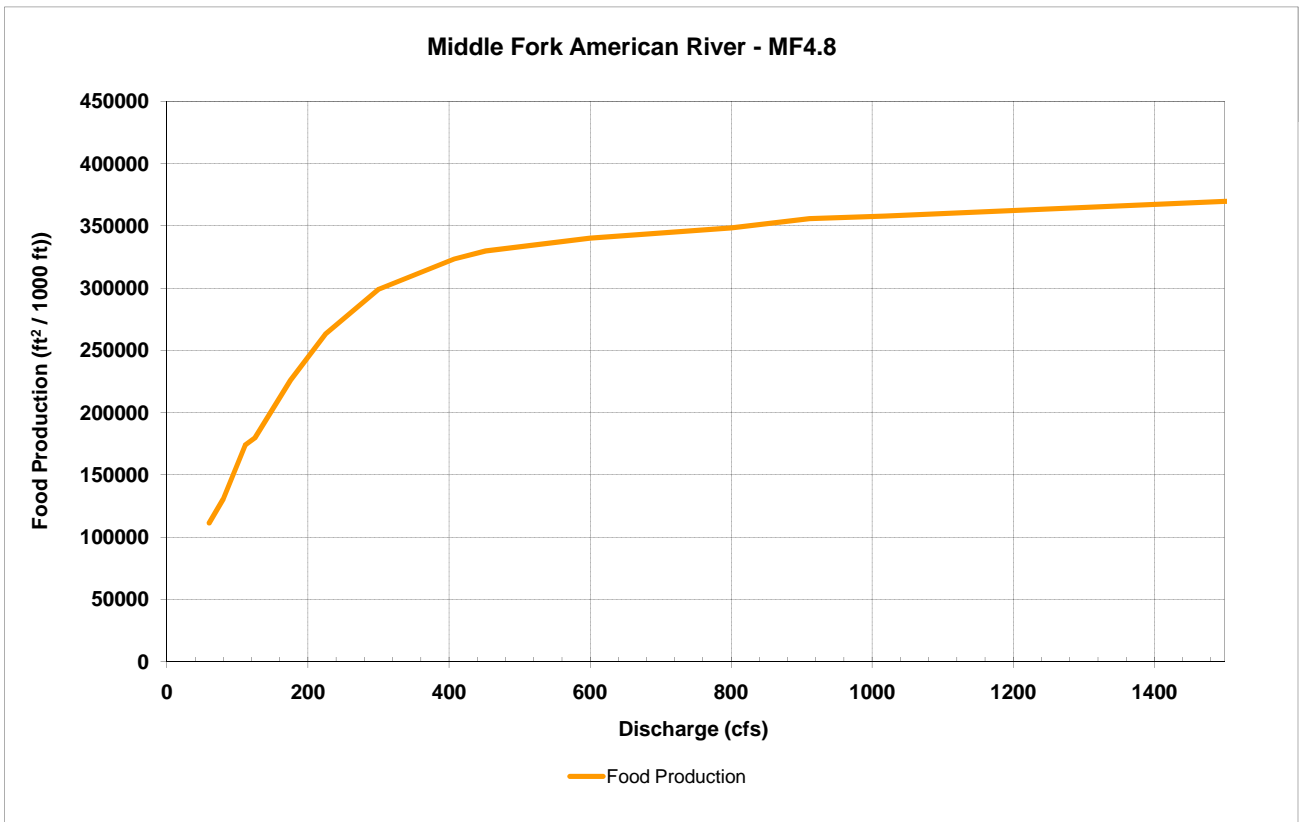
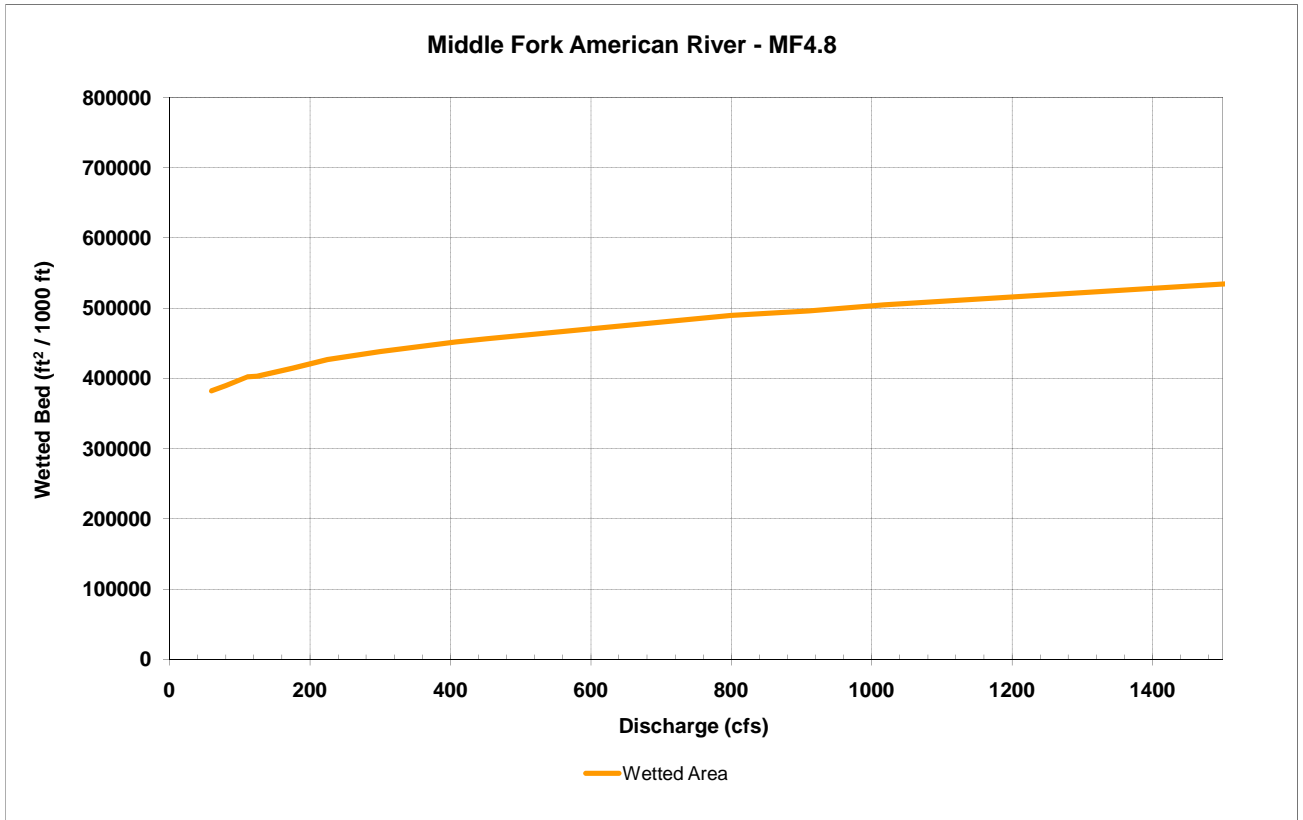


Figure 36. Middle Fork American River - MF4.8 Wetted Bed and Food Production by Flow.



EFFECTIVE HABITAT ANALYSES

Middle Fork American River at Fords Bar MF14.1
Effective Habitat Matrices

Figure 37. Middle Fork American River MF14.1 Effective Rainbow Trout Spawning Habitat Matrix.

| Starting Discharge (cfs) | Ending Discharge (cfs) | | | | | | | | | | | | | | | | | Initial Habitat vs Flow Relationship |
|--------------------------|------------------------|------|------|------|------|------|------|------|------|-------|-------|------|------|------|------|------|------|--------------------------------------|
| | 2500 | 2000 | 1500 | 1018 | 800 | 600 | 452 | 407 | 300 | 225 | 175 | 125 | 101 | 80 | 60 | 40 | 30 | |
| 2500 cfs | 1227 | 852 | 564 | 283 | 163 | 67 | 20 | 12 | 4 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1227 |
| 2000 cfs | | 1499 | 1134 | 672 | 458 | 221 | 89 | 58 | 15 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1499 |
| 1500 cfs | | | 2111 | 1505 | 1121 | 644 | 396 | 322 | 187 | 135 | 95 | 48 | 35 | 25 | 15 | 7 | 4 | 2111 |
| 1018 cfs | | | | 3563 | 2990 | 2296 | 1893 | 1745 | 1438 | 1243 | 1067 | 876 | 792 | 694 | 559 | 410 | 321 | 3563 |
| 800 cfs | | | | | 4632 | 3857 | 3390 | 3208 | 2775 | 2466 | 2193 | 1876 | 1724 | 1535 | 1245 | 947 | 774 | 4632 |
| 600 cfs | | | | | | 6242 | 5725 | 5519 | 4966 | 4506 | 4112 | 3591 | 3322 | 2957 | 2427 | 1916 | 1595 | 6242 |
| 452 cfs | | | | | | | 7839 | 7600 | 6948 | 6412 | 5930 | 5229 | 4844 | 4331 | 3610 | 2891 | 2424 | 7839 |
| 407.6 cfs | | | | | | | | 8453 | 7771 | 7209 | 6697 | 5936 | 5513 | 4948 | 4145 | 3337 | 2809 | 8453 |
| 300 cfs | | | | | | | | | 9708 | 9104 | 8518 | 7635 | 7141 | 6462 | 5459 | 4427 | 3749 | 9708 |
| 225 cfs | | | | | | | | | | 10057 | 9415 | 8468 | 7940 | 7201 | 6100 | 4974 | 4215 | 10057 |
| 175 cfs | | | | | | | | | | | 10186 | 9195 | 8630 | 7841 | 6667 | 5456 | 4628 | 10186 |
| 125 cfs | | | | | | | | | | | | 9883 | 9283 | 8452 | 7210 | 5904 | 4992 | 9883 |
| 101.3 cfs | | | | | | | | | | | | | 9660 | 8764 | 7455 | 6096 | 5140 | 9660 |
| 80 cfs | | | | | | | | | | | | | | 9006 | 7649 | 6235 | 5235 | 9006 |
| 60 cfs | | | | | | | | | | | | | | | 7826 | 6334 | 5293 | 7826 |
| 40 cfs | | | | | | | | | | | | | | | | 6431 | 5346 | 6431 |
| 30 cfs | | | | | | | | | | | | | | | | | 5367 | 5367 |

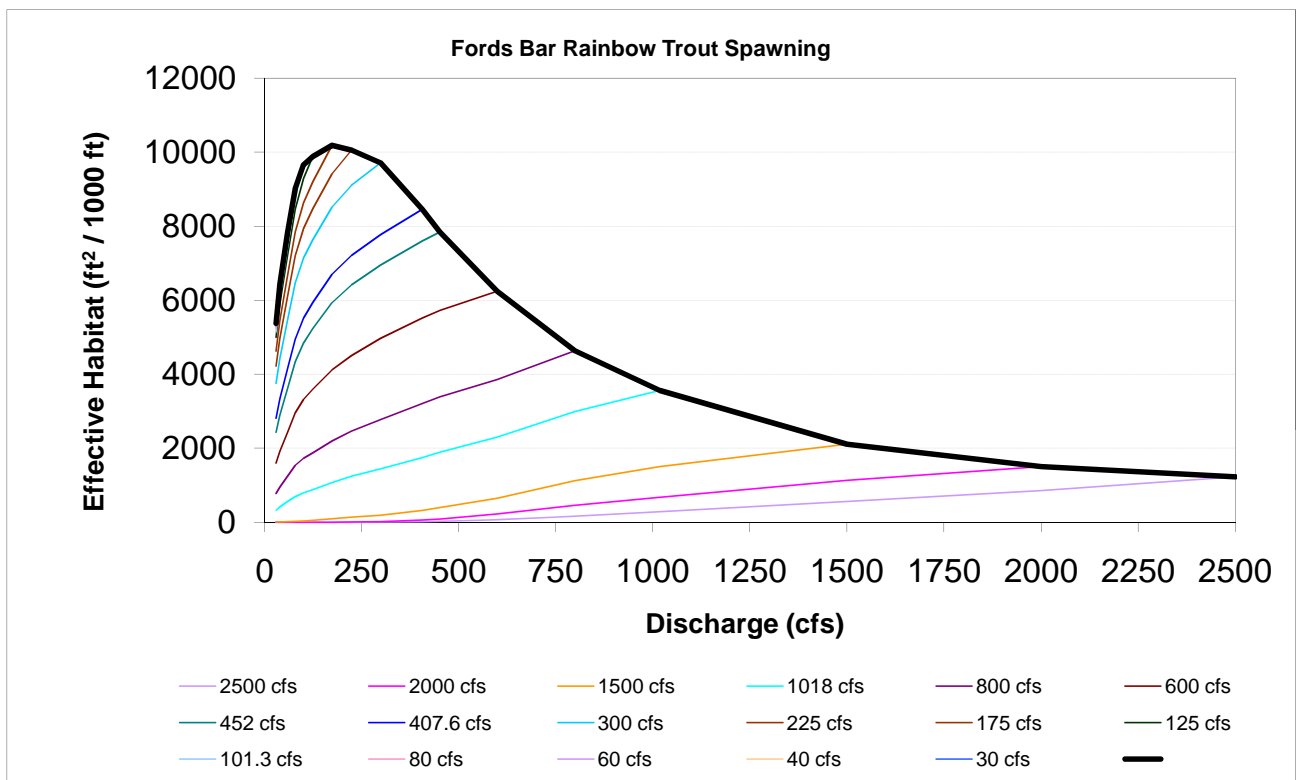


Figure 38. Middle Fork American River MF14.1 Effective Rainbow Trout Incubation Habitat Matrix.

| Starting Discharge (cfs) | Ending Discharge (cfs) | | | | | | | | | | | | | | | | | Initial Habitat vs Flow Relationship |
|--------------------------|------------------------|------|------|------|------|------|------|------|------|-------|-------|------|------|------|------|------|------|--------------------------------------|
| | 2500 | 2000 | 1500 | 1018 | 800 | 600 | 452 | 407 | 300 | 225 | 175 | 125 | 101 | 80 | 60 | 40 | 30 | |
| 2500 cfs | 1227 | 1014 | 712 | 387 | 217 | 81 | 20 | 13 | 7 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1227 |
| 2000 cfs | | 1499 | 1329 | 918 | 615 | 303 | 109 | 64 | 19 | 4 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 1499 |
| 1500 cfs | | | 2111 | 1813 | 1465 | 906 | 509 | 392 | 212 | 133 | 83 | 45 | 30 | 22 | 12 | 6 | 3 | 2111 |
| 1018 cfs | | | | 3563 | 3417 | 2783 | 2220 | 2030 | 1617 | 1373 | 1148 | 924 | 844 | 747 | 597 | 460 | 354 | 3563 |
| 800 cfs | | | | | 4632 | 4318 | 3782 | 3579 | 3090 | 2757 | 2425 | 2064 | 1932 | 1758 | 1468 | 1178 | 950 | 4632 |
| 600 cfs | | | | | | 6242 | 6031 | 5880 | 5389 | 5004 | 4580 | 4091 | 3895 | 3621 | 3145 | 2629 | 2206 | 6242 |
| 452 cfs | | | | | | | 7839 | 7778 | 7428 | 7016 | 6558 | 6015 | 5788 | 5456 | 4865 | 4172 | 3587 | 7839 |
| 407.6 cfs | | | | | | | | 8453 | 8200 | 7820 | 7370 | 6823 | 6586 | 6232 | 5612 | 4863 | 4223 | 8453 |
| 300 cfs | | | | | | | | | 9708 | 9494 | 9205 | 8713 | 8464 | 8076 | 7406 | 6561 | 5826 | 9708 |
| 225 cfs | | | | | | | | | | 10057 | 9849 | 9523 | 9293 | 8916 | 8271 | 7411 | 6647 | 10057 |
| 175 cfs | | | | | | | | | | | 10186 | 9946 | 9780 | 9471 | 8907 | 8083 | 7328 | 10186 |
| 125 cfs | | | | | | | | | | | | 9883 | 9752 | 9580 | 9201 | 8526 | 7842 | 9883 |
| 101.3 cfs | | | | | | | | | | | | | 9660 | 9484 | 9198 | 8641 | 8015 | 9660 |
| 80 cfs | | | | | | | | | | | | | | 9006 | 8744 | 8365 | 7882 | 9006 |
| 60 cfs | | | | | | | | | | | | | | | 7826 | 7519 | 7214 | 7826 |
| 40 cfs | | | | | | | | | | | | | | | | 6431 | 6144 | 6431 |
| 30 cfs | | | | | | | | | | | | | | | | | 5367 | 5367 |

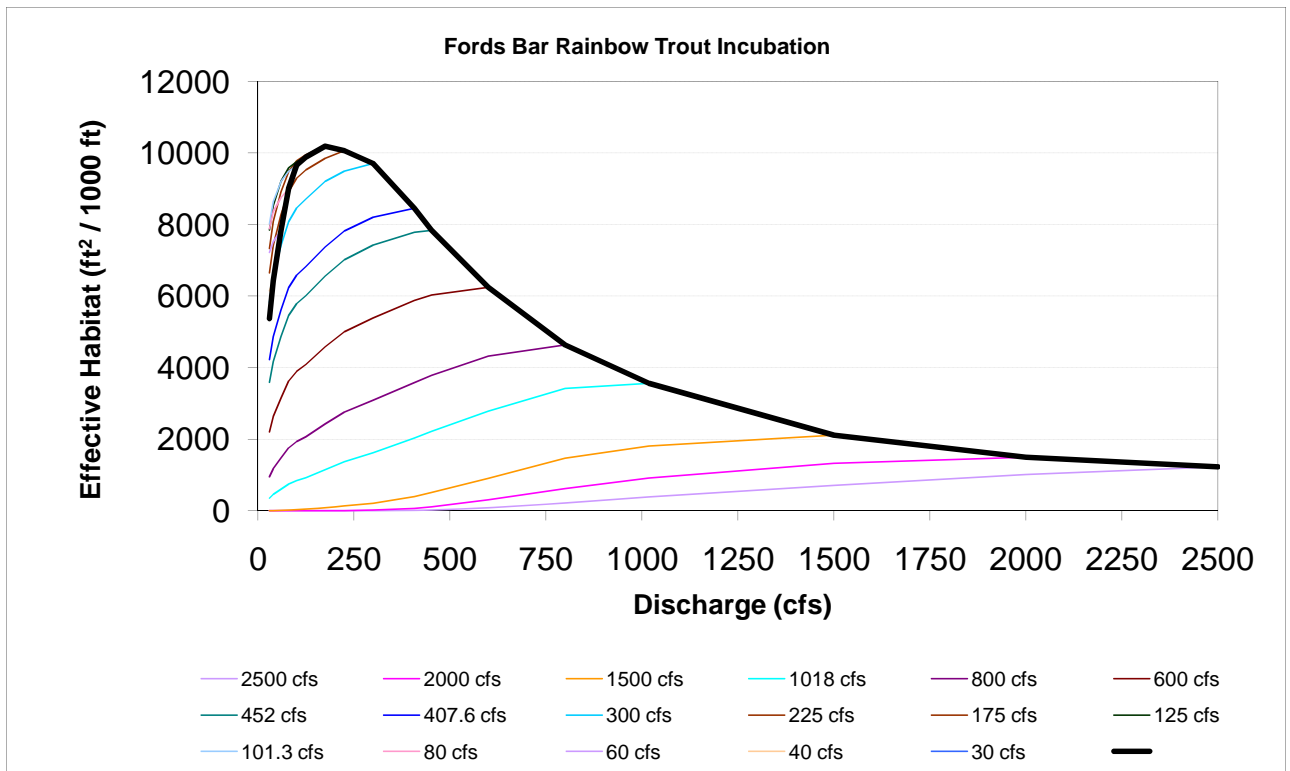


Figure 39. Middle Fork American River MF14.1 Effective Rainbow Trout Depth Sensitivity Spawning Habitat Matrix.

| Starting Discharge (cfs) | Ending Discharge (cfs) | | | | | | | | | | | | | | | | | Initial Habitat vs Flow Relationship |
|--------------------------|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|--------------------------------------|
| | 2500 | 2000 | 1500 | 1018 | 800 | 600 | 452 | 407 | 300 | 225 | 175 | 125 | 101 | 80 | 60 | 40 | 30 | |
| 2500 cfs | 8801 | 8024 | 7446 | 6609 | 5950 | 5198 | 4789 | 4569 | 3909 | 3489 | 3033 | 2538 | 2370 | 2137 | 1749 | 1417 | 1196 | 8801 |
| 2000 cfs | | 10776 | 10115 | 9149 | 8387 | 7443 | 6908 | 6635 | 5751 | 5137 | 4503 | 3770 | 3508 | 3150 | 2557 | 2059 | 1736 | 10776 |
| 1500 cfs | | | 13332 | 12250 | 11356 | 10236 | 9599 | 9255 | 8106 | 7269 | 6413 | 5419 | 5038 | 4509 | 3672 | 2972 | 2522 | 13332 |
| 1018 cfs | | | | 16318 | 15248 | 13951 | 13193 | 12781 | 11375 | 10278 | 9166 | 7792 | 7218 | 6475 | 5361 | 4334 | 3651 | 16318 |
| 800 cfs | | | | | 17392 | 15972 | 15168 | 14730 | 13228 | 11981 | 10764 | 9235 | 8561 | 7682 | 6357 | 5099 | 4264 | 17392 |
| 600 cfs | | | | | | 18030 | 17171 | 16700 | 15127 | 13799 | 12507 | 10822 | 10036 | 8977 | 7373 | 5857 | 4844 | 18030 |
| 452 cfs | | | | | | | 18720 | 18155 | 16513 | 15141 | 13797 | 12003 | 11146 | 9967 | 8170 | 6436 | 5303 | 18720 |
| 407.6 cfs | | | | | | | | 18681 | 17014 | 15613 | 14251 | 12424 | 11546 | 10340 | 8479 | 6668 | 5488 | 18681 |
| 300 cfs | | | | | | | | | 18036 | 16584 | 15186 | 13292 | 12370 | 11110 | 9137 | 7168 | 5893 | 18036 |
| 225 cfs | | | | | | | | | | 17077 | 15575 | 13618 | 12672 | 11391 | 9378 | 7365 | 6047 | 17077 |
| 175 cfs | | | | | | | | | | | 15890 | 13908 | 12945 | 11649 | 9611 | 7570 | 6227 | 15890 |
| 125 cfs | | | | | | | | | | | | 14151 | 13173 | 11868 | 9814 | 7748 | 6378 | 14151 |
| 101.3 cfs | | | | | | | | | | | | | 13396 | 12010 | 9921 | 7839 | 6454 | 13396 |
| 80 cfs | | | | | | | | | | | | | | 12113 | 10003 | 7903 | 6499 | 12113 |
| 60 cfs | | | | | | | | | | | | | | | 10104 | 7959 | 6535 | 10104 |
| 40 cfs | | | | | | | | | | | | | | | | 8039 | 6581 | 8039 |
| 30 cfs | | | | | | | | | | | | | | | | | 6597 | 6597 |

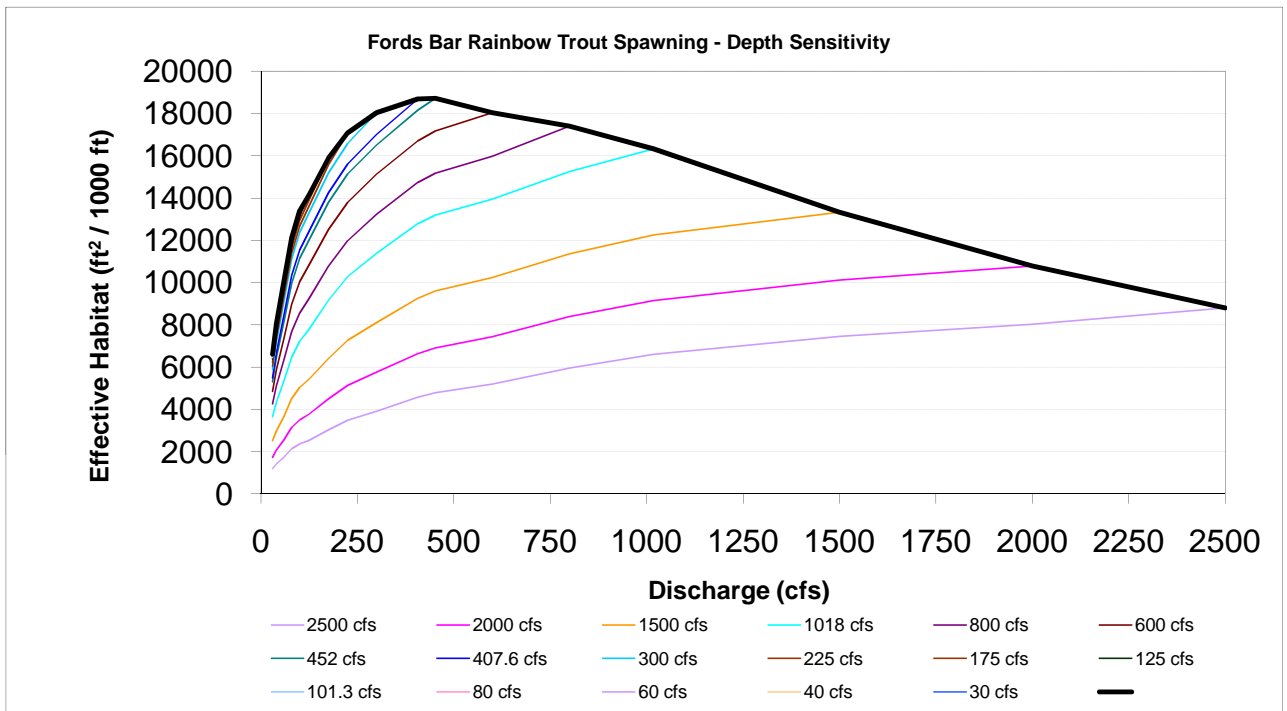


Figure 40. Middle Fork American River MF14.1 Effective Rainbow Trout Spawning Depth Sensitivity Incubation Habitat Matrix.

| Starting Discharge (cfs) | Ending Discharge (cfs) | | | | | | | | | | | | | | | | Initial Habitat vs Flow Relationship | |
|--------------------------|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------------------------------------|-------|
| | 2500 | 2000 | 1500 | 1018 | 800 | 600 | 452 | 407 | 300 | 225 | 175 | 125 | 101 | 80 | 60 | 40 | | 30 |
| 2500 cfs | 8801 | 8542 | 8157 | 7658 | 7253 | 6761 | 6425 | 6269 | 5304 | 4663 | 4168 | 3572 | 3367 | 3055 | 2476 | 1884 | 1307 | 8801 |
| 2000 cfs | | 10776 | 10550 | 10048 | 9579 | 9003 | 8589 | 8415 | 7415 | 6708 | 6138 | 5496 | 5217 | 4796 | 3966 | 3099 | 2284 | 10776 |
| 1500 cfs | | | 13332 | 12945 | 12467 | 11757 | 11271 | 11062 | 10025 | 9275 | 8638 | 7933 | 7605 | 7092 | 6100 | 4972 | 3830 | 13332 |
| 1018 cfs | | | | 16318 | 16055 | 15307 | 14718 | 14475 | 13432 | 12652 | 11934 | 11134 | 10732 | 10131 | 8984 | 7608 | 6158 | 16318 |
| 800 cfs | | | | | 17392 | 16980 | 16429 | 16190 | 15226 | 14486 | 13782 | 12928 | 12480 | 11832 | 10615 | 9116 | 7540 | 17392 |
| 600 cfs | | | | | | 18030 | 17772 | 17594 | 16782 | 16103 | 15424 | 14593 | 14144 | 13503 | 12261 | 10670 | 9003 | 18030 |
| 452 cfs | | | | | | | 18720 | 18588 | 18000 | 17374 | 16731 | 15865 | 15396 | 14748 | 13498 | 11841 | 10089 | 18720 |
| 407.6 cfs | | | | | | | | 18681 | 18194 | 17631 | 17014 | 16198 | 15755 | 15109 | 13867 | 12229 | 10480 | 18681 |
| 300 cfs | | | | | | | | | 18036 | 17642 | 17249 | 16564 | 16165 | 15546 | 14401 | 12855 | 11183 | 18036 |
| 225 cfs | | | | | | | | | | 17077 | 16696 | 16189 | 15823 | 15270 | 14289 | 12889 | 11350 | 17077 |
| 175 cfs | | | | | | | | | | | 15890 | 15432 | 15172 | 14744 | 13933 | 12698 | 11324 | 15890 |
| 125 cfs | | | | | | | | | | | | 14151 | 13829 | 13576 | 13019 | 12059 | 10930 | 14151 |
| 101.3 cfs | | | | | | | | | | | | | 13396 | 12989 | 12541 | 11732 | 10722 | 13396 |
| 80 cfs | | | | | | | | | | | | | | 12113 | 11540 | 10946 | 10139 | 12113 |
| 60 cfs | | | | | | | | | | | | | | | 10104 | 9436 | 8891 | 10104 |
| 40 cfs | | | | | | | | | | | | | | | | 8039 | 7290 | 8039 |
| 30 cfs | | | | | | | | | | | | | | | | | 6597 | 6597 |

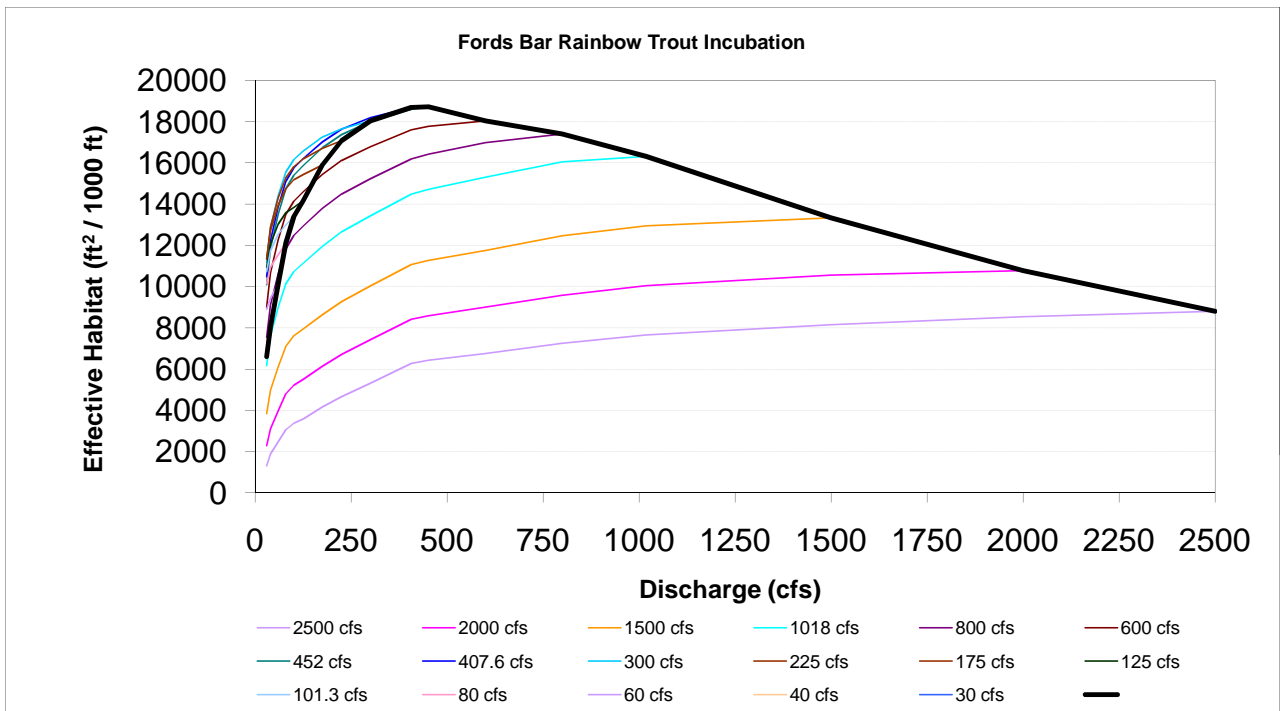


Figure 41. Middle Fork American River MF14.1 Effective FYLF Egg Mass Habitat Matrix.

| Starting Discharge (cfs) | Ending Discharge (cfs) | | | | | | | | | | | | | | | | Initial Habitat vs Flow Relationship | |
|--------------------------|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|--------------------------------------|-------|
| | 2500 | 2000 | 1500 | 1018 | 800 | 600 | 452 | 407 | 300 | 225 | 175 | 125 | 101 | 80 | 60 | 40 | | 30 |
| 2500 cfs | 668 | 399 | 239 | 74 | 33 | 25 | 20 | 15 | 11 | 7 | 6 | 3 | 2 | 1 | 1 | 1 | 1 | 668 |
| 2000 cfs | | 985 | 601 | 265 | 101 | 48 | 35 | 30 | 22 | 15 | 13 | 8 | 6 | 5 | 3 | 2 | 2 | 985 |
| 1500 cfs | | | 1418 | 655 | 331 | 173 | 96 | 84 | 72 | 41 | 37 | 26 | 24 | 21 | 18 | 13 | 12 | 1418 |
| 1018 cfs | | | | 2451 | 1254 | 690 | 430 | 351 | 200 | 122 | 99 | 74 | 70 | 63 | 53 | 42 | 40 | 2451 |
| 800 cfs | | | | | 2857 | 1457 | 914 | 757 | 490 | 347 | 238 | 160 | 136 | 117 | 97 | 82 | 77 | 2857 |
| 600 cfs | | | | | | 3627 | 2193 | 1791 | 1226 | 959 | 771 | 494 | 381 | 281 | 204 | 150 | 139 | 3627 |
| 452 cfs | | | | | | | 4300 | 3429 | 2238 | 1781 | 1483 | 1003 | 790 | 619 | 481 | 335 | 259 | 4300 |
| 407.6 cfs | | | | | | | | 4820 | 2977 | 2357 | 1930 | 1323 | 1069 | 872 | 712 | 523 | 402 | 4820 |
| 300 cfs | | | | | | | | | 5759 | 4289 | 3395 | 2429 | 2031 | 1752 | 1506 | 1191 | 1008 | 5759 |
| 225 cfs | | | | | | | | | | 6339 | 4996 | 3626 | 3083 | 2688 | 2343 | 1899 | 1630 | 6339 |
| 175 cfs | | | | | | | | | | | 7491 | 5638 | 4864 | 4297 | 3823 | 3243 | 2884 | 7491 |
| 125 cfs | | | | | | | | | | | | 9021 | 7662 | 6878 | 6157 | 5357 | 4871 | 9021 |
| 101.3 cfs | | | | | | | | | | | | | 9970 | 8923 | 7931 | 6984 | 6395 | 9970 |
| 80 cfs | | | | | | | | | | | | | | 11687 | 10256 | 9016 | 8291 | 11687 |
| 60 cfs | | | | | | | | | | | | | | | 14472 | 12565 | 11548 | 14472 |
| 40 cfs | | | | | | | | | | | | | | | | 16476 | 15066 | 16476 |
| 30 cfs | | | | | | | | | | | | | | | | | 17926 | 17926 |

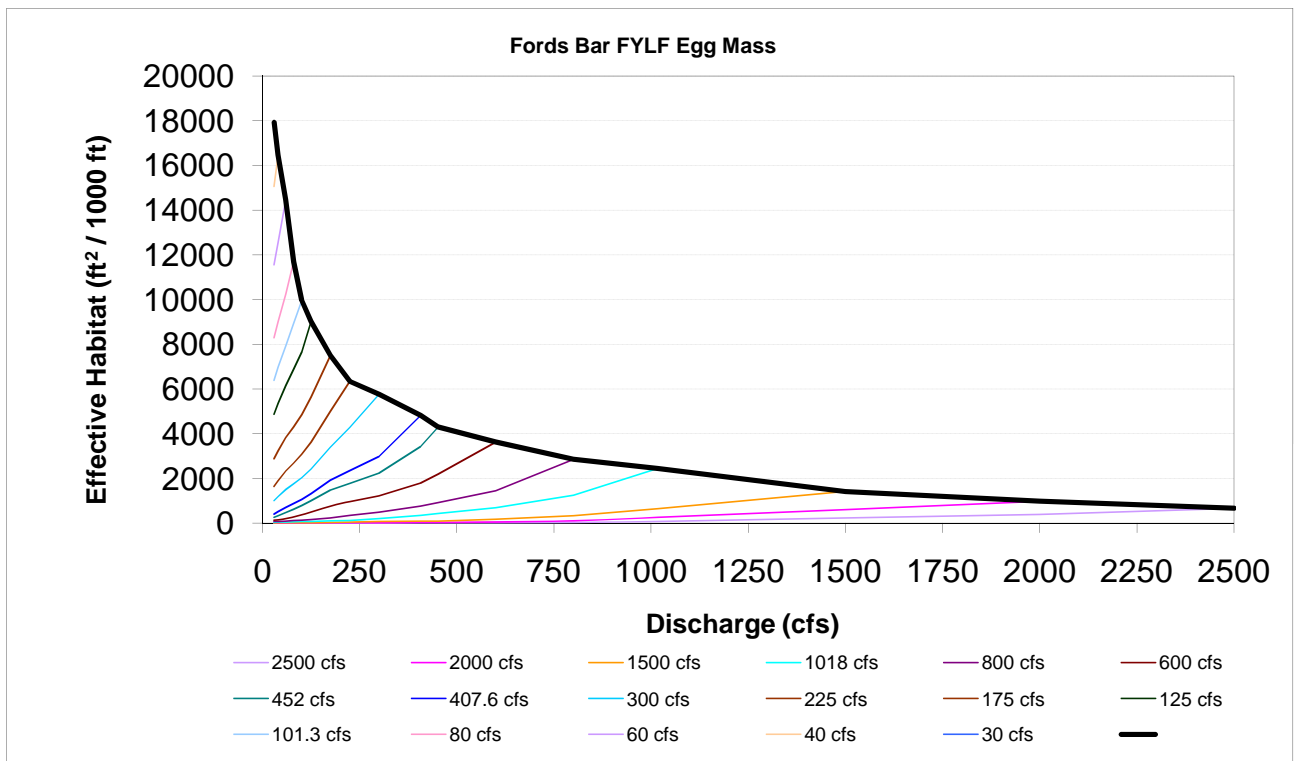


Figure 42. Middle Fork American River MF14.1 Effective FYLF Tadpole Habitat Matrix.

| Starting Discharge (cfs) | Ending Discharge (cfs) | | | | | | | | | | | | | | | | | Initial Habitat vs Flow Relationship |
|--------------------------|------------------------|------|------|------|------|------|------|------|------|------|------|-------|------|-------|-------|-------|-------|--------------------------------------|
| | 2500 | 2000 | 1500 | 1018 | 800 | 600 | 452 | 407 | 300 | 225 | 175 | 125 | 101 | 80 | 60 | 40 | 30 | |
| 2500 cfs | 1264 | 626 | 263 | 116 | 102 | 87 | 52 | 49 | 18 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1264 |
| 2000 cfs | | 1512 | 724 | 274 | 148 | 118 | 77 | 70 | 30 | 11 | 9 | 5 | 4 | 3 | 1 | 1 | 1 | 1512 |
| 1500 cfs | | | 1858 | 801 | 412 | 189 | 132 | 121 | 71 | 39 | 33 | 25 | 21 | 18 | 15 | 7 | 6 | 1858 |
| 1018 cfs | | | | 3125 | 1665 | 872 | 468 | 356 | 190 | 125 | 111 | 93 | 86 | 79 | 73 | 59 | 55 | 3125 |
| 800 cfs | | | | | 3437 | 1718 | 1023 | 818 | 440 | 232 | 195 | 163 | 152 | 138 | 128 | 111 | 104 | 3437 |
| 600 cfs | | | | | | 4379 | 2483 | 1986 | 1179 | 793 | 578 | 333 | 282 | 236 | 217 | 186 | 177 | 4379 |
| 452 cfs | | | | | | | 5153 | 3861 | 2209 | 1623 | 1278 | 888 | 639 | 450 | 355 | 285 | 270 | 5153 |
| 407.6 cfs | | | | | | | | 5589 | 3005 | 2254 | 1820 | 1338 | 1006 | 752 | 576 | 423 | 381 | 5589 |
| 300 cfs | | | | | | | | | 6639 | 4732 | 3849 | 2918 | 2333 | 1906 | 1558 | 1157 | 884 | 6639 |
| 225 cfs | | | | | | | | | | 7682 | 6072 | 4617 | 3807 | 3263 | 2763 | 2188 | 1784 | 7682 |
| 175 cfs | | | | | | | | | | | 8780 | 6591 | 5495 | 4773 | 4159 | 3420 | 2902 | 8780 |
| 125 cfs | | | | | | | | | | | | 10222 | 8454 | 7379 | 6467 | 5457 | 4797 | 10222 |
| 101.3 cfs | | | | | | | | | | | | | | 10972 | 9580 | 8248 | 6984 | 10972 |
| 80 cfs | | | | | | | | | | | | | | | 12423 | 10529 | 8885 | 12423 |
| 60 cfs | | | | | | | | | | | | | | | | 14520 | 12157 | 14520 |
| 40 cfs | | | | | | | | | | | | | | | | | 16857 | 16857 |
| 30 cfs | | | | | | | | | | | | | | | | | | 18640 |

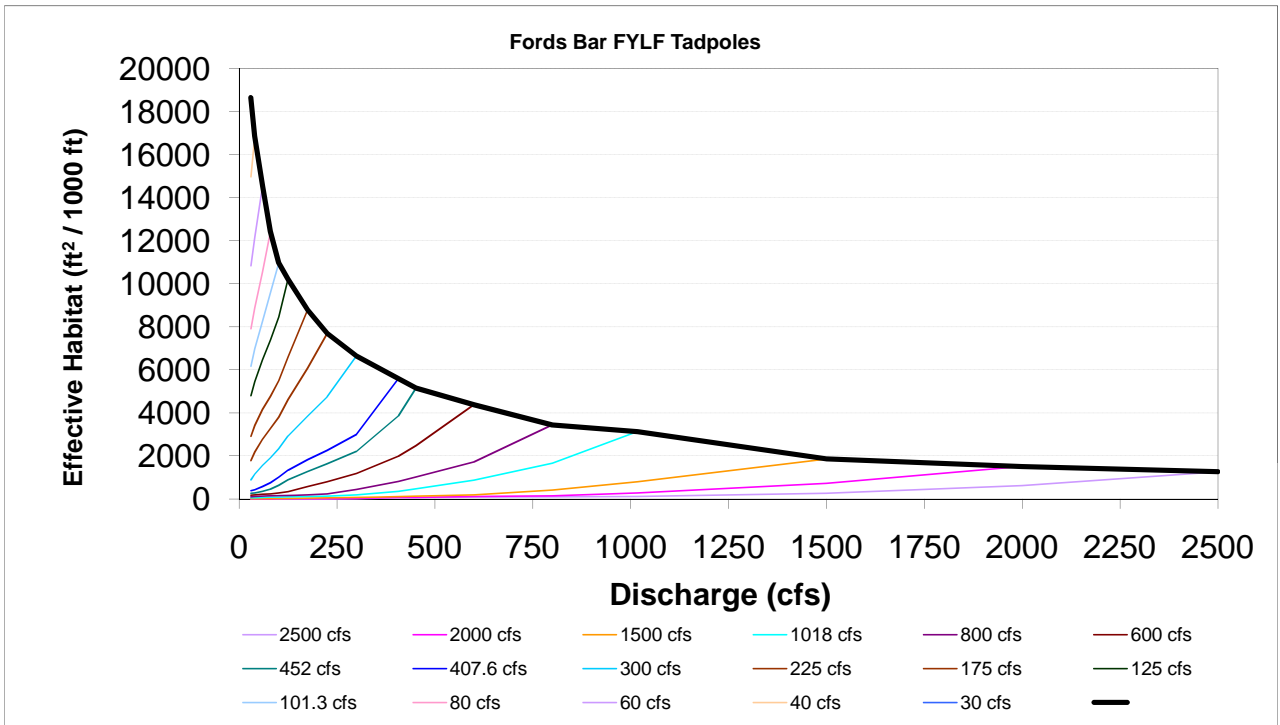
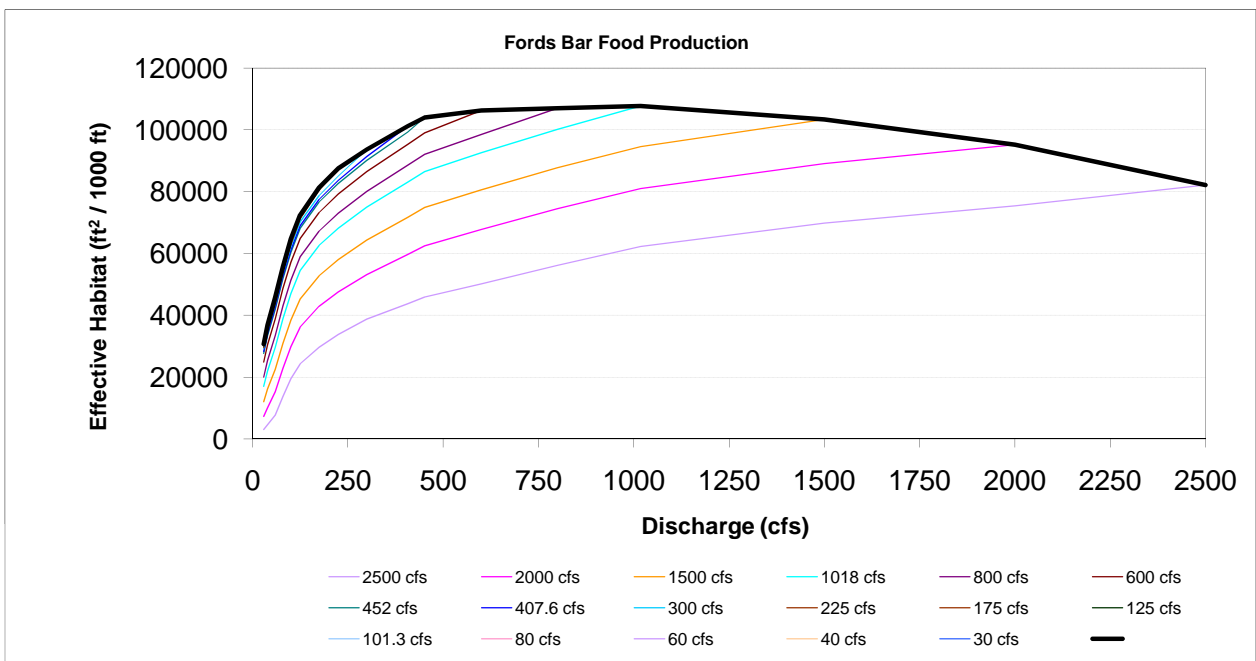


Figure 43. Middle Fork American River MF14.1 Effective Food Production Habitat Matrix.

| Starting Discharge (cfs) | Ending Discharge (cfs) | | | | | | | | | | | | | | | | Initial Habitat vs Flow Relationship | |
|--------------------------|------------------------|-------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|--------------------------------------|--------|
| | 2500 | 2000 | 1500 | 1018 | 800 | 600 | 452 | 407 | 300 | 225 | 175 | 125 | 101 | 80 | 60 | 40 | | 30 |
| 2500 cfs | 82078 | 75359 | 69776 | 62262 | 56087 | 50125 | 45857 | 43702 | 38740 | 33765 | 29679 | 24269 | 19538 | 13730 | 7722 | 4545 | 2991 | 82078 |
| 2000 cfs | | 95204 | 89029 | 80958 | 74435 | 67745 | 62485 | 59653 | 53125 | 47537 | 42921 | 36110 | 29840 | 22754 | 15214 | 10075 | 7229 | 95204 |
| 1500 cfs | | | 103390 | 94561 | 87679 | 80521 | 74838 | 71687 | 64269 | 57964 | 52757 | 45277 | 38412 | 30878 | 22524 | 16130 | 12019 | 103390 |
| 1018 cfs | | | | 107696 | 100096 | 92600 | 86482 | 83084 | 74980 | 68155 | 62509 | 54447 | 47017 | 38860 | 29565 | 21977 | 17005 | 107696 |
| 800 cfs | | | | | 107013 | 98431 | 92093 | 88533 | 80072 | 73036 | 67171 | 58926 | 51346 | 43003 | 33328 | 25361 | 19976 | 107013 |
| 600 cfs | | | | | | 106258 | 99025 | 95302 | 86446 | 79204 | 73224 | 64848 | 57162 | 48698 | 38772 | 30516 | 24884 | 106258 |
| 452 cfs | | | | | | | 103990 | 99247 | 90064 | 82633 | 76597 | 68134 | 60383 | 51856 | 41834 | 33422 | 27649 | 103990 |
| 407.6 cfs | | | | | | | | 101210 | 91371 | 83587 | 77487 | 68985 | 61160 | 52619 | 42553 | 34120 | 28320 | 101210 |
| 300 cfs | | | | | | | | | 93632 | 85023 | 78704 | 70164 | 62286 | 53696 | 43567 | 35103 | 29276 | 93632 |
| 225 cfs | | | | | | | | | | 87534 | 80338 | 71248 | 62925 | 54098 | 43804 | 35334 | 29500 | 87534 |
| 175 cfs | | | | | | | | | | | 81336 | 71735 | 63317 | 54467 | 44130 | 35655 | 29817 | 81336 |
| 125 cfs | | | | | | | | | | | | 72341 | 63646 | 54711 | 44308 | 35831 | 29993 | 72341 |
| 101.3 cfs | | | | | | | | | | | | | 64643 | 55156 | 44488 | 35991 | 30148 | 64643 |
| 80 cfs | | | | | | | | | | | | | | 55640 | 44680 | 36124 | 30233 | 55640 |
| 60 cfs | | | | | | | | | | | | | | | 45736 | 36479 | 30365 | 45736 |
| 40 cfs | | | | | | | | | | | | | | | | 36791 | 30472 | 36791 |
| 30 cfs | | | | | | | | | | | | | | | | | 30672 | 30672 |



Middle Fork American River at Buckeye Bar MF4.8
Effective Habitat Matrices

Figure 44. Middle Fork American River MF4.8 Effective Rainbow Trout Spawning Habitat Matrix.

| Starting Discharge (cfs) | Ending Discharge (cfs) | | | | | | | | | | | | | | | | Initial Habitat vs Flow Relationship |
|--------------------------|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------------------------------------|
| | 2500 | 2000 | 1500 | 1018 | 911 | 800 | 600 | 452 | 407 | 300 | 225 | 175 | 125 | 111 | 80 | 60 | |
| 2500 cfs | 764 | 315 | 155 | 54 | 34 | 18 | 4 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 764 |
| 2000 cfs | | 658 | 453 | 235 | 186 | 132 | 54 | 19 | 12 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 658 |
| 1500 cfs | | | 1067 | 728 | 639 | 518 | 333 | 198 | 156 | 83 | 44 | 23 | 8 | 7 | 6 | 3 | 1067 |
| 1018 cfs | | | | 2011 | 1874 | 1680 | 1329 | 1030 | 921 | 701 | 522 | 376 | 248 | 222 | 115 | 69 | 2011 |
| 911 cfs | | | | | 2341 | 2114 | 1730 | 1392 | 1270 | 998 | 766 | 580 | 398 | 359 | 204 | 131 | 2341 |
| 800 cfs | | | | | | 2602 | 2193 | 1808 | 1670 | 1322 | 1022 | 793 | 557 | 505 | 306 | 205 | 2602 |
| 600 cfs | | | | | | | 3411 | 2957 | 2782 | 2302 | 1850 | 1505 | 1099 | 1012 | 696 | 519 | 3411 |
| 452 cfs | | | | | | | | 4076 | 3878 | 3282 | 2705 | 2241 | 1678 | 1563 | 1147 | 899 | 4076 |
| 407.6 cfs | | | | | | | | | 4221 | 3594 | 2978 | 2482 | 1876 | 1753 | 1301 | 1030 | 4221 |
| 300 cfs | | | | | | | | | | 4409 | 3706 | 3134 | 2439 | 2295 | 1752 | 1410 | 4409 |
| 225 cfs | | | | | | | | | | | 4265 | 3632 | 2875 | 2716 | 2105 | 1716 | 4265 |
| 175 cfs | | | | | | | | | | | | 4128 | 3305 | 3126 | 2441 | 2010 | 4128 |
| 125 cfs | | | | | | | | | | | | | 3678 | 3478 | 2758 | 2296 | 3678 |
| 111 cfs | | | | | | | | | | | | | | 3564 | 2820 | 2346 | 3564 |
| 80 cfs | | | | | | | | | | | | | | | 3130 | 2629 | 3130 |
| 60 cfs | | | | | | | | | | | | | | | | 2805 | 2805 |

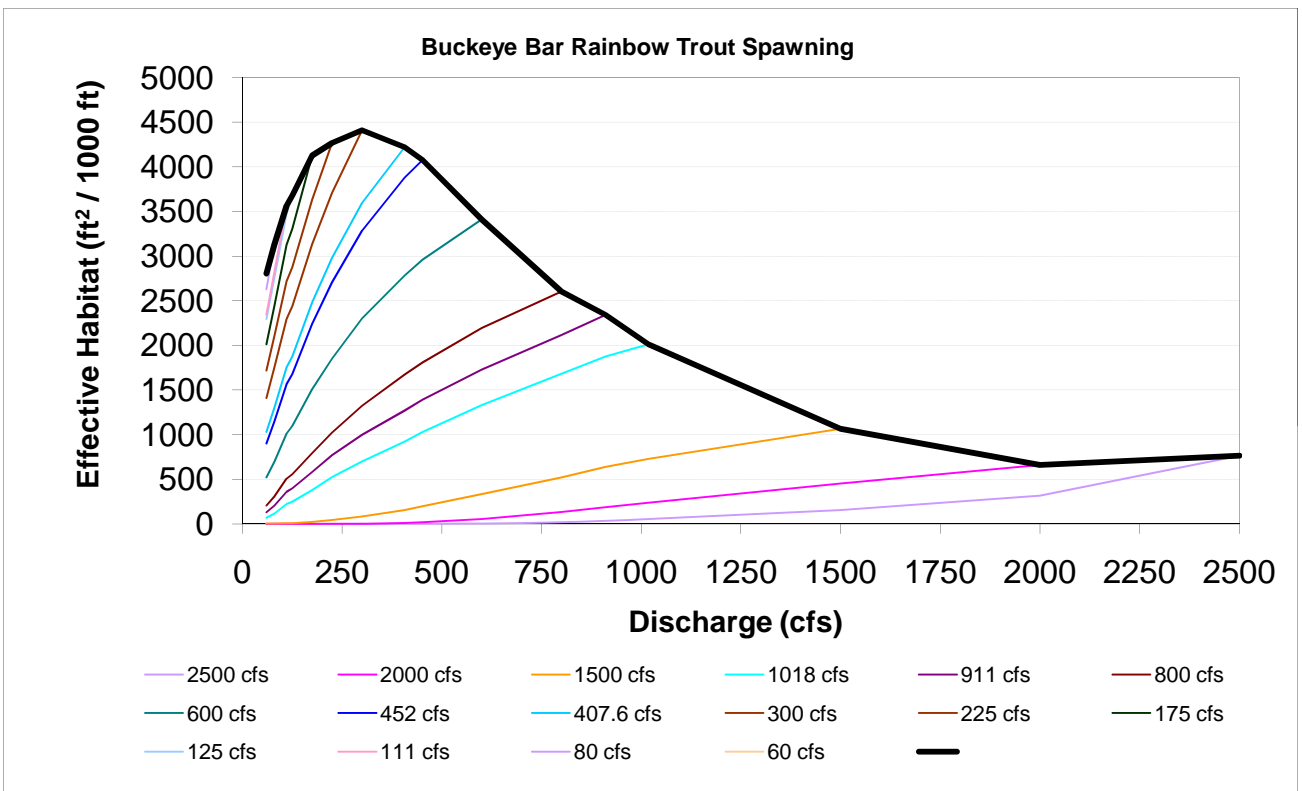


Figure 45. Middle Fork American River MF4.8 Effective Rainbow Trout Incubation Habitat Matrix.

| Starting Discharge (cfs) | Ending Discharge (cfs) | | | | | | | | | | | | | | | | Initial Habitat vs Flow Relationship |
|--------------------------|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------------------------------------|
| | 2500 | 2000 | 1500 | 1018 | 911 | 800 | 600 | 452 | 407 | 300 | 225 | 175 | 125 | 111 | 80 | 60 | |
| 2500 cfs | 764 | 389 | 167 | 55 | 36 | 15 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 764 |
| 2000 cfs | | 658 | 496 | 298 | 232 | 150 | 53 | 16 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 658 |
| 1500 cfs | | | 1067 | 884 | 776 | 633 | 384 | 222 | 172 | 68 | 30 | 16 | 6 | 6 | 5 | 1 | 1067 |
| 1018 cfs | | | | 2011 | 1957 | 1866 | 1551 | 1241 | 1122 | 783 | 536 | 350 | 234 | 221 | 117 | 65 | 2011 |
| 911 cfs | | | | | 2341 | 2259 | 1976 | 1654 | 1527 | 1138 | 824 | 561 | 395 | 374 | 212 | 129 | 2341 |
| 800 cfs | | | | | | 2602 | 2401 | 2100 | 1972 | 1537 | 1150 | 805 | 581 | 551 | 337 | 223 | 2602 |
| 600 cfs | | | | | | | 3411 | 3217 | 3116 | 2662 | 2176 | 1644 | 1283 | 1219 | 861 | 658 | 3411 |
| 452 cfs | | | | | | | | 4076 | 3990 | 3691 | 3219 | 2552 | 2075 | 1982 | 1495 | 1208 | 4076 |
| 407.6 cfs | | | | | | | | | 4221 | 3964 | 3531 | 2848 | 2336 | 2237 | 1721 | 1409 | 4221 |
| 300 cfs | | | | | | | | | | 4409 | 4140 | 3586 | 3033 | 2926 | 2366 | 2007 | 4409 |
| 225 cfs | | | | | | | | | | | 4265 | 3889 | 3459 | 3356 | 2796 | 2452 | 4265 |
| 175 cfs | | | | | | | | | | | | 4128 | 3761 | 3670 | 3163 | 2849 | 4128 |
| 125 cfs | | | | | | | | | | | | | 3678 | 3517 | 3270 | 3025 | 3678 |
| 111 cfs | | | | | | | | | | | | | | 3564 | 3253 | 3023 | 3564 |
| 80 cfs | | | | | | | | | | | | | | | 3130 | 2946 | 3130 |
| 60 cfs | | | | | | | | | | | | | | | | 2805 | 2805 |

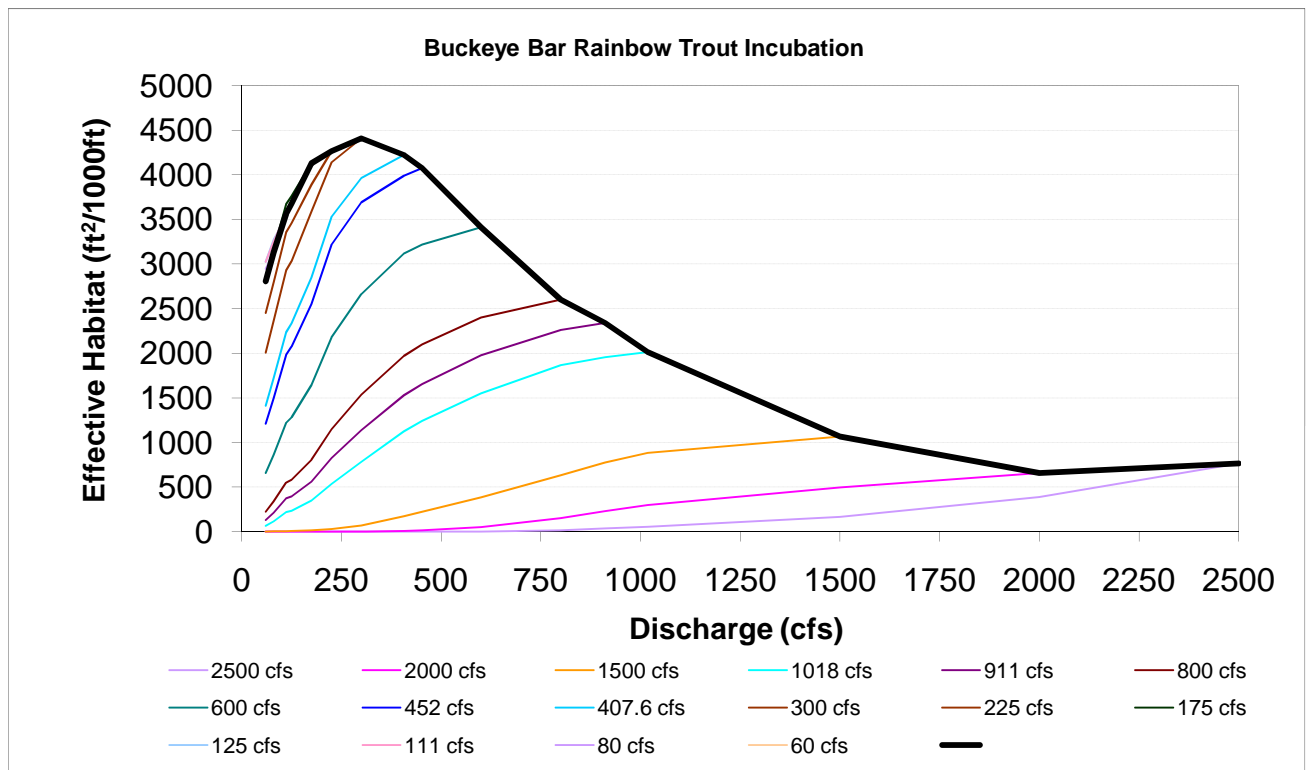


Figure 46. Middle Fork American River MF4.8 Effective Rainbow Trout Depth Sensitivity Spawning Habitat Matrix.

| Starting Discharge (cfs) | Ending Discharge (cfs) | | | | | | | | | | | | | | | | Initial Habitat vs Flow Relationship | |
|--------------------------|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|--------------------------------------|------|
| | 2500 | 2000 | 1500 | 1018 | 911 | 800 | 600 | 452 | 407 | 300 | 225 | 175 | 125 | 111 | 80 | 60 | | |
| 2500 cfs | 16998 | 16140 | 15535 | 14483 | 14030 | 13506 | 12495 | 11126 | 10650 | 9150 | 7702 | 6327 | 4903 | 4544 | 3476 | 2878 | 16998 | |
| 2000 cfs | | 18998 | 18366 | 17250 | 16728 | 16168 | 15087 | 13525 | 12917 | 10910 | 9143 | 7404 | 5720 | 5321 | 4096 | 3382 | 18998 | |
| 1500 cfs | | | 20774 | 19558 | 18977 | 18391 | 17251 | 15576 | 14853 | 12398 | 10283 | 8284 | 6416 | 5981 | 4577 | 3741 | 20774 | |
| 1018 cfs | | | | 21107 | 20474 | 19876 | 18684 | 16932 | 16178 | 13474 | 11143 | 8981 | 6898 | 6432 | 4860 | 3955 | 21107 | |
| 911 cfs | | | | | 20840 | 20095 | 18894 | 17130 | 16373 | 13644 | 11293 | 9102 | 6978 | 6505 | 4905 | 3991 | 20840 | |
| 800 cfs | | | | | | 20688 | 19332 | 17478 | 16711 | 13926 | 11518 | 9282 | 7096 | 6611 | 4978 | 4048 | 20688 | |
| 600 cfs | | | | | | | 19820 | 17933 | 17144 | 14296 | 11834 | 9547 | 7261 | 6757 | 5084 | 4125 | 19820 | |
| 452 cfs | | | | | | | | 18284 | 17462 | 14531 | 11966 | 9642 | 7329 | 6819 | 5134 | 4161 | 18284 | |
| 407.6 cfs | | | | | | | | | 17522 | 14580 | 11997 | 9662 | 7342 | 6830 | 5142 | 4168 | 17522 | |
| 300 cfs | | | | | | | | | | 14709 | 12085 | 9723 | 7390 | 6875 | 5181 | 4202 | 14709 | |
| 225 cfs | | | | | | | | | | | 12329 | 9830 | 7479 | 6961 | 5254 | 4264 | 12329 | |
| 175 cfs | | | | | | | | | | | | 10063 | 7640 | 7065 | 5330 | 4328 | 10063 | |
| 125 cfs | | | | | | | | | | | | | | 7825 | 7224 | 5472 | 4453 | 7825 |
| 111 cfs | | | | | | | | | | | | | | | 7499 | 5526 | 4496 | 7499 |
| 80 cfs | | | | | | | | | | | | | | | | 5758 | 4688 | 5758 |
| 60 cfs | | | | | | | | | | | | | | | | | 4796 | 4796 |

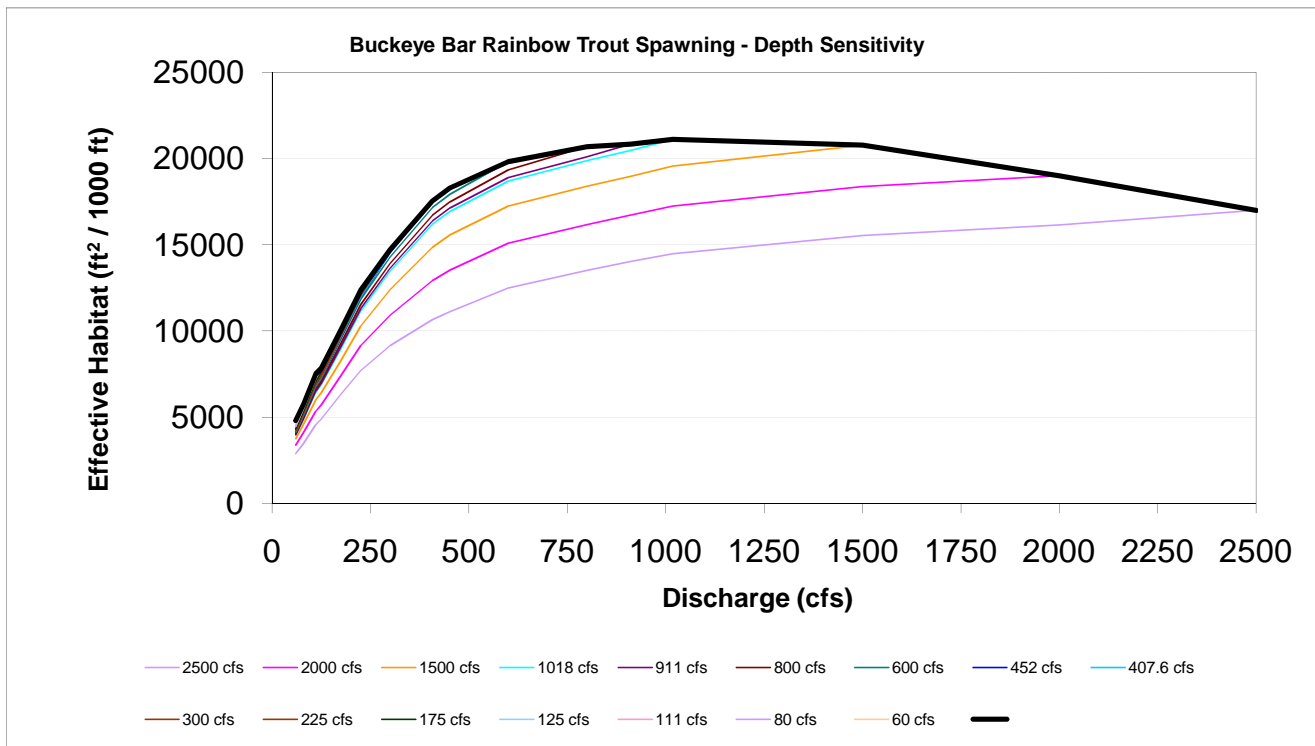


Figure 47. Middle Fork American River MF4.8 Effective Rainbow Trout Spawning Depth Sensitivity Incubation Habitat Matrix.

| Starting Discharge (cfs) | Ending Discharge (cfs) | | | | | | | | | | | | | | | | Initial Habitat vs Flow Relationship |
|--------------------------|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|--------------------------------------|
| | 2500 | 2000 | 1500 | 1018 | 911 | 800 | 600 | 452 | 407 | 300 | 225 | 175 | 125 | 111 | 80 | 60 | |
| 2500 cfs | 16998 | 16581 | 16255 | 15922 | 15614 | 15299 | 14774 | 14001 | 13747 | 12954 | 11723 | 10487 | 8501 | 7611 | 5595 | 3776 | 16998 |
| 2000 cfs | | 18998 | 18783 | 18492 | 18225 | 17897 | 17339 | 16521 | 16263 | 15449 | 14217 | 12868 | 10699 | 9779 | 7329 | 5012 | 18998 |
| 1500 cfs | | | 20774 | 20541 | 20288 | 19969 | 19404 | 18590 | 18324 | 17486 | 16278 | 14805 | 12476 | 11543 | 8800 | 6135 | 20774 |
| 1018 cfs | | | | 21107 | 20957 | 20795 | 20317 | 19550 | 19293 | 18461 | 17378 | 15819 | 13385 | 12499 | 9630 | 6821 | 21107 |
| 911 cfs | | | | | 20840 | 20674 | 20251 | 19646 | 19415 | 18625 | 17509 | 15980 | 13533 | 12623 | 9740 | 6919 | 20840 |
| 800 cfs | | | | | | 20688 | 20371 | 19677 | 19445 | 18641 | 17581 | 16029 | 13595 | 12749 | 9875 | 7062 | 20688 |
| 600 cfs | | | | | | | 19820 | 19312 | 19141 | 18430 | 17475 | 16010 | 13663 | 12854 | 10003 | 7224 | 19820 |
| 452 cfs | | | | | | | | 18284 | 18076 | 17641 | 16774 | 15518 | 13438 | 12678 | 9951 | 7212 | 18284 |
| 407.6 cfs | | | | | | | | | 17522 | 17054 | 16252 | 15075 | 13106 | 12393 | 9808 | 7163 | 17522 |
| 300 cfs | | | | | | | | | | 14709 | 14051 | 13181 | 11638 | 11061 | 8975 | 6821 | 14709 |
| 225 cfs | | | | | | | | | | | 12329 | 11486 | 10393 | 9960 | 8170 | 6353 | 12329 |
| 175 cfs | | | | | | | | | | | | 10063 | 8980 | 8563 | 7219 | 5869 | 10063 |
| 125 cfs | | | | | | | | | | | | | 7825 | 7012 | 6198 | 5225 | 7825 |
| 111 cfs | | | | | | | | | | | | | | 7499 | 6105 | 5101 | 7499 |
| 80 cfs | | | | | | | | | | | | | | | 5758 | 4379 | 5758 |
| 60 cfs | | | | | | | | | | | | | | | | 4796 | 4796 |

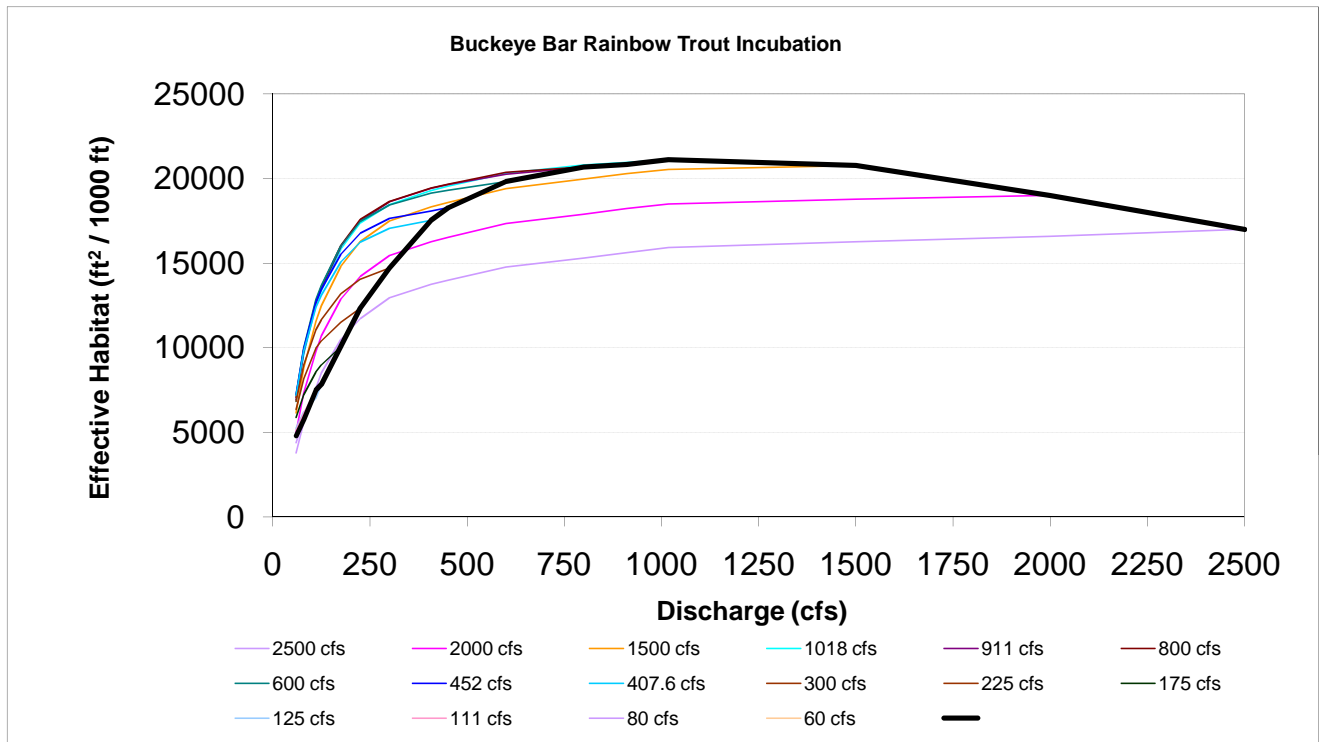


Figure 48. Middle Fork American River MF4.8 Effective FYLF Egg Mass Habitat Matrix.

| Starting Discharge (cfs) | Ending Discharge (cfs) | | | | | | | | | | | | | | | | Initial Habitat vs Flow Relationship |
|--------------------------|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------------------------------------|
| | 2500 | 2000 | 1500 | 1018 | 911 | 800 | 600 | 452 | 407 | 300 | 225 | 175 | 125 | 111 | 80 | 60 | |
| 2500 cfs | 3309 | 1985 | 751 | 291 | 233 | 195 | 72 | 32 | 26 | 11 | 10 | 5 | 3 | 2 | 1 | 0 | 3309 |
| 2000 cfs | | 4029 | 2641 | 468 | 375 | 321 | 161 | 115 | 106 | 68 | 30 | 10 | 6 | 5 | 4 | 3 | 4029 |
| 1500 cfs | | | 5145 | 2676 | 2028 | 1489 | 285 | 174 | 157 | 110 | 69 | 44 | 24 | 23 | 14 | 11 | 5145 |
| 1018 cfs | | | | 5202 | 4260 | 3518 | 1913 | 1159 | 895 | 272 | 157 | 97 | 66 | 63 | 45 | 40 | 5202 |
| 911 cfs | | | | | 4842 | 4070 | 2425 | 1639 | 1349 | 684 | 218 | 128 | 78 | 75 | 55 | 48 | 4842 |
| 800 cfs | | | | | | 5036 | 3165 | 2134 | 1775 | 999 | 428 | 192 | 110 | 104 | 78 | 69 | 5036 |
| 600 cfs | | | | | | | 4951 | 3412 | 2913 | 1852 | 1161 | 697 | 295 | 285 | 175 | 127 | 4951 |
| 452 cfs | | | | | | | | 4493 | 3855 | 2541 | 1755 | 1186 | 710 | 686 | 433 | 293 | 4493 |
| 407.6 cfs | | | | | | | | | 4425 | 2912 | 2073 | 1474 | 970 | 944 | 676 | 461 | 4425 |
| 300 cfs | | | | | | | | | | 4380 | 3105 | 2297 | 1671 | 1637 | 1284 | 1029 | 4380 |
| 225 cfs | | | | | | | | | | | 4894 | 3525 | 2577 | 2518 | 1951 | 1618 | 4894 |
| 175 cfs | | | | | | | | | | | | 4615 | 3450 | 3383 | 2714 | 2306 | 4615 |
| 125 cfs | | | | | | | | | | | | | 5088 | 4919 | 3899 | 3344 | 5088 |
| 111 cfs | | | | | | | | | | | | | | 5790 | 4412 | 3747 | 5790 |
| 80 cfs | | | | | | | | | | | | | | | 5898 | 5116 | 5898 |
| 60 cfs | | | | | | | | | | | | | | | | 6413 | 6413 |

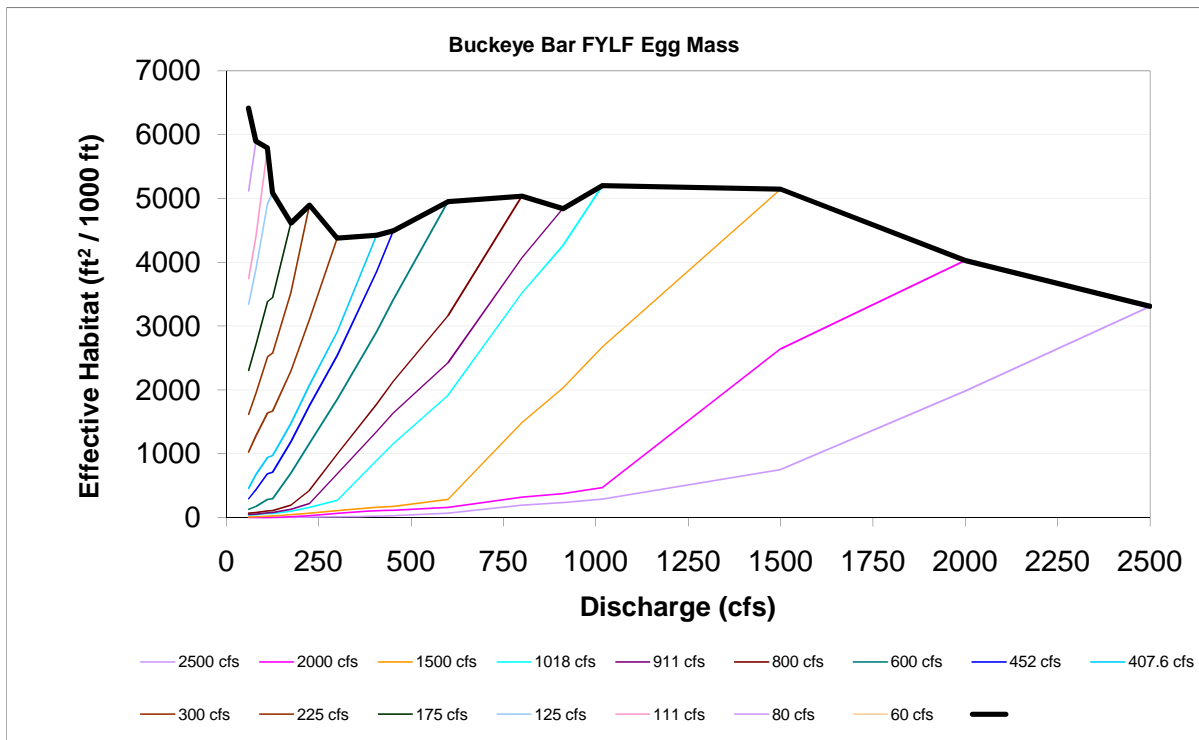


Figure 49. Middle Fork American River MF4.8 Effective FYLF Tadpole Habitat Matrix.

| Starting Discharge (cfs) | Ending Discharge (cfs) | | | | | | | | | | | | | | | | Initial Habitat vs Flow Relationship |
|--------------------------|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------------------------------------|
| | 2500 | 2000 | 1500 | 1018 | 911 | 800 | 600 | 452 | 407 | 300 | 225 | 175 | 125 | 111 | 80 | 60 | |
| 2500 cfs | 2892 | 1385 | 363 | 194 | 167 | 140 | 36 | 10 | 9 | 6 | 5 | 1 | 1 | 0 | 0 | 0 | 2892 |
| 2000 cfs | | 3211 | 1593 | 347 | 298 | 247 | 121 | 76 | 69 | 33 | 9 | 4 | 3 | 2 | 2 | 1 | 3211 |
| 1500 cfs | | | 3202 | 1396 | 1009 | 594 | 213 | 148 | 137 | 92 | 49 | 27 | 15 | 14 | 7 | 6 | 3202 |
| 1018 cfs | | | | 4380 | 3736 | 3146 | 1321 | 568 | 404 | 187 | 127 | 88 | 59 | 58 | 40 | 35 | 4380 |
| 911 cfs | | | | | 4402 | 3741 | 1857 | 1075 | 898 | 261 | 164 | 116 | 82 | 81 | 58 | 52 | 4402 |
| 800 cfs | | | | | | 4831 | 2628 | 1665 | 1431 | 546 | 227 | 154 | 114 | 111 | 83 | 75 | 4831 |
| 600 cfs | | | | | | | 4883 | 3389 | 3011 | 1815 | 942 | 346 | 210 | 187 | 147 | 133 | 4883 |
| 452 cfs | | | | | | | | 4985 | 4422 | 2877 | 1841 | 1113 | 540 | 499 | 296 | 231 | 4985 |
| 407.6 cfs | | | | | | | | | 5191 | 3378 | 2261 | 1466 | 831 | 783 | 372 | 287 | 5191 |
| 300 cfs | | | | | | | | | | 5203 | 3558 | 2541 | 1720 | 1653 | 974 | 696 | 5203 |
| 225 cfs | | | | | | | | | | | 6030 | 4257 | 3020 | 2914 | 1975 | 1543 | 6030 |
| 175 cfs | | | | | | | | | | | | 5915 | 4293 | 4159 | 3048 | 2532 | 5915 |
| 125 cfs | | | | | | | | | | | | | 6308 | 6037 | 4478 | 3741 | 6308 |
| 111 cfs | | | | | | | | | | | | | | 7150 | 5213 | 4305 | 7150 |
| 80 cfs | | | | | | | | | | | | | | | 7200 | 6039 | 7200 |
| 60 cfs | | | | | | | | | | | | | | | | 7856 | 7856 |

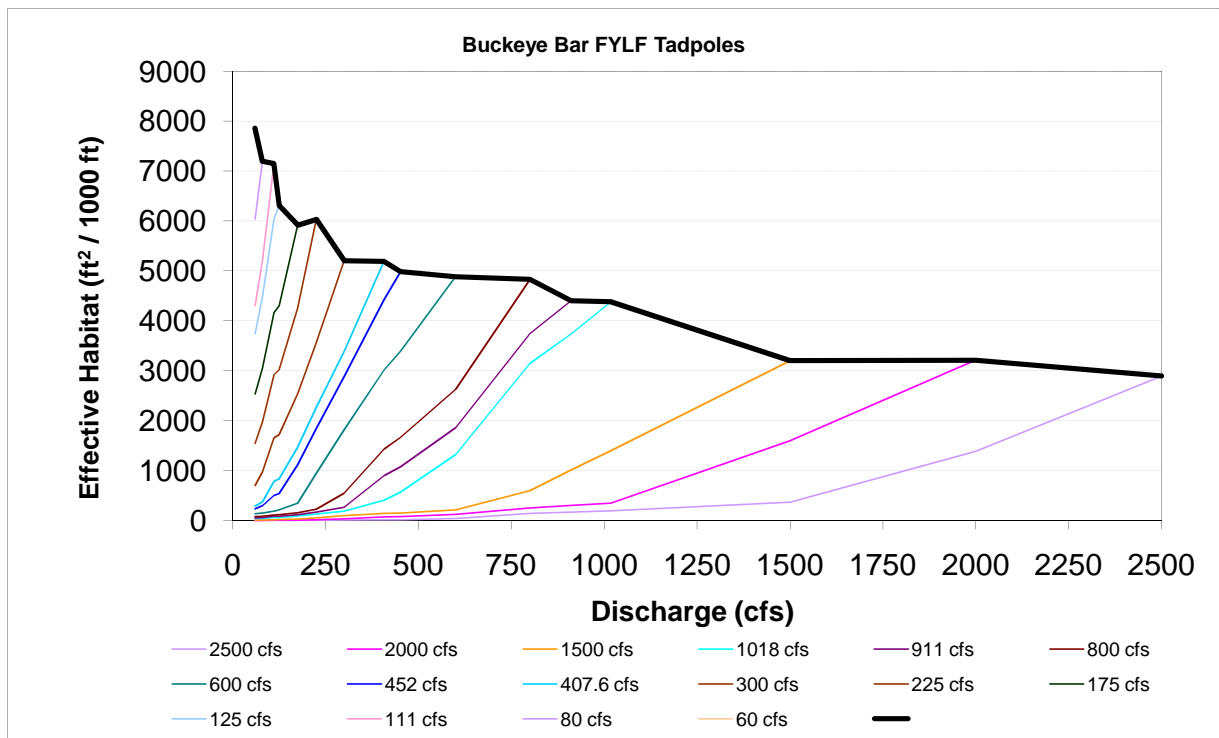


Figure 50. Middle Fork American River MF4.8 Effective Food Production Habitat Matrix.

| Starting Discharge (cfs) | Ending Discharge (cfs) | | | | | | | | | | | | | | | | Initial Habitat vs Flow Relationship |
|--------------------------|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------------------------------------|
| | 2500 | 2000 | 1500 | 1018 | 911 | 800 | 600 | 452 | 407 | 300 | 225 | 175 | 125 | 111 | 80 | 60 | |
| 2500 cfs | 94386 | 87594 | 81657 | 73449 | 71476 | 67927 | 62685 | 57763 | 55986 | 49601 | 41510 | 32140 | 21472 | 19456 | 11620 | 8995 | 94386 |
| 2000 cfs | | 94191 | 87787 | 79050 | 76344 | 72470 | 66875 | 61623 | 59700 | 52944 | 44265 | 34735 | 23680 | 21525 | 12895 | 9826 | 94191 |
| 1500 cfs | | | 93796 | 84480 | 80996 | 77039 | 71228 | 65705 | 63660 | 56565 | 47363 | 37634 | 26276 | 23856 | 14712 | 10992 | 93796 |
| 1018 cfs | | | | 90811 | 87111 | 83130 | 77198 | 71498 | 69391 | 62012 | 52457 | 42567 | 30896 | 28153 | 18513 | 14424 | 90811 |
| 911 cfs | | | | | 90275 | 84841 | 78856 | 73096 | 70966 | 63477 | 53820 | 43885 | 32162 | 29394 | 19681 | 15524 | 90275 |
| 800 cfs | | | | | | 88394 | 81700 | 75458 | 73306 | 65736 | 55946 | 45899 | 34050 | 31203 | 21425 | 17163 | 88394 |
| 600 cfs | | | | | | | 86248 | 79817 | 77655 | 70029 | 60062 | 49796 | 37700 | 34759 | 24891 | 20513 | 86248 |
| 452 cfs | | | | | | | | 83693 | 81189 | 73163 | 62928 | 52443 | 40149 | 37164 | 27224 | 22789 | 83693 |
| 407.6 cfs | | | | | | | | | 82057 | 73954 | 63667 | 53158 | 40829 | 37845 | 27882 | 23422 | 82057 |
| 300 cfs | | | | | | | | | | 75891 | 65434 | 54858 | 42480 | 39480 | 29494 | 24976 | 75891 |
| 225 cfs | | | | | | | | | | | 66817 | 56008 | 43621 | 40616 | 30625 | 26093 | 66817 |
| 175 cfs | | | | | | | | | | | | 57403 | 44664 | 41506 | 31412 | 26772 | 57403 |
| 125 cfs | | | | | | | | | | | | | 45641 | 42223 | 31996 | 27235 | 45641 |
| 111 cfs | | | | | | | | | | | | | | 44190 | 32091 | 27313 | 44190 |
| 80 cfs | | | | | | | | | | | | | | | 33184 | 28109 | 33184 |
| 60 cfs | | | | | | | | | | | | | | | | 28269 | 28269 |

