

MORPHOLOGICAL DATA

MORPHOLOGICAL MEASUREMENTS TABLE

SMITH CREEK ENHANCEMENT
-P SMITHCREEK- Reach 1 Sta. 10 + 00.00 to Sta. 14 + 80.70

Variables	Existing Channel	Proposed Reach	USGS Station	Reference Reach
1.Stream type	64	64		E4
2.Drainage area	088	088		067
3.Bankfull width	Mean: 13.8 Range: 13.4-14.1	Mean: 16.7 Range: 1.1		Mean: 13.7 Range: 1.4
4.Bankfull mean depth	Mean: 1.3 Range: 1.0-1.6	Mean: 1.1 Range: 1.0-1.2		Mean: 1.4 Range: 1.0-1.6
5.Width/depth ratio	Mean: 10.6 Range: 9.8-11.4	Mean: 15.2 Range: 14.0-16.4		Mean: 9.8 Range: 8.0-11.6
6.Bankfull cross-sectional area	Mean: 17.7 Range: 17.2-18.2	Mean: 18.5 Range: 18.0-19.0		Mean: 9.8 Range: 9.0-10.6
7.Bankfull mean velocity	Mean: 5.3 Range: 5.0-5.5	Mean: 5.0 Range: 4.5-5.5		Mean: 2.8 Range: 2.0-3.6
8.Bankfull discharge,cf s	Mean: 93.5 Range: 90.3-94.9	Mean: 93 Range: 88.0-98.0		Mean: 50.0 Range: 40.0-60.0
9.Bankfull max depth	Mean: 1.8 Range: 1.6-1.9	Mean: 1.6 Range: 1.4-1.8		Mean: 1.7 Range: 1.4-2.0
10.Width of floodprone area	Mean: 24.5 Range: 13.7-45.7	Mean: 225.0 Range: 13.7-45.7		Mean: 225.0 Range: 13.7-45.7
11.Entrenchment ratio	Mean: 3.8 Range: 1.5-6.0	Mean: 22.2 Range: 1.5-6.0		Mean: 22.2 Range: 1.5-6.0
12.Meander length	Mean: 73.6 Range: 49.0-99.0	Mean: 73.6 Range: 49.0-99.0		Mean: 73.6 Range: 49.0-99.0
13.Ratio of meander length to bankfull width	Mean: 5.4 Range: 3.6-7.2	Mean: 5.4 Range: 3.6-7.2		Mean: 5.4 Range: 3.6-7.2
14.Radius of curvature	Mean: 57.9 Range: 20.0-76.0	Mean: 57.9 Range: 20.0-76.0		Mean: 57.9 Range: 20.0-76.0
15.Ratio of radius of curvature to bankfull width	Mean: 4.2 Range: 1.5-5.5	Mean: 4.2 Range: 1.5-5.5		Mean: 4.2 Range: 1.5-5.5
16.Belt width	Mean: 25.0 Range: 20.0-35.0	Mean: 25.0 Range: 20.0-35.0		Mean: 25.0 Range: 20.0-35.0
17.Meander width ratio	Mean: 1.8 Range: 1.5-2.5	Mean: 1.8 Range: 1.5-2.5		Mean: 1.8 Range: 1.5-2.5
18.Sinuosity (stream length/valley length)	Mean: 1.1 Range: 1.0-1.2	Mean: 1.1 Range: 1.0-1.2		Mean: 1.1 Range: 1.0-1.2
19.Valley slope	Mean: 0.0095 Range: 0.0095	Mean: 0.0095 Range: 0.0095		Mean: 0.0280 Range: 0.0280
20.Average slope	Mean: 0.0086 Range: 0.0086	Mean: 0.0086 Range: 0.0086		Mean: 0.0086 Range: 0.0086
21.Pool slope	Mean: 0.0 Range: 0.0	Mean: 0.0 Range: 0.0		Mean: 0.0 Range: 0.0
22.Ratio of pool slope to average slope	Mean: 0.0 Range: 0.0	Mean: 0.0 Range: 0.0		Mean: 0.0 Range: 0.0
23.Maximum pool depth	Mean: 2.2 Range: 1.8-2.5	Mean: 2.2 Range: 1.8-2.5		Mean: 2.2 Range: 1.8-2.5
24.Ratio of pool depth to average bankfull depth	Mean: 1.7 Range: 1.0-2.4	Mean: 1.7 Range: 1.0-2.4		Mean: 1.7 Range: 1.0-2.4
25.Pool width	Mean: 12.4 Range: 10.8-14.0	Mean: 12.4 Range: 10.8-14.0		Mean: 12.4 Range: 10.8-14.0
26.Ratio of pool width to bankfull width	Mean: 0.9 Range: 0.9	Mean: 0.9 Range: 0.9		Mean: 0.9 Range: 0.9
27.Pool to pool spacing	Mean: 64.7 Range: 38.0-96.0	Mean: 64.7 Range: 38.0-96.0		Mean: 64.7 Range: 38.0-96.0
28.Ratio of pool to pool spacing to bankfull width	Mean: 4.7 Range: 2.8-7.0	Mean: 4.7 Range: 2.8-7.0		Mean: 4.7 Range: 2.8-7.0
29.Ratio of lowest bank height to bankfull height (or max bankfull depth)	Mean: 2.1 Range: 1.6-2.5	Mean: 1.0 Range: 1.0		Mean: 1.0 Range: 1.0

MORPHOLOGICAL MEASUREMENTS TABLE

SMITH CREEK RESTORATION
-P SMITHCREEK- Reach 2 Sta. 17 + 27.70 to Sta. 28 + 12

Variables	Existing Channel	Proposed Reach	USGS Station	Reference Reach
1.Stream type	64	64		E4
2.Drainage area	103	103		067
3.Bankfull width	Mean: 12.6 Range: 1.5	Mean: 17.0 Range: 1.2		Mean: 13.7 Range: 1.4
4.Bankfull mean depth	Mean: 1.5 Range: 1.0-2.0	Mean: 1.2 Range: 1.0-1.4		Mean: 1.4 Range: 1.0-1.6
5.Width/depth ratio	Mean: 8.4 Range: 7.0-9.8	Mean: 13.7 Range: 12.0-15.4		Mean: 9.8 Range: 8.0-11.6
6.Bankfull cross-sectional area	Mean: 19.3 Range: 17.7-20.9	Mean: 21.1 Range: 19.3-22.9		Mean: 9.8 Range: 9.0-10.6
7.Bankfull mean velocity	Mean: 5.2 Range: 5.0-5.4	Mean: 4.7 Range: 4.5-4.8		Mean: 2.8 Range: 2.0-3.6
8.Bankfull discharge,cf s	Mean: 100.8 Range: 96.9-104.4	Mean: 98.7 Range: 95.8-101.1		Mean: 50.0 Range: 40.0-60.0
9.Bankfull max depth	Mean: 2.0 Range: 1.7-2.3	Mean: 2.0 Range: 1.7-2.3		Mean: 1.7 Range: 1.4-2.0
10.Width of floodprone area	Mean: 17.7 Range: 14.1-20.0	Mean: 237.0 Range: 14.1-20.0		Mean: 237.0 Range: 14.1-20.0
11.Entrenchment ratio	Mean: 1.5 Range: 1.5	Mean: 22.2 Range: 1.5		Mean: 22.2 Range: 1.5
12.Meander length	Mean: 97.6 Range: 54.0-150.0	Mean: 157.4 Range: 136.0-183.0		Mean: 97.6 Range: 54.0-150.0
13.Ratio of meander length to bankfull width	Mean: 7.7 Range: 4.3-11.9	Mean: 9.3 Range: 8.0-10.8		Mean: 7.7 Range: 4.3-11.9
14.Radius of curvature	Mean: 45.6 Range: 10.0-180.0	Mean: 51.2 Range: 40.0-64.0		Mean: 51.2 Range: 40.0-64.0
15.Ratio of radius of curvature to bankfull width	Mean: 3.6 Range: 0.8-14.3	Mean: 3.0 Range: 2.4-3.8		Mean: 3.6 Range: 0.8-14.3
16.Belt width	Mean: 23.9 Range: 15.0-32.0	Mean: 51.0 Range: 34.0-65.0		Mean: 23.9 Range: 15.0-32.0
17.Meander width ratio	Mean: 1.9 Range: 1.2-2.5	Mean: 3.0 Range: 2.0-3.8		Mean: 1.9 Range: 1.2-2.5
18.Sinuosity (stream length/valley length)	Mean: 1.1 Range: 1.0-1.2	Mean: 1.2 Range: 1.0-1.2		Mean: 1.1 Range: 1.0-1.2
19.Valley slope	Mean: 0.0079 Range: 0.0079	Mean: 0.0082 Range: 0.0082		Mean: 0.0280 Range: 0.0280
20.Average slope	Mean: 0.0072 Range: 0.0072	Mean: 0.00680 Range: 0.00680		Mean: 0.0072 Range: 0.0072
21.Pool slope	Mean: 0.0 Range: 0.0	Mean: 0.0 Range: 0.0		Mean: 0.0 Range: 0.0
22.Ratio of pool slope to average slope	Mean: 0.0 Range: 0.0	Mean: 0.0 Range: 0.0		Mean: 0.0 Range: 0.0
23.Maximum pool depth	Mean: 3.0 Range: 2.0-4.0	Mean: 4.0 Range: 3.2-4.8		Mean: 3.0 Range: 2.0-4.0
24.Ratio of pool depth to average bankfull depth	Mean: 2.0 Range: 1.0-3.0	Mean: 3.2 Range: 2.0-4.4		Mean: 2.0 Range: 1.0-3.0
25.Pool width	Mean: 10.2 Range: 8.0-12.4	Mean: 21.0 Range: 16.0-26.0		Mean: 10.2 Range: 8.0-12.4
26.Ratio of pool width to bankfull width	Mean: 0.8 Range: 0.8	Mean: 1.2 Range: 1.0-1.4		Mean: 0.8 Range: 0.8
27.Pool to pool spacing	Mean: 80.1 Range: 31.0-264.0	Mean: 91.4 Range: 77.0-116.0		Mean: 80.1 Range: 31.0-264.0
28.Ratio of pool to pool spacing to bankfull width	Mean: 6.4 Range: 2.5-21.0	Mean: 5.4 Range: 4.5-6.8		Mean: 6.4 Range: 2.5-21.0
29.Ratio of lowest bank height to bankfull height (or max bankfull depth)	Mean: 2.7 Range: 2.0-3.4	Mean: 1.0 Range: 1.0		Mean: 1.0 Range: 1.0

MORPHOLOGICAL MEASUREMENTS TABLE

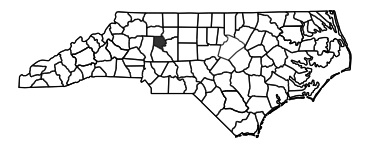
UT RESTORATION
-P UT- Sta. 10 + 00.00 to Sta. 13 + 55.85

Variables	Existing Channel	Proposed Reach	USGS Station	Reference Reach
1.Stream type	64	64		E4
2.Drainage area	013	013		022
3.Bankfull width	Mean: 4.1 Range: 3.0-5.2	Mean: 6.0 Range: 5.0-7.0		Mean: 6.1 Range: 5.0-7.0
4.Bankfull mean depth	Mean: 1.1 Range: 1.0-1.2	Mean: 0.6 Range: 0.5-0.7		Mean: 1.0-1.1 Range: 0.5-0.7
5.Width/depth ratio	Mean: 3.7 Range: 3.0-4.4	Mean: 10.0 Range: 8.0-12.0		Mean: 5.8-8.0 Range: 4.0-10.0
6.Bankfull cross-sectional area	Mean: 4.6 Range: 4.0-5.2	Mean: 3.6 Range: 3.0-4.2		Mean: 6.4-8.7 Range: 4.0-10.0
7.Bankfull mean velocity	Mean: 5.0 Range: 4.0-6.0	Mean: 6.2 Range: 5.0-7.4		Mean: 2.9 Range: 2.0-3.8
8.Bankfull discharge,cf s	Mean: 23.0 Range: 22.9-24.9	Mean: 22.0 Range: 21.4-22.8		Mean: 22.0 Range: 21.4-22.8
9.Bankfull max depth	Mean: 1.6 Range: 1.4-1.8	Mean: 1.2 Range: 1.0-1.4		Mean: 1.2 Range: 1.0-1.4
10.Width of floodprone area	Mean: 6.9 Range: 6.3-7.5	Mean: 214.0 Range: 6.3-7.5		Mean: 214.0 Range: 6.3-7.5
11.Entrenchment ratio	Mean: 3.6 Range: 3.6	Mean: 22.2 Range: 22.2		Mean: 3.7-4.3 Range: 3.7-4.3
12.Meander length	Mean: 51.1 Range: 44.8-57.5	Mean: 74.3 Range: 64.0-81.0		Mean: 74.3 Range: 64.0-81.0
13.Ratio of meander length to bankfull width	Mean: 12.5 Range: 10.9-14.0	Mean: 12.5 Range: 10.9-14.0		Mean: 12.5 Range: 10.9-14.0
14.Radius of curvature	Mean: 10.5 Range: 4.0-23.0	Mean: 21.7 Range: 18.0-25.0		Mean: 21.7 Range: 18.0-25.0
15.Ratio of radius of curvature to bankfull width	Mean: 2.6 Range: 1.0-5.6	Mean: 2.6 Range: 1.0-5.6		Mean: 2.6 Range: 1.0-5.6
16.Belt width	Mean: 10.6 Range: 5.0-17.0	Mean: 28.0 Range: 18.0-35.0		Mean: 10.6 Range: 5.0-17.0
17.Meander width ratio	Mean: 2.6 Range: 1.2-4.1	Mean: 2.6 Range: 1.2-4.1		Mean: 2.6 Range: 1.2-4.1
18.Sinuosity (stream length/valley length)	Mean: 1.1 Range: 1.0-1.2	Mean: 1.2 Range: 1.0-1.2		Mean: 1.1 Range: 1.0-1.2
19.Valley slope	Mean: 0.0151 Range: 0.0151	Mean: 0.0120 Range: 0.0120		Mean: 0.0120 Range: 0.0120
20.Average slope	Mean: 0.01375 Range: 0.01375	Mean: 0.0239 Range: 0.0239		Mean: 0.0239 Range: 0.0239
21.Pool slope	Mean: 0.0 Range: 0.0	Mean: 0.0 Range: 0.0		Mean: 0.0 Range: 0.0
22.Ratio of pool slope to average slope	Mean: 0.0 Range: 0.0	Mean: 0.0 Range: 0.0		Mean: 0.0 Range: 0.0
23.Maximum pool depth	Mean: N/A Range: N/A	Mean: 2.5 Range: 2.5		Mean: 2.5 Range: 2.5
24.Ratio of pool depth to average bankfull depth	Mean: 1.0 Range: 1.0	Mean: 1.0 Range: 1.0		Mean: 1.0 Range: 1.0
25.Pool width	Mean: 10.0 Range: 10.0	Mean: 10.0 Range: 10.0		Mean: 10.0 Range: 10.0
26.Ratio of pool width to bankfull width	Mean: 1.0 Range: 1.0	Mean: 1.0 Range: 1.0		Mean: 1.0 Range: 1.0
27.Pool to pool spacing	Mean: 33.0 Range: 18.0-49.0	Mean: 33.0 Range: 18.0-49.0		Mean: 33.0 Range: 18.0-49.0
28.Ratio of pool to pool spacing to bankfull width	Mean: 1.3 Range: 1.3	Mean: 1.0 Range: 1.0		Mean: 1.3 Range: 1.3
29.Ratio of lowest bank height to bankfull height (or max bankfull depth)	Mean: 1.3 Range: 1.3	Mean: 1.0 Range: 1.0		Mean: 1.3 Range: 1.3

U-6187

OSM-02i

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DAVIE COUNTY



ENVIRONMENTAL ANALYSES UNIT

HYDRAULIC DESIGN
ENGINEER



PREPARED BY


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