

Appendix II

Biological Water Quality Data Collected by DWQ

- **Benthic Macroinvertebrate Collections**
 - **Fish Community Assessments**
 - **Lakes Assessments**

Benthic Macroinvertebrate Sampling Methods and Criteria

Freshwater Wadeable and Flowing Waters

Benthic macroinvertebrates can be collected from wadeable, freshwater, flowing waters using two sampling procedures. The Division of Water Quality's standard qualitative sampling procedure includes 10 composite samples: two kick-net samples, three bank sweeps, two rock or log washes, one sand sample, one leafpack sample, and visual collections from large rocks and logs (NCDEHNR, 1997). The purpose of these collections is to inventory the aquatic fauna and produce an indication of relative abundance for each taxon. Organisms are classified as Rare (1-2 specimens), Common (3-9 specimens), or Abundant (≥ 10 specimens).

Several data analysis summaries (metrics) can be produced to detect water quality problems. These metrics are based on the idea that unstressed streams and rivers have many invertebrate taxa and are dominated by intolerant species. Conversely, polluted streams have fewer numbers of invertebrate taxa and are dominated by tolerant species. The diversity of the invertebrate fauna is evaluated using taxa richness counts; the tolerance of the stream community is evaluated using a biotic index.

EPT taxa richness (EPT S) is used with DWQ criteria to assign water quality ratings (bioclassifications). "EPT" is an abbreviation for Ephemeroptera + Plecoptera + Trichoptera, insect groups that are generally intolerant of many kinds of pollution. Higher EPT taxa richness values usually indicate better water quality. Water quality ratings also are based on the relative tolerance of the macroinvertebrate community as summarized by the North Carolina Biotic Index (NCBI).

Both tolerance values for individual species and the final biotic index values have a range of 0-10, with higher numbers indicating more tolerant species or more polluted conditions. Water quality ratings assigned with the biotic index numbers are combined with EPT taxa richness ratings to produce a final bioclassification, using criteria for coastal plain streams. EPT abundance (EPT N) and total taxa richness calculations also are used to help examine between-site differences in water quality. If the EPT taxa richness rating and the biotic index differ by one bioclassification, the EPT abundance value is used to determine the final site rating.

Benthic macroinvertebrates can also be collected using an EPT sampling procedure. Four rather than 10 composite qualitative samples are taken at each site: 1 kick, 1 sweep, 1 leafpack and visual collections. Only EPT groups are collected and identified, and only EPT criteria are used to assign a bioclassification.

Both EPT taxa richness and biotic index values also can be affected by seasonal changes. DWQ criteria for assigning bioclassification are based on summer sampling: June - September. For samples collected outside summer, EPT taxa richness can be adjusted by subtracting out winter/spring Plecoptera or other adjustment based on resampling of summer site. The biotic index values also are seasonally adjusted for samples outside the summer season.

Criteria have been developed to assign bioclassifications ranging from Poor to Excellent to each benthic sample. These bioclassifications primarily reflect the influence of chemical pollutants. The major physical pollutant, sediment, is not assessed as well by a taxa richness analysis.

Flow Measurement

Changes in the benthic macroinvertebrate community are often used to help assess between-year changes in water quality. Some between-year changes in the macroinvertebrates, however, may be due largely to changes in flow. High flow years magnify the potential effects of nonpoint source runoff, leading to scour, substrate instability and reduced periphyton. Low flow years may accentuate the effect of point source dischargers by providing less dilution of wastes. For these reasons, all between-year changes in the biological communities are considered in light of flow conditions (high, low or normal) for one month prior to the sampling date. Daily flow information is obtained from the closest available USGS monitoring site and compared to the long-term mean flows. High flow is defined as a mean flow >140 percent of the long-term mean for that time period, usually July or August. Low flow is defined as a mean flow <60 percent of the long-term mean, while normal flow is 60-140 percent of the mean. While broad scale regional patterns are often observed, there may be large geographical variation within the state, and large variation within a single summer period.

Habitat Evaluation

The Division has developed a habitat assessment form to better evaluate the physical habitat of a stream. The habitat score has a potential range of 1-100, based on evaluation of channel modification, amount of instream habitat, type of bottom substrate, pool variety, bank stability, light penetration and riparian zone width. Higher numbers suggest better habitat quality, but no criteria have been developed to assign impairment ratings.

Table A-II-1 Benthic macroinvertebrate data collected in the Catawba River Basin, 1983 - 2002
(Current basinwide sites are in bold font.)

| Waterbody | Location | County | Index No. | Date | ST | EPT | BI | EPT BI | Rating | | | |
|-------------------|----------------------------------|----------|-------------|--------------|----------|-------------|---------|-----------|-----------------|-----------|------|-----------|
| 03-08-30 | | | | | | | | | | | | |
| Catawba R | SR 1274 at end | McDowell | 11-(1) | 8/8/02 | --- | 26 | --- | 2.75 | Good-Fair | | | |
| Catawba R | SR 1273 at Graphite ab RR | McDowell | 11-(1) | 8/7/97 | --- | 24 | --- | 2.88 | Good-Fair | | | |
| Mill Cr | | McDowell | | 4/18/85 | 99 | 49 | 4.24 | 2.97 | Good | | | |
| Mill Cr | | McDowell | | 11-7 | 8/7/97 | --- | 31 | --- | 1.63 | Excellent | | |
| Mill Cr | SR 1400/1407 | McDowell | 11-7 | 7/9/92 | 85 | 49 | 2.62 | 2.13 | Excellent | | | |
| Mill Cr | | | | 2/10/92 | --- | 39 | 1.65 | 1.65 | Good | | | |
| Mill Cr | | | | 1/12/98 | --- | 40 | --- | 2.49 | Good | | | |
| Mill Cr | SR 1401 | McDowell | 11-7 | 6/15/94 | 81 | 43 | 3.40 | 2.33 | Excellent | | | |
| Swannanoa Cr | | | | SR 1400/1407 | McDowell | 11-7-9 | 1/12/98 | --- | 37 | --- | 2.73 | Good |
| Swannanoa Cr | | | | | | | 8/7/97 | --- | 18 | --- | 3.26 | Fair |
| Swannanoa Cr | 8/8/02 | --- | 31 | | | | --- | 2.26 | Excellent | | | |
| Swannanoa Cr | SR 1400/1407 | McDowell | 11-7-9 | 1/12/99 | --- | 35 | --- | 2.75 | Excellent | | | |
| Swannanoa Cr | | | | 1/12/98 | --- | 16 | --- | 2.31 | Fair | | | |
| Swannanoa Cr | | | | 4/8/97 | --- | 18 | --- | 1.34 | Fair | | | |
| Catawba R | off SR 1234 I-40, be Old Fort | McDowell | 11-(8) | 6/15/94 | --- | 35 | --- | 1.90 | Excellent | | | |
| Catawba R | | McDowell | 11-(8) | 4/18/85 | 82 | 39 | 4.51 | 3.17 | Good-Fair | | | |
| Catawba R | | McDowell | 11-(8) | 7/23/87 | 74 | 30 | 5.75 | 4.66 | Good-Fair | | | |
| Catawba R | SR 1234 | McDowell | 11-(8) | 8/8/02 | 89 | 36 | 4.72 | 3.55 | Good | | | |
| Catawba R | | | | 8/7/97 | 70 | 31 | 5.32 | 4.18 | Good-Fair | | | |
| Catawba R | | | | 7/9/92 | 102 | 41 | 4.13 | 3.20 | Good | | | |
| Catawba R | | | | 7/26/90 | 84 | 38 | 4.43 | 3.71 | Good | | | |
| Catawba R | | | | 4/18/85 | 86 | 28 | 6.29 | 4.02 | Fair | | | |
| Catawba R | SR 1221 | McDowell | 11-(8) | 8/7/02 | 73 | 27 | 5.38 | 4.11 | Good-Fair | | | |
| Catawba R | | | | 8/6/97 | 75 | 35 | 4.46 | 3.89 | Good | | | |
| Catawba R | | | | 7/8/92 | 90 | 42 | 4.42 | 3.60 | Good | | | |
| Catawba R | | | | 7/26/90 | 77 | 43 | 4.27 | 3.77 | Good | | | |
| Catawba R | | | | 8/11/88 | 86 | 31 | 5.60 | 4.74 | Good-Fair | | | |
| Catawba R | | | | 7/28/88 | --- | 27 | --- | 3.88 | Good-Fair | | | |
| Catawba R | | | | 7/21/86 | 78 | 26 | 5.74 | 4.11 | Good-Fair | | | |
| Catawba R | | | | 8/15/85 | 73 | 24 | 5.50 | 4.38 | Good-Fair | | | |
| Catawba R | | | | 8/23/84 | 63 | 23 | 4.99 | 4.42 | Good-Fair | | | |
| Catawba R | | | | 8/9/83 | 70 | 27 | 5.64 | 4.61 | Good-Fair | | | |
| Curtis Cr | off SR 1227 | McDowell | 11-10-(6) | 8/8/02 | --- | 30 | --- | 3.35 | Good | | | |
| Curtis Cr | | | | 8/7/97 | --- | 34 | --- | 2.46 | Good | | | |
| Curtis Cr | | | | 2/10/92 | --- | 42 | 2.13 | 2.10 | Good | | | |
| Curtis Cr | | | | 4/19/85 | 97 | 44 | 3.86 | 2.37 | Good | | | |
| Curtis Cr | US 70 below WWTP | McDowell | 11-10-(14) | 6/15/94 | --- | 30 | --- | 2.65 | Good | | | |
| Curtis Cr | | | | 4/18/85 | 56 | 25 | 5.76 | 3.11 | Fair | | | |
| Crooked Cr | SR 1135 | McDowell | 11-12 | 8/7/02 | 74 | 32 | 4.41 | 3.65 | Good | | | |
| Crooked Cr | | | | 8/6/97 | 69 | 38 | 4.25 | 3.74 | Good | | | |
| Crooked Cr | | | | 7/8/92 | --- | 32 | --- | 3.02 | Good | | | |
| Mackey Cr | SR 1453 | McDowell | 11-15-(3.5) | 8/8/02 | --- | 23 | --- | 3.32 | Not Impaired | | | |
| Mackey Cr | | | | 8/6/97 | --- | 29 | --- | 2.92 | Good | | | |
| Mackey Cr | | | | 2/11/92 | --- | 45 | --- | 1.98 | Excellent | | | |
| Mackey Cr | | | | above US 70 | McDowell | 11-15-(3.5) | 3/25/98 | 68 | 37 | 3.60 | 2.72 | Good |
| Mackey Cr | | | | below US 70 | McDowell | 11-15-(3.5) | 10/2/96 | 68 | 30 | 4.36 | 3.82 | Good |
| Mackey Cr | below US 70 | McDowell | 11-15-(3.5) | 8/6/02 | 67 | 30 | 4.24 | 3.68 | Good | | | |
| Mackey Cr | | | | 3/25/98 | 29 | 15 | 4.44 | 3.92 | Fair | | | |
| Mackey Cr | | | | 10/2/96 | 43 | 25 | 4.90 | 4.47 | Good-Fair | | | |
| Buck Cr | off NC 80 | McDowell | 11-19-(1) | 8/5/02 | --- | 31 | --- | 3.03 | Good | | | |
| Buck Cr | | | | 8/6/97 | --- | 38 | --- | 2.58 | Excellent | | | |
| Buck Cr | | | | 6/14/94 | 75 | 41 | 3.28 | 2.47 | Excellent | | | |
| Buck Cr | | | | 2/10/92 | --- | 42 | --- | 2.19 | Excellent | | | |
| Buck Cr | | | | US 70 | McDowell | 11-19-(14) | 6/14/94 | 58 | 20 | 4.64 | 3.40 | Good-Fair |
| L Buck Cr | SR 1436 | McDowell | 11-19-11 | 8/6/02 | --- | 35 | --- | 2.74 | Good | | | |
| L Buck Cr | | | | 8/6/97 | --- | 37 | --- | 2.44 | Excellent | | | |
| L Buck Cr | | | | 2/10/92 | --- | 43 | --- | 2.00 | Excellent | | | |
| L Buck Cr | | | | 7/9/91 | 60 | 37 | 2.75 | 2.31 | Good | | | |

| Waterbody | Location | County | Index No. | Date | ST | EPT | BI | EPT BI | Rating |
|-----------------------|---------------------------|----------|-----------------|----------|-----------|-----|------|--------|--------------|
| Toms Cr | SR 1434 | McDowell | 11-21-(2) | 8/5/02 | --- | 26 | --- | 2.41 | Not Impaired |
| | | | | 8/4/97 | 62 | 33 | 3.17 | 2.59 | Good |
| | | | | 7/7/92 | 75 | 37 | 3.54 | 2.68 | Excellent |
| | | | | 2/10/92 | --- | 49 | --- | 2.29 | Excellent |
| N Fk Catawba R | Linville Falls | McDowell | 11-24-(1) | 1/9/91 | --- | 37 | --- | 1.89 | Good |
| | | | | 1/9/91 | --- | 42 | --- | 2.57 | Good |
| N Fk Catawba R | US 221 | McDowell | 11-24-(1) | 1/9/91 | --- | 42 | --- | 2.57 | Good |
| N Fk Catawba R | SR 1573 | McDowell | 11-24-(1) | 8/6/02 | --- | 28 | --- | 3.78 | Good |
| | | | | 8/8/97 | --- | 37 | --- | 2.74 | Excellent |
| | | | | 1/9/91 | --- | 37 | --- | 2.83 | Good |
| N Fk Catawba R | SR 1560 | McDowell | 11-24-(1) | 8/6/02 | 74 | 23 | 5.90 | 4.92 | Fair |
| | | | | 8/5/97 | 81 | 39 | 3.89 | 3.09 | Good |
| | | | | 7/7/92 | 95 | 41 | 4.19 | 3.30 | Good |
| | | | | 1/9/91 | --- | 44 | --- | 2.60 | Excellent |
| N Fk Catawba R | below Sevier | McDowell | 11-24-(1) | 8/5/97 | 84 | 39 | 4.52 | 3.48 | Good |
| | | | | 7/7/92 | 88 | 43 | 4.03 | 3.27 | Excellent |
| Laurel Br | US 221 | McDowell | 11-24-3 | 1/8/91 | --- | 32 | --- | 1.37 | Good |
| Pond Br | SR 1560 | McDowell | 11-24-4 | 1/9/91 | --- | 24 | --- | 1.54 | Good |
| Stillhouse Br | SR 1560 | McDowell | 11-24-6 | 1/9/91 | --- | 25 | --- | 1.55 | Good |
| Honeycutt Cr | US 221 | McDowell | 11-24-8 | 1/9/91 | --- | 44 | --- | 2.60 | Good |
| Pepper Cr | US 221 | McDowell | 11-24-10 | 1/8/91 | --- | 42 | --- | 2.53 | Good |
| Armstrong Cr | end of FS Rd | McDowell | 11-24-14-(1.5) | 8/6/02 | --- | 38 | --- | 2.80 | Excellent |
| | | | | 8/5/97 | --- | 36 | --- | 2.15 | Excellent |
| | | | | 7/7/92 | --- | 38 | --- | 2.10 | Excellent |
| Three Mile Cr | SR 1443 | McDowell | 11-24-14-10 | 6/14/94 | --- | 40 | --- | 2.17 | Excellent |
| Cox Cr | OFF NC 226 | McDowell | 11-24-14-12 | 6/14/94 | --- | 37 | --- | 2.89 | Excellent |
| Armstrong Cr | off NC 226 | | 11-24-14-(13.5) | 6/14/94 | 99 | 48 | 3.47 | 2.60 | Excellent |
| Paddy Cr | NC 126 | Burke | 11-29 | 5/19/99 | --- | 36 | --- | 2.80 | Good |
| Linville R | off NC 105 ab golf course | Avery | 11-29-(1) | 6/9/97 | 60 | 32 | 2.90 | 1.86 | Good |
| Linville R | NC 105, near Briery Knob | Avery | 11-29-(1) | 6/9/97 | --- | 32 | --- | 2.18 | Good |
| Linville R | US 221 | Avery | 11-29-(1) | 11/8/89 | --- | 27 | --- | 3.30 | Good-Fair |
| | | | | 8/6/02 | --- | 28 | --- | 3.90 | Good |
| | | | | 8/5/97 | --- | 27 | --- | 3.25 | Good-Fair |
| | | | | 6/10/97 | --- | 24 | --- | 3.24 | Good-Fair |
| | | | | 7/6/92 | --- | 30 | --- | 3.27 | Good |
| L Grassy Cr | off NC 105 ab golf course | Avery | 11-29-2 | 11/8/89 | --- | 22 | --- | 3.98 | Good-Fair |
| | | | | 6/9/97 | 60 | 37 | 1.83 | 1.06 | Excellent |
| W Fk Linville R | SR 1349 | Avery | 11-29-4 | 11/8/89 | --- | 39 | --- | 1.76 | Good |
| Grandmother Cr | SR 1511 | Avery | 11-29-5-(2) | 11/7/89 | --- | 30 | --- | 2.62 | Good |
| Linville R | NC 126 | Burke | 11-29-(23) | 8/23/02 | 91 | 48 | 4.21 | 3.47 | Excellent |
| | | | | 8/7/02 | 90 | 47 | 3.98 | 3.20 | Excellent |
| | | | | 8/4/97 | 107 | 53 | 4.05 | 3.11 | Excellent |
| | | | | 7/7/92 | 108 | 48 | 4.14 | 3.14 | Excellent |
| | | | | 7/9/91 | 84 | 43 | 4.03 | 3.02 | Excellent |
| | | | | 1/8/91 | --- | 48 | --- | 2.51 | Excellent |
| | | | | 10/24/90 | 94 | 47 | 3.81 | 2.75 | Excellent |
| | | | | 7/27/90 | 104 | 46 | 4.22 | 3.13 | Excellent |
| | | | | 4/10/90 | 113 | 54 | 3.70 | 2.39 | Excellent |
| | | | | 1/22/90 | --- | 49 | --- | 2.14 | Excellent |
| | | | | 1/22/90 | 94 | 56 | 3.45 | 2.50 | Excellent |
| | | | | 11/7/89 | 100 | 54 | 3.42 | 2.62 | Excellent |
| | | | | 11/7/89 | --- | 48 | --- | 2.52 | Excellent |
| | | | | 8/8/89 | --- | 45 | --- | 3.10 | Excellent |
| | | | | 8/8/89 | 99 | 46 | 3.93 | 2.75 | Excellent |
| | | | | 3/29/89 | 89 | 43 | 3.67 | 3.18 | Good |
| | | | | 2/15/89 | 113 | 59 | 3.83 | 2.88 | Excellent |
| 2/15/89 | --- | 41 | --- | 2.77 | Excellent | | | | |
| 8/3/87 | --- | 42 | --- | 3.30 | Excellent | | | | |
| 7/23/87 | 113 | 48 | 4.52 | 3.32 | Excellent | | | | |
| 8/16/85 | 101 | 41 | 5.11 | 3.69 | Good | | | | |
| 8/10/83 | 105 | 45 | 4.61 | 3.45 | Good | | | | |

| Waterbody | Location | County | Index No. | Date | ST | EPT | BI | EPT BI | Rating |
|-------------------|-----------------------|----------|----------------|----------|-----|-----|------|--------|-----------|
| Catawba R | SR 1147 | Burke | 11-(31) | 8/8/02 | 60 | 21 | 4.03 | 2.97 | Good |
| | | | | 8/8/97 | 66 | 30 | 4.25 | 3.21 | Good |
| | | | | 8/12/88 | 79 | 34 | 4.83 | 3.36 | Good |
| N Muddy Cr | SR 1750 | McDowell | 11-32-1-(0.5) | 8/5/02 | 77 | 32 | 5.53 | 4.61 | Good-Fair |
| | | | | 8/4/97 | 63 | 33 | 4.76 | 4.26 | Good |
| | | | | 7/8/92 | 80 | 32 | 4.95 | 4.46 | Good-Fair |
| Youngs Fk | SR 1819 | McDowell | 11-32-1-4 | 4/17/85 | 85 | 35 | 5.48 | 4.16 | Good-Fair |
| | | | | 8/7/02 | 66 | 22 | 5.79 | 4.65 | Good-Fair |
| | | | | 4/9/01 | 52 | 15 | 5.36 | 4.73 | Fair |
| | | | | 8/8/97 | --- | 16 | --- | 5.02 | Fair |
| | | | | 9/12/90 | 55 | 17 | 6.11 | 5.36 | Fair |
| | | | | 4/17/85 | 64 | 19 | 6.67 | 4.80 | Fair |
| Youngs Fk | off NC 226 | McDowell | 11-32-1-4 | 4/9/01 | 30 | 5 | 7.46 | 6.52 | Poor |
| Jacktown Cr | US 226 | McDowell | 11-32-1-4-1 | 4/9/01 | 54 | 19 | 4.88 | 3.93 | Fair |
| Youngs Fk | SR 1794 | McDowell | 11-32-1-4 | 4/9/01 | 62 | 16 | 6.20 | 4.16 | Fair |
| | | | | 9/12/90 | 44 | 8 | 7.16 | 6.61 | Poor |
| | | | | 4/17/85 | 58 | 17 | 6.62 | 4.60 | Fair |
| S Muddy Cr | SR 1764 | McDowell | 11-32-2-(8.5) | 8/5/02 | --- | 23 | --- | 4.21 | Good-Fair |
| | | McDowell | | 8/4/97 | --- | 24 | --- | 3.67 | Good-Fair |
| | | McDowell | | 7/8/92 | --- | 27 | --- | 3.64 | Good-Fair |
| High Shoals Cr | SR 1798 | McDowell | 11-32-2-6 | 7/22/86 | 76 | 32 | 4.30 | 2.91 | Good |
| Canoe Cr | SR 1250 | Burke | 11-33-(2) | 8/21/02 | --- | 28 | --- | 3.50 | Good |
| | | | | 8/04/97 | --- | 19 | --- | 4.05 | Good-Fair |
| | | | | 8/03/92 | --- | 25 | --- | 3.13 | Good-Fair |
| 03-08-31 | | | | | | | | | |
| Catawba R | NC 181 | Burke | 11-(31) | 08/22/02 | 46 | 21 | 4.44 | 3.54 | Good-Fair |
| | | | | 08/04/97 | 57 | 23 | 4.56 | 3.12 | Good-Fair |
| | | | | 07/06/92 | 76 | 30 | 4.79 | 3.71 | Good |
| Silver Cr | SR 1127 | Burke | 11-34-(0.5) | 08/21/02 | --- | 25 | --- | 3.74 | Good-Fair |
| | SR 1149 | Burke | 11-34-(0.5) | 08/04/97 | 73 | 32 | 5.26 | 4.48 | Good-Fair |
| Clear Cr | Ab Hospital Reservoir | Burke | 11-34-6-(1) | 08/03/92 | 71 | 29 | 5.53 | 4.46 | Good-Fair |
| | | | | 12/12/91 | --- | 30 | --- | 2.38 | Good |
| Bailey Fork | SR 1102 | Burke | 11-34-8-(2) | 08/03/92 | --- | 24 | --- | 3.30 | Good-Fair |
| Warrior Fk | SR 1440 | Burke | 11-35-(1) | 08/21/02 | --- | 34 | --- | 3.30 | Good |
| | | | | 08/04/97 | --- | 41 | --- | 3.25 | Excellent |
| Upper Cr | NC 181 | Burke | 11-35-2-(1) | 09/22/88 | --- | 46 | --- | 2.38 | Excellent |
| Upper Cr | USFS Rd 128 | Burke | 11-35-2-(1) | 03/29/89 | --- | 44 | --- | 2.53 | Good |
| | | | | 10/24/88 | --- | 34 | --- | 2.73 | Good |
| | | | | 09/21/88 | --- | 26 | --- | 3.37 | Good-Fair |
| Upper Cr | Ab USFS Rd 982 | Burke | 11-35-2-(1) | 06/13/94 | 100 | 51 | 3.58 | 2.60 | Excellent |
| UT Upper Cr | Ab Timbered Br | Burke | 11-35-2-(1) | 06/08/93 | 94 | 47 | 3.54 | 2.61 | Excellent |
| | | | | 06/13/94 | 56 | 27 | 3.30 | 2.20 | Excellent |
| Timbered Br | USFS Road 982 | Burke | 11-35-2-9 | 06/08/93 | 63 | 27 | 3.69 | 2.15 | Excellent |
| | | | | 06/13/94 | 79 | 47 | 2.86 | 2.28 | Not Rated |
| Upper Cr | Be USFS Rd 982 | Burke | 11-35-2-(8.5) | 06/08/93 | 74 | 38 | 3.15 | 2.10 | Not Rated |
| | | | | 09/21/88 | --- | 20 | --- | 2.98 | Good-Fair |
| | | | | 06/13/94 | 103 | 57 | 3.45 | 2.63 | Excellent |
| Upper Cr | At Optimist's Park | Burke | 11-35-2-(10) | 06/08/93 | 108 | 58 | 3.44 | 2.38 | Excellent |
| | | | | 09/21/88 | 108 | 45 | 4.47 | 3.12 | Excellent |
| Steels Cr | USFS Rd 128 | Burke | 11-35-2-12-(1) | 05/17/90 | --- | 48 | --- | 1.73 | Excellent |
| Gingercake Cr | USFS Rd 496 | Burke | 11-35-2-12-3 | 09/22/88 | --- | 38 | --- | 2.70 | Excellent |
| | | | | 05/17/90 | --- | 39 | --- | 1.68 | Excellent |
| | | | | 10/25/88 | --- | 31 | --- | 1.38 | Excellent |
| Buck Cr | Ab Steels Cr | Burke | 11-35-2-12-4 | 05/17/90 | --- | 40 | --- | 1.78 | Excellent |
| Little Fork | USFS Rd 128 | Burke | 11-35-2-12-6 | 09/21/88 | --- | 38 | --- | 2.45 | Excellent |
| | | | | 03/19/86 | 102 | 45 | 3.27 | 2.38 | Excellent |
| Steels Cr | Ab NC 181 | Burke | 11-35-2-12-(7) | 05/17/90 | --- | 49 | --- | 2.12 | Excellent |
| Upper Cr | SR 1407 | Burke | 11-35-2-(13) | 09/22/88 | 105 | 43 | 4.50 | 3.33 | Good |
| | | | | 10/25/88 | --- | 34 | --- | 3.35 | Good |
| Upper Cr | SR 1439 | Burke | 11-35-2-(13) | 09/20/88 | 100 | 42 | 4.77 | 3.60 | Good |

| Waterbody | Location | County | Index No. | Date | ST | EPT | BI | EPT BI | Rating |
|----------------------|----------------------------|----------|---------------|----------|-----|-----|------|--------|-----------------|
| Johns R | SR 1367 | Caldwell | 11-38-(1) | 03/28/89 | --- | 45 | --- | 2.25 | Good |
| Johns R | SR 1356 | Caldwell | 11-38-(9) | 08/22/02 | --- | 42 | --- | 3.46 | Excellent |
| | | | | 08/05/97 | --- | 49 | --- | 2.56 | Excellent |
| | | | | 08/03/92 | --- | 43 | --- | 3.15 | Excellent |
| | | | | 03/28/89 | --- | 40 | --- | 2.69 | Good |
| | | | | 10/30/84 | 108 | 48 | 4.10 | 2.85 | Excellent |
| Gragg Pr | SR 1462 | Caldwell | 11-38-10 | 03/27/89 | --- | 47 | --- | 2.34 | Good |
| Anthony Cr | Ab Gragg Pr | Caldwell | 11-38-10-3 | 03/27/89 | --- | 30 | --- | 2.30 | Good-Fair |
| Johns R | SR 1438 | Burke | 11-38-(28) | 08/22/02 | --- | 35 | --- | 3.44 | Good |
| | | | | 03/28/89 | 116 | 63 | 3.90 | 2.76 | Excellent |
| | | | | 08/10/83 | 89 | 43 | 4.04 | 3.31 | Excellent |
| Mulberry Cr | SR 1368 | Caldwell | 11-38-32-(11) | 03/27/89 | --- | 53 | --- | 2.59 | Excellent |
| Mulberry Cr | SR 1310 | Caldwell | 11-38-32-(15) | 03/27/89 | --- | 43 | --- | 2.86 | Good |
| Wilson Cr | US 221 | Avery | 11-38-34 | 07/23/90 | 65 | 32 | 2.65 | 1.32 | Excellent |
| | | | | 08/08/88 | 81 | 37 | 3.16 | 1.63 | Excellent |
| | | | | 07/24/86 | 67 | 36 | 2.58 | 1.54 | Excellent |
| | | | | 08/28/84 | 38 | 20 | 2.64 | 1.19 | Good |
| Wilson Cr | SR 1358 | Caldwell | 11-38-34 | 07/09/91 | 92 | 50 | 3.78 | 2.88 | Excellent |
| | | | | 03/29/89 | --- | 57 | --- | 2.14 | Excellent |
| | | | | 07/24/86 | 106 | 49 | 3.68 | 2.65 | Excellent |
| Wilson Cr | off SR 1328 Be Mortimer | Caldwell | 11-38-34 | 08/22/02 | 85 | 45 | 3.33 | 2.48 | Excellent |
| Wilson Cr | SR 1335 | Caldwell | 11-38-34 | 08/05/97 | --- | 47 | --- | 2.68 | Excellent |
| Harper Cr | SR 1328 | Caldwell | 11-38-34-14 | 08/22/02 | --- | 42 | --- | 2.78 | Excellent |
| N Harper Cr | USFS Rd 58 | Avery | 11-38-34-14-2 | 08/06/86 | 90 | 43 | 3.68 | 2.36 | Excellent |
| Lower Cr | NC 90 | Caldwell | 11-39-(0.5) | 09/09/02 | 45 | 9 | 6.46 | 5.35 | Poor |
| | | | | 06/10/97 | 51 | 22 | 5.21 | 4.50 | Good-Fair |
| Lower Cr | Harrisburg St, Lenoir | Caldwell | 11-39-(0.5) | 09/15/87 | 65 | 22 | 5.92 | 4.73 | Fair |
| Lower Cr | SR 1303, Fairview Rd | Caldwell | 11-39-(0.5) | 09/10/02 | 57 | 13 | 6.67 | 5.53 | Fair |
| | | | | 06/10/97 | 43 | 18 | 5.36 | 4.35 | Fair |
| Zacks Fk Cr | SR 1531 | Caldwell | 11-39-1 | 09/09/02 | 54 | 19 | 5.67 | 5.02 | Not Impaired |
| Zacks Fk Cr | NC 18/321A | Caldwell | 11-39-1 | 09/10/02 | 32 | 6 | 6.87 | 6.15 | Not Rated |
| | | | | 06/10/97 | --- | 18 | --- | 4.54 | Fair |
| | | | | 09/15/87 | 55 | 19 | 6.05 | 5.39 | Fair |
| Spainhour Cr | SR 1303 | Caldwell | 11-39-3 | 06/11/97 | --- | 14 | --- | 5.03 | Fair |
| Spainhour Cr | NC 18 Bus | Caldwell | 11-39-3 | 09/09/02 | 49 | 15 | 6.46 | 5.82 | Fair |
| UT Spainhour Cr | SR 1513 | Caldwell | 11-39-3 | 09/09/02 | 32 | 13 | 4.66 | 4.38 | Not Rated |
| Blair Fk | NC 90 | Caldwell | 11-39-3-1 | 09/09/02 | 24 | 5 | 6.42 | 5.58 | Not Rated |
| Greasy Cr | NC 18 | Caldwell | 11-39-4 | 09/10/02 | 45 | 14 | 5.70 | 5.19 | Not Rated |
| | | | | 06/11/97 | --- | 15 | --- | 4.31 | Fair |
| Greasy Cr | SR 1305 | Caldwell | 11-39-4 | 09/10/02 | 47 | 13 | 4.86 | 3.99 | Not Rated |
| Abingdon Cr | NC 18 Bypass | Caldwell | 11-39-6 | 09/10/02 | 57 | 20 | 5.60 | 5.11 | Not Impaired |
| Lower Cr | SR 1142, Calico Rd | Caldwell | 11-39-(6.5) | 09/10/02 | 50 | 11 | 6.52 | 5.54 | Fair |
| | | | | 06/11/97 | 39 | 16 | 5.91 | 4.86 | Fair |
| Lower Cr | SR 1501 | Burke | 11-39-(6.5) | 09/11/02 | 55 | 14 | 6.14 | 4.96 | Fair |
| | | | | 06/10/97 | 46 | 19 | 5.52 | 4.87 | Fair |
| | | | | 08/03/92 | 55 | 20 | 5.85 | 4.80 | Fair |
| | | | | 07/10/90 | 62 | 19 | 6.59 | 5.23 | Fair |
| | | | | 07/23/87 | 61 | 18 | 6.82 | 4.85 | Fair |
| | | | | 08/07/84 | 60 | 20 | 6.39 | 5.00 | Fair |
| Celia Cr | | Caldwell | 11-39-7-1-(1) | 09/11/02 | 39 | 10 | 5.78 | 4.77 | Not Rated |
| Husband Cr | Old NC 18 | Caldwell | 11-39-7-(2) | 09/11/02 | 59 | 24 | 5.28 | 4.54 | Not Impaired |
| Husband Cr | NC 18 | Caldwell | 11-39-7-(2) | 09/11/02 | 36 | 14 | 5.24 | 4.34 | Not Rated |
| | | | | 06/11/97 | --- | 20 | --- | 4.77 | Good-Fair |
| Bristol Cr | NC 18 | Caldwell | 11-39-8 | 09/11/02 | 55 | 12 | 5.56 | 4.39 | Not Rated |
| | | | | 06/10/97 | --- | 15 | --- | 4.61 | Fair |
| White Mill Cr | Piney Rd | Caldwell | 11-39-8-1-(2) | 09/11/02 | 37 | 12 | 4.74 | 3.06 | Not Rated |
| Smoky Cr | SR 1515 | Burke | 11-41-1 | 08/21/02 | --- | 26 | --- | 3.55 | Good-Fair |
| | | | | 08/05/97 | --- | 32 | --- | 3.58 | Good |
| | | | | 08/04/92 | --- | 30 | --- | 3.22 | Good |
| McGalliard Cr | SR 1538 | Burke | 11-44-(0.5) | 08/21/02 | --- | 16 | --- | 5.09 | Fair |
| | | | | 08/05/97 | --- | 21 | --- | 4.81 | Good-Fair |
| | | | | 08/04/92 | 66 | 22 | 5.60 | 4.56 | Good-Fair |

| Waterbody | Location | County | Index No. | Date | ST | EPT | BI | EPT BI | Rating |
|------------------------|-----------------------------|-------------|----------------|----------|-----|-----|------|--------|-----------|
| 03-08-32 | | | | | | | | | |
| Huffman Br | Sta 2, be Huffman Finishing | Burke | 11-(51)-1 | 10/11/84 | 13 | 0 | 9.30 | --- | Poor |
| Huffman Br | Sta 3 | Burke | 11-(51)-1 | 10/11/84 | 19 | 1 | 9.25 | 6.22 | Poor |
| Huffman Br | Sta 4 | Burke | 11-(51)-1 | 10/11/84 | 20 | 0 | 8.94 | N/A | Poor |
| Horseford Cr | 16 th Ave NW | Catawba | 11-54-(0.5) | 09/12/02 | 32 | 8 | 6.58 | 6.34 | Fair |
| Gunpowder Cr | SR 1718 | Caldwell | 11-55-(1.5) | 08/21/02 | --- | 23 | --- | 4.68 | Good-Fair |
| Gunpowder Cr | SR 1002 | Caldwell | 11-55-(1.5) | 08/05/97 | --- | 25 | --- | 4.27 | Good-Fair |
| Upper Little R | SR 1740 | Caldwell | 11-58-(5.5) | 08/20/02 | 83 | 33 | 4.91 | 3.93 | Good |
| | | | | 08/06/97 | 90 | 39 | 4.35 | 3.47 | Good |
| | | | | 08/04/92 | 74 | 38 | 4.17 | 3.55 | Good |
| Middle Little R | SR 1153 | Alexander | 11-62 | 08/20/02 | 18 | --- | --- | 3.74 | Good-Fair |
| | | | | 08/06/97 | --- | 26 | --- | 3.95 | Good-Fair |
| | | | | 08/04/92 | 32 | 32 | 4.14 | 4.14 | Good |
| Duck Cr | NC 127 | Alexander | 11-62-2-(4) | 08/20/02 | --- | 33 | --- | 3.76 | Good |
| | | | | 08/06/97 | --- | 26 | --- | 3.93 | Good-Fair |
| | | | | 08/04/92 | --- | 26 | --- | 3.42 | Good-Fair |
| Lower Little R | SR 1313 | Alexander | 11-69 | 07/28/88 | 87 | 32 | 5.19 | 3.51 | Good-Fair |
| | | | | 08/27/88 | --- | 29 | --- | 4.42 | Good |
| | | | | 08/08/85 | 53 | 18 | 5.78 | 5.42 | Fair |
| Lower Little R | SR 1131 | Alexander | 11-69 | 08/20/02 | 61 | 28 | 4.85 | 3.92 | Good-Fair |
| | | | | 08/06/97 | 74 | 34 | 4.94 | 4.19 | Good |
| | | | | 08/04/92 | 70 | 29 | 4.60 | 3.85 | Good |
| Muddy Fk | Ab Schneider Mills | Alexander | 11-69-4 | 06/17/92 | 70 | 19 | 5.53 | 4.46 | Good-Fair |
| Muddy Fk | NC 16, Be WWTP | Alexander | 11-69-4 | 06/16/92 | 66 | 19 | 6.79 | 4.92 | Fair |
| Muddy Fk | SR 1313 | Alexander | 11-69-4 | 08/19/02 | --- | 12 | --- | 6.05 | Fair |
| | | | | 08/06/97 | 76 | 22 | 6.26 | 5.42 | Good-Fair |
| Elk Shoal Cr | SR 1605 | Alexander | 11-73-(0.5) | 08/20/02 | --- | 16 | --- | 5.03 | Good-Fair |
| | | | | 08/07/97 | --- | 18 | --- | 4.48 | Good-Fair |
| | | | | 08/05/92 | --- | 15 | --- | 4.92 | Good-Fair |
| Lyle Cr | US 64/70 | Catawba | 11-76-(3.5) | 08/19/02 | --- | 22 | --- | 4.69 | Good-Fair |
| | | | | 09/07/97 | 51 | 23 | 4.95 | 4.22 | Good-Fair |
| | | | | 08/05/92 | 62 | 22 | 5.66 | 4.88 | Good-Fair |
| McLin Cr | SR 1722 | Catawba | 11-76-5-(0.7) | 08/19/02 | --- | 23 | --- | 5.14 | Good-Fair |
| | | | | 08/07/97 | 57 | 27 | 5.17 | 4.33 | Good-Fair |
| 03-08-33 | | | | | | | | | |
| McDowell Cr | SR 2128 | Mecklenburg | 11-115-(1) | 8/20/02 | 48 | 8 | 6.6 | 5.7 | Fair |
| | | | | 9/13/90 | 54 | 17 | 6.2 | 5.4 | Good-Fair |
| McDowell Cr | SR 2136 | Mecklenburg | 11-115-(1.5) | 9/13/90 | 55 | 15 | 6.5 | 5.8 | Fair |
| Gar Cr | SR 2074 | Mecklenburg | 11-116-(1) | 8/20/97 | --- | 21 | --- | 4.9 | Good |
| | | | | 6/8/94 | 64 | 20 | 5.6 | 4.9 | Good |
| | | | | 8/20/92 | 87 | 24 | 5.5 | 4.6 | Good |
| Dutchmans Cr | SR 1918 | Gaston | 11-119-(0.5) | 8/21/02 | --- | 19 | --- | 5.0 | Good-Fair |
| | | | | 8/19/97 | 73 | 33 | 5.2 | 4.5 | Good |
| | | | | 6/8/94 | 66 | 26 | 5.1 | 4.5 | Good |
| | | | | 8/6/92 | 77 | 33 | 5.6 | 4.7 | Good |
| | | | | 7/26/88 | 83 | 34 | 5.3 | 4.7 | Excellent |
| Leepers Cr | SR 1354 | Lincoln | 11-119-1-(1) | 6/9/94 | --- | 31 | --- | 3.4 | Excellent |
| Leepers Cr | NC 73 | Lincoln | | 6/9/94 | 71 | 30 | 5.0 | 4.3 | Excellent |
| Leepers Cr | NC 150 | Lincoln | | 6/12/84 | 86 | 30 | 4.9 | 4.3 | Excellent |
| Leepers Cr | SR 1820 | Gaston | 11-119-1-(12) | 6/8/94 | --- | 29 | --- | 4.3 | Excellent |
| Killian Cr | SR 1511 | Lincoln | 11-119-2-(0.5) | 8/20/02 | --- | 12 | --- | 5.0 | Fair |
| | | | | 8/19/97 | --- | 24 | --- | 3.9 | Good |
| | | | | 6/8/94 | 82 | 33 | 5.1 | 4.9 | Excellent |
| | | | | 8/5/92 | --- | 28 | --- | 4.9 | Excellent |

| Waterbody | Location | County | Index No. | Date | ST | EPT | BI | EPT BI | Rating |
|-----------------|-----------------|-------------|-----------------|----------|-----|-----|------|-----------|-----------|
| 03-08-34 | | | | | | | | | |
| Long Cr | SR 2042 | Mecklenburg | 11-120-(7) | 7/12/879 | 65 | 17 | 6.1 | 5.7 | Good-Fair |
| Sugar Cr | SC 160 | York, SC | 11-137 | 8/19/02 | 34 | 7 | 6.4 | 6.1 | Fair |
| | | | | 8/21/97 | 57 | 12 | 6.9 | 6.1 | Fair |
| | | | | 8/19/92 | 58 | 21 | 6.7 | 5.6 | Good-Fair |
| | | | | 7/8/91 | 49 | 14 | 6.7 | 6.1 | Fair |
| | | | | 7/24/90 | 39 | 7 | 7.0 | 5.6 | Fair |
| | | | | 7/25/88 | 53 | 9 | 7.9 | 6.6 | Poor |
| | | | | 7/23/86 | 40 | 2 | 8.5 | 8.9 | Poor |
| | | | | 8/6/84 | 45 | 9 | 8.0 | 6.1 | Poor |
| | | | | 11/8/83 | 30 | 3 | 8.2 | 6.1 | Poor |
| | | | | 8/20/02 | --- | 5 | --- | 7.0 | Poor |
| Sugar Cr | SR 1156 | Mecklenburg | 11-137-1 | 8/21/97 | --- | 7 | --- | 6.1 | Fair |
| | | | | 8/18/92 | 55 | 8 | 7.7 | 6.7 | Poor |
| Irwin Cr | I-77 | Mecklenburg | 11-137-1 | 8/18/92 | 55 | 8 | 7.7 | 6.7 | Poor |
| Irwin Cr | SR 2523 | Mecklenburg | 11-137-1 | 2/28/90 | 52 | 17 | 6.0 | 5.0 | Good-Fair |
| Irwin Cr | Ab Landfill | Mecklenburg | 11-137-1 | 10/17/84 | 50 | 13 | 7.4 | 6.1 | Fair |
| Irwin Cr | Bel Landfill | Mecklenburg | 11-137-1 | 10/17/84 | 36 | 11 | 7.6 | 6.0 | Fair |
| Irwin Cr | Ab WWTP | Mecklenburg | 11-137-1 | 11/9/83 | 23 | 2 | 8.2 | 6.9 | Poor |
| Stewart Cr | SR 2050 | Mecklenburg | 11-137-1-2 | 2/27/90 | 37 | 14 | 6.6 | 3.9 | Not Rated |
| McCullough Br | NC 51 | Mecklenburg | 11-137-7 | 2/27/90 | 34 | 5 | 7.6 | 6.9 | Not Rated |
| L Sugar Cr | Polk Street | Mecklenburg | 11-137-8 | 8/19/02 | --- | 6 | --- | 6.7 | Poor |
| L Sugar Cr | NC 51 | Mecklenburg | 11-137-8 | 8/21/97 | --- | 7 | --- | 6.9 | Fair |
| | | | | 9/19/92 | 43 | 3 | 8.1 | 6.3 | Poor |
| L Sugar Cr | Archdale Rd | Mecklenburg | 11-137-8 | 11/9/83 | 15 | 1 | 8.8 | 7.4 | Poor |
| UT Edwards Br | Sheffield Park | Mecklenburg | 11-137-8-2-1 | 8/10/00 | 10 | 0 | 7.1 | 0 | Not Rated |
| Edwards Br | Campbell St | Mecklenburg | 11-137-8-2-1 | 8/10/00 | 13 | 3 | 7.7 | 7.5 | Not Rated |
| Edwards Br | Sheffield St | Mecklenburg | 11-137-8-2-1 | 8/10/00 | 14 | 3 | 7.8 | 6.7 | Not Rated |
| McAlpine Cr | NC 51 | Mecklenburg | 11-137-9 | 8/19/02 | 43 | 7 | 7.0 | 6.0 | Fair |
| | | | | 8/21/97 | 59 | 17 | 6.9 | 6.0 | Fair |
| | | | | 8/19/92 | 55 | 9 | 7.2 | 5.7 | Fair |
| McAlpine Cr | Dorman Rd | York, SC | 11-137-9 | 8/19/92 | 40 | 11 | 7.0 | 6.3 | Fair |
| McAlpine Cr | Ab WWTP | Mecklenburg | 11-137-9 | 3/26/87 | 33 | 5 | 7.5 | 5.3 | Poor |
| McAlpine Cr | Bel WWTP | Mecklenburg | 11-137-9 | 3/26/87 | 18 | 2 | 7.8 | 3.7 | Poor |
| McAlpine Cr | Sardis Rd | Mecklenburg | 11-137-9 | 3/26/87 | 45 | 12 | 6.1 | 5.0 | Fair |
| McAlpine Cr | NC 521 | Mecklenburg | 11-137-9 | 11/9/83 | 61 | 12 | 6.7 | 5.8 | Fair |
| | | | | 11/9/83 | 24 | 3 | 8.5 | 6.4 | Poor |
| Walker Br | NC 49 | Mecklenburg | 11-137-10-1 | 2/27/90 | 68 | 18 | 6.1 | 5.5 | Good-Fair |
| 03-08-35 | | | | | | | | | |
| S Fk Catawba R | NC 10 | Catawba | 11-129-(0.5) | 8/18/97 | 60 | 25 | 5.56 | 4.70 | Good |
| | | | | 8/17/92 | 75 | 24 | 6.20 | 5.05 | Good-Fair |
| | | | | 7/9/90 | 56 | 16 | 6.57 | 5.27 | Fair |
| | | | | 7/28/88 | 67 | 24 | 6.25 | 5.07 | Good-Fair |
| | | | | 7/21/86 | 49 | 12 | 6.59 | 4.68 | Fair |
| | | | | 8/7/84 | 67 | 26 | 5.28 | 4.15 | Good-Fair |
| | | | | 9/10/84 | 77 | 29 | 5.58 | 4.17 | Good |
| S Fk Catawba R | NC 27 | Lincoln | 11-129-(3.5) | 9/10/84 | 77 | 29 | 5.58 | 4.17 | Good |
| Henry Fk | SR 1854 | Burke | 11-129-1-(1) | 9/13/01 | 38 | 18 | 5.5 | 5.2 | Fair |
| Henry Fk | SR 1803 | Burke | 11-129-1-(1) | 9/12/01 | 79 | 33 | 5.1 | 4.3 | Good-Fair |
| Henry Fk | SR 1918 | Burke | 11-129-1-(1) | 4/18/88 | 106 | 53 | 3.29 | 2.11 | Excellent |
| Henry Fk | SR 1922 | Burke | 11-129-1-(2) | 4/19/88 | 116 | 62 | 3.59 | 2.52 | Excellent |
| Henry Fk | NC 18 | Burke | 11-129-1-(2) | 4/20/88 | 127 | 65 | 3.84 | 2.68 | Excellent |
| UT Henry Fk | SR 1915 | Burke | 11-129-1-(2) | 4/20/88 | 110 | 52 | 3.83 | 2.33 | Good |
| He Cr | Ab Water Intake | Burke | 11-129-1-4-(1) | 4/20/88 | --- | 45 | --- | 2.01 | Excellent |
| Ivy Cr | SR 1919 | Burke | 11-129-1-6 | 4/19/88 | --- | 42 | --- | 2.36 | Good |
| Long Br | SR 1917 | Burke | 11-129-1-8 | 4/19/88 | --- | 46 | --- | 2.87 | Excellent |
| Rock Cr | SR 1915 | Burke | 11-129-1-12 | 4/19/88 | --- | 43 | --- | 2.84 | Good |
| Henry Fk | SR 1124 | Catawba | 11-129-1-(12.5) | 8/22/02 | 95 | 38 | 4.7 | 3.3 | Good |
| | | | | 8/18/97 | 76 | 38 | 3.90 | 3.30 | Good |
| | | | | 8/22/92 | 74 | 38 | 4.58 | 3.75 | Good |
| | | | | 7/10/89 | 64 | 27 | 4.65 | 4.22 | Good |
| | | | | 7/22/87 | 73 | 25 | 5.09 | 4.01 | Good-Fair |
| | | | | 7/21/86 | 79 | 28 | 5.39 | 3.88 | Good-Fair |
| Henry Fk | SR 1008 | Catawba | 11-129-1-(12.5) | 11/16/83 | 27 | 5 | 6.87 | 4.20 | Poor |

| Waterbody | Location | County | Index No. | Date | ST | EPT | BI | EPT BI | Rating |
|-----------------------------|---------------------------------|--------------------|----------------------------------|----------|-----|-----|------|--------|-----------|
| UT Henry Fk | SR 1213 | Catawba | | 6/20/85 | 29 | 8 | 6.34 | 4.23 | Fair |
| | | | | 6/20/85 | 31 | 7 | 6.24 | 2.71 | Fair |
| UT Henry Fk | SR 1148 | Burke | | 2/9/87 | --- | 36 | --- | 2.13 | Excellent |
| UT Henry Fk | US 64 | Burke | | 2/9/87 | --- | 0 | --- | 0 | Poor |
| UT Henry Fk | Be Discharge I-40 | Burke | | 2/9/87 | --- | 5 | --- | 5.96 | Poor |
| UT Henry Fk | | Burke | | 2/9/87 | --- | 17 | --- | 3.40 | Good-Fair |
| Jacob Fk | S Mt St Pk | Burke | 11-129-2-(1) | 5/18/90 | --- | 42 | --- | 2.49 | Excellent |
| Jacob Fk | SR 1904 | Burke | 11-129-2-(1) | 5/18/90 | --- | 42 | --- | 2.31 | Excellent |
| Jacob Fk | SR 1924 | Burke | 11-129-2-(1) | 8/22/02 | --- | 35 | --- | 3.3 | Good |
| | | | | 8/18/97 | 99 | 47 | 4.06 | 3.20 | Excellent |
| | | | | 8/20/92 | 104 | 48 | 4.48 | 3.32 | Excellent |
| | | | | 10/24/90 | 102 | 50 | 3.95 | 2.60 | Excellent |
| | | | | 7/10/90 | 92 | 45 | 4.77 | 4.01 | Excellent |
| | | | | 5/18/90 | --- | 48 | --- | 2.56 | Excellent |
| | | | | 1/25/90 | 86 | 55 | 3.41 | 2.87 | Excellent |
| | | | | 7/22/87 | 96 | 35 | 4.96 | 3.76 | Good |
| | | | | 8/6/85 | 75 | 32 | 5.14 | 3.99 | Good-Fair |
| | | | | 5/18/90 | --- | 41 | --- | 2.13 | Excellent |
| | | | | 11/16/83 | 79 | 35 | --- | --- | Good |
| Jacob Fk | NC 27 | Catawba | 11-129-2-(9.5) | 11/16/83 | 79 | 35 | --- | --- | Good |
| Jacob Fk | SR 1139 | Catawba | 11-129-2-(9.5) | 11/16/83 | 69 | 23 | --- | --- | Good-Fair |
| Hop Cr | SR 1131 | Catawba | 11-129-2-14 | 6/19/85 | 86 | 36 | 4.56 | 3.44 | Good |
| Howards Cr | SR 1200 | Lincoln | 11-129-4 | 8/21/02 | --- | 17 | --- | 4.5 | Good-Fair |
| | | | | 8/19/97 | --- | 25 | --- | 4.15 | Good |
| | | | | 8/17/92 | --- | 25 | --- | 4.33 | Good |
| Clark Cr | US 64 | Catawba | 11-129-5-(0.3) | 9/12/84 | 57 | 15 | 6.14 | 5.15 | Good-Fair |
| Clark Cr | SR 1149 | Catawba | 11-129-5-(0.3) | 4/17/01 | 49 | 20 | 5.6 | 4.6 | Good-Fair |
| | | | | 7/26/00 | 37 | 13 | 6.0 | 5.6 | Fair |
| | | | | 8/5/92 | --- | 16 | --- | 5.74 | Good-Fair |
| | | | | 9/12/84 | 60 | 16 | 6.65 | 5.81 | Good-Fair |
| Clark Cr | SR 2014 | Catawba | 11-129-5-(0.3) | 9/12/90 | 50 | 13 | 7.16 | 6.46 | Fair |
| | | | | 9/12/84 | 59 | 15 | 6.79 | 6.17 | Fair |
| | | | | 6/12/84 | 59 | 16 | 6.25 | 5.80 | Good-Fair |
| Clark Cr | SR 2012 | Catawba | 11-129-5-(0.3) | 7/26/00 | 38 | 13 | 6.0 | 5.6 | Fair |
| | | | | 9/12/90 | 40 | 6 | 7.11 | 5.33 | Fair |
| | | | | 9/12/84 | 64 | 19 | 7.11 | 6.26 | Good-Fair |
| | | | | 6/12/84 | 46 | 14 | 6.51 | 5.81 | Good-Fair |
| Clark Cr | SR 1274 | Catawba | 11-129-5-(9.5) | 9/12/84 | 70 | 16 | 6.92 | 6.06 | Fair |
| Clark Cr | 16 th St | Catawba | 11-129-5-(9.5) | 4/17/01 | 28 | 9 | 7.2 | 5.7 | Not Rated |
| Clark Cr | Sweetwater Rd | Catawba | 11-129-5-(9.5) | 4/17/01 | 19 | 3 | 7.6 | 6.5 | Not Rated |
| Clark Cr Clark Cr | 20 th Ave SR 1008 | Catawba Lincoln | 11-129-5-(9.5) 11-129-5-(9.5) | 7/18/00 | 22 | 8 | 6.6 | 6.4 | Not Rated |
| | | | | 8/14/00 | 42 | 10 | 6.5 | 6.0 | Fair |
| | | | | 8/21/02 | 47 | 9 | 6.2 | 5.1 | Fair |
| | | | | 8/19/97 | 48 | 16 | 5.72 | 5.16 | Good-Fair |
| | | | | 8/5/92 | 48 | 10 | 6.67 | 5.63 | Fair |
| | | | | 7/27/88 | 54 | 11 | 6.78 | 6.11 | Fair |
| | | | | 8/5/85 | 48 | 13 | 7.14 | 6.25 | Fair |
| | | | | 9/11/84 | 79 | 27 | 6.62 | 5.40 | Good |
| | | | | 11/16/83 | 38 | 9 | --- | --- | Fair |
| | | | | 7/26/00 | 37 | 16 | 5.5 | 5.2 | Not Rated |
| Cline Cr | SR 1164 | Catawba | 11-129-5-2 | 9/12/84 | 50 | 11 | 7.16 | 6.21 | Fair |
| Town Cr | US 321 | Catawba | 11-129-5-4 | 8/14/00 | 49 | 14 | 5.6 | 5.4 | Good-Fair |
| Pinch Gut Cr | SR 2007 | Catawba | 11-129-5-7 | 4/17/01 | 76 | 29 | 5.3 | 4.3 | Good |
| Maiden Cr | SR 1858 | Catawba | 11-129-5-7-2-(1) | 3/18/93 | 55 | 22 | 4.85 | 4.02 | Good |
| Maiden Cr | SR 1810 | Catawba | 11-129-5-7-2-(3) | 8/21/02 | 31 | 5 | 7.1 | 6.4 | Fair |
| Maiden Cr | SR 2007 | Catawba | 11-129-5-7-2-(3) | 3/18/93 | 67 | 26 | 4.93 | 4.26 | Good |
| | | | | 9/11/84 | 86 | 18 | 6.55 | 5.76 | Good-Fair |
| Shady Br | SR 2005 | Catawba | 11-129-5-7-3 | 9/11/84 | 32 | 1 | 8.86 | 7.37 | Poor |
| Carpenter Cr | US 321 | Lincoln | 11-129-5-9 | 4/17/01 | 57 | 27 | 4.6 | 4.4 | Not Rated |
| Carpenter Cr | US 301 | Lincoln | 11-129-5-9 | 6/9/94 | 64 | 28 | 4.47 | 3.90 | Good |
| | | | | 9/11/84 | 85 | 30 | 4.94 | 4.61 | Excellent |
| Walker Cr | SR 1405 | Lincoln | 11-129-5-10 | 9/11/84 | 75 | 18 | 7.09 | 6.11 | Good-Fair |

| Waterbody | Location | County | Index No. | Date | ST | EPT | BI | EPT BI | Rating |
|------------------------|-------------|---------|-----------------|----------|-----|-----|------|--------|-----------|
| Indian Cr Indian Cr | SR 1177 | Lincoln | 11-129-8-(5) | 8/21/02 | --- | 13 | --- | 4.8 | Fair |
| | SR 1252 | Lincoln | 11-129-8-(5) | 8/19/97 | 73 | 24 | 5.23 | 4.63 | Good |
| | | | | 8/17/92 | 79 | 29 | 6.06 | 5.38 | Good |
| | | | | 7/22/87 | 67 | 18 | 6.33 | 5.52 | Good-Fair |
| | | | | 7/23/86 | 77 | 18 | 6.58 | 5.40 | Good-Fair |
| | | | | 11/16/83 | 50 | 6 | 6.90 | 5.36 | Fair |
| | | | | 8/12/83 | 51 | 12 | 6.39 | 6.00 | Good-Fair |
| Hoyle Cr | SR 1836 | Gaston | 11-129-15-(4) | 11/15/83 | 50 | 15 | 6.12 | 4.88 | Good-Fair |
| Mauney Cr | SR 1831 | Gaston | 11-129-15-5 | 5/13/97 | 49 | 11 | 6.73 | 5.34 | Fair |
| 03-08-36 | | | | | | | | | |
| S Fk Catawba R | SR 2003 | Gaston | 11-129-(15.5) | 8/11/83 | 49 | 19 | 6.51 | 5.65 | Good-Fair |
| S Fk Catawba R | NC 7 | Gaston | 11-129-(15.5) | 8/20/97 | 61 | 16 | 6.02 | 5.05 | Good-Fair |
| | | | | 8/18/92 | 63 | 18 | 6.70 | 5.40 | Good-Fair |
| | | | | 7/11/89 | 62 | 15 | 6.32 | 4.72 | Good-Fair |
| | | | | 7/20/87 | 65 | 23 | 6.50 | 5.43 | Good-Fair |
| | | | | 8//585 | 55 | 16 | 7.02 | 5.34 | Fair |
| | | | | 11/15/83 | 7 | 2 | 7.82 | 5.64 | Poor |
| Limekiln Cr | Kiser Dairy | Gaston | 11-129-16-2 | 5/21/01 | 60 | 6 | 7.4 | 3.2 | Not Rated |
| Limekiln Cr | SR 1409 | Gaston | 11-129-16-2 | 4/20/98 | 71 | 22 | 5.2 | 4.3 | Good |
| Long Cr | SR 1409 | Gaston | 11-129-16-(2.3) | 4/18/95 | 67 | 14 | 5.84 | 4.78 | Good-Fair |
| Long Cr | SR 1408 | Gaston | 11-129-16-(2.3) | 4/4/94 | 81 | 29 | 5.28 | 4.39 | Good |
| Long Cr | SR 1405 | Gaston | 11-129-16-(2.3) | 4/5/93 | 83 | 31 | 5.21 | 3.80 | Good |
| | | | | 4/11/92 | 73 | 26 | 5.47 | 4.43 | Good |
| | | | | 4/3/91 | 63 | 24 | 5.53 | 4.55 | Good |
| | | | | 4/18/95 | --- | 22 | --- | 5.07 | Good-Fair |
| | | | | 4/4/94 | 89 | 29 | 5.63 | 4.70 | Good |
| Long Cr | NC 274 | Gaston | 11-129-16-(4) | 4/5/93 | 75 | 28 | 4.90 | 3.95 | Good |
| | | | | 4/2/92 | 73 | 25 | 5.58 | 4.91 | Good |
| | | | | 4/3/91 | 63 | 21 | 5.69 | 4.90 | Good-Fair |
| | | | | 4/19/95 | 79 | 19 | 5.82 | 5.22 | Good-Fair |
| | | | | 4/5/95 | 90 | 24 | 6.35 | 4.92 | Good-Fair |
| Long Cr | SR 1443 | Gaston | 11-129-16-(4) | 4/5/94 | 90 | 37 | 5.09 | 4.35 | Good |
| Long Cr | SR 1446 | Gaston | 11-129-16-(4) | 4/6/93 | 98 | 35 | 5.22 | 4.40 | Good |
| | | | | 4/11/92 | 65 | 25 | 5.30 | 4.80 | Good |
| | | | | 4/4/91 | 54 | 20 | 5.58 | 4.87 | Good-Fair |
| | | | | 4/4/94 | 76 | 24 | 6.20 | 5.40 | Good-Fair |
| | | | | 4/3/93 | 70 | 23 | 5.52 | 4.68 | Good |
| Long Cr | SR 1448 | Gaston | 11-129-16-(4) | 4/1/92 | 76 | 26 | 4.97 | 4.19 | Good |
| | | | | 4/4/91 | 62 | 22 | 5.57 | 4.89 | Good-Fair |
| | | | | 4/19/95 | 80 | 23 | 5.82 | 5.15 | Good |
| | | | | 4/4/94 | 86 | 30 | 5.83 | 5.04 | Good |
| Long Cr | NC 275 | Gaston | 11-129-16-(4) | 4/5/93 | 89 | 31 | 5.51 | 4.54 | Good |
| | | | | 4/1/92 | 59 | 21 | 5.45 | 5.0 | Good |
| | | | | 4/5/91 | 51 | 21 | 5.55 | 5.07 | Good-Fair |
| | | | | 4/18/95 | 72 | 20 | 6.36 | 5.47 | Good-Fair |
| | | | | 4/4/94 | 84 | 21 | 6.26 | 5.17 | Good-Fair |
| Long Cr | SR 1456 | Gaston | 11-129-16-(4) | 8/20/97 | 62 | 21 | 5.81 | 4.79 | Good-Fair |
| | | | | 7/25/90 | 67 | 18 | 6.42 | 5.39 | Good-Fair |
| | | | | 7/20/87 | 71 | 19 | 6.59 | 5.61 | Good-Fair |
| | | | | 8/6/84 | 62 | 17 | 6.25 | 5.44 | Good-Fair |
| Long Cr | SR 2003 | Gaston | 11-129-16-(4) | 7/25/90 | 54 | 14 | 7.33 | 6.30 | Fair |
| | | | | 11/15/83 | 20 | 3 | 8.61 | 4.93 | Poor |
| UT Long Cr | SR 1446 | Gaston | 11-129-16-(4) | 4/5/94 | --- | 26 | --- | 4.89 | Good-Fair |
| | | | | 4/4/91 | 76 | 25 | 5.46 | 4.39 | Good |
| UT Long Cr | SR 1456 | Gaston | 11-129-16-(4) | 4/5/91 | 55 | 26 | 4.44 | 4.25 | Good |
| UT Long Cr | Dallas WWTP | Gaston | 11-129-16-(4) | 6/17/92 | 42 | 10 | 6.45 | 6.11 | Good-Fair |
| UT Long Cr | SR 2275 | Gaston | 11-129-16-(4) | 6/17/92 | 39 | 8 | 7.60 | 6.40 | Fair |
| Kiser Br | Kiser Dairy | Gaston | 11-129-16-(4) | 5/21/01 | 60 | 6 | 7.4 | 3.2 | Not Rated |
| | | | | 4/20/98 | 60 | 10 | 6.7 | 4.0 | Fair |
| | | | | 6/13/96 | 59 | 8 | 7.09 | 6.13 | Fair |
| Kaglor Br | Rankin Park | Gaston | 11-129-16-5 | 4/20/98 | 33 | 9 | 6.3 | 5.4 | Not Rated |
| | | | | 6/13/96 | 55 | 8 | 6.29 | 5.8 | Not Rated |

| Waterbody | Location | County | Index No. | Date | ST | EPT | BI | EPT BI | Rating |
|--------------------|----------------|-------------|-------------|---------|-----|-----|------|-----------|-----------|
| 03-08-37 | | | | | | | | | |
| Catawba Cr | SR 2446 | Gaston | 11-130 | 7/26/90 | 42 | 10 | 6.94 | 6.66 | Fair |
| | | | | 5/8/85 | 55 | 16 | 7.09 | 6.13 | Fair |
| Catawba Cr | SR 2439 | Gaston | 11-130 | 7/25/90 | 43 | 1 | 8.12 | 7.40 | Poor |
| | | | | 5/8/85 | 38 | 5 | 8.55 | 6.07 | Poor |
| Catawba Cr | SR 2435 | Gaston | 11-130 | 5/8/85 | 43 | 6 | 8.44 | 6.50 | Poor |
| Crowders Cr | SR 1118 | Gaston | 11-135 | 5/21/02 | 31 | 10 | 5.1 | 5.0 | Not Rated |
| | | | | 9/12/89 | 50 | 14 | 6.02 | 4.73 | Good-Fair |
| Crowders Cr | SR 1125 | Gaston | 11-135 | 5/21/02 | 63 | 21 | 5.4 | 5.1 | Good-Fair |
| | | | | 9/12/89 | 55 | 13 | 7.07 | 6.11 | Fair |
| Crowders Cr | SR 1131 | Gaston | 11-135 | 5/22/02 | 54 | 14 | 6.2 | 5.3 | Fair |
| | | | | 9/13/89 | 46 | 7 | 7.69 | 7.00 | Fair |
| Crowders Cr | NC 321 | Gaston | 11-135 | 9/13/89 | 46 | 10 | 6.81 | 5.64 | Fair |
| Crowders Cr | SR 2424 | Gaston | 11-135 | 9/13/89 | 51 | 15 | 6.86 | 5.87 | Fair |
| Crowders Cr | SC 564 | York, SC | 11-135 | 5/20/02 | 57 | 14 | 6.3 | 5.9 | Fair |
| | | | | 8/20/97 | 67 | 11 | 6.56 | 5.94 | Fair |
| | | | | 8/18/92 | 66 | 18 | 6.55 | 5.65 | Good-Fair |
| | | | | 9/14/89 | 61 | 15 | 6.83 | 6.13 | Fair |
| | | | | 7/26/88 | 43 | 4 | 8.30 | 7.50 | Poor |
| McGill Cr | Ab WWTP | Gaston | 11-135-2 | 9/12/89 | --- | 4 | --- | 7.43 | Poor |
| McGill Cr | SR 1300 | Gaston | 11-135-2 | 9/12/89 | --- | 6 | --- | 7.09 | Poor |
| Abernethy Cr | SR 1302 Ab UT | Gaston | 11-135-4 | 5/21/02 | 56 | 18 | 5.5 | 5.1 | Not |
| | | | | | | | | | Impaired |
| | | | | 3/23/93 | 56 | 20 | 5.76 | 4.95 | Good-Fair |
| | | | | 9/12/89 | --- | 12 | --- | 4.93 | Fair |
| | | | | 6/10/87 | 67 | 13 | 7.40 | 5.81 | Fair |
| Abernethy Cr | SR 1302 Bel UT | Gaston | 11-135-4 | 5/21/02 | 38 | 12 | 6.4 | 5.7 | Fair |
| | | | | | | | | | |
| | | | | 3/23/93 | 51 | 19 | 6.49 | 5.39 | Good-Fair |
| | | | | 6/10/87 | 43 | 4 | 7.78 | 7.53 | Poor |
| Abernethy Cr | Ab WWTP | Gaston | 11-135-4 | 9/12/89 | --- | 3 | --- | 6.90 | Poor |
| Abernethy Cr | Bel WWTP | Gaston | 11-135-4 | 9/12/89 | --- | 1 | --- | 6.57 | Poor |
| UT Abernethy Cr | Bel Lithium | Gaston | 11-135-4 | 5/21/02 | 44 | 12 | 5.7 | 3.5 | Not Rated |
| | | | | 3/23/93 | 40 | 5 | 7.77 | 7.52 | Poor |
| | | | | 6/10/87 | 25 | 0 | 7.90 | 0 | Poor |
| Blackwood Cr | Davis Park Rd | Gaston | 11-135-7 | 5/21/02 | 35 | 8 | 6.3 | 6.2 | Not Rated |
| S Fk Crowders Cr | SC 148 | York, SC | 11-135-10 | 5/20/02 | --- | 13 | --- | 4.7 | Fair |
| S Fk Crowders Cr | SC 79 | York, SC | 11-135-10 | 5/20/02 | --- | 19 | --- | 4.3 | Good-Fair |
| S Crowders Cr | SR 1103 | Gaston | 11-135-10-1 | 5/9/85 | 89 | 31 | 5.31 | 4.41 | Good-Fair |
| S Crowders Cr | SR 1109 | Gaston | 11-135-10-1 | 5/20/02 | 59 | 18 | 5.7 | 5.1 | Good-Fair |
| | | | | 9/13/89 | --- | 16 | --- | 5.56 | Good-Fair |
| UT Crowders Cr | SR 2416 | Gaston | | 5/20/02 | 67 | 15 | 6.2 | 5.1 | Good-Fair |
| | | | | 9/13/89 | --- | 11 | --- | 6.62 | Fair |
| 03-08-38 | | | | | | | | | |
| Twelvemile Cr | NC 16 | Union | 11-138 | 2/27/90 | --- | 30 | --- | 4.93 | Good-Fair |
| | | | | 7/11/89 | 71 | 20 | 6.25 | 5.37 | Good-Fair |
| | | | | 11/8/83 | 50 | 7 | 7.15 | 6.33 | Fair |
| Sixmile Cr | SR 3445 | Mecklenburg | 11-138-3 | 3/26/87 | 67 | 22 | 5.26 | 3.58 | Good-Fair |
| Waxhaw Cr | SR 1103 | Union | 11-139 | 8/19/92 | --- | 14 | --- | 5.53 | Good-Fair |
| | | | | 11/8/83 | 38 | 6 | 6.82 | 5.39 | Fair |

Fish Community Sampling Methods and Criteria

Wadeable Stream Sampling Methods

At each sample site, a 600-foot section of stream was selected and measured. The fish in the delineated stretch of stream were then collected using two backpack electrofishing units and two persons netting the stunned fish. After collection, all readily identifiable fish were examined for sores, lesions, fin damage, or skeletal anomalies, measured (total length to the nearest 1 mm), and then released. Those fish that were not readily identifiable were preserved and returned to the laboratory for identification, examination and total length measurement. Detailed descriptions of the sampling methods may be found at <http://www.esb.enr.state.nc.us/bar.html>.

NCIBI Analysis

The assessment of biological integrity using the North Carolina Index of Biotic Integrity (NCIBI) is provided by the cumulative assessment of 12 parameters or metrics. The values provided by the metrics are converted into scores on a 1, 3 or 5 scale. A score of 5 represents conditions which would be expected for undisturbed reference streams in the specific river basin or ecoregion, while a score of 1 indicates that the conditions deviate greatly from those expected in undisturbed streams of the region. Each metric is designed to contribute unique information to the overall assessment. The scores for all metrics are then summed to obtain the overall NCIBI score. Finally, the score (an even number between 12 and 60) is then used to determine the ecological integrity class of the stream from which the sample was collected.

The NCIBI has recently been revised (NCDENR, 2001). Currently, the focus of using and applying the NCIBI has been restricted to wadeable streams that can be sampled by a crew of four persons. The bioclassifications and criteria have also been recalibrated against regional reference site data (Biological Assessment Unit Memorandum 09222000) (Table 1).

Table 1 Revised Scores and Classes for Evaluating the Fish Community of a Wadeable Stream Using the North Carolina Index of Biotic Integrity (NCIBI) in the Broad, Catawba, Savannah and Yadkin River Basins

| NCIBI Scores | NCIBI Classes |
|---------------------|----------------------|
| > 54 | Excellent |
| 48 - 52 | Good |
| 42 - 46 | Good-Fair |
| 36 - 40 | Fair |
| ≤ 34 | Poor |

Table 2 Fish Community Structure Data Collected in the Catawba River Basin, 1993 – 2002 (Current basinwide sites are in bold font.)

| Subbasin/Waterbody | Location | County | Index No. | Date | NCIBI Score | NCIBI Rating |
|------------------------|---------------|-----------|---------------|----------|-------------|--------------|
| 03-08-30 | | | | | | |
| Catawba R | SR 1110 | McDowell | 11-1 | 04/29/02 | 46 | Good-Fair |
| | | | | 05/07/97 | 50 | Good |
| Mill Cr | SR 1400 | McDowell | 11-7-(0.5) | 06/08/99 | 58 | Excellent |
| Curtis Cr | US 70 | McDowell | 11-10 | 04/30/02 | 60 | Excellent |
| Crooked Cr | SR 1135 | McDowell | 11-12 | 04/30/02 | 56 | Excellent |
| Mackey Cr | US 70/SR 1413 | McDowell | 11-15-(3.5) | 03/25/98 | 48 | Good |
| Mackey Cr | US 70 | McDowell | 11-15-(3.5) | 04/29/02 | 52 | Good |
| | | | | 03/25/98 | 18 | Poor |
| Armstrong Cr | SR 1456 | McDowell | 11-24-14-(1) | 09/23/99 | 54 | Excellent |
| | | | | 06/22/99 | 56 | Excellent |
| | | | | 04/15/99 | 54 | Excellent |
| | | | | 05/07/97 | 56 | Excellent |
| Paddy Cr | NC 126 | Burke | 11-28 | 05/01/02 | 46 | Good-Fair |
| | | | | 05/05/97 | 40 | Fair |
| North Muddy Cr | SR 1760 | McDowell | 11-32-1 | 04/30/02 | 48 | Good |
| | | | | 05/07/97 | 52 | Good |
| Corpening Cr | SR 1794 | McDowell | 11-32-1-4 | 09/23/02 | 40 | Fair |
| South Muddy Cr | SR 1764 | McDowell | 11-32-2 | 05/01/02 | 48 | Good |
| | | | | 07/02/97 | 50 | Good |
| | | | | 06/28/93 | 50 | Good |
| Canoe Cr | SR 1250 | Burke | 11-33-(2) | 05/02/02 | 50 | Good |
| | | | | 05/05/97 | 54 | Excellent |
| | | | | 05/10/93 | 46 | Good-Fair |
| 03-08-31 | | | | | | |
| Silver Cr | SR 1149 | Burke | 11-34-(0.5) | 05/01/02 | 60 | Excellent |
| Upper Cr | SR 1439 | Burke | 11-35-2-(13) | 09/22/99 | 56 | Excellent |
| | | | | 06/21/99 | 54 | Excellent |
| | | | | 04/16/99 | 56 | Excellent |
| | | | | 07/01/97 | 54 | Excellent |
| Irish Cr | SR 1439 | Burke | 11-35-3-(2) | 05/02/02 | 38 | Fair |
| Hunting Cr | SR 1512 | Burke | 11-36-(0.3) | 05/01/02 | 38 | Fair |
| Gragg Prong | SR 1367 | Caldwell | 11-38-10 | 05/25/99 | 56 | Excellent |
| | | | | 10/01/98 | 56 | Excellent |
| Mulberry Cr | NC 90 | Caldwell | 11-38-32-(15) | 09/22/99 | 60 | Excellent |
| | | | | 06/21/99 | 58 | Excellent |
| | | | | 04/16/99 | 56 | Excellent |
| | | | | 05/08/97 | 60 | Excellent |
| Lower Cr | SR 1142 | Caldwell | 11-39-(6.5) | 05/10/93 | 44 | Good-Fair |
| Lower Cr | SR 1501 | Burke | 11-39-(6.5) | 05/02/02 | 42 | Good-Fair |
| | | | | 10/24/97 | 44 | Good-Fair |
| Smoky Cr | SR 1515 | Burke | 11-41-(1) | 05/03/02 | 58 | Excellent |
| McGalliard Cr | SR 1538 | Burke | 11-44-(0.5) | 05/03/02 | 40 | Fair |
| | | | | 05/06/97 | 48 | Good |
| | | | | 05/10/93 | 38 | Fair |
| 03-08-32 | | | | | | |
| Upper Little R | SR 1786 | Caldwell | 11-58-(5.5) | 05/24/02 | 42 | Good-Fair |
| Middle Little R | SR 1002 | Alexander | 11-62 | 05/23/02 | 56 | Excellent |
| | | | | 05/08/97 | 52 | Good |
| | | | | 05/11/93 | 46 | Good-Fair |
| Duck Cr | NC 90 | Alexander | 11-62-2-(1) | 05/23/02 | 48 | Good |
| | | | | 05/08/97 | 48 | Good |
| | | | | 05/11/93 | 40 | Fair |
| Lower Little R | SR 1318 | Alexander | 11-69-(0.5) | 05/23/02 | 38 | Fair |
| | | | | 05/09/97 | 48 | Good |
| | | | | 05/11/93 | 28 | Poor |

| Subbasin/Waterbody | Location | County | Index No. | Date | NCIBI Score | NCIBI Rating |
|----------------------------|------------------|-------------------|------------------------------|----------|-------------|--------------|
| Elk Shoal Cr | SR 1605 | Alexander | 11-73-(0.5) | 05/23/02 | 48 | Good |
| | | | | 05/09/97 | 54 | Excellent |
| | | | | 05/11/93 | 48 | Good |
| Lyle Cr | US 70 | Catawba | 11-76-(3.5) | 07/01/97 | 48 | Good |
| Buffalo Shoals Cr | SR 1503 | Iredell | 11-78-(0.5) | 05/11/93 | 50 | Good |
| | | | | 06/04/97 | 58 | Excellent |
| 03-08-33 | | | | | | |
| McDowell Cr | SR 2136 | Mecklenburg | 11-115-(1.5) | 05/20/02 | 22 | Poor |
| Dutchmans Cr Leepers Cr | SR 1918 NC 73 | Gaston Lincoln | 11-119-(0.5) 11-119-1-(1) | 06/12/97 | 40 | Fair |
| | | | | 06/30/93 | 50 | Good |
| | | | | 05/20/97 | 52 | Good |
| Killian Cr | NC 73 | Lincoln | 11-119-2-(0.5) | 06/29/93 | 56 | Excellent |
| | | | | 05/21/02 | 46 | Good-Fair |
| Killian Cr | SR 1511 | Lincoln | 11-119-2-(0.5) | 05/20/97 | 52 | Good |
| | | | | 06/29/93 | 56 | Excellent |
| 03-08-34 | | | | | | |
| Sugar Cr | SR 1156 | Mecklenburg | 11-137-1 | 04/15/99 | 28 | Poor |
| | | | | 06/30/97 | 32 | Poor |
| | | | | 06/30/93 | 18 | Poor |
| Little Sugar Cr | NC 51 | Mecklenburg | 11-137-8 | 04/15/99 | 42 | Good-Fair |
| | | | | 06/30/97 | 40 | Fair |
| 03-08-35 | | | | | | |
| Henry Fork | SR 1922 | Burke | 11-129-1-(2) | 09/28/98 | 52 | Good |
| Henry Fork | SR 1916 | Burke | 11-129-1-(2) | 05/06/97 | 46 | Good-Fair |
| Jacob Fork | SR 1924 | Burke | 11-129-2-(4) | 05/03/99 | 54 | Excellent |
| | | | | 09/28/98 | 52 | Good |
| | | | | 05/06/97 | 56 | Excellent |
| Pott Cr | SR 1217 | Lincoln | 11-129-3-(0.7) | 05/21/02 | 50 | Good |
| | | | | 05/21/97 | 50 | Good |
| Maiden Cr | SR 1858 | Catawba | 11-129-5-7-2-(1) | 03/18/93 | 42 | Good-Fair |
| Maiden Cr | off SR 1892 | Catawba | 11-129-5-7-2-(1) | 03/18/93 | 30 | Poor |
| Indian Cr | SR 1252 | Lincoln | 11-129-8-(6.5) | 05/21/02 | 38 | Fair |
| | | | | 07/01/97 | 38 | Fair |
| Beaverdam Cr | SR 1609 | Gaston | 11-129-9-(0.7) | 05/21/02 | 50 | Good |
| Hoyle Cr | SR 1836 | Gaston | 11-129-15-(1.5) | 05/22/02 | 42 | Good-Fair |
| | | | | 06/12/97 | 48 | Good |
| 03-08-36 | | | | | | |
| Long Cr | US 321 | Gaston | 11-129-16-(4) | 05/22/02 | 46 | Good-Fair |
| | | | | 05/20/97 | 40 | Fair |
| | | | | 06/30/93 | 30 | Poor |
| 03-08-37 | | | | | | |
| Catawba Cr | SR 2435 | Gaston | 11-130 | 05/22/02 | 40 | Fair |
| Crowders Cr | SR 1108 | Gaston | 11-135 | 05/19/97 | 42 | Good-Fair |
| | | | | 05/22/02 | 38 | Fair |
| | | | | 05/19/97 | 36 | Fair |
| 03-08-38 | | | | | | |
| Twelvemile Cr | NC 16 | Union | 11-138 | 05/20/02 | 42 | Good-Fair |
| Sixmile Cr | SR 1312 | Union | 11-138-3 | 06/11/97 | 48 | Good |
| | | | | 05/20/02 | 38 | Fair |
| | | | | 06/11/97 | 40 | Fair |
| Waxhaw Cr | SR 1103 | Union | 11-139 | 06/11/97 | 56 | Excellent |

Lake Assessment Program

Lakes Monitored

Ten lakes in the basin were monitored as part of the Lakes Assessment Program in 2002 (Table 3). Surface physical and photic zone chemistry data collected from 1997 through 2002 (from 1992 for Newton City and Bessemer City Lakes) are presented in Table 5.

Lake Sampling Methods

Lake monitoring stations are sited to provide representative samples of lake water quality based on morphology, size and site-specific features such as coves and tributaries. Physical field measurements (dissolved oxygen, pH, water temperature and conductivity) are made with a calibrated HydrolabTM. Readings are taken at the surface of the lake (0.15 meters) and at one-meter increments to the bottom of the lake. Secchi depths are measured at each sampling station with a weighted Secchi disk attached to a rope marked off in centimeters. Surface water samples are collected for chloride, hardness, fecal coliform bacteria and metals.

A LablineTM sampler is used to composite water samples within the photic zone (a depth equal to twice the Secchi depth). Nutrients, chlorophyll *a*, solids, turbidity and phytoplankton are collected at this depth. Nutrients and chlorophyll *a* from the photic zone are used to calculate the North Carolina Trophic State Index score. The LablineTM sampler is also used to collect a grab water samples near the bottom of the lake for nutrients. Water samples are collected and preserved in accordance with specified protocols (NCDEHNR, 1996; and subsequent updates).

Data Interpretation

The North Carolina water quality standards per 15A NCAC 2B .0200 are used in determining if a lake is meeting its designated uses. In addition to data collected through field sampling efforts, lake water quality assessments are also based on information obtained from other lake monitoring programs such as those implemented by municipalities and major hydroelectric companies. Observations and comments from citizens, local government personnel, water treatment facility staff, and others are also considered in the assessment process.

Table 3 Lakes Monitored in the Catawba River Basin during the 2001 – 2002 Sampling Effort

| Subbasin/ Lake | County | Classification | Surface Area (ac) | Mean Depth (ft.) | Volume (X10 ⁶ m ³) | Watershed (mi ²) | Mean Retention Time (days) |
|----------------------|---------------------------|------------------|----------------------|---------------------|--|---------------------------------|----------------------------------|
| 03-08-30 | | | | | | | |
| Lake Tahoma | McDowell | WS-II, B Tr, HQW | 1,61 | 30 | 0.7 | 23 | |
| Lake James | Burke | WS-IV, V, B Tr | 6,510 | 46 | 36.9 | 380 | 208 |
| 03-08-31 | | | | | | | |
| Lake Rhodhiss | Burke- Caldwell | WS-IV, B, CA | 3,515 | 20 | 36.7 | 1,090 | 21 |
| 03-08-32 | | | | | | | |
| Lake Hickory | Alexander- Catawba | WS-IV, V, B, CA | 4,100 | 33 | 17.0 | 1,310 | 33 |
| Lookout Shoals Lake | Catawba Iredell | WS-IV, V, B, CA | 1,270 | 30 | 4.6 | 1,450 | 7 |
| Lake Norman | Mecklenburg - Lincoln | WS-IV, B, CA | 32,510 | 33 | 131.5 | 1,790 | 239 |
| 03-08-33 | | | | | | | |
| Mountain Island Lake | Mecklenburg - Gaston | WS-IV, B, CA | 3,235 | 16 | 71.0 | 1,860 | 12 |
| 03-08-34 | | | | | | | |
| Lake Wylie | Mecklenburg - York, SC | WS-IV, V, B, CA | 12,450 | 23 | 35.3 | 3,020 | 39 |
| 03-08-35 | | | | | | | |
| Newton City Lake | Catawba | WS-III, CA | 17 | 10 | 0.1 | 100 | |
| 03-08-36 | | | | | | | |
| Bessemer City Lake | Gaston | WS-II, HQW, CA | 15 | 10 | 0.02 | 0.4 | |

In addition to determining use support, data collected during ambient lakes monitoring are used to evaluate the trophic state of lakes. An index was developed specifically for North Carolina lakes as part of the state's original Clean Lakes Classification Survey of 1982. The North Carolina Trophic State Index (NCTSI) is based on total phosphorus (TP in mg/L), total organic nitrogen (TON in mg/L), Secchi depth (SD in inches), and chlorophyll *a* (CHL in µg/L). Lakewide means for these parameters are used to produce a NCTSI score for each lake, using the equations:

$$\text{TON Score} = ((\text{Log (TON)} + 0.45)/0.24)*0.90$$

$$\text{TPScore} = ((\text{Log (TP)} + 1.55)/0.35)*0.92$$

$$\text{SDScore} = ((\text{Log (SD)} - 1.73)/0.35)*-0.82$$

$$\text{CHLScore} = ((\text{Log (CHL)} - 1.00)/0.48)*0.83$$

$$\text{NCTSI} = \text{TONScore} + \text{TPScore} + \text{SDScore} + \text{CHLScore}$$

In general, NCTSI scores relate to trophic classifications (Table 4). When scores border between classes, best professional judgment is used to assign an appropriate classification. Scores may be skewed by highly colored water typical of dystrophic lakes. Some variation in the trophic state between years is not unusual because of the variability of data collections, which usually involve sampling a limited number of times during the growing season.

Table 4 Lakes Classification Criteria

| NCTSI Score | Trophic Classification |
|--------------------|-------------------------------|
| < -2.0 | Oligotrophic |
| -2.0 – 0.0 | Mesotrophic |
| 0.0 – 5.0 | Eutrophic |
| > 5.0 | Hypereutrophic |

Oligotrophic lakes are characteristically found in the mountains or in undisturbed watersheds. Many mesotrophic and eutrophic lakes are found in the central piedmont. There are a few hypereutrophic lakes where point or nonpoint sources of pollution contribute to high levels of nutrients.

References

- Chutter, F. M. 1972. *An Empirical Biotic Index of the Quality of Water in South African Streams and Rivers*. *Water Research*. 6:19-30.
- Hilsenhoff, W. L. 1977. *Use of Arthropods to Evaluate Water Quality in Streams*. Wisconsin Department of Natural Resources. Technical Bulletin No. 100.
- Lenat, D. L. 1993. *A Biotic Index for the Southeastern United States: Derivation and List of Tolerance Values, with Criteria for Assigning Water Quality Ratings*. *J. North American Benthological Society*. 12:279-290.
- NCDEHNR. 1996. *Standard Operating Procedures Manual. Physical and Chemical Monitoring*. North Carolina Department of Environment, Health and Natural Resources. Division of Water Quality. Water Quality Section. Raleigh, NC.
- NCDENR. 2001. *Standard Operating Procedures Manual. Biological Monitoring. Stream Fish Community Assessment and Fish Tissue*. *Ibid*. North Carolina Department of Environment and Natural Resources. Division of Water Quality. Water Quality Section. Raleigh, NC.