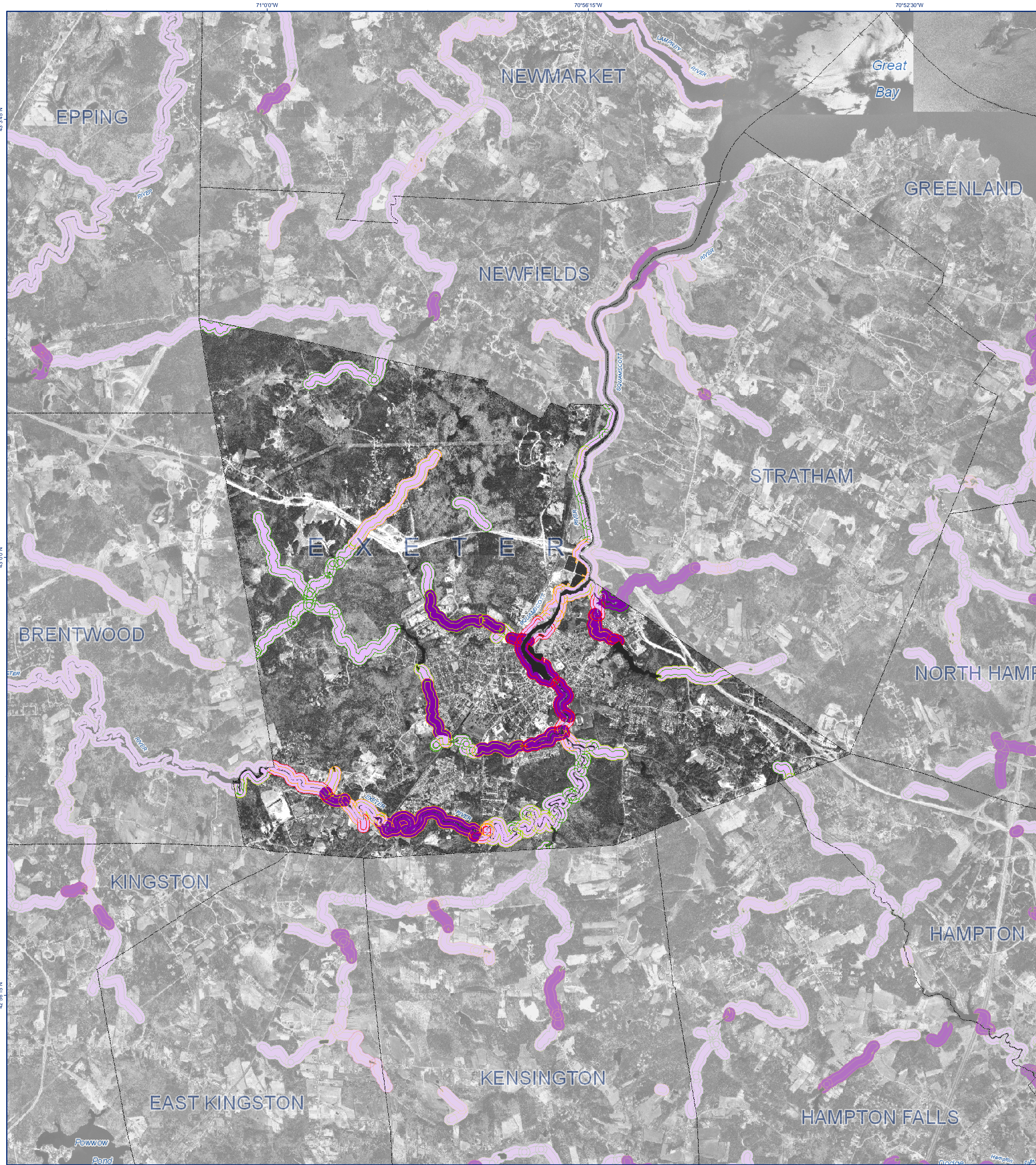


# STREAM BUFFER CHARACTERIZATION STUDY

## Town of Exeter, NH



### Project Description:

The Complex Systems Research Center at the University of New Hampshire conducted a characterization of 2<sup>nd</sup> order and higher streams within the Piscataqua/Coastal Basin of coastal New Hampshire. Existing GIS and remote sensing data were used to map a suite of anthropogenic factors, including land use, impervious surface coverage, and transportation infrastructure, within standard buffers around each stream segment. These factors were then analyzed to produce a categorical indicator representing the status of each stream.

Processing began using the GRANIT hydrography data to identify perennial streams/streams of order 2 or higher. Each stream segment was buffered by 150' to support water quality analyses and by 300' to support habitat analyses, and the buffers were then combined with land use data derived from 1998 USGS Digital Orthophotographs (DOQs). Finally, the buffer/land use composites were categorized

based on the degree to which each buffer was impacted by human activity.

Specifically, the buffer categories reflect the percent of land area within each buffer mapped as either developed, transportation, or agriculture, and include:

| Category          | Decision Rule   |
|-------------------|-----------------|
| Intact            | <10% impacted   |
| Mostly Intact     | 10-25% impacted |
| Somewhat Modified | 25-50% impacted |
| Altered           | >50% impacted   |

The buffer characterizations are depicted on the map and summarized in the tables below. The map also displays the 300' buffers based on the degree of imperviousness in 2005, and the townwide conservation lands data; Impervious surface coverage by town for 1990, 2000, and 2005, as well as conservation lands acreage by town, are also reported.

### Stream Buffer Characterization

- Intact
- Mostly Intact
- Somewhat Modified
- Altered

### Percent Impervious by 300-ft Buffer Segment

- Less Than 10%
- Greater Than 10%

### Conservation Lands

- Level 1, 2, or 2A

### 150-ft Buffer Stream Characterization Data Summary

| Town Name     | Total Acres   | Land Area     |             | Surface Water Area |            | 150' Buffer Area |            | Percent of Town Buffer Acreage Categorized as: |               |                   |            |
|---------------|---------------|---------------|-------------|--------------------|------------|------------------|------------|--|---------------|-------------------|------------|
|               |               | Acres         | % of Town   | Acres              | % of Town  | Acres            | % of Town  | Intact   | Mostly Intact | Somewhat Modified | Altered    |
| Alton         | 53231         | 40629         | 76.3        | 12602              | 23.7       | 0                | 0.0        | 0.0  | 0.0           | 0.0               | 0.0        |
| Barrington    | 31117         | 29719         | 95.5        | 1399               | 4.5        | 1580             | 5.3        | 4.2  | 0.0           | 0.0               | 0.0        |
| Brentwood     | 10863         | 10741         | 98.9        | 122                | 1.1        | 481              | 4.5        | 2.2  | 2.1           | 0.0               | 0.1        |
| Brookfield    | 14880         | 14593         | 98.1        | 287                | 1.9        | 323              | 2.2        | 2.2  | 0.0           | 0.0               | 0.0        |
| Candia        | 19557         | 19340         | 98.9        | 217                | 1.1        | 489              | 2.5        | 2.1  | 0.2           | 0.2               | 0.0        |
| Chester       | 16718         | 16618         | 99.4        | 100                | 0.6        | 579              | 3.5        | 2.4  | 0.9           | 0.0               | 0.0        |
| Danville      | 7569          | 7439          | 98.3        | 131                | 1.7        | 51               | 0.7        | 0.3  | 0.4           | 0.0               | 0.0        |
| Deerfield     | 32348         | 32584         | 97.7        | 764                | 2.3        | 1038             | 3.2        | 2.5  | 0.5           | 0.2               | 0.0        |
| Derry         | 23226         | 22880         | 97.7        | 945                | 2.3        | 0                | 0.0        | 0.0  | 0.0           | 0.0               | 0.0        |
| Dover         | 18592         | 17100         | 92.0        | 1492               | 8.0        | 1086             | 6.3        | 2.3  | 2.0           | 1.3               | 0.7        |
| Durham        | 15852         | 14305         | 90.2        | 1548               | 9.8        | 590              | 3.8        | 1.2  | 1.7           | 1.5               | 0.4        |
| East Kingston | 6381          | 6318          | 99.0        | 63                 | 1.0        | 209              | 3.3        | 2.3  | 0.7           | 0.4               | 0.0        |
| Epping        | 16776         | 16470         | 98.2        | 306                | 1.8        | 1011             | 6.1        | 3.7  | 1.8           | 0.6               | 0.0        |
| Exeter        | 12927         | 12886         | 98.1        | 241                | 1.9        | 281              | 2.2        | 1.8  | 0.4           | 0.3               | 0.0        |
| Farmington    | 23640         | 23218         | 98.2        | 422                | 1.8        | 773              | 3.3        | 1.6  | 1.1           | 0.3               | 0.3        |
| Fremont       | 11442         | 11035         | 96.5        | 407                | 3.6        | 565              | 5.1        | 2.2  | 1.7           | 1.0               | 0.2        |
| Greenland     | 8524          | 8781          | 103.0       | 1743               | 20.5       | 329              | 4.9        | 2.1  | 2.2           | 0.2               | 0.2        |
| Hamptstead    | 9014          | 8543          | 94.8        | 471                | 5.2        | 0                | 0.0        | 0.0  | 0.0           | 0.0               | 0.0        |
| Hampton       | 9073          | 8287          | 91.3        | 786                | 8.7        | 966              | 11.7       | 9.8  | 0.7           | 0.7               | 0.4        |
| Hampton Falls | 2078          | 7719          | 371.4       | 359                | 4.4        | 174              | 10.0       | 8.9  | 1.0           | 0.2               | 0.0        |
| Kennington    | 7668          | 7635          | 99.6        | 32                 | 0.4        | 370              | 4.9        | 3.2  | 0.7           | 0.7               | 0.2        |
| Kingston      | 13450         | 12494         | 92.9        | 957                | 7.1        | 224              | 1.8        | 1.5  | 0.1           | 0.1               | 0.1        |
| Lee           | 12927         | 12886         | 98.1        | 241                | 1.9        | 768              | 6.1        | 3.3  | 1.6           | 1.2               | 0.0        |
| Madbury       | 7799          | 7400          | 94.9        | 400                | 5.1        | 387              | 5.2        | 3.2  | 1.9           | 0.0               | 0.0        |
| Middleton     | 11843         | 11559         | 97.6        | 284                | 2.4        | 407              | 3.5        | 3.0  | 0.5           | 0.0               | 0.1        |
| Milton        | 21936         | 21089         | 96.1        | 847                | 3.9        | 853              | 4.0        | 3.0  | 0.6           | 0.4               | 0.0        |
| New Castle    | 1348          | 506           | 37.6        | 841                | 62.4       | 145              | 28.7       | 3.3  | 0.0           | 0.0               | 25.3       |
| New Durham    | 28054         | 26345         | 93.9        | 1709               | 6.1        | 323              | 1.2        | 1.1  | 0.1           | 0.0               | 0.0        |
| Newfields     | 4647          | 4541          | 97.7        | 106                | 2.3        | 293              | 6.5        | 4.4  | 1.4           | 0.4               | 0.0        |
| Newington     | 7917          | 5216          | 65.9        | 2700               | 34.1       | 178              | 3.4        | 0.4  | 0.5           | 1.3               | 1.1        |
| Newmarket     | 9080          | 8038          | 88.5        | 1043               | 11.5       | 458              | 5.7        | 2.8  | 1.2           | 1.1               | 0.7        |
| North Hampton | 8923          | 8962          | 99.3        | 61                 | 0.7        | 490              | 5.5        | 3.9  | 0.1           | 0.2               | 0.0        |
| Northwood     | 19357         | 17974         | 92.9        | 1383               | 7.1        | 285              | 1.6        | 1.4  | 0.1           | 0.0               | 0.0        |
| Nottingham    | 30997         | 29862         | 96.4        | 1135               | 3.6        | 1409             | 4.7        | 4.1  | 0.5           | 0.0               | 0.1        |
| Pittsfield    | 15559         | 15190         | 97.8        | 369                | 2.4        | 0                | 0.0        | 0.0  | 0.0           | 0.0               | 0.0        |
| Portsmouth    | 10763         | 10002         | 92.9        | 761                | 7.1        | 431              | 4.3        | 1.8  | 0.2           | 0.5               | 1.9        |
| Raymond       | 18944         | 18459         | 97.4        | 485                | 2.6        | 1092             | 5.9        | 2.6  | 2.3           | 0.9               | 0.1        |
| Rochester     | 29081         | 28321         | 97.4        | 759                | 2.6        | 2161             | 7.5        | 2.6  | 1.9           | 0.9               | 0.4        |
| Rollinsford   | 4843          | 4682          | 96.7        | 161                | 3.3        | 296              | 6.3        | 3.2  | 0.0           | 2.8               | 0.3        |
| Rye           | 8406          | 7998          | 95.1        | 408                | 4.9        | 554              | 6.9        | 4.7  | 1.1           | 0.5               | 0.7        |
| Sandown       | 9232          | 8888          | 96.3        | 343                | 3.7        | 599              | 6.7        | 2.8  | 0.4           | 0.2               | 0.0        |
| Seabrook      | 6161          | 5664          | 91.9        | 497                | 8.1        | 721              | 12.7       | 10.4   | 0.5           | 1.4               | 0.4        |
| Somerset      | 5398          | 6219          | 97.2        | 179                | 2.8        | 280              | 4.5        | 2.1  | 0.4           | 1.3               | 0.8        |
| South Hampton | 5147          | 5044          | 98.0        | 102                | 2.0        | 0                | 0.0        | 0.0  | 0.0           | 0.0               | 0.0        |
| Stratford     | 32779         | 31151         | 95.0        | 1628               | 5.0        | 691              | 2.2        | 2.1  | 0.0           | 0.0               | 0.0        |
| Stratham      | 9902          | 9674          | 97.7        | 228                | 2.3        | 439              | 4.5        | 3.1  | 0.9           | 0.4               | 0.1        |
| Wakefield     | 28177         | 25264         | 89.7        | 3453               | 12.0       | 948              | 3.8        | 2.2  | 0.8           | 0.6               | 0.2        |
| Wolfeboro     | 37406         | 30693         | 82.1        | 6713               | 17.9       | 0                | 0.0        | 0.0  | 0.0           | 0.0               | 0.0        |
| <b>Total</b>  | <b>759673</b> | <b>708144</b> | <b>93.2</b> | <b>51529</b>       | <b>6.8</b> | <b>25279</b>     | <b>3.6</b> | <b>2.3</b>                                     | <b>0.7</b>    | <b>0.4</b>        | <b>0.2</b> |

### Townwide Conservation Lands Data Summary

| Town Name     | Acres        | Townwide Conservation Lands |                |
|---------------|--------------|-----------------------------|----------------|
|               |              | % of Town Area              | % of Land Area |
| Alton         | 3766         | 7.1                         | 9.3            |
| Barrington    | 2687         | 8.6                         | 9.0            |
| Brentwood     | 1387         | 12.8                        | 12.9           |
| Brookfield    | 1817         | 12.2                        | 12.5           |
| Candia        | 2008         | 10.3                        | 10.4           |
| Chester       | 1312         | 7.8                         | 7.9            |
| Danville      | 540          | 7.1                         | 7.3            |
| Deerfield     | 5582         | 16.7                        | 17.1           |
| Derry         | 1119         | 4.8                         | 4.9            |
| Dover         | 1529         | 8.2                         | 8.9            |
| Durham        | 4321         | 27.3                        | 30.2           |
| East Kingston | 670          | 10.5                        | 10.6           |
| Epping        | 1271         | 7.6                         | 7.7            |
| Exeter        | 3486         | 27.3                        | 27.6           |
| Farmington    | 1242         | 5.3                         | 5.3            |
| Fremont       | 181          | 1.6                         | 1.6            |
| Greenland     | 893          | 10.5                        | 13.2           |
| Hamptstead    | 1506         | 16.7                        | 17.6           |
| Hampton       | 408          | 4.5                         | 4.9            |
| Hampton Falls | 633          | 7.8                         | 8.2            |
| Kennington    | 1549         | 20.2                        | 20.3           |
| Kingston      | 1376         | 10.2                        | 11.0           |
| Lee           | 2299         | 17.8                        | 18.1           |
| Madbury       | 1328         | 17.0                        | 17.9           |
| Middleton     | 488          | 4.1                         | 4.2            |
| Milton        | 2553         | 11.6                        | 11.6           |
| New Castle    | 92           | 6.8                         | 18.1           |
| New Durham    | 1751         | 6.2                         | 6.6            |
| Newfields     | 753          | 16.2                        | 16.6           |
| Newington     | 1307         | 16.5                        | 25.1           |
| Newmarket     | 1331         | 14.7                        | 16.6           |
| North Hampton | 709          | 8.0                         | 8.0            |
| Northwood     | 2381         | 12.3                        | 13.2           |
| Nottingham    | 5860         | 18.9                        | 19.6           |
| Pittsfield    | 728          | 4.7                         | 4.7            |
| Portsmouth    | 1099         | 10.2                        | 11.0           |
| Raymond       | 972          | 5.1                         | 5.3            |
| Rochester     | 431          | 1.5                         | 1.5            |
| Rollinsford   | 409          | 8.4                         | 8.7            |
| Rye           | 1488         | 17.7                        | 18.6           |
| Sandown       | 470          | 5.1                         | 5.1            |
| Seabrook      | 447          | 7.3                         | 7.9            |
| Somerset      | 221          | 3.5                         | 3.6            |
| South Hampton | 284          | 5.5                         | 5.5            |
| Stratford     | 5281         | 16.1                        | 16.9           |
| Stratham      | 1023         | 10.3                        | 10.6           |
| Wakefield     | 390          | 1.4                         | 1.5            |
| Wolfeboro     | 2248         | 6.0                         | 7.3            |
| <b>Total</b>  | <b>75596</b> | <b>10.0</b>                 | <b>10.7</b>    |

### 300-ft Buffer Stream Characterization Data Summary

| Town Name     | Total Acres | Land Area |           | Surface Water Area |           | 300' Buffer Area |           | Percent of Town Buffer Acreage Categorized as: |               |          |         |
|---------------|-------------|-----------|-----------|--------------------|-----------|------------------|-----------|--|---------------|----------|---------|
|               |             | Acres     | % of Town | Acres              | % of Town | Acres            | % of Town | Intact   | Mostly Intact | Modified | Altered |
| Alton         | 53231       | 40629     | 76.3      | 12602              | 23.7      | 0                | 0.0       | 0.0  | 0.0           | 0.0      | 0.0     |
| Barrington    | 31117       | 29719     | 95.5      | 1399               | 4.5       | 3210             | 10.3      | 2.9  | 2.9           | 4.1      | 0.4     |
| Brentwood     | 10863       | 10741     | 98.9      | 122                | 1.1       | 558              | 6.9       | 2.2  | 5.8           | 0.5      | 0.4     |
| Brookfield    | 14880       | 14593     | 98.1      | 287                | 1.9       | 647              | 4.4       | 4.1  | 0.3           | 0.0      | 0.0     |
| Candia        | 19557       | 19340     | 98.9      | 217                | 1.1       | 1035             | 5.4       | 4.2  | 0.4           | 0.7      | 0.0     |
| Chester       | 16718       | 16618     | 99.4      | 100                | 0.6       | 1205             | 7.3       | 3.4  | 2.3           | 1.5      | 0.0     |
| Danville      | 7569        | 7439      | 98.3      | 131                | 1.7       | 88               | 1.3       | 0.6  | 0.7           | 0.0      | 0.0     |
| Deerfield     | 32348       | 32584     | 97.7      | 764                | 2.3       | 2161             | 6.6       | 4.9  | 1.0           | 0.0      | 0.0     |
| Derry         | 23226       | 22880     | 97.7      | 545                | 2.3       | 0                | 0.0       | 0.0  | 0.0           | 0.0      | 0.0     |
| Dover         | 18592       | 17100     | 92.0      | 1492               | 8.0       | 2139             | 12.5      | 3.0  | 3.3           | 4.7      | 1.5     |
| Durham        | 15852       | 14305     | 90.2      | 1548               | 9.8       | 1377             | 8.6       | 1.5  | 1.7           | 4.9      | 1.5     |
| East Kingston | 6381        | 6318      | 99.0      | 63                 | 1.0       | 416              | 6.6       | 2.4  | 2.1           | 1.2      | 0.8     |
| Epping        | 16776       | 16470     | 98.2      | 306                | 1.8       | 1980             | 12.0      | 4.0  | 5.3           | 2.4      | 0.3     |
| Exeter        | 12927       | 12886     | 98.0      | 240                | 2.0       | 1927             | 15.3      | 6.3  | 7.5           | 11.0     | 12.4    |
| Farmington    | 23640       | 23218     | 98.2      | 422                | 1.8       | 1548             | 6.7       | 2.5  | 2.0           | 1.3      | 0.8     |
| Fremont       | 11442       | 11035     | 96.5      | 407                | 3.6       | 1127             | 10.2      | 5.3  | 1.6           | 2.1      | 1.2     |
| Greenland     | 8524        | 8781      | 103.0     | 1743               | 20.5      | 470              | 5.9       | 1.9  | 2.0           | 0.7      | 0.0     |
| Hamptstead    | 9014        | 8543      | 94.8      | 471                | 5.2       | 0                | 0.0       | 0.0  | 0.0           | 0.0      | 0.0     |
| Hampton       | 9073        | 8287      | 91.3      | 786                | 8.7       | 2242             | 27.1      | 21.7   | 2.4           | 1.5      | 1.5     |
| Hampton Falls | 2078        | 7719      | 371.4     | 359                | 4.4       | 1752             | 22.7      | 16.9   | 4.4           | 6.9      | 0.1     |
| Kennington    | 7668        | 7635      | 99.6      | 32                 | 0.4       | 815              | 10.7      | 6.1  | 0.8           | 3.7      | 0.1     |
| Kingston      | 13450       | 12494     | 92.9      | 957                | 7.1       | 458              | 3.7       | 2.7  | 0.5           | 0.3      | 0.1     |
| Lee           | 12927       | 12886     | 98.1      | 241                | 1.9       | 1521             | 12.1      | 3.7  | 5.0           | 1.2      | 0.1     |
| Madbury       | 7799        | 7400      | 94.9      | 400                | 5.1       | 745              | 10.1      | 3.7  | 3.7           | 5.0      | 1.2     |
| Middleton     | 11843       | 11559     | 97.6      | 284                | 2.4       | 843              | 7.3       | 6.2  | 0.9           | 0.0      | 0.0     |
| Milton        | 21936       | 21089     | 96.1      | 847                | 3.9       | 1759             | 8.9       | 6.3  | 4.0           | 1.0      | 0.2     |
| New Castle    | 1348        | 506       | 37.6      | 841                | 62.4      | 269              | 53.2      | 5.7  | 0.0           | 0.0      | 47.5    |
| New Durham    | 28054       | 26345     | 93.9      | 1709               | 6.1       | 703              | 2.7       | 2.5  | 0.1           | 0.1      | 0.0     |
| Newfields     | 4647        | 4541      | 97.7      | 106                | 2.3       | 596              | 15.1      | 8.6  | 0.4           | 3.3      | 0.6     |
| Newington     | 7917        | 5216      | 65.9      | 2700               | 34.1      | 364              | 7.0       | 0.9  | 0.8           | 2.2      | 3.1     |
| Newmarket     | 9080        | 8038      | 88.5      | 1043               | 11.5      | 324              | 11.6      | 3.2  |               |          |         |