

Lake Erie Tributary Watersheds

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The Lake Erie Tributary Watersheds are Hydrologic Unit 04100010 010. This series of watersheds flows in a northeasterly direction directly to Maumee Bay or Lake Erie. Otter Creek is 7.98 miles long. It flows northeasterly from Northwood through Oregon and Toledo towards Maumee Bay. Otter Creek is the first stream after the Maumee River to discharge into the south side of Maumee Bay. An early 1800s map of the Maumee River shows that Otter Creek was once connected to Grassy Creek via a marshland, ten miles from Maumee Bay.¹

Otter Creek Use Attainment Data²

| River Mile | Sample Year | ICI Score | HELP Ecoregion ICI Criteria | Lacustrary ICI Score* | HELP Ecoregion Lacustrary ICI Criteria* | Modified Index of Well Being Score | HELP Ecoregion Miwb Criteria | IBI Score | HELP Ecoregion IBI Criteria | Lacustrary IBI Score* | HELP Ecoregion Lacustrary IBI Criteria* | QHEI Score | HELP Ecoregion QHEI Criteria |
|------------|-------------|-----------|-----------------------------|-----------------------|---|------------------------------------|------------------------------|-----------|-----------------------------|-----------------------|---|------------|------------------------------|
| 0.3 | 1986 | | | 6 | 42 | | | | | | | | |
| 0.4 | 1993 | | | 28 | 42 | | | | | | | | |
| 0.5 | 1986 | | | | | 1.322 | 8.6 | | | 4 | 42 | 37.5 | 60 |
| 0.5 | 1986 | | | | | | | | | 7 | 42 | | |
| 0.5 | 1993 | | | | | 5.439 | 8.6 | | | 12 | 42 | 21.5 | 60 |
| 0.5 | 1993 | | | | | 4.255 | 8.6 | | | 12 | 42 | | |
| 2 | 1986 | | | | | | | | | 13 | 42 | 24.5 | 60 |
| 2.1 | 1993 | 6 | 34 | | | 1.587 | 8.6 | 12 | 34 | | | 14.5 | 60 |
| 2.1 | 1993 | | | | | 5.816 | 8.6 | 22 | 34 | | | | |
| 2.1 | 1997 | | | | | 4.725 | 8.6 | 36 | 34 | | | 38.5 | 60 |
| 2.2 | 1997 | | | | | 4.452 | 8.6 | 44 | 34 | | | 33 | 60 |
| 2.4 | 1997 | | | | | 4.533 | 8.6 | 34 | 34 | | | 35.5 | 60 |
| 3.1 | 1993 | | | | | 1.369 | 7.3 | 12 | 32 | | | 16 | 60 |
| 3.2 | 1993 | 6 | 34 | | | | | | | | | | |
| 3.8 | 1993 | | | | | | | | | | | 25.5 | 60 |
| 4 | 1986 | | | | | | | 12 | 32 | | | 37.5 | 60 |
| 4 | 1986 | | | | | | | 12 | 32 | | | | |
| 4 | 1986 | | | | | | | 12 | 32 | | | | |
| 4.4 | 1993 | | | | | | | | | | | 33 | 60 |
| 4.6 | 1993 | 6 | 34 | | | | | | | | | | |
| 4.7 | 1993 | | | | | 2.335 | 7.3 | 14 | 32 | | | 27.5 | 60 |
| 4.9 | 1993 | | | | | | | | | | | 34.5 | 60 |
| 5.6 | 1993 | | | | | | | | | | | 37.5 | 60 |
| 5.8 | 1986 | | | | | | | 12 | 32 | | | 35.5 | 60 |
| 5.8 | 1986 | | | | | | | 12 | 32 | | | | |
| 5.8 | 1986 | | | | | | | 12 | 32 | | | | |
| 5.9 | 1993 | 4 | 34 | | | 1.397 | 7.3 | 14 | 32 | | | 19 | 60 |
| 6 | 1993 | 2 | 34 | | | | | | | | | | |
| 7.2 | 1986 | | | | | | | | | | | 19 | 60 |
| 7.2 | 1993 | 2 | 34 | | | | | | | | | 14 | 60 |
| 7.2 | 1993 | | | | | | | | | | | 27.5 | 60 |

* The double horizontal line represents the lacustrary divide of Otter Creek, although it is noted that lacustrary lengths are approximate and fluctuate with lake levels and wind direction.³

Otter Creek DELT Data⁴

| River Mile | Sample Year | Percent DELT Anomalies | Percent Deformities | Percent Eroded Fins | Percent Lesions | Percent Tumors | Relative Number of Fish Collected | Relative Number of Species Collected | Relative Number of Fish Minus Tolerants | Relative Weight of Fish Collected (in grams) |
|------------|-------------|------------------------|---------------------|---------------------|-----------------|----------------|-----------------------------------|--------------------------------------|---|--|
| 0.5 | 1986 | 50 | 0 | 50 | 0 | 0 | 4 | 1 | 0 | 0.722 |
| 0.5 | 1986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.5 | 1986 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0.44 |
| 0.5 | 1993 | 12 | 0 | 12 | 0 | 0 | 50 | 4 | 38 | 13.79 |
| 0.5 | 1993 | 2.8302 | 0 | 2.83 | 0 | 0 | 212 | 4 | 198 | 16.191 |
| 2 | 1986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 1986 | 0 | 0 | 0 | 0 | 0 | 3.64 | 1 | 0 | 0.011 |
| 2 | 1986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.1 | 1993 | 50.01 | 0 | 50.01 | 0 | 0 | 30 | 3 | 1.67 | 5.667 |
| 2.1 | 1993 | 17.7778 | 0 | 17.78 | 0 | 0 | 180 | 8 | 134 | 0.804 |
| 2.1 | 1997 | 0 | 0 | 0 | 0 | 0 | 1601.99 | 14 | 1520.31 | 0 |
| 2.2 | 1997 | 0.0997 | 0 | 0 | 0 | 0 | 1672.02 | 13 | 1580.33 | 0 |
| 2.4 | 1997 | 0.1894 | 0 | 0 | 0 | 0 | 990.03 | 12 | 930.02 | 0 |
| 3.1 | 1993 | 33.3333 | 0 | 33.33 | 0 | 0 | 13.5 | 2 | 0 | 0.092 |
| 4 | 1986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 1986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 1986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.7 | 1993 | 100 | 0 | 95.65 | 0 | 0 | 34.5 | 4 | 0 | 0.519 |
| 5.8 | 1986 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0.044 |
| 5.8 | 1986 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0.002 |
| 5.8 | 1986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.9 | 1993 | 29.4118 | 0 | 23.53 | 0 | 5.88 | 25.5 | 3 | 0 | 3.425 |
| 7.2 | 1986 | 0 | 0 | 0 | 0 | 0 | 4.5 | 1 | 0 | 0.008 |
| 7.2 | 1986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7.2 | 1986 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0.012 |
| 7.2 | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

* The double horizontal line represents the lacustuary divide of Otter Creek, although it is noted that lacustuary lengths are approximate and fluctuate with lake levels and wind direction.⁵

Wolf Creek is the watershed immediately east of Otter Creek with Cedar, Crane, and Turtle creeks following. Wolf Creek (a.k.a. Berger Ditch) has a drainage area of 15.9 square miles.⁶ Wolf Creek also begins in Northwood flowing through Oregon where it joins with Berger Ditch, then emptying into Lake Erie at Maumee Bay State Park marina.

Wolf Creek Use Attainment Data⁷

| River Mile | Sample Year | ICI Score | HELP Ecoregion ICI Criteria | Lacustrary ICI Score* | HELP Ecoregion Lacustrary ICI Criteria* | Modified Index of Well Being Score | HELP Ecoregion Miwb Criteria | IBI Score | HELP Ecoregion IBI Criteria | Lacustrary IBI Score* | HELP Ecoregion Lacustrary IBI Criteria* | QHEI Score | HELP Ecoregion QHEI Criteria |
|------------|-------------|-----------|-----------------------------|-----------------------|---|------------------------------------|------------------------------|-----------|-----------------------------|-----------------------|---|------------|------------------------------|
| 2.7 | 1993 | | | | | 4.767 | 7.3 | 24 | 32 | | | 15.5 | 60 |

Wolf Creek DELT Data⁸

| River Mile | Sample Year | Percent DELT Anomalies | Percent Deformities | Percent Eroded Fins | Percent Lesions | Percent Tumors | Relative Number of Fish Collected | Relative Number of Species Collected | Relative Number of Fish Minus Tolerants | Relative Weight of Fish Collected (in grams) |
|------------|-------------|------------------------|---------------------|---------------------|-----------------|----------------|-----------------------------------|--------------------------------------|---|--|
| 2.7 | 1993 | 3.6585 | 0 | 3.66 | 0 | 0 | 123 | 10 | 63 | 14.548 |

Cedar, Crane, and Turtle creeks flow in a similar northeasterly direction and are each 20 to 25 miles in length. The headwaters of all of three of these watersheds are in Wood County. Each of these waterways flows through mostly agricultural lands and small villages, such as Walbridge, Millbury, and Clay Center.

The Cedar Creek drainage area when combined with Big Cooley Creek, and Reno Side Cut (a.k.a. Cooley Canal) is 58.3 square miles.⁹ Cedar Creek is 23.39 miles long with an average fall of 0.9 feet per mile.¹⁰ The two main tributaries to Cedar Creek are Little Cedar Creek and Dry Creek. Little Cedar Creek is 2.63 miles in length with an average fall is 3 feet per mile.¹¹ Dry Creek has an average fall of 3 feet per mile.¹² Wards Canal is located at the mouth of Cedar Creek. These two 14-digit HUCs include the Cedar Point National Wildlife Refuge, Metzger Marsh Boat Launch at Wards Canal, and Metzger Marsh State Wildlife Area. Nonpoint pollutants such as agricultural crop production, silviculture, and on-site waste treatment systems impact the Cedar Creek watershed.¹³

Cedar Creek Watershed Use Attainment Data¹⁴

| River Mile | Sample Year | ICI Score | HELP Ecoregion ICI Criteria | Lacustrary ICI Score* | HELP Ecoregion Lacustrary ICI Criteria* | Modified Index of Well Being Score | HELP Ecoregion Miwb Criteria | IBI Score | HELP Ecoregion IBI Criteria | Lacustrary IBI Score* | HELP Ecoregion Lacustrary IBI Criteria* | QHEI Score | HELP Ecoregion QHEI Criteria |
|--------------------|-------------|-----------|-----------------------------|-----------------------|---|------------------------------------|------------------------------|-----------|-----------------------------|-----------------------|---|------------|------------------------------|
| <i>Cedar Creek</i> | | | | | | | | | | | | | |
| 6.5 | 1993 | 34 | 34 | | | | | | | | | | |
| 6.6 | 1993 | | | | | 4.872 | 7.3 | 22 | 32 | | | 26.5 | 60 |
| 6.6 | 1993 | | | | | 5.836 | 7.3 | 22 | 32 | | | | |
| 14.4 | 1993 | | | | | 5.517 | 7.3 | 20 | 32 | | | 23.5 | 60 |
| 14.5 | 1993 | 34 | 34 | | | | | | | | | | |
| 15.5 | 1993 | 16 | 34 | | | 6.302 | 7.3 | 18 | 32 | | | 44.5 | 60 |
| 15.5 | 1993 | | | | | 4.98 | 7.3 | 18 | 32 | | | | |
| 17.2 | 1993 | 12 | 34 | | | 5.638 | 7.3 | 20 | 32 | | | 18 | 60 |
| 18.3 | 1993 | 10 | 34 | | | | | | | | | | |
| 18.5 | 1993 | | | | | 2.389 | 7.3 | 20 | 32 | | | 26.5 | 60 |
| 20.8 | 1986 | 34 | 34 | | | | | | | | | | |
| <i>Dry Creek</i> | | | | | | | | | | | | | |
| 0.1 | 1993 | | | | | | | | | | | 40.5 | 60 |
| 2.2 | 1993 | | | | | | | | | | | 29 | 60 |
| 3 | 1993 | | | | | | | | | | | 45.5 | 60 |
| 4 | 1993 | | | | | | | | | | | 46 | 60 |
| 4.8 | 1993 | | | | | 1.436 | 7.3 | 18 | 32 | | | 20.5 | 60 |
| 4.8 | 1993 | | | | | 3.801 | 7.3 | 18 | 32 | | | | |
| 7 | 1993 | | | | | 2.559 | 7.3 | 16 | 32 | | | 27 | 60 |
| 7.9 | 1993 | | | | | 2.633 | 7.3 | 20 | 32 | | | 21.5 | 60 |

Cedar Creek Watershed DELT Data¹⁵

| River Mile | Sample Year | Percent DELT Anomalies | Percent Deformities | Percent Eroded Fins | Percent Lesions | Percent Tumors | Relative Number of Fish Collected | Relative Number of Species Collected | Relative Number of Fish Minus Tolerants | Relative Weight of Fish Collected (in grams) |
|--------------------|-------------|------------------------|---------------------|---------------------|-----------------|----------------|-----------------------------------|--------------------------------------|---|--|
| <i>Cedar Creek</i> | | | | | | | | | | |
| 6.6 | 1993 | 1.2422 | 0.62 | 0.62 | 0 | 0 | 241.5 | 11 | 51 | 2.885 |
| 6.6 | 1993 | 1.2012 | 0 | 1.2 | 0 | 0 | 475.86 | 17 | 107.18 | 3.524 |
| 14.4 | 1993 | 0 | 0 | 0 | 0 | 0 | 904.5 | 9 | 127.5 | 3.127 |
| 15.5 | 1993 | 3.3842 | 0.31 | 3.08 | 0.31 | 0 | 609.45 | 16 | 153.79 | 32.068 |
| 15.5 | 1993 | 5.2205 | 0 | 4.82 | 0.4 | 0.4 | 439.52 | 14 | 65.33 | 22.328 |
| 17.2 | 1993 | 0.1212 | 0 | 0.12 | 0 | 0 | 1237.5 | 10 | 195 | 3.437 |
| 18.5 | 1993 | 0.2257 | 0 | 0 | 0 | 0 | 664.5 | 6 | 25.5 | 0 |
| <i>Dry Creek</i> | | | | | | | | | | |
| 4.8 | 1993 | 10.5689 | 0 | 2.17 | 5.42 | 0 | 175.77 | 5 | 0 | 82.856 |
| 4.8 | 1993 | 10.0366 | 0 | 10.04 | 0.37 | 0 | 409.5 | 7 | 61.5 | 54.359 |
| 7 | 1993 | 1.6949 | 0 | 1.69 | 0 | 0 | 265.5 | 5 | 0 | 2.419 |
| 7.9 | 1993 | 0.2217 | 0 | 0.22 | 0 | 0 | 676.5 | 6 | 1.5 | 2.52 |

Crane Creek drainage area is 55.5 square miles¹⁶ with an average fall is 1.9 feet per mile.¹⁷ There are four tributaries to Crane Creek including, Ayers Creek, Little Crane Creek, Henry Creek, with the latter two being intermittent streams. Ayers Creek has an average fall is only 1.76 feet per mile.¹⁸ Little Crane Creek is 3.74 miles long with an average fall is 5.7 feet per mile.¹⁹ Henry Creek is 9.74 miles long with an average fall is 3.9 feet per mile.²⁰ This 14-digit HUC includes some of the most extensive coastal wetland areas in Ohio, including Ottawa National Wildlife Refuge, Magee Marsh State Wildlife Area, and Crane Creek State Park. Nonpoint pollutants such as agricultural crop production and on-site waste treatment systems impair the Crane Creek watershed.²¹

Crane Creek Watershed Use Attainment Data²²

| River Mile | Sample Year | ICI Score | HELP Ecoregion ICI Criteria | Lacustrary ICI Score* | HELP Ecoregion Lacustrary ICI Criteria* | Modified Index of Well Being Score | HELP Ecoregion Miwb Criteria | IBI Score | HELP Ecoregion IBI Criteria | Lacustrary IBI Score* | HELP Ecoregion Lacustrary IBI Criteria* | QHEI Score | HELP Ecoregion QHEI Criteria |
|------------------------|-------------|-----------|-----------------------------|-----------------------|---|------------------------------------|------------------------------|-----------|-----------------------------|-----------------------|---|------------|------------------------------|
| <i>Crane Creek</i> | | | | | | | | | | | | | |
| 0.2 | 2001 | | | | | 6.947 | 8.6 | | | 26 | 34 | | |
| 7.4 | 1993 | | | | | 4.25 | 7.3 | 20 | 32 | | | 34 | 60 |
| 7.5 | 1993 | 22 | 34 | | | | | | | | | | |
| 13.1 | 1993 | | | | | 3.146 | 7.3 | 18 | 32 | | | 49 | 60 |
| 13.1 | 1993 | | | | | 4.277 | 7.3 | 16 | 32 | | | | |
| <i>Henry Creek</i> | | | | | | | | | | | | | |
| 0.1 | 1993 | | | | | | | | | | | 38.5 | 60 |
| 0.9 | 1993 | | | | | | | | | | | 26 | 60 |
| 2.1 | 1993 | | | | | | | | | | | 21.5 | 60 |
| 2.9 | 1993 | | | | | | | | | | | 23 | 60 |
| 3.7 | 1993 | | | | | 3.816 | 7.3 | 18 | 32 | | | 37.5 | 60 |
| 3.7 | 1993 | | | | | 3.927 | 7.3 | 12 | 32 | | | | |
| 4.4 | 1993 | | | | | 2.005 | 7.3 | 16 | 32 | | | 17 | 60 |
| 5.6 | 1993 | | | | | | | | | | | 24 | 60 |
| 6.6 | 1993 | | | | | | | | | | | 15 | 60 |
| <i>Little Crane Ck</i> | | | | | | | | | | | | | |
| 1.1 | 1993 | | | | | 3.056 | 7.3 | 16 | 32 | | | 17.5 | 60 |

*The double horizontal line represents the lacustrary divide of Crane Creek, although it is noted that lacustrary lengths are approximate and fluctuate with lake levels and wind direction.²³

Crane Creek Watershed DELT Data²⁴

| River Mile | Sample Year | Percent DELT Anomalies | Percent Deformities | Percent Eroded Fins | Percent Lesions | Percent Tumors | Relative Number of Fish Collected | Relative Number of Species Collected | Relative Number of Fish Minus Tolerants | Relative Weight of Fish Collected (in grams) |
|------------------------|-------------|------------------------|---------------------|---------------------|-----------------|----------------|-----------------------------------|--------------------------------------|---|--|
| <i>Crane Creek</i> | | | | | | | | | | |
| 0.2 | 2001 | 0.7093 | 0.24 | 0.47 | 0 | 0 | 288.47 | 13 | 225.05 | 1.284 |
| 7.4 | 1993 | 0 | 0 | 0 | 0 | 0 | 480 | 12 | 49.5 | 15.297 |
| 13.1 | 1993 | 1.4189 | 0 | 1.42 | 0 | 0 | 1980 | 8 | 54 | 14.349 |
| 13.1 | 1993 | 1.0017 | 0 | 0.33 | 0.67 | 0 | 898.5 | 6 | 61.5 | 4.895 |
| <i>Henry Creek</i> | | | | | | | | | | |
| 3.7 | 1993 | 0.1383 | 0.14 | 0 | 0 | 0 | 1276.13 | 7 | 10.6 | 5.073 |
| 3.7 | 1993 | 4.4639 | 0 | 4.46 | 0 | 0 | 282 | 5 | 6 | 1.308 |
| 4.4 | 1993 | 1.02 | 0 | 1.02 | 0 | 0 | 150 | 3 | 0 | 0.279 |
| <i>Little Crane Ck</i> | | | | | | | | | | |
| 1.1 | 1993 | 1.3333 | 0 | 1.33 | 0 | 0 | 337.5 | 5 | 0 | 0.509 |

* The double horizontal line represents the lacustrine divide of Crane Creek, although it is noted that lacustrine lengths are approximate and fluctuate with lake levels and wind direction.²⁵

Turtle Creek drainage area is 41.5 square miles.²⁶ Turtle Creek is 12.59 miles long and begins at the confluence of the North and South Branches. Its average fall is only 1.8 feet per mile, with the land use primarily in agricultural production. This watershed includes the Turtle Creek Fishing Access and is adjacent to the Magee Marsh State Wildlife Area.

Turtle Creek Watershed Use Attainment Data²⁷

| River Mile | Sample Year | ICI Score | HELP Ecoregion ICI Criteria | Lacustrine ICI Score* | HELP Ecoregion Lacustrine ICI Criteria* | Modified Index of Well Being Score | HELP Ecoregion Miwb Criteria | IBI Score | HELP Ecoregion IBI Criteria | Lacustrine IBI Score* | HELP Ecoregion Lacustrine IBI Criteria* | QHEI Score | HELP Ecoregion QHEI Criteria |
|----------------------------------|-------------|-----------|-----------------------------|-----------------------|---|------------------------------------|------------------------------|-----------|-----------------------------|-----------------------|---|------------|------------------------------|
| <i>Turtle Creek</i> | | | | | | | | | | | | | |
| 0.1 | 1995 | | | | | 7.1 | 8.6 | | | 22 | 42 | 45.5 | 60 |
| 0.1 | 1995 | | | | | 7.904 | 8.6 | | | 38 | 42 | | |
| 0.2 | 1995 | | | 38 | 42 | | | | | | | | |
| 0.3 | 1995 | | | 38 | 42 | | | | | | | | |
| 1 | 1995 | | | | | 6.788 | 8.6 | | | 22 | 42 | 42 | 60 |
| 1 | 1995 | | | | | 9.031 | 8.6 | | | 31 | 42 | | |
| 3 | 1995 | | | 4 | 42 | | | | | | | | |
| 3.2 | 1995 | | | | | 5.561 | 8.6 | | | 6 | 42 | 20 | 60 |
| 3.2 | 1995 | | | | | 5.312 | 8.6 | | | 6 | 42 | | |
| 8.9 | 1993 | | | | | 5.408 | 7.3 | 26 | 32 | | | 15.5 | 60 |
| <i>South Branch Turtle Creek</i> | | | | | | | | | | | | | |
| 1.4 | 1993 | | | | | 4.387 | 7.3 | 12 | 32 | | | 16 | 60 |
| <i>North Branch Turtle Creek</i> | | | | | | | | | | | | | |
| 0.8 | 1993 | | | | | | | | | | | 18.5 | 60 |

* The double horizontal line represents the lacustrine divide of Turtle Creek, although it is noted that lacustrine lengths are approximate and fluctuate with lake levels and wind direction.²⁸

Turtle Creek Watershed DELT Data²⁹

| River Mile | Sample Year | Percent DELT Anomalies | Percent Deformities | Percent Eroded Fins | Percent Lesions | Percent Tumors | Relative Number of Fish Collected | Relative Number of Species Collected | Relative Number of Fish Minus Tolerants | Relative Weight of Fish Collected (in grams) |
|----------------------------------|-------------|------------------------|---------------------|---------------------|-----------------|----------------|-----------------------------------|--------------------------------------|---|--|
| <i>Turtle Creek</i> | | | | | | | | | | |
| 0.1 | 1995 | 9.15 | 0.65 | 0 | 8.5 | 0 | 306 | 13 | 186 | 108.069 |
| 0.1 | 1995 | 1.74 | 0.27 | 0.54 | 0.81 | 0.13 | 1490 | 19 | 1180 | 238.949 |
| 1 | 1995 | 26.08 | 1.14 | 5.06 | 19.87 | 0 | 316 | 13 | 174 | 167.702 |
| 1 | 1995 | 4.7 | 0.47 | 0 | 4.24 | 0 | 1086 | 20 | 852 | 131.135 |
| 3.2 | 1995 | 36.09 | 0 | 0 | 31.17 | 0 | 128 | 6 | 60 | 22.717 |
| 3.2 | 1995 | 13.64 | 0 | 0 | 13.64 | 0 | 132 | 7 | 72 | 44.956 |
| 8.9 | 1993 | 1.5464 | 0.52 | 0.52 | 0 | 0.52 | 291 | 15 | 79.5 | 3.855 |
| <i>South Branch Turtle Creek</i> | | | | | | | | | | |
| 1.4 | 1993 | 8.012 | 0 | 8.01 | 0 | 0 | 334.5 | 6 | 15 | 2.224 |

** The double horizontal line represents the lacustrary divide of Turtle Creek, although it is noted that lacustrary lengths are approximate and fluctuate with lake levels and wind direction.³⁰*

Lake Erie Tributary Watersheds Impairments Causes and Sources of Impairments³¹

| Segment | Miles Assessed & Aquatic Life Use Designation [#] | Causes of Impairment* | Sources of Impairment* | Comments |
|------------------|--|---|---|--|
| Otter Creek | 10.23 (RM 0-10.23) LRW & MWH-C | Oil and grease-H Siltation-H Flow alteration-M Other habitat alterations-M Total toxics-M Unknown toxicity-M | Major industrial point Source-H Minor industrial point Source-S Urban runoff/Storm sewers (NPS)-M Landfills-H Hazardous waste-S Channelization-M Removal of riparian Vegetation-M Streambank modification/ Destabilization-M | 305(b)-1996: Data in this table |
| Driftmeyer Ditch | 2.43 (RM 0-2.43) | Other habitat alterations-H Nutrients-M Siltation-M Organic enrichment/DO-S | Channelization-H Nonirrigated crop production-H Removal of riparian vegetation-M Streambank modification/ Destabilization-M Land development/ Suburbanization-S Onsite wastewater systems (septic tanks)-S | 305(b)-2000: stream is an agricultural drainage ditch; channelization and Siltation severely limit the potential of the stream; poorly performing septic systems notes along end of segment; nutrient enrichment is obvious from upstream farms. |

| Segment | Miles Assessed & Aquatic Life Use Designation[#] | Causes of Impairment* | Sources of Impairment* | Comments |
|----------------|--|---|---|--|
| Wolf Creek | 8.25 (RM 0-8.25) WWH | Flow alteration-H Nutrients-H Other habitat alterations-H Siltation-M | Channelization-H Dredging-H Nonirrigated crop production-H Removal of riparian Vegetation-H Streambank modification/ Destabilization-H Land development/ Suburbanization-M Highway/road/bridge/ sewer line-S | 305(b)-2000: stream is a channelized ditch, containing a tolerant fish community; farm runoff probably has the most direct impact with lack of habitat a second cause. |
| Dry Creek | 11.5 (RM 0-1.5) WWH | Flow alteration-H Other habitat alterations-H Pesticides-M Priority organics-M Metals-M Siltation-M Organic enrichment/DO-S | Nonirrigated crop Production-H Removal of riparian Vegetation-H Streambank modification/ Destabilization-H Channelization-M Dredging-M Land development/ Suburbanization-M Onsite wastewater systems (septic tanks)-S Other Urban Runoff-S | 305(b)-2000: PCBs and pesticides are apparent in carp tissue samples; source could be runoff from railroad yard operations and ag; probably exists throughout the stream, but not documented; habitat is destroyed; runoff is most likely toxic; sedimentation is filling stream; much trash was present. |
| Cedar Creek | 23.95 (RM 0-23.95) WWH | Flow alteration-H Other habitat alterations-H Metals-M Pesticides-M Priority organics-M Siltation-M | Channelization-M Flow regulation/ Modification-M Removal of riparian Vegetation-H Streambank modification/ Destabilization-H Nonirrigated crop production-M Minor industrial point Source-S | 305(b)-2000: PCBs and pesticides were detected in fish tissue samples; contamination was significant; probable sources are the railroad yards, village of Walbridge, and ag sources; habitat degradation, probable toxic inputs via NPS runoff, and point sources; much trash and other materials; fish community was poor, with better macro-invertebrates in some spots; there may be a PAH problem due to the many railroad ties found in the stream. |
| Henry Creek | 9.0 (RM 0-9.0) WWH | Other habitat alterations-H Flow alteration-H Organic enrichment/DO-M Siltation-M | Nonirrigated crop production-H Channelization/ag-H Removal of riparian Vegetation-H Streambank modification/ Destabilization/Ag-H Channelization/ag-M Package Plants-M Onsite wastewater systems (septic systems)-S | 305(b)-2000: sewage sludge and grey water impacts are significant pollutant inputs; poor habitat and evidence of wide variation in flow, large amounts of trash |

| Segment | Miles Assessed & Aquatic Life Use Designation [#] | Causes of Impairment* | Sources of Impairment* | Comments |
|---------------------------|--|--|--|--|
| Little Crane Creek | 3.5 (RM 0-3.5) WWH | Other habitat alterations-H Flow alteration-H Siltation-M | Nonirrigated crop production-H Channelization/ag-H Removal of riparian Vegetation-M Streambank modification/ Destabilization/Ag-M | 305(b)-2000: this is a typical northwest Ohio drainage ditch; flow regime is quite variable to dry; ag inputs probably impact the stream, either toxic or otherwise. |
| Ayers Creek | 5.77 (RM 0-5.77) | Organic enrichment/DO-H Metals-M | Nonirrigated crop production-S Onsite wastewater systems (septic systems)-S | 305(b)-1996: Data in this table |
| Crane Creek | 28.07 (RM 0-28.07) WWH | Other habitat alterations-H Siltation-M Flow alteration-S Metals-S Pesticides-S Priority organics-S | Nonirrigated crop production-H Removal of riparian Vegetation-M Land development/ Suburbanization-S | 305(b)-2000: PCBs and pesticides were reported in fish tissue samples at significant concentrations; source is probably agricultural or railroad yard; ag runoff probably contributes chemical contaminants found in fish; consistent flow is a problem. |
| Turtle Creek | 9.5 (RM 0-9.5) WWH | Flow alteration-H Other habitat alterations-H Nutrients-M Siltation-M | Channelization/ag-H Dredging-M Nonirrigated crop production-H Removal of riparian Vegetation-M Streambank modification/ Destabilization/Ag-M | 305(b)-1996: Data in this table |
| South Branch Turtle Creek | 6.4 (RM 0-6.4) WWH | Other habitat alterations-H Flow alteration-M Organic enrichment/DO-M Siltation-M | Channelization/ag-H Nonirrigated crop Production-M Removal of riparian Vegetation/Ag-M Streambank modification/ Destabilization/Ag-M Unknown source-M | 305(b)-2000: sewage sludge is present in the stream with unknown source; little to no habitat due to dredging and channelization; no riparian zone; ag inputs and Siltation limit the stream community |

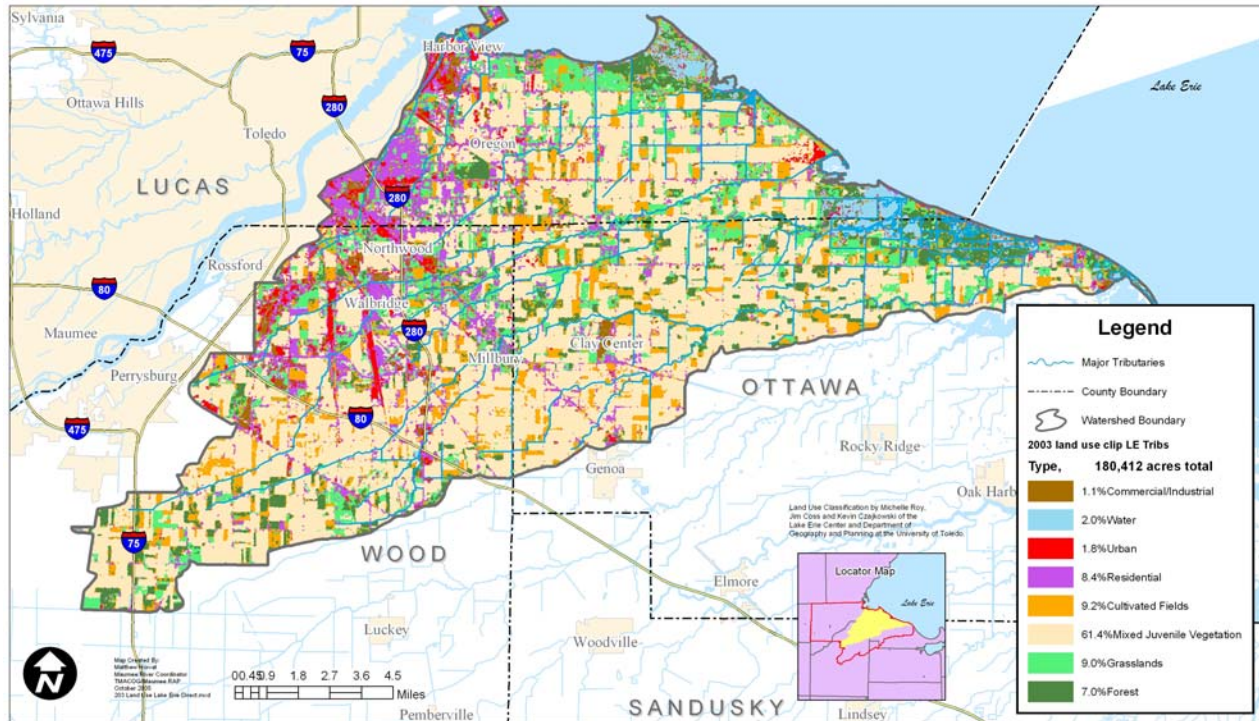
*Magnitude of that cause or source of impairment: H=high, M=moderate, S=slight, T=identifies a threat

[#]Aquatic Life Use Designation: WWH=Warm Water Habitat, MWH=Modified Warm Water Habitat, LRW=Limited Resource Water

Land Use of the Lake Erie Tributary Watersheds

In 2003 land use classifications produced by The University of Toledo for the Lake Erie Tributary watersheds showed 61 percent of the land used by mixed juvenile vegetation. This vegetation type can be row crops in an early stage of growth, tracts of open space or yards. Forest and grassland account for 7 percent and 9 percent respectively, and 9 percent is in cultivated fields. Approximately 8 percent of the watershed has been developed for residential use, 2 percent for urban uses, and 1 percent for commercial/industrial uses.

2003 Land Use in the Lake Erie Tributary Watersheds



Status of Beneficial Use Impairments

When the Maumee Area of Concern was defined in the late 1980s, the Maumee RAP Public Advisory Council determined which beneficial uses were impaired based on the entire AOC. This was done because the only way of delisting an AOC was a comprehensive one; all listed or all delisted. Now that there are alternative methods for incrementally delisting an AOC by watershed or impairment, the Maumee RAP needed to determine the BUIs by watershed. This was done using data and resources that were available before 1990. The two tables below summarize the BUIs impacting the Lake Erie Tributary Watersheds in 1990 and 2004.

Following the BUI Summary Tables are maps of this watershed, including the jurisdictions, 14-digit HUCs, and custom-digitized river mile maps made specifically for the Maumee AOC watersheds.

The heart of this plan, the Watershed Project Tables (WPTs), is found in Volume 2. As explained in the Introduction, the WPTs are the living portion of the report that will change and grow, as projects are implemented and goals are attained. These tables have been organized by Causes and Sources and include Projects, Potential Project Partners, Funding Sources, Timeline, Status, Performance/ Environmental Measures, HUC/Stream Segment Addressed, and indicate the Beneficial Use Impairment (BUI) that could be effected by the project. Also incorporated into the table (where

applicable) is a reference to the ODNR Coastal Management Measures that may benefit from the implementation of an identified project.

There are differing levels of detail in the WPTs, often depending on how soon a project will be implemented, what source will be funding it, or by the amount of data available for that watershed. The status of projects in the WPTs has been organized and color-coded as follows: **In Progress**, **Planning**, **Concept**, **Ongoing**, and **Complete**.

Beneficial Use Impairments In 1990 For the Lake Erie Tributaries

(as determined in 2002)

| Beneficial Use Impairments | Otter Creek | Wolf Creek | Cedar Creek | Crane Creek* | Turtle Creek | Reasons/Data Source |
|---|----------------|------------|--------------|----------------|----------------|---|
| BUI 1: Restriction on fish and wildlife consumption | Impaired | | Not Impaired | Unknown | Unknown | Otter - ODH data re: LE and MR Others – PCB and pesticides in fish tissue |
| BUI 2: Tainting of fish & wildlife flavor | Unknown | | Unknown | Unknown | Unknown | Others - No data to indicate |
| BUI 3: Degradation on fish and wildlife populations | Impaired | | Not Impaired | Unknown | Unknown | Otter - OEPA data, historical data |
| BUI 4: Fish tumors or other deformities | Impaired | | Not Impaired | Unknown | Unknown | Otter - OEPA data but have Phyllis review/confirm |
| BUI 5: Bird or animal deformities or reproductive problems | Unknown | | Not Impaired | Impaired | Impaired | Others – 1991 total reproduction failure in gulls along LE/Maumee Bay coastline |
| BUI 6: Degradation of benthos | Impaired | | Not Impaired | Impaired | Impaired | Otter - OEPA data Others – failed septic systems in Clay Center and Genoa CSO issues |
| BUI 7: Restriction on dredging activities | Not Applicable | | Not Impaired | Unknown | Unknown | Otter -? Needs clarification? Others – no data to indicate |
| BUI 8: Eutrophication or undesirable algae | Not Impaired | | Not Impaired | Unknown | Unknown | Otter - No info Others – Organic enrichment, ag runoff |
| BUI 9: Restrictions on drinking water consumption, or taste and odor | Not Applicable | | Not Impaired | Impaired | Unknown | All – no drinking water intakes in these creeks |
| BUI 10: Beach closings | Unknown | | Not Impaired | Not Applicable | Not Applicable | Otter - No beaches, need more data on chemical concerns that could limit recreational contact |
| BUI 11: Degradation of aesthetics | Impaired | | Not Impaired | Unknown | Unknown | Otter - BPJ |
| BUI 12: Added cost to agriculture and industry | Not Applicable | | Not Impaired | Unknown | Unknown | Otter - no known ag or industrial users |
| BUI 13: Degradation of phytoplankton & zooplankton populations | Unknown | | Not Impaired | Unknown | Unknown | |
| BUI 14: Loss of fish and wildlife habitat | Impaired | | Not Impaired | Unknown | Unknown | Otter - Historical info, photos, and BPJ |

*Note: In 1990 all of Cedar Creek was surveyed and determined to be in full attainment of WWH designation

Possible answers – Impaired, Not Impaired, Unknown, Not Applicable

Beneficial Use Impairments In 2005 For the Lake Erie Tributaries

(last updated 12/1/05)

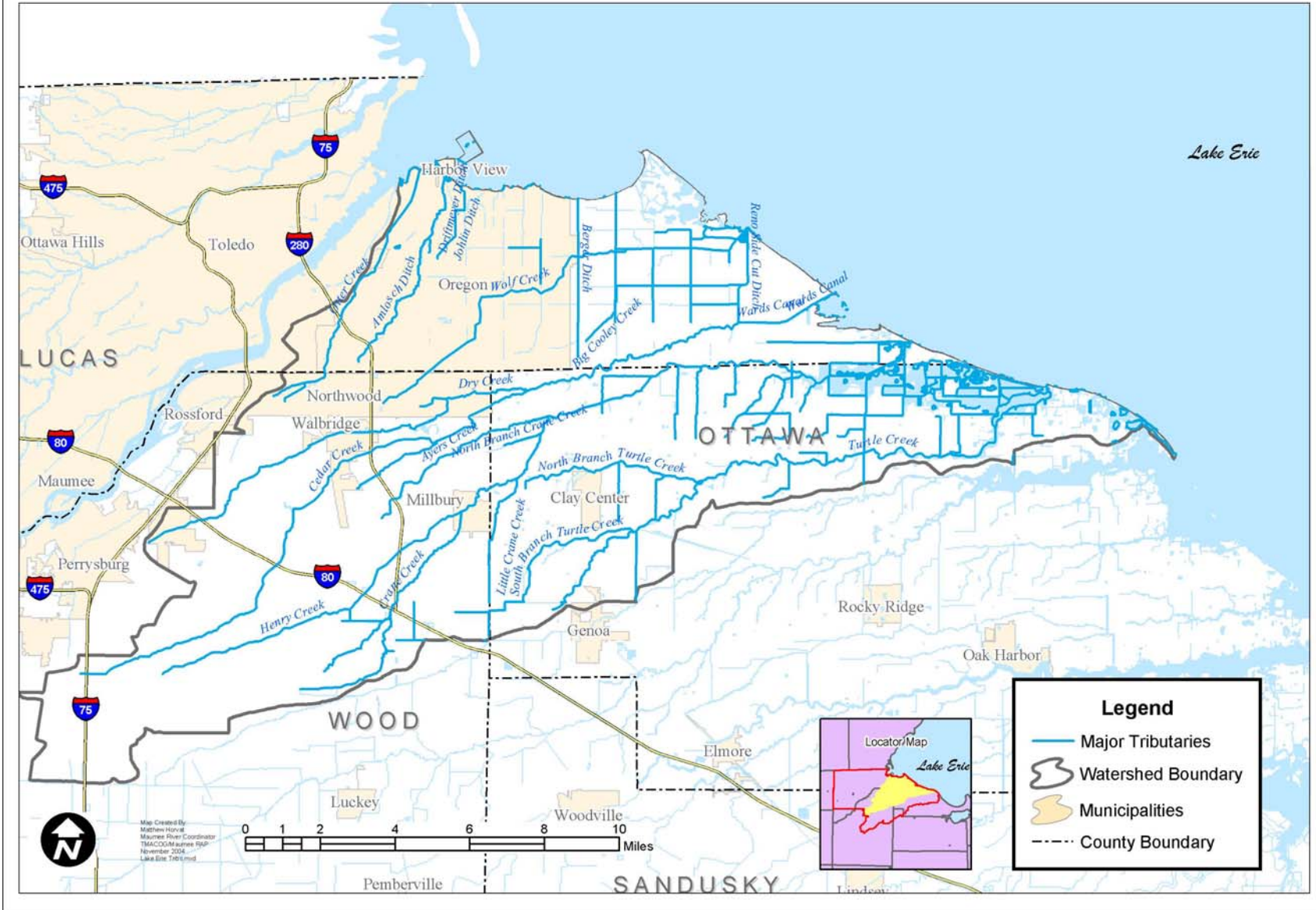
| Beneficial Use Impairments | Otter Creek | Wolf Creek | Cedar Creek | Crane Creek | Turtle Creek | Reasons/Data Source |
|---|----------------|----------------|----------------|----------------|----------------|---|
| BUI 1: Restriction on fish and wildlife consumption | Impaired | Impaired | Not Impaired | Impaired | Impaired | 2004 Ohio Snapping Turtle Consumption Advisory for PCBs and mercury: Ottawa National Wildlife Refuges, Ottawa County: Turtle and Crane Creeks 2004 Ohio Sport Fish Consumption Advisory: Lake Erie/Channel Catfish (PCBs) |
| BUI 2: Tainting of fish & wildlife flavor | Unknown | Not Impaired | Not Impaired | Not Impaired | Not Impaired | no known reports of tainting of fish and wildlife flavor; no known sources of phenols and related compounds, but further research and studies may be required for Otter Creek because of potential historical industrial |
| BUI 3: Degradation on fish and wildlife populations | Impaired | Impaired | Impaired | Impaired | Impaired | Otter riverine IBI 17.1; lac.IBI 6 (poor) Crane riverine IBI 19.2 (poor); Cedar riverine IBI 20 (poor); Turtle riverine IBI 19; lac.IBI 20.8(poor) Miwb scores: Otter 1.432 (poor); Cedar 5.076 (poor); Crane 4.335 (poor); Turtle 6.436(fair)No data or determination of degradation of wildlife populations |
| BUI 4: Fish tumors or other deformities | Impaired | Impaired | Impaired | Not Impaired | Impaired | Otter Creek: 63 DELTS = 2.25% Cedar Creek: 32 DELTS = 1.08% Crane Creek: 12 DELTS = 0.487% Turtle Creek: 134 DELTS = 6.24% |
| BUI 5: Bird or animal deformities or reproductive problems | Not Impaired | Not Impaired | Not Impaired | Not Impaired | Not Impaired | No known data sources or studies |
| BUI 6: Degradation of benthos | Impaired | Impaired | Impaired | Impaired | Impaired | Otter riverine ICI 2 (poor);lac.ICI 17 (fair) Crane riverine ICI 5.5 (poor), Cedar riverine 23.3 (fair): Turtle lacustuary 26.6 (fair) |
| BUI 7: Restriction on dredging activities | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable | no navigational dredging activities on these streams |

| Beneficial Use Impairments | Otter Creek | Wolf Creek | Cedar Creek | Crane Creek | Turtle Creek | Reasons/Data Source |
|---|--------------------|-------------------|--------------------|--------------------|---------------------|--|
| BUI 8: Eutrophication or undesirable algae | Unknown | Unknown | Unknown | Unknown | Unknown | status of this BUI is unknown dissolved O2 data?? Meet OWQS? No TMDL available |
| BUI 9: Restrictions on drinking water consumption, or taste and odor | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable | no treated drinking water supplies in these streams |
| BUI 10: Beach closings | Not Impaired | Impaired | Not Impaired | Impaired | Not Impaired | no data for recreational contact for Cedar and Turtle |
| BUI 11: Degradation of aesthetics | Impaired | Impaired | Impaired | Impaired | Impaired | public health nuisances associated with raw or poorly treated sewage can be a problem in these streams. due to number, density of units (homes), age, poor maintenance, and no monitoring of septic systems |
| BUI 12: Added cost to agriculture and industry | Not Impaired | Unknown | Unknown | Unknown | Unknown | Status of this BUI is unknown |
| BUI 13: Degradation of phytoplankton & zooplankton populations | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable | |
| BUI 14: Loss of fish and wildlife habitat | Impaired | Impaired | Impaired | Impaired | Impaired | loss of wildlife habitat is unknown; stream modification has resulted in some loss of fish habitat in streams (best professional judgment), but no comprehensive studies or inventories completed to date QHEI scores: Otter 27.97; Crane 33.5; Cedar 27.8; Turtle 26.25. |

Possible answers – Impaired, Not Impaired, Unknown, Not Applicable

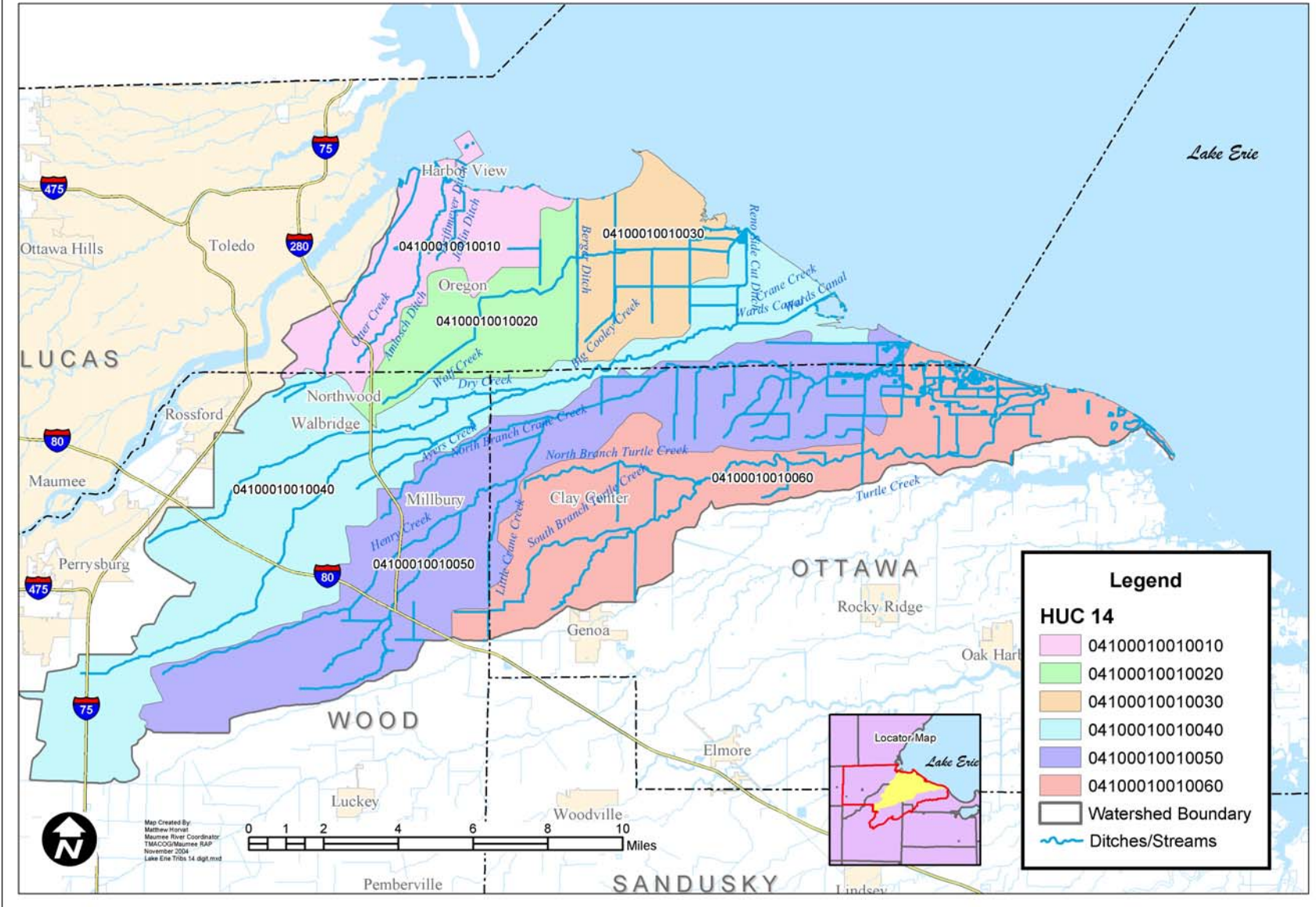
Lake Erie Direct Tributaries

Otter, Wolf, Cedar, Crane, and Turtle Creeks HUC 04100010 010



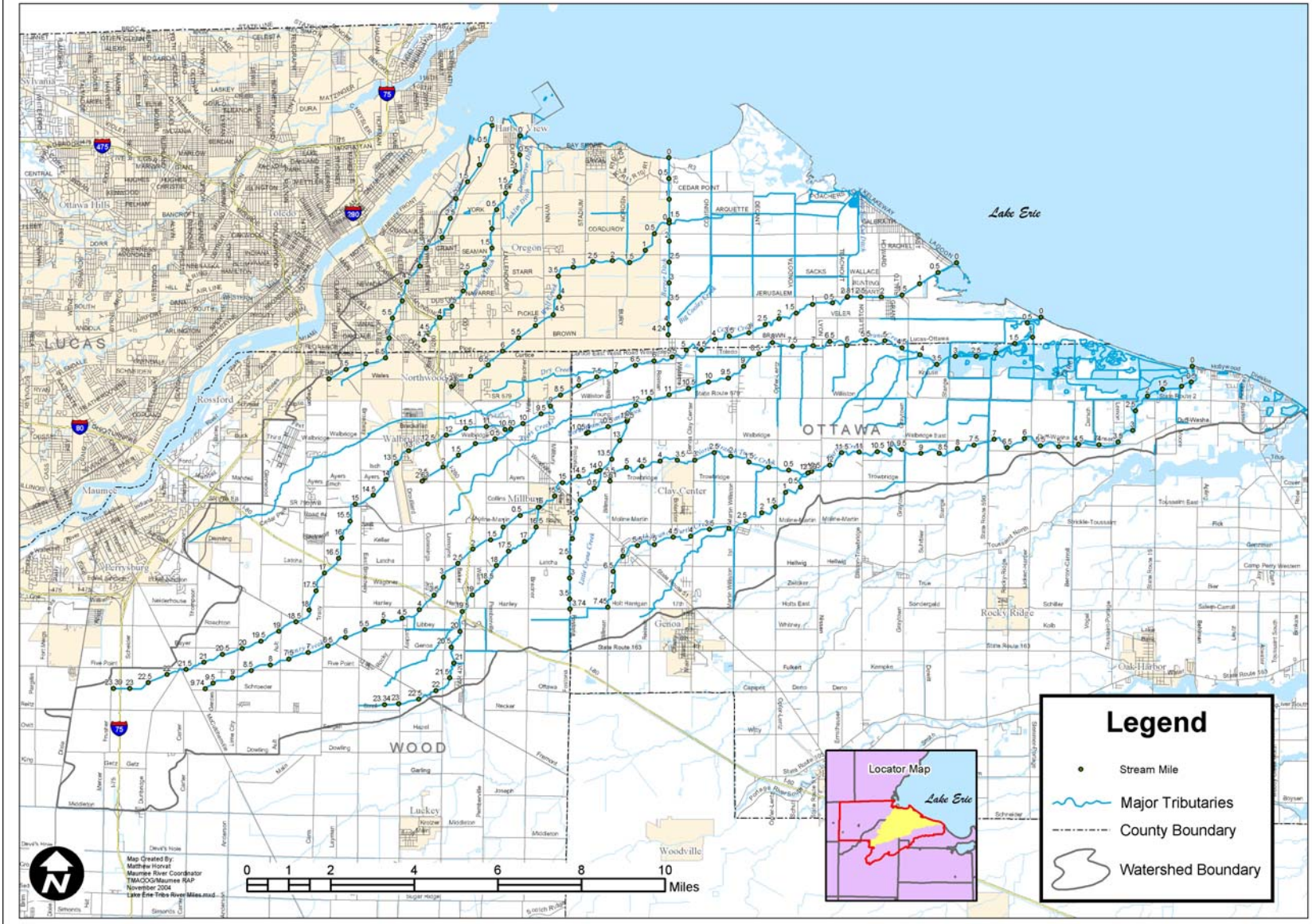
Lake Erie Direct Tributaries - 14 Digit HUC

Otter, Wolf, Cedar, Crane, and Turtle Creeks HUC 04100010 010



Lake Erie Direct Tributaries - River Miles

Otter, Wolf, Cedar, Crane, and Turtle Creeks HUC 04100010 010



See Volume 2 for the:

- Otter Creek Watershed Projects Table
- Wolf Creek/Berger Ditch Watershed Projects Table
- Cedar Creek Watershed Projects Table
- Crane Creek Watershed Projects Table
- Turtle Creek Watershed Projects Table

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- ¹ *Duck and Otter Creeks: The Watersheds, The Problems, and The Cleanup*, Maumee RAP Newsletter Issue #37, January 1999.
- ² Ohio EPA, STORET Data, April 2004.
- ³ *Delisting Targets for Ohio Areas of Concern*, Ohio EPA, June 2005.
- ⁴ Ohio EPA, STORET Data, April 2004.
- ⁵ *Delisting Targets for Ohio Areas of Concern*, Ohio EPA, June 2005.
- ⁶ USDA Natural Resource Conservation Service website: <http://www.oh.nrcs.usda.gov/technical/>.
- ⁷ Ohio EPA, STORET Data, April 2004.
- ⁸ Ohio EPA, STORET Data, April 2004.
- ⁹ USDA Natural Resource Conservation Service website: <http://www.oh.nrcs.usda.gov/technical/>.
- ¹⁰ *Maumee River Basin Area of Concern Remedial Action Plan Recommendations for Implementation Vol. 4*, TMACOG, July 1991, p 6-1.
- ¹¹ *Maumee River Basin Area of Concern Remedial Action Plan Recommendations for Implementation Vol. 4*, TMACOG, July 1991, p 6-1.
- ¹² *Maumee River Basin Area of Concern Remedial Action Plan Recommendations for Implementation Vol. 4*, TMACOG, July 1991, p 6-1.
- ¹³ *Ohio EPA 305(b) Report*, Ohio EPA, 1988.
- ¹⁴ Ohio EPA, STORET Data, April 2004.
- ¹⁵ Ohio EPA, STORET Data, April 2004.
- ¹⁶ USDA Natural Resource Conservation Service website: <http://www.oh.nrcs.usda.gov/technical/>.
- ¹⁷ *Maumee River Basin Area of Concern Remedial Action Plan Recommendations for Implementation Vol. 4*, TMACOG, July 1991, p 6-1.
- ¹⁸ *Maumee River Basin Area of Concern Remedial Action Plan Recommendations for Implementation Vol. 4*, TMACOG, July 1991, p 6-1.
- ¹⁹ *Maumee River Basin Area of Concern Remedial Action Plan Recommendations for Implementation Vol. 4*, TMACOG, July 1991, p 6-1.
- ²⁰ *Maumee River Basin Area of Concern Remedial Action Plan Recommendations for Implementation Vol. 4*, TMACOG, July 1991, p 6-1.
- ²¹ *Ohio EPA 305(b) Report*, Ohio EPA, 1988.
- ²² Ohio EPA, STORET Data, April 2004.
- ²³ *Delisting Targets for Ohio Areas of Concern*, Ohio EPA, June 2005.
- ²⁴ Ohio EPA, STORET Data, April 2004.
- ²⁵ *Delisting Targets for Ohio Areas of Concern*, Ohio EPA, June 2005.
- ²⁶ USDA Natural Resource Conservation Service website: <http://www.oh.nrcs.usda.gov/technical/>.
- ²⁷ Ohio EPA, STORET Data, April 2004.
- ²⁸ *Delisting Targets for Ohio Areas of Concern*, Ohio EPA, June 2005.
- ²⁹ Ohio EPA, STORET Data, April 2004.
- ³⁰ *Delisting Targets for Ohio Areas of Concern*, Ohio EPA, June 2005.
- ³¹ *Ohio EPA 305b Report*, Ohio EPA, 1996 and 2000.

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- Screening Analysis Sediment Quality Assessment Study of the Maumee River Area of Concern*, USEPA-GLNPO, 1995-1996.
- OEPA 305(b) Report*, Ohio EPA, 1998.