Chapter 3
Current Conditions and Projected Development

This chapter discusses the current water quality conditions in Northeast Ohio. It also addresses population and employment changes that have occurred since 1970, changes which have markedly affected water quality in the region. The last section of the chapter discusses the impacts that may be expected to occur given continuation of existing trends in population and employment over the next two decades.

I. Current Water Quality Conditions in Northeast Ohio

Background

The definitive source of information concerning current water quality conditions in Northeast Ohio is the 305(b) report prepared by the State on a biennial basis. This report is a requirement of Section 305(b) of the federal Clean Water Act which calls for states to submit to U.S. EPA a biennial report summarizing the status and trends in water quality of both surface and ground waters. The intent is for the 305(b) report to be a routine check on the progress that states are making toward achieving the goals of the Clean Water Act. Readers are encouraged to consult the full 305(b) report for details, a copy of which can be found on Ohio EPA’s web page at [www.epa.state.oh.us](http://www.epa.state.oh.us).

The basis for the 305(b) report is the periodic surveys of water quality and aquatic life (biosurveys) that Ohio EPA conducts on each major river system throughout Ohio. State priorities and resource availability to perform the survey work dictate the frequency with which watersheds are assessed. Northeast Ohio's major rivers are surveyed on an approximate five-year rotation.

Ohio EPA’s water quality survey objectives are to assess the attainment status of water quality standards, to assess whether assigned use designations are appropriate, and to determine if changes in water quality have taken place over time, and if these changes can be attributed to point and/or nonpoint source controls.

The findings and conclusions of these water quality surveys are published as Water Quality Permit Support Documents (WQPSDs). They may factor in regulatory actions taken by Ohio EPA (e.g., NPDES permits, Director’s Orders, the Ohio Water Quality Standards), and are eventually incorporated into the Ohio Water Quality Management Plan and the Ohio Nonpoint Source Assessment in addition to the Ohio Water Resource Inventory (305(b) Report).

The following are the most recent published reports available which document studies that were performed for the watersheds within the Northeast Ohio 208 planning area:


“Biological and Water Quality Study of the Grand and Ashtabula River Basins including Arcola Creek, Cowles Creek and Conneaut Creek (Ashtabula, Geauga, Lake and Trumbull Counties)”, 1996.


WATER QUALITY STANDARDS APPLICABLE TO NORTHEAST OHIO

Water quality standards consist of numerical standards geared to attainment of designated stream uses. Use designations consist of two broad groups, aquatic life and non-aquatic life uses. There are five different aquatic life uses currently defined in the Ohio WQS that apply to Northeast Ohio streams. These include: Warmwater Habitat (WWH), Exceptional Warmwater Habitat (EWH), Coldwater Habitat (CWH), Modified Warmwater Habitat (MWH), and Limited Resource Water (LRW).

The vast majority of segments in Northeast Ohio are designated Warmwater Habitat. There are some notable exceptions. The mainstem of the Grand River is classified as Exceptional Warmwater Habitat (WWH) - this use designation defines the “typical” warmwater assemblage of aquatic organisms for Ohio rivers and streams; this use represents the principal restoration target for the majority of water resource management efforts in Ohio. Exceptional Warmwater Habitat (EWH) - this use designation is reserved for waters which support “unusual and exceptional” assemblages of aquatic organisms which are characterized by a high diversity of species, particularly those which are highly intolerant and/or rare, threatened, endangered, or special status (i.e., declining species); this designation represents a protection goal for water resource management efforts dealing with Ohio’s best water resources. Coldwater Habitat (CWH) - this use is intended for waters which support assemblages of cold water organisms and/or those which are stocked with salmonids with the intent of providing a put-and-take fishery on a year round basis which is further sanctioned by the Ohio DNR, Division of Wildlife; this use should not be confused with the Seasonal Salmonid Habitat (SSH) use which applies to the Lake Erie tributaries that support periodic “runs” of salmonids during the spring, summer, and/or fall. Modified Warmwater Habitat (MWH) - this use applies to streams and rivers which have been subjected to extensive, maintained, and essentially permanent hydro modifications such that the biocriteria for the WWH use are not attainable and where the activities have been sanctioned and permitted by state and federal law; the representative aquatic assemblages are generally composed of species which are tolerant to low dissolved oxygen, silt, nutrient, enrichment, and poor quality habitat. Limited Resource Water (LRW) - this use applies to small streams (usually less than a three square mile drainage area) and other water courses which have been irretrievably altered to the extent that no appreciable assemblage of aquatic life can be supported; such waterways generally include small streams in extensively urbanized areas, those which lie in watersheds with extensive drainage modifications, those which completely lack water on a recurring annual basis (i.e. true ephemeral streams), or other irretrievably altered waterways.
Warmwater Habitat. Within the Chagrin River basin, the East Branch and Silver Creek are classified as Cold Water Habitat. Griswold Creek, Willey Creek, McFarland Creek and Beaver Creek are Exceptional Warm Water Habitat streams. The Cuyahoga River basin has numerous streams that are classified as Modified Warm Water Habitat or as Limited Resource Waters. Streams that are in the modified category include portions of the Ohio Canal, Fish Creek, Congress Lake Outlet, and Wahoo Ditch. Limited waters include part of Wahoo Ditch, Kingsbury Run, Morgana Run, the Burke Branch, the Ford Branch of Big Creek, Wood Creek, and Pond Brook.

Ohio EPA employs biological criteria that have been codified in the Ohio Water Quality Standards (WQS) to ascertain the attainment status of aquatic life uses in streams. It uses three different indices to measure fish and macroinvertebrate community characteristics and to determine if aquatic life uses are in FULL, PARTIAL or NON-ATTAINMENT status. Attainment of aquatic life use is in FULL ATTAINMENT if all three indices meet the applicable criteria, PARTIAL ATTAINMENT if at least one of the indices does not attain and biological community performance is at least fair, and NON-ATTAINMENT if all indices fail to attain, or any index indicates poor or very poor performance. PARTIAL ATTAINMENT or NON-ATTAINMENT indicates that the receiving water is impaired and does not meet the designated use criteria specified by the Ohio WQS.

How does the water quality of Northeast Ohio streams compare to streams statewide? Figure 3-1 compares the biological integrity of Northeast Ohio’s streams to 106 Ohio Rivers and statewide. It is based on a tool developed by Ohio EPA, Biological Integrity Equivalents (BIE), that integrates the three Ohio EPA biological indices into a single value on a scale of 0-100. The BIE includes measures of the fish and macroinvertebrate community structure and health of rivers and stream segment. The ranking reflects the degree to which biological integrity is achieved or the degree of impairment. Rivers and river tributaries across Ohio are measured and categorized in this new index, which can reflect potential (of lack of potential) for recovery to a higher status.

The Water Quality Use designations, the attainment status evaluation, and the BIE all serve to document existing conditions and trends within the rivers and streams of Ohio. The following discussion summarizes conditions in the streams of Northeast Ohio based on these tools.

WATER QUALITY TRENDS IN NORTHEAST OHIO

Ohio EPA has identified that major changes have occurred, which have contributed to the improvements in current water quality condition statewide. Ohio EPA notes that most of
<table>
<thead>
<tr>
<th>Statewide Rating of the Biological Integrity of N. E. Ohio Rivers &amp; Streams</th>
<th>Narrative Rating</th>
<th>Cultural / Watershed Influences &amp; Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ranking</strong></td>
<td></td>
<td>Highest quality Ohio stream and riverine resources with exceptional quality biological assemblages, significant populations of imperiled species, high quality instream and riparian habitat (effects of nonpoint sources are mitigated by these characteristics); point source impacts are generally minimal to nonexistent; significant recovery has occurred in some due to WWTP upgrades.</td>
</tr>
<tr>
<td>21. Grand River (1995)</td>
<td>Exceptional</td>
<td>High quality Ohio streams and rivers, most with intact instream &amp; riparian habitat; significant recovery has occurred in some due to WWTP upgrades.</td>
</tr>
<tr>
<td>27. Upper Cuyahoga R. (1991)</td>
<td>Very Good</td>
<td>Typifies characteristics common to most Ohio stream and riverine resources; quality of instream &amp; riparian habitat is generally good at most locations; effects of point and/or nonpoint sources are more evident; significant recovery has occurred in some areas due to WWTP upgrades.</td>
</tr>
<tr>
<td>36. Chagrin River (1995)</td>
<td>Good</td>
<td>Increased non-attainment of WWH evident; marginal attainment of WWH at many locations; effects of point and/or nonpoint sources are increasingly evident; riparian and instream habitat degradation, siltation, and nutrient enrichment are increasingly important factors; recovery from point source impacts is incomplete and may be inhibited by these factors.</td>
</tr>
<tr>
<td>50. W. Br. Rocky River (1992) 51. E. Br. Rocky River (1992)</td>
<td>Marginally Good</td>
<td>Few sites attain WWH, non-attainment at most sites due to watershed-wide riparian and instream habitat degradation, agricultural and suburban nonpoint sources, industrial and municipal WWTP impacts and/or non-acidic mine drainage; recovery from point source impacts is incomplete and may be inhibited by other factors.</td>
</tr>
<tr>
<td></td>
<td>Poor</td>
<td>Extreme degradation due to residual problems; very low recovery potential.</td>
</tr>
<tr>
<td></td>
<td>Very Poor</td>
<td></td>
</tr>
</tbody>
</table>

Source: 1996 Ohio Water Resources Inventory 305(b) Report by Ohio EPA

Figure 3-1
these water quality improvements can be attributed to improvements in point source control and that future threats to water quality will come from nonpoint sources of pollution. Their assessment is applicable to Northeast Ohio as well. Ohio EPA states:

“the impacts from nonpoint sources of pollution, such as combined sewer overflows, urban storm water, siltation of substrates, and habitat degradation, agricultural and storm water run-off, etc., are becoming increasingly evident as historically more pronounced impacts from point sources (e.g. municipal WWTPs, some industrial effluents) are reduced. Since 1988, there has been a 48% decline in point sources as a major source of impairment in reassessed streams in Ohio... Nonpoint sources have emerged as a major source of impairment in streams and rivers during this period...River and stream attainments will not be achieved by the restoration of point source related impairments alone. Even if point source associated impairment is virtually eliminated (and assuming no new nonpoint source impacts are revealed) the result would be over 70% of streams and rivers fully attaining aquatic life criteria. Given these facts, “new” successes in controlling, abating, and preventing nonpoint and other sources of impairment will be needed.

“While successes resulting form the abatement of point sources have been documented, there are other indications that impact from nonpoint source runoff, habitat degradation, and watershed disturbances may be worsening. Siltation of substrates (i.e. stream bed, stream channel, stream bottom, etc.) and habitat degradation are now the second and third leading causes of aquatic life impairment in Ohio streams and rivers, surpassing ammonia and heavy metals. These impairments are principally the result of agricultural land use, intensive urbanization, and suburban development, the latter of which is emerging as one of the most significant threats to watersheds... Increasingly, water pollution problems are associated with nonpoint sources such as, construction sites, farm land, abandoned mines, landfills, pits and lagoons, oil and gas wells, domestic sewage systems, manure and treatment processing residuals.”

The following discussion summarizes water quality conditions within the watersheds of Northeast Ohio. Each watershed is discussed in terms of its water quality standards attainment status, of gains or losses in overall water quality since the development of the original 208 Water Quality Management Plan, and the outlook for the future.

**Black River Watershed:** Figure 3-2 summarizes current water quality conditions in the Black River watershed. Most of the watershed has been identified to be in Non-Attainment or Partial Attainment of the Water Quality Standards. Problematic waters include the navigation channel and most of the mainstems of the East Branch and West Branch. Several scattered stream and tributary segments have been determined to be in Full Attainment. Nonpoint source pollution is a major contributor to the Black River’s Non-Attainment or Partial Attainment status in the East and West Branches. Impacts from agricultural runoff affect the largest number of stream miles (primarily in the upper reaches) of these streams. Urbanizing runoff and failing home sewage disposal systems are

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significant factors in the lower East Branch. Nutrient enrichment from wastewater treatment plants, contaminated sediments, and low levels of dissolved oxygen are major factors impairing water quality in the main stem of the Black River. The Black River is an Area of Concern subject to Remedial Action Plan requirements of the Great Lakes Water Quality Agreement.

Since 1982, the Black River has seen improvement in some areas and declines in others. In the past the Black River suffered from excessive wastewater treatment discharges, combined sewer overflows and industrial problems. Much progress has been made in dealing with these problems. Nonpoint source pollution has become the major problem in the Black River, particularly in the upper reaches of the watershed. Degraded habitat and large sediment loadings are the most pronounced problems. Storm water runoff from agricultural fields and from advancing urbanization is the most often cited cause of these problems.

The BIE index reflects the stressed conditions noted in the Black River. The East and West Branches of the Black River are classified as “Fair” and received respective rankings of 61st and 73rd. The Black River mainstem received a ranking of 80th in the state out of 106.

**Rocky River Watershed:** Figure 3-3 summarizes current water quality conditions in the Rocky River watershed. Large stretches of both the East Branch and West Branch of the Rocky River are fully attaining the water quality standards. However, the lower stretches of these two branches and both Baldwin Creek and Abrams Creek are not attaining water quality standards. Much of the mainstem is only in partial attainment of the standards.

The majority of the water pollution problems and resulting status of Non-Attainment lies north of Berea, downstream from Baldwin Lake on the East Branch and below Blodgett Creek on the West Branch. These tributaries may contribute to poor water quality downstream of their confluence with the East Branch and mainstem. Rapid urbanization is a major contributing factor in those areas of the Rocky River that do not meet water quality standards.

Between 1981 and the present the Rocky River can also be described as improving in some areas and declining in others. The Rocky River experienced many WWTP upgrades during this period and water quality improved markedly in downstream areas. Management of nonpoint source pollution has maintained a moderately good aquatic habitat status although concern exists over increasing urban runoff throughout the watershed.

According to the BIE index, the West and East Branches of the Rocky River were ranked 50th and 51st in the state, respectively, and were considered “marginally good.” This means that there is only marginal attainment of Warmwater Habitat standards at many locations.

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Black River Water Quality Standards Use Attainment

Use Attainment Status
- Full Attainment
- Partial Attainment
- Non Attainment
- Not Assessed

Figure 3-2

Source: Ohio Environmental Protection Agency
Figure 3-3

Rocky River Water Quality Standards Use Attainment

Use Attainment Status
- Full Attainment
- Partial Attainment
- Non Attainment
- Not Assessed

Source: Ohio Environmental Protection Agency

Northeast Ohio 208 Water Quality Management Plan

Prepared by Northeast Ohio Areawide Coordinating Agency

November 2000
The effects of point and/or nonpoint sources are also increasingly evident. Riparian and in stream habitat degradation, siltation, and nutrient enrichment are increasingly important factors. Stream and river recovery from point source impacts is incomplete and may continue to be inhibited by these factors. The mainstem of the Rocky River was ranked 84th statewide. The mainstem is considered to be in a “fair” status which indicates that wastewater treatment impacts remain.

Cuyahoga River Watershed: Figure 3-4 summarizes current water quality conditions in the Cuyahoga River watershed. In the upper Cuyahoga River (in Geauga and Portage Counties) the river has been identified as being in Full Attainment except in a few segments. The East Branch is most heavily impacted stretch with one segment in non-attainment and the balance in Partial Attainment. From the confluence of the East Branch and the West Branch to the Portage County line, the river is in partial attainment of the standard. A twenty-five mile portion of the Cuyahoga River, through this stretch, from the Troy/Burton Township line in Geauga County to Route 14 in Portage County, has been designated a State Scenic River.

Much of the middle Cuyahoga River which lies in Portage and Summit Counties upstream of the confluence with the Little Cuyahoga River is in full attainment of the standards. The lower 45 miles of the river, from the Ohio Edison Dam near the confluence of the Little Cuyahoga is an Area of Concern subject to Remedial Action Plan requirements of the Great Lakes Water Quality Agreement.5

The Cuyahoga River has greatly improved since 1984. Most improvements were due to wastewater treatment plant upgrades and pretreatment programs at industrial facilities. The Cuyahoga’s habitat condition in the navigation channel limits biological recovery. Habitat above the navigation channel has improved in many locales but is threatened in rapidly urbanizing areas of the watershed.

The Upper Cuyahoga River is ranked second in Northeast Ohio and 27th statewide by the BIE index. It received a ranking of “good.” “Good” streams and rivers typically possess the following characteristics: the quality of the in-stream and riparian habitat is good at most locations, while the effects of point and nonpoint source pollution are not evident.

The Lower Cuyahoga River was measured twice, once with 1991 data, and once with 1986 and 1991 data combined. Both times the river fell within a “fair to poor” classification. With 1991 data alone, the lower Cuyahoga ranked 88th in Ohio. The fair to poor classification indicates that very few if any sites attain warmwater standards and there are very extensive riparian and in-stream habitat degradation due to urban non-point problems, combined sewers overflow (CSOs), sanitary sewer overflows (SSOs), industrial impactors and sediment contamination. Tinkers Creek is ranked right below the lower Cuyahoga and is also in the fair to poor category.

**Chagrin River Watershed:** Figure 3-5 summarizes current water quality conditions in the Chagrin River watershed. Portions of the Chagrin River have been designated a State Scenic River including the Aurora Branch below the SR 82 bridge, the mainstem from the Aurora Branch to the US 6 bridge in Lake County and the East Branch from the Heath Road bridge to its confluence with the mainstem. This mileage is characterized by exceptional aquatic habitat and high quality forest land.

The Chagrin River is a very high quality stream with several segments designated Cold Water Habitat (East Branch and Silver Creek). Exceptional Warmwater Habitat designations apply to several tributaries. Significant portions of the Chagrin River are fully attaining water quality standards. However some segments, including the upper stretches of the Aurora Branch in Portage County, the mainstem near Chagrin Falls and near Gates Mills and Mayfield Village in Cuyahoga County are only in partial attainment of the standards. Moreover some of the very high quality segments, notably Silver Creek, show a partial attainment status. The water quality in the Chagrin River appears to be threatened as the result of rapid urbanization.

The BIE index ranks the Chagrin River as third best in the region and 36th in the State. The river is in the good category. There exists widespread concern that advancing urbanization is threatening this ranking. Loss of aquatic habitat and increases in sediment loads are the basis for this concern.

**Grand River Watershed:** Figure 3-6 summarizes current water quality conditions in the Grand River. Note that only the lower portion of the Grand River lies within the study area for this plan. The Grand River is a very high quality stream with some of the highest water quality in Northeast Ohio. Significant portions of the Grand River have been designated an Exceptional Warm Water Habitat including a large majority of the mainstem in Lake County. Portions of the Grand River have received designation as a Wild and Scenic River from the Ohio Department of Natural Resources (ODNR). This includes twenty-three miles of the Grand River from the US-322 crossing downstream to the Harpersfield Covered Bridge in Ashtabula County which are classified as “Scenic”. Thirty-three miles of the Grand River from the Harpersfield Covered Bridge downstream to the Norfolk Southern Railroad Crossing in Painesville are designated “Wild”. The entire upper mainstem of the Grand River that has been designated Warmwater Habitat is fully attaining that standard, while most of the lower mainstem is in full attainment of its Exceptional Warmwater standards.

The Grand River was ranked the highest of the five watersheds within Northeast Ohio and 21st out of the 106 Ohio streams and rivers ranked by the BIE index. It received a ranking of “very good.” Streams and rivers with this ranking are considered “high quality water, with most stream and riparian habitat intact.
Chagrin River Water Quality Standards Use Attainment

Figure 3-5

Chagrin River

Use Attainment Status
- Full Attainment
- Partial Attainment
- Non Attainment
- Not Assessed

Source: Ohio Environmental Protection Agency

Northeast Ohio 208 Water Quality Management Plan

Prepared by: Northeast Ohio Areawide Coordinating Agency

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6003e/November 9, 2000

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Figure 3-6

Grand River Water Quality Standards Use Attainment

Use Attainment Status

✓ Full Attainment

☆ Partial Attainment

△ Non Attainment

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Source: Ohio Environmental Protection Agency

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To summarize, overall water quality conditions have improved somewhat in Northeast Ohio in recent years. This is largely due to improvements in wastewater treatment facilities. However, major problems persist and are likely to worsen over time. Insight into how water quality problems have changed, particularly in urbanizing areas of the region, can be obtained by an analysis of regional population trends which indicate where populations, households and businesses have relocated to previously undeveloped portions of the region adding to the nonpoint source pollution burden in those areas. The areas that are expected to be subject to the same stresses over the next 20 years are identified by the projection of growth through 2020.

II. Regional Population & Employment Developments Since 1979

A significant factor influencing water quality in Northeast Ohio is the continuing dispersal of people and jobs. This dispersal is an ongoing phenomenon, affecting people, businesses and communities in complex ways.

POPULATION AND DEMOGRAPHIC CHANGES

Urban population dispersal in the absence of population growth makes Northeast Ohio atypical compared to other regions in the United States. The region’s largest city, Cleveland, achieved its maximum population in 1950 while its largest county, Cuyahoga, peaked in 1970 as did the region as a whole. Since then the NOACA area has experienced a net population decline of 200,000: Cuyahoga County has lost more than 300,000 residents and the four surrounding counties in the NOACA area have gained 100,000 residents. The population gains in the surrounding counties can be attributed both to relocations and a natural increase due to births.

The experience of Summit and Portage Counties in the southeastern part of this region and outside the NOACA area differs slightly from that of the NOACA counties. Portage County has exhibited a steady growth in population, some of which may be due to out-migration from the north. Although residents in the northern parts of Summit and Portage Counties may have more of a Cleveland orientation, the City of Akron is a strong presence throughout a large part of Summit and Portage Counties. As in Cuyahoga County, Summit County’s population peaked with the 1970 census. After an initial decline, largely attributed to the loss of jobs at several tire and rubber manufacturers, Summit County’s population has begun to increase.

After twenty years of decline following the 1970 census, the NOACA area population stabilized, increasing by 20,000 between 1990 and 1998. Population loss continued to occur in Cuyahoga County with that county’s share of NOACA area population declining from about three-quarters of the whole in 1970 to two-thirds in 1998. The loss is balanced by modest gains in the surrounding counties.

County-to-county migration patterns, however, do not tell the whole story. Population is also shifting within Cuyahoga County. Recent studies show that 56 of 163 jurisdictions in the NOACA area lost population since 1990. The pattern of loss is almost exclusively within the NOACA area’s two large central cities - Cleveland and Lorain - and the inner
ring suburbs of Cuyahoga County. Many of these residents are moving to the outer fringe of the county. In the NEFCO counties, the population shift is much less drastic, with 10 of 61 jurisdictions experiencing slight population losses between 1990-1998. However, as with the NOACA area, the greatest population losses occurred in NEFCO counties’ largest cities.

Other people are moving farther out. The open space available in Geauga, Medina and Portage counties meets the demand for homes for a growing population, changes in housing patterns, large lot preferences and rural character. Virtually all communities in the outlying four NOACA counties surrounding Cuyahoga have gained population, and much of that gain is from Cuyahoga County. Of Cuyahoga County's net outmigration of 56,519 residents between 1990 and 1996, almost three-fourths (40,322) settled in one of the six counties contiguous to Cuyahoga. This exemplifies the development pattern of Northeast Ohio: much of the recent increase in outlying county population is actually redistribution within the region.

This dispersal trend will probably continue for Cuyahoga County, which is expected to shrink by about 90,000 residents or about 6 percent between 1990 and 2025. During the same time frame, population in the outlying suburbs of the NOACA area is expected to grow collectively by about 22 percent. NOACA projects that Medina County will gain approximately 64,000 in population between 1990 and 2025 - an increase of over 50 percent.

The experience of NEFCO’s counties is somewhat different. Combining the totals for the Summit and Portage Counties, population peaked in 1970 with 679,237, and then declined by 3 percent with a population loss of 18,911 by 1980. This decline had slowed to 2,753 (0.4 %) in 1990. Recent 1998 estimates of the population indicate that the two-county area has more than gained back the numbers lost. Estimates of the 1998 populations of Summit and Portage Counties show steady increases of 4 and 6 percent, respectively, since 1990. These figures account for a sub-regional total of 688,900 which surpasses the previous 1970 population peak. A steady economy and economic diversification efforts by Akron are expected to continue these population trends.

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Table 3-1 summarizes population changes between 1970 and 1998 for the seven counties in Northeast Ohio.

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<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuyahoga</td>
<td>1,720.8</td>
<td>57%</td>
<td>1,498.4</td>
<td>1,412.1</td>
<td>1,380.7</td>
<td>49%</td>
<td>-20</td>
</tr>
<tr>
<td>Geauga</td>
<td>63.0</td>
<td>2%</td>
<td>74.5</td>
<td>81.1</td>
<td>88.8</td>
<td>3%</td>
<td>+41</td>
</tr>
<tr>
<td>Lake</td>
<td>197.2</td>
<td>7%</td>
<td>212.8</td>
<td>215.5</td>
<td>223.8</td>
<td>8%</td>
<td>+13</td>
</tr>
<tr>
<td>Lorain</td>
<td>256.8</td>
<td>9%</td>
<td>274.9</td>
<td>271.1</td>
<td>282.1</td>
<td>10%</td>
<td>+10</td>
</tr>
<tr>
<td>Medina</td>
<td>82.7</td>
<td>3%</td>
<td>113.2</td>
<td>122.4</td>
<td>144.0</td>
<td>5%</td>
<td>+74</td>
</tr>
<tr>
<td>Portage</td>
<td>125.9</td>
<td>4%</td>
<td>135.9</td>
<td>142.6</td>
<td>151.2</td>
<td>5%</td>
<td>+20</td>
</tr>
<tr>
<td>Summit</td>
<td>553.4</td>
<td>18%</td>
<td>524.5</td>
<td>515.0</td>
<td>537.7</td>
<td>19%</td>
<td>-3</td>
</tr>
</tbody>
</table>

**TOTAL**       **2,999.8**  **100%**  **2,834.2**  **2,759.8**  **2,808.3**  **100%**  **-6**


Figure 3-7 shows communities in the seven-county Northeast Ohio region with population growth of 1,000 or more in decades between 1980 and 1998. In the decade 1980-1990, the 22 communities that experienced a population increase of a thousand or more were outside the urban core cities of Cleveland and Akron. This trend continued in the period, 1990-1998, with 24 communities in the NOACA area and 19 communities in the NEFCO counties experienced a population growth of 1,000 or more.
EMPLOYMENT CHANGE

NOACA and NEFCO staff looked at employment trends, and particularly non-manufacturing employment trends by community as an indicator of where commercial development has occurred in Northeast Ohio over the past two decades.

The economy in the NOACA area has been characterized by slow growth and an increasing pattern of dispersal throughout the region. Similar patterns are apparent in portions of the NEFCO area, however with less dispersal around the central City of Akron than found in the Cleveland area. While many retail and service jobs migrated outward in response to population movement, other businesses moved to construct more modern and efficient production facilities.

From 1969 to 1996 the NOACA area experienced a 17 percent gain in total employment (187,000 jobs). This gain was not, however, equally distributed throughout the region. Of the total increase, Cuyahoga County gained 37,000 jobs while the remaining 150,000 were distributed among the four outlying NOACA counties. Despite the employment gain, Cuyahoga County's share of regional employment shrunk from 83 to 73 percent. The largest numerical gain occurred in Lake County, while Geauga and Medina Counties had the largest proportional gains.

If this trend continues, Cuyahoga County's share of NOACA area employment is projected to shrink from 74 percent to 69 percent between 1993 and 2010. In that time frame, Cuyahoga County will lose 2 percent of its jobs while NOACA's outlying counties will experience a 26 percent job gain.

Within the NEFCO area, the economic outlook has been more positive. In the early 1980s, Portage and Summit Counties experienced economic setbacks. However by 1998 the two counties saw significant job growth. The number of jobs has increased by 82,100, representing a 30 percent gain. More than three out of four of these jobs were in Summit County which includes the City of Akron. Although Akron has also experienced some dispersal of its employment within the greater Akron area, the City has been successful in attracting new industries.

Besides shifting geographically, the Northeast Ohio economy underwent a major structural change from a manufacturing-based economy to a service-based one. The region's manufacturing core was rooted in traditional heavy industries such as automobiles, rubber, and steel, with many jobs located in large centralized factories. Following the recession of the early 1980s, large manufacturing operations were downsized or shut down and the shift to a service-based economy began. Both trends-newer, smaller manufacturing operations and the evolution of the services economy- encouraged job migration to suburban industrial parks and edge cities. As a consequence, in the NOACA area the central cities of Lorain and Cleveland, as well as Cleveland's inner ring suburbs, suffered the greatest job losses. The most significant decline was in Cleveland, where over 11,000 jobs and 1,300 establishments disappeared between 1972 and 1992.
Clearly the structure of the regional economy underwent significant change over the study period. In 1969, 33 percent of the NOACA area's jobs were in the manufacturing industries while services accounted for 18 percent. By 1996 the structure reversed: services provided 31 percent of the jobs while manufacturing shrank to 17 percent. The NEFCO area showed similar trends in its employment history. In 1970, manufacturing jobs in Portage and Summit Counties represented 35 percent of all employment while service industries accounted for only 17 percent. By 1996, manufacturing employment had fallen to 18 percent while services increased to 30 percent.

The growth of the non-manufacturing sector of the region’s economy has occurred mainly in the retail trade and services industries. Regionally the services industry expanded much more rapidly than did the retail sector. In the NOACA area from 1972 to 1992 the number of service establishments more than doubled, adding more than 100,000 jobs. Retail outlets grew eight percent yielding 35,000 new jobs. The retail industry clearly seeks out areas of population growth and interstate system access. Virtually all the communities that added over 1,000 jobs, e.g., North Olmsted, Mentor, Beachwood, Strongsville, share these characteristics and have had strong growth in employment.

In NEFCO’s Portage and Summit Counties, the number of service establishments grew from 2,914 in 1972 to 6,166 in 1996. As in the NOACA area, retail trade in these counties now accounts for a large portion of the area’s jobs with 60,100 persons employed in the service industry.

Table 3-2 summarizes commercial employment change between 1970 and 1996 for the seven counties in Northeast Ohio. Note the three most industrialized counties, Cuyahoga, Lorain and Summit, had the lowest growth rates, while employment in the four suburban counties, responding in part to population growth, more than doubled.

In sum, Northeast Ohio has undergone significant changes in a generation. People and jobs, once centered in central cities such as Akron and Cleveland, are now scattered throughout the region. The region has shifted from a manufacturing-based economy, characterized by heavy industry, to a service-based economy. Earnings, tax revenues and demands for new infrastructure have accompanied people and jobs in their migratory pattern.
Table 3-2
Northeast Ohio Commercial Employment 1970 to 1996*
(in thousands)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuyahoga</td>
<td>457.6</td>
<td>65%</td>
<td>520</td>
<td>605.2</td>
<td>654.0</td>
<td>58%</td>
<td>+43</td>
</tr>
<tr>
<td>Geauga</td>
<td>8.2</td>
<td>1%</td>
<td>12.9</td>
<td>18.8</td>
<td>22.3</td>
<td>2%</td>
<td>+172</td>
</tr>
<tr>
<td>Lake</td>
<td>32.6</td>
<td>5%</td>
<td>47.8</td>
<td>60.8</td>
<td>69.5</td>
<td>6%</td>
<td>+113</td>
</tr>
<tr>
<td>Lorain</td>
<td>46.2</td>
<td>6%</td>
<td>57.4</td>
<td>68.0</td>
<td>76.1</td>
<td>7%</td>
<td>+65</td>
</tr>
<tr>
<td>Medina</td>
<td>13.8</td>
<td>2%</td>
<td>22.6</td>
<td>31.2</td>
<td>41.3</td>
<td>4%</td>
<td>+199</td>
</tr>
<tr>
<td>Portage</td>
<td>21.8</td>
<td>3%</td>
<td>30.3</td>
<td>37.5</td>
<td>45.4</td>
<td>4%</td>
<td>+108</td>
</tr>
<tr>
<td>Summit</td>
<td>120.6</td>
<td>17%</td>
<td>147.3</td>
<td>180.1</td>
<td>209.5</td>
<td>19%</td>
<td>+74</td>
</tr>
<tr>
<td>TOTAL</td>
<td>700.8</td>
<td>100%</td>
<td>838.3</td>
<td>1001.6</td>
<td>1118.1</td>
<td>100%</td>
<td>+60</td>
</tr>
</tbody>
</table>

* Commercial employment is defined as: Retail Trade; Finance, Insurance and Real Estate; Services; Government.

* Source: Bureau of Economic Analysis, “Regional Economic Information System” (REIS) 1969-96.

III. Future Changes in Regional Population, Households and Employment

As noted above, regional dispersal of population is expected to continue in Northeast Ohio during the next two decades. Population growth is expected to continue in communities on the outer fringes of the Cities of Cleveland and Akron. Figure 3-8 utilizes projected population figures developed for the NOACA Long Range Transportation Plan and projection data developed by the Akron Metropolitan Area Transportation Study (AMATS) to provide a picture of the geographic distribution that is expected to occur throughout Northeast Ohio in the next two decades.

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6 Population projection data was developed utilizing 1990 as the base year and reflects a trends analysis approach. Projections through 2025 were not available for Portage and Summit Counties; projections through 2020 were utilized for these counties.
communities that have experienced growth since the 1980's can expect to grow through 2025. Modest population growth and continued decrease in the average household size has resulted in an increase in the number of households throughout the region. The expected geographic distribution of these new households will also lead to demand for new housing in previously undeveloped areas of the region. Figure 3-9 illustrates the geographic distribution of projected household growth in Northeast Ohio during the next twenty five years.

FUTURE REGIONAL EMPLOYMENT DISTRIBUTION

Regional employment trends of the past twenty five years are expected to continue in the region unless there is some currently unexpected intervening factor. In the NOACA area, Cuyahoga County’s share of area employment is projected to shrink from 74 percent to 69 percent between 1993 and 2010. In that time frame, Cuyahoga County will lose 2 percent of its jobs while the outlying counties will experience a 26 percent job gain. Figure 3-10 shows regional employment trends.

Conclusion

What do these trends signify for regional water quality? The overlay of watershed boundaries as shown in Figure 3-11 illustrates the key point that much of the future regional population growth will occur in watershed areas that currently feature relatively high water quality. This includes areas like the lower Grand River and the Aurora Branch of the Chagrin River which are projected to be high growth areas. The middle Cuyahoga River and the upper portion of the lower Cuyahoga are also expected to grow substantially. Both the East and West Branches of the Rocky River are projected to experience growth, with particular impacts expected in the vicinity of the City of Medina. The lower reaches of the East Branch of the Black River and nearby areas of Lorain County that drain directly to Lake Erie will also be affected.

Population growth and the associated demands for newly constructed housing will result in the continued disturbance of undeveloped lands precisely in those watershed areas most vulnerable to these changes. The locations of new homes will influence many businesses to relocate to be closer to their employees or their customers. Land uses will continue to change from a predominantly rural character to urbanizing uses, and this will affect how water runs off the land surface or into the ground. The increase in urban runoff and other sources of nonpoint source pollution can degrade water quality, habitat for aquatic life and aquatic life itself. If these trends continue and no countervailing water quality management strategies are implemented regional water quality is expected to decline, reversing the gains of the last twenty years.

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Projected Population Growth in Seven County Area

NOACA 5 County Region 2000-2025*
Summit and Portage 1990-2020*

1 Dot = Gain of 30 Persons

Figure 3-8
NORTHEAST OHIO AREAWIDE COORDINATING AGENCY

MEMORANDUM

TO: NOACA Governing Board

FROM: Dave Ritter, Water Quality Planner
dritter@mpo.noaca.org

DATE: August 31, 2011

RE: Resolution No. 2011-036 - Addendum to Clean Water 2000 Chapter 3 – Current Conditions

NOACA serves as the areawide planning agency for water quality in the five counties of Northeast Ohio. Under Section 208 of the Federal Clean Water Act, NOACA must maintain a management plan for wastewater. NOACA’s 208 plan is entitled Clean Water 2000.

Chapter 3 of Clean Water 2000 NOACA’s Water Quality Management Plan has been updated with an addendum to reflect the water quality planning and project progress made in the NOACA region watersheds since 2000. The addendum is a summary of the current condition of activities in the NOACA region as they relate to water quality improvement.

The NOACA Water Quality Advisory Committee reviewed the proposed amendments at the meeting of August 24, 2011, and recommends approval.
RESOLUTION NO. 2011-036  
(ADDENDUM TO CLEAN WATER 2000,  
CHAPTER 3 - CURRENT CONDITIONS)

RESOLUTION OF THE GOVERNING BOARD  
OF THE  
NORTHEAST OHIO AREAWIDE COORDINATING AGENCY

WHEREAS, the Northeast Ohio Areawide Coordinating Agency (NOACA) is the metropolitan planning organization for the counties of Cuyahoga, Geauga, Lake, Lorain and Medina, and is the areawide planning agency designated by the Governor of Ohio pursuant to Section 208 of the federal Clean Water Act, as amended, to engage in water quality management planning in the Northeast Ohio Lake Erie Basin, including the Cuyahoga, Chagrin, Grand, Rocky, and Black River basins, on behalf of the five counties and the municipalities and townships within them; and

WHEREAS, Clean Water 2000, the current update to the NOACA Section 208 Water Quality Management Plan, was adopted by the NOACA Governing Board, certified by the Governor of Ohio, and approved by the United States Environmental Protection Agency; and

WHEREAS, Clean Water 2000 has been and will be continuously updated by the NOACA Governing Board in order to continue to achieve water quality improvements in the region; and

WHEREAS, Because water quality planning and project implementation in the NOACA region watersheds have advanced since the adoption of Clean Water 2000, an update to Chapter 3 was needed to capture and document changes in the watersheds; and

WHEREAS, the NOACA Water Quality Advisory Committee reviewed the proposed amendments and recommends that the Governing Board approve them, as shown in Attachment A.

NOW, THEREFORE, BE IT RESOLVED by the Governing Board of the Northeast Ohio Areawide Coordinating Agency, consisting of forty-four principal officials serving general purpose local governments throughout and within the counties of Cuyahoga, Geauga, Lake, Lorain, and Medina that:

Section 1. The Clean Water 2000 Plan is amended to include the language Addendum to Chapter 3 detailed in Attachment A.
RESOLUTION NO. 2011-036
(ADDENDUM TO CLEAN WATER 2000,
CHAPTER 3 - CURRENT CONDITIONS)

-2-

Section 2. The Executive Director is authorized and directed to send a copy of this Resolution to the Director of the Ohio Environmental Protection Agency, and to post the amended version of *Clean Water 2000* to NOACA's website.

Certified to be a true copy of a Resolution of the Governing Board of the Northeast Ohio Areawide Coordinating Agency adopted this 9th day of September, 2011.

Secretary

Date Signed: 9/9/2011
Clean Water 2000
Chapter 3 Addendum: Current Conditions
September 2011

This addendum to Chapter 3 of *Clean Water 2000* is to outline activities and changes in conditions of watersheds in the NOACA region since 2000. Information provided in this addendum has been gathered from a variety of sources and summarized to provide a picture of the on-going water quality improvement work that has occurred.

**Background**

The definitive source of information concerning current water quality conditions in Northeast Ohio is the Integrated Water Quality Monitoring and Assessment report prepared by the Ohio EPA on a biennial basis. This report is a requirement of the Section 305(b) and 303(d) of the Federal Clean Water Act which calls for states to submit to U.S. EPA a biennial report summarizing the status and trends in water quality of both surface and ground waters. The intent is for the 305(b) report to be a routine check on the progress that states are making toward achieving the goals of the Clean Water Act. The 305(b) report also establishes a baseline of water quality data by which to gauge changes introduced by the implementation of best management practices. Readers are encouraged to consult the full 305(b) and 303(d) priority list for additional information. A copy of the most recent report is available at www.epa.state.oh.us.

By only looking at the data summaries in the 305(b) report it looks like our streams have not improved much since 2000. While impairments still prevent some of our streams from meeting use attainment goals many success stories throughout the region are commonplace and localized improvement has occurred. Our region was one of the first areas Ohio EPA began to study so much of the data on our streams is five to ten years old and may not reflect improvements that have been made. That being said, the current threats to the health of our streams are very similar to the threats our streams faced in 2000. Non-point source pollution and modification of stream hydrology are persistent threats that have been and will continue to be addressed. One of the biggest differences in our region today verses in 2000 is that localized groups and organizations have taken ownership of their watersheds and have invested heavily in putting professional staff in place to address the threats to our streams as we move into the next decade. Since 2000 new rules and regulations have been adopted to address non-point source pollution. In 2003 Ohio EPA enacted the NPDES Phase II Storm Water Permits program. This program requires urbanized communities to educate the population on water quality, to pass ordinances to protect water quality, and to develop programs to address erosion and sediment control and post construction storm water quality. In addition the Ohio Department of Health is currently revising rules and regulations for home sewage treatment systems, which will potentially reduce the pollution potential of these systems. The following report will identify the work that is going on and the organizations that are in place to address non-point source pollution and hydrologic modification that are impacting our streams.
Since 2000, five Total Maximum Daily Load (TMDL) Analyses have been conducted by Ohio EPA and approved by US EPA. These include the Black River, Rocky River, Upper and Lower Cuyahoga River, and the Chagrin River. The Lower Grand River TMDL is nearly complete. The TMDL program, established under Section 303(d) of the Clean Water Act (33 U.S.C. 1313); focuses on identifying and restoring polluted rivers, streams, lakes and other surface waterbodies. A TMDL can serve as a guide to what is wrong with a stream and where efforts need to be focused to begin to restore a stream to the point where it is meeting its aquatic and recreational use designations. These reports will serve as a guide to bring streams into attainment with their designated use goals over the next decade.

Figure 3-12 is a snapshot of the watersheds, the groups involved, major milestones and improvements, and where to find more information on a particular watershed.

The Black River

The Black River drains over 467 square miles of land. Although flowing primarily in Lorain County the watershed includes drainage from Medina, Ashland, Huron and Cuyahoga Counties. Over fifty percent of the land within the watershed is used for agriculture production, twenty five percent is forested, and eighteen percent is urban in nature. The French Creek sub-watershed has been designated by Ohio EPA as one of only twelve rapidly developing watersheds in Ohio. Over the past few decades, water and sediment quality have improved in the Black River. The contaminated sediments from past industrial activities were remedially dredged and impacts from point sources have been significantly reduced. Today the main concern is nonpoint source impacts coming from the entire watershed. Land disturbances associated with development and intensive agricultural practices are a particular problem.

In 2008 the Ohio EPA published the Black River Watershed TMDL Report. The report identified that approximately two thirds of the sampling sites throughout the watershed were meeting or partially meeting water quality goals. The attainment of water quality goals in the upper rural watershed is limited by channel modification, and agricultural management practices that lead to sedimentation, habitat degradation, and high nutrient and pathogen loadings. In the mainstem and French Creek watersheds urban runoff, combined sewer overflows, channel modification, and industrial discharges limit the attainment of aquatic use goals. While the river still faces challenges there have been marked improvements in the health of the river over the past 10 years.

One of the most significant milestones was the delisting of the degradation of the Benthos Beneficial Use Impairment in the East Branch of the Black River in 2005. This was the first delisting by a Remedial Action Group in the U.S. Other milestones include the 2004 re-designation of the fish tumors and other deformities use impairment from “impaired” to “in
recovery". Also in 2004 a 21 year old contact advisory for the lower mainstem of the Black River was lifted by the Ohio Department of Health.

Properly managing urban, suburban and rural land use practices along the Black River will improve the quality and productivity of this valuable natural resource. Recognizing that land use practices differ in each area of the watershed, the Black River RAP has been attempting to establish small sub-watershed groups. The Black River RAP/U.S. Army Corps partnership have completed a French Creek sub-watershed habitat survey and produced a French Creek specific handbook that was mailed to landowners and decision-makers. In 2003, a similar project has started in the northern East Branch sub-watershed. Currently, the entire Black River AOC suffers from bacterial contamination, especially after storm events. The City of Elyria has been working to relieve the effects from discharges from combined sewer overflows and the Lorain County General Health District has started an inspection, operations and maintenance program to address impacts from old, failing and failed home sewage treatment systems (HSTS).

The Black River RAP and its community partners have been making a difference. Through the support of the Riparian Corridor Resolution and through various education programs, the Black River RAP and its community partners have fostered a new and heightened awareness to protect this area. A Black River Watershed Action Plan is currently being prepared for endorsement by the state.

The Lower Black River has been the focus of intense protection and restoration work over the past few years. From riparian land protection to in-stream habitat improvement projects the Lower Black has become a model of industrial river recovery. Projects include: installation of over 3,000 linear feet of fish habitat shelves to provide shelter for native fish species along the shipping channel, removal of industrial stockpiles to create floodplain, and the acquisition and improvement of property along the river to provide habitat and riparian function. All these actions are consistent with the Lower Black River Ecological Master Plan.

The Rocky River

The Rocky River Watershed consists of a 294 square-mile network of neighborhoods, farms, forests, parks, roads and streams. It stretches from southern Medina County to Lake Erie, and includes parts of Cuyahoga, Medina, Lorain and Summit Counties, including all or part of 32 municipalities and townships.

The Rocky River TMDL report was one of the first written in the area and dates back to October of 2001. The plan was to provide updates to the TMDL every five years. Due to funding issues this has not occurred. The next scheduled monitoring period is 2021.

Nutrients in the form of nitrogen and phosphorus along with in-stream habitat modification due to siltation and stream hydrology modifications are the primary water quality stressors facing the Rocky River Watershed. Nutrient loading and habitat modification is a problem to some extent
throughout the watershed. In the lower portion of the watershed the impairments imposed by nutrients and sediment are more acute than in the upper sub-watersheds except for Baldwin Creek that has highly elevated nutrient levels. Habitat modification, including channel incision, bank erosion, and siltation becomes a problem in the smaller sub-watersheds.

Even though the 2001 Rocky River TMDL does not address sediment, the Rocky River Watershed Action Plan identifies siltation, embedded substrate, and sediment loading as a problem in the Mainstem, Abram Creek, East Branch, Baldwin Creek, North Royalton ‘A’ Tributary, Healey Creek, West Branch, Mallet Creek, North Branch, and Plum Creek at Brunswick.

Urban and suburban development is the most important factor impacting water quality and aquatic habitat in the Rocky River Watershed. New developments, both large and small, have been commonplace for more than 50 years. The lower portion of the watershed, including the Mainstem, Abram Creek and Baldwin Creek sub-watersheds, is almost entirely urban and suburban. Many of the impaired stream segments in the watershed are associated with developed areas. Abram Creek, Baldwin Creek, and Plum Creek in Brunswick are all over 20% urbanized and each is considered impaired for its designated aquatic life uses.

Since the development of the TMDL a lot of positive actions have occurred within the watershed. In 2002 the Rocky River Watershed Council was formed to begin to evaluate and take action on pollution issues in the watershed. In 2006 a Watershed Action Plan was developed and was endorsed by Ohio EPA and ODNR. Starting in 2007 the Cuyahoga County Soil and Water Conservation District hired a Watershed Coordinator to facilitate the implementation of the Watershed Action Plan. In 2009 a Balanced Growth Plan for the Upper West Branch was endorsed by the State.

The Cuyahoga River

The Cuyahoga River has its origins in Geauga County, just thirty miles east of where it enters Lake Erie. It flows 112 miles, first south to Akron then north. Along the way it drains 812 square miles as it receives runoff from 91 units of local government and parts of six counties. It empties into Lake Erie at Cleveland, Ohio which developed key elements of its economy as a shipping and industrial center. The river is the focal element of the Cuyahoga Valley National Park, which was created in 1974 and which has emerged as an important environmental resource in the Area of Concern. Since 1970 within the watershed and the NE Ohio region the population of approximately 1.2 million has been dispersing: imperviousness has tripled while the population has remained essentially unchanged. Like many other Great Lakes cities the Cuyahoga region has an important but declining manufacturing base and a fragile, sprawl influenced local economy, Geo-political complexity, the impact of runoff and non-point source pollutants will continue as key stressors to recovery of this infamous urban river.
Many activities are occurring within the Cuyahoga River watershed and the combined sum of these activities is leading to restoration of a resource that at one time was severely degraded. The following summary provides a snapshot of ongoing Delisting Actions for each of the listed Delisting Management Units.

Ship Channel - The lower 5.5 miles dredged navigation channel of the Cuyahoga as it enters Lake Erie is impaired by lack of habitat, sedimentation, low dissolved oxygen, and concentration of pollutants from upstream. The restoration of habitat is critical to allow for the passage of larval fish that will benefit from the restoration activities that are occurring upstream. To meet that goal various shoreline management treatments, riparian restoration projects, and “green bulkheads” have been demonstrated along the ship channel. A grant has been submitted by the Port Authority for the construction of a Debris Harvester to remove trash and debris from the ship channel to meet action plan goals.

Dams – A number of dams were constructed in the mainstem of the Cuyahoga over the years for various commercial enterprises. The removal of dams provides an almost instant benefit to water quality. In the NOACA region the Station Rd. dam is currently under study for removal. Immediately downstream of the Station Rd. dam fish populations have recently exceeded the requirements for exceptional warm water habitat.

Several dams have been removed or bypassed upstream in Summit and Portage Counties that benefits water quality as the river flows into Cuyahoga County. Dam removal plans are also being discussed in several tributaries to the Cuyahoga.

Sediment – Excess sediment is an impairment in the watershed as it clogs substrate and carries with it excess nutrients that are bound to it. Dredging of excess sediments in the shipping channel is a recurring cost. Historical sediments may be contaminated and require expensive disposal and degrade water quality. In the lower Cuyahoga a long-term dredge and sediment re-use study is in place to address sediment deposited in the shipping channel. Research has begun on the beneficial re-use of some of the dredged sediment from the ship channel. Work is underway to dredge remnant toxic sediments out of the old river channel. Urbanized communities that drain to the Cuyahoga have been implementing erosion and sediment control and storm water regulations for developing sites. These ordinances will help to reduce sediment inputs into the stream system and preserve hydraulic conditions within the channels.

Wetland and Habitat Restoration - Loss of wetlands diminishes habitat and bio-diversity, vital nutrient and pollutant filtering, runoff attenuation and base flow restoration. Restoration of wetland resources provides an opportunity to restore natural function to the flood plain of the Cuyahoga and its tributaries. In 2008 the RAP completed an analysis of wetlands within the area of concern and ranked them as to their restoration potential. The results provide a database of potential projects that can be undertaken to provide storm water management, water quality benefits, and habitat restoration.
Combined Sewer Overflows — Combined sewer overflow (CSO) events impair water quality through excess nutrient, elevated bacteria, water contact advisories, fish consumption advisories, and low oxygen levels. This historical problem is extremely costly to correct and will take many years. Both the Northeast Ohio Regional Sewer District and the City of Akron are close to having their long term plans for correction approved by USEPA and Ohio EPA. Major investments have already been made to capture and treat CSO discharge.

**Cuyahoga Tributary based watershed organizations and management plans:**

Big Creek - The Friends of Big Creek worked with the Cuyahoga River Community Planning Organization (CRCPO) to develop a Watershed Balanced Growth Management Plan based on the Ohio Lake Erie Commission Balanced Growth Initiative. The plan was approved in June of 2011. The Big Creek watershed is the most urbanized to date where a BGI plan has been approved.

Mill Creek - CRCPO provided technical studies and wetlands assessment and prepared a Watershed Action Plan. CRCPO supports Mill Creek Watershed Partnership composed of local communities and Agencies. A Watershed Action Plan has been drafted.

West Creek - West Creek has a well-organized Watershed Committee and two staff positions. A Watershed Action Plan has been endorsed by the state.

Tinkers Creek & Pond Brook - Tinkers Creek has a Watershed Partnership led by Cuyahoga County Board of Health. The CRCPO sponsored the Pond Brook Initiative and Restoration Priorities Plan. CRCPO also conducted a wetland assessment and restoration potential analysis. The Tinkers Creek Partners are working on developing a Watershed Management Plan.

Chippewa Creek - CRCPO led formation of a tributary based Community Partnership and has completed an ODNR funded Watershed Management Plan, based on the Ohio Lake Erie Commission Balanced Growth Initiative. The Chippewa BGI Watershed Management Plan was the first such plan to be completed in Ohio as part of a pilot project. CRCPO conducted a wetland assessment and analysis of restoration potential, which will be included as part of the wetland and habitat restoration actions.

Doan Brook - Is a direct tributary of Lake Erie with a Watershed Organization, Council of Governments, and a Watershed Coordinator are in place. Doan Brook Watershed partners have developed a Draft Watershed Plan linked to the TMDL.

Euclid Creek - A Watershed Plan and a Watershed Planning Guide have been created. and TMDL The Friends of Euclid Creek along with a Watershed Coordinator with the Cuyahoga SWCD have initiated many stream improvement projects. This work is accomplished in conjunction with the Euclid Creek Watershed Council that is comprised of the mayors of the ten watershed communities.
The Chagrin River

The Chagrin River drains approximately 267 square miles to Lake Erie in northeast Ohio. The Main Branch of the Chagrin River begins as the Upper Main Branch above Bass Lake in Munson Township and flows 48 miles before entering Lake Erie in the City of Eastlake. Along its path, the Main Branch is joined by the River’s other branches - the Aurora Branch, flowing from the City of Aurora and meeting the Main Branch in the Village of Bentleyville, and the East Branch, beginning in Geauga County and joining the Main Branch in the City of Willoughby.

Seventy-one miles of the Chagrin River have been designated as a State Scenic River. The original designation made in 1979 consisted of 50 miles including the Aurora Branch from S.R. 82, 12 miles downstream to its confluence with the main stem of the Chagrin, 23 miles of the main stem from its confluence with the Aurora Branch downstream to US Rt. 6, and 15 miles of the East Branch from Heath Road Bridge downstream to its confluence with the mainstem. The river’s Scenic designation was extended in November 2002 to include the headwaters of the Chagrin, also known as the Upper Chagrin. The recent 22-mile designation runs from the Woodiebrook Road Bridge continuing downstream to the confluence with the Aurora Branch of the Chagrin River in Bentleyville. Scenic designated reaches of the river are characterized by exceptional aquatic habitat and adjacent high quality forests.

Several sections of the river are designated by Ohio EPA as exceptional warm water habitat or cold water habitat. Portions of McFarland Creek have stream segments designated as exceptional warmwater habitat. Griswold Creek, Willey Creek, Beaver Creek, East Branch and tributaries, Linton Creek, Silver Creek, and several unnamed tributaries that support Ohio Brook Trout populations are designated as coldwater habitat streams. Other segments of the Chagrin River and tributaries have a warmwater habitat use designation. The mainstem below Daniels Park is classified as a Seasonal Salmonid stream.

In the 2003-2004 Ohio EPA sampling, the Chagrin River watershed had an assessment unit score of 81. An assessment unit score of 80 is used as a benchmark above which a watershed is considered to be in good condition relative to aquatic life uses. Based on aquatic life use assessment from sampling in 2003-2004, all streams draining over 50 square miles were in full attainment of their aquatic life uses. Fourteen sites were in partial attainment and eight sites were in non-attainment. Fifty-seven percent of the coldwater habitat streams in the lower sub-watershed and twenty-two percent of the coldwater habitat stream segments in the upper sub-watershed were not in full attainment of their aquatic life use.

Ohio EPA noted that riparian protection is an essential part of maintaining this ecosystem and general riparian encroachment needs to be minimized. The Chagrin River Watershed Partners (CRWP) and other organizations strive to protect riparian corridors through direct land protection and zoning tools. Primary causes of impairment in the Chagrin River watershed are organic enrichment, nutrient enrichment, flow alteration, and habitat degradation.
Projects in the watershed over the past 10 years have focused on mitigating the impacts of growth and development on the watershed. Ultimately the protection of the watershed is needed to maintain the high degree of quality streams in the Chagrin watershed. Along with reducing pollutants from home sewage treatment systems and restoration of degraded stream segments, the groups in the Chagrin River watershed are committed to protecting and improving this resource.

The Grand River

On January 17, 1974, the Grand River became Ohio's second wild and scenic river. The "wild" designation applies to the section from Harpersfield covered bridge downstream to the Norfolk and Western Railroad trestle south of Painesville (23 miles). The "scenic" designation runs from the US 322 bridge in Ashtabula County downstream to Harpersfield covered bridge (33 miles). The lower section of the Grand River in Lake County is designated wild. Here, the river is characterized by steeply-incised valley walls of Chagrin Shale. The Grand River is a very high quality stream and is meeting or exceeding its designated uses as determined by a 2003 Biological study of the Lower Grand River by Ohio EPA. The Grand River is the only Ohio tributary to Lake Erie that harbors a self-sustaining population of Great Lakes muskellunge, and therefore is a priority for conservation. The Grand River also has a native population of walleye and northern pike making it singularly unique among Ohio streams. The Grand River and its tributaries provide habitat for many species considered rare by Ohio EPA, or listed as threatened or endangered by the Ohio Department of Natural Resources including: 32 macro invertebrate and freshwater mussel species, and 11 fish species.

This exceptional biological richness is the direct result of the fact that the physical habitat of the Grand River and most of its tributaries has, been minimally altered and therefore remains largely intact. Land preservation through park land acquisition and conservation easements, and the numerous woodlots dotting the watershed, has maintained forest cover along much of the riparian zone, the adjacent valley slopes, and in the uplands; consequently, the water resource is, with few exceptions, very good. All of the Lower Grand River mainstem and most of its tributaries are meeting their designated aquatic life uses with a few exceptions. The cause of impairment in those tributaries is tied to impacts from development. Agricultural land uses also have some impact within the watershed.

The Grand River has an active Partnership in place that focuses on preservation of the existing conditions within the watershed. Land acquisition and protection through conservation easements has benefited the Grand River and its tributaries. Ordinances related to development such as erosion and sediment control, storm water management, and riparian setbacks will help to mitigate impacts from changes in land use.

To summarize over the past ten years the problems affecting our watersheds have been identified and more importantly action plans have been developed to address the concerns watershed by
watershed. As implementation of the plans continues, water quality in the region will continue to improve. Point sources of pollution have largely been eliminated over the years. Non-point source pollution and change in stream hydrology continue to threaten our watersheds. Since 2000, however, tools and programs have been developed to address those threats. Redevelopment and retrofitting of our built areas along with regulations in the undeveloped areas will continue to benefit water quality in our streams.

References:


Figure 3-12
2011 Watershed Snapshot

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<th>Rocky River</th>
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Links:
epa.oh.gov/dsw/tmdl/PlumCreekRockyRiverTMDL.aspx
rockyriver.org
ccbh.net
cuyahogaswcd.org
medinaswcd.org
wlandconservancy.org

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<td>Lorain County Health District, Medina County SWCD</td>
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<td>-2001 French Creek habitat survey and watershed guide developed</td>
<td>- 2002 Riparian restoration</td>
<td>- 2002 Headwater Streams Evaluation</td>
<td>- 2006 Watershed Action Plan endorsed updated 2010</td>
<td>- 2005 Ecosystem management Plan Lake to Lake Trail</td>
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Links:
blackriverrap.com
loraincountyhealth.com
epa.state.oh.us/dsw/tmdl/BlackRiverTMDL.aspx
lorainswcd.com
medinaswcd.org
wlandconservancy.org
blackriverwatershed.org
epa.gov/glnsp/soh/blackriver.html

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### Figure 3-12

#### 2011 Watershed Snapshot

| Cuyahoga River | Tinkers Creek to mouth | Links: cuyahogariverrap.org | 2003 | 1988 | CRCPO, NEORSD | Friends of Crooked River | - Sustainable Sediment Management
| | | | | | | | - Riparian Restoration
| | | | | | | | - Bulkhead fish habitat
| | | | | | | | - Delisting request submitted for fish and benthos 2009
| Brandywine Creek to Tinkers Creek | 2003 | | | | | |
| Headwaters to Black Brook | 2003 | | | | | |
| Tributaries to Cuyahoga | | | | | | |
| Big Creek | 2003 | Draft | 2010 | AOC | Friends of Big Creek, CRCPO | Friends of Big Creek | - Balanced Growth Plan 2011
| | | | | | | | - Developing Watershed Action Plan
| | | | | | | | - Conservation areas identified
| | | | | | | | - Stormwater retrofit prioritization
| West Creek | 2003 | 2005 w/ updates | AOC | West Creek, CRCPO Cleveland MetroParks | West Creek Preservation Committee | - Watershed Action Plan
| | | | | | | | - Community Education
| | | | | | | | - Expansion of Metroparks to 400 acres
| | | | | | | | - Wetland Restoration/Easement Acquisition
| | | | | | | | - Lower West Creek Restoration
| | | | | | | | - Greenway and Trail Development
| | | | | | | | - A mile of stream and riparian restoration / a half mile under design
| Mill Creek | 2003 | Draft | AOC | Mill Creek Watershed Partnership, CRCPO | Mill Creek Watershed Partnership | - Draft Watershed Action Plan
| | | | | | | | - Prioritized Wetland Restoration Plan
| | | | | | | | - Stream restoration projects
| Tinkers Creek | 2003 | 2010 | AOC | Tinkers Creek Watershed Partners, CRCPO | Tinkers Creek Watershed Partners | - Part-time staff
| | | | | | | | - Rain garden grant program
| | | | | | | | - 2005 Conservation Plan

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### Tributaries to Cuyahoga

<table>
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<tr>
<th>Link</th>
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<td>AOC</td>
<td>Cuyahoga SWCD, Cuyahoga Co. Planning Commission</td>
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<td>NA</td>
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</table>

### Milestones Since 2010
- Balanced Growth Plan 2008
- Prioritized Wetland Restoration Plan
- 2006 - Euclid Creek Watershed Guide completed
- 2007 - Lower Euclid Creek Greenway Plan conducted
- 2010 - Stormwater retrofit inventory conducted in the upper watershed
- 2010 - East Branch Dam removed in the Cleveland Metroparks Euclid Creek Reservation
- 2010 - Conducted 13 rain barrel workshops in watershed communities
- 2010 - Installation of 10 demonstration rain gardens in Watershed communities
- 2010 - Conducted 13 rain barrel workshops in watershed communities
- 2011 - Proposed 2,000 linear feet of restoration
- 2011 - Parklands Management Plan
- 2011 - Estuarine Wetland Restoration underway at Wildwood Lakefront State Park
- 2011 - 1.4 mile riparian protection
- 2012 - Proposed 2,000 linear feet of restoration
- 2012 - Establishment of a riparian area protection
- 2012 - Riparian and wetland setbacks adopted by 45% of watershed communities
- 2012 - Acquisitions of land or easements to protect open space currently 23,742 acres or 14% of the watershed area protected

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Figure 3-12
2011 Watershed Snapshot

| Grand River | Mill Creek to Mouth | 69 | In Progress | Grand River Partners, Geauga SWCD, Lake SWCD, Ashtabula SWCD | Grand River Advisory Council. The Nature Conservancy |

Links:
- epa.ohio.gov/dw/tmdl/GrandRiverLowerTMDI.aspx
- epa.gov/ednrmnl/models/sustain/index.html
- ohioofr.com/dwnp
- epa.state.oh.us/portals/31/documents/GrandRiverBasinTMD2006.pdf

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