



Division of Surface Water

Ohio 2004 Integrated Water Quality Monitoring and Assessment Report

prepared to fulfill the requirements of
Sections 305(b) and 303(d) of the Clean Water Act

ASSESS the situation

PRIORITIZE..... the problems

Schedule..... the work

March 30, 2004

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What Changed from 2002 Integrated Report?

➤ New Methods

1. The 2004 report contains a comprehensive look at how the State's protocol to issue Fish Consumption Advisory (FCA) relates to the human health single route exposure water quality criteria for PCBs, mercury and a few other chemicals.
2. The Recreation Use method was refined from 2002: more data spread over wider area.

➤ More Data

3. Monthly operating report records from NPDES permit holders greatly expanded the bacteria data base.
4. Lake Erie beach bacteria data from the Ohio Department of Health were included for the first time.
5. For the Recreation Use analysis, data were available to assess approximately half of the State's waters for recreation use condition.

➤ Results

6. More waters are listed in Category 5 due to new methods and more data.
7. A net increase of 37 assessment units in Category 5.
8. Most of Ohio's coastal beaches met the bacteria standard more than 95 percent of the time on average during the past five years. However, eight coastal Lake Erie beaches exhibited consistent pollution, exceeding the state's bacteria standards for 23-60 percent of the recreation season on average during the past five years.
9. For every watershed attaining the primary contact recreation use, there are two watersheds that are impaired.
10. For the aquatic life uses, a slight increase in watershed "full attainment" score (1.5 units) and 23 additional miles of large rivers attaining standards.
11. Minor changes were made in the TMDL priority system and the schedules for monitoring and TMDL work; overall impact was small.

More information on all these topics are included in this report; consult the table of contents. More information and updates may be made available through the Ohio EPA TMDL Web page at <http://www.epa.state.oh.us/dsw/tmdl/index.html>.

Section 1

1 Purpose

This report describes the status of Ohio's surface waters, as required by Sections 305(b) and 303(d) of the federal Clean Water Act. Recent guidance from the U.S. Environmental Protection Agency (U.S. EPA) directs states to prepare an **integrated** 305(b) water quality inventory and 303(d) list of impaired water bodies (U.S. EPA 2003). Therefore, we have titled this document the *Ohio 2004 Integrated Water Quality Monitoring and Assessment Report*, or Integrated Report (**IR**).

Section 305(b) requires a summary of the status of the state's surface waters, while Section 303(d) of the Clean Water Act requires the state to develop a list of water bodies that do not meet established standards. Such waters are referred to as "**impaired waters.**" The state must take appropriate actions to improve impaired water bodies, including the development of total maximum daily loads (TMDLs), water quality based permitting, and nonpoint pollution control measures. As such the *Ohio 2004 Integrated Report* is an important document that provides information and direction to much of the State's work in water quality planning, monitoring, financial and technical assistance, permitting, and nonpoint source programs.

Section 2

2 Introduction

The 2004 Integrated Report (IR) continues Ohio's evolution to a fully-formed watershed basis for reporting on water quality conditions. For the past decade Ohio has maintained strong linkages between Section 305(b) reporting and Section 303(d) listing. Under the title *Water Resource Inventories*, Ohio prepared Section 305(b) reports every two years since 1988 using a biologically based assessment methodology¹. Subsequently, Section 303(d) lists were compiled using the output of Section 305(b) reporting in 1992, 1994, 1996, and 1998. In 2002, the first IR was produced addressing the needs of both reporting functions.

In response to the 2003 federal guidance on preparing integrated reports to satisfy Sections 303(d) and 305(b) of the Clean Water Act, and the lessons learned in doing TMDL projects in recent years, Ohio's 2004 IR incorporates some changes in data interpretation and a refined methodology for judging the quality of Ohio's waters. Assessment methodologies are described in Section 6.

While some important revisions and additions were made in the assessment methodologies, the overall rating of water quality conditions in Ohio has not substantially changed compared to the 2002 IR. A majority of assessment units (AUs) where data is available are still placed in category 5, impaired waters needing a TMDL. As was done for the 2002 report, AUs types are:

- ✓ Watershed Assessment Units (WAUs) that align with the 11-digit HUC code system
- ✓ Large River Assessment Units (LRAUs) - for 23 rivers segments
- ✓ Lake Erie Assessment Units - for 3 areas of the lake

Major differences in the assessment methodologies compared to those used in the 2002 IR are as follows:

- ✓ fish consumption advisory data were considered as it relates to human health based Water Quality Standards criterion that apply to all waters of the State; and,
- ✓ bacteria count data from Ohio EPA and outside data sources were considered using a more robust methodology.

The remainder of this report explains the beneficial uses assigned to Ohio's waters, the assessment methodologies used, the data used to determine attainment or impairment of Water Quality Standards, and the conclusions drawn about water quality conditions in each assessment unit.

¹ In 1990 the linkage of fish and macroinvertebrate community index scores and attainment of aquatic life use designations was established in Ohio's Water Quality Standards (OAC 3745-1).

Section 3

3 Ohio's Water Resource

3.1 Facts and Figures

Ohio is a water rich state with more than 23,000 miles² of named and designated rivers and streams, a 451 mile border on the Ohio River, more than 188,000 acres among more than 446 lakes, ponds, and reservoirs (118,800 acres publicly owned), and more than 230 miles of Lake Erie shoreline. Since 1994 Ohio EPA has endorsed a slightly larger estimate for the length of perennial streams (those having water year round) in Ohio - 29,113 miles³. The various water resource statistics for Ohio, the large rivers in Ohio and Ohio's Scenic River System presented in Figures 3-1, 3-2 and 3-3, respectively.

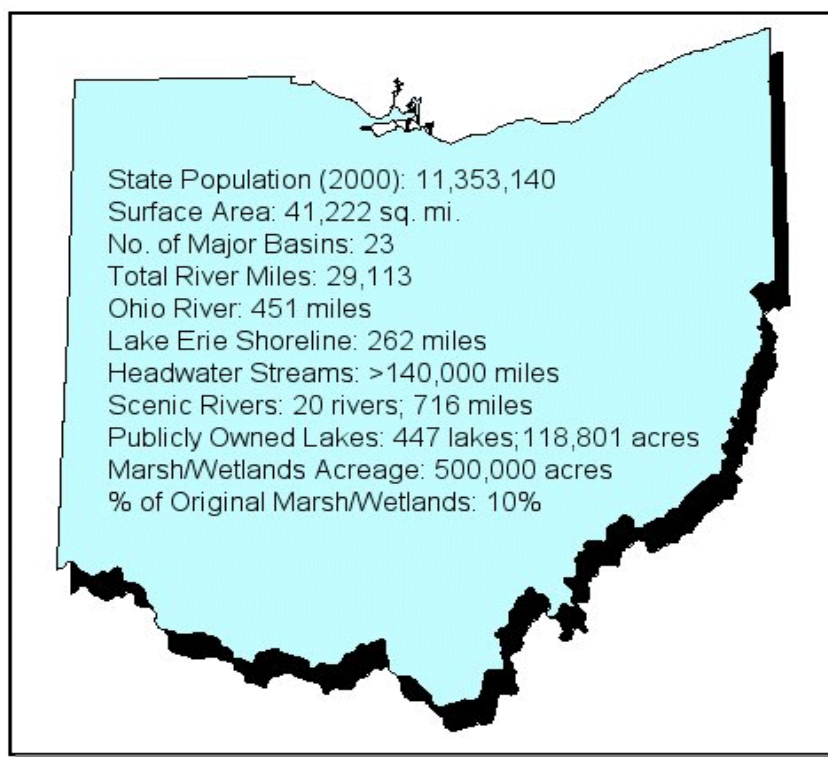


Figure 3-1. Ohio's water resource statistics.

² Mileage figure for waters listed by Ohio Department of Natural Resources in *Gazetteer of Ohio Streams, 2nd edition* (Ohio DNR, 2001).

³ An estimate prepared from a computer-digitized map of U.S. streams and rivers produced by the USGS (1:100,000 scale Digital Line Graph [DLG] method). The U.S. EPA version of this map is known as Reach File 3 (RF3) (U.S. EPA 1991).



Figure 3-2. Ohio's large rivers with greater than 500 mi² of drainage area.



Figure 3-3. Ohio's Scenic River System.

The larger water bodies included in the preceding statistical summaries do comprise the major aquatic resources that are used and enjoyed by Ohioans for water supplies, recreation and other purposes. The quality of these perennial streams and other larger water bodies is strongly influenced by the condition and quality of the small feeder streams, often called the headwaters. Approximately 30,000 miles of the over 61,000 miles of stream channels digitally mapped in Ohio are headwater streams. However, the digital maps currently available for Ohio do not include the smallest of headwater channels. Results of a special study of primary headwater streams (drainage areas less than 1 mi²) place the estimate of primary headwaters between 146,000 to almost 250,000 miles (Ohio EPA 2002). Some of these primary headwater streams are in fact perennial habitats for aquatic life that supply base flow in larger streams. This illustrates the importance of taking a holistic watershed perspective in water resource management.

Ohio is an economically important and diverse state with strong manufacturing and agricultural industries. Many of the historical patterns of environmental impact in Ohio are related to the geographical distribution of basic industries, land use, mineral resources, and population centers. Also important, however, is an understanding of Ohio's geology, land form, land use, and other natural features as these determine the basic characteristics and ecological potential of streams and rivers. Ohio EPA bases the selection, development, and calibration of ecological, toxicological, and chemical/physical indicators on these factors. These are then employed via systematic ambient monitoring to provide information about existing environmental problems, threats to existing high quality waters, and successes in abating some past and current water pollution problems in Ohio's surface waters.

3.2 State Agencies and Departments Working Together

3.2.1 *Ohio Water Resources Council*

In 2002, Governor Taft released the Ohio Water Resources Council Four-Year Strategic Plan. This plan serves as a guide in the protection of one of Ohio's most important natural resources - water. Since the creation of the permanent Ohio Water Resources Council in July 2001, the group has made significant progress and is currently developing strategic elements of a 10-year vision for managing the water resources of Ohio. Nine State agencies, including Ohio EPA, continue to meet monthly to work on the 10-year vision, and seek input from a multi-interest advisory group. Additional information is available on line at: <http://www.dnr.state.oh.us/owrc/>.

3.2.2 *Ohio Lake Erie Commission*

The Ohio Lake Erie Commission is comprised of the directors of the Ohio departments of the environmental protection agency, natural resources, transportation, development, health and agriculture. The commission was established to preserve Lake Erie's natural resources, water quality and ecosystem. It also promotes economic development in the region. The commission oversees the Ohio Lake Erie Protection Fund (LEPF). During the last 11 years, the commission has raised nearly \$7 million through the sale of Lake Erie license plates. This money is used to fund LEPF grants that focus on improving the quality of Lake Erie and to furthering the goals laid out in the Lake Erie Protection & Restoration Plan. Additional information is available on line at: <http://www.epa.state.oh.us/oleo/>.

Section 4

4 Watershed Focus within Ohio EPA Programs

4.1 Background

In 1990 Ohio EPA initiated an organized, sequential approach to monitoring and assessment termed the Five-Year Basin Approach. One of the principal objectives of this new approach was to better coordinate the collection of ambient monitoring data so that information and reports would be available in time to support water quality management activities such as the re-issuance of NPDES permits and periodic revision of the Ohio water quality standards (WQS).

The State was divided into twenty-five different areas that were aggregations of subbasins within major river basins. Each of the twenty-five areas were assigned to one of the 5 basin years, taking into account the need to appropriately distribute the monitoring workload among Ohio EPA's 5 district offices. The initial workload estimates and resource planning done in the 1990s for the Five-Year Basin Approach indicated that 5 years would be needed to complete the cycle of monitoring. However, the monitoring program has never been fully funded to meet those resource needs, and thus the monitoring cycle takes closer to 10 years to complete.

The Five-Year Basin Approach and the core work of the biological and water quality monitoring program has gradually become the Division's assessment component within the Total Maximum Daily Load (TMDL) program. Ohio's TMDL program has been designed to be watershed focused and to promote integration of other ongoing water program elements on a watershed basis.

4.2 Program Summary - Surface Water

Integration of program activities around the TMDL program and a watershed based approach to assessments and delivery of services has been a program management objective within the Division of Surface Water (DSW) for several years. Summary descriptions of selected surface water programs are presented below.

4.2.1 *Biological and Water Quality Surveys*

Ohio EPA routinely conducts biological and water quality surveys, or biosurveys, on a systematic basis statewide. A biosurvey is an interdisciplinary monitoring effort coordinated on a reach specific or watershed scale. Such efforts may involve a relatively simple setting focusing on one or two small streams, one or two principal stressors, and a handful of sampling sites or a much more complex effort including entire drainage basins, multiple and overlapping stressors, and tens of sites.

Each year Ohio EPA conducts biosurveys in 20-25 Watershed and Large River Assessment Units with an aggregate total of 400-450 sampling sites. Biological, chemical, and physical monitoring and assessment techniques are employed in biosurveys in order to meet four major objectives:

- ✓ to provide a current and thorough assessment of water quality conditions in watersheds that are

scheduled for TMDLs in the near future (1-3 years);

- ✓ to determine the extent to which use designations assigned in the Ohio Water Quality Standards (WQS) are either attained or not attained;
- ✓ to determine if use designations assigned to a given water body are appropriate and attainable;
- ✓ to determine if any changes in key ambient biological, chemical, or physical indicators have taken place over time, particularly before and after the implementation of point source pollution controls or best management practices.

The data gathered by a biosurvey is processed, evaluated, and synthesized in a biological and water quality report. The findings and conclusions of each biological and water quality study may factor into regulatory actions taken by Ohio EPA and are incorporated into Water Quality Permit Support Documents (WQPSDs), State Water Quality Management Plans, the Ohio Nonpoint Source Assessment, and the Ohio Integrated Water Quality Report. This information also provides the basis for the list of waters impaired for the aquatic life beneficial use as required by Section 303(d) of the Clean Water Act.

4.2.2 TMDL Program

Ohio EPA is committed to producing meaningful TMDLs. From the outset of Ohio EPA's TMDL work a basic tenet has been that the effort must be a meaningful expenditure of resources to bring about real environmental improvement. While Ohio EPA has the responsibility to establish TMDLs based on federal regulatory requirements, it also has a responsibility to the people of Ohio to protect, improve, and restore the integrity of all waters in Ohio. The TMDL process provides a road map for the specific implementation of a watershed-based delivery of resources aimed at eliminating impairments to Ohio waters.

Ohio EPA has worked to build on traditional programmatic strengths in monitoring, modeling, permitting, and nonpoint source incentives to develop an integrated approach to TMDLs that aligns program goals and uses resources efficiently. In addition to program integration, Ohio adopted an active stakeholder process for its TMDLs. Given the fact that nonpoint source pollution is the dominant cause of impairment in Ohio, this local involvement is a key to success in restoring impaired waters. Recent experience has reinforced the importance of public involvement in local problem-solving and decision-making, as local stakeholders work to formulate implementation plans or reach consensus on local priorities. While such involvement leads to better decisions and more sustainable solutions, it complicates project schedules and makes product delivery more difficult to predict.

In addition to public involvement, an important feature of Ohio's TMDL process is the in-depth watershed assessment that typically kicks off the project. While the "causes and sources" included in this document are valid for various uses, decisions about how to bring waters into attainment with aquatic life, recreation, and other uses are best made with recent data. Thus, how best to approach restoration of uses and what parameters to target within TMDLs is decided as part of the TMDL project itself.

Ohio's TMDL program approach has been endorsed by an external advisory group of Ohio citizens, businesses, and interest groups. The program already incorporates many of the recommendations of the National Research Council 2001 study.

A schedule for completing all TMDLs in Ohio within fifteen years (from 1998) was established in February 1999. The schedule called for a limited number of projects in the first few years, with an accelerated pace beginning with the 2002 field season (TMDLs to U.S. EPA in 2004). Neither of the actions needed to move to the accelerated pace materialized, namely the completion of federal TMDL rule revisions and technical guidance and the acquisition of additional funding for TMDLs in the state budget cycle. Accordingly, in August 2001, Ohio EPA notified U.S. EPA Region 5 that the TMDL schedule would be revised. In October 2001, U.S. EPA was sued by several environmental interest groups over the pace of progress in Ohio's TMDL program. This was the 41st such lawsuit in the country. Ohio and various utilities and industry groups have intervened in this litigation.

Ohio EPA continues to seek other sources of funding for TMDLs and to work with other agencies or groups to produce TMDLs and similar products.

4.2.3 Nonpoint Source (NPS) Program

In a broad context, NPS pollution control is integral to Ohio EPA's surface water program as well as many other state and federal agencies. However, NPS pollution control is administered as a distinct program because of the manner in which the federal CWA addresses the issue, Ohio EPA's organizational structure, and the environmental significance of the issue. The NPS Program is also directed by the State NPS Management Plan. The agencies primarily responsible for implementing the State plan and overall management of the program are Ohio EPA DSW and ODNR Division of Soil and Water. Both agencies are currently working together to develop a revised State plan by January 2005.

The focus of Ohio's Nonpoint Source program is upon identifying best management practices and measures which will reduce pollutant loadings, control pollution added from nonpoint sources to the navigable waters within the State and improve the overall quality of these waters. The NPS Program also addresses nontraditional (i.e., there is no pollutant load associated) forms of impairment such as low head dams, habitat alteration and flow modification. Without such additional actions to control nonpoint sources of pollution, watersheds cannot reasonably be expected to attain or maintain applicable Ohio water quality standards.

Our approach to NPS pollution control is evolving but is linked strongly to local watershed planning and implementation. Other program improvement steps include, after a comprehensive review of our own program needs and consideration of other states' programs and U. S. EPA recommendations, streamlining the process for funding NPS projects (primarily through Section 319 funds and State Revolving Fund loans), striving toward those that definitively restore, protect, or improve Ohio water resources. This approach underscores and integrates multiple DSW program commitments, such as Total Maximum Daily Load (TMDL) plans, ecological assessment, 401/wetland certification, NPDES Phase II and source water protection. The entire process builds upon existing monitoring, permitting, and modeling efforts, and works within our five year basin approach.

Our intent is increased integration of DSW program efforts with the goal of systematically addressing impaired waters of the state not meeting use attainment, largely due to NPS impacts. Presently, Ohio EPA's goal is 80% use attainment by 2010. Ohio relies heavily on watershed management plans, that meet U. S. EPA 319 Guidance, to identify and correct water quality problems caused by NPS pollution. These plans emphasize: identification of the nature, extent, and cause of water quality problems; development and implementation of a specific plan to correct these problems; education and evaluation. The watershed management plans are developed locally with input and support from Ohio EPA, Ohio Department of Natural Resources (ODNR), Natural Resources Conservation Service (NRCS), Ohio State University Extension, other public agencies, and numerous local public and private partners. The watershed management and plan development program is jointly overseen and funded by DSW and ODNR's Division of Soil and Water. This program currently supports 38 watershed coordinators, covering about 43% of the state. About half of these watershed plans are being developed in concert with TMDLs (with the plan becoming the implementation component of the TMDL) and about half of the plans will be developed in advance of TMDLs (potentially eliminating the need for a TMDL when the plan is implemented and removing the watershed from the 303d list.) The Ohio watersheds web page (<http://ohiowatersheds.osu.edu/>) contains information on watershed activities in Ohio. Contact information for the watershed coordinators can be found at <http://www.dnr.state.oh.us/soilandwater/docs/watershedcoord.pdf>.

4.2.4 *Permits*

To protect Ohio's water resources, Ohio EPA issues National Pollutant Discharge Elimination System (NPDES) permits. These permits authorize the discharge of substances at levels that meet the more stringent of technology or water based effluent limits and establish other conditions related to issues such as combined sewer overflows, pretreatment and sludge disposal. This is an overview of the process for issuing individual NPDES permits. The series of steps for a particular permit may vary somewhat depending on the size, nature, and complexity of the discharge.

The first step in developing an NPDES permit is acquisition of chemical, physical, and biological data from the field and laboratory. Instream chemical data are collected to determine the effect of the discharge on receiving water and sediment quality. Biological data are collected to determine if the discharge is having an impact on the fish and macroinvertebrate organisms that live in the receiving water. Effluent chemical data are also obtained to establish an accurate portrayal of current discharge conditions. Instream chemical data and stream physical data, such as cross section measurements and flow, are necessary for conducting water quality modeling.

As part of developing effluent limits and monitoring requirements, the water quality standards that apply to the receiving water are determined, and federal effluent guidelines are consulted for applicability. Permit conditions are developed to protect the designated use and associated chemical criteria of the receiving stream as well as any applicable technology requirements. Permits are also based on the applicable regulatory requirements to address issues such as new or expanded discharges, combined sewer overflows, sludge disposal, and industrial pretreatment programs.

Over the past decade Ohio EPA has moved to issuing permits on a watershed basis. Ohio EPA has built on this watershed approach in recent years by integrating the NPDES renewals with the TMDL process. Permit writers are included on the TMDL team and work with permittees and the TMDL team on permit language necessary to implement the TMDL. This allows concurrent

development of the TMDL and renewal of NPDES permits. Permit conditions are included in the TMDL as well as the individual permits.

4.2.5 Combined Sewer Overflow Control Program

Combined sewers were built to collect sanitary and industrial wastewater, as well as storm water runoff, and transport this combined wastewater to treatment facilities. During dry weather, they are designed to transport all flow to the treatment plant. When it rains, the volume of storm water and wastewater may exceed the capacity of the combined sewers or of the treatment plant. When this happens, the combined sewers are designed to allow a portion of the combined wastewater to overflow into the nearest ditch, stream, river or lake. This is a combined sewer overflow. Ohio has about 1,400 known CSOs in 88 communities (October 2003), ranging from small, rural villages to large metropolitan areas.

In 1994, U.S. EPA published the national CSO Control Policy. Working from the national policy, Ohio EPA issued its CSO Control Strategy in 1995. The primary goals of Ohio's Strategy are to control CSOs so that they do not significantly contribute to violations of water quality standards or impairment of designated uses and to minimize the total loading of pollutants discharged during wet weather. Ohio's Strategy addresses several issues that aren't covered by the national Policy; for example, sanitary sewer extensions that occur up pipe of CSOs.

In 2000, Congress passed the Wet Weather Water Quality Act, which did two important things. It codified the 1994 national policy by making it part of the Clean Water Act, and it required that all actions taken to implement CSO controls be consistent with the provisions of the national Policy.

Ohio EPA continues to implement CSO controls through provisions included in NPDES permits and using orders and consent agreements when appropriate. The NPDES permits for our CSO communities require them to implement the nine minimum control measures. Requirements to develop and implement Long Term Control Plans are also included where appropriate. In regards to long-term control plans (LTCP), our progress is summarized by the following statistics (October 2003): 27 LTCPs under active review; 35 LTCPs required but not yet due; and 26 LTCPs approved. Of the 26 approved plans, 21 are eliminating CSOs by sewer separation (almost all small communities), and 5 are proposing CSO controls (all medium sized communities).

4.2.6 General Permits

Ohio EPA is working to eliminate the backlog of pending applications and expired minor discharger permits. The issuance of general permits is one important tool in this effort. A general permit is a single permit issued to cover specific types of discharges, pollutants and best management practices deemed necessary to protect water quality. Permits may cover all regions of the State, or only specific areas. For example, some permits are not available for certain streams that have very strict water quality conditions. Applicants submit a brief "Notice of Intent" (NOI) and the appropriate fee to be covered by a specific general permit.

U.S. EPA delegated administration of the general permit program to Ohio EPA on August 17, 1992. Ohio EPA currently has 8 general permits currently available to dischargers. These permits cover the following areas:

- ✓ discharge of non-contact cooling water;
- ✓ discharge of wastewater for petroleum related corrective actions;
- ✓ coal strip mining;
- ✓ small municipality storm water (2 permits)
- ✓ industrial storm water;
- ✓ construction storm water; and
- ✓ small sanitary wastewater dischargers.

4.2.7 Sewage Sludge Program

In addition to sewage treatment and disposal facilities, ORC § 6111 gives the Director of Ohio EPA the authority to issue permits for the disposal, use, storage, or treatment of sewage sludge. Sewage sludge generators located within the State of Ohio are required to have a valid NPDES permit, or until such NPDES permit is acquired, a valid Sludge Management Plan as per OAC 3745-42-02(A)(2), that describes how the sewage sludge they generate shall be treated, managed, transported, and ultimately disposed of. Entities wishing to bring sewage sludge generated outside the state to Ohio for use or disposal, or regional sewage sludge treatment facilities that receive sludge from numerous generators for treatment and subsequent sale or disposal, also must obtain a NPDES permit or be covered under a Sludge Management Plan until a NPDES permit is approved.

The Director of Ohio EPA adopted rules under ORC § 6111 for the disposal, use, storage, or treatment of sewage sludge in Ohio, effective April 8, 2002. Those rules are found under Chapter 3745-40 of the Ohio Administrative Code. The rules address management options other than land application such as disposal in a sanitary landfill, incineration and disposal in a sewage sludge surface disposal site (which is prohibited). The majority of the rules address the land application of sewage sludge. Management practices to protect public health established in federal regulations are incorporated into Ohio's rules. Watershed protection is addressed in Ohio's sewage sludge rules by incorporating best management practices for the land application of nutrients established by the United States Department of Agriculture, Natural Resources Conservation Service.

With the authorizing legislation in effect, and rules thereunder, the Director of Ohio EPA is in the process of seeking delegation of the federal sewage sludge management program from U.S. EPA. Once obtained, Ohio EPA will serve as the regulatory authority over the management of sewage sludge. Ohio EPA will be the responsible authority for conducting all aspects of the sewage sludge management program including permitting, monitoring and compliance, and enforcement if necessary.

4.2.8 Concentrated Animal Feeding Operations

On December 14, 2000 Governor Taft signed a bill that started the process of transferring authority to regulate concentrated animal feeding facilities to the Ohio Department of Agriculture. The Ohio Department of Agriculture now regulates construction and operation of large concentrated animal feeding facilities under their Permit to Install (PTI) and permit to operate (PTO) program. However, PTI authority for sewage treatment and disposal systems at animal feeding facilities and for animal feeding facilities that discharge to publicly owned treatment works remains with Ohio EPA.

Ohio EPA also retains authority for implementing the National Pollutant Discharge Elimination System (NPDES) permit program for animal feeding operations until the delegation agreement with U.S. EPA is revised by Ohio and approved by U.S. EPA. Any facilities that meet the definition of a concentrated animal feeding operation (CAFO) need to apply to Ohio EPA for an NPDES permit

U.S. EPA recently revised the federal regulations addressing definitions, the duty to apply for NPDES permits, and the requirements that must be contained in the NPDES permits for CAFOs. The revised federal regulations for CAFOs became effective on April 14, 2003. Ohio EPA is in the process of updating its CAFO regulatory program to incorporate the revised federal regulations. A draft NPDES General Permit for CAFOs that contains the new federal requirements was released for public comment in August 2003.

The CAFO program at Ohio EPA uses a watershed perspective to prioritize work. Over the last several years, inspections were scheduled based on watershed to provide the best support possible for TMDL activities. Individual permitting has been prioritized based on watershed issues to some degree, although the general the permit work has temporarily superceded that in order to get a more widespread impact. The status of the watershed is also considered in making decisions about enforcement and compliance activities (e.g. supplemental environmental projects may be preferred over penalties, more technical assistance may be focused on TMDL watersheds).

4.2.9 Storm Water Permit Program

Ohio EPA implements the federal regulations for storm water dischargers. Dischargers currently covered include certain municipalities (Phase I and II of the program) with separate storm sewer systems (MS4s) and those facilities that meet the definition of industrial activity, including construction, in the federal regulations.

Ohio EPA initially issued two storm water general permits: one for construction activity and the other for all remaining categories of industrial activity in 1992. The strategy was to permit the majority of storm water dischargers with these baseline general permits (33 USC § 1342; OAC 3745-38). It is estimated that 15,000 storm water discharges have been granted general permit coverage since that time. The industrial permit has been renewed twice. The construction permit was renewed in 2003 and addresses large and small constructions sites. The application form is a one-page Notice of Intent (NOI). Ohio EPA responds to NOI with approval letters for coverage under one of the general permits.

After the baseline general permits were issued, Ohio EPA directed its efforts towards further permitting, compliance and enforcement activities, education and technical assistance. Inspections and complaint investigations for compliance and enforcement have been handled at the district level as resources allow. Best management practices (BMPs) and pollution prevention has been the major thrust of education and technical assistance activities.

On the municipal side of permitting, five large and medium municipalities in Ohio submitted applications between November 1991 and November 1993. A work group was formed with the cities to draft acceptable permit language for the municipal permits. Best management practices included in a city-wide storm water management plan is the primary focus of the permits. The city of Dayton, Toledo and Akron received their original permits in 1997. Exceptions for Cleveland and

Cincinnati were also processed. Columbus received its initial permit in 2000, and Dayton's permit was also renewed in 2000.

Additional categories of discharges, both public and privately owned, were included in Phase II. U.S. EPA issued Phase II regulations in December of 1999. The Phase II storm water regulations required a general permit for small MS4s be issued by December of 2002, and required applications by March of 2003. Ohio EPA issued two general permits for small MS4s during 2002. One is a baseline permit and the second is for MS4s in rapidly developing watersheds. This latter permit accelerates construction and post-construction measures to protect surface waters from the impacts of high density land use development. Federal regulations allowed small MS4s to apply for individual NPDES permits in lieu of general permit coverage.

4.2.10 Section 401 Permits

According to the federal Clean Water Act, anyone who wishes to discharge dredged or fill material into the waters of the U.S., regardless of whether on private or public property, must obtain a Section 404 permit from the U.S. Army Corps of Engineers (Corps) and a Section 401 Water Quality Certification (WQC) from the state. Ohio EPA has pre-granted Section 401 Water Quality Certifications to 404 permits for certain types of projects that are similar in nature and cause minimal degradation to waters of the state. These permits are called Nationwide Permits and substantially expedite the permitting process.

For projects requiring an individual Section 401 WQC Ohio EPA has prepared Pre-application Guidelines and Projects and Activities of Concern to assist with the permitting process. For projects involving activity within a wetland the Ohio Rapid Assessment Method for Wetlands is most often used to assist in determining the appropriate wetland classification per Ohio's WQS.

Staff reviewing 401 WQCs have been organized by watersheds in order to better understand the issues and concerns that are unique to any particular watershed. By focusing their application reviews within specific geographical areas, DSW staff are better able to conduct application reviews that consider issues in a broader, watershed context.

4.2.11 Wetland Protection Program

Ohio's WQS (OAC 3745-1-50 to -54) contain definitions, beneficial use designations, narrative criteria and antidegradation provisions specific to wetlands. Many of the provisions for other surface water bodies apply to wetlands, including the narrative "free froms." For antidegradation review purposes wetlands are placed into the classifications of either Limited Quality Waters (Category 1 wetlands) or General High Quality Waters (Category 2 & 3 wetlands). There are specific provisions for wetland use designation, wetland narrative criteria, numeric criteria for waste water discharges to wetlands, and wetland antidegradation.

All wetlands receive the same beneficial use designation. OAC 3745-1-53 gives all wetlands the "wetland" designated use. The wetland antidegradation rule, OAC 3745-1-54, places wetlands into one of three categories based on the wetland's relative functions and values, sensitivity to disturbance, rarity, and potential to be adequately compensated for by wetland mitigation. The level of protection provided and the corresponding demonstrations necessary to allow impacts, the

mitigation ratios and mitigation location all vary with the category of wetland impacted.

Categories 1, 2, and 3 wetlands demonstrate minimal, moderate and superior wetland functions, respectively. Wetlands assigned to Category 1 may be typified by hydrologic isolation, low species diversity, a predominance of non-native species, no significant habitat or wildlife use, and limited potential to achieve beneficial wetland functions. Category 2 wetlands may be typified by wetlands dominated by native species but generally without the presence of or habitat for, rare, threatened or endangered species and wetlands which are degraded but have a reasonable potential for reestablishing lost wetland functions. Wetlands assigned to Category 3 typically have high levels of diversity, a high proportion of native species, high functional values and may contain the presence of or habitat for rare, threatened and endangered species. Wetlands that are scarce, either regional or statewide, form a subcategory of Category 3 wetlands for which only short-term disturbances to water quality can be authorized.

4.2.12 Wetland Bioassessment Program

Several grants from U.S. EPA have funded work that is advancing the science of wetland assessment methodologies in Ohio. Recently published work include an amphibian index of biotic integrity (AmphIBI) for wetlands and a vegetation index of biotic integrity (VIBI) for wetlands. These reports are available on the Division of Surface Water web page.

DSW recently received a grant from the federal government to develop wetland condition assessment techniques for watershed level assessment of wetland conditions. The Cuyahoga River watershed will be studied under this grant.

4.2.13 Enforcement and Compliance Program

The Division of Surface Water staff works closely with the regulated community and local health departments to ensure that surface waters of the state are free of pollution. The regulated community with which DSW staff works includes wastewater facilities, both municipal and industrial, and small, unsewered communities experiencing problems with unsanitary conditions.

DSW staff provides technical assistance, conducts inspections of wastewater treatment plants, reviews operation reports, oversees land application of biosolids and manure from large concentrated animal feeding operations, and investigates complaints regarding malfunctioning waste water treatment plants and violations of Ohio's Water Quality Standards. DSW strives to ensure that permitted facilities comply with their National Pollutant Discharge Elimination System (NPDES) permits. DSW also assists small communities with inadequate means of waste water treatment seek alternatives to help abate pollution to waters of the state.

In cases which Ohio EPA is unable to resolve continuing water quality problems, DSW may recommend that enforcement action be taken. The enforcement and compliance staff work with Ohio EPA attorneys, as well as the Attorney General's Office to resolve these cases. Where possible, an added emphasis and priority is given to actions in sensitive watershed. DSW has begun to post 2003 enforcement actions on the web page.

4.3 Program Summary - Environmental and Financial Assistance

The Division of Environmental and Financial Assistance (DEFA) provides incentive financing, supports the development of effective projects, and encourages environmentally proactive behaviors. See Section 4.5 for a ten year financial summary of the program. The following program accomplishment summary is taken from the Agency's 2002 annual report.

4.3.1 *Water Pollution Control Loan Fund*

In State Fiscal Year 2002 (SFY'02), the Water Pollution Control Loan Fund (WPCLF) financed a number of nonpoint source pollution needs. Water quality activities undertaken through the WPCLF's Water Resource Restoration Sponsor Program (WRRSP) ranged from protection to full restoration of aquatic habitats. More than \$10.6 million was awarded for 10 WRRSP projects, including the design for modifications to the Kent dam to improve water quality in the middle portion of the Cuyahoga River, and toward the acquisition and protection of Bass Lake in the Chagrin River watershed. The WPCLF was used to finance cleanup of abandoned hazardous waste sites. A \$361,000 loan was made to Harrison County toward developing closure and post-closure plans and capping a site to address contaminated soil residues and ground water contamination plumes under a federal consent agreement. The WPCLF's linked deposit programs made five loans totaling \$65,637 for septic system improvements and 251 loans totaling \$7.4 million for agricultural best management practices in several watersheds.

Also, \$242 million in low-interest loans were made from the WPCLF for municipal treatment works improvements. This below-market financing saved Ohio communities more than \$59.6 million in interest costs. New interest rates of 0 percent and 1 percent were adopted for hardship communities.

4.3.2 *Village Capital Improvement Fund*

Interest-free loans totaling \$515,948 were provided through the Village Capital Improvements Fund to 15 villages. These assist in planning and designing wastewater treatment and public water supply facilities.

4.3.3 *Ohio Power Siting Board*

There was a significant increase in applications to the Ohio Power Siting Board over the last year in response to deregulation of the electric utility industry and increased demand for electricity. As a result, division staff reviewed more than 45 projects, including the protection of a perennial stream and major portions of a mature forest at the Rolling Hills generation site in Vinton County. Water Supply Revolving Loan Account The Water Supply Revolving Loan Account, in its fourth year, awarded more than \$35 million for drinking water system improvements. The WSRLA made 18 loans, including a loan where DEFA staff worked closely with Cleveland's Division of Water to establish a long-range WSRLA funding strategy.

4.4 Program Summary - Environmental Services

The Division of Environmental Services (DES) provides quality biological and chemical data and

technical assistance to other Ohio EPA divisions as well as other state and local agencies to help monitor and protect human health and the environment and to ensure a high quality of life in Ohio. The following are some of the vital services provided by DES as reported in the Agency's 2002 annual report:

- ✓ processed over 8,300 samples and generated over 140,000 inorganic and 2,200 organic scan test results covering a variety of matrices including water, drinking water, soil, sediment, air canister, air filter and fish tissue;
- ✓ performed over 90 bioassay toxicity tests of point source effluents for permit compliance and river assessment work;
- ✓ analyzed almost 500 fish tissue samples for the Fish Consumption Advisory program;
- ✓ conducted laboratory approvals, audits of laboratories and review of documents for Voluntary Action Program lab certification program;
- ✓ conducted laboratory surveys and review of applications and lab plans for the drinking water laboratory certification program; and,
- ✓ responded to over 6,700 requests for technical assistance requests (over half from individuals outside Ohio EPA).

4.5 Economic Costs and Benefits of Pollution Controls

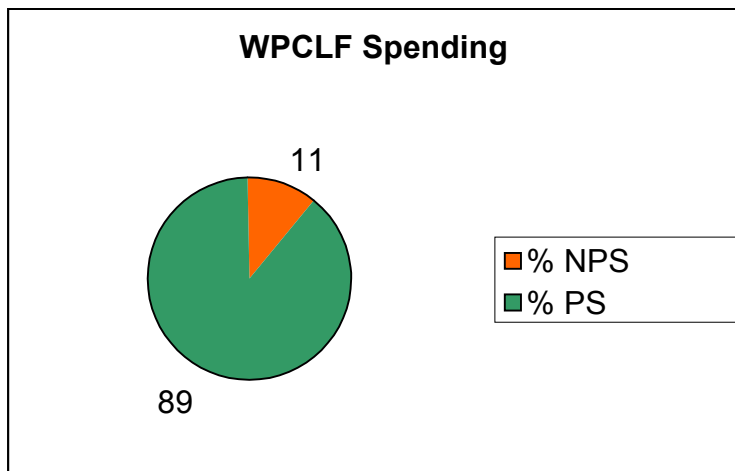
The State of Ohio has several funding sources available for improving overall water quality. Ohio EPA has a publication titled "State and Federal Funding for Drinking Water and Wastewater Systems" that details some of the funding sources. A few of the entities with funding available in Ohio include: Ohio EPA, the Ohio Public Works Commission, the Ohio Water Development Authority, and Rural Development. These financing mechanisms, as well as the investment in water pollution control measures made by municipal and county governments and the private sector, are the reason for dramatic improvements in water quality in Ohio since the inception of the CWA in 1972. It is beyond our means in this report to place a dollar value on the environmental improvements. However, Ohio EPA has documented the recovery numerous major river segments including the Cuyahoga River, Licking River, Paint Creek and Scioto River. The latter two are featured success stories on the Division's web page (<http://www.epa.state.oh.us/dsw/bioassess/AquaticLifeGoal.html>).

One of the major funding sources is the Water Pollution Control Loan Fund (WPCLF). The WPCLF is administered by the Ohio EPA's Division of Environmental and Financial Assistance. It provides loans with interest rates that are below market rate for activities such as:

- ✓ improvements to wastewater treatment facilities;
- ✓ brownfield/contaminated site remediation;
- ✓ agricultural runoff control;
- ✓ urban storm water runoff;
- ✓ septage receiving facilities;
- ✓ landfills; and
- ✓ forestry best management practices.

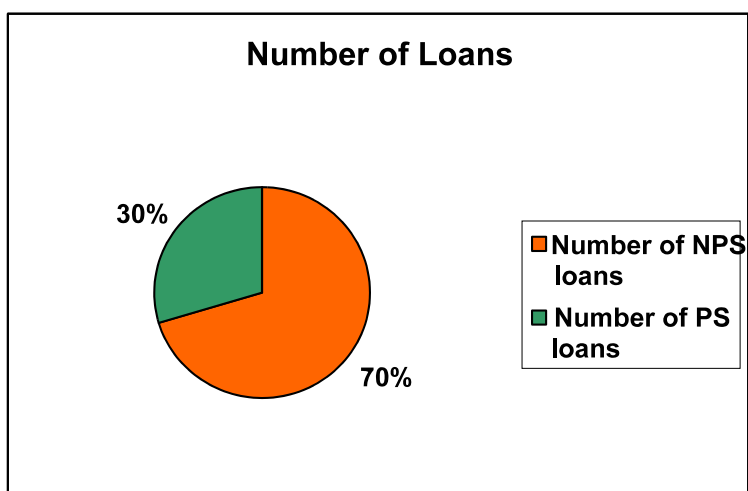
4.5.1 WPCLF Spending

Over the past ten years the WPCLF has loaned out about 2.15 billion dollars. Of that, 11%, or 244 million dollars, were used to address non-point source (NPS) issues including: agricultural runoff, landfills, and Brownfields. The other 89%, or about 1.9 billion dollars, were used to address point source (PS) related problems such as: wastewater treatment plans, combined sewer overflows, new sewer costs, storm water costs, and sewer rehab costs.



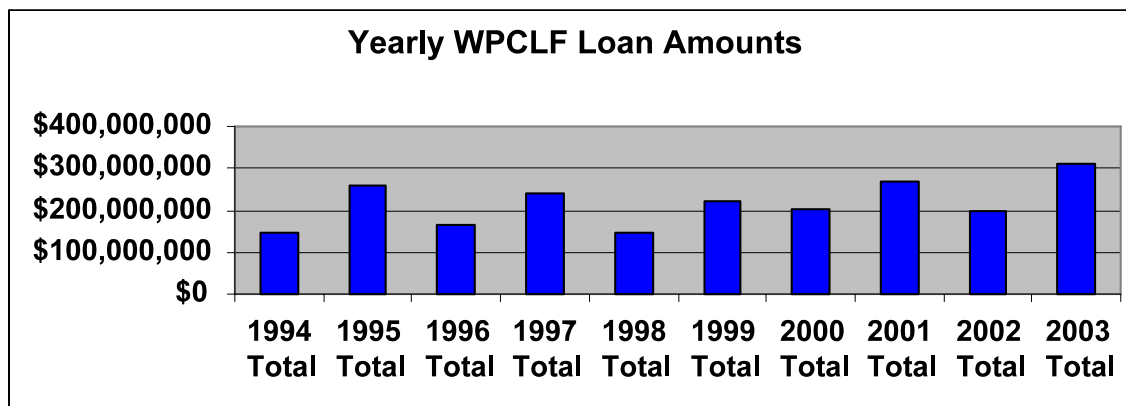
4.5.2 Number of WPCLF Loans

From 1994 to 2003 there were 1,477 WPCLF loans made. A majority, 1,037 loans or 70%, were for NPS issues. The other 30%, or 440 loans, were for PS related problems. PS loans were only 30% of the total number of loans but accounted for 89% of the money loaned. Therefore, PS loans were typically bigger loans for bigger projects.

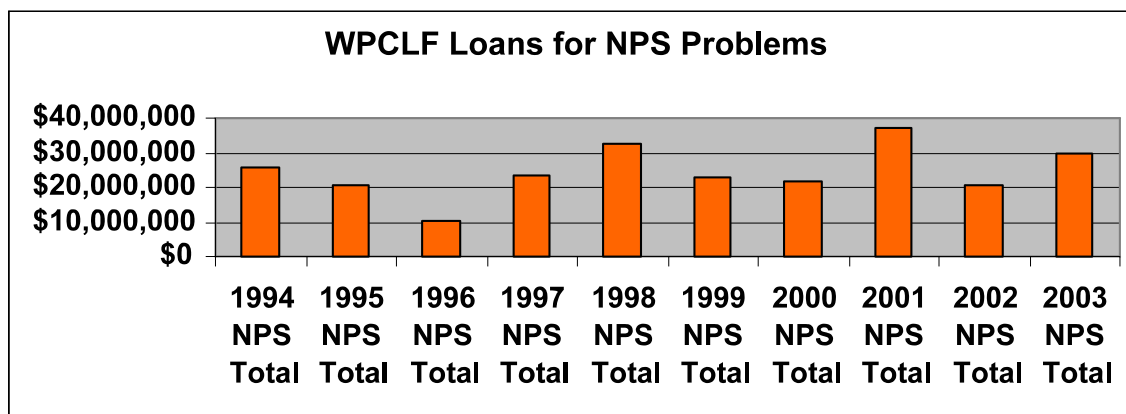


4.5.3 Yearly WPCLF Loan Amounts

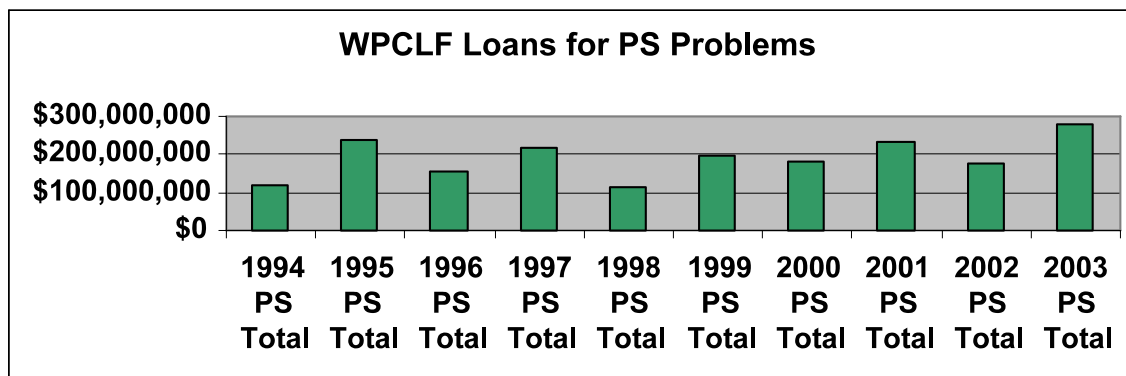
Total yearly WPCLF loan amounts tended to fluctuate with higher totals in odd years. Total loan amounts have varied over the period from a low of \$144,996,845 in 1994, to a high of \$310,447,491 in 2003.



NPS loans didn't have any real trends to speak of over the past ten years. The smallest NPS yearly loan total of the period was \$10,116,511 in 1996. The largest amount was \$37,394,997 in 2001.



Since they accounted for 89% of the total loan dollar amount, it is logical that PS loans were the driving force behind the total WPCLF trend of higher loan amounts every other year in odd years. PS loans for \$281,007,419 marked a ten year high in 2003. However, while the lowest total yearly WPCLF loan amount of the period was from 1994, 1998 had the lowest PS loan total of \$112,645,724.



Section 5

5 Ohio's WQS Use Designations

Beneficial use designations describe existing or potential uses of water bodies. They take into consideration the use and value of water for public water supplies, protection and propagation of aquatic life, recreation in and on the water, agricultural, industrial and other purposes. Ohio EPA assigns beneficial use designations to water bodies in the state. There may be more than one use designation assigned to a water body. Examples of beneficial use designations include: public water supply, primary contact recreation, and numerous sub-categories of aquatic life uses. The following chart lists all of Ohio's WQS designated uses and the status of the evaluation that was conducted for the Ohio 2004 IR.

Beneficial Use Category	Key Attributes, or why a water would be designated in the category	Evaluation status in 2004 Integrated Report
<i>Categories for the protection of aquatic life</i>		
Coldwater Habitat	native cold water or cool water species; put-and-take trout stocking	Assessed on case by case basis
Seasonal Salmonid Habitat	supports lake run steelhead trout fisheries	No direct assessment, streams assessed as EWH or WWH
Exceptional Warmwater Habitat	unique and diverse assemblage of fish and invertebrates	69% of the Watershed Assessment Units and 96% of the Large River Assessment Units fully assessed using direct comparisons of fish and macroinvertebrate community index scores to the biocriteria in Ohio's WQS; sources and causes of impairment were assessed using biological indicators and water chemistry data
Warmwater Habitat (WWH)	typical assemblages of fish and invertebrates	
Modified Warmwater Habitat	tolerant assemblages of fish and macro-invertebrates; irretrievable condition precludes WWH	
Limited Resource Waters	fish and macroinvertebrates severely limited by physical habitat or other irretrievable condition	Assessed on case by case basis
<i>Categories for the protection of recreational activities</i>		
Bathing Waters	Lake Erie (entire lake); for inland waters bathing beach with lifeguard/bath house	Lake Erie beaches fully evaluated no inland waters evaluated
Primary Contact Recreation	water depth allows full body immersion	44% of the assessment units assessed using percentile rankings of fecal coliform counts
Secondary Contact Recreation	water depth prevents full body immersion	Not assessed, see Section 6.4.1
<i>Categories for the protection of water supplies</i>		
Public Water Supply	waters within 500 yards of all public water supply surface water intakes	Not assessed, methods under development, see Section 6.2.1
Agricultural Water Supply	water used, or potentially used, for livestock watering and/or irrigation	Not assessed
Industrial Water Supply	water used for industrial purposes	Not assessed

Section 6

6 Methods to Assess Use Attainment

This Section describes the data used and the assessment methodologies employed to determine if specific uses were met, impaired or partially impaired. See Section 7.2 for information on the situation of “threatened waters.” For WQS uses that were not assessed, or certain water body types that were not assessed, an explanation is presented along with a status report on efforts to collect data and develop methods.

6.1 Sources of Existing and Readily Available Data

For two decades Ohio EPA has placed a high priority on collecting data to accurately measure the quality of Ohio’s rivers and streams. Therefore, the Agency has a lot of information and data to draw upon for the IR. The chart below summarizes the WQS uses evaluated in the 2004 IR, the basic types of data used, the period of record considered, the sources of data and the minimum amount of data needed to evaluate a water body. Specific methodologies used to assess attainment of the standards are described in more detail in the text that follows. The available data sets from Ohio EPA and external sources, including efforts used to obtain additional data, are also discussed below.

WQS Uses & Criteria Evaluated (basic rationale ¹)	Type of Data Time period	Source(s) of Data	Minimum Data Requirement
Human health, single route exposure via food chain accumulation and eating sport fish (criteria apply to all waters of the State)	Fish Consumption Advisories (FCA) 1983 to 2002 (Most FCAs date from 1993 onward, but some locations are older)	State issued FCAs and support data	Adequate data to issue FCA. Generally, 2 composited fish tissue samples per species, per location, and 3 or more species collected, representing range of trophic levels, per location.
Recreation Use, pooled all data within water body and compared the average and maximum criteria to the 75 th & 90 th percentiles of the data, respectively	Bacteria counts 1998 to 2003 (May to Oct. only)	Ohio EPA NPDES permittees Health depts. Northeast Ohio Regional Sewer District (NEORSD)	Bathing Waters - 5 <i>E. coli</i> samples over 30 day period Primary Contact - 3 sites per assessment unit and 15 fecal coliform samples
Aquatic life (specific sub-categories), fish and macroinvertebrate community index scores compared to biocriteria in WQS ²	Watershed scale biological and water quality surveys & other more targeted monitoring 1993 to 2002	Ohio EPA Ohio DNR Miami University Ohio Northern U. MBI CABB NEORSD	Fish and/or macroinvertebrate samples collected using methods cited in WQS ³ . Generally, at least 5 locations sampled per watershed assessment unit (11-digit HUC).

¹ Additional explanation is provided in the text of Section 6.

² OAC 3745-1-07(A)(6) and Table 7-15.

³ OAC 3745-1-03(A)(5)

Ohio's 2002 IR did not consider fish consumption advisories (FCAs) in the listing methodology. U.S. EPA considered the omission to be a deficiency and only **partially** approved the State's 2002 Section 303(d) list. In a separate step, U.S. EPA preliminarily listed 17 additional category 5 waters in Ohio based upon FCA information (see Federal Register, August 25, 2003).

Ohio EPA's 2004 IR considers FCAs as an impairment of the human health based water quality criteria in situations where the advisory is less protective than WQS criterion. This new methodology affected 11 of the water body segments preliminarily listed by U.S. EPA (see Section 8.3.1).

Bacteria data were examined in a substantially more rigorous fashion compared to the method used in 2002, and external data was pooled with Ohio EPA results. Direct comparisons to the specifications in the WQS (i.e., 5 samples over a 30 day period) were still not possible, however. This new methodology and larger data set resulted an increase in assessed waters, and 4 WAUs listed as impaired for recreation use in 2002 now show attainment of the primary contact recreation use (see Section 7.3.2).

Most bacteria data generated by outside entities were acquired directly through access to the NPDES permit monthly operating data (MOR). Over 25,000 MOR records were retrieved and included in the analysis of recreational use impairment. All these NPDES permit holders, plus selected other organizations involved with water quality in Ohio, received a direct mailing inviting them to submit additional bacteria data. Nine entities responded. Information from the Ohio Department of Health, Lake Erie beach monitoring program was the only data set used. The records from the other respondents were either not in the format specified, did not provide any new data, or were received too late for our use. See Appendix C.2 for a copy of the mailing.

The evaluation of biological and water quality survey data was not changed from the approach used in the 2002 IR. Ohio EPA and outside sources of data were evaluated, provided the required methods were followed. The external sources of biological and water quality data from the past decade been compiled from several different sources. Sources include the Ohio Department of Natural Resources - Division of Wildlife, Midwest Biodiversity Institute (MBI), Center for Applied Bioassessment and Biocriteria (CABB), Northeast Ohio Regional Sewer District, Miami University, and Ohio Northern University. These sources have either received intensive training and certification from Ohio EPA or have staff who are well versed in Ohio EPA field and laboratory protocols. Ohio EPA has confidence that data submitted by these sources meet the rigorous QA/QC protocols necessary to meet Ohio EPA data quality objectives. Because of Ohio EPA familiarity with the sources and types of biosurvey data being collected in Ohio, it was determined that no additional specific solicitation of external data was necessary.

In 2003 a new law was enacted in Ohio dealing with external sources of data. The "credible data law" as it is known (ORC 6111.50 to 6111.56) requires that the Director of Ohio EPA propose rules within the next year to accomplish, among other things, the following:

- ✓ to establish by rule a water quality monitoring program for the purpose of collecting credible data under the act, specifies that the rules must require qualified data collectors to follow plans pertaining to data collection, and requires the submission of a certification that the data were collected in accordance with such a plan; and,

- ✓ to establish and maintain a computerized database or databases of all credible data in the Director's possession, and requires each state agency in possession of surface water quality data to submit them to the Director.

In addition, the law explicitly established that outside data used for certain regulatory purposes, such as the Section 303(d) list, must be collected by a qualified data collector, and be found compliant with the specifications of "level 3 credible data". Therefore, Ohio EPA did not actively solicit for outside sources of data other than the bacteria data from permit holders and health departments described above. Provided the adoption of rules proceeds as scheduled, a more active and defined solicitation for external data might be possible when the 2006 IR is prepared.

6.2 Methods under Development

6.2.1 *Drinking Water Use*

Ohio EPA has undertaken the following steps to develop a meaningful assessment that is consistent with key elements of the state's water quality standards.

Ohio Drinking Water Assessment Criteria and Data Sources Beginning in the summer of 2002, an Agency workgroup began development of a methodology appropriate for assessing the drinking water use in Ohio. The workgroup reviewed methodologies practiced by other states and data from public water supply systems to establish criteria for evaluating the drinking water use.

The workgroup examined existing and potential data sources for assessing the drinking water use, including public water system treated and raw water data, Ohio EPA ambient and Source Water Assessment and Protection (SWAP) data. The draft methodology relies primarily on treated water data due to availability but also includes ambient (raw water) data collected by Ohio EPA and potentially ambient data collected by public water systems. Use attainment determinations will be based on a combination of exceedences of SDWA MCLs and other concentration limits, treatment plant process changes related to source water quality issues, and public water system compliance history as related to source water quality.

Data Analysis for Drinking Water Use Assessment In spring 2003, Ohio initiated collection of ambient data for pesticides and nitrates in watersheds with Public Drinking Water Use designations. Figure 6-1 identifies Ohio watershed assessment units (HUC-11) which contain at least one surface water drinking water intake. Watersheds will be sampled in coordination with TMDL and other DSW sampling efforts. Sample location and frequency were selected to assist in drinking water use assessment determinations. This data and additional data collected in 2004 and 2005 will be used to complete assessments of Drinking Water Use for inclusion in the 2006 integrated report.

A draft methodology for assessment of the Drinking Water Use has been created and is currently undergoing internal review. Ohio EPA anticipates initiating a public notice and comment period in mid-2004. The completion of this and the above tasks should allow drinking water assessments to be completed for the 2006 integrated report. The draft methodology will incorporate evaluation of several indicator contaminants into an overall drinking water use assessment determination. This evaluation will then be incorporated into the overall 305(b) evaluation for each hydrologic

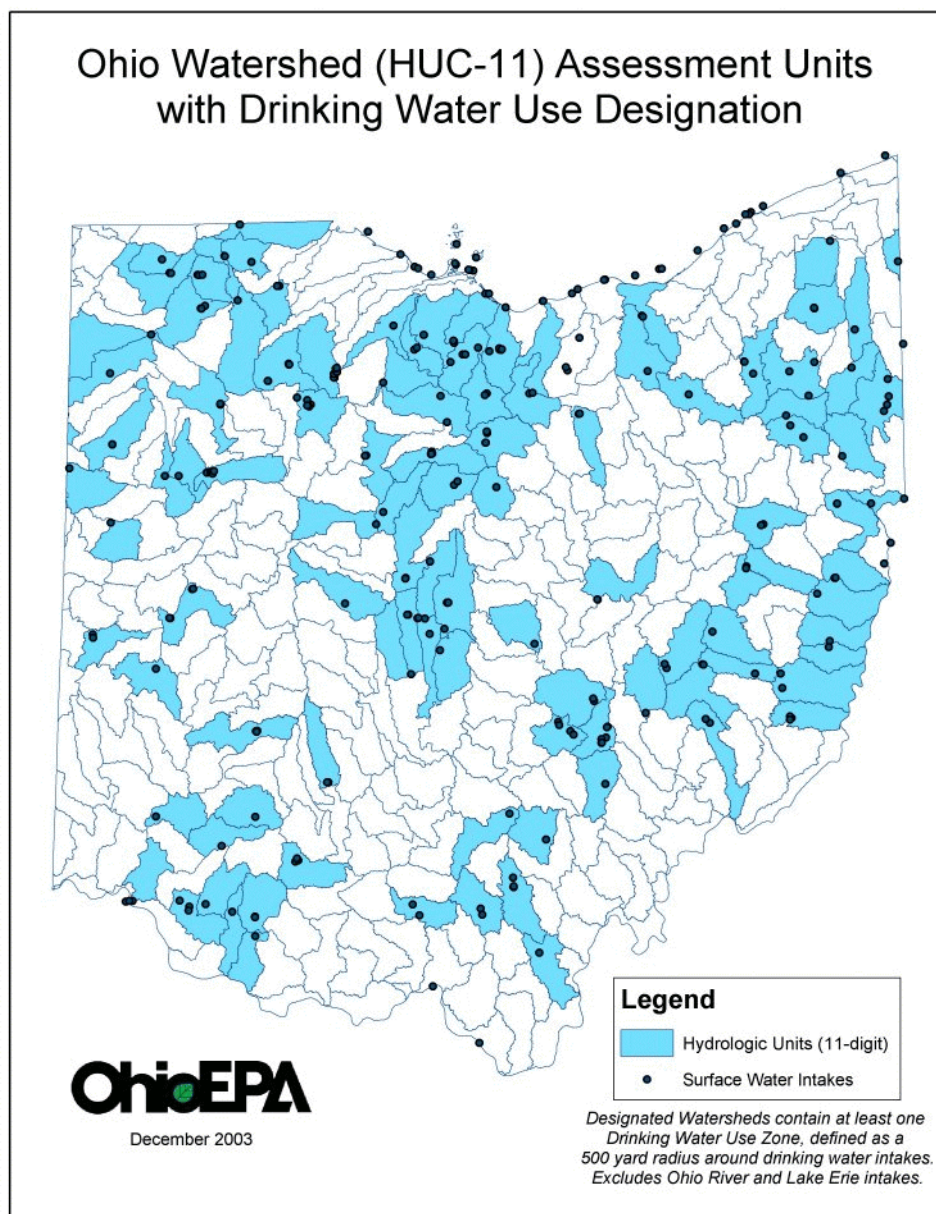


Figure 6-1. Watershed and Lake Erie assessment units containing one or more surface water drinking water intakes.

assessment unit. Initially, the drinking water use determinations will be completed for active public water system surface water intakes and related drinking water use zones. The methodology is being developed to allow for future evaluations of other drinking water use zones identified in OAC 3745-01-07(b) including all publically owned lakes and reservoirs which are not currently used as a public water supply.

6.2.2 Wetlands

Ohio EPA began development of tools to determine beneficial use status of wetlands in 1996. In 1998, the State of Ohio established wetland water quality standards. Narrative criteria have been codified which protect the functional and recreational aspects of a designated wetland. Numeric biological criteria are anticipated in the future. These criteria will establish benchmarks for attainment of a likely tiered, ecoregion-specific wetland use system. The ecological integrity of a particular wetland will be evaluated using vascular plants, macroinvertebrates, and amphibians.

With hundreds of thousands of potential wetlands to be evaluated, methods to accurately characterize the status of an assessment unit which may include large numbers of designated wetlands are being considered. A probabilistic evaluation of wetland quality in several watershed assessment units has been initiated. To date, 286 individual wetlands have been evaluated using bioassessment tools. Attainment status of wetlands will be determined subsequent to further advances in wetland water quality standards.

6.2.3 Inland Lakes and Reservoirs

Ohio EPA's most recent work to assess lakes began in 1989 with a Clean Water Act Section 314 Lake Water Quality Assessment grant that supported the evaluation of 52 lakes. Various additional grants enabled the evaluation of 89 more lakes through 1995. An analysis and determination of use status for 447 public lakes (>5 acres in surface area) was presented in Volume 3 of the 1996 Ohio Water Resource Inventory (305(b) report). As part of the 1996 Section 305(b) report, Ohio EPA developed and applied the Lake Condition Index (LCI) to characterize overall lake health and to assess beneficial use status. From 1996 to the present, Ohio EPA has monitored 53 lakes, but LCI scores have not been calculated.

Although the LCI methodology was later revised to address changes in the interpretation of the threatened use the full use attainment categories, the current implications of identifying a lake as impaired with the necessity of a TMDL were not anticipated. Thus, uncertainty exists about how a lake sampled in the early 1990s and characterized as "threatened" should be categorized under the present regulations and guidance on Section 303(d) listings. The Ohio 2002 IR indicated that the Agency would strive to include lakes in this reporting cycle. However, available resources continue to be inadequate to attend to this evaluation need. If additional resources could be devoted to a lake monitoring and assessment effort, Ohio EPA intends to incorporate the LCI into the assessment of use attainment and 303(d) listing. Water quality in lakes will be evaluated as TMDLs are developed for various WAUs that have inland lakes.

6.3 Methodology for Fish Consumption Advisories (FCA)

6.3.1 Background

The State of Ohio has operated a FCA program for approximately 10 years and, until July 2002, the program's technical and decision making expertise was housed at the Ohio Department of Health. The risk assessment protocols used were developed in the early 1990s under the auspices of the Great Lakes Governors Association. While Ohio EPA was involved with sample collection

and the assessment of sources and causes of pollution, the connections between the human health risk assessment protocols of the FCA program and the human health water quality criteria adopted in the State's WQS regulations in the 1990s were never made.

In prior Integrated Reports Ohio EPA did not evaluate available data to determine attainment status with respect to risks associated with human consumption of sport fish. Although cited as a deficiency in comments from U.S. EPA in 2002, Ohio EPA opted to postpone this assessment until the 2004 IR because of the need to examine the connections between the human health risk assessment protocols of the FCA program and the human health water quality criteria.

Ohio has adopted human health WQS criteria to protect the public from adverse impacts, both carcinogenic and non-carcinogenic, due to exposure via drinking water (applicable at public water supply intakes) and to exposure in the contaminated flesh of sport fish (applicable in all surface waters). The latter criterion is called the non-drinking water human health criterion. The purpose of that criterion is to ensure levels of a chemical in water do not bioaccumulate in fish to levels harmful to people who catch and eat the fish. The relationship of the non-drinking water human health criterion to the FCA risk assessment protocols is explained below.

6.3.2 *Rationale and Evaluation Method*

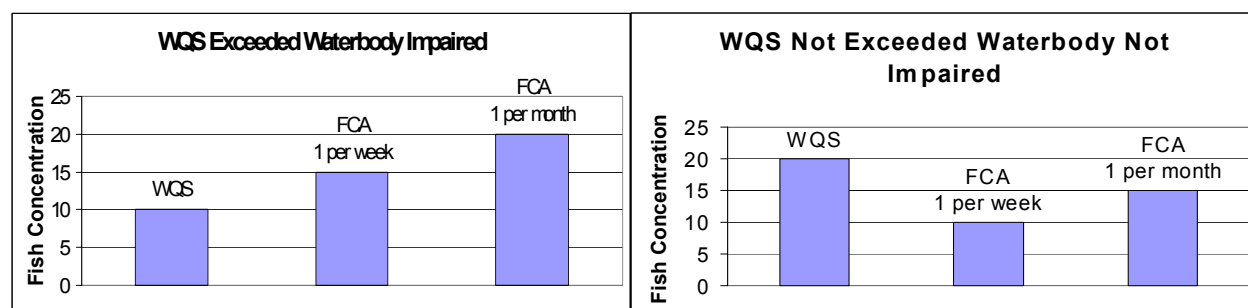
U.S. EPA's guidance for preparing 2004 integrated reports states:

"EPA generally believes that fish and shellfish consumption advisories and certain shellfish growing area classifications based on segment specific information demonstrates impairment of CWA Section 101(a) "fishable" uses. For purposes of determining whether a segment is impaired by a pollutant and should be included in Category 5, EPA considers a fish consumption advisory, and the supporting data to be existing and readily available data and information that demonstrate non-attainment of a Section 101(a) "fishable" use when:

- ✓ the advisory is based on fish and shellfish tissue data;
- ✓ the data are collected from the specific segment in question, and
- ✓ the risk assessment parameters (e.g., toxicity, risk level, exposure duration and consumption rate) of the advisory or classification are cumulatively equal to, or less protective than those in the State's WQSs." (U.S. EPA 2003)

Ohio's WQS regulations do not describe human consumption of sport fish as an explicit element of aquatic life protection. However, the WQS do include human health criteria that are applicable to all surface waters of the State. Certain of these criteria are derived using assumptions about the bioaccumulation of chemicals in the food chain, and the criteria are intended to protect people from adverse health impacts that could arise from consuming fish caught in Ohio's waters. To determine when and how waters should be listed as impaired because of FCAs, the risk assessment parameters on which the human health WQS criteria are based were compared with those used in the Ohio FCA program. If the State has issued an advisory for a specific water body and that advisory is equal to or less protective than the State's WQS, then one can assume there is an exceedence of the WQS. On the other hand, if the advisory is more protective than the WQS, one cannot assume that the issuance of the advisory indicates an exceedence of the WQS. Figure 6-2 illustrates this point.

Figure 6-2. Illustration of the relationship among the water quality standard (WQS) values, the values that trigger issuance of fish consumption advisories (FCAs) and the resulting decision regarding waterbody impairment associated with an FCA.



A FCA is determined based on the quantity of a chemical in fish, such as micrograms of chemical per kilogram of fish tissue (ug/kg). WQS, on the other hand, are expressed as the quantity of chemical in water, such as micrograms of chemical per liter of water (ug/l). The information used to calculate the human health non-drinking WQS criterion can be used to calculate a maximum safe fish concentration. That fish concentration value can then be directly compared to the FCA program values to determine whether the advisory is less or more protective than the WQS criterion. The values in the chart below make this comparison for chemicals for which there is both an FCA and an Ohio human health non-drinking water criterion. Because Ohio human health criteria differ between the Lake Erie and Ohio River basins, separate comparison are presented.

Basin / Parameter	Fish concentration on which the WQS is based ¹	Range of fish concentrations triggering an "eat no more than one meal per week" advisory	Range of fish concentrations triggering an "eat no more than one meal per month" advisory
Lake Erie / PCB	23 ug/kg	50 - 220 ug/kg	221 - 1,000 ug/kg
Ohio River / PCB	54 ug/kg	50 - 220 ug/kg	221 - 1,000 ug/kg
Lake Erie / mercury	350 ug/kg	50 - 220 ug/kg	221 - 1,000 ug/kg
Ohio River / mercury	1,000 ug/kg	50 - 220 ug/kg	221 - 1,000 ug/kg
Lake Erie / lead ²	2,000 ug/kg	86 - 371 ug/kg	372 - 1,609 ug/kg
Ohio River / hexachlorobenzene ³	67ug/kg	800 - 3,499 ug/kg	3,500 - 15,099 ug/kg

values
values
values

advisory is less protective than WQS criterion, WQS exceeded, waterbody impaired

advisory may be more, or less, protective than WQS criterion

advisory is more protective than WQS criterion, WQS not exceeded, no impairment from FCA

¹ See Appendix A.1 for an explanation of how these concentrations were calculated.

² There is no Ohio human health non-drinking water criterion for lead in the Ohio River basin.

³ There are no FCAs for hexachlorobenzene in the Lake Erie basin.

Based on these comparisons, the following conventions have been applied in considering whether FCA issued by the State support the premise that the State's non-drinking water human health criteria are exceeded in a water body.

PCBs - In both the Lake Erie basin and Ohio River basin, the advisory protocol at both the "once per week" and "once per month" levels is less protective than the WQS criterion. Therefore, individual water bodies with these advisories (or more restrictive advisories) will be considered impaired. More restrictive fish consumption advisories ("eat no more than 6 meals per year" and "do not eat") are based on higher fish concentrations (greater than 1,000 ug/kg) and are thus less protective than the PCB WQS criterion in both drainage basins. Water bodies with an "eat no more than 6 meals per year" advisory or a "do not eat" advisory will be considered impaired.

Mercury - In both the Lake Erie basin and Ohio River basin, the advisory protocol at the "once per week" level is more protective than the WQS criterion. In addition, in the Ohio River basin, the advisory protocol at the "once per month" level is more protective than the WQS criterion. These advisory situations will not result in the water body being considered impaired.

For mercury in the Lake Erie basin the "once per month" advisory level could be more protective, or less protective, than the WQS criterion. In this situation, it was necessary to compare the fish tissue results upon which the advisory was issued to the fish concentration on which the WQS is based (350 ug/kg).

More restrictive fish consumption advisories ("eat no more than 6 meals per year" and "do not eat") are based on higher fish concentrations (greater than 1,000 ug/kg) and are thus less protective than the mercury WQS in both drainage basins. Water bodies with an "eat no more than 6 meals per year" advisory or a "do not eat" advisory will be considered impaired.

Lead (Lake Erie basin) - The advisory protocol at the "once per week" level and the "once per month" level is more protective than the WQS criterion. These advisory situations will not result in the water body being considered impaired. No FCAs for lead have been issued at more restrictive levels of consumption.

Hexachlorobenzene - The advisory protocol at both the "once per week" and "once per month" levels is less protective than the WQS criterion. Therefore, individual water bodies with these advisories (or more restrictive advisories) will be considered impaired.

The 2004 IR includes information on FCAs issued by the Department of Health in 2003 (*2003 Ohio Sport Fish Consumption Advisory*, Ohio EPA 2003) as well as final draft advisory information prepared for release in 2004. A Statewide "no more than one meal per week" advisory was issued in 2003 because of the statewide and nationwide mercury advisory for sensitive populations and the increasing number of location specific one meal per week advisories. Following U.S. EPA guidance (U.S. EPA 2003), waters were listed as impaired based upon a "once per week" advisory only if water body specific information was available in support of such an advisory. Results are presented in Section 7.3.1.

6.4 Methodology for Recreation Uses

6.4.1 Background

Prior to the 2002 IR, the reporting of recreational use impairment in Ohio was sporadic. Section 305(b) reports (1998 and earlier) may have included an indication of the potential for recreational use impairment in various streams, but a cohesive listing was not presented. The 2002 IR employed a uniform methodology to examine readily available data on fecal coliform counts. This approach was based on counting the number of exceedences of the secondary contact recreational use maximum criterion (5000/100 ml fecal coliform or 576/100 ml *E. coli*). Any assessment unit with five or more samples over the last five years above these values was listed as impaired. Additionally, if a dermal contact advisory has been issued by the Ohio Department of Health or a county health board for any part of the assessment unit, then the affected unit was identified as impaired. The methodology description in the 2002 IR indicated that Ohio EPA expected to implement a more robust recreational use attainment analysis in future years, including incorporation of data from other parties.

Application of the secondary contact criterion was dropped in the 2004 IR because, on the scale of WAUs being assessed, the secondary use is not representative of the generally applicable designated use. The existence of a dermal contact advisory as a trigger for recreation use impairment was also dropped from consideration for several reasons. Again, the scale of the WAUs being assessed are much larger than the six small stream segments where dermal contact advisories exist. In each case these dermal advisories exist in areas that have contaminated sediments from legacy site sources that have already been addressed through remedial actions, or are in the planning stages for such work. In any case these impaired waters are not prime candidates for TMDL work. See Section 8.3.2 for additional information on how these water are listed.

The revised methodology and its linkage to the Ohio WQS is summarized in the following chart. Additional explanation is provided in the following text.

Bathing Waters		
Indicator	Criterion (Table 7-13, OAC 3745-1-07)	Assessment Method
<i>E. coli</i>	geometric mean <i>E. coli</i> content (either MPN or MF), based on not less than five samples within a thirty-day period, shall not exceed 126 per 100 ml and <i>E. coli</i> content (either MPN or MF) shall not exceed 235 per 100 ml in more than ten per cent of the samples taken during any thirty-day period	Lake Erie beach data was extensive enough to allow direct comparisons of geometric mean to the water quality criteria of 126; running geometric means calculated to arrive at the number of days in recreational season above the criterion; threshold of 10 days above criterion considered impairment of bathing water use.

Primary Contact		
Indicator	Criterion (Table 7-13, OAC 3745-1-07)	Assessment Method
Fecal coliform	geometric mean fecal coliform content (either MPN or MF), based on not less than five samples within a thirty-day period, shall not exceed 1,000 per 100 ml and fecal coliform content (either MPN or MF) shall not exceed 2,000 per 100 ml in more than ten per cent of the samples taken during any thirty-day period	Statewide data on rivers and streams was not extensive enough to allow direct comparison of geometric mean to the water quality criterion of 1000; data pooled from all sources over period of record; thresholds used for impairment of primary contact use were 75 th percentile compared to 1000 and 90 th percentile compared to 2000.

6.4.2 Evaluation Method - Lake Erie

Attainment of recreational water quality standards for the three Lake Erie assessment units was based upon examination of *E. coli* data provided by the Ohio Department of Health (ODH). Routine bacteria monitoring is performed by local health districts, ODH, and the Northeast Ohio Regional Sewer District (NEORS) in order to monitor bacteria levels at public bathing beaches and advise the public when elevated bacteria are present that represent an increased risk of contracting waterborne illness as a result of exposure to pathogens while recreating in the water. Bacteria data collected by local or state health agencies during the recreation season from 1999 through 2003 were included in the analysis. Ohio's water quality standards define the recreation season as May 1- October 15, though Lake Erie beach monitoring typically commences in late May and concludes by September 1st.

Each of the 22 beaches (shown in Figure 6-3) were individually analyzed to evaluate the percentage of recreation days during which the bathing water geometric mean water quality criteria of 126/100 ml were exceeded. The total number of recreation days for a particular beach were determined by adding the number of days starting with the first day of sampling and ending with Labor Day. The total number of days exceeding the bathing water geometric mean criteria was determined by adding the total number of days during the recreation season (as defined above) during which the running geometric mean of the samples exceeded the criteria. Once the running geometric mean exceeded the criteria, it was assumed to continue exceeding the criteria until further sampling documented that the criterion was not being exceeded.

The percentage of exceeding days was determined for each beach over the five-year period. The 5-year beach data for the individual beaches were then pooled into the corresponding Lake Erie recreation assessment units in order to determine the attainment status for each of the three units. Attainment status for each Lake Erie assessment unit was based upon whether the average number of days the geometric mean *E. coli* bathing water quality criteria exceeded ten days. The basis for using a benchmark of ten days is Ohio's 1998 State of the Lake Report prepared by the Ohio Lake Erie Commission (Ohio LEC 1998). While the stated goal in this report for beaches is to have clean beaches all of the time (no days under advisement) the report considered having ten or fewer days under advisement to be "excellent".

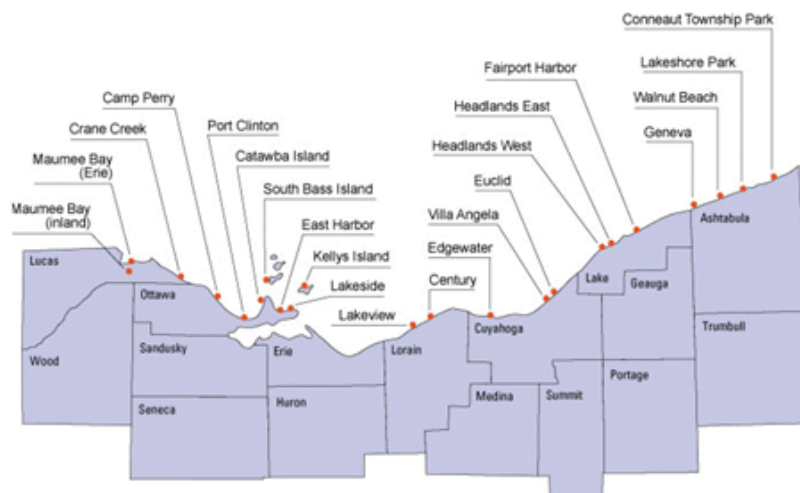


Figure 6-3. Lake Erie beaches sampled by Ohio health departments.

6.4.3 Evaluation Method - Rivers and Streams

The 2004 recreational use impairment list was developed using ambient fecal coliform data collected from 1998 to August, 2003. These data were obtained from the STORET and SWIMS databases, which contain ambient monitoring data collected by Ohio EPA and ambient monitoring data collected by point source dischargers, respectively. Data collected outside of the recreation season, as defined in Ohio's Water Quality Standards, were excluded from the analysis. Values reported as "too numerous to count" and values reported as "greater than" were also excluded from further analysis. In addition, values reported to be "less than" values ranging from 100-2,000 were excluded. Approximately 33,500 fecal coliform bacteria records were used in the analysis, of which approximately 25% were from STORET and 75% were from SWIMS. Data were sorted into their respective 11-digit HUCs using a geo-spatial analysis of the latitude/longitude data associated with each fecal coliform value.

Statistical analysis performed include computation of the geometric mean, median, 75th percentile, and 90th percentile of the fecal coliform data for each assessment unit for which data were available. Statistical computations were performed using Microsoft Excel 2000. The geometric mean was computed as the arithmetic mean of the log-transformed fecal coliform values. The median and percentiles were computed by ranking (i.e., non-parametrically) untransformed fecal coliform values. A tally of the number of ambient sites and the number of NPDES dischargers reporting fecal coliform data to Ohio EPA's SWIMS database for each assessment unit was made. The amount of fecal coliform data included in the statistical analysis for each assessment was also tallied (MOR, ambient, combined total).

Recreational use assessment determinations were based on a comparison of the 75th percentile to Ohio's geometric mean fecal coliform criterion of 1,000 and the 90th percentile to Ohio's single sample maximum fecal coliform criterion of 2,000. An assessment unit was determined to be impaired when either the 75th percentile exceeded 1,000 fecal coliform or the 90th percentile exceeded 2,000 fecal coliform. A minimum of three sampling locations within the assessment unit and 15 measurements were required in order to make an assessment determination.

6.5 Methodology for Aquatic Life Uses

6.5.1 *Background and Rationale*

Ohio EPA has been evaluating streams using similar methods for more than twenty years. Our stream evaluations are based on the experience gained through the collection of about 20,000 fish population samples, 8200 macroinvertebrate samples and more than 68,000 water chemistry samples. This report is based on data collected in the years 1993 to 2002.

Ohio's WQS have seven subcategories of aquatic life uses (see summary presented in Section 5). The WQS rule contains a narrative for each aquatic life use and the three most commonly assigned aquatic life uses have quantitative, numeric biological criteria that express the desired level of biological performance measured on three separate indices. A specially designed study known as the Stream Regionalization Project was used to select reference, or least impacted sites, in each of Ohio's five ecoregions. Biological data from these sites was used to establish the ecoregion specific biocriteria for each aquatic life use. Note that some criteria vary according to stream size and some indices do not apply in certain circumstances. Ohio's WQS rule stipulates that "biological criteria provide a direct measure of attainment of the warmwater habitat, exceptional warmwater habitat and modified warmwater habitat aquatic life uses" (OAC 3745-1-07(A)(6)). The numeric biological criteria applicable to Exceptional Warmwater Habitat, Warmwater Habitat and Modified Warmwater Habitat waters are found in Table 7-14 of the WQS rule. Coldwater Habitats don't have numeric biological criteria and attainment status must be determined on a case by case evaluations. The Coldwater Habitat and Limited Resource Water uses either don't have numeric biological criteria or have interim biological criteria which are not codified in the Water Quality Standards. For sites and segments designated with these aquatic life uses, assessment of the attainment status was determined on a case by case basis using the use narrative in the Water Quality Standards (CWH, LRW) and the available interim biological criteria where applicable (LRW only).

6.5.2 *General Determination of Attainment Status*

A biological community at a sampling site must achieve the relevant criteria for all three indices in order to be in full attainment of the water quality standard. Partial attainment is determined if one criterion is not achieved while non-attainment results when all biological scores are less than the criteria or if very poor index scores are measured in either fish or macroinvertebrate communities. The chemical and physical data collected as part of Ohio EPA's comprehensive watershed evaluations are considered in gaging causes and sources of pollution and factor into the confirmation of impaired uses.

Adequate sampling is necessary to represent the aquatic life use attainment status for all streams in a WAU. Despite Ohio EPA's significant biological sampling effort, about one third of the state's WAUs are precluded from this analysis due to insufficient data. Many of these un-assessed WAUs were evaluated prior to 1993 but have not been sampled since then. In other un-assessed WAUs where recent sampling may have occurred, the scope of monitoring was likely judged too limited to adequately generate a WAU assessment and watershed score. Generally, at least five sample sites are minimally considered necessary for extrapolation. Presently, Ohio EPA prefers that the principal investigators make informed decisions about the data relevance for a particular WAU evaluation rather than institute specific guidance on minimum effort.

Recognizing the state's limited resources, one way to increase WAU assessment coverage is to utilize all available relevant data. While Ohio EPA uses data from a variety of sources in its work, the data used to determine the aquatic life use status in this report was primarily collected by Ohio EPA. Some additional biological data were provided by the Ohio Department of Natural Resources, Northeast Ohio Regional Sewer District, Miami University, Ohio Northern University, Midwest Biodiversity Institute, and Center for Applied Bioassessment and Biocriteria. Those interested in providing data for aquatic life use attainment status determinations may attend appropriate training (such as the Voluntary Action Program training provided by Ohio EPA) or otherwise become competent in Ohio EPA biological sampling protocols. All data used to make attainment determinations is carefully reviewed for consistency with all Ohio EPA methods and guidance.

6.5.3 Evaluation Method - Large River Assessment Units (LRAUs)

Decades of monitoring work by Ohio EPA has resulted in an extensive data set which includes recent data for all but one of the 23 defined LRAUs in Ohio. The longitudinal sampling pattern (upstream to downstream and bracketing pollution sources and tributaries) used to measure fish community health, macroinvertebrate community condition and water chemistry allows WQS attainment status to be fairly precisely estimated based on linear distances. The length of the river deemed to be in attainment, as described in the previous section, was divided by the total length of the large river assessment and multiplied by 100 to yield a value between 0 (no miles in attainment) and 100 (all miles in attainment). A LRAU was considered meeting its aquatic life designated use only if a score of 100 was reported. In other words, if all sites are not in full attainment then the assessment unit is listed as not attaining the aquatic life use.

6.5.4 Evaluation Method - Watershed Assessment Units

The assessment of aquatic life use attainment in WAUs was determined using a combination of spatial and linear analysis. Data was grouped according to the watershed size at the point of sampling: sites with drainages $\leq 5 \text{ mi}^2$; sites with drainages $> 5 \text{ mi}^2$ and less $\leq 20 \text{ mi}^2$; sites with drainages $> 20 \text{ mi}^2$ and less $\leq 50 \text{ mi}^2$; and, sites with drainages $> 50 \text{ mi}^2$. Within each WAU a "linear" attainment score was calculated for the stream segments with drainage areas greater than 50 mi^2 in the fashion described above for large rivers. A separate "spatial" attainment score was calculated for each WAU using information about the fraction or proportion of sites within data groups that demonstrated full aquatic life use attainment. To correct a bias in biosurvey design that generates a larger number of data points from small watersheds the following formula was used to give more weight in the final spatial score to results from larger streams.

Data Group 1	Data Group 2	Data Group 3	
$\leq 5 \text{ mi}^2$	$> 5 \text{ mi}^2 \text{ to } \leq 20 \text{ mi}^2$	$> 20 \text{ mi}^2 \text{ to } \leq 50 \text{ mi}^2$	Spatial Score
$\frac{\left(\frac{a}{b} + \frac{a}{b} \right)}{2} + \frac{(a/b)}{2} * 100 = c$			

where

- a = number of sites in full attainment
- b = number of sites in data group
- c = spatial attainment score for WAU

The spatial and linear scores within each WAU were averaged for an overall measure of aquatic life attainment in the watershed. Watershed Assessment Units were considered meeting their aquatic life designated use only if a score of 100 was reported. In other words, if all sites are not in full attainment then the assessment unit is listed as not attaining the aquatic life use.

6.5.5 Evaluation Method - Lake Erie Nearshore, Islands, and Lacustuaries

Aquatic life use determinations are predicated on a narrative description of the aquatic community associated with the relevant use tier. In the absence of numeric criteria, the narrative expectation provides the impairment determination. Ohio EPA completed *Development of Biological Indices Using Macroinvertebrates in Ohio Nearshore Waters, Harbors, and Lacustuaries of Lake Erie in Order to Evaluate Water Quality* in 1997. In 1999, *Biological Monitoring and an Index of Biotic Integrity for Lake Erie's Nearshore Waters* was produced. The data analysis in these documents provide a foundation to establish numeric biocriteria for aquatic life use in Lake Erie along the Ohio shoreline and in lacustuary areas.

The term "lacustuary" was coined to specify the zone where Lake Erie water levels have intruded into tributary river channels. The aquatic life use status of a lacustuary is included in the assessment of the tributary river. Excluding lacustuaries, the status of the Lake Erie shoreline is evaluated in three assessment units: western basin nearshore, islands, and central basin nearshore ("nearshore" in this case meaning areas within 100 meters of the shoreline). Techniques to assess open water areas are being explored under grants from the Ohio Lake Erie Protection Fund.

6.6 Methodology for Ohio River

Ohio EPA participates in an Ohio River Valley Water Sanitation Commission (ORSANCO) workgroup to promote consistency in 305(b) reporting and 303(d) listing. The workgroup discussed and agreed upon methods to evaluate attainment / non-attainment of aquatic life, recreation and public water supply uses, as well as FCAs. ORSANCO has prepared the Section 305(b) report for the Ohio River and has listed the impaired segments of the Ohio River. Ohio EPA defers to the ORSANCO's analysis and the list of impaired Ohio River segments found in *Biennial Assessment of Ohio River Water Quality Conditions, 2002-2003* (ORSANCO In prep.).

Section 7

7 List of Impaired Waters

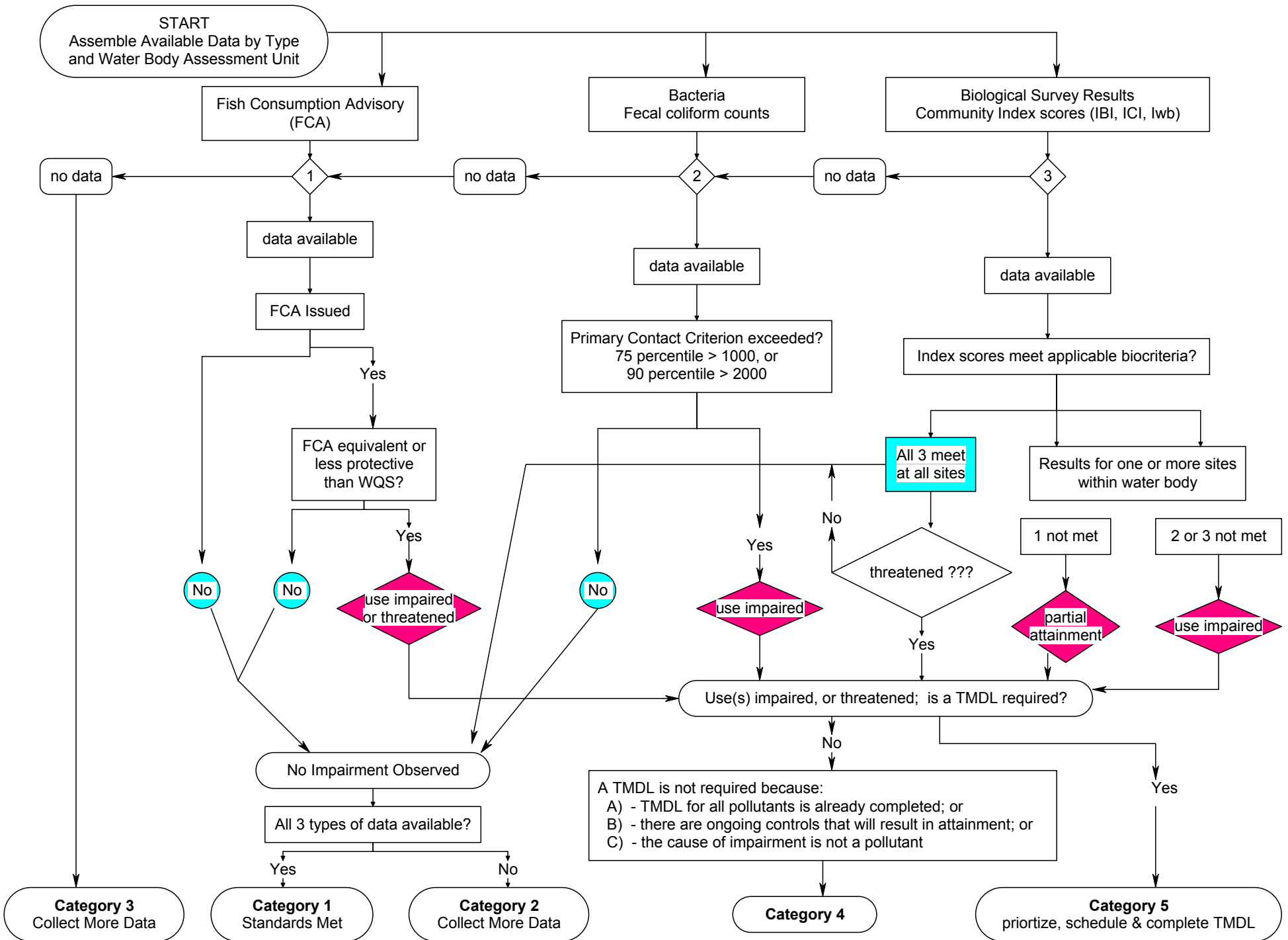
7.1 Section 303(d) Listing Methodology - Categories of Waters

After assessing attainment status of the WQS uses as described in Section 6, each Assessment Unit was placed in one of five categories. These categories reflect U.S. EPA guidance and are summarized below.

Category Reported Pursuant to Section 303(d)	Results of Data Assessment and Determination of WQS Use Attainment
Category 1	All designated uses are met, and no use is threatened
Category 2	Some of the designated uses are met but there is insufficient data to determine if remaining designated uses are met
Category 3	Insufficient data to determine whether <u>any</u> designated uses are met
Category 4	Water is impaired or threatened but a TMDL is not needed
4A	- TMDL has been completed
4B	- other required control measures will result in attainment of WQS
4C	- impairment or threat not caused by a pollutant
Category 5	Water is impaired or threatened and a TMDL is needed.

See Figure 7-1 for an illustration of the overall decision process linking the types of data examined, the basic decision on WQS use impairment and the 303(d) list categories.

FIGURE 7-1. OHIO'S 2004 SECTION 303(d) LISTING PROCESS



7.2 Threatened Water Situations

U.S. EPA guidance provides the following information on this topic:

“Threatened waters are waters that are currently attaining WQS, but which are expected to exceed WQS by the next listing cycle (every two years). Waters should be listed if the analysis demonstrates a declining trend in a specific water quality criterion(WQC), and the projected trend will result in a failure to meet a criterion by the date of the next list (i.e., 2006 for purposes of the 2004 assessment cycle).” (U.S. EPA 2003)

Ohio EPA lacked sufficient water chemistry and bacteria data to demonstrate any specific trends in water quality parameters, and could not predict declines in either aquatic life or recreational use attainment status by 2006. However, one aspect of the methods employed in the issuance of FCAs does lend itself to the threatened water category. When sampling indicated that only one or two species-specific samples (among 3 or fewer samples) exceeded the one meal per month FCA concentration, a decision to collect additional data could have been made in lieu of issuing a one meal per month advisory, knowing that the State-wide one meal per week FCA applies. Factors entering this decision include the water body type (lake or reservoir vs stream or river), and historical data if available. Water bodies with this situation were assigned a threatened condition based on a likelihood that repeat sampling could indicate a water body specific FCA for one or more pollutants in the next reporting cycle. Table 7-1 identifies these waters. They have been listed as category 5 waters.

Table 7-1. Waters considered threatened because fish tissue levels of PCBs in a limited number of samples exceed the threshold level upon which the WQS criterion is based. Water bodies listed in bold were subject to a disapproval action by U.S. EPA because they did not appear on Ohio's 2002 Section 303(d) list.

Water Body	Assessment unit(s)	Pollutant	Level(s) of Advisory: One meal per
<i>2003 Ohio Sport Fish Consumption Advisory (Ohio EPA 2003)</i>			
West Branch St. Joseph River	04100003020	PCBs	week
<i>2004 Ohio Sport Fish Consumption Advisory (Ohio EPA 2004)</i>			
Duck Creek	05030201120	PCBs DDT/DDE/DDD	week week
East Branch Black River	04110001040	PCBs	week
Little Beaver Creek	05030101090	PCBs	week
Little Darby Creek	05060001210	PCBs	week
Olentangy River	05060001110 05060001120	PCBs	week
Rocky Fork Licking River	05040006050	PCBs	week
West Branch Black River	04110001020	PCBs	week

7.3 Results by Use Designation Category

Data were compiled for each Large River and Watershed Assessment Unit and the three Lake Erie assessment units. The data was evaluated to determine whether the assessment unit supported, partially supported, or did not support its designated uses. Results are discussed below by type of data; fish consumption advisories (human health criteria), bacteria counts (recreation uses), and fish and macroinvertebrate community index scores (aquatic life uses). Each assessment unit was then placed in one of the five Section 303(d) listing categories. Specific results for each assessment unit in the State are found in Appendix D. General State-wide observations about the overall results for each type of use impairment are presented below.

7.3.1 Impairment Due to Fish Consumption Advisory

7.3.1.1 Mercury and PCBs

The majority of FCAs issued in Ohio are because of PCBs or mercury. Waters impaired because fish tissue levels of PCBs or mercury exceed the threshold level upon which the WQS criterion is based are listed in Table 7-2. This assessment was made using the protocol explained in the Section 6.3. The information on the waters subject to fish consumption advisories was obtained from the 2003 *Ohio Sport Fish Consumption Advisory* (Ohio EPA 2003) and supplemented with information in the 2004 advisory publication (December 2003 draft, Ohio EPA 2004). The pollutant(s) identified in the advisory publication, either PCBs and/or mercury, are listed along with the level of advisory that has been issued for the water body. For mercury at the one meal per month advisory level in the Lake Erie Basin it was necessary to compare species composite average mercury concentrations with the level upon which the WQS criterion is based (see Appendix A.2 for these data). Three of the 20 Lake Erie Basin water bodies with mercury fish consumption advisories had species composite average mercury concentrations above 350 ug/kg.

Table 7-2. Waters impaired because fish tissue levels of PCBs or mercury exceed the threshold level upon which the WQS criterion is based.

Water Body ^a	Assessment unit(s)	Pollutant	Level(s) of Advisory: One meal per
<i>2003 Ohio Sport Fish Consumption Advisory</i> (Ohio EPA 2003)			
Ashtabula River 24th St Bridge to Lake Erie	04110003050	PCBs	week, month & 2 months ¹
Auglaize River US Rt 33 in Wapakoneta to Maumee R.	Auglaize River Mainstem 04100007020 04100007060	PCBs, mercury	week month ²
Berlin Lake	05030103020	PCBs	month
Black River 31 st St. bridge in Sheffield to Lake Erie	04110001050	PCBs	week & month ¹

Water Body ^a	Assessment unit(s)	Pollutant	Level(s) of Advisory: One meal per
Cuyahoga River Ohio Edison Dam Pool to Lake Erie	Cuyahoga River Mainstem 04110002030 04110002040	PCBs	week, month & 2 months ¹
Dicks Creek Oxford St (Middletown) to the Great Miami R.	05080002050	PCBs	do not eat
Eastwood Lake	05080001190	PCBs	month
Ford (a.k.a. Hamilton) Hydraulic Canal	05080002050 05080002090	PCBs	month
Grand River	Grand River Mainstem 04110004010 04110004020 04110004040	PCBs, mercury	week & month ³ month ²
Great Miami River	Great Miami River Mainstem 05080001010 05080001030 05080001040	PCBs	week, month, 2 months & do not eat ⁴
Hocking River	Hocking River Mainstem 05030204010 05030204050	PCBs	month
Lake Erie	Western basin Central basin Lake Erie Islands	PCBs	week, month, 2 months & do not eat ⁵
Lake Nesmith	05040001010	PCBs	do not eat
Little Beaver Creek	05030101090	PCBs	month & 2 months ¹
Mad River U.S. 36 Urbana to Dayton footnote that some species have more restrictive advisories	Mad River Mainstem 05080001160	PCBs	week & month ¹
Mahoning River Berlin Dam to PA Border	Mahoning River Mainstem 05030103030 05030103040	PCBs	week, month & do not eat ⁴

Water Body ^a	Assessment unit(s)	Pollutant	Level(s) of Advisory: One meal per
Maumee River	Maumee River Mainstem	PCBs	week, month & do not eat ⁴
Mill Creek (Cincinnati)	05090203010	PCBs	month
Muskingum River	Muskingum River Mainstem	PCBs	week & month ¹
New Lyme Lake	04110004030	mercury	month ²
Nimishillen Creek	05040001050	PCBs	month
North Branch Portage River	04100010050	PCBs	2 months
Ottawa River (Lima)	04100007050 04100007040 04100007030	PCBs	week ⁶
Ottawa River (Toledo) I-475 N of Wildwood Preserve to Maumee Bay	04100001020	PCBs	do not eat
Portage Canal (a.k.a. Ohio Canal)	05040001010	PCBs	do not eat
Portage River Ohio Turnpike to Lake Erie	04100010060 04100010070	PCBs	week & month ¹
Sandusky River	Sandusky R. Mainstem 04100011020 04100011040	PCBs	week & month ¹
Sandy Creek	05040001040 05040001060	PCBs	month
Scioto River	Scioto River Mainstem 05060001010 05060001030	PCBs	week, month & 2 months ⁵
Scippo Creek Kingston Pike to Scioto River	05060002010	PCBs	month
St. Joseph River	04100003030 04100003060	PCBs	month
Summit Lake	04110002030	PCBs	do not eat

Water Body ^a	Assessment unit(s)	Pollutant	Level(s) of Advisory: One meal per
Tuscarawas River Barberton to New Philadelphia	Tuscarawas River Mainstem 05040001010 05040001030	PCBs, hexachloro- benzene	week, month & 2 months ¹
Twin Creek	05080002030 05080002040	PCBs	week ⁶
Walhonding River	Walhonding River Mainstem	PCBs	week & month ¹
Walnut Creek	05060001170 05060001180	PCBs	month
<i>2004 Ohio Sport Fish Consumption Advisory (Ohio EPA 2004)</i>			
Cross Creek	05030101340	PCBs	month
Big Darby	05060001190 05060001200 05060001220	PCBs	month
Middle Fk. Little Beaver Creek SR 14 at Allen Rd to Little Beaver Creek	05030101070	PCBs	month
Paint Creek (lower 5 miles)	Paint Creek mainstem	PCBs	month
Whitewater River (lower 8 miles)	mainstem	PCBs	month
Wolf Creek (lower 3 miles)	05080002010	PCBs	month

^a Water bodies listed in bold were subject to a disapproval action by U.S. EPA because they did not appear on Ohio's 2002 Section 303(d) list.

¹ Varies by species.

² Average species composite mercury concentration exceeded 350 ug/kg.

³ Varies by size of fish.

⁴ Varies by species and segment.

⁵ Varies by species and size of fish.

⁶ Raw data indicate PCBs present at the one meal per month concentration.

7.3.1.2 Other Parameters

The 2003 *Ohio Sport Fish Consumption Advisory* (Ohio EPA 2003) contains a few water body specific advisories that were based upon risks posed from contaminants other than PCBs or mercury. These waters are listed below along with an explanation of how they are included in the 2004 IR.

Water Body	Pollutant	one meal per:	Section 303(d) listing decision relative to FCA for pollutant listed:
Middle Fk. Little Beaver Creek SR 14 at Allen Rd to Little Beaver Creek	mirex	do not eat	Not listed as impaired because there is no Ohio WQS criterion; a major source of the contamination has been identified and remediation is ongoing.
Little Scioto River SR 739 to Holland Rd	PAHs	do not eat	Threatened by presence of PAHs in sediments. Not listed as impaired because the source of the contamination has been identified and removal of in-place sediments is underway.
Tuscarawas River Barberton to New Philadelphia	Hexachlorobenzene	2 months	Listed as impaired due to FCA for hexachlorobenzene (see Table 7-2)
Chagrin River (Lake Erie basin)	Lead	month	Not listed as impaired due to FCA because the "once per month" advisory for lead is more protective than WQS criterion.
Great Miami River (Ohio River basin)	Lead	month	Not listed as impaired because there is no Ohio WQS criterion.
Little Miami River (Ohio River basin)	Lead	week	Not listed as impaired because there is no Ohio WQS criterion.
Portage River (Lake Erie basin)	Lead	week	Not listed as impaired due to FCA because the "once per week" advisory for lead is more protective than WQS criterion.

7.3.1.3 Waters Listed By U.S. EPA

Finally, in 2003, U.S. EPA disapproved portions of Ohio's 2002 Section 303(d) list because 17 assessment units that have fish consumption advisories were not included. U.S. EPA then listed these 17 waters (Federal Register, August 25, 2003). Ohio EPA has since developed a methodology that links the advisory to Ohio's WQS, as described in Section 6.3. Using the new methodology, eleven of the 17 U.S. EPA listed assessment units do not have impairment relative to the FCAs. Table 7-3 summarizes the rationale for each of the 11 assessment units and their status in the Ohio 2004 IR. Appendix A.3 presents the original information on the 17 assessment units listed by U.S. EPA and adds notations for a couple of errors made in that document.

Table 7-3. Waters preliminarily listed in category 5 by U.S. EPA in 2003 due to fish consumption advisory (FCA) that are not impaired using 2004 methodology				
Assessment Unit	Pollutant	Advisory Level(s): one meal per	Reasons for non impairment decision relative to FCA for pollutant listed:	2004 Category
Waters remaining on list for reasons other than FCA				
E. Br. Black River 04110001-030	mercury	month	For mercury in the Lake Erie basin the "once per month" advisory level could be more protective, or less protective, than the WQS. In this situation, the highest species average mercury value was 355 ug/kg, more protective than the concentration on which the WQS is based, 350 ug/kg.	5
Little Miami River 05090202-020	mercury lead	month week	The "once per month" level for mercury in the Ohio River basin is more protective than the WQS. For lead, there is no WQS criterion.	5
Little Scioto River 05090103-040	mercury	month	The "once per month" level for mercury in the Ohio River basin is more protective than the WQS.	5
Vermillion River 04100012-050 04100012-060	mercury	month	For mercury in the Lake Erie basin the "once per month" advisory level could be more protective, or less protective, than the WQS. In this situation, the highest species average mercury value was 285 ug/kg, more protective than the concentration on which the WQS is based, 350 ug/kg.	5
Waters being delisted; see Section 8.3.1				

Assessment Unit	Pollutant	Advisory Level(s): one meal per	Reasons for non impairment decision relative to FCA for pollutant listed:	2004 Category
Little Miami River 05090202-010 05090202-030	mercury lead	month week	The "once per month" level for mercury in the Ohio River basin is more protective than the WQS. For lead, there is no WQS criterion.	4A
Paint Creek 05060003 LR	mercury	month	The "once per month" level for mercury in the Ohio River basin is more protective than the WQS.	2
Stillwater River 05080001 LR	mercury	month	The "once per month" level for mercury in the Ohio River basin is more protective than the WQS.	4c
St. Mary's River 04100004-030	mercury	month	For mercury in the Lake Erie basin the "once per month" advisory level could be more protective, or less protective, than the WQS. In this situation, the highest species average mercury value was 254 ug/kg, more protective than the concentration on which the WQS is based, 350 ug/kg.	3
Symmes Creek 05090101-100	mercury	month	The "once per month" level for mercury in the Ohio River basin is more protective than the WQS.	3

7.3.2 Bacteria Counts and Recreation Use Impairment

7.3.2.1 Lake Erie Beaches

Information about water quality conditions at Lake Erie bathing beaches is summarized in Table 7-4. The locations of these beaches is shown in Figure 6-3. Data for the past five recreation seasons was examined to track the number of days over the sampling period when the geometric mean of 5 consecutive samples within a 30 day period exceeded the bathing water *E. coli* criterion of 126. For the full 5 year period the percent of days with criteria exceedences ranged from 0% to a high of 60%. These extremes coincided with a remoteness from pollution sources along the Lake Erie Island beaches compared to the close proximity of urban areas in Lorain and Cuyahoga counties where inputs of storm water runoff and combined sewer overflows are know sources of bacteria.

Table 7-4 . The number of days (and the percentage for all years) when Lake Erie beaches exceeded Ohio's bathing water geometric mean <i>E. coli</i> criteria compared to the total number of days in the sampling period, 1999 - 2003.						
Beach	1999	2000	2001	2002	2003	all years (%)
Western Basin Assessment Unit						
Camp Perry	36/97	9/105	45/97	7/85	16/106	113/490 (23 %)
Catawba Island State Park	0/97	0/105	5/97	0/85	13/106	18/490 (3.7%)
Crane Creek State Park	0/97	7/105	0/97	1/104	2/106	10/509 (2.0%)
East Harbor State Park	0/97	0/105	0/97	0/85	11/106	11/490 (2.2%)
Lakeside	0/97	0/105	0/97	0/85	26/106	26/490 (5.3%)
Maumee Bay State Park (inland)	0/97	0/105	0/105	0/104	15/106	15/517 (2.9%)
Maumee Bay State Park (Erie)	0/97	41/105	34/105	8/104	44/106	127/517 (25%)
Port Clinton	no data	48/105	42/109	0/91	27/106	117/411 (28%)
Central Basin Assessment Unit						
Century Beach	no data	no data	4/98	2/85	0/98	6/281 (2.1%)
Conneaut Park	0/97	0/104	0/98	0/85	8/98	8/482 (1.7%)
Edgewater State Park	41/127	63/105	36/105	38/106	91/106	269/549 (50%)
Euclid State Park	65/127	30/104	36/98	34/85	31/98	196/512 (38%)
Fairport Harbor	0/106	0/104	0/105	0/106	23/111	23/532 (4.3%)

Beach	1999	2000	2001	2002	2003	all years (%)
Geneva State Park	0/98	0/104	0/98	0/85	1/98	1/483 (<0.1%)
Headlands State Park (East Beach)	1/106	3/104	0/105	0/106	0/111	4/532 (<0.1%)
Headlands State Park (West Beach)	1/106	2/104	11/105	0/106	0/111	14/532 (2.6%)
Lakeshore Park	40/98	21/104	43/98	39/85	31/98	174/483 (36%)
Lakeview	20/97	no data	38/98	57/85	11/98	126/378 (33%)
Villa Angela State Park	35/98	69/105	55/105	73/106	78/106	310/520 (60%)
Walnut Beach	0/98	0/104	0/98	2/85	0/98	2/483 (<0.1%)
Lake Erie Island Assessment Unit						
South Bass Island State Park	0/97	0/103	0/97	0/83	0/78	0/458 (0%)
Kelly's Island State Park	0/93	0/103	0/83	0/82	0/92	0/453 (0%)

Impairment of the bathing water recreational use was determined by pooling data from beaches in each of the 3 Lake Erie assessment units and calculating the percentage of days in the recreational season when the *E. coli* criterion was exceeded. A threshold of impairment was set at 10 days per season based upon the Ohio Lake Erie Commission's evaluation system (Ohio LEC 1998). Results are shown in Table 7-5.

Table 7-5. Bathing water geometric mean *E. coli* exceedence frequency at 22 Lake Erie beaches from 1999-2003 pooled by Lake Erie assessment unit to report attainment status.

	Western Basin	Central Basin	Lake Erie Islands
Number of beaches	8	12	2
Total recreation days	3,914	5,767	911
Total days in exceedence	437	1,133	0
Exceedence percentage	11.2%	19.6%	0%
Average # of days <i>E. coli</i> criteria exceeded per beach per season ¹	11	19	0
Attainment status	Non attainment	Non attainment	Full attainment

¹ Divide the total days in exceedence in a basin by the number of beaches in the basin, and then divide that result by the number of seasons (5) from which the exceedence data were accumulated.

7.3.2.2 Rivers and Streams

A great many more bacteria results were examined in 2004 and the result was a large increase in the number of waters assessed. Using the methodology described in Section 6.4.3 it was possible to determine the status of recreational use attainment in 47% of the WAUs and LRAUs. This represents an approximate three-fold increase compared to the 2002 IR (see Table 7-5). In 2002, 18% of the assessed watersheds were in attainment. By contrast, 33% of the watersheds for which sufficient data were available attained the primary contact recreation use designation in 2004. These differences reflect the change in methodology used to determine attainment status, a change in the period of record used to determine attainment status (though this would not lead to the delisting of an impaired watershed), and more data available with the inclusion of discharger monitoring data and increased sampling effort by Ohio EPA. The changes between reporting years are summarized in Table 7-6.

Table 7-6. Overall differences in the assessment of recreation use attainment, 2002 to 2004.				
	2002 Report		2004 Report	
	number	percentage	number	percentage
Total AUs	354	100	354	100
Assessed	56	16	166	47
Attaining Recreation Use	10	3 (18)	56	15 (33)
Impaired Recreation Use	46	13 (82)	110	31 (67)
Not Assessed	298	84	188	53

Four AUs identified as impaired in the 2002 IR are now identified as attaining the recreational use designation. In the 2002 report, an AU was identified as not attaining the recreation use if five or more bacteria samples exceeded the secondary contact recreation criteria. The methodology used to assess recreational use attainment status in 2004 is based upon a comparison of the 75th and 90th percentile fecal coliform data in a WAU to the primary contact recreation criteria of 1,000 and 2,000, respectively. WAUs in which neither percentile exceeds the criteria are defined as attaining the recreation use. Table 7-7 compares the results of the analysis used in the 2002 methodology

with the results of the 2004 methodology for the 4 AUs. All of the AUs remain listed due to aquatic life use impairments.

Table 7-7. Assessment units listed as impaired for recreation use in 2002 and found to be in attainment in the 2004 report.

Assessment Unit	Location Description	2002 # Samples FC > 5,000	2004 Results		
			# site/ # samples	Percentile values	
				75 th	90 th
04110002 010	Cuyahoga River (headwaters to downstream Black Brook)	13	19 / 168	580	1100
04110002 030	Cuyahoga River (downstream Breakneck Creek to downstream Little Cuyahoga River)	35	11 / 345	360	1687
05060001 120	Olentangy River (downstream Delaware Run to the mouth)	7	42 / 392	626	1692
05060001 180	Walnut Creek (downstream Sycamore Creek to the mouth)	9	6 / 96	565	1600

Nine WAUs identified as impaired in the 2002 IR are now identified as having an unknown recreational use attainment status in the 2004 IR. In the 2002 report, a WAU was identified as not attaining the recreation use if five or more bacteria samples were above the secondary contact recreation criteria. All 9 of these WAUs met this threshold with the exception of assessment units 05080002050 and 04100001020 which were listed due to the presence of a dermal contact advisory on a water body within assessment unit (Table 7-8).

The methodology used to assess recreational use attainment status in 2004 was based upon a comparison of the 75th and 90th percentile fecal coliform data in a WAU to the primary contact recreation fecal coliform criteria of 1,000 and 2,000, respectively. In addition, minimum data requirements were set such that for attainment status of a WAU to be determined, a minimum of fifteen sample results from at least three sites within the WAU are required. None of the 9 WAUs met the minimum data requirements necessary in order to determine the present recreational use attainment status (Table 7-8).

Table 7-8. Assessment units for which recreational use impairment status changed from impaired in 2002 to unknown in 2004.

Assessment Unit	Location Description (d/s downstream u/s upstream)	2002 # Samples FC > 5,000 or E. coli > 576	2004 Results			
			# Sample Sites	# Data Points	75 th Percentile	90 th Percentile
04100001020	Ottawa River - I 475 N of Wildwood to Maumee Bay	0 ¹	1	16	655	845
04100005020	Maumee River - d/s Hamm Ditch to u/s Tiffin River	7	2	55	2200	30000
04100006050	Lick Creek	11	2	69	2000	8720
04100009020	South Turkeyfoot Cr.	8	1	12	369	434
04100009030	Maumee River - d/s S Turkeyfoot Cr to u/s Bad Cr	6	2	185	2400	6780
04100011100	Wolf Creek ²	7	0	0	n/a	n/a
04110003050	Ashtabula River	5	2	8	1098	1840
05030204010	Hocking R - headwaters to Enterprise (w/o Rush and Clear creeks)	11	2	113	3700	16800
05080002050	Great Miami R - d/s Twin Cr to u/s Fourmile Cr	0 ¹	0	0	n/a	n/a

¹ Assessment unit listed as impaired in 2002 because of dermal contact advisory.² WAU subject to delisting, see Section 8.2.2.

For reasons explained in Section 6.4.1 the 2004 methodology for recreation use assessment did not include dermal contact advisories issued by State or local health Departments. There were no situations of delisting a water from category 5 waters because of dropping the association of dermal contact advisories with recreation use impairment. Table 7-9 presents pertinent information regarding the 6 waters that have dermal contact advisories.

Table 7-9. Assessment units where dermal advisories resulted in a category 5 listing in 2002 with an explanation of status in the 2004 listing.		
AU Number	AU Name	Comments
05030101070	Middle Fk. Little Beaver Creek - SR 14 at Allen Rd to SR 11 near Lisbon	Localized problem not representative of condition of AU; a major source of mirex contamination has been identified and remediation is ongoing; Primary Contact Recreation use is impaired based upon recent bacteria data and evaluation method ¹
04100001020	Ottawa River - I 475 N of Wildwood to Maumee Bay	Insufficient data to evaluate bacteria levels and recreation use
05030103001	Mahoning River - Warren to PA state line	Primary Contact Recreation use is impaired based upon recent bacteria data and evaluation method
04110001050	Black River - 31 st in Lorain to Lake Erie	Contaminated sediment has been removed from portion of segment; Primary Contact Recreation use is impaired based upon recent bacteria data and evaluation method
05060001040	Little Scioto River - SR 739 to Holland Rd	Stream re-location project underway to address contaminated sediment problems; Primary Contact Recreation use is impaired based upon recent bacteria data and evaluation method
05080002050	Great Miami R - d/s Twin Cr to u/s Fourmile Cr (Dicks Creek in Middletown)	Insufficient data to evaluate bacteria levels and recreation use

¹ The 90th percentile fecal coliform result was 2000 (the cut off value for attainment vs. non-attainment). Ohio EPA District staff familiar with conditions in the watershed were consulted to arrive at the decision to call the assessment unit impaired for recreation use.

7.3.3 Aquatic Life Use Impairment

For the 2004 Integrated Report, new aquatic life data collected in 2001 and 2002 were incorporated into the assessment database. During the two-year period, biosurvey data from approximately 1000 sampling sites located in 70 WAUs, 40 sampling sites located in LRAUs, and 19 sampling sites located in the three Lake Erie AUs were available from all credible sources to update previously assessed AUs or provide new assessments for AUs with unknown aquatic life status. A further examination of individual assessment units was then made to determine status changes due to site data collected during 1991 and 1992 which now exceeds the 10-year data threshold and has become “historical”. From this examination, it was determined that data from 14 Watershed and 1 Large River AUs were now insufficient to provide adequate spatial coverage either due to all data being age restricted or enough that number of sites fell below the minimum needed to assess. These AUs are not being de-listed. Summarized 2004 Integrated Report statistics for aquatic life assessments for Watershed, Large River, and Lake Erie AUs as well as the comparable statistics from the 2002 Integrated Report are tabulated in Table 7-10. Detailed aquatic life statistics for all AUs are provided in Appendices D.2 - D.4.

Table 7-10. Summary of aquatic life use assessment for Ohio's watershed, large river, and Lake Erie Assessment Units (AUs), 2004 and 2002.		
	2004 (1993-2002)	2002 (1991-2000)
Watershed AUs (331)		
No. AUs Assessed (percent of total)	225 (68.0%)	224 (67.7%)
No. Sites Assessed	3623	3273
Average AU Scores		
Full Attainment	48.1	46.6
Partial Attainment	23.8	25.2
Non-Attainment	28.1	28.2
Large River AUs (23 rivers totaling 1285 Miles)		
No. AUs Assessed	21	22
No. Miles Assessed (percent of miles)	927 (72.1%)	904 (71.0 %)
% Miles Full Attainment	64.0	62.5
% Miles Partial Attainment	21.4	23.0
% Miles Non-Attainment	14.6	14.5
Lake Erie AUs (3)		
No. AUs Assessed	3	3
No. Sites Assessed	111	92

	2004 (1993-2002)	2002 (1991-2000)
% Sites Full Attainment	18.0	12.0
% Sites Partial Attainment	14.4	13.0
% Sites Non-Attainment	67.6	75.0

While causes and sources of aquatic life use impairment in Ohio's Watershed, Large River, and Lake Erie AUs have not been fully developed for the new 2001 and 2002 data, it is not suspected that they will be substantially different than those determined in previous assessment cycles. For the time period 1991-2000, principal causes for Watershed and Large River AU impairments were those primarily related to landscape modification issues involving agricultural land use and urban development. An assessment of these traditional non-point source causes for the period 1991-2000 is provided in Table 7-11.

Table 7-11. Assessment of non-point source (NPS) related causes of impairment in Ohio's Watershed and Large River Assessment Units (AUs) based on biological and water quality survey data collected from 1991-2000.

Assessment Unit (AU)	No.	Number & Percentage of Monitored AUs Having Non-point Source Related Causes of Impairment ¹			
		Siltation / Sediment	Nutrients	Habitat Modification	Hydro-Modification
Watershed		110 - 49%	85 - 38%	133 - 59%	94 - 42%
total	331				
monitored 1991 to 2000	224				
impaired aquatic life use	214				
1 or more NPS causes	190				
un-assessed	107				
Large River		6 - 27%	5 - 23%	10 - 45%	7 - 32%
total	23				
monitored 1991 to 2000	22				
impaired aquatic life use	17				
1 or more NPS causes	14				
un-assessed	1				

¹ Listed as high magnitude for one stream within watershed or one reach within large river.

7.4 Overall Results

Comparing results of the 2002 IR with the results of this reporting cycle reveals a higher number of WAUs and LRAU in category 5, impaired waters needing a TMDL. There are fewer assessment units with insufficient data, and fewer attaining some of the applicable water quality standards. Table 7-12 provides the comparison for all Section 303(d) list categories. These situations can be attributed primarily to the evaluation of fish consumption advisory information relative to Ohio's WQS, and a greatly expanded data base of bacteria data upon which recreation use attainment was evaluated. There was very little change in results for the aquatic life use. Overall, the 2004 report includes assessment results on more waters, but does not indicate any substantial decline or improvement in Ohio's waters over the past 2 years.

Table 7-12. Comparison of 303(d) listing results for Ohio's inland waters, 2002 vs. 2004 Integrated Report.

Category	Watershed		Large River	
	2002	2004	2002	2004
1 Attaining all WQS	1	1	0	1
2 Attaining some WQS	11	7	5	1
3 Insufficient data	105	75	1	0
4 Impaired, no TMDL	9	6	2	0
5 Impaired, TMDL	205	242	15	21

Section 8

8 Removing Waters From the 303(d) List

Federal regulations require a demonstration of good cause for not including waterbodies on the 303(d) list that were included on previous 303(d) lists (40 CFR 130.7(b)(6)(iv)). In its guidance for preparation of this report, U.S. EPA outlined a number of causes for delisting (pages 9-10 of 7/21/2003 Guidance for 2004 Assessment, Listing, and Reporting Requirements, U.S. EPA 2003). Ohio is delisting ten assessment units based on three of these causes:

- ✓ errors in the original analysis of data led to an incorrect listing (2 Assessment Units)
- ✓ development of new listing methodology and reassessment of the data that led to the prior listing (6 Assessment Units)
- ✓ approval by U.S. EPA of a TMDL (2 Assessment Units).

Details for each delisting are summarized in the following text and tables.

8.1 Flaws in the Original Data Analysis

Two watershed assessment units were incorrectly assigned to Category 5 in the 2002 IR. Table 8-1 identifies the watersheds, explains the errors, and the 2004 category.

Table 8-1. Assessment units removed from category 5 because of errors in the prior analysis.			
AU Number	AU Name	Explanation	2004 Category
05040003 010	Kokosing River (headwaters to upstream North Branch)	Corrections during data evaluation not carried forward to database; available data shows no impairment at any site	2
05090201 060	Ohio River tributaries (downstream Ohio Brush Creek to upstream Eagle Creek)	Data mis-assigned to AU in 2002. Data available at only 3 sites in AU, so data insufficient to make a determination	3

8.2 Development of New Listing Methodology

More refined methodologies in two areas are resulting in delistings: the fish consumption advisory and recreation use.

8.2.1 Fish Consumption Advisory

Five waters preliminarily listed by U.S. EPA in 2003 for Ohio would be delisted using the methodology developed for this report (see Table 8-2). Using the new Ohio EPA methodology, eleven of the 17 U.S. EPA preliminarily listed assessment units do not have impairment relative to the FCAs, and six of those have no other impairments identified. Table 7-3 Includes the specific rationale for each of the delisted assessment units. Appendix A.3 presents the original information on the 17 assessment units preliminarily listed by U.S. EPA and adds notations for errors made in that document. Whether or not these are actually delistings depends on the disposition of the proposed federal action.

Table 8-2. Assessment units removed from category 5 because of new methodology for FCA impairment.

AU Number	AU Name	Pollutant	2004 Category
05090202 010	Little Miami River (headwaters to upstream Massies Creek)	mercury, lead	4A
05090202 030	Little Miami River (downstream Beaver Creek to upstream Caesar Creek)	mercury, lead	4A
05060003 LR	Paint Creek Mainstem (downstream Rocky Fork to mouth)	mercury	2
05080001 LR	Stillwater River	mercury	4C
04100004 030	St. Mary's River (downstream Twelvemile Creek to upstream Twentyseven Mile Creek [IN])	mercury	3
05090101 100	Symmes Creek (downstream Buffalo Creek to mouth); Ohio River tributaries (Symmes Cr. to Big Sandy R)	mercury	3

8.2.2 Recreation Use

One assessment unit is being delisted based on changes in the methodology for determining impairment of the Recreation Use. In the 2002 report, an AU had sufficient data for determination of impairment status if 5 data points were available anywhere in the unit. In 2004's more sophisticated methodology, at least 15 data points from at least 3 different sites were required. Table 8-3 indicates the data available for the assessment unit and the 303(d) category assigned in the 2004 IR.

Table 8-3. Assessment unit removed from category 5 based on change in recreation use methodology.

AU Number	AU Name	Explanation	2004 Category
04100011 100	Wolf Creek	11 data points from 3 sites is not sufficient data set for application of 2004 methodology. At 157 square miles, this AU is larger than average size, so no special consideration is warranted.	3

8.3 Approval of TMDL

Two assessment units are being delisted because TMDLs that address all identified impairments have been approved by U.S. EPA (see Table 8-4).

Table 8-4. Assessment unit removed from category 5 based on TMDL approval.			
AU Number	AU Name	Date Approved	Pollutants Allocated, per U.S. EPA ¹
04110002 060	Cuyahoga River (below Tinkers Creek to Lake Erie)	9/26/2003	fecal coliform, phosphorus
05030201 110	East Fork Duck Creek	9/23/2003	siltation, metals, nutrients, organic enrichment / dissolved oxygen, habitat

¹ The TMDL goal is attainment of biological criteria; pollutants listed here were specifically recognized in U.S. EPA decision documents.

Section 9

9 Prioritize Future TMDL Work

After waters are identified as impaired and requiring a TMDL, the category 5 waters are prioritized.

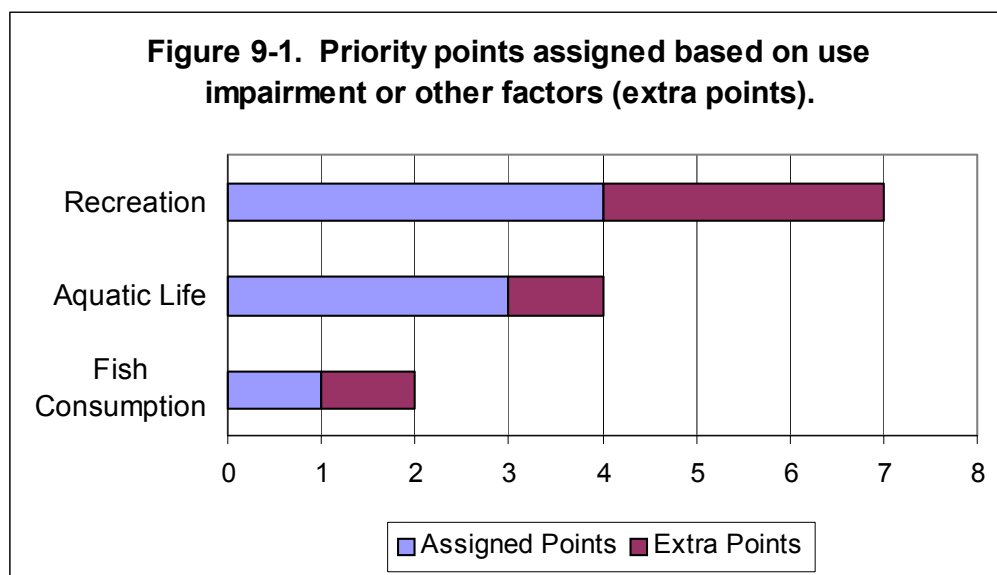
9.1 Ohio River and Lake Erie

Other organizations have accepted lead responsibility for TMDLs in two special waters affected by multiple jurisdictions: U.S. EPA for the open waters of Lake Erie, ORSANCO for the mainstem of the Ohio River. Ohio EPA automatically assigns these waters a low priority *for Ohio EPA-initiated action*. Ohio EPA will participate in TMDL actions conducted by the lead organizations.

Lake Erie nearshore areas are assigned the priority of their contiguous Water Assessment Units.

9.2 Inland Waters

A point system similar to that used in the 2002 Integrated Report was used to assign priority. Impairment of the Recreation Use continues to be more heavily weighted compared to the Aquatic Life Use and Fish Consumption Advisory. A total of 13 points could be assigned to an assessment unit, distributed as shown in Figure 9-1.



The priority results for specific Assessment Units are reported in Appendices B.1, B.2 and D.

As a practical matter, only the 331 watershed and 23 large-river assessment units are included in the priority-setting exercise. Recognizing the functionality and importance of watersheds, areas and assessment units identified in other ways (inland lakes, Lake Erie nearshore areas) were assigned the priority of the appropriate surrounding or contiguous watershed assessment unit. The assessment units were assigned priority points using the following protocol.

9.2.1 Status of the Recreation Use (maximum of 7 points)

Each AU was assigned points using these guidelines.

Points	Condition	# Assessment Units
4	listed as impaired for recreation use	111
1	geometric mean of available fecal coliform data was greater than 1000	35
1	75 th percentile of available fecal coliform data greater than 3000	15
1	total number of sites was greater than 15 and the geometric mean of available fecal coliform data was greater than 1000 or impairment is to bathing water recreation use (Lake Erie)	7 2

9.2.2 Status of the Aquatic Life Use (maximum of 4 points)

Each AU was assigned points using these guidelines.

Priority Points	AU Scores	Explanation
1	0 - 39	Scores in this range generally indicate severe basin-wide problems, comprehensive degradation that may require significant time and resources and broad-scale fixes, including, possibly, fundamental changes in land use practices. Educating about how water quality is affected by various practices and encouraging stewardship may be more effective in these areas than a traditional TMDL approach. For example, a program by Ohio EPA and the Ohio Department of Natural Resources that funds local watershed coordinators to develop a comprehensive, implementable, community-driven watershed plan may be appropriate in these areas.
2	80 - 99	Scores in this range generally indicate a localized water quality issue. Addressing the impairment may not require a complete watershed effort; rather, a targeted fix for a particular problem may be most effective.
3	40 - 79	Scores in this range indicate a problem of such scale that purposeful action should produce a measurable response within a 10-year period. These waters are the best candidates for a traditional TMDL. The watershed coordinator idea mentioned above can also work effectively in these areas in concert with a TMDL effort.
1	n/a	Where over half of the Aquatic Life Use "non-attainment" is "partial," the chances for recovery are better. Additional priority is given to assessment units with this characteristic.

9.2.3 Impairment indicated by Fish Consumption Advisory (maximum of 2 points)

Applying the methodology in Section 6.3, impairment attributed to the existence of a FCA resulted in one point. A second priority point was added to the score in assessment units that have the most severe levels of advisories (do not eat or 1 meal per 2 months).

Section 10

10 Schedule for TMDL Work

Once waters are assessed and the impaired waters prioritized, the next step is to determine a schedule to address the monitoring needs of all waters and restoration needs (including TMDLs) of the impaired ones. Various factors must be considered, including Ohio's ongoing TMDL work, the process identified to do TMDLs, the monitoring strategy, and the resources available for the work.

10.1 Ohio TMDL Status

Ohio EPA is currently working on TMDLs in more than 30 project areas, encompassing approximately 80 assessment units, as illustrated in the "TMDLs In Progress" map. Most of these TMDLs address Aquatic Life Use impairments, and some also addresses a Recreation Use impairment. TMDLs in nine of the areas are approved, and implementation is proceeding.

Table 10-1 summarizes Ohio TMDLs approved by U.S. EPA.

Table 10-1. Ohio TMDLs approved by U.S. EPA as of December 2003.			
Basin Code	Basin Name	Date Approved	Pollutants Allocated, per U.S. EPA ¹
04110002 020	Cuyahoga River (below Black Brook to below Breakneck Creek)	10/11/2000	dissolved oxygen
04110002 030	Cuyahoga River (below Breakneck Creek to below Little Cuyahoga River)		
04110001 070	Rocky River (below West Br. to Lake Erie [including East Br.] and Lake Erie tribs [above Porter Cr to above Cuyahoga R]): Plum Creek	12/04/2001	phosphorus, nitrate-nitrite
05090202 010	Little Miami River (headwaters to above Massies Creek)	7/02/2002	phosphorus, sediment
05090202 020	Little Miami River (above Massies Creek to below Beaver Creek)		
05090202 030	Little Miami River (below Beaver Creek of above Caesar Creek)		
05090202 040	Anderson Fork Caesar Creek		
05090202 050	Caesar Creek (except Anderson Fork)		
05060001 060	Scioto River (above Bokes Creek to above Mill Creek)	9/27/2002	phosphorus, sediment
04110002 040	Cuyahoga River (below Little Cuyahoga River to below Brandywine Creek)	9/26/2003	fecal coliform, phosphorus
04110002 050	Cuyahoga River (below Brandywine Creek to below Tinkers Creek)		

Basin Code	Basin Name	Date Approved	Pollutants Allocated, per U.S. EPA ¹
04110002 060	Cuyahoga River (below Tinkers Creek to Lake Erie)		
05030201 110	East Fork Duck Creek	9/23/2003	siltation, metals, nutrients, organic enrichment / dissolved oxygen, habitat
05030201 120	Duck Creek (except East Fork)		
05040001 100	Sugar Creek (headwaters to above Middle Fork Sugar Creek)	11/20/2002	phosphorus, nitrogen, sediments
05040001 110	South Fork Sugar Creek		
05040001 120	Sugar Creek (upstream Middle Fork to mouth)		
05090101 020	Raccoon Creek (headwaters to above Hewett Fork)	3/20/2003	pH (acid), metals
05090101 030	Raccoon Creek (above Hewett Fork to below Elk Fork)		
05060001 070	Mill Creek (Scioto River basin)	9/02/2003	CBOD, ammonia-N, phosphorus, pesticides, sediment

¹ The TMDL goal is attainment of biological criteria; pollutants listed here were specifically recognized in U.S. EPA decision documents. TMDL reports typically include such parameters for targeting, pollutant load characterization, and measuring interim progress, and may explore other indicators of watershed condition.

10.2 Long-Term Schedules for Monitoring and TMDLs

Ohio's five-year basin approach provides a foundation for scheduling monitoring and TMDL projects. The assessment methodology allows that, generally, aquatic life use monitoring data up to ten years old are valid for judging assessment units, so it follows that each assessment unit must be monitored at least once every ten years to maintain coverage. Thus, each assessment unit is assigned to one of the next two monitoring cycles using the following factors:

- ✓ Ohio EPA's five-year basin monitoring strategy;
- ✓ time since most recent assessment;
- ✓ distribution of work effort among Ohio EPA district offices; and,
- ✓ TMDL schedule.

Our experience in doing TMDLs indicates that local involvement is a key to success. Although one indicator of local involvement is included among the scheduling criteria, it is difficult to gauge the level of local interest sufficient to sustain a TMDL effort. Thus, the schedule is flexible and can be influenced by expressions of local interest to undertake a TMDL (e.g., significant interest from local citizens and decision-makers, especially combined with letters of resolution from local

governments).

The long-term TMDL schedule was generated based on the following criteria:

- ✓ existing commitments;
- ✓ priority ranking;
- ✓ presence of a funded watershed coordinator who can assist with TMDL activities; and,
- ✓ distribution of work effort among Ohio EPA districts.

In an effort to maintain the monitoring and TMDL schedule, Ohio EPA is committed to researching and pursuing additional resources, both in terms of funding and partnering opportunities.

The scheduling and TMDL information is reported on the detailed information sheets for each assessment unit (see Appendix D). Appendix B.3 presents the scheduling information by monitoring year. Both the long-term monitoring and TMDL schedules are illustrated on maps included in the report.

10.3 Short-Term Schedule for TMDL Development

Ohio EPA has scheduled several TMDL projects during the next two years, as indicated in Table 10-2. Because Ohio's TMDL process begins with a watershed assessment, all TMDLs to be completed in the next 2 years are already in progress.

The TMDL goal is attainment of biological criteria. Pollutants to be targeted for pollutant load characterization and as measures of interim progress will be determined as part of the TMDL process described in Section 4.2.2.

In addition, U.S. EPA Region 5 is also doing TMDLs in two areas: nutrients in the Wabash River watershed (05120101 101 and 040) and bacteria in the Mahoning River watershed (05030103 050 and 080). Ohio EPA is providing available data and technical assistance.

Table 10-2. Short-Term Schedule for TMDL Development	
TMDLs to be submitted to U.S. EPA in 2004	
04110002 010	Cuyahoga River (headwaters to below Black Brook)
05080001 090	Stillwater River (headwaters to above Swamp Creek)
05080001 100	Stillwater River (above Swamp Creek to above Greenville Creek)
05080001 110	Greenville Creek (headwaters to below West Branch)
05080001 120	Greenville Creek (below West Branch to Stillwater River)
05080001 130	Stillwater River (below Greenville Creek to above Ludlow Creek)
05080001 140	Stillwater River (above Ludlow Creek to Great Miami River)
05090101 040	Raccoon Creek (below Elk Fork to above Little Raccoon Creek)

05090203 010	Mill Creek
04100007 010	Auglaize River (headwaters to below Pusheta Creek)
04100007 020	Auglaize River (below Pusheta Creek to above Jennings Creek)
04100007 060	Auglaize River (above Jennings Creek to above Little Auglaize River)
04100011 020	Sandusky River (headwaters to above Broken Sword Creek)
04100011 030	Broken Sword Creek
04100011 040	Sandusky River (below Broken Sword Creek to above Tymochtee Creek)
04100011 050	Tymochtee Creek (headwaters to below Warpole Creek)
04100011 060	Tymochtee Creek (downstream Warpole Creek to Sandusky River)
04100011 070	Sandusky River (below Tymochtee Creek to above Honey Creek)
04100011 080	Honey Creek
05030204 060	Monday Creek
05030204 070	Sunday Creek
05060001 130	Big Walnut Creek (headwaters to Hoover Dam)
05060001 140	Big Walnut Creek (below Hoover Dam to above Alum Creek)
05060001 150	Alum Creek (headwaters to Alum Creek Dam)
05060001 160	Big Walnut Creek (above Alum Creek [except above Alum Creek Dam] to Scioto River)
05060001 190	Big Darby Creek (headwaters to below Sugar Run)
05060001 200	Big Darby Creek (below Sugar Run to above Little Darby Creek)
05060001 210	Little Darby Creek
05060001 220	Big Darby Creek (below Little Darby Creek to Scioto River)
04100012 010	West Branch Huron River (headwaters to above Slate Run)
04100012 020	West Branch Huron River (above Slate Run to above East Branch Huron River)
04100012 030	Huron River (above East Branch to Lake Erie) and Lake Erie Tributaries (below Sawmill Creek to below Huron River)
04100012 040	Lake Erie Tributaries (below Huron River to above Vermilion River)
04100012 050	Vermilion River (headwaters to above East Branch)
04100012 060	Vermilion River (above East Branch to Lake Erie)
TMDLs to be submitted to U.S. EPA in 2005	
04110001 060	West Branch Rocky River (bacteria)
04110001 070	Rocky River and East Branch Rocky River (bacteria)
05030101 070	Middle Fork Little Beaver Creek

05030101 080	West Fork Little Beaver Creek
05030101 090	Little Beaver Creek (downstream Middle and West Forks to mouth)
04110001 020	West Branch Black River (headwaters to Black River)
04110001 030	East Branch Black River (headwaters to below Coon Creek)
04110001 040	East Branch Black River (below Coon Creek to Black River)
04110001 050	Black River (below East Branch to Lake Erie) and Lake Erie tribs (below Black R. to above Porter Cr)
04100010 020	Toussaint Creek
05040004 020	Wakatomika Creek (headwaters to downstream Brushy Fork)
05040004 030	Wakatomika Creek (downstream Brushy Fork to mouth)
05060001 090	Olentangy River (headwaters to downstream Flat Run)
05060001 100	Whetstone Creek
05060001 110	Olentangy River (downstream Flat Run to downstream Delaware Run); excluding Whetstone Creek
05060001 120	Olentangy River (downstream Delaware Run to mouth)
05080001 150	Mad River (headwaters to downstream Kings Creek)
05080001 160	Mad River (downstream Kings Creek to downstream Chapman Creek)
05080001 170	Buck Creek
05080001 180	Mad River (downstream Chapman Creek to upstream Mud Creek); excluding Buck Creek and Mad R. mainstem
05080001 190	Mad River (upstream Mud Creek to mouth); excluding Mad R. mainstem
TMDLs to be submitted to U.S. EPA in 2006	
05040001 010 ^A	Tuscarawas River (headwaters to downstream Wolf Creek)
05040001 020 ^A	Chippewa Creek
05040001 030 ^A	Tuscarawas River (downstream Wolf Creek to downstream Sippo Creek); excluding Chippewa Creek
05040001 050 ^A	Nimishillen Creek
05040001 090 ^A	Tuscarawas River (downstream Sippo Creek to upstream Sugar Creek); excluding Tuscarawas R. mainstem
05040001 130 ^A	Tuscarawas River (downstream Sugar Cr. to upstream Stillwater Cr.); excluding Tuscarawas R. mainstem
05040001 180 ^A	Tuscarawas River (downstream Stillwater Cr. to upstream Evans Cr.); excluding Tuscarawas R. mainstem
05040001 190 ^A	Tuscarawas River (upstream Evans Creek to mouth); excluding Tuscarawas R. mainstem

04110003 020	Chagrin River (headwaters to downstream Aurora Branch)
04110003 030	Chagrin River (downstream Aurora Branch to mouth)
04110004 050	Mill Creek
04110004 060	Grand River (downstream Mill Creek to mouth); excluding Grand R. mainstem
05030204 010	Hocking River (headwaters to Enterprise); excluding Rush Creek and Clear Creek
05030204 020	Rush Creek (headwaters to upstream Little Rush Creek)
05030204 030	Rush Creek (upstream Little Rush Creek to mouth)
05030204 040	Clear Creek
05030204 050	Hocking River (Enterprise to upstream Monday Creek); excluding Hocking R. mainstem dst. Duck Creek
05030204 080	Hocking River (downstream Monday Creek to Athens/RM 33.1); excluding Hocking R. mainstem
05030204 090	Federal Creek
05030204 100	Hocking River (downstream Athens/RM 33.1 to mouth); excluding Federal Creek and Hocking R. mainstem
05060001 010	Scioto River (headwaters to downstream Taylor Creek)
05060001 020	Rush Creek
05060001 030	Scioto River (downstream Taylor Creek to upstream Little Scioto River); excluding Rush Creek
05080002 030	Twin Creek (headwaters to upstream Bantas Fork)
05080002 040	Twin Creek (upstream Bantas Fork to mouth)
05080002 070	Fourmile Creek (excluding Sevenmile Creek)
05080002 060	Sevenmile Creek

^A The Tuscarawas TMDL was scheduled to be completed in 2005, but record-setting rainfall and the resulting high stream flows during the 2003 sampling season delayed completion of the field assessment; the TMDL will be delayed for a year.

Section 11

11 Public Involvement

Ohio EPA convened an advisory group that included representatives from the regulated community (e.g., industries, municipalities), environmental groups, consultants, citizens, state and federal agencies, farm organizations, and development interests. The group, which included about eighty active participants, met from late 1998 to June 2000. One subgroup addressed listing issues. Their conclusions were as follows:

- ✓ monitoring and data quality are essential;
- ✓ use outside data of highest quality;
- ✓ endorse priorities of 1998 list;
- ✓ increase attention to human health issues;
- ✓ quantify “cost of inaction”;
- ✓ more monitoring is needed;
- ✓ data should be accessible and geographically referenced;
- ✓ increased public involvement is needed; and,
- ✓ current funding and resources are inadequate.

The cost associated with implementing the advisory group’s listing recommendations was \$3.2 million annually; the cost for implementing all advisory group recommendations was \$9.7 million annually. Ohio EPA used these estimates to seek additional state funding but ultimately was unsuccessful in competing with other state funding priorities. We have incorporated the “low cost” recommendations (the first four listed above), and we continue to seek ways to address all of the group’s recommendations.

Much of the data used in this report has been presented to the public in meetings and publications concerning individual watersheds. Data and assessments have also been available in previous 305(b) reports. All of this information can be accessed from the following Internet web site: http://www.epa.state.oh.us/dsw/document_index/psdindx.html.

Preparation of the 2004 IR was prominently featured on the Ohio EPA Division of Surface Water main web page beginning in August 2003. See Appendix C.3 for the specific content. Division staff presented information and updates at meetings of Ohio Water Resource Council in July and September 2003. A mailing to over 500 outside parties was sent in August 2003 to solicit bacteria data (See Section 6.1 and Appendix C.2). Staff from Ohio Department of Health, Ohio Department of Natural Resources and two knowledgeable outside people were contacted and asked to review the initial method write-up concerning how to report impairment due to fish consumption advisories.

An official public comment period was announced in the Ohio EPA Weekly Review and in legal notices published in Ohio’s major daily newspapers (see Appendix C.5). A public information session was held in Columbus on February 3, 2004. The comment period for the draft 2004 Integrated Report ran from January 12 through February 20, 2004. Comments received, and responses to those comments, are summarized in Appendix C.6.

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