

**Ohio EPA 2006 Integrated Report Appendix E.3
Large River Assessment Unit (LRAU) Results**

LRAU Description

Maumee River Mainstem (Indiana border to Lake Erie)

LRAU Size (mi²)

6608.0

Integrated Report Assessment Category: 5

Priority Points: 5

Next Scheduled Monitoring: 2016

Aquatic Life Use (ALU) Assessment

Subcategories of ALU: WWH

Sampling Year(s): 1993, 1996, 1997

Impairment: Yes (5)

LRAU Total Length (miles): 107.87

No. Miles Full Attainment: 44.00

LRAU Monitored Miles: 94.35

No. Miles Partial Attainment: 13.15

No. Sites Sampled: 51

No. Miles Non-Attainment: 37.20

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
46.7	13.9	39.4

High Magnitude Causes

Flow Alteration
Direct Habitat Alterations
Turbidity
Nutrients
Unionized Ammonia
Siltation
Total Toxics

High Magnitude Sources

Nonirrigated Crop Production
Channelization - Agriculture
Combined Sewer Overflow
Major Municipal Point Source

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: No

Geometric Mean: 111

No. of Ambient Sites: 5

No. of Ambient Sampling Records: 45

75th %ile: 350

No. of NPDES MOR Sites: 7

No. of NPDES MOR Records: 523

90th %ile: 897

Other:

Fish Tissue Assessment

Large River Sampled: Yes Impairment: Yes (5)

Miles Monitored: 106.30 Miles Impaired: 106.30

Pollutant(s): PCBs

Comments

The City of Toledo is initiating a major CSO remediation project which will positively benefit the lower mainstem within Lucas County. Future monitoring of the Maumee River mainstem assessment unit will be conducted within the normal rotating basin schedule after the cessation of the project and when sufficient recovery time has elapsed. Besides the historical aquatic life use impairment, the 2004 Integrated Report assessment of fish tissue data documented body burdens of one or more pollutants at levels exceeding the threshold level upon which Ohio Water Quality Standards human health criteria are based which resulted in listing as impaired for fish consumption.

**Ohio EPA 2006 Integrated Report Appendix E.3
Large River Assessment Unit (LRAU) Results**

LRAU Description

Tiffin River Mainstem (downstream Brush Creek to mouth)

LRAU Size (mi²)

777.0

Integrated Report Assessment Category: 5

Priority Points: 3

Next Scheduled Monitoring: 2011

Aquatic Life Use (ALU) Assessment

Subcategories of ALU: WWH

Sampling Year(s): 1992

Impairment: Yes (5-Historical Data)

LRAU Total Length (miles): 19.67

No. Miles Full Attainment: 0.00

LRAU Monitored Miles: 19.67

No. Miles Partial Attainment: 19.67

No. Sites Sampled: 3

No. Miles Non-Attainment: 0.00

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
0.0	100.0	0.0

High Magnitude Causes

Direct Habitat Alterations
Siltation

High Magnitude Sources

Channelization - Agriculture
Highway/Road/Bridge/Sewer Line
Nonirrigated Crop Production

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: Unknown

Geometric Mean:

No. of Ambient Sites:

No. of Ambient Sampling Records:

75th %ile:

No. of NPDES MOR Sites:

No. of NPDES MOR Records:

90th %ile:

Other:

Fish Tissue Assessment

Large River Sampled: Yes Impairment: Yes (5)

Miles Monitored: 19.67 Miles Impaired: 19.67

Pollutant(s): PCBs, Mercury

Comments

The Tiffin River mainstem assessment unit has not been surveyed since 1992. Though this data is now considered historical, the mainstem will remain listed as Category 5 since it had been previously listed in the 2002 Integrated Report for aquatic life impairment. Besides the historical aquatic life use impairment, the 2006 Integrated Report assessment of fish tissue data documented body burdens of one or more pollutants at levels exceeding the threshold level upon which Ohio Water Quality Standards human health criteria are based which resulted in listing as impaired for fish consumption.

**Ohio EPA 2006 Integrated Report Appendix E.3
Large River Assessment Unit (LRAU) Results**

LRAU Description

Auglaize River Mainstem (downstream Ottawa River to mouth)

LRAU Size (mi²)

2435.0

Integrated Report Assessment Category: 5

Priority Points: 1

Next Scheduled Monitoring: 2015

Aquatic Life Use (ALU) Assessment

Subcategories of ALU: WWH

Sampling Year(s): 1996, 2000

Impairment: Yes (4A)

LRAU Total Length (miles): 33.26

No. Miles Full Attainment: 14.26

LRAU Monitored Miles: 23.73

No. Miles Partial Attainment: 4.10

No. Sites Sampled: 5

No. Miles Non-Attainment: 5.37

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
60.1	17.3	22.6

High Magnitude Causes

Flow Alteration

High Magnitude Sources

Flow Reg/Mod - Development
Channelization - Agriculture

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: Unknown

Geometric Mean:

No. of Ambient Sites:

No. of Ambient Sampling Records:

75th %ile:

No. of NPDES MOR Sites:

No. of NPDES MOR Records:

90th %ile:

Other:

Fish Tissue Assessment

Large River Sampled: Yes Impairment: Yes (5)

Miles Monitored: 33.26 Miles Impaired: 33.26

Pollutant(s): Mercury

Comments

A report developing TMDLs for pollutants impairing aquatic life uses in the upper Auglaize River basin, including the Auglaize River mainstem assessment unit between the Ottawa River and the Little Auglaize River (about 2/3 of the designated mainstem reach), was approved by U.S. EPA on September 23, 2004. Monitoring in support of the TMDLs was conducted in 2000. As this assessment unit continues to have a fish consumption impairment, it will remain Category 5 until TMDLs are developed for all pollutants impairing all beneficial uses. The TMDL report is available at <http://www.epa.state.oh.us/dsw/tmdl/index.html>.

**Ohio EPA 2006 Integrated Report Appendix E.3
Large River Assessment Unit (LRAU) Results**

LRAU Description

Blanchard River Mainstem (downstream Dukes Run to mouth)

LRAU Size (mi²)

771.0

Integrated Report Assessment Category: 5

Priority Points: 5

Next Scheduled Monitoring: 2020

Aquatic Life Use (ALU) Assessment

Subcategories of ALU: WWH

Sampling Year(s): 1996

Impairment: Yes (5)

LRAU Total Length (miles): 35.65

No. Miles Full Attainment: 9.65

LRAU Monitored Miles: 14.65

No. Miles Partial Attainment: 5.00

No. Sites Sampled: 3

No. Miles Non-Attainment: 0.00

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
65.9	34.1	0.0

High Magnitude Causes

Flow Alteration
Organic Enrichment/DO

High Magnitude Sources

Channelization - Agriculture

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: No

Geometric Mean: 290

No. of Ambient Sites: 7

No. of Ambient Sampling Records: 56

75th %ile: 408

No. of NPDES MOR Sites: 1

No. of NPDES MOR Records: 52

90th %ile: 992

Other:

Fish Tissue Assessment

Large River Sampled: Yes Impairment: Yes (5)

Miles Monitored: 35.65 Miles Impaired: 35.65

Pollutant(s): PCBs

Comments

Intensive chemical, physical, and biological monitoring was conducted in the Blanchard River basin in 2005. The 1996 sampling in the mainstem was focused primarily in the 30 mile reach upstream and downstream from Findlay. 2005 biological and chemical data for assessment of aquatic life uses were not available for this report but will be the basis for the TMDL and included in the 2008 Integrated Report. Check the TMDL web page at <http://www.epa.state.oh.us/dsw/tmdl/index.html> for updated information. Besides the aquatic life use impairment, the 2006 Integrated Report assessment of fish tissue data documented body burdens of one or more pollutants at levels exceeding the threshold level upon which Ohio Water Quality Standards human health criteria are based which resulted in listing as impaired for fish consumption.

**Ohio EPA 2006 Integrated Report Appendix E.3
Large River Assessment Unit (LRAU) Results**

LRAU Description

Sandusky River Mainstem (downstream Tymochtee Creek to mouth)

LRAU Size (mi²)

1420.0

Integrated Report Assessment Category: 5

Priority Points: 1

Next Scheduled Monitoring: 2009

Aquatic Life Use (ALU) Assessment

Subcategories of ALU: WWH

Sampling Year(s): 1995, 1999, 2001

Impairment: Yes (4C)

LRAU Total Length (miles): 65.73

No. Miles Full Attainment: 41.23

LRAU Monitored Miles: 47.73

No. Miles Partial Attainment: 0.00

No. Sites Sampled: 15

No. Miles Non-Attainment: 6.50

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
86.4	0.0	13.6

High Magnitude Causes

Siltation
Direct Habitat Alterations
Flow Alteration

High Magnitude Sources

Hydromodification-Development
Dam Construction-Development

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: No

Geometric Mean: 112

No. of Ambient Sites: 9

No. of Ambient Sampling Records: 35

75th %ile: 290

No. of NPDES MOR Sites: 2

No. of NPDES MOR Records: 150

90th %ile: 672

Other:

Fish Tissue Assessment

Large River Sampled: Yes Impairment: Yes (5)

Miles Monitored: 65.73 Miles Impaired: 65.73

Pollutant(s): PCBs

Comments

Development of TMDLs for pollutants is underway for the upper Sandusky River watershed (headwaters to north of Tiffin and covering about 1/2 of the designated mainstem reach). Monitoring in support of the TMDL was conducted in 2001. All aquatic life use impairment within the mainstem assessment unit downstream from Tymochtee Creek is restricted to habitat limited dam pools behind two dams (St. John's and Ballville). Removal of the St. John's dam commenced during the summer of 2003. Besides the historical aquatic life use impairment, the 2004 Integrated Report assessment of fish tissue data documented body burdens of one or more pollutants at levels exceeding the threshold level upon which Ohio Water Quality Standards human health criteria are based which resulted in listing as impaired for fish consumption. Additionally, assessment of available bacteria data indicated an impairment of the Primary Contact Recreation beneficial use. A report on the findings of the 2001 biological and water quality survey can be found at (www.epa.state.oh.us/dsw/document_index/psdindx.html).

Ohio EPA 2006 Integrated Report Appendix E.3 Large River Assessment Unit (LRAU) Results

LRAU Description

Cuyahoga River Mainstem (downstream Brandywine Cr. to mouth incl. old channel)

LRAU Size (mi²)

809.0

Integrated Report Assessment Category: 5
Priority Points: 2
Next Scheduled Monitoring: 2020
Aquatic Life Use (ALU) Assessment

Subcategories of ALU: WWH, LRW

Sampling Year(s): 1996, 2000-2002, 2004

Impairment: Yes (4A)

LRAU Total Length (miles): 25.34

No. Miles Full Attainment: 6.98

LRAU Monitored Miles: 25.34

No. Miles Partial Attainment: 11.08

No. Sites Sampled: 30

No. Miles Non-Attainment: 7.28

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
27.6	43.7	28.7

High Magnitude Causes

Organic Enrichment/DO
Unknown Toxicity
Direct Habitat Alterations
Total Toxics
Unionized Ammonia

High Magnitude Sources

Combined Sewer Overflow
Major Municipal Point Source
Contaminated Sediments
Dredging/Development
Marinas
Spills
Urban Runoff/Storm Sewers (NPS)
Streambank Modification/Destabilization

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment:

Geometric Mean: 477

No. of Ambient Sites: 0

No. of Ambient Sampling Records: 0

 75th %ile: 935

No. of NPDES MOR Sites: 1

No. of NPDES MOR Records: 126

 90th %ile: 6400

Other:

Fish Tissue Assessment

Large River Sampled: Yes Impairment: Yes (5)

Miles Monitored: 24.16 Miles Impaired: 24.16

Pollutant(s): PCBs

Comments

A report developing TMDLs for pollutants impairing beneficial uses (aquatic life and recreation) in the lower Cuyahoga River basin including the Cuyahoga River mainstem assessment unit was approved by U.S. EPA on September 26, 2003. Monitoring in support of the TMDLs was conducted in 1996, 1999, and 2000. Limited data collected by NEORSD in 2001 and 2004 was used to update aquatic life conditions in the vicinity of the Southerly WWTP. The TMDL report is available at <http://www.epa.state.oh.us/dsw/tmdl/index.html>. Besides the historical aquatic life and recreation use impairments, the 2004 Integrated Report assessment of fish tissue data documented body burdens of one or more pollutants at levels exceeding the threshold level upon which Ohio Water Quality Standards human health criteria are based which resulted in listing as impaired for fish consumption.

**Ohio EPA 2006 Integrated Report Appendix E.3
Large River Assessment Unit (LRAU) Results**

LRAU Description

Grand River Mainstem (downstream Mill Creek to mouth)

LRAU Size (mi²)

705.0

Integrated Report Assessment Category: 5

Priority Points: 1

Next Scheduled Monitoring: 2019

Aquatic Life Use (ALU) Assessment

Subcategories of ALU: EWH, WWH, SSH

Sampling Year(s): 2003, 2004

Impairment: No (1)

LRAU Total Length (miles): 41.28

No. Miles Full Attainment: 38.28

LRAU Monitored Miles: 38.28

No. Miles Partial Attainment: 0.00

No. Sites Sampled: 12

No. Miles Non-Attainment: 0.00

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
100.0	0.0	0.0

High Magnitude Causes

High Magnitude Sources

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: Unknown

Geometric Mean:

No. of Ambient Sites:

No. of Ambient Sampling Records:

75th %ile:

No. of NPDES MOR Sites:

No. of NPDES MOR Records:

90th %ile:

Other:

Fish Tissue Assessment

Large River Sampled: Yes Impairment: Yes (5)

Miles Monitored: 41.28 Miles Impaired: 41.28

Pollutant(s): PCBs, Mercury

Comments

The 2004 Integrated Report assessment of fish tissue data documented body burdens of one or more pollutants at levels exceeding the threshold level upon which Ohio Water Quality Standards human health criteria are based which resulted in listing as impaired for fish consumption. The 2003/2004 watershed survey revealed full attainment of the aquatic life use in the monitored reach of the mainstem assessment unit. However, the mainstem remains threatened by suburban development. The area around the waste lagoons in the lower mainstem showed aquatic life use impairment as recently as 2000. High base flows in 2003 and 2004 likely attenuated some of this impact. DELTs were still elevated in 2004 suggesting the fish remain stressed by pollution.

Ohio EPA 2006 Integrated Report Appendix E.3

Large River Assessment Unit (LRAU) Results

LRAU Description

Mahoning River Mainstem (downstream Eagle Creek to Pennsylvania Border)

LRAU Size (mi²)

1075.0

Integrated Report Assessment Category: 5
Priority Points: 7
Next Scheduled Monitoring: 2013
Aquatic Life Use (ALU) Assessment

Subcategories of ALU: WWH

Sampling Year(s): 1994, 2002, 2003

Impairment: Yes (5-Historical Data)

LRAU Total Length (miles): 35.40

No. Miles Full Attainment: 0.30

LRAU Monitored Miles: 35.40

No. Miles Partial Attainment: 5.80

No. Sites Sampled: 32

No. Miles Non-Attainment: 29.30

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
0.8	16.4	82.8

High Magnitude Causes

Metals	Oil and Grease
Nutrients	Thermal Modifications
Organic Enrichment/DO	
Pathogens	
Priority Organics	
Direct Habitat Alterations	
Cause Unknown	
Chlorine	

High Magnitude Sources

Combined Sewer Overflow	Minor Industrial Point Source
Contaminated Sediments	Source Unknown
Dam Construction - Development	
Major Municipal Point Source	
Spills	
Urban Runoff/Storm Sewers (NPS)	
Flow Reg/Mod - Development	
Hazardous Wastes	

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: Yes

Geometric Mean: 278

No. of Ambient Sites: 0

No. of Ambient Sampling Records: 0

 75th %ile: 922

No. of NPDES MOR Sites: 7

No. of NPDES MOR Records: 358

 90th %ile: 2101

Other: A "Dermal Contact Advisory" is in effect for the Mahoning River due to PAH and PCB contamination. The area under the advisory is from NW Bridge Rd. in Warren to the Pennsylvania border.

Fish Tissue Assessment

Large River Sampled: Yes Impairment: Yes (5)

Miles Monitored: 34.32 Miles Impaired: 34.32

Pollutant(s): PCBs

Comments

Severe sediment and water column contamination is present in the Mahoning River from Warren to the Pennsylvania border. A major Army Corps of Engineers dredging project is being planned for the mainstem to help mitigate the sediment contamination issue. Biological communities are impaired throughout this reach of the river although data, collected in 1994, have exceeded the 10-year threshold and are now historical. A minimal amount of data collected in 2002 and 2003 addressed a two mile reach but were not considered sufficient to characterize current status of the entire mainstem. The 2004 Integrated Report assessment of fish tissue data documented body burdens of one or more pollutants at levels exceeding the threshold level upon which Ohio Water Quality Standards human health criteria are based which resulted in listing as impaired for fish consumption. A report developing the TMDL for bacterial contaminants impairing the recreation beneficial use in the Mahoning River basin including the Mahoning River mainstem was approved by the U.S. EPA on September 17, 2004. The TMDL report is available at <http://www.epa.state.oh.us/dsw/tmdl/index.html>.

**Ohio EPA 2006 Integrated Report Appendix E.3
Large River Assessment Unit (LRAU) Results**

LRAU Description

Hocking River Mainstem (downstream Scott Creek to mouth)

LRAU Size (mi²)

1197.0

Integrated Report Assessment Category: 5

Priority Points: 5

Next Scheduled Monitoring: 2019

Aquatic Life Use (ALU) Assessment

Subcategories of ALU: WWH

Sampling Year(s): 2004

Impairment: No (1)

LRAU Total Length (miles): 68.96

No. Miles Full Attainment: 68.96

LRAU Monitored Miles: 68.96

No. Miles Partial Attainment: 0.00

No. Sites Sampled: 12

No. Miles Non-Attainment: 0.00

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
100.0	0.0	0.0

High Magnitude Causes

High Magnitude Sources

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: Yes

Geometric Mean: 343

No. of Ambient Sites: 0

No. of Ambient Sampling Records: 0

75th %ile: 618

No. of NPDES MOR Sites: 4

No. of NPDES MOR Records: 252

90th %ile: 3000

Other:

Fish Tissue Assessment

Large River Sampled: Yes Impairment: Yes (5)

Miles Monitored: 68.96 Miles Impaired: 68.96

Pollutant(s): PCBs

Comments

Development of TMDLs for pollutants impairing beneficial uses is underway in the Hocking River basin. Biological and water quality monitoring in support of the TMDLs was conducted in 2004 and included the Hocking River mainstem assessment unit from Scott Creek to the Ohio River.

Ohio EPA 2006 Integrated Report Appendix E.3

Large River Assessment Unit (LRAU) Results

LRAU Description

Tuscarawas River Mainstem (downstream Chippewa Creek to mouth)

LRAU Size (mi²)

2596.0

Integrated Report Assessment Category: 5

Priority Points: 9

Next Scheduled Monitoring: 2017

Aquatic Life Use (ALU) Assessment

Subcategories of ALU: EWH, WWH

Sampling Year(s): 2004, 2005

Impairment: Yes (5)

LRAU Total Length (miles): 103.22

No. Miles Full Attainment: 88.52

LRAU Monitored Miles: 103.22

No. Miles Partial Attainment: 14.70

No. Sites Sampled: 24

No. Miles Non-Attainment: 0.00

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
85.8	14.2	0.0

High Magnitude Causes

Organic Enrichment/DO
Suspended Solids
Nutrients
Salinity/TDS/Chlorides
Unknown Toxicity

High Magnitude Sources

Major Municipal Point Source
Major Industrial Point Source
Industrial Land Treatment
Nonirrigated Crop Production

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: Yes

Geometric Mean: 641

No. of Ambient Sites: 0

No. of Ambient Sampling Records: 0

75th %ile: 1375

No. of NPDES MOR Sites: 2

No. of NPDES MOR Records: 104

90th %ile: 4197

Other:

Fish Tissue Assessment

Large River Sampled: Yes Impairment: Yes (5)

Miles Monitored: 103.22 Miles Impaired: 103.22

Pollutant(s): PCBs, Hexachlorobenzene

Comments

Intensive chemical, physical, and biological sampling was conducted in the assessment unit in 2004 and 2005 as part of monitoring in the Tuscarawas River watershed to develop TMDLs for pollutants causing beneficial use impairments.

**Ohio EPA 2006 Integrated Report Appendix E.3
Large River Assessment Unit (LRAU) Results**

LRAU Description

Mohican River Mainstem (entire length)

LRAU Size (mi²)

1004.0

Integrated Report Assessment Category: 2

Priority Points:

Next Scheduled Monitoring: 2012

Aquatic Life Use (ALU) Assessment

Subcategories of ALU: WWH

Sampling Year(s): 1997, 1998

Impairment: No (1)

LRAU Total Length (miles): 27.58

No. Miles Full Attainment: 8.10

LRAU Monitored Miles: 8.10

No. Miles Partial Attainment: 0.00

No. Sites Sampled: 2

No. Miles Non-Attainment: 0.00

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
100.0	0.0	0.0

High Magnitude Causes

High Magnitude Sources

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: Unknown

Geometric Mean:

No. of Ambient Sites:

No. of Ambient Sampling Records:

75th %ile:

No. of NPDES MOR Sites:

No. of NPDES MOR Records:

90th %ile:

Other:

Fish Tissue Assessment

Large River Sampled: Yes

Impairment: Unknown (3-Historical Data)

Miles Monitored: 23.00

Miles Impaired: 0.00

Pollutant(s):

Comments

Sampling of the Mohican River mainstem assessment unit has been limited (2 sites), but both sites indicated full attainment of ecoregional biological criteria and the WWH aquatic life use.

**Ohio EPA 2006 Integrated Report Appendix E.3
Large River Assessment Unit (LRAU) Results**

LRAU Description

Walhonding River Mainstem (entire length)

LRAU Size (mi²)

2256.0

Integrated Report Assessment Category: 5

Priority Points: 1

Next Scheduled Monitoring: 2008

Aquatic Life Use (ALU) Assessment

Subcategories of ALU: EWH

Sampling Year(s): 1994

Impairment: No (1-Historical Data)

LRAU Total Length (miles): 23.19

No. Miles Full Attainment: 23.19

LRAU Monitored Miles: 23.19

No. Miles Partial Attainment: 0.00

No. Sites Sampled: 3

No. Miles Non-Attainment: 0.00

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
100.0	0.0	0.0

High Magnitude Causes

High Magnitude Sources

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: Unknown

Geometric Mean:

No. of Ambient Sites:

No. of Ambient Sampling Records:

75th %ile:

No. of NPDES MOR Sites:

No. of NPDES MOR Records:

90th %ile:

Other:

Fish Tissue Assessment

Large River Sampled: Yes Impairment: Yes (5)

Miles Monitored: 16.20 Miles Impaired: 16.20

Pollutant(s): PCBs

Comments

Biological and water quality data collected in 1994 were used in the 2002 and 2004 Integrated Reports to document full attainment of the EWH aquatic life beneficial use. These data have since exceeded the ten-year threshold and are now considered historical. The 2004 Integrated Report assessment of fish tissue data documented body burdens of pollutants at levels reflecting a violation(s) of Ohio Water Quality Standards criteria which resulted in listing as impaired for fish consumption. While reflecting the current status that insufficient data are available to assess the aquatic life use status, the assessment unit will remain Category 5 until TMDLs for the fish consumption impairment are completed and approved by the U.S. EPA.

**Ohio EPA 2006 Integrated Report Appendix E.3
Large River Assessment Unit (LRAU) Results**

LRAU Description

Muskingum River Mainstem (entire length)

LRAU Size (mi²)

8051.0

Integrated Report Assessment Category: 5

Priority Points: 9

Next Scheduled Monitoring: 2013

Aquatic Life Use (ALU) Assessment

Subcategories of ALU: WWH

Sampling Year(s): 1994

Impairment: Yes (5-Historical Data)

LRAU Total Length (miles): 111.14

No. Miles Full Attainment: 11.83

LRAU Monitored Miles: 21.73

No. Miles Partial Attainment: 9.90

No. Sites Sampled: 9

No. Miles Non-Attainment: 0.00

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
54.4	45.6	0.0

High Magnitude Causes

Organic Enrichment/DO

High Magnitude Sources

Major Industrial Point Source

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: Unknown

Geometric Mean:

No. of Ambient Sites:

No. of Ambient Sampling Records:

75th %ile:

No. of NPDES MOR Sites:

No. of NPDES MOR Records:

90th %ile:

Other:

Fish Tissue Assessment

Large River Sampled: Yes Impairment: Yes (5)

Miles Monitored: 105.70 Miles Impaired: 105.70

Pollutant(s): PCBs

Comments

Biological and water quality data collected in 1994 from the upper 20 miles of the Muskingum River were used in the 2002 and 2004 Integrated Reports which resulted in a Category 5 (impaired) listing for the aquatic life beneficial use. These data have since exceeded the ten-year threshold and are now considered historical. However, while reflecting the current status that insufficient data are available to assess the aquatic life and recreation use status, the assessment unit will remain Category 5 until TMDLs for all beneficial use impairments (aquatic life, recreation, and fish consumption) are completed and approved by the U.S. EPA.

**Ohio EPA 2006 Integrated Report Appendix E.3
Large River Assessment Unit (LRAU) Results**

LRAU Description

Wills Creek Mainstem (downstream Leatherwood Creek to mouth)

LRAU Size (mi²)

853.0

Integrated Report Assessment Category: 5

Priority Points: 2

Next Scheduled Monitoring: 2013

Aquatic Life Use (ALU) Assessment

Subcategories of ALU: WWH

Sampling Year(s): 1994

Impairment: Yes (5-Historical Data)

LRAU Total Length (miles): 64.98

No. Miles Full Attainment: 9.90

LRAU Monitored Miles: 64.98

No. Miles Partial Attainment: 41.88

No. Sites Sampled: 4

No. Miles Non-Attainment: 13.20

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
15.2	64.5	20.3

High Magnitude Causes

Siltation

High Magnitude Sources

Surface Mining

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: Unknown

Geometric Mean:

No. of Ambient Sites:

No. of Ambient Sampling Records:

75th %ile:

No. of NPDES MOR Sites:

No. of NPDES MOR Records:

90th %ile:

Other:

Fish Tissue Assessment

Large River Sampled: No

Impairment: Unknown (3-No Data)

Miles Monitored: 0.00

Miles Impaired: 0.00

Pollutant(s):

Comments

Biological and water quality data collected in 1994 were used in the 2002 and 2004 Integrated Reports which resulted in a Category 5 (impaired) listing for the aquatic life beneficial use. These data have since exceeded the ten-year threshold and are now considered historical. However, while reflecting the current status that insufficient data are available to assess the aquatic life use status, the assessment unit will remain Category 5 until TMDLs for all beneficial use impairments are completed and approved by the U.S. EPA.

**Ohio EPA 2006 Integrated Report Appendix E.3
Large River Assessment Unit (LRAU) Results**

LRAU Description

Licking River Mainstem (entire length)

LRAU Size (mi²)

779.0

Integrated Report Assessment Category: 5

Priority Points: 3

Next Scheduled Monitoring: 2008

Aquatic Life Use (ALU) Assessment

Subcategories of ALU: WWH

Sampling Year(s): 1993, 1994

Impairment: Yes (5-Historical Data)

LRAU Total Length (miles): 30.21

No. Miles Full Attainment: 28.41

LRAU Monitored Miles: 30.21

No. Miles Partial Attainment: 1.80

No. Sites Sampled: 11

No. Miles Non-Attainment: 0.00

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
94.0	6.0	0.0

High Magnitude Causes

Unionized Ammonia

High Magnitude Sources

Upstream Impoundment

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: Unknown

Geometric Mean:

No. of Ambient Sites:

No. of Ambient Sampling Records:

75th %ile:

No. of NPDES MOR Sites:

No. of NPDES MOR Records:

90th %ile:

Other:

Fish Tissue Assessment

Large River Sampled: Yes

Impairment: Unknown (3-Insufficient Data)

Miles Monitored: 22.80

Miles Impaired: 0.00

Pollutant(s):

Comments

Biological and water quality data collected in 1993 and 1994 were used in the 2002 and 2004 Integrated Reports which resulted in a Category 5 (impaired) listing for the aquatic life beneficial use. Aquatic life non-attainment in the Licking River is restricted to a short reach below Dillon Reservoir and is most likely due to the hypolimnetic reservoir release of hypereutrophic/eutrophic water. However, these data have since exceeded the ten-year threshold and are now considered historical. While reflecting the current status that insufficient data are available to assess the aquatic life use status, the assessment unit will remain Category 5 until TMDLs for all beneficial use impairments are completed and approved by the U.S. EPA.

**Ohio EPA 2006 Integrated Report Appendix E.3
Large River Assessment Unit (LRAU) Results**

LRAU Description

Scioto River Mainstem (downstream Little Scioto River to mouth)

LRAU Size (mi²)

6517.0

Integrated Report Assessment Category: 5

Priority Points: 8

Next Scheduled Monitoring: 2009

Aquatic Life Use (ALU) Assessment

Subcategories of ALU: WWH, MWH-Impounded
Impairment: Yes (5)

Sampling Year(s): 1995, 1997-2000, 2002

LRAU Total Length (miles): 177.35

No. Miles Full Attainment: 136.65

LRAU Monitored Miles: 151.79

No. Miles Partial Attainment: 6.20

No. Sites Sampled: 67

No. Miles Non-Attainment: 8.94

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
90.0	4.1	5.9

High Magnitude Causes

Organic Enrichment/DO
Direct Habitat Alterations
Unionized Ammonia
Flow Alteration

High Magnitude Sources

Streambank Destabilization - Agriculture
Major Industrial Point Source
Major Municipal Point Source
Dam Construction - Agriculture
Dam Construction - Development
Combined Sewer Overflow
Flow Reg/Mod - Development

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: Yes

Geometric Mean: 668

No. of Ambient Sites: 0

No. of Ambient Sampling Records: 0

75th %ile: 2400

No. of NPDES MOR Sites: 6

No. of NPDES MOR Records: 465

90th %ile: 6500

Other:

Fish Tissue Assessment

Large River Sampled: Yes Impairment: Yes (5)

Miles Monitored: 177.35 Miles Impaired: 177.35

Pollutant(s): PCBs

Comments

The Scioto River mainstem assessment unit has been extensively monitored between Columbus and Circleville since 1988 to assess the improvements in the river due to upgrades at the two major WWTPs in Columbus. Additionally, large scale surveys were done in 1995 (upper Scioto River) and 1997 (lower Scioto River). While biological communities have recovered significantly since the 1970s and are generally performing very well, fish consumption advisories exist for several species of fish throughout the length of the river. As a result, the 2004 Integrated Report assessment of fish tissue data documented body burdens of one or more pollutants at levels exceeding the threshold level upon which Ohio Water Quality Standards human health criteria are based which resulted in listing as impaired for fish consumption. Additionally, assessment of available bacteria data indicated an impairment of the Primary Contact Recreation beneficial use.

**Ohio EPA 2006 Integrated Report Appendix E.3
Large River Assessment Unit (LRAU) Results**

LRAU Description

Paint Creek Mainstem (downstream Rocky Fork to mouth)

LRAU Size (mi²)

1144.0

Integrated Report Assessment Category: 5

Priority Points: 1

Next Scheduled Monitoring: 2006

Aquatic Life Use (ALU) Assessment

Subcategories of ALU: EWH, WWH

Sampling Year(s): 1997

Impairment: No (1)

LRAU Total Length (miles): 37.12

No. Miles Full Attainment: 37.12

LRAU Monitored Miles: 37.12

No. Miles Partial Attainment: 0.00

No. Sites Sampled: 12

No. Miles Non-Attainment: 0.00

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
100.0	0.0	0.0

High Magnitude Causes

High Magnitude Sources

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: Unknown

Geometric Mean:

No. of Ambient Sites:

No. of Ambient Sampling Records:

75th %ile:

No. of NPDES MOR Sites:

No. of NPDES MOR Records:

90th %ile:

Other:

Fish Tissue Assessment

Large River Sampled: Yes Impairment: Yes (5)

Miles Monitored: 37.12 Miles Impaired: 37.12

Pollutant(s): PCBs

Comments

A Watershed Management Plan prepared by a CWA Section 319 funded Watershed Coordinator under the direction of the Paint Creek watershed SWCDs (Ross, Fayette, Highland, Greene, Madison, and Clinton) was submitted to Ohio EPA in October, 2002; the plan is currently under review and revision. Monitoring in support of the project was conducted in the Paint Creek watershed by the Ohio EPA in 1997; survey results indicated full WWH and EWH aquatic life use attainment of ecoregional biocriteria in the Paint Creek mainstem assessment unit which was assigned to Category 2 (unimpaired) in the 2002 Integrated Report. However, the 2004 Integrated Report assessment of fish tissue data documented body burdens of one or more pollutants at levels exceeding the threshold level upon which Ohio Water Quality Standards human health criteria are based which resulted in listing as impaired for fish consumption.

**Ohio EPA 2006 Integrated Report Appendix E.3
Large River Assessment Unit (LRAU) Results**

LRAU Description

Great Miami River Mainstem (downstream Tawawa Creek to mouth)

LRAU Size (mi²)

5371.0

Integrated Report Assessment Category: 5

Priority Points: 6

Next Scheduled Monitoring: 2009

Aquatic Life Use (ALU) Assessment

Subcategories of ALU: EWH, WWH

Sampling Year(s): 1994, 1995, 2000

Impairment: Yes (5)

LRAU Total Length (miles): 130.41

No. Miles Full Attainment: 87.42

LRAU Monitored Miles: 130.38

No. Miles Partial Attainment: 39.36

No. Sites Sampled: 89

No. Miles Non-Attainment: 3.60

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
67.0	30.2	2.8

High Magnitude Causes

Flow Alteration
Direct Habitat Alterations
Organic Enrichment/DO
Nutrients
Priority Organics

High Magnitude Sources

Dam Construction - Development
Flow Reg/Mod - Development
Major Municipal Point Source
Upstream Impoundment
Combined Sewer Overflow
Major Industrial Point Source
Removal of Riparian Vegetation - Development

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: No

Geometric Mean: 283

No. of Ambient Sites: 0

No. of Ambient Sampling Records: 0

75th %ile: 693

No. of NPDES MOR Sites: 14

No. of NPDES MOR Records: 925

90th %ile: 2000

Other:

Fish Tissue Assessment

Large River Sampled: Yes Impairment: Yes (5)

Miles Monitored: 98.90 Miles Impaired: 98.90

Pollutant(s): PCBs

Comments

Biological and water quality surveys were conducted throughout the mainstem in 1994 (upper Great Miami River) and 1995 (lower Great Miami River). Sampling was conducted in the Middletown reach of the river in 2000. Most of the mainstem assessment unit is in full or partial attainment of designated aquatic life uses (EWH and WWH) based on biological criteria. However, the 2004 Integrated Report assessment of fish tissue data documented body burdens of one or more pollutants at levels exceeding the threshold level upon which Ohio Water Quality Standards human health criteria are based which resulted in listing as impaired for fish consumption. Additionally, assessment of available bacteria data indicated an impairment of the Primary Contact Recreation beneficial use.

**Ohio EPA 2006 Integrated Report Appendix E.3
Large River Assessment Unit (LRAU) Results**

LRAU Description

Stillwater River Mainstem (downstream Greenville Creek to mouth)

LRAU Size (mi²)

676.0

Integrated Report Assessment Category: 4C

Next Scheduled Monitoring: 2019

Priority Points:

Aquatic Life Use (ALU) Assessment

Subcategories of ALU: EWH

Sampling Year(s): 1994, 1999, 2001

Impairment: Yes (4C)

LRAU Total Length (miles): 32.38

No. Miles Full Attainment: 31.38

LRAU Monitored Miles: 32.38

No. Miles Partial Attainment: 0.00

No. Sites Sampled: 16

No. Miles Non-Attainment: 1.00

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
96.9	0.0	3.1

High Magnitude Causes

Direct Habitat Alterations

High Magnitude Sources

Dam Construction - Development

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: No

Geometric Mean: 116

No. of Ambient Sites: 0

No. of Ambient Sampling Records: 0

75th %ile: 236

No. of NPDES MOR Sites: 5

No. of NPDES MOR Records: 380

90th %ile: 450

Other:

Fish Tissue Assessment

Large River Sampled: Yes Impairment: No (1)

Miles Monitored: 32.38 Miles Impaired: 0.00

Pollutant(s):

Comments

A report developing TMDLs for pollutants impairing aquatic life uses in the Stillwater River basin was approved by U.S. EPA on June 15, 2004. The TMDL report is available at <http://www.epa.state.oh.us/dsw/tmdl/index.html>. Monitoring in support of the TMDL was primarily conducted in 1999. A report on the findings of the biological and water quality survey can be found at www.epa.state.oh.us/dsw/document_index/psdindx.html. The entire mainstem assessment unit was in full attainment of the designated EWH aquatic life use based on biological criteria with the exception of one modified site (impounded) upstream from Englewood Dam. The aquatic life non-attainment was due to habitat modifications associated with the impounded reach. As such, it was listed as Category 4C (impairment not caused by a pollutant) in the 2002 Integrated Report.

**Ohio EPA 2006 Integrated Report Appendix E.3
Large River Assessment Unit (LRAU) Results**

LRAU Description

Mad River Mainstem (downstream Donnels Creek to mouth)

LRAU Size (mi²)

657.0

Integrated Report Assessment Category: 5

Priority Points: 8

Next Scheduled Monitoring: 2018

Aquatic Life Use (ALU) Assessment

Subcategories of ALU: WWH

Sampling Year(s): 2003

Impairment: Yes (5)

LRAU Total Length (miles): 18.38

No. Miles Full Attainment: 15.40

LRAU Monitored Miles: 18.38

No. Miles Partial Attainment: 2.98

No. Sites Sampled: 8

No. Miles Non-Attainment: 0.00

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
83.7	16.3	0.0

High Magnitude Causes

Flow Alteration

High Magnitude Sources

Channelization - Agriculture

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: Yes

Geometric Mean: 514

No. of Ambient Sites: 0

No. of Ambient Sampling Records: 0

75th %ile: 2300

No. of NPDES MOR Sites: 3

No. of NPDES MOR Records: 197

90th %ile: 6380

Other:

Fish Tissue Assessment

Large River Sampled: Yes Impairment: Yes (5)

Miles Monitored: 18.38 Miles Impaired: 18.38

Pollutant(s): PCBs

Comments

Development of TMDLs for pollutants impairing beneficial uses is underway in the Mad River basin. Biological and water quality monitoring in support of the TMDLs was conducted in 2003 and included the Mad River mainstem assessment unit from Donnels Creek to the mouth. A report on the findings of the biological and water quality survey can be found at: www.epa.state.oh.us/dsw/document_index/psdindx.html.

**Ohio EPA 2006 Integrated Report Appendix E.3
Large River Assessment Unit (LRAU) Results**

LRAU Description

Whitewater River Mainstem (entire length)

LRAU Size (mi²)

1474.0

Integrated Report Assessment Category: 5

Priority Points: 1

Next Scheduled Monitoring: 2010

Aquatic Life Use (ALU) Assessment

Subcategories of ALU: EWH

Sampling Year(s): 1995, 1996, 2000

Impairment: No (1)

LRAU Total Length (miles): 8.26

No. Miles Full Attainment: 8.26

LRAU Monitored Miles: 8.26

No. Miles Partial Attainment: 0.00

No. Sites Sampled: 6

No. Miles Non-Attainment: 0.00

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
100.0	0.0	0.0

High Magnitude Causes

High Magnitude Sources

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: Unknown

Geometric Mean:

No. of Ambient Sites:

No. of Ambient Sampling Records:

75th %ile:

No. of NPDES MOR Sites:

No. of NPDES MOR Records:

90th %ile:

Other:

Fish Tissue Assessment

Large River Sampled: Yes Impairment: Yes (5)

Miles Monitored: 6.80 Miles Impaired: 6.80

Pollutant(s): PCBs

Comments

Biological and water quality monitoring conducted in the Whitewater River mainstem assessment unit (lower 8.26 miles of stream located in Ohio) in 1995 and 1996 showed full attainment of the designated EWH aquatic life use based on biological criteria. This is one of the few large Ohio rivers with 100% attainment of the aquatic life use and that supports exceptional aquatic communities. However, the 2004 Integrated Report assessment of fish tissue data documented body burdens of one or more pollutants at levels exceeding the threshold level upon which Ohio Water Quality Standards human health criteria are based which resulted in listing as impaired for fish consumption.

**Ohio EPA 2006 Integrated Report Appendix E.3
Large River Assessment Unit (LRAU) Results**

LRAU Description

Raccoon Creek Mainstem (downstream Little Raccoon Creek to mouth)

LRAU Size (mi²)

681.0

Integrated Report Assessment Category: 2

Next Scheduled Monitoring: 2014

Priority Points:

Aquatic Life Use (ALU) Assessment

Subcategories of ALU: WWH

Sampling Year(s): 1993, 1994, 1995

Impairment: No (1)

LRAU Total Length (miles): 37.55

No. Miles Full Attainment: 22.37

LRAU Monitored Miles: 22.37

No. Miles Partial Attainment: 0.00

No. Sites Sampled: 6

No. Miles Non-Attainment: 0.00

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
100.0	0.0	0.0

High Magnitude Causes

High Magnitude Sources

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: Unknown

Geometric Mean:

No. of Ambient Sites:

No. of Ambient Sampling Records:

75th %ile:

No. of NPDES MOR Sites:

No. of NPDES MOR Records:

90th %ile:

Other:

Fish Tissue Assessment

Large River Sampled: Yes

Impairment: Unknown (3-Insufficient Data)

Miles Monitored: 37.55

Miles Impaired: 0.00

Pollutant(s):

Comments

Full attainment of the designated WWH aquatic life use based on biological criteria was achieved at all sampling locations monitored in the Raccoon Creek mainstem assessment unit in 1995. Despite extensive mining activities in the upper portion of the basin, the lower Raccoon mainstem reflected no major adverse effects. Monitoring to assess the recreation beneficial use and human health issues related to fish consumption also revealed no problems but the recreation data are now historical. A report developing TMDLs for pollutants impairing beneficial uses (aquatic life) in the upper Raccoon Creek watershed was approved by U.S. EPA on March 20, 2003. Monitoring in support of these TMDLs was conducted in 1995 and 1999. The TMDL report is available at (www.epa.state.oh.us/dsw/tmdl/index.html).

Ohio EPA 2006 Integrated Report Appendix E.3 Large River Assessment Unit (LRAU) Results

LRAU Description

Little Miami River Mainstem (downstream Caesar Creek to mouth)

LRAU Size (mi²)

1757.0

Integrated Report Assessment Category: 5
Priority Points: 3
Next Scheduled Monitoring: 2007
Aquatic Life Use (ALU) Assessment

Subcategories of ALU: EWH, WWH

Sampling Year(s): 1998

Impairment: Yes (5)

LRAU Total Length (miles): 50.92

No. Miles Full Attainment: 11.80

LRAU Monitored Miles: 48.02

No. Miles Partial Attainment: 34.92

No. Sites Sampled: 16

No. Miles Non-Attainment: 1.30

% LRAU Attainment (Monitored Miles)

Full	Partial	Non
24.6	72.7	2.7

High Magnitude Causes

Nutrients
Siltation
Suspended Solids
Cause Unknown
Metals
Organic Enrichment/DO
Direct Habitat Alterations

High Magnitude Sources

Major Municipal Point Source
Minor Municipal Point Source
Nonirrigated Crop Production
Combined Sewer Overflow
Dam Construction - Development
Land Development/Suburbanization
Urban Runoff/Storm Sewers (NPS)

Recreation Use Assessment

Subcategory of Use: Primary Contact

Impairment: No

Geometric Mean: 198

No. of Ambient Sites: 0

No. of Ambient Sampling Records: 0

 75th %ile: 361

No. of NPDES MOR Sites: 4

No. of NPDES MOR Records: 120

 90th %ile: 891

Other:

Fish Tissue Assessment

Large River Sampled: Yes Impairment: Yes (5)

Miles Monitored: 50.92 Miles Impaired: 50.92

Pollutant(s): PCBs

Comments

A report developing TMDLs for pollutants impairing beneficial uses (aquatic life) in the upper Little Miami watershed (to and including the Caesar Creek watershed) was approved by U.S. EPA on July 2, 2002. Monitoring in support of these TMDLs was conducted in 1998. The TMDL report is available at (www.epa.state.oh.us/dsw/tmdl/index.html). Besides the aquatic life use impairment, the 2006 Integrated Report assessment of fish tissue data documented body burdens of one or more pollutants at levels exceeding the threshold level upon which Ohio Water Quality Standards human health criteria are based which resulted in listing as impaired for fish consumption.