Root River Watershed Restoration Plan: Report on Chapter IV (partial)

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Presentation to the Root River Restoration Planning Group

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SEWRPC
Serving the counties of Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington, and Waukesha

#207827

Partners and Funding Agencies

Wisconsin Coastal Management Program

UW Extension
University of Wisconsin–Extension

sweet water
SOUTHEASTERN WISCONSIN WATERSHEDS TRUST, INC.

Watershed Initiative Network
WIN
ROOT-PIKE

MMSD
Preserving The Environment • Improving Water Quality

Municipalities and Counties of the Root River Watershed

Wisconsin Department of Natural Resources

Racine County Wisconsin
Since 1836

The Fund for Lake Michigan

Southeastern Wisconsin Regional Planning Commission

Plan Approach

1. Summarize Recommendations of the Regional Water Quality Management Plan Update (RWQMPU)
2. Evaluate Implementation of the RWQMPU
3. Inventory Recent and Ongoing Projects, Programs, and Initiatives and Integrate these Into Recommendations
4. Review and Refine Initially Identified Focus Issues
5. Characterize the Watershed Concentrating on Features Related to the Focus Issues

Plan Approach

6. Identify Targets to be Achieved by the End of the Plan Period
7. For Each Target, Identify Actions to be Taken
8. Identify Foundation Actions
9. Present Actions in Addition to those Recommended in the RWQMPU
10. Develop an Implementation Strategy

The plan is being documented in:

SEWRPC Community Assistance Planning Report No. 316, *A Watershed Restoration Plan for the Root River Watershed*

Report Chapters

I. Introduction

II. Summary of recommendations of the RWQMPU for the Root River and evaluation of implementation to date

III. Inventory of relevant plans, programs, and initiatives

IV. Characterization of the watershed

V. Description of targets to be achieved and alternative management measures

VI. Recommended watershed restoration plan

VII. Implementation strategies

Chapter IV—Characterization of the Root River Watershed

Topics

1. Water Quality Conditions
2. Riparian Buffer Inventory
3. Examination of Horlick dam

1—Water Quality Conditions

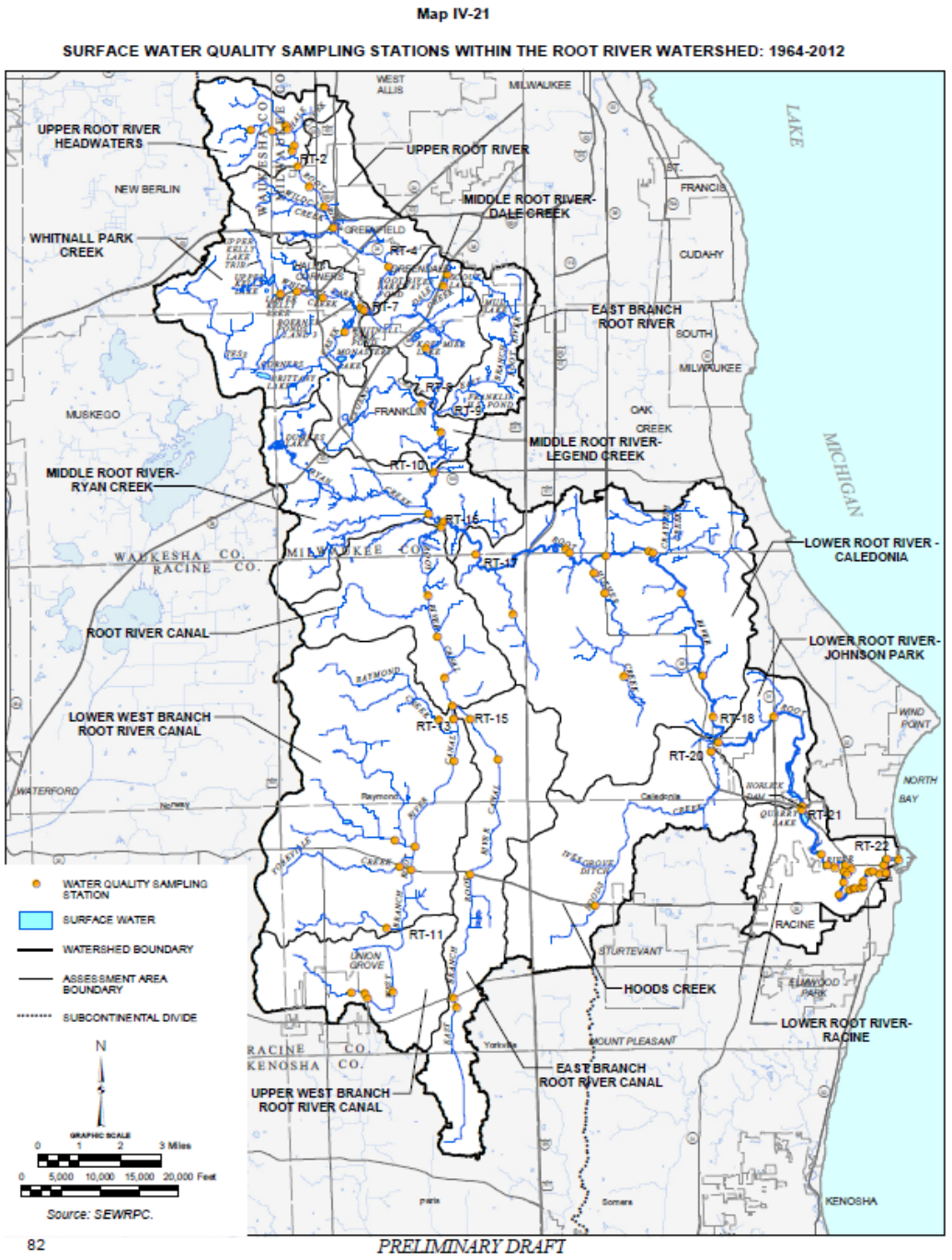
Water Quality Sampling Sites

(1964-2012)

47 on mainstem

39 on tributaries

10 on lakes and ponds



Sources of Water Quality Data

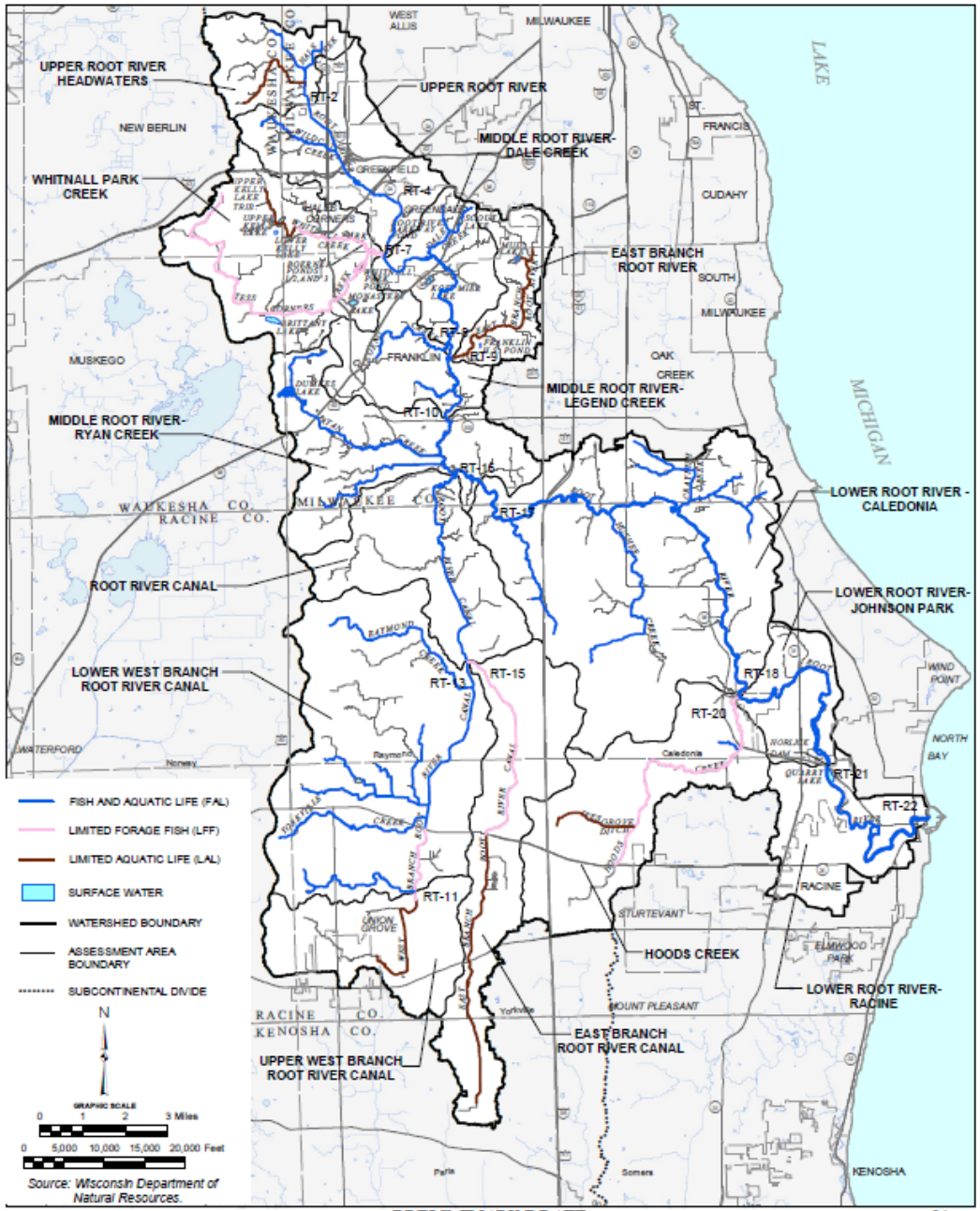
- SEWRPC
- Milwaukee Metropolitan Sewerage District
- City of Racine Health Department
- U.S. Geological Survey
- Wisconsin Department of Natural Resources
- UW-Extension Water Action Volunteers
- Wisconsin Citizen Lake Monitoring Program

Analytical Periods

- Chosen to be consistent with RWQMPU
- 1964-1974
- 1975-1986
- 1987-1993
- 1994-1997
- 1998-2004
- 2004-mid 2012

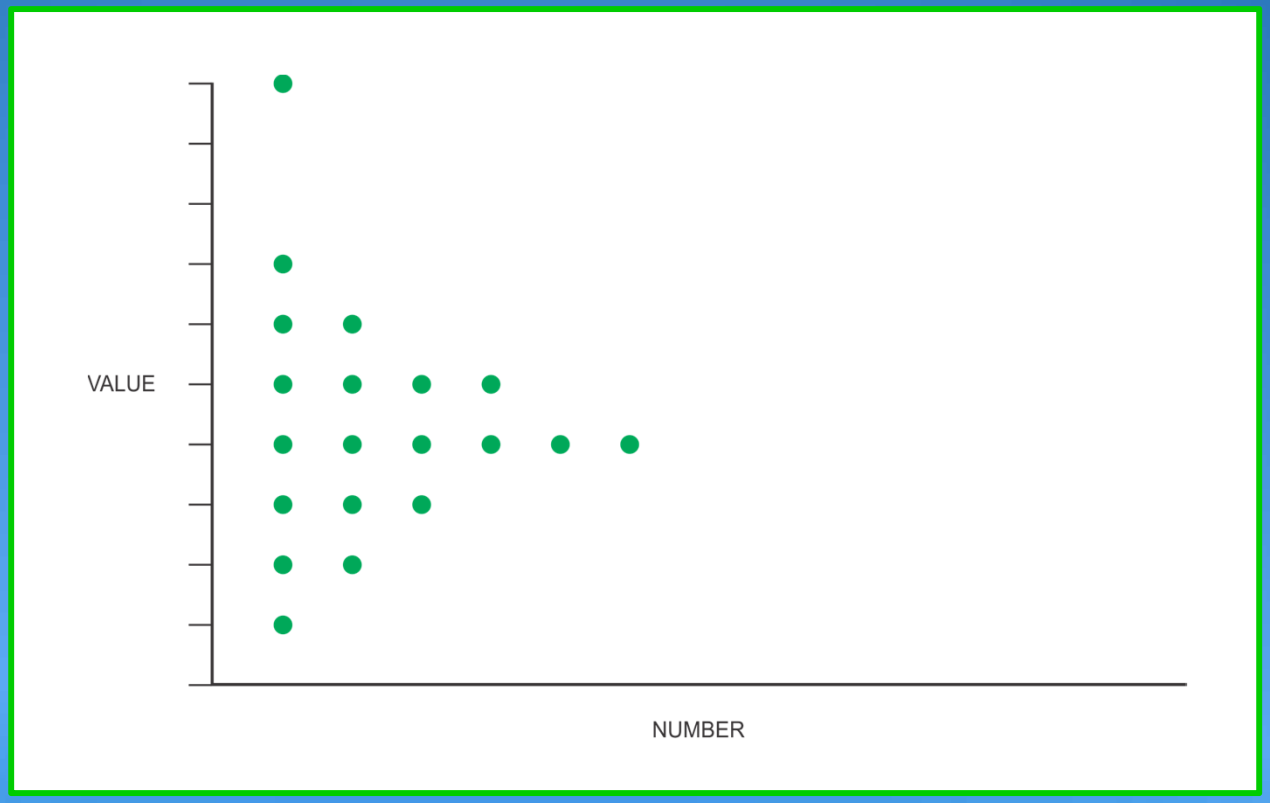
Map IV-20

CURRENT REGULATORY WATER USE CLASSIFICATIONS FOR SURFACE WATERS IN THE ASSESSMENT AREAS WITHIN THE ROOT RIVER WATERSHED

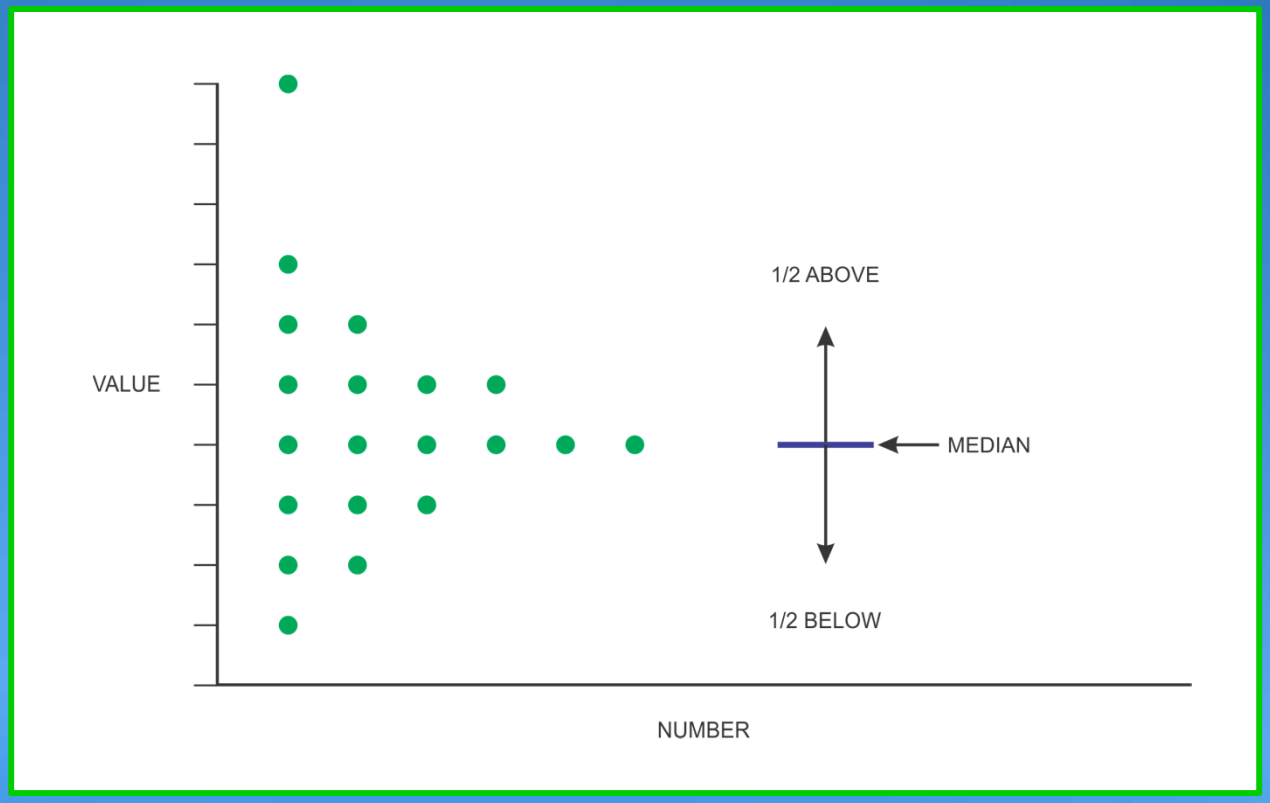


Source: Wisconsin Department of Natural Resources.

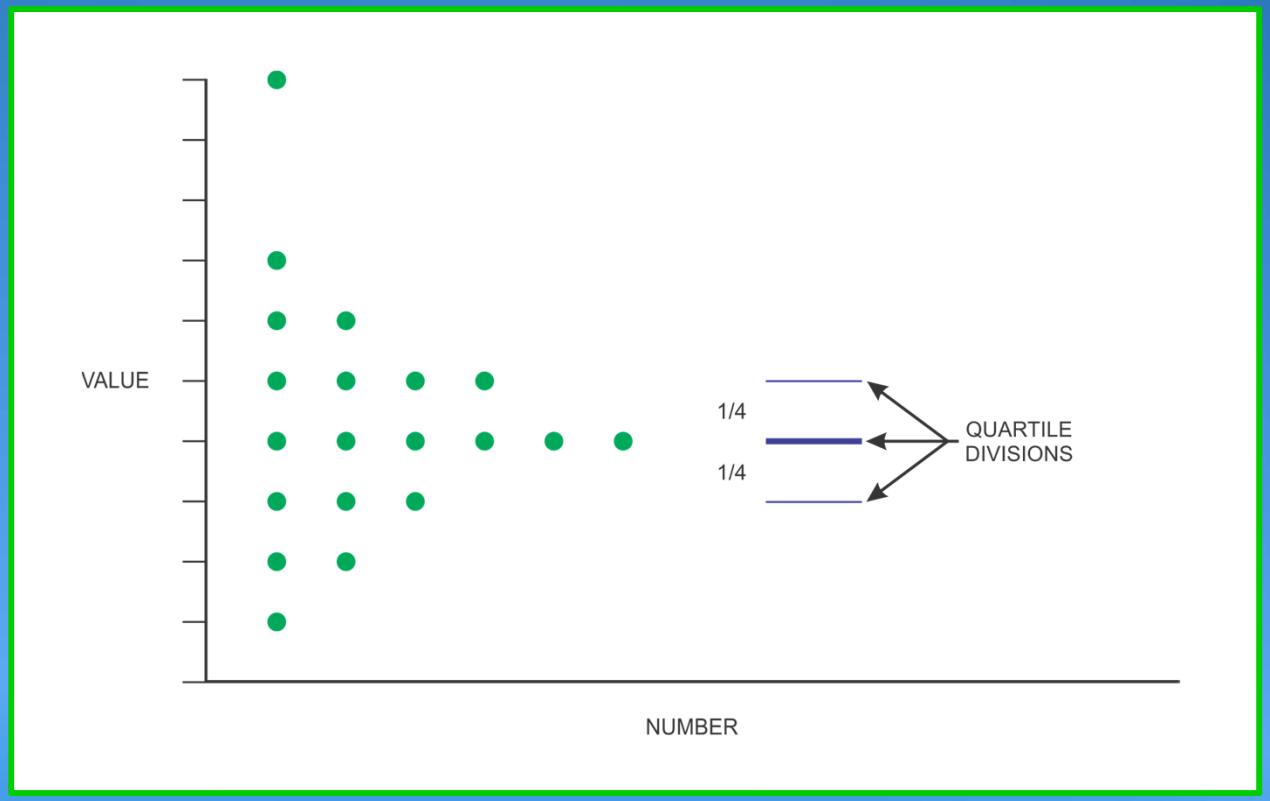
Explanation of Box Plot—1



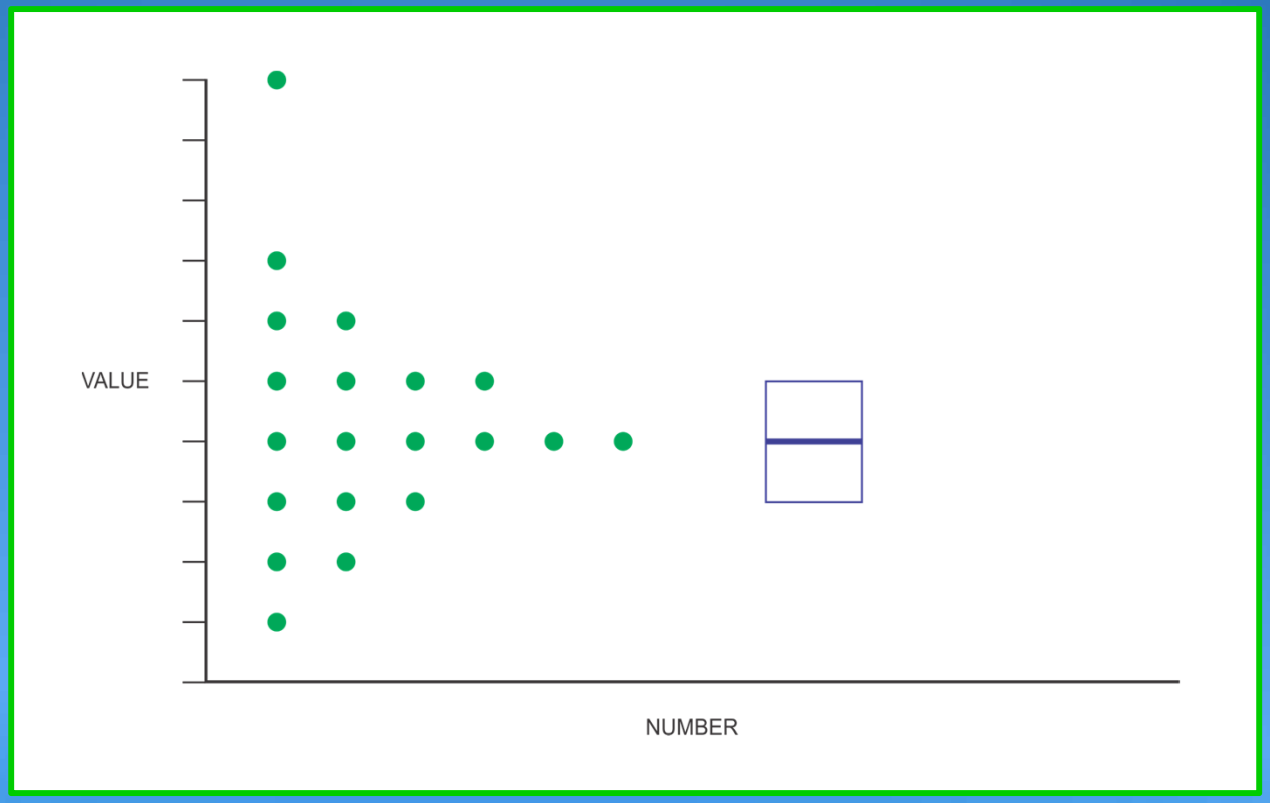
Explanation of Box Plot—2



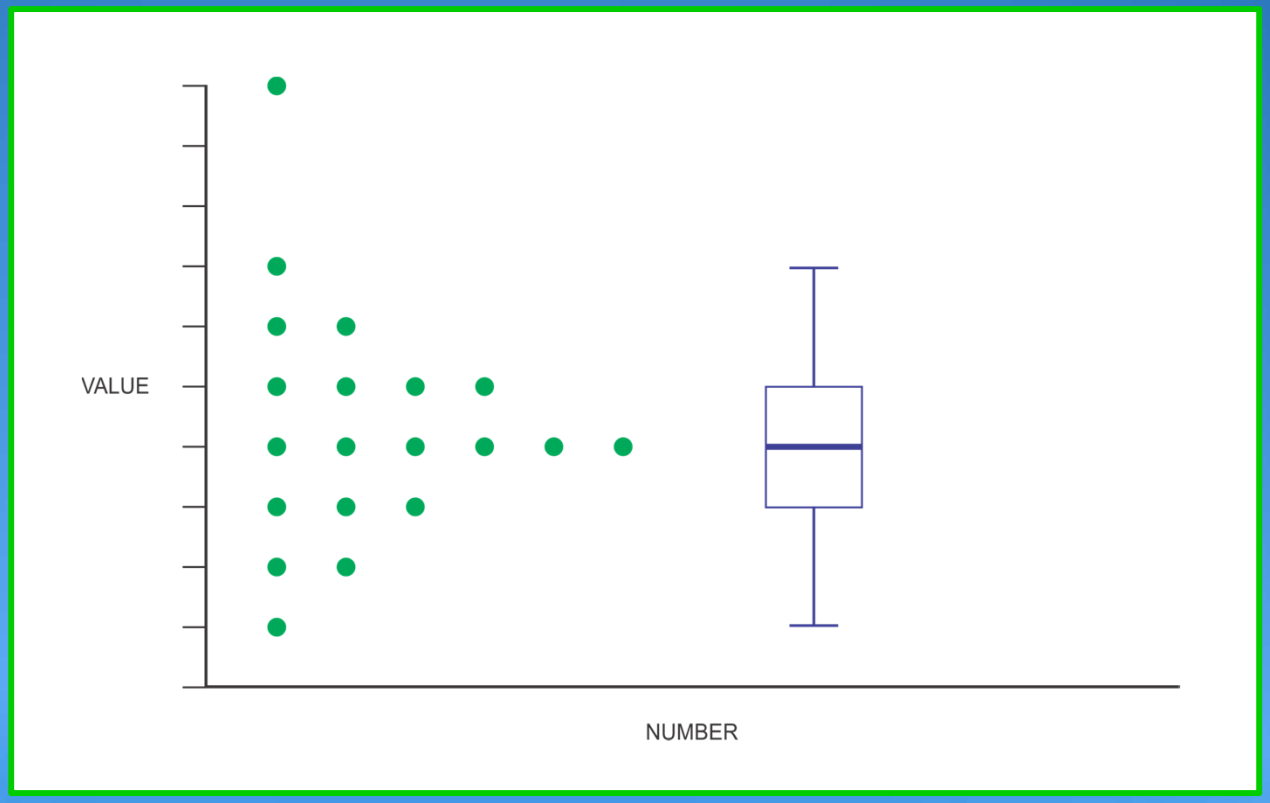
Explanation of Box Plot—3



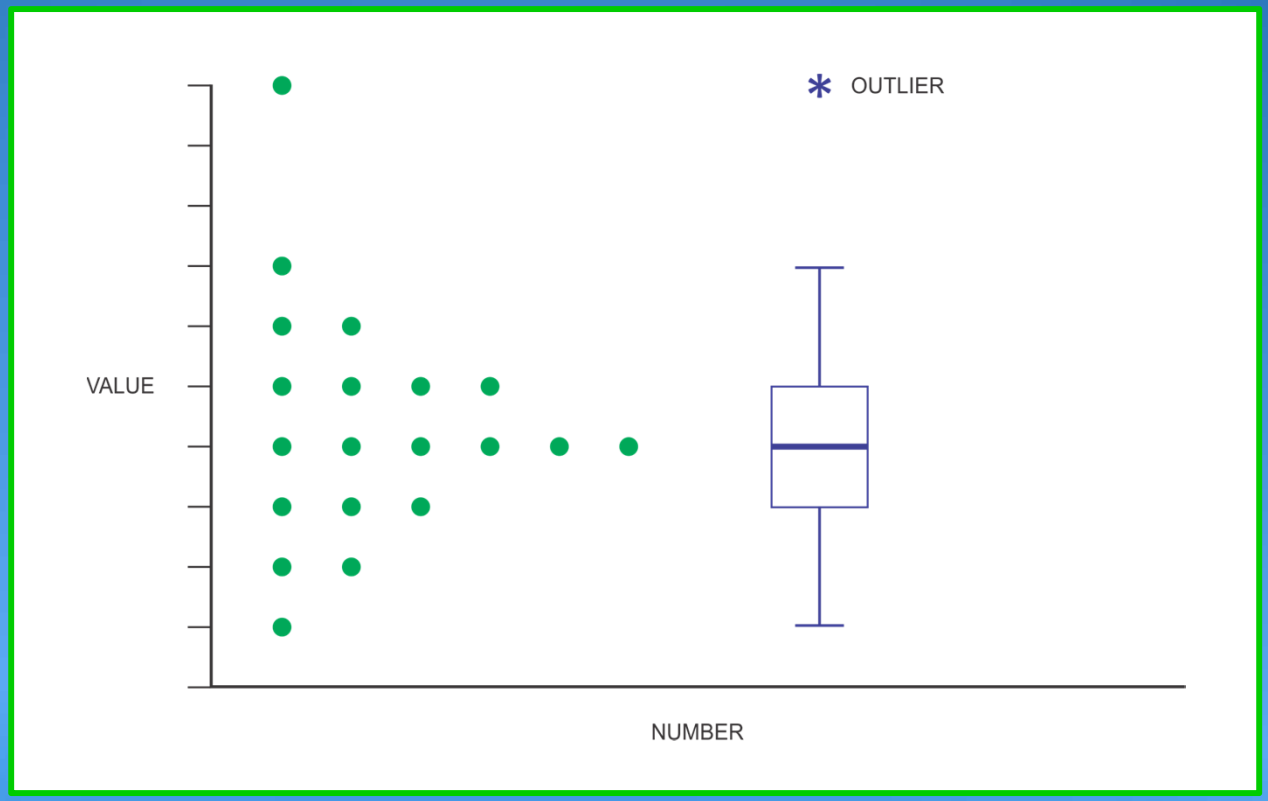
Explanation of Box Plot—4



Explanation of Box Plot—5



Explanation of Box Plot—6



Explanation of Box Plot—7

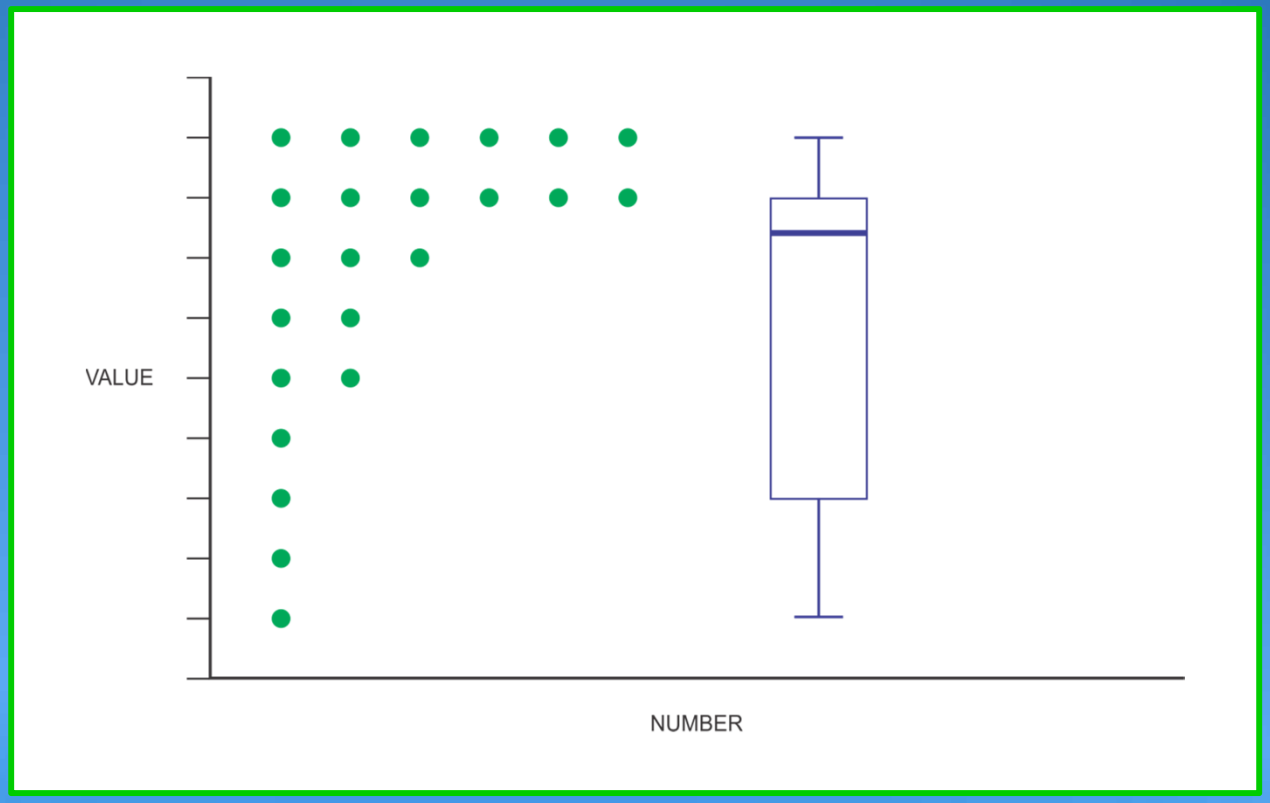


Figure IV-23

CHLORIDE CONCENTRATIONS AT SITES ALONG THE MAINSTEM OF THE ROOT RIVER: 1964-2012

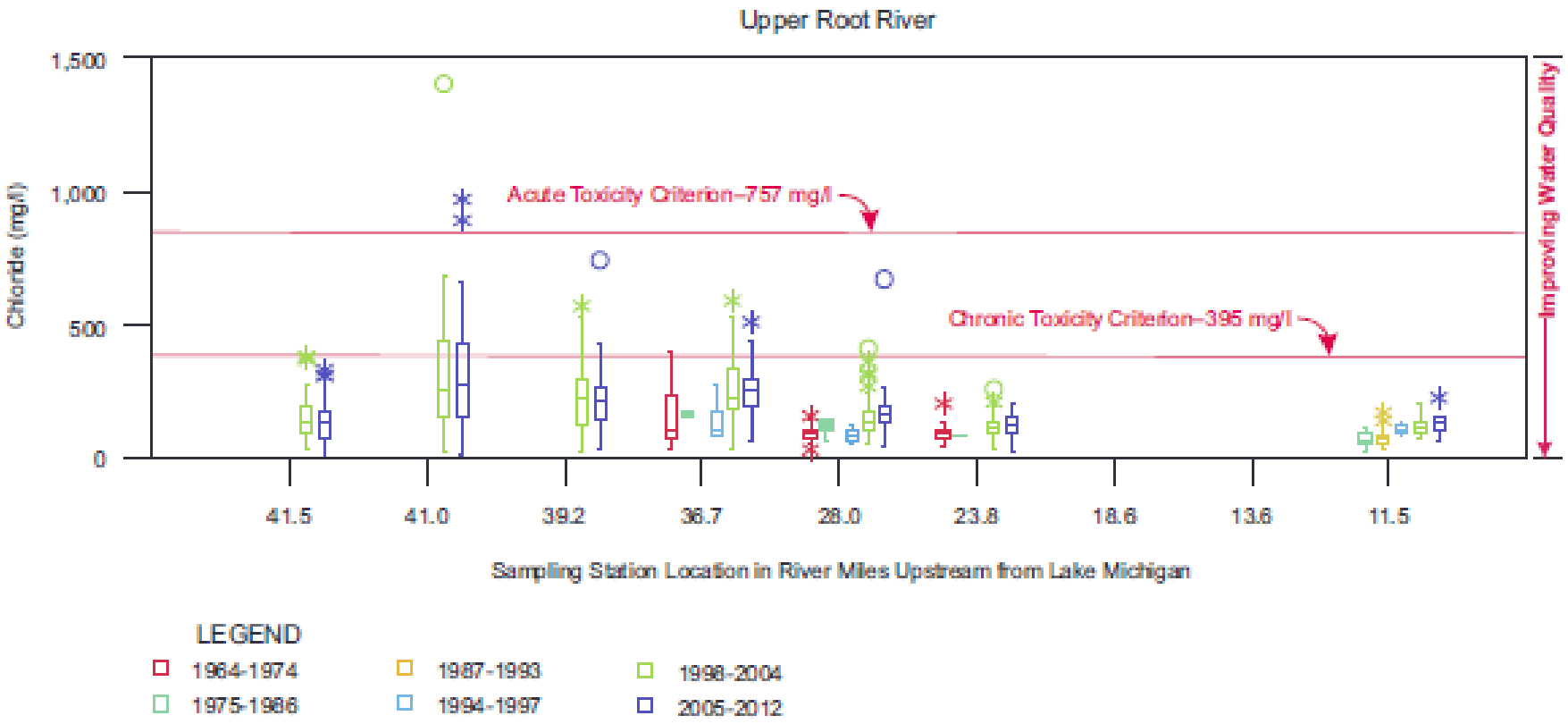
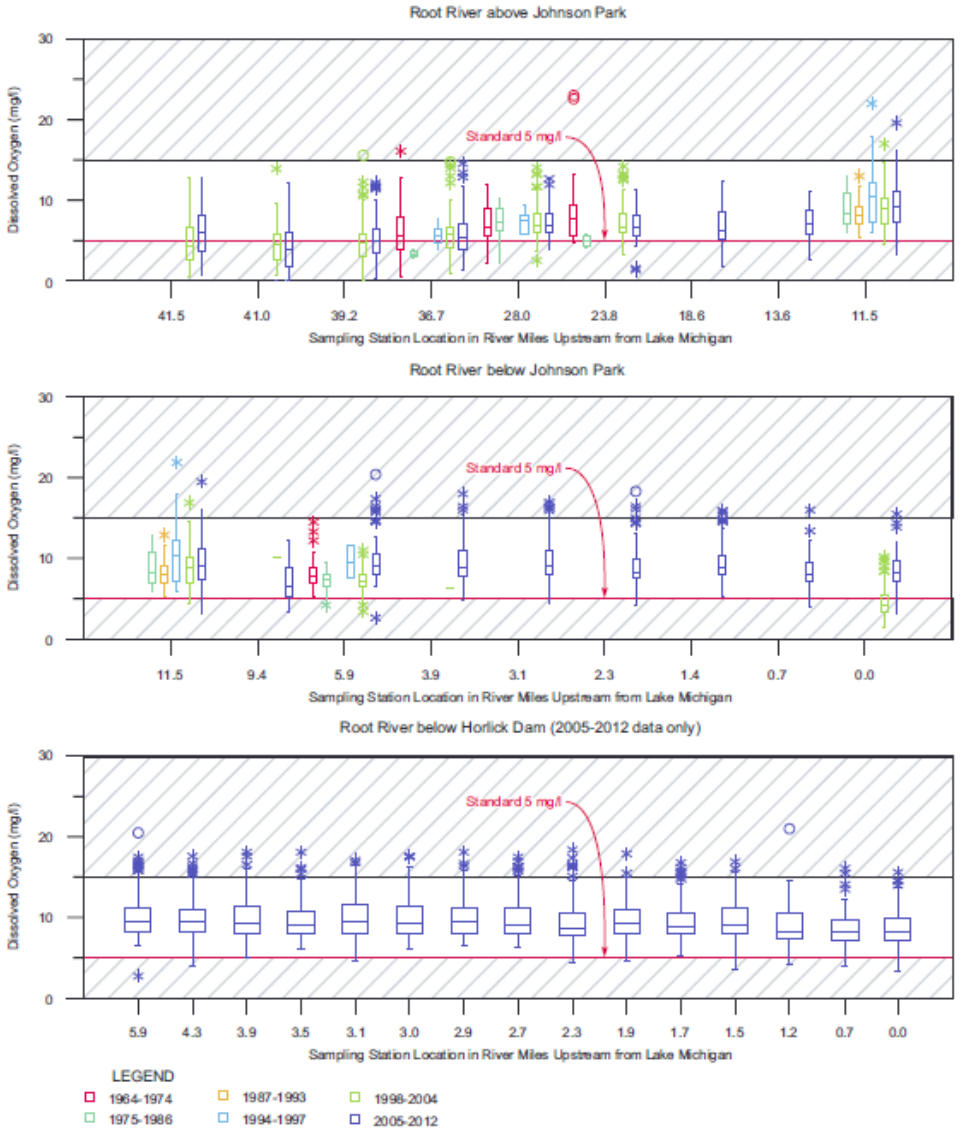


Figure IV-17

DISSOLVED OXYGEN CONCENTRATIONS AT SITES ALONG THE MAINSTEM OF THE ROOT RIVER: 1964-2012



NOTES: See Figure IV-7 for description of symbols.

See Table IV-10 for location of sample sites.

Saturation levels of dissolved oxygen of 140 percent and higher can cause fish kills. A 15 mg/l dissolved oxygen concentration translates to a saturation of approximately 150 percent at an average water temperature of 14 degrees Celsius.

Source: U.S. Geological Survey, Wisconsin Department of Natural Resources, University of Wisconsin-Extension, Milwaukee Metropolitan Sewerage District, City of Racine Health Department, and SEWRPC.

Figure IV-18

DISSOLVED OXYGEN CONCENTRATIONS AT SITES ALONG THE ROOT RIVER CANAL AND ITS BRANCHES: 1964-2012

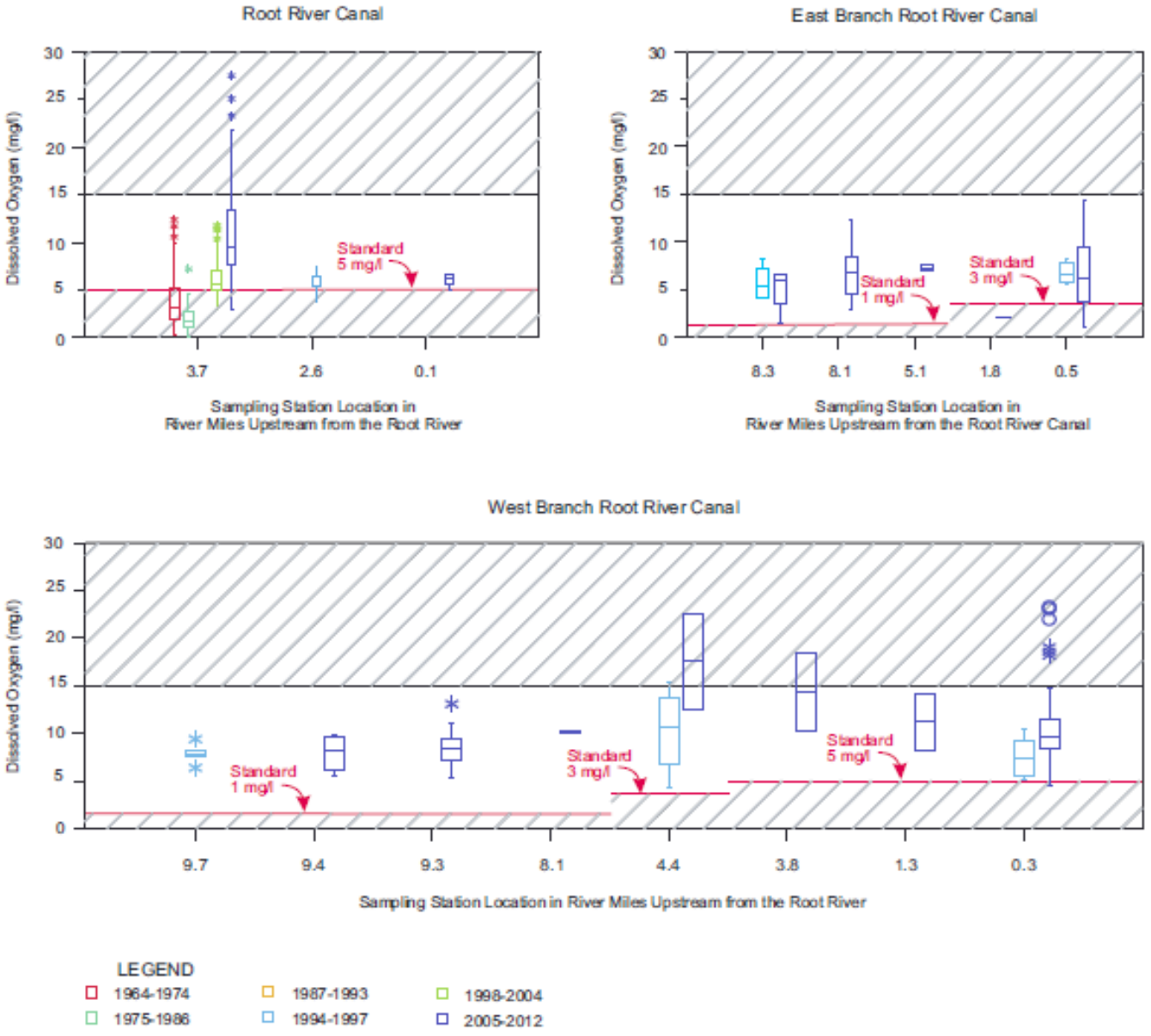
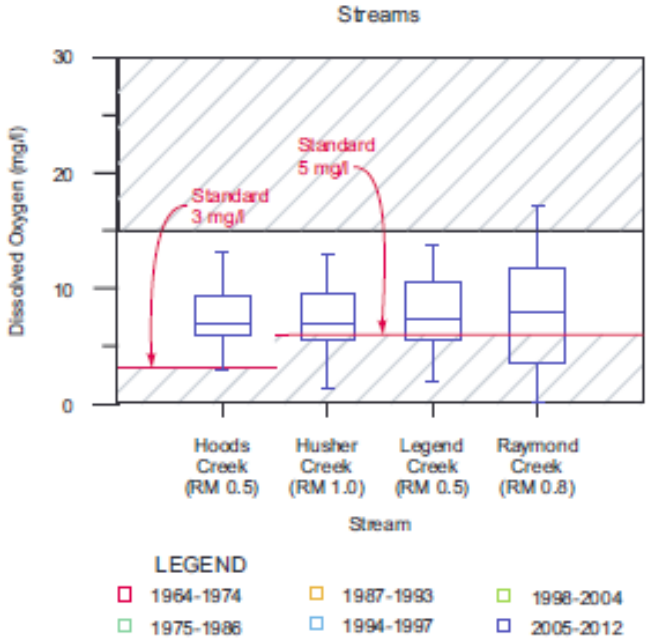


Figure IV-19

DISSOLVED OXYGEN CONCENTRATIONS IN TRIBUTARY STREAMS IN THE ROOT RIVER WATERSHED: 2005-2012



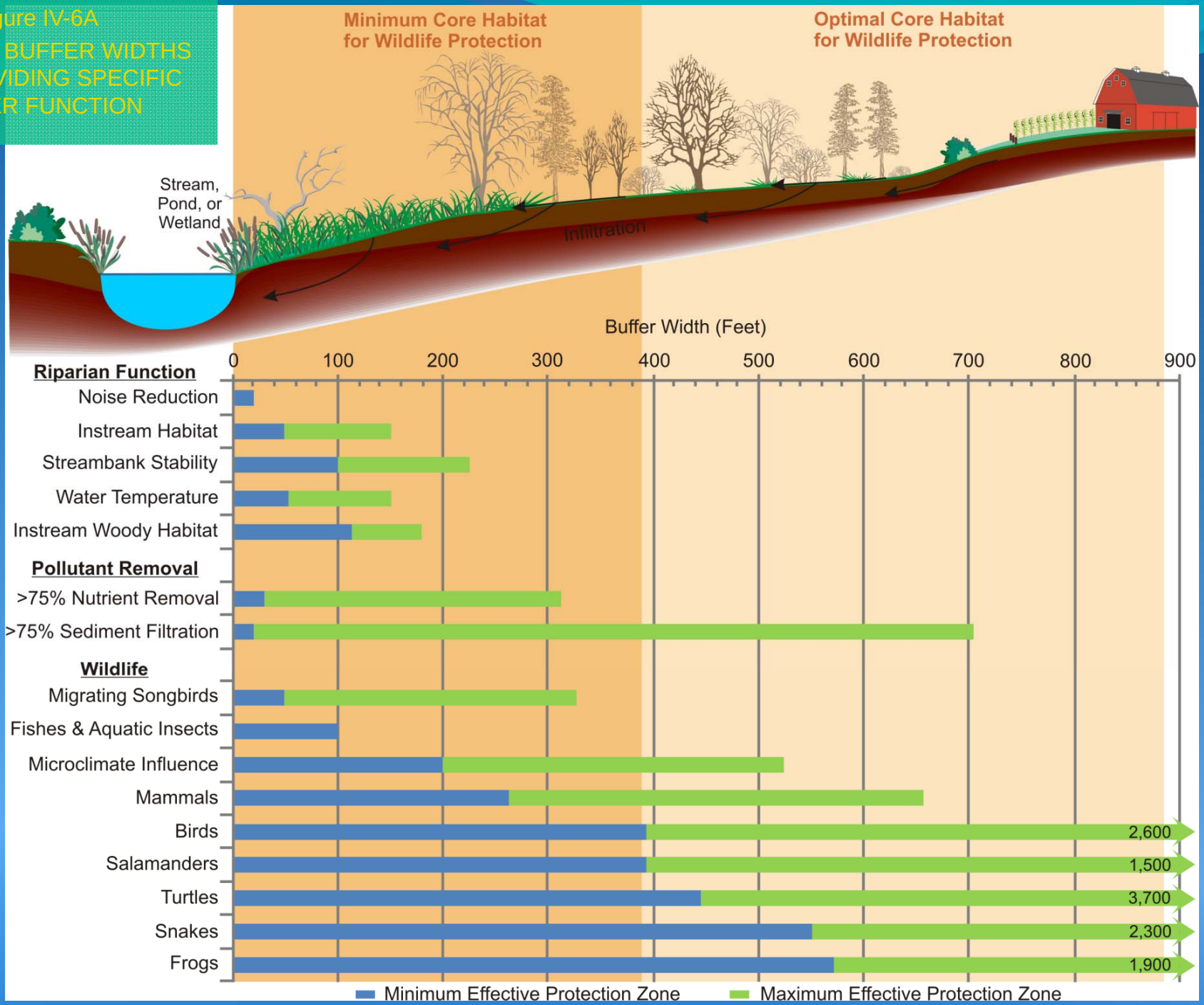
NOTES: See Figure IV-7 for description of symbols.

Saturation levels of dissolved oxygen of 140 percent and higher can cause fish kills. A 15 mg/l dissolved oxygen concentration translates to a saturation of approximately 150 percent at an average water temperature of 14 degrees Celsius.

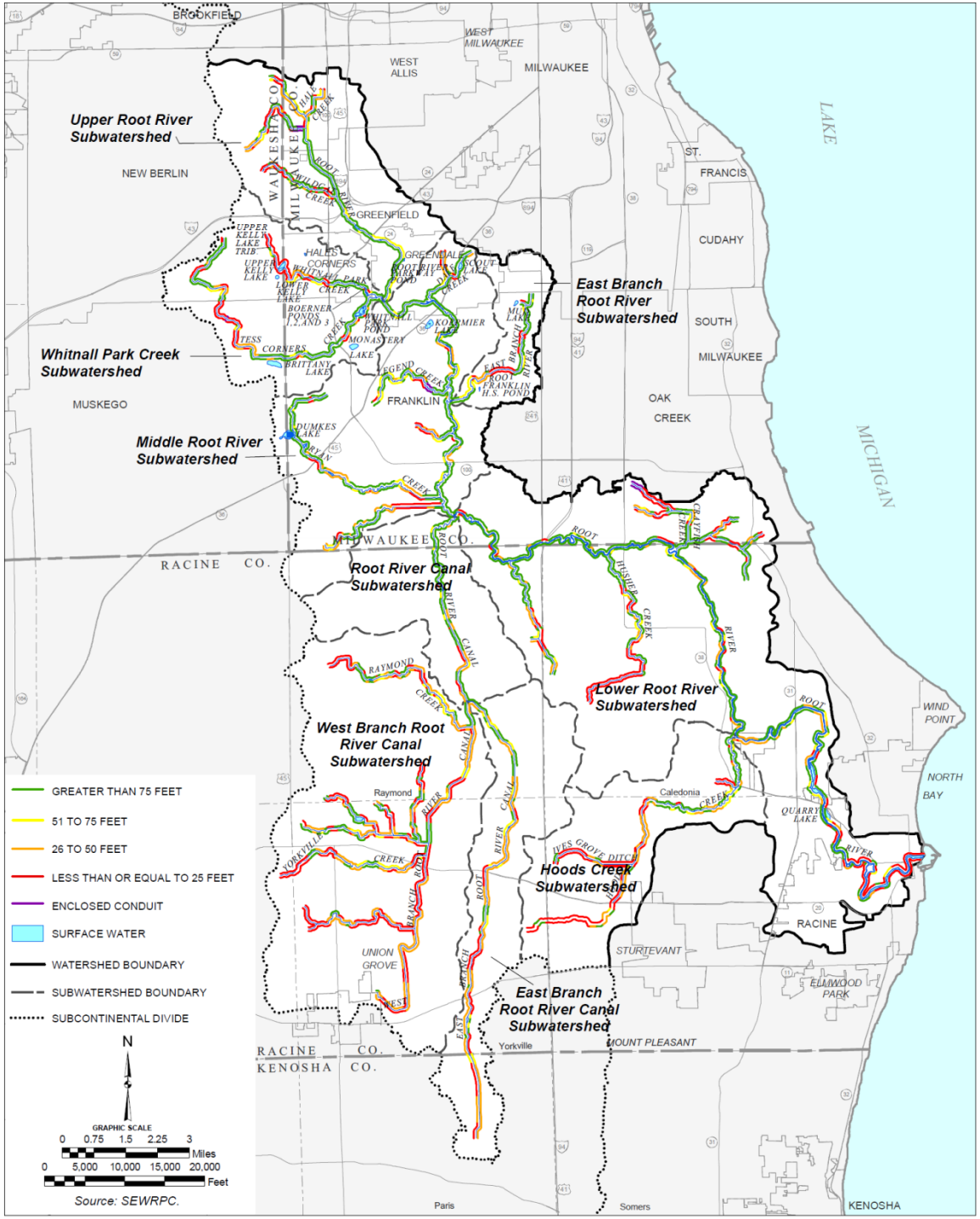
Source: Wisconsin Department of Natural Resources and City of Racine Health Department.

Figure IV-6A

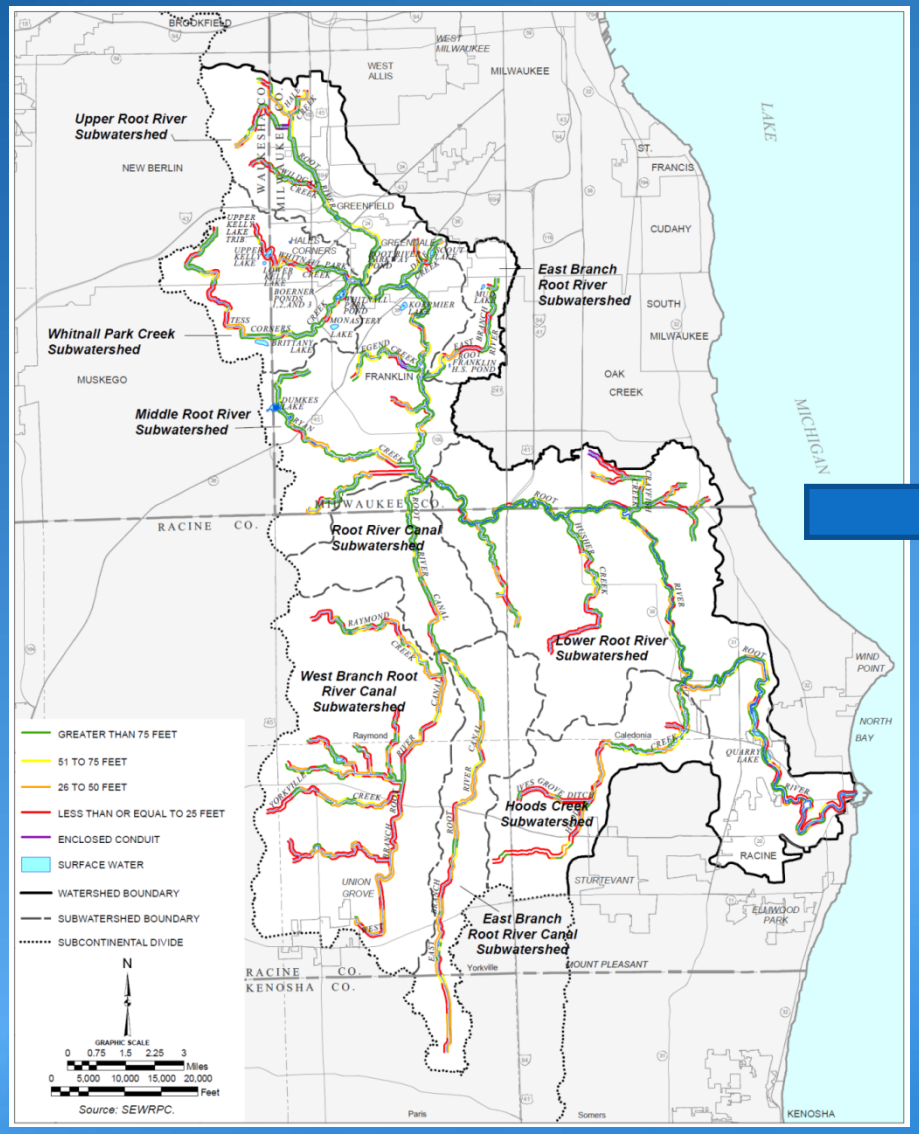
RANGE OF BUFFER WIDTHS FOR PROVIDING SPECIFIC BUFFER FUNCTION



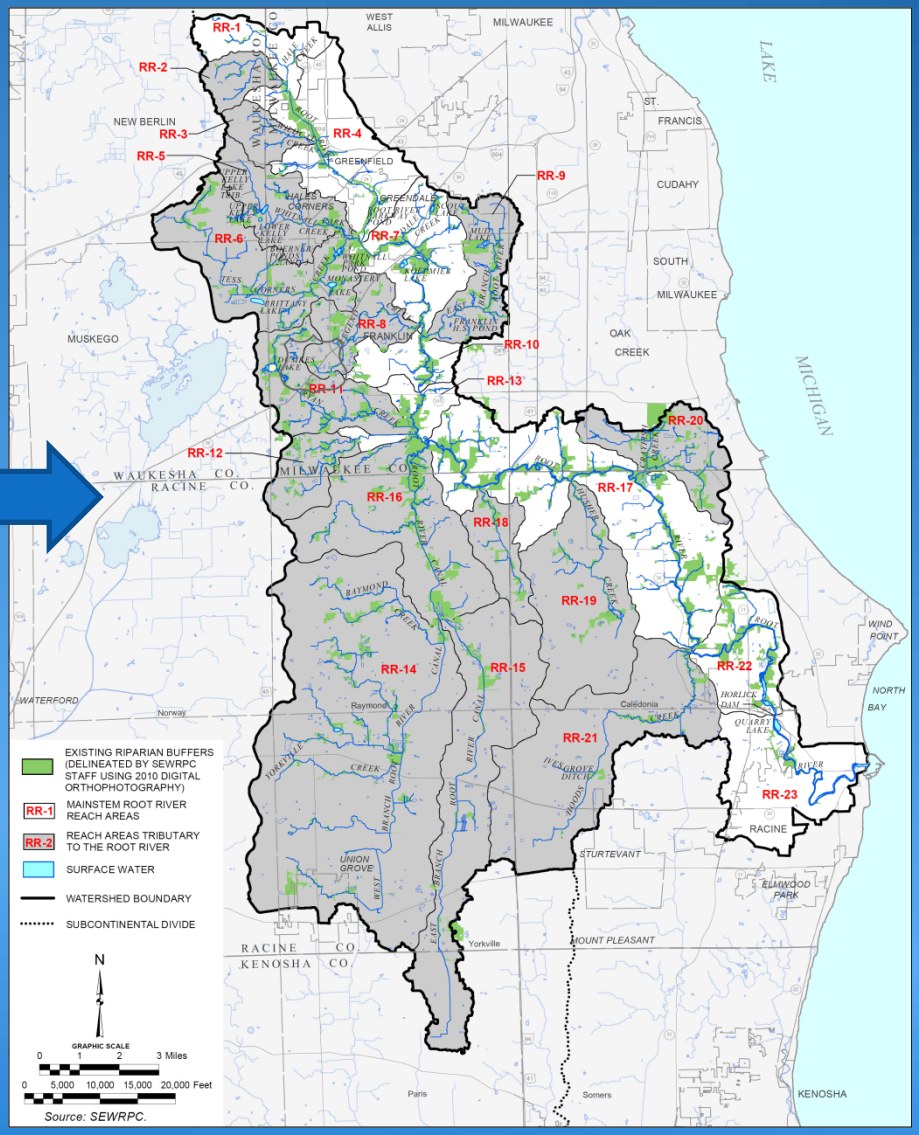
Riparian Buffers in the Root River Watershed: 2000 RWQMPU (2007)



RWQMPU Analysis



Current Analysis

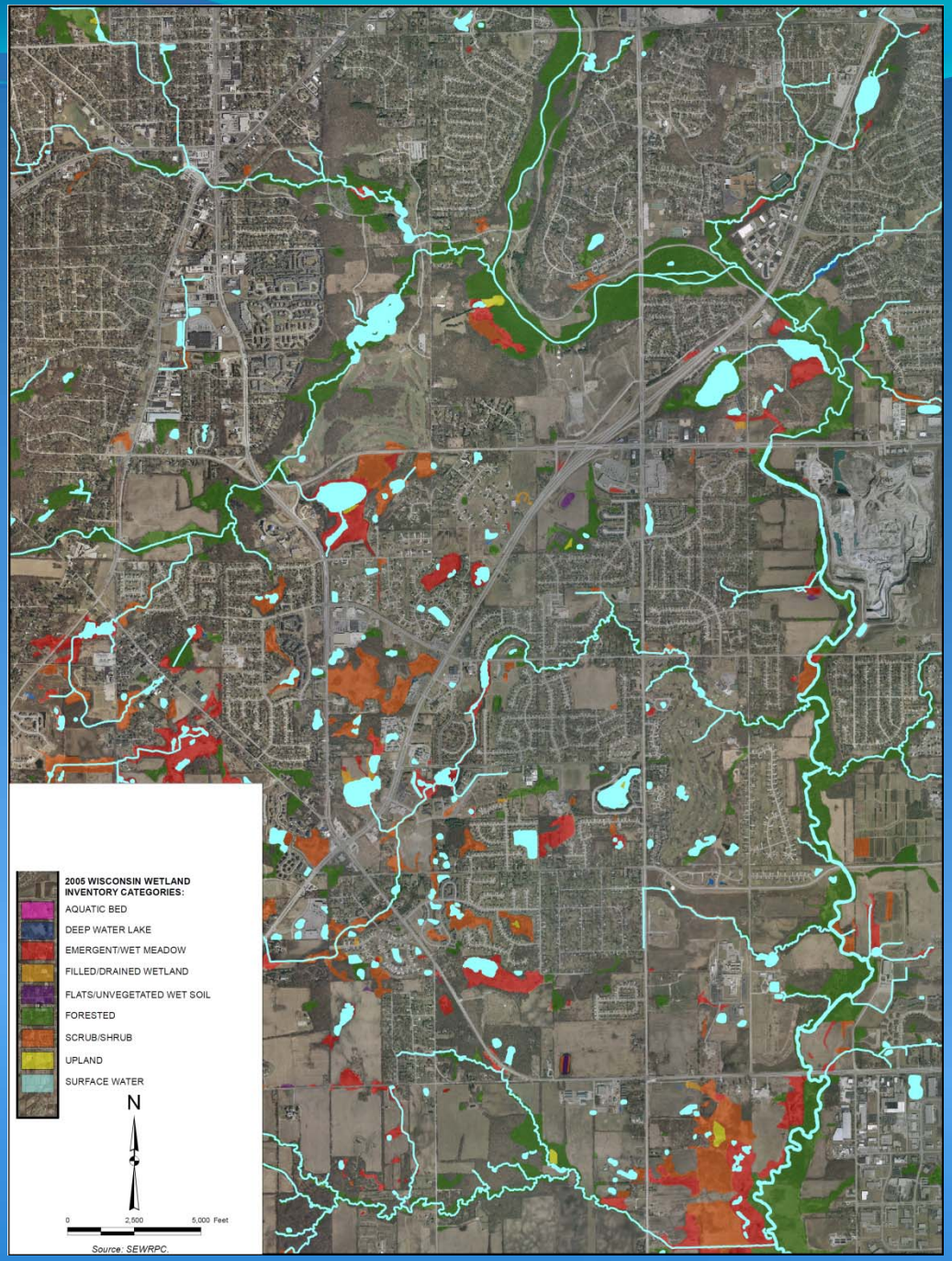


Riparian Buffers in the Root River Watershed: 2010

- 2010 Digital Orthophotographs

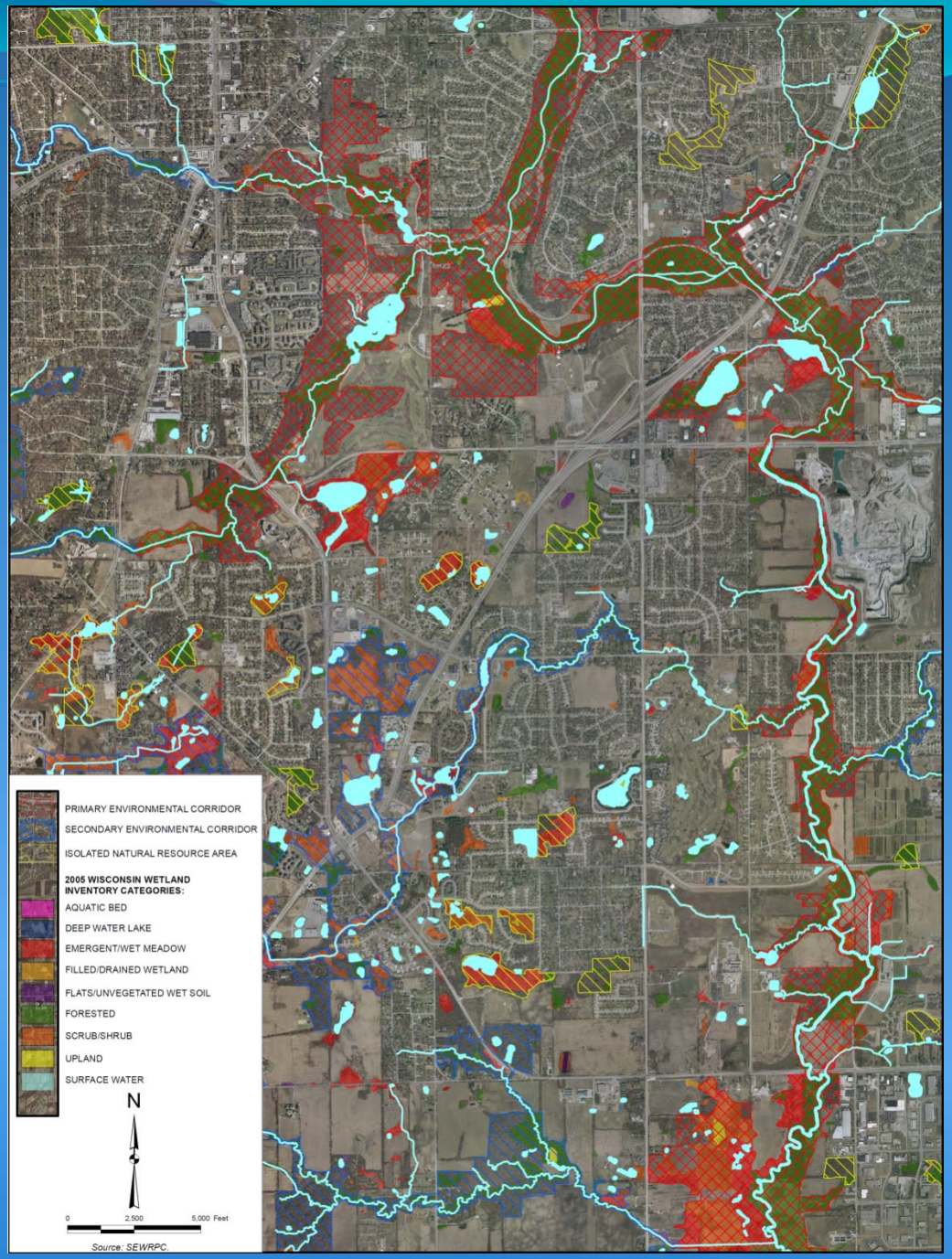
Riparian Buffers in the Root River Watershed: 2010

- 2010 Digital Orthophotographs
- 2005 Wisconsin Wetland Inventory



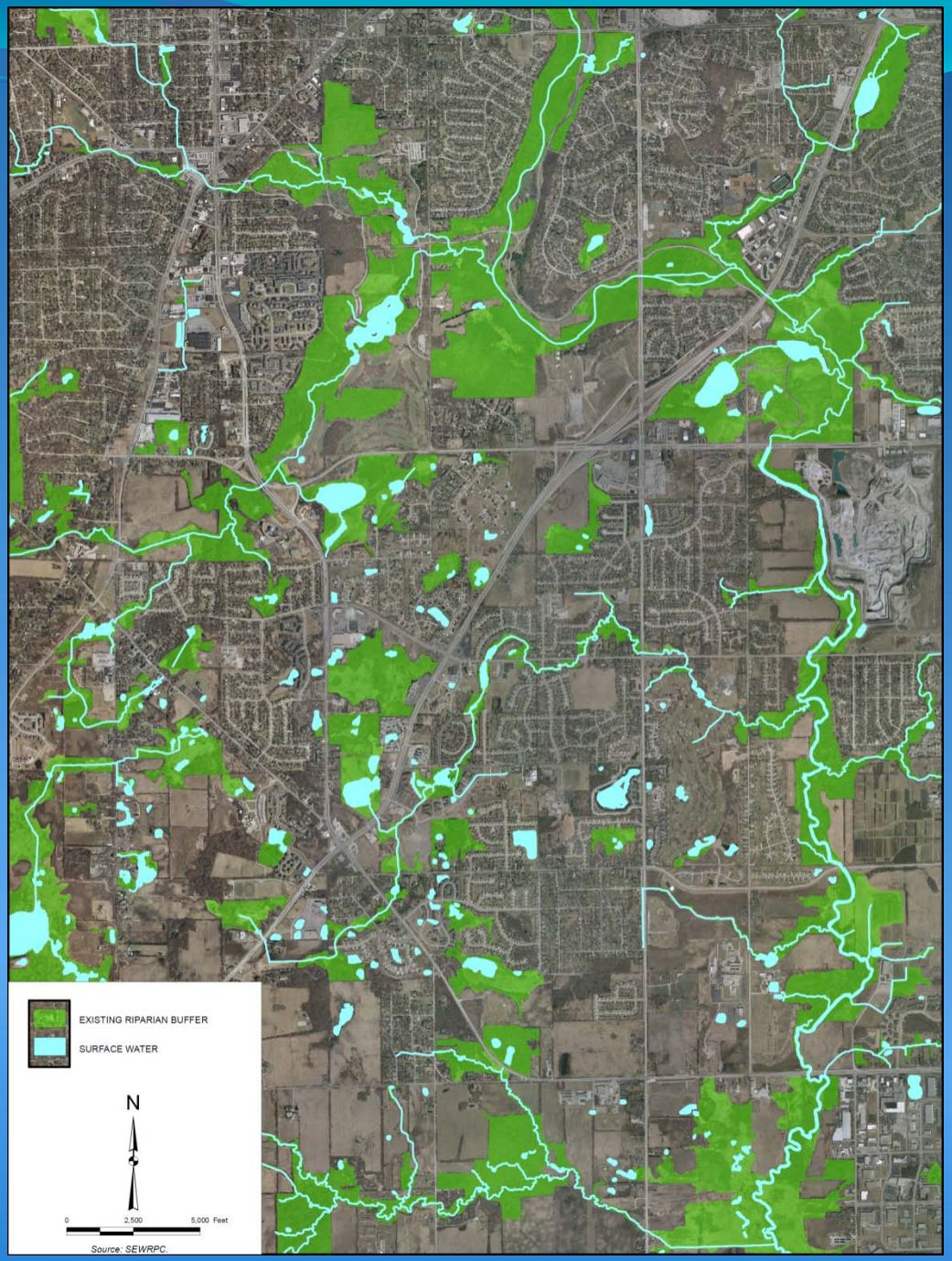
Riparian Buffers in the Root River Watershed: 2010

- 2010 Digital Orthophotographs
- 2005 Wisconsin Wetland Inventory
- 2005 Primary and Secondary Environmental Corridors and Isolated Natural Resource Areas

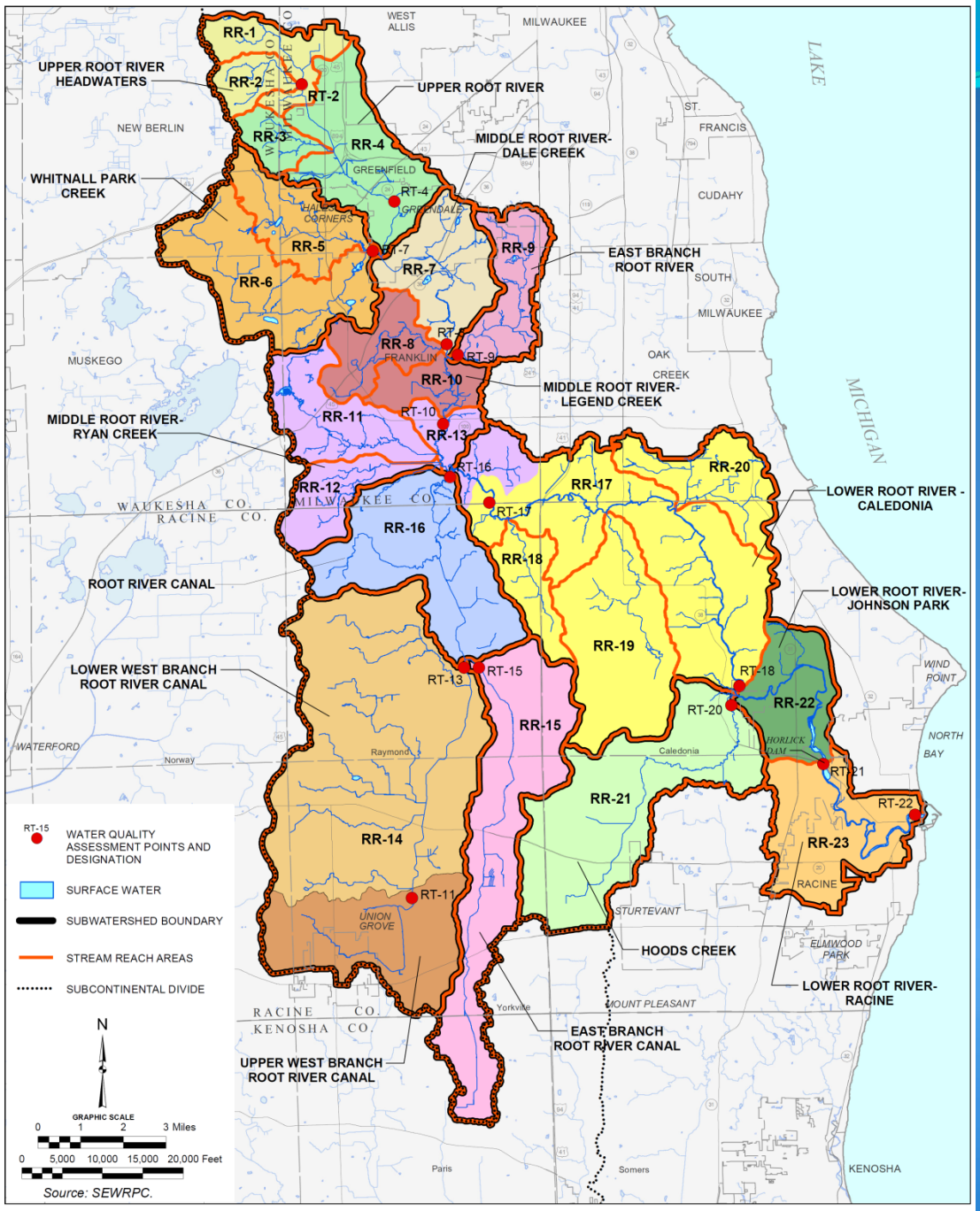


Riparian Buffers in the Root River Watershed: 2010

- Delineated Existing Riparian Buffer



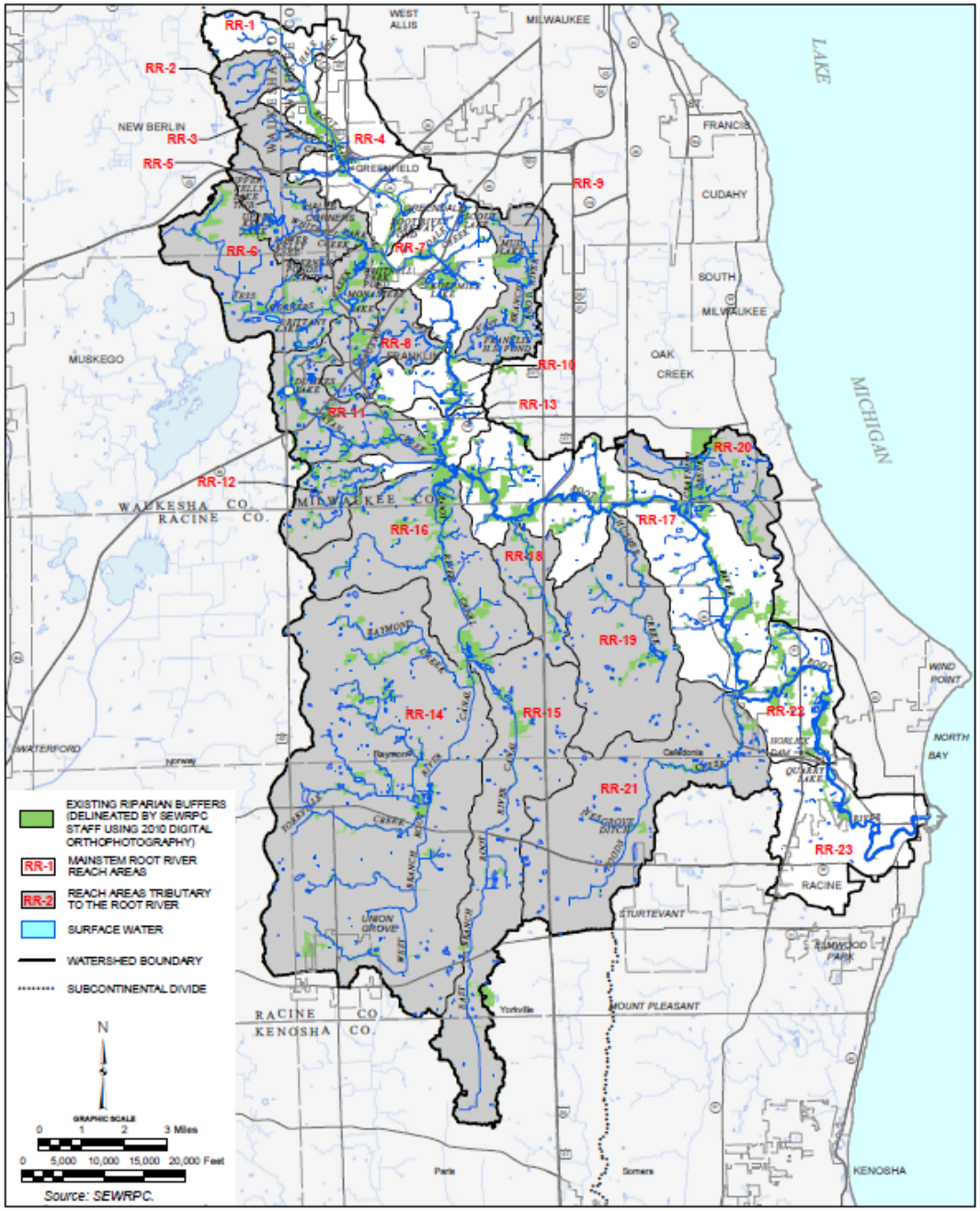
WATER QUALITY ASSESSMENT AREAS AND STREAM REACH AREAS WITHIN THE ROOT RIVER WATERSHED



Source: SEWRPC.

Map IV-19B

RIPARIAN BUFFERS WITHIN THE ROOT RIVER WATERSHED: 2010

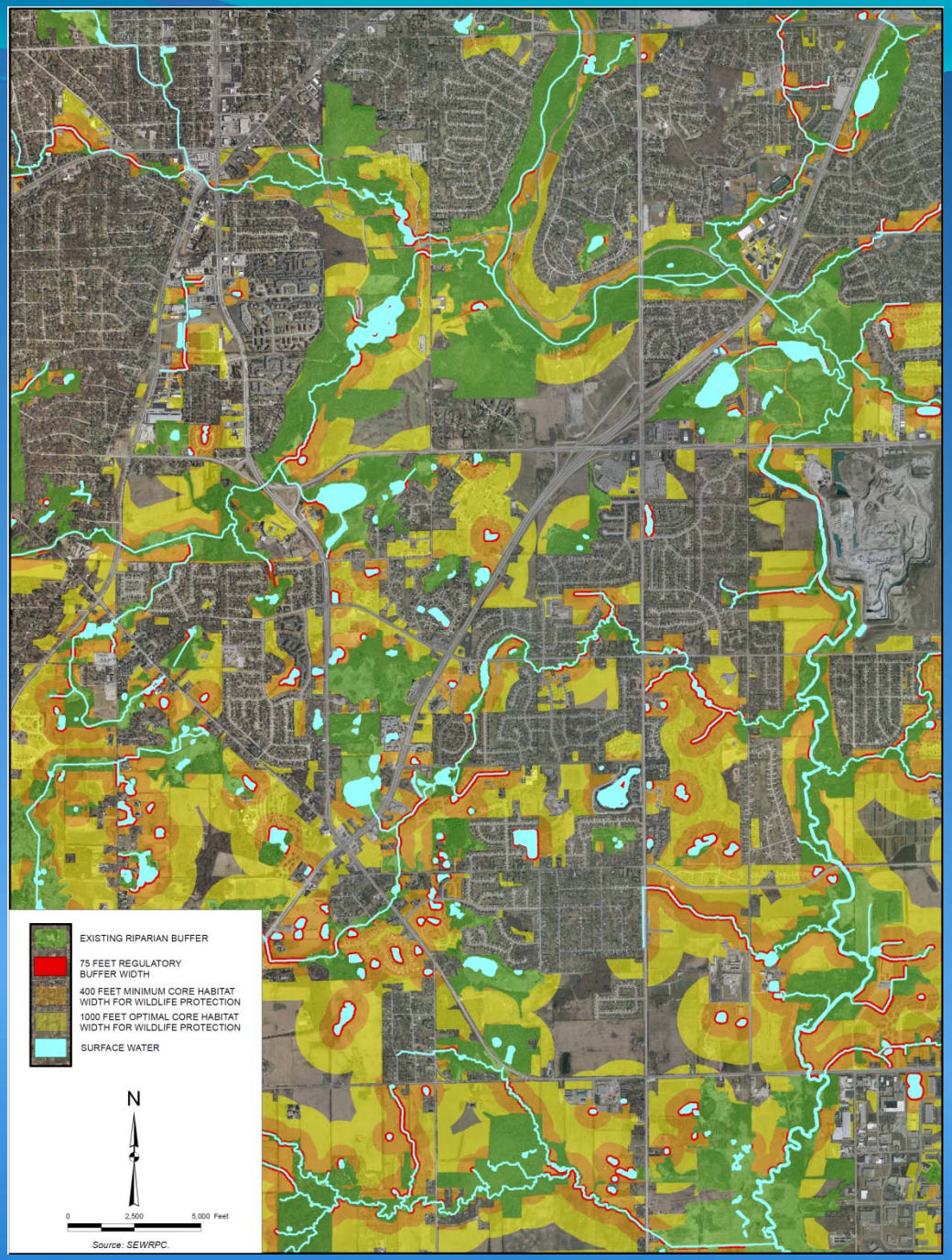


Source: SEWRPC.

Riparian Buffers

Next Step:

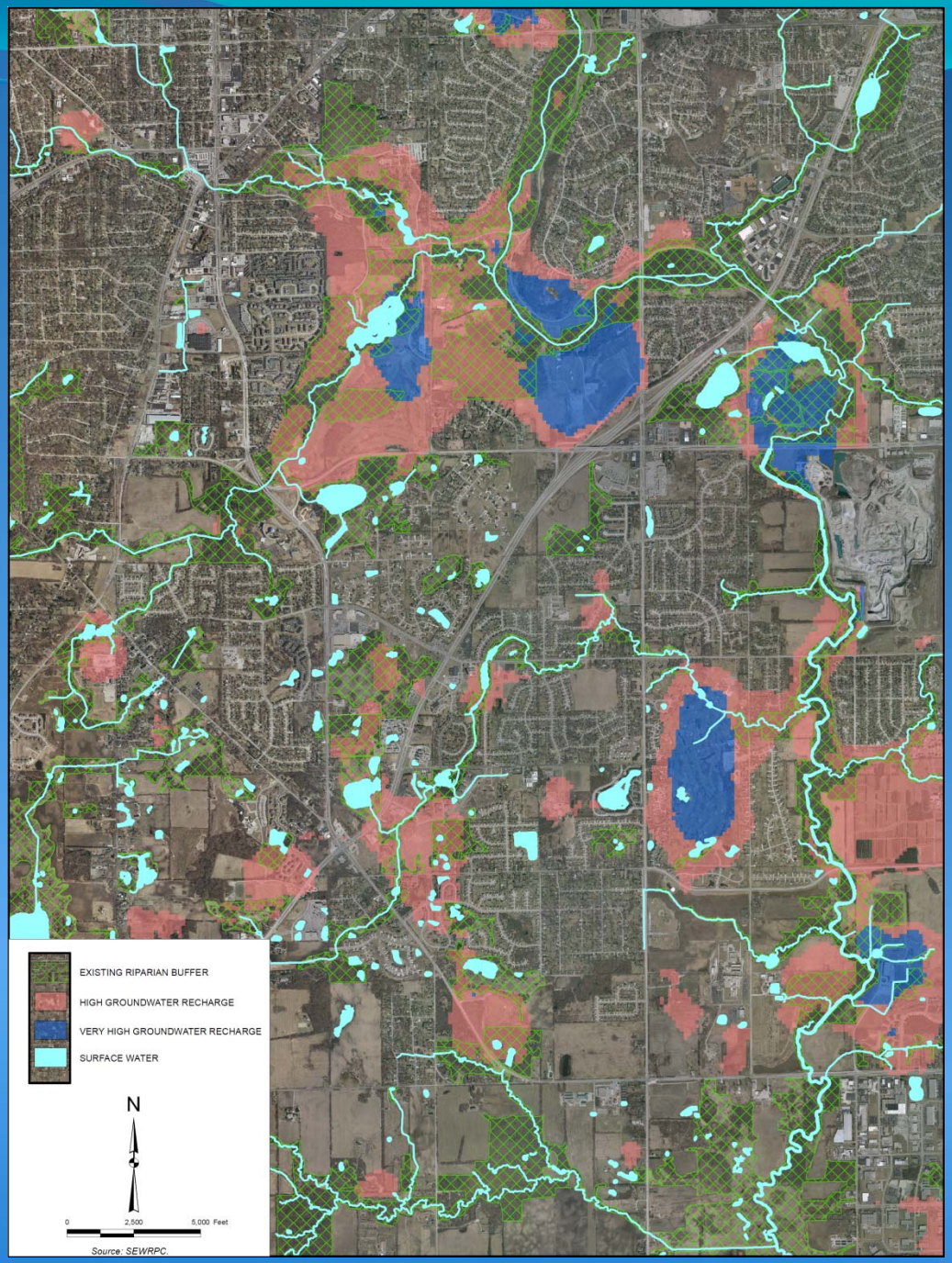
- Examine 75, 400, 900 Foot Buffer Width Distribution Among Reach Areas
- Best Opportunities For Riparian Buffer Expansion?



Riparian Buffers

Next Step:

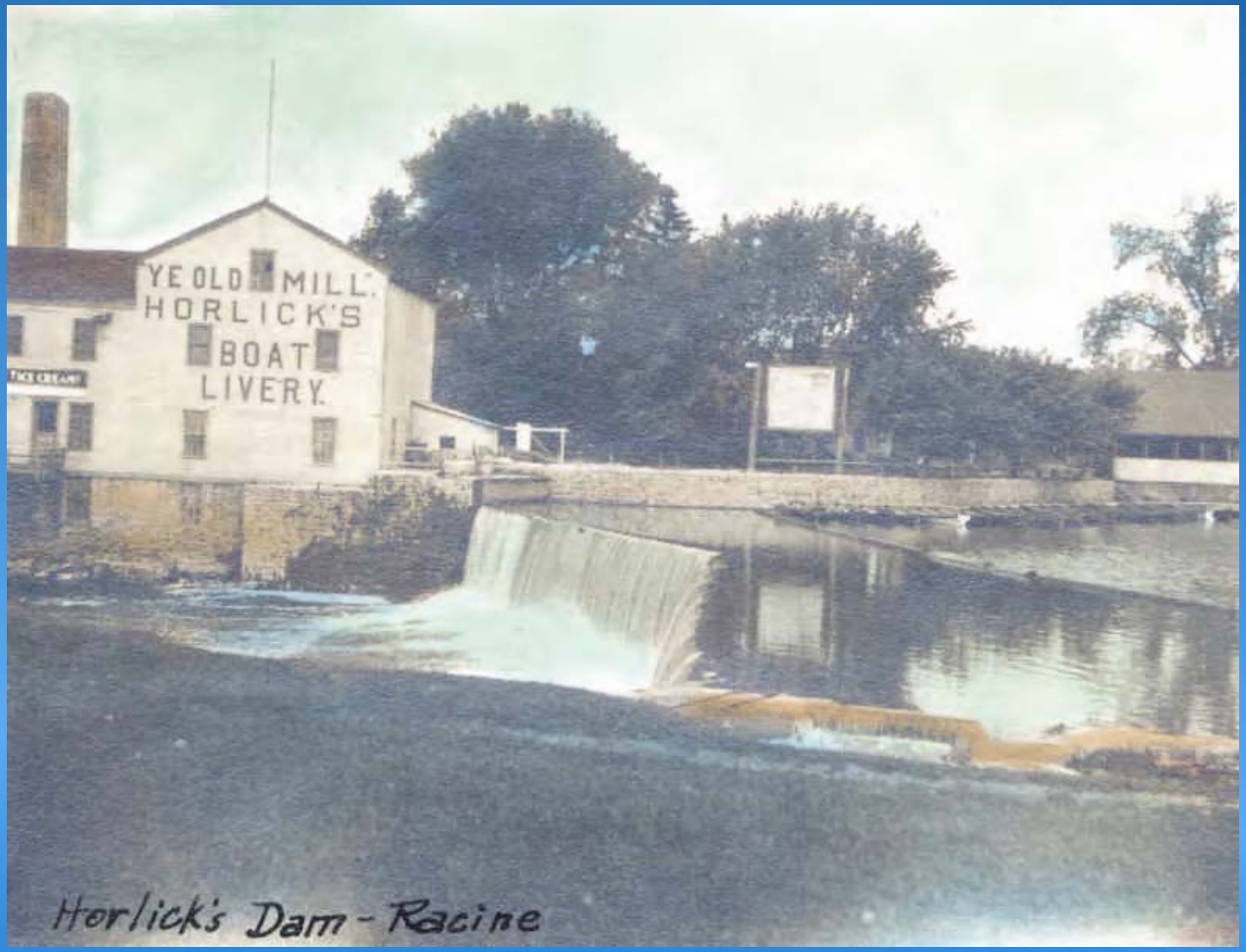
- Examine Groundwater Recharge Areas In Relation to Riparian Buffers
- Opportunities for Riparian Buffer Expansion And Protection of Areas of Highest Groundwater Recharge Potential?



Horlick dam

- History
- Sediment in Impoundment
- River Flows

1915



1915

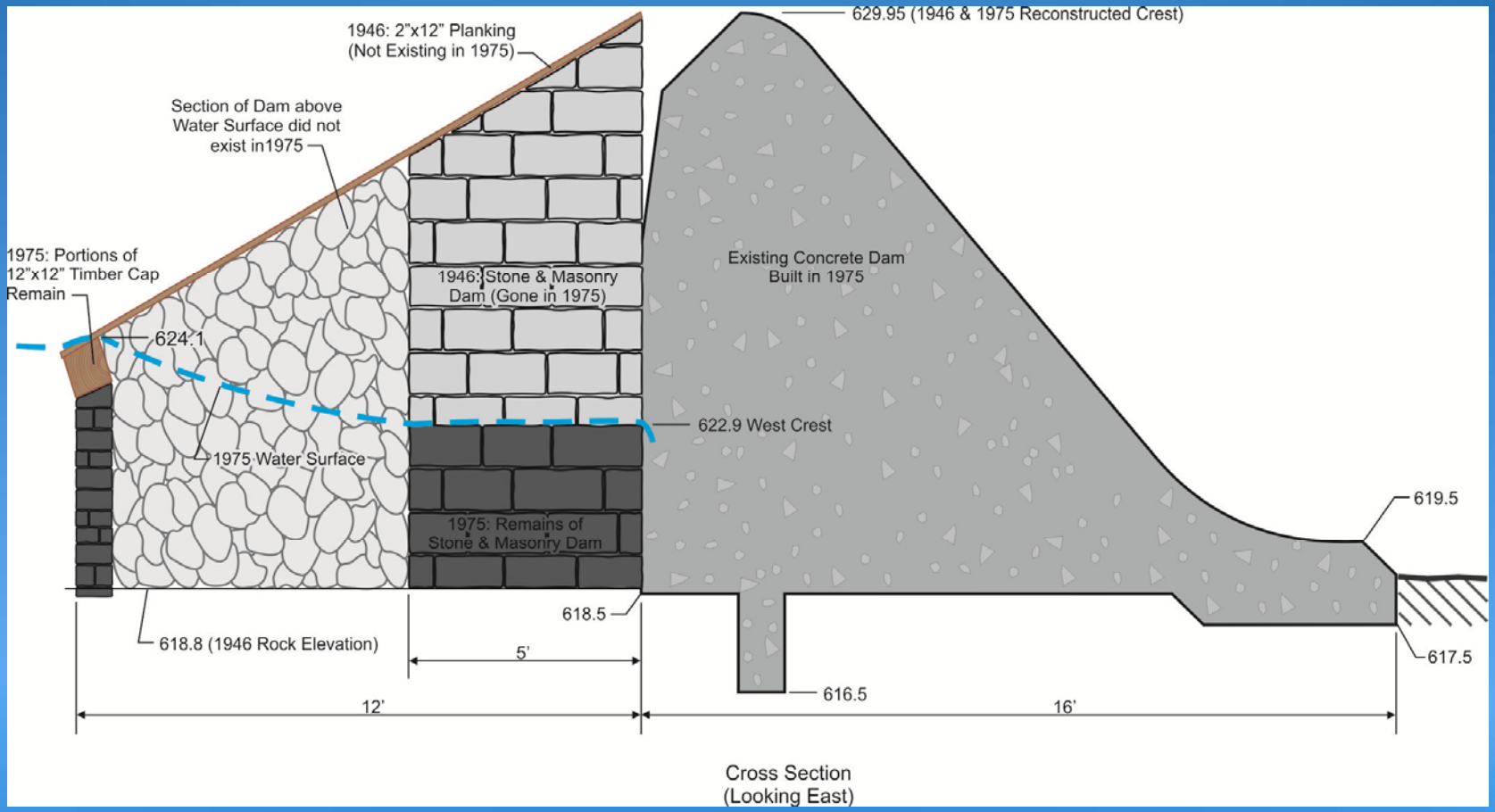
1950

1960

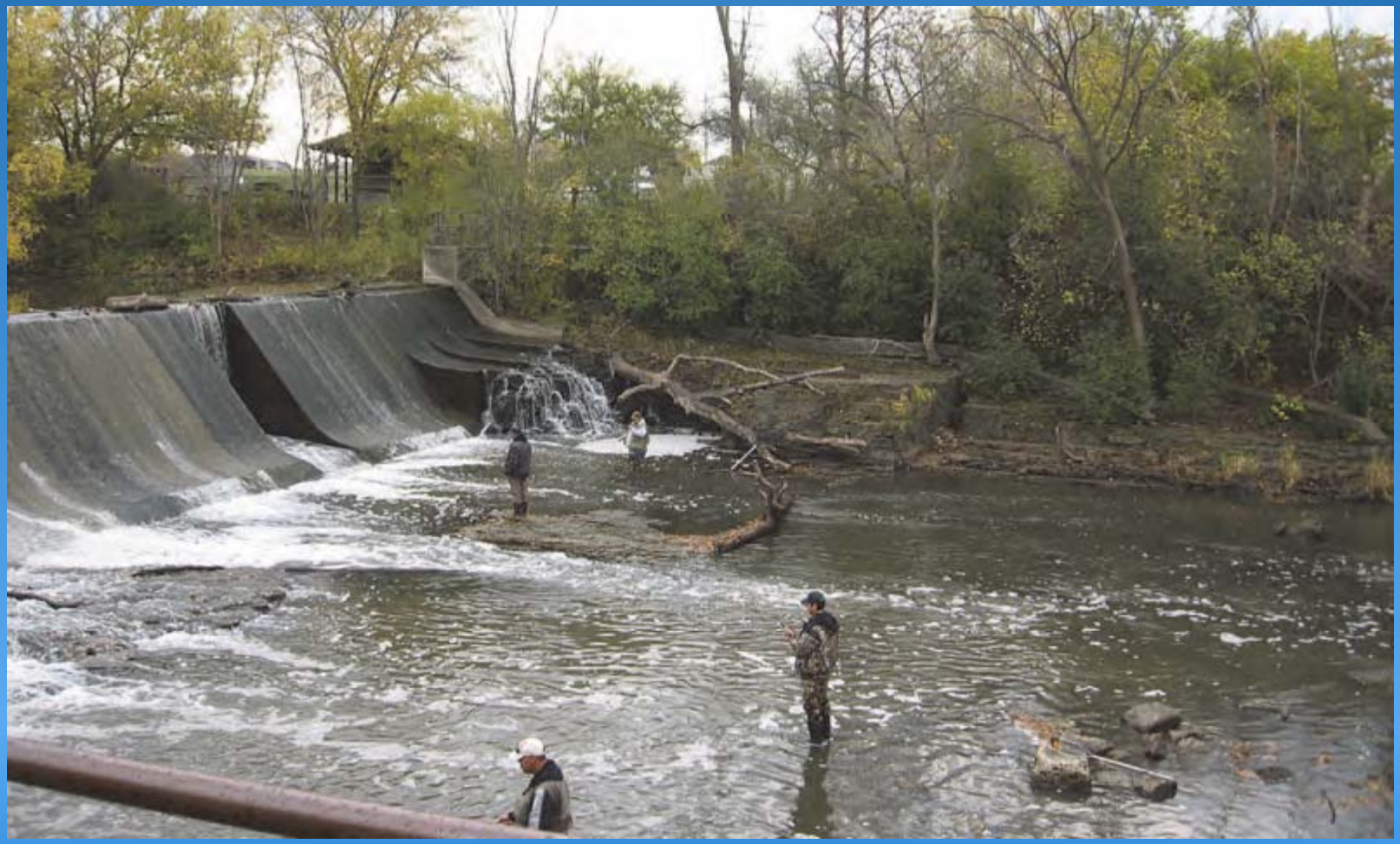
1975 before reconstruction

1975 Reconstruction

1975 Reconstruction



2011



Sediment Evaluation

Map IV-B

STREAM CROSS SECTION LOCATIONS

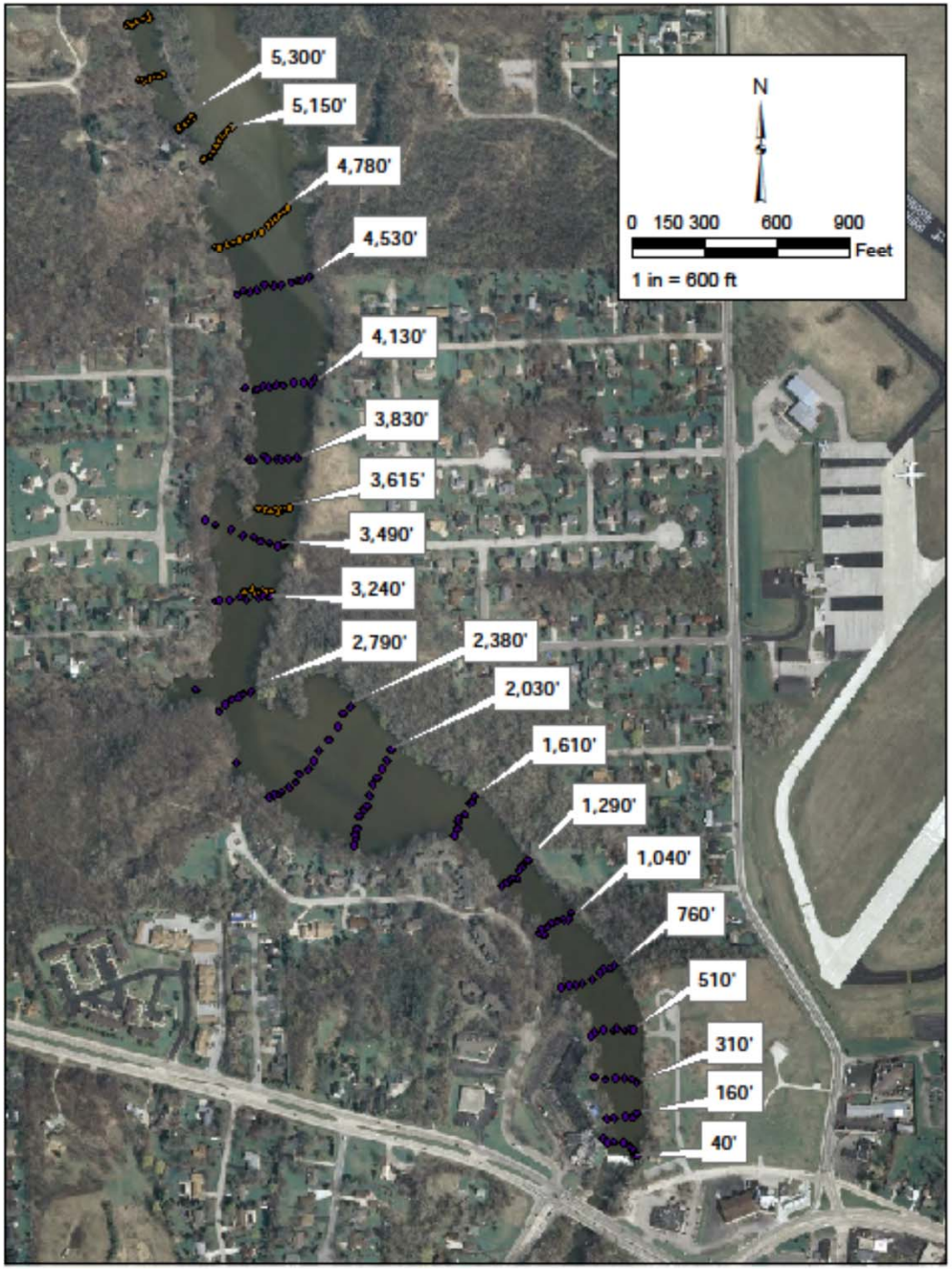
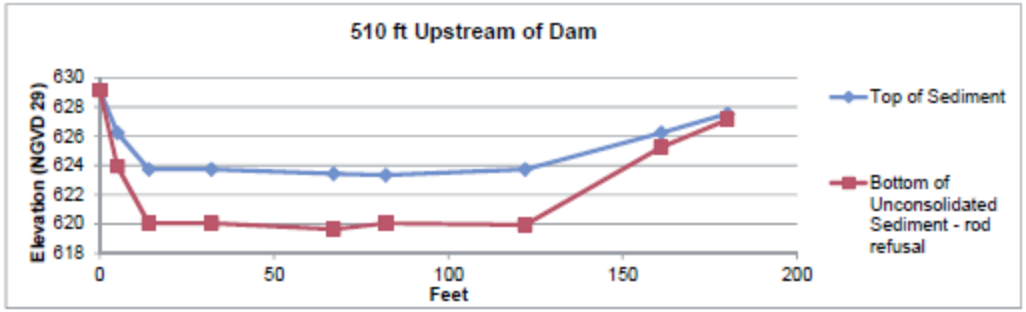
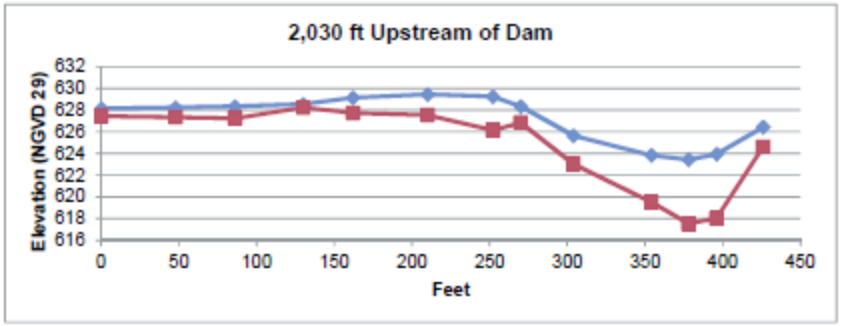
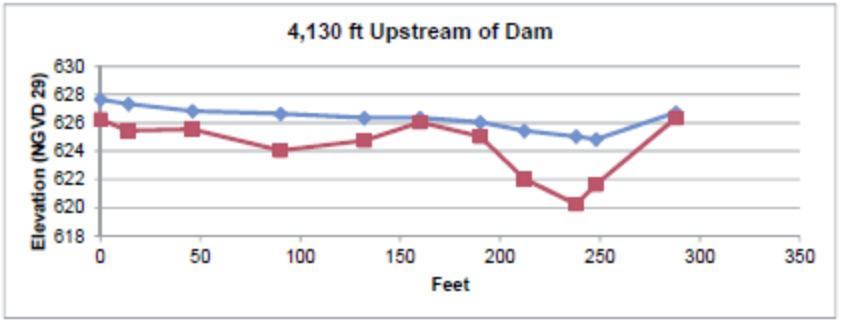


Figure IV-J

SELECTED HORLICK DAM IMPOUNDMENT CROSS-SECTIONS (looking downstream)







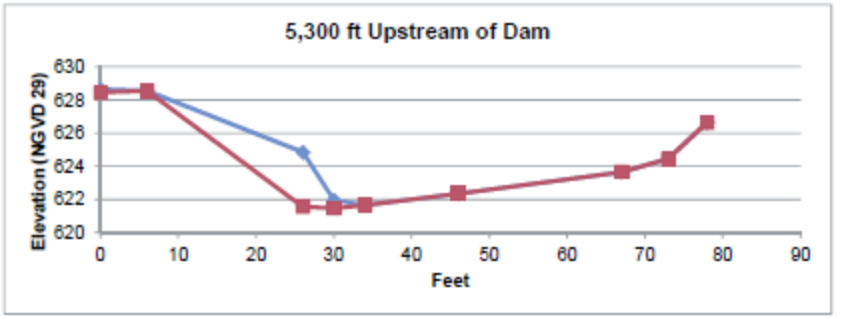
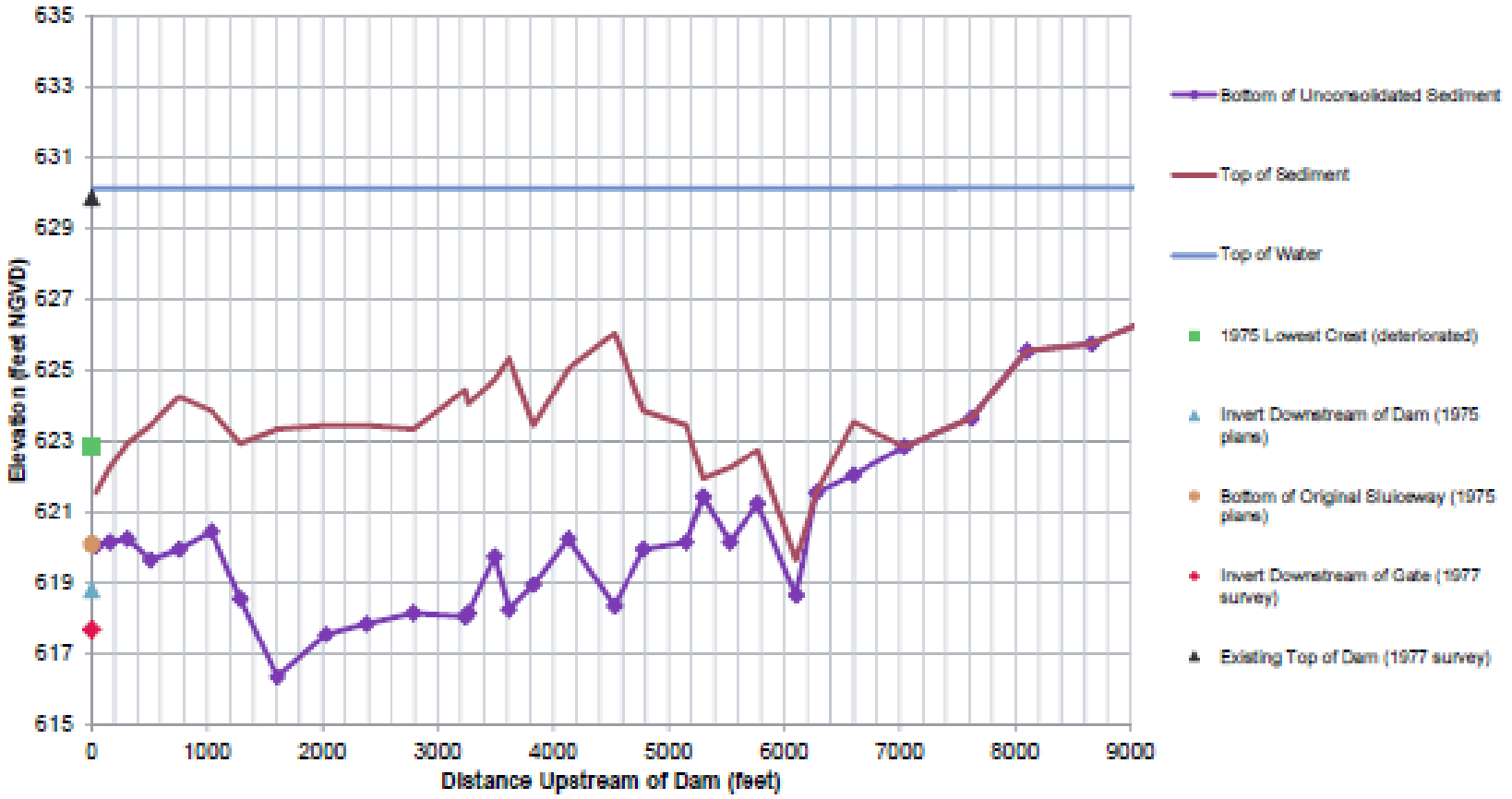


Figure IV-K

HORLICK IMPOUNDMENT PROFILE ON DECEMBER 1, 2011



River Flows

Figure IV-L

MONTHLY AVERAGE AND MAXIMUM MEAN DAILY FLOW
ROOT RIVER AT HORLICK DAM: WATER YEAR 1963 THROUGH 2011

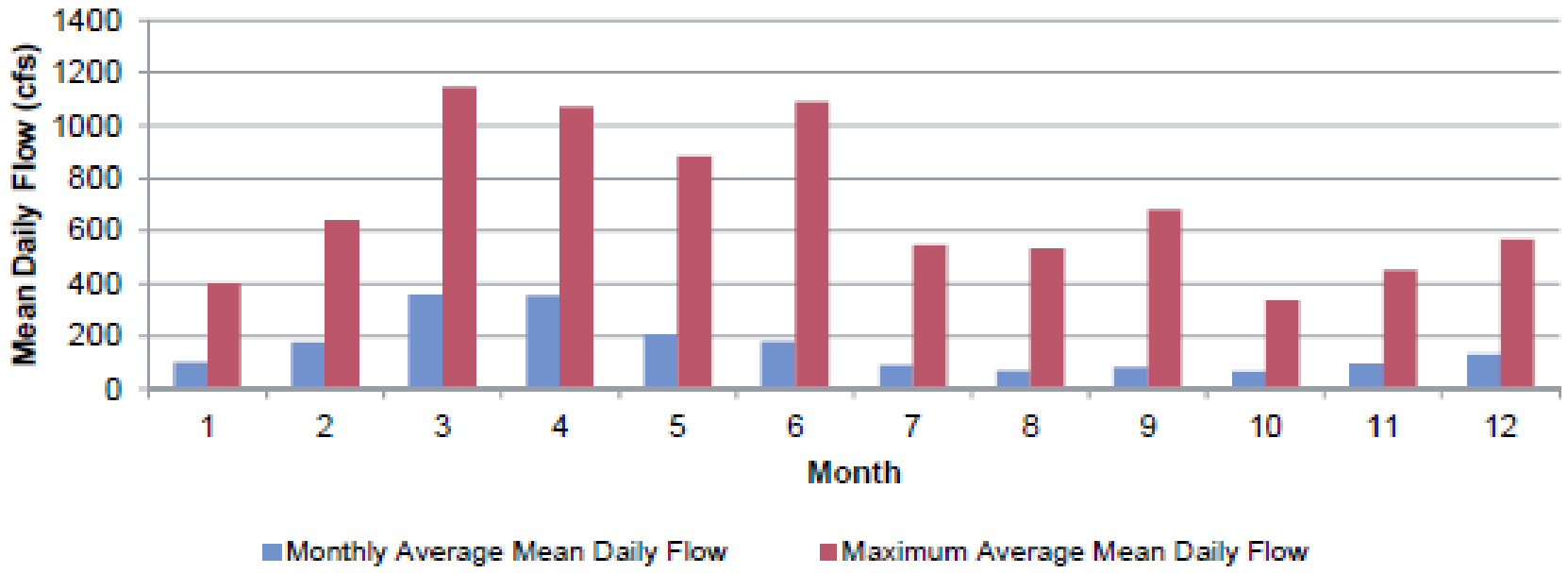
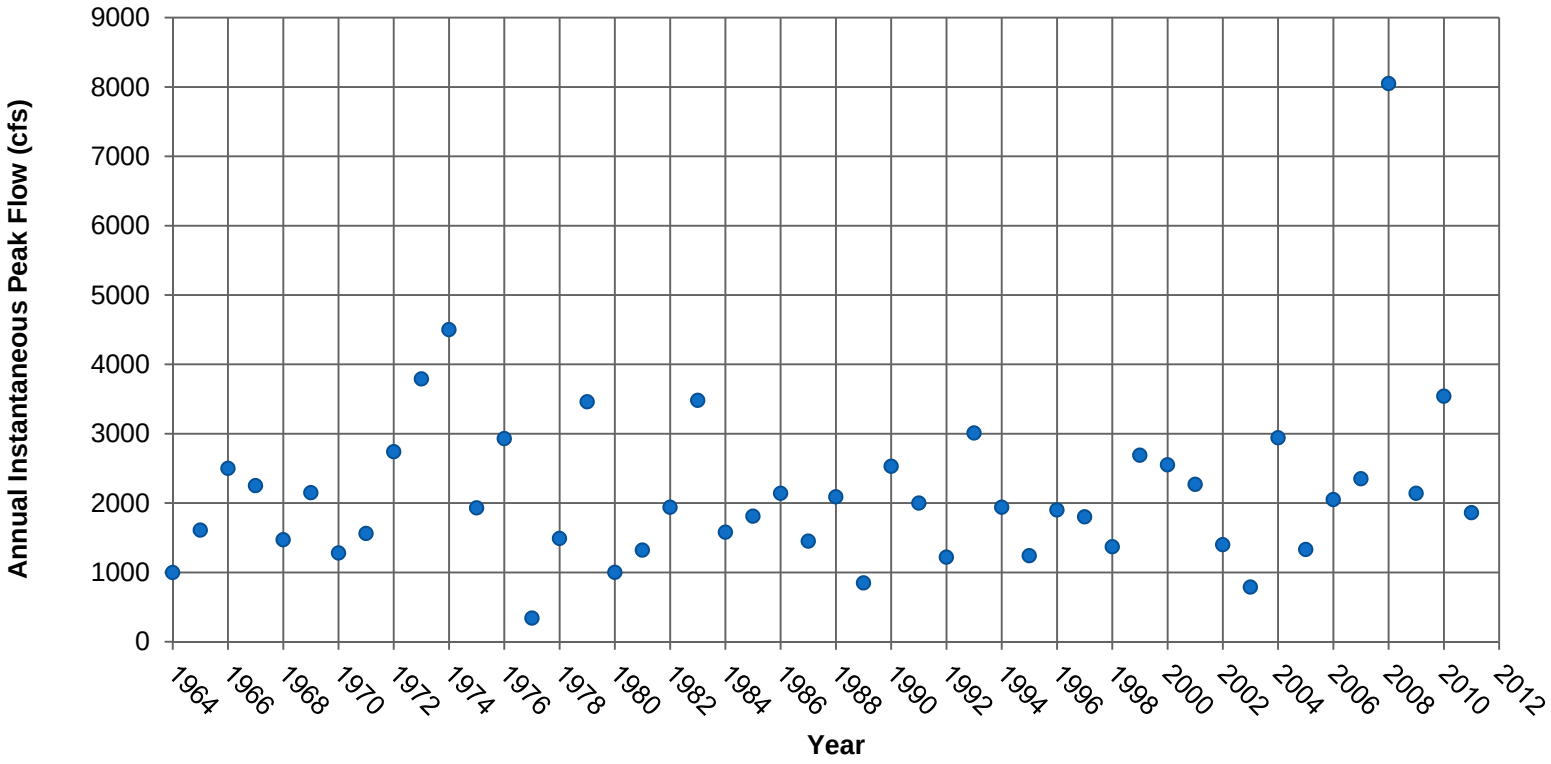


Figure IV-M

ANNUAL INSTANTANEOUS PEAK FLOWS
ROOT RIVER AT HORLICK DAM: WATER YEARS 1964 THROUGH 2011



Next Steps

- Continue and complete characterization of the watershed
  - Water quality
  - Biological conditions
    - Fish, macroinvertebrates, mussels
  - Invasive species
  - Buffer analyses
  - Stream Characteristics
- Identify targets to be achieved by the end of the plan implementation period

Project Web Site

- http://www.sewrpc.org/SEWRPC/Environment/Root-River-Watershed-Restoration-Plan.htm

  - Presentations from RRRPG meetings
  - Summary notes from Advisory Group meetings
  - Draft chapters as they are completed
  - Comment screen