

SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

W239 N1812 ROCKWOOD DRIVE • PO BOX 1607 • WAUKESHA, WI 53187-1607 • TELEPHONE (262) 547-6721
FAX (262) 547-1103

Serving the Counties of:

KENOSHA
MILWAUKEE
OZAUKEE
RACINE
WALWORTH
WASHINGTON
WAUKESHA



February 8, 2016

Ms. Susan L. Sylvester
Director, Bureau of Water Quality
Wisconsin Department of Natural Resources
101 S. Webster Street – GEF2
P.O. Box 7921
Madison, WI 53707-7921

Dear Ms. Sylvester:

Pursuant to the provisions of the cooperative agreement entered into on May 20, 2015 and amended on October 12, 2015, between the Southeastern Wisconsin Regional Planning Commission and the Wisconsin Department of Natural Resources governing the conduct of continuing areawide water quality management planning in southeastern Wisconsin during 2015, we are providing to you herewith a report of work completed under that agreement for the period from January 1, 2015, through December 31, 2015. The work completed is summarized in two tables attached hereto.

Table 1 indicates the work products specified to be provided under each work element of the cooperative agreement, as well as a summary listing of the work products completed during the year. Table 2 provides additional detail as to the specific work products completed, and indicates the status of the delivery of those work products to you. The tabular data are also being submitted electronically to the Department SWIMS database, as is the agreed-upon procedure.

Should you have any questions concerning this matter, please do not hesitate to contact Laura L. Kletti of the Commission staff directly at (262) 953-3224, or lkletti@sewrpc.org.

Sincerely,

Kenneth R. Yunker P.E.
Executive Director

KRY/MGH/LLK/kmd
WDNR 2015 FULL YEAR WQ PLAN STATUS REPORT (00230001).DOC

Enclosures

cc: Mr. Tim Asplund, Section Chief, WDNR-Madison
Ms. Lisa Helmuth, Water Resources Management Specialist, WDNR-Madison
Ms. Johanna Lathrop, Water Resources Management Specialist, WDNR-Madison
Ms. Sharon L. Gayan, WDNR Water Quality Deputy Bureau Director (w/Tables 1 & 2)

Table 1

**2015 CONTINUING WATER QUALITY PLANNING PROGRAM PROJECT OUTPUT SUMMARY
January 1, 2015 through December 31, 2015**

Work Project and Project Output Anticipated from January 1, through December 31, 2015 per 2015 Agreement	Project Outputs Completed during January 1, through December 31, 2015 (see Table 2 for details)
Project 300-1000: Water Quality Management Plan Coordination and Extension of Implementation Activities	
1. Two letter reports or memoranda	1. Three letter reports
2. Assistance and Data Provision to WDNR, County Land and Water Conservation Committees, and Other Designated Management Agencies for Watershed and other Water Quality-Related WDNR Advisory Committees, Including Statewide Activities	2. <ul style="list-style-type: none"> • Attendance and material review for seven meetings of MMSD Technical Advisory Team (TAT) • Served on the following MMSD project committees: <ul style="list-style-type: none"> ○ Burnham Canal technical stakeholder committee ○ Phase 1 Menomonee River fish passage restoration project ○ Removal of low head fish passage barriers on Menomonee River near Hoyt Park ○ Kinnickinnic River (Reach 2, Phase 1) stream rehabilitation and flood mitigation project • Continued to serve as a technical advisor on the WDNR Milwaukee Estuary Area of Concern Fish and Wildlife Technical Team • Served on an NRCS technical standards committee developing new agricultural filter strip standards • Participated as technical advisory committee member of the Wisconsin Wetlands Association's (WWA) Land Use and Wetlands Advisory Group for development of a statewide <i>Conservation Wetland Ordinance</i> • Participation as member of the Root-Pike Watershed Initiative Network (WIN) • Participation as a technical advisor to the Southeastern Wisconsin Fox River Commission • Participation in the Southeastern Wisconsin Watersheds Trust, Inc. (Kinnickinnic, Menomonee, and Root River watersheds; Oak Creek watershed; Lake Michigan direct drainage area; Milwaukee Harbor estuary; and nearshore Lake Michigan area). Commission staff serves on the Board of Directors; Science, Policy, and Strategic Planning Committees • Participated as a project partner in the Oconomowoc River Watershed Protection Program (OWPP) and Regional Conservation Partnership Program (RCPP) sponsored by the City of Oconomowoc
3. Assistance to 35 Lake Organizations and Participation with WDNR and Others in Statewide Lake Planning	3. <ul style="list-style-type: none"> • Provision of assistance to 34 lake and river-related organizations and two counties • Participation with WDNR Southeast Region staff and State, national, and international lakes organizations to coordinate lakes planning, including attendance at meetings
4. 30 Public Informational Reports or Presentations	4. 28 presentations on water quality issues and environmental corridors

Table 1 (continued)

Work Project and Project Output Anticipated from January 1, through December 31, 2015 per 2015 Agreement	Project Outputs Completed during January 1, through December 31, 2015 (see Table 2 for details)
5. WDNR-SEWRPC Program Coordination	5. Coordination with WDNR, including contract and work program development, and submittal of work products In 2015, included GIS files of year 2010 urban areas served by public sanitary sewers
6. Attendance at 140 Meetings Related to Water Quality	6. Attendance at 146 meetings related to water quality planning
7. Special subwatershed or County Land and Water Management Plan assistance	7. No specific assistance, but many of the activities listed elsewhere in this summary report relate to land and water resource management in the counties of the Region. See specifically 300-1000, Items 2, 3, and 8 and 300-4000, Item 2
8. Miscellaneous Plan Implementation Activities	8. <ul style="list-style-type: none"> • Maintain permit and data files; provision of information on a walk-in or telephone basis (240 meetings/phone calls/e-mails) (see Project 300-2000, Item 3) • Participated in the Menomonee River Watershed-Based Permit Partners Group that is implementing the permit compliance components of the new watershed-based MS4 permit
Project 300-2000: Sanitary Sewer Extension Reviews and Assistance	
1. 110 Public and Private Sewer Extension Reviews	1. 136 public and private sewer extension reviews and letter reports
2. 12 Letter Reports Documenting In-Field Delineations of Environmentally Sensitive Lands	2. 35 letter reports
3. 125 Meetings/Phone Calls/E-mails to Review Environmentally Sensitive Areas and Related Matters Concerning Sewer Extensions and Sewer Service Areas	3. About 240 meetings/phone calls/e-mails with landowners, developers, and local officials
Project 300-3000: Sewer Service Area Plan Refinements	
1. One Sewer Service Area Plan	1. One 2 nd edition sewer service area plan was completed
2. Revisions to 5 Previous Sewer Service Area Plans	2. Five amendments to previous sewer service area plans were completed
3. 12 Special Letter Reports on Environmentally Sensitive Areas	3. 32 letter reports
4. Provision of Data for WDNR Environmental Assessments	4. Provision of data for environmental assessments is now routinely provided
5. Meetings and Miscellaneous Activities	5. As needed
6. Development of Procedures for Environmentally Sensitive Lands Recommendations	6. Continued refinement of procedures and provision of additional mapping within each sewer service area
Project 300-4000: Regional Water Quality Management Plan Update	
1. Continue to Support Subregional Plan Amendment Activities	1. See 300-1000, Item 1 and 300-3000, Items 1 and 2
2. Implementation of the regional water quality management plan update for the greater Milwaukee watersheds	2. Obtained USEPA certification that the plan set forth in SEWRPC Community Assistance Planning Report No. 316, <i>A Restoration Plan for the Root River Watershed</i> , July 2014, is consistent with the nine minimum elements of a watershed-based plan.

Table 1 (continued)

Work Project and Project Output Anticipated from January 1, through December 31, 2015 per 2015 Agreement	Project Outputs Completed during January 1, through December 31, 2015 (see Table 2 for details)
Project 300-5000: Regional Water Quality Management Plan Update—Groundwater Management Studies	
1. Miscellaneous activities	<ol style="list-style-type: none"> 1. Assisted the Village of Mount Pleasant and coordinated with WDNR in evaluating issues relative to water supply issues in the portion of the Village within the Mississippi River Basin 2. Coordinated with the WDNR regarding Waukesha water supply service area issues 3. Participated in the Wisconsin Water Conservation Coalition

00230001.DOC
 KRY/MGH/LLK/kmd
 02/05/16

Table 2

SUMMARY OF 2014 WORK PROGRAM PROJECT OUTPUTS AND STATUS OF DOCUMENTATION
January 1, 2015 through December 31, 2015

Work Products	Status of Documentation ^a
Project 300-1000: Water Quality Management Plan Coordination and Extension and Implementation Activities	
1. Three Letter Reports	
<ul style="list-style-type: none"> • City of Lake Geneva: Review of aerobic digester design report 01/19/15 1 • Walworth County: Review of issues related to WDNR determination that the County operates a municipal separate storm sewer system that requires coverage under WPDES General Permit No. WI-S050181-1 (two letter reports) 01/23/15 1 02/05/15 	
2. Assistance and Data Provision for WDNR and Major Water Quality Management Plan Designated Management Agency Programs	
<ul style="list-style-type: none"> • Participation as Member of MMSD TAT, Including Meetings and Material Reviews. During the Reporting Period, Attended Seven Meetings 2 • Served on four MMSD project committees related to stream rehabilitation, fish passage, and wetland restoration 2 • Continued to serve as a technical advisor on the WDNR Milwaukee Estuary Area of Concern Fish and Wildlife Technical Team 2 • Served on an NRCS technical standards committee developing new agricultural filter strip standards 2 • Participated as technical advisory committee member of the Wisconsin Wetlands Association's (WWA) Land Use and Wetlands Advisory Group for development of a statewide <i>Conservation Wetland Ordinance</i> 2 • Participation in Root-Pike Watershed Initiative Network 2 • Participation as a nonvoting Commissioner and technical advisor to the Southeastern Wisconsin Fox River Commission (SEWFRC) 2 • Participation in Southeastern Wisconsin Watersheds Trust, Inc. 2 • Project partner in the Oconomowoc River Watershed Protection Program (OWPP) and Regional Conservation Partnership Program (RCPP) 2 	
3. Assistance to Lake Organizations	
<ul style="list-style-type: none"> • Provision of Assistance to a Total of 34 Lake or River Organizations and two counties (not including actual plan preparation). See Table, Item 3, 300-1000 3 • Participation in WDNR and Other Organizational, Regional, Statewide, National, and International Lakes Planning Programs 2 	
4. Public Information—Education Reports or Presentations	
<ul style="list-style-type: none"> • Participated in the 2015 Wisconsin Lakes Convention 2 • 28 presentations on Water Quality Topics 3 (three examples provided) 	
5. WDNR Project Coordination and Work Program Development	
<ul style="list-style-type: none"> • General Coordination with WDNR 2 • Preparation of Annual Work Plans 2 • Submittal of Work Products (In 2015, included GIS files of year 2010 urban areas served by public sanitary sewers) 2 	
6. Attendance at 146 Meetings Related to Water Quality Planning	2
7. County Land and Water Resource Management Plan Assistance	2
8. Miscellaneous Plan Activities	
<ul style="list-style-type: none"> • Maintenance and Review of Water Quality Related File Data, Including WPDES Permits for Public Sewage Treatment Plants 2 • Provision of Available Information on Sewage Systems, Lakes, Environmentally Significant Areas. (Walk-In or by Telephone), About 240 Meetings/Phone Calls/E-mails (also relates to Project 300-2000, Item 3) 2 • Participated in the Menomonee River Watershed-Based Permit Partners Group that is implementing the permit compliance components of the new watershed-based MS4 permit 2 	

Table 2 (continued)

Work Products	Status of Documentation ^a
Project 300-2000: Sanitary Sewer Extension Reviews	
1. 64 Public and 72 Private Sewer Extension Reviews (see listings)	3
2. 35 Letter Reports on Field Delineation of Environmentally Sensitive Lands for Sewer Extension Projects	3 (three examples provided)
3. About 240 Meetings/Phone Calls/E-mails Related to Environmentally Sensitive Lands Data and Related Matters Concerning Sewer Extensions, Service Areas, and Other Development or Preservation Projects (also relates to Projects 300-1000 and 300-3000)	2
Project 300-3000: Sewer Service Area Plan Refinements	
1. One Sewer Service Area Plan <ul style="list-style-type: none"> • Village of Mukwonago and Environs 	4 http://www.sewrpc.org/SEWRPCFiles/Publications/CAPR/capr-191-2nd-ed-ssa-village-of-mukwonago.pdf
2. Amendment Documents for Five Previous Sewer Service Area Plans <ul style="list-style-type: none"> • City of Kenosha-Final • Village of Germantown-Final • Village of Grafton-Final • Village of Hartland-Final • Village of Walworth-Final 	4 http://www.sewrpc.org/SEWRPCFiles/Publications/ssa/2015-06-amendment-greater-kenosha-area.pdf 4 http://www.sewrpc.org/SEWRPCFiles/Publications/ssa/2015-06-amendment-germantown-wi.pdf 4 http://www.sewrpc.org/SEWRPCFiles/Publications/ssa/2015-03-amendment-Cedarburg.pdf 4 http://www.sewrpc.org/SEWRPCFiles/Publications/ssa/2015-03-amendment-hartland.pdf 4 http://www.sewrpc.org/SEWRPCFiles/Publications/ssa/2015-03-amendment-walworth.pdf
3. 32 Special Letter Reports	3 (two examples provided)
4. Provision of Data for Environmental Assessments is Routinely Provided As Part of Submittal to WDNR	2

Table 2 (continued)

Work Products	Status of Documentation ^a
5. Meetings and Other Miscellaneous Activities	2
6. Procedures for Adding Detail to Sewer Service Area Plans Regarding Environmentally Sensitive Lands Changes Are Incorporated into New Reports and Routine Submittal of Supplementary Data with Report Submittal. Will Continue to Refine Procedure	2
Project 300-4000: Regional Water Quality Management Plan Updating and Extension	
1. Continue to Support Subregional Plan Amendment Activities	See 300-1000, Item 1 and 300-3000, Items 1 and 2
2. Continue implementing the regional water quality management plan update for the greater Milwaukee watersheds: Obtained USEPA certification that the plan set forth in SEWRPC Community Assistance Planning Report No. 316, <i>A Restoration Plan for the Root River Watershed</i> , July 2014, and supplemented by SEWRPC Memorandum Report No. 220, <i>Supplemental Information Developed for the Root River Watershed Restoration Plan</i> , April 2015, is consistent with the nine minimum elements of a watershed-based plan.	4 http://www.sewrpc.org/SEWRPCFiles/Publications/mr/mr-220-supplemental-info-for-root-river-wshed-plan.pdf
Project 300-5000: Regional Water Quality Management Plan Update—Groundwater Management Studies	
1. Miscellaneous Activities Related to Water Conservation and the Regional Water Supply Plan	
• Assisted the Village of Mount Pleasant and coordinated with WDNR in evaluating issues relative to water supply issues in the portion of the Village within the Mississippi River Basin	2
• Coordinated with the WDNR staff regarding Waukesha water supply service area issues	2
• Participated in the Wisconsin Water Conservation Coalition	2

^aStatus of documentation Categories:

- 1—Previously provided to Wisconsin Department of Natural Resources with project output reports.
- 2—No specific documentation required.
- 3—Provided to Wisconsin Department of Natural Resources with this report.
- 4—See SEWRPC website.

00230001.DOC
 KRY/MGH/LLK/kmd
 02/05/16

300-1000
ITEM 3

2015 LAKE AND RIVER WATER QUALITY MANAGEMENT ACTIVITIES (300-1000-ITEM 3)
January 1, 2015 through December 31, 2015

Lake or River	Activity
Rock Lake	<p>SEWRPC staff provided advisory services to the Rock Lake Restoration Association and WDNR on aquatic plant harvesting techniques and permitting issues</p> <p>SEWRPC staff completed the final version of Community Assistance Planning Report No. 319 entitled, <i>A Lake Protection Plan for Rock Lake, Kenosha County, Wisconsin</i>, published in June 2015</p> <p>SEWRPC hosted a community meeting to communicate planning efforts as well as to collect issues of concerns to Lake residents</p>
Pike Lake	SEWRPC staff continued planning efforts which will contribute to the ongoing Pike Lake Protection Plan.
Little Muskego Lake	<p>SEWRPC staff provided advisory services to the Little Muskego Lake Association on aquatic plant chemical treatment and permitting issues, including issues related to a new invasive species found in the Lake (Starry Stonewort)</p> <p>SEWRPC Staff continued planning efforts which will contribute to the ongoing Pike Lake Protection Plan.</p>
Nagawicka Lake	SEWRPC staff began work on a new Lake Protection Planning Project for the City of Delafield Lake Welfare Committee.
Hooker Lake	SEWRPC staff continued planning efforts which will contribute to the ongoing Hooker Lake Water Quality Assessment and Aquatic Plant Management Plan.
Gilbert Lake and Big Cedar	<p>SEWRPC staff completed the draft of Staff Memorandum entitled, <i>Groundwater investigation for Gilbert Lake in Washington County</i>.</p> <p>SEWRPC staff attended Commissioner meeting to discuss report edits.</p>
Pleasant Lake	SEWRPC staff continued planning efforts which will contribute to the ongoing Pleasant Lake Protection and Aquatic Plant Management Plan
Lake Denoon	SEWRPC staff continued planning efforts which will contribute to the ongoing Denoon Lake Management Plan
Bark Lake	SEWRPC staff presented the finalized Lake Protection Plan at a Bark Lake Association annual meeting.
Silver Lake (Washington County)	SEWRPC staff began work on a new Lake Protection Planning Project for the Silver Lake Protection and Rehabilitation District, which has included the partial completion of an aquatic plant management survey.
Pewaukee Lake	SEWRPC staff continued planning efforts which will contribute to the ongoing Pewaukee Lake Protection Plan
Waterford Impoundment	SEWRPC staff completed an amendment to the 2012 SEWRPC Staff Memorandum <i>An Aquatic Plant Management Plan Update for Waterford Impoundment, Racine County, Wisconsin</i> which incorporated a new aquatic plant management technique
Whitewater and Rice Lakes (Walworth County)	SEWRPC staff continued planning efforts which will contribute to the ongoing Whitewater and Rice Lakes Protection and Aquatic Plant Management Plan.
Kenosha County Lakes and Streams	<p>SEWRPC staff continued planning efforts focused on the preparation of updated ordinance recommendations consistent with the requirements of Chapter NR 115, "Wisconsin's Shoreland Protection Program," of the <i>Wisconsin Administrative Code</i></p> <p>SEWRPC staff completed impervious surface and setback calculations for 19 subwatersheds within Kenosha County</p>
Walworth County Lakes and Streams	SEWRPC staff presented planning efforts and provided advisory services at the Walworth County Lakes Association annual meeting
Jackson Creek	SEWRPC staff provided advisory services to the Kettle Moraine Land Trust and conduct inventories and participated in meetings as part of the ongoing watershed protection planning efforts

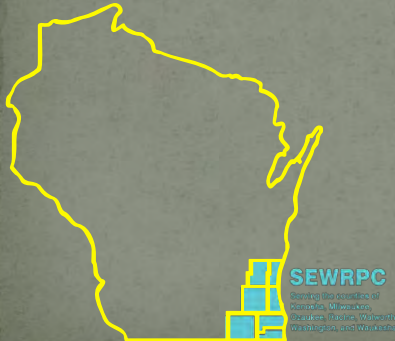
**2015 LAKE AND RIVER WATER QUALITY MANAGEMENT ACTIVITIES (300-1000-ITEM 3)
January 1, 2015 through December 31, 2015 (continued)**

Lake or River	Activity
Mason Creek	SEWRPC staff provided advisory services to North Lake and Tall Pines Conservancy and conduct inventories and participated in meetings as part of the ongoing watershed protection planning efforts
Pewaukee River	SEWRPC staff provided advisory services to the Pewaukee River Partnership
Menomonee River and Kinnickinnic River	<p>SEWRPC staff provided advisory services to the Southeastern Wisconsin Watersheds Trust, Inc.</p> <p>SEWRPC staff provided technical advisory services to MMSD and WDNR associated with the U.S. Fish and Wildlife Service Fish Passage Project on the Menomonee River involving concrete removal and design and construction of instream habitat to promote fish passage</p> <p>Continued to serve on the Menomonee River Technical Stakeholder Committee as part of the MMSD project for the removal of three low flow barriers to improve fish passage</p> <p>Continued to serve on the Kinnickinnic River (Reach 2, Phase 1) stream rehabilitation and flood mitigation project stakeholder and team member committee providing advice on MMSD efforts to rehabilitate the stream reaches and improve flood management between S. 6th Street and S. 27th Street</p>
Milwaukee Estuary Area of Concern	SEWRPC staff continued to serve on the Milwaukee Estuary Area of Concern (AOC) Fish and Wildlife Technical Advisory Committee, the Habitat Improvement in the Estuary Environment (HIPEE) Technical Advisory Team, and the Burnham Canal Technical Stakeholder Committee for an MMSD and US Army Corps of Engineers project
Little Menomonee River, Bark River, Pike River, Fox River, and Tributaries to the Des Plaines River, Menomonee River, and Oak Creek	SEWRPC staff provided technical advisory services for several project involving stream channel assessment, culvert replacement and fish passage design, potential channel relocation alternatives, and/or stream and wetland restoration recommendations for the Wisconsin Department of Transportation and Wisconsin Department of Natural Resources staff
Other	<p>Participated in Statewide programs: SEWRPC staff continued to provide assistance as requested to the Wisconsin Lakes Partnership</p> <p>Worked with the Southeastern Wisconsin Fox River Commission, Southeast Fox River Partnership, and the Fox River Ecosystem Partnership to organize and host the 4th Annual Fox River Summit to continue to bring together watershed organizations in Wisconsin and Illinois for a one-day discussion of common interests and possible opportunities for future cooperation</p> <p>Gave a presentation on the water quality benefits of buffers at a "Wild Ones" Chapter Meeting and at the Friends of Mukwonago Annual meeting</p>
Other (continued)	<p>One SEWRPC staff person completed a "Shoreline Restoration" training program, developed by the UW-Extension system.</p> <p>Three SEWRPC staff presented at, and attended, the Wisconsin Lakes Partnership conference to remain aware of developments in Statewide lake management efforts</p>

300-1000
ITEM 4

Lake and Watershed Management Planning Status & Updates

in Southeastern Wisconsin



Thomas M. Slawski

Southeast Region

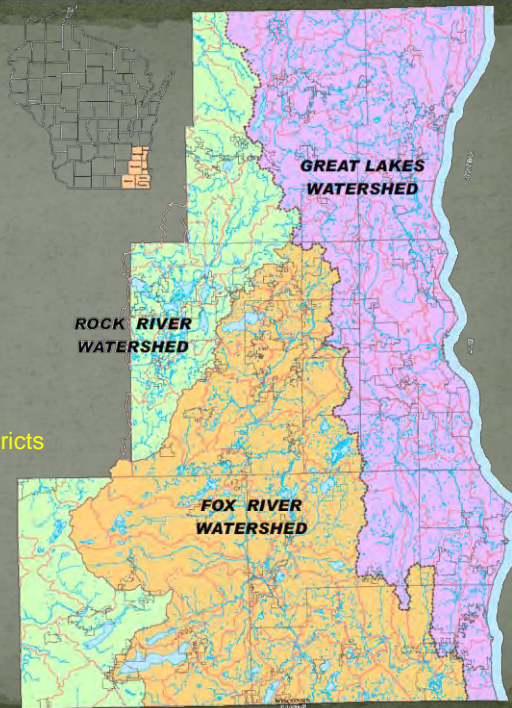
4.8% of the total land area
of the State

34% of the total population

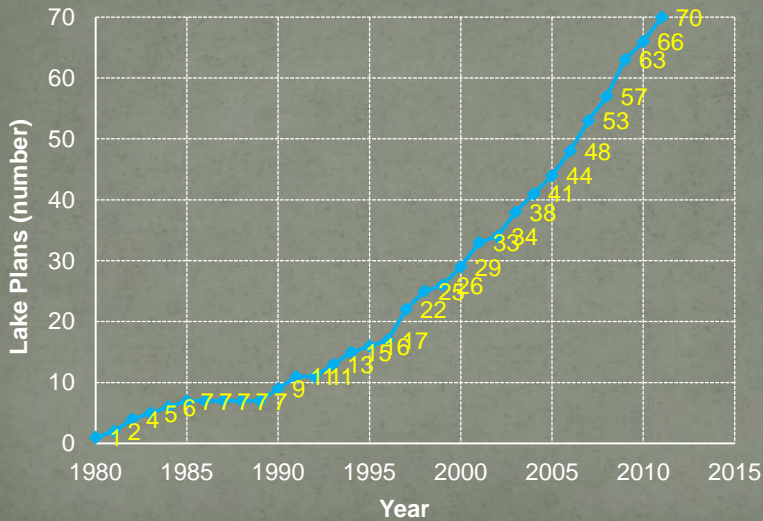
373 lakes or 2.3% of the
total number of lakes in the
State

46 total Lake Associations
44 total Lake Management Districts

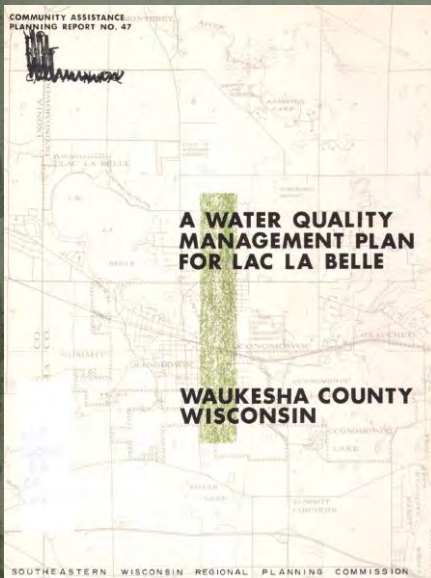
26% of the total number of
lake organizations in the
State of Wisconsin



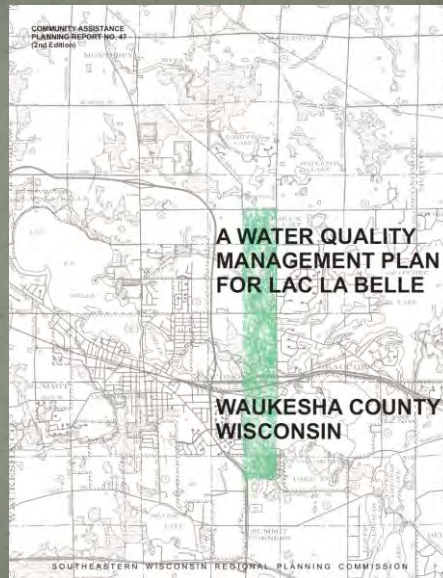
SEWRPC has completed 70 Lake Plans from 1980-2011 (about 2.2 plans/year)



First Lake Plan: 1980

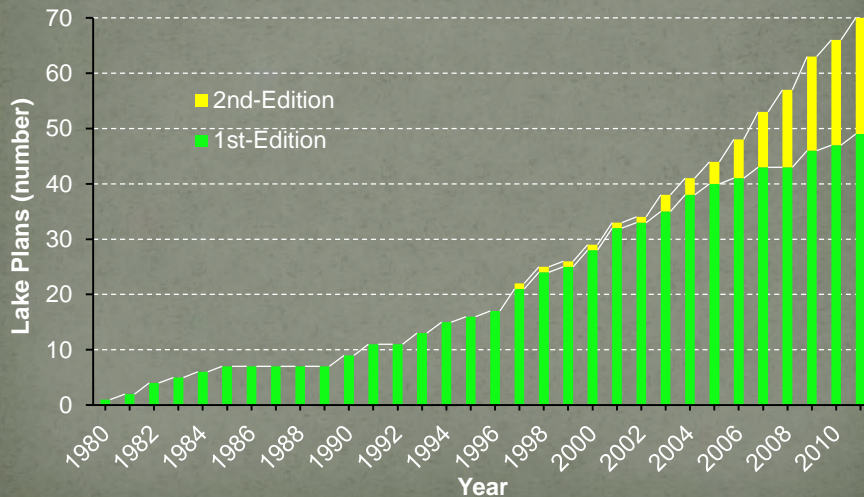


53rd Lake Plan: 2007



Second Edition Plans have accounted for about 30% of total plans from 1980-2011

(range from 6 to 27 years, mean 15.6 yrs between plans)



• Recent/Ongoing Projects

- Silver Lake, Waukesha (Tributary Investigation)
- Rock Lake, Kenosha (Lake Protection Plan – 1st)
- Gilbert Lake, Washington (Groundwater flow investigation)
- Pike Lake, Washington (Lake Protection Plan)
- Pleasant Lake, Walworth (Lake Protection Plan)
- Hooker Lake, Kenosha (Lake Protection Plan – 1st)
- Whitewater and Rice Lakes, Walworth (Lake Protection Plan)
- Denoon Lake, Waukesha (Lake Management Plan – 1st)
- Little Muskego Lake, Waukesha (Lake Protection Plan)
- Pewaukee Lake, Waukesha (Tributary and Lake Management Plan)
- Silver Lake, Washington (Groundwater and surface water protection plan)
- Nagawicka Lake, Washington (Upstream and Lake Protection Plan)

• What's New?

1) Plan structure – More user friendly/shorter

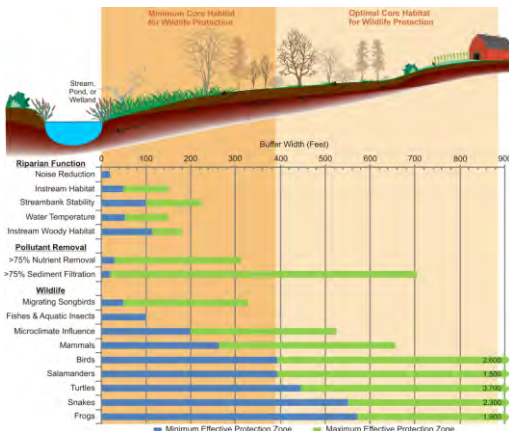
THEN

- Physical Description
- Historical, Existing, and Planned Land Use
- Water Quality
- Natural Resource Base (Aquatic Biota and Ecologically Valuable Areas) and Recreational Activities
- Existing Management and Legal Considerations Affecting Water Quality
- Current Water Use and Water Use Objectives
- Alternative Water Quality Management Measures
- Recommended Management Plan

NOW

- Introduction/Background
- Issues of Concern/Explanations
- Recommendations/Implementation

2) Comprehensive Shoreline Assessments – Greater emphasis on promoting shoreline restoration



3) Emphasis on buffer and habitat enhancement within the watershed



5) Emphasis on the benefits of aquatic plants

Potamogeton pectinatus
Native

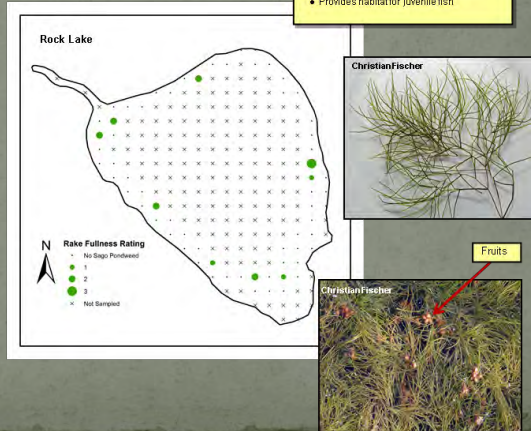
Sago Pondweed

Identifying Features

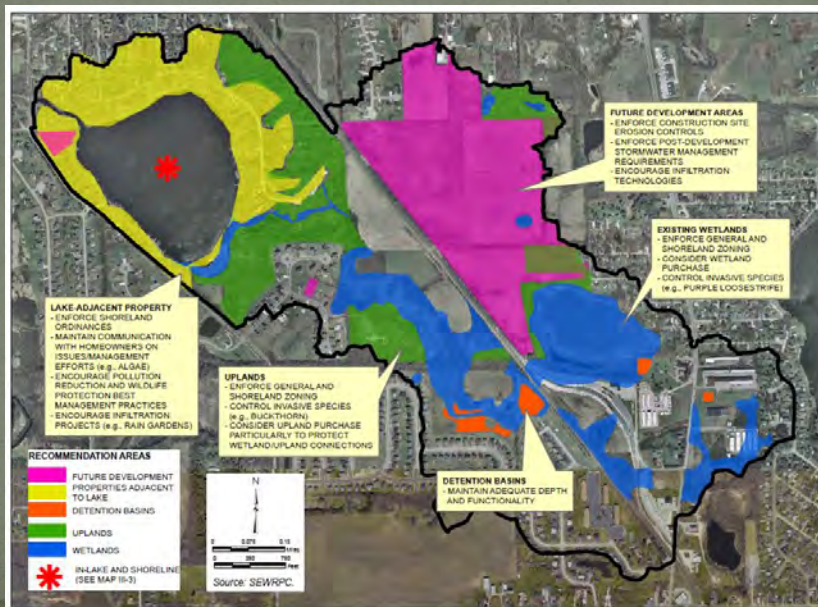
- Stems often *slightly zig-zagged* and forked multiple times, yielding a fan-like form
- Leaves one to four inches long, very thin, and ending in a sharp point
- Whorls of fruits spaced along the stem may appear as beads on a string

Ecology

- Lakes and streams
- Overwinters as rhizomes and starchy tubers
- Tolerates murky water and disturbed conditions
- Provides abundant fruits and tubers, which are an important food for waterfowl
- Provides habitat for juvenile fish

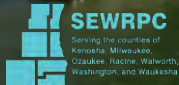


6) More user friendly recommendation maps



A Lake Protection Plan For Hooker Lake Kenosha County, Wisconsin Update

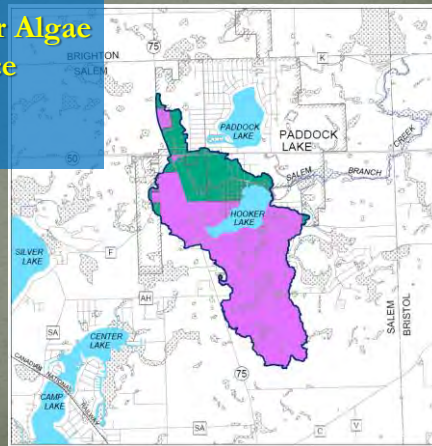
September 17, 2015
Hooker Lake Annual
Meeting
Town of Salem



Thomas M. Slawski

ISSUES AND CONCERNS

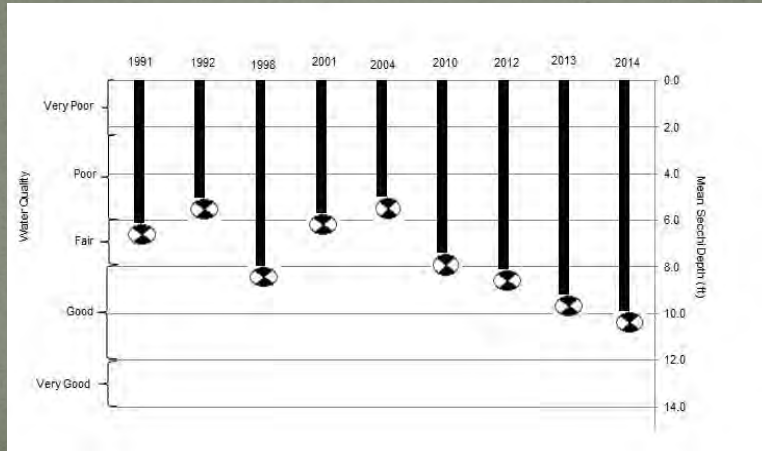
- Issue 1: Water Quality
- Issue 2: Water Quantity
- Issue 3: Dam/Lake Outflow
- Issue 4: Aquatic Plant Growth
- Issue 5: Blue-green And Other Algae
- Issue 6: Shoreline Maintenance
- Issue 7: Wildlife
- Issue 8: Plan Implementation



ISSUES AND CONCERNS

ISSUE 1: WATER QUALITY

AVERAGE SUMMER SECCHI DISK MEASUREMENTS FOR HOOKER LAKE: 1991-2014



ISSUES AND CONCERNS

ISSUE 1: WATER QUALITY

AVERAGE SUMMER SECCHI DISK MEASUREMENTS FOR HOOKER LAKE: 1991-2014

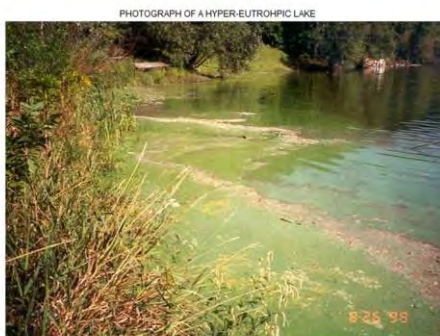


TROPHIC STATUS OF HOOKER LAKE: 1991-2014

ILLUSTRATION OF AGING AFFECTING TROPHIC STATUS

OLIGOTROPHIC	MESOTROPHIC	EUTROPHIC
<ul style="list-style-type: none"> • Clear water, low productivity • Very desirable fishery of large game fish 	<ul style="list-style-type: none"> • Increased production • Accumulated organic matter • Occasional algal bloom • Good fishery 	<ul style="list-style-type: none"> • Very productive • May experience oxygen depletion • Rough fish common

Source: Wisconsin Department of Natural Resources



Source: University of Minnesota, College of Natural Resources, 2003.

ILLUSTRATION OF TROPHIC STATES

Eutrophic

Mesotrophic

Oligotrophic

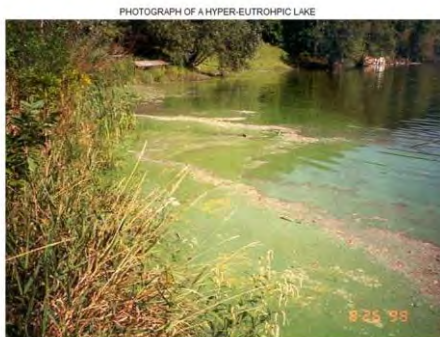
Source: DH Environmental Consulting, 1995.

TROPHIC STATUS OF HOOKER LAKE: 1991-2014

ILLUSTRATION OF AGING AFFECTING TROPHIC STATUS

OLIGOTROPHIC	MESOTROPHIC	EUTROPHIC
<ul style="list-style-type: none"> • Clear water, low productivity • Very desirable fishery of large fish 	<ul style="list-style-type: none"> • Increased production • Accumulated organic matter • Occasional algal bloom • Good fishery 	<ul style="list-style-type: none"> • Very productive • May experience oxygen depletion • Rough fish common

Source: Wisconsin Department of Natural Resources

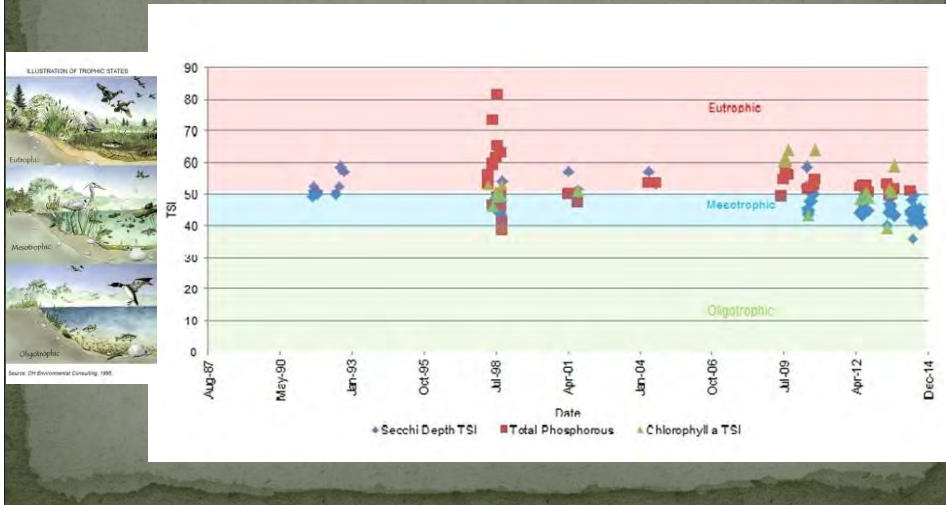


Source: University of Minnesota, College of Natural Resources, 2003.

ISSUES AND CONCERNS

ISSUE 1: WATER QUALITY

TROPHIC STATUS OF HOOKER LAKE: 1991-2014



ISSUES AND CONCERNS

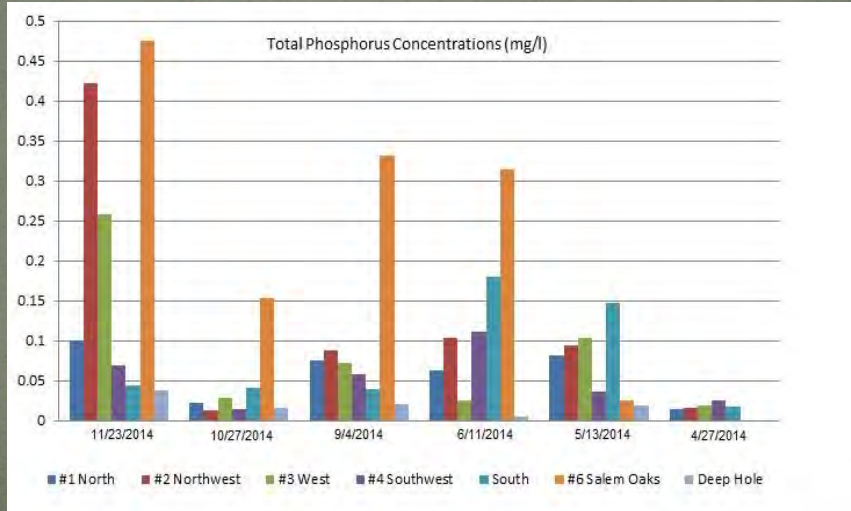
ISSUE 1: WATER QUALITY

Tributary/Inlet Sampling



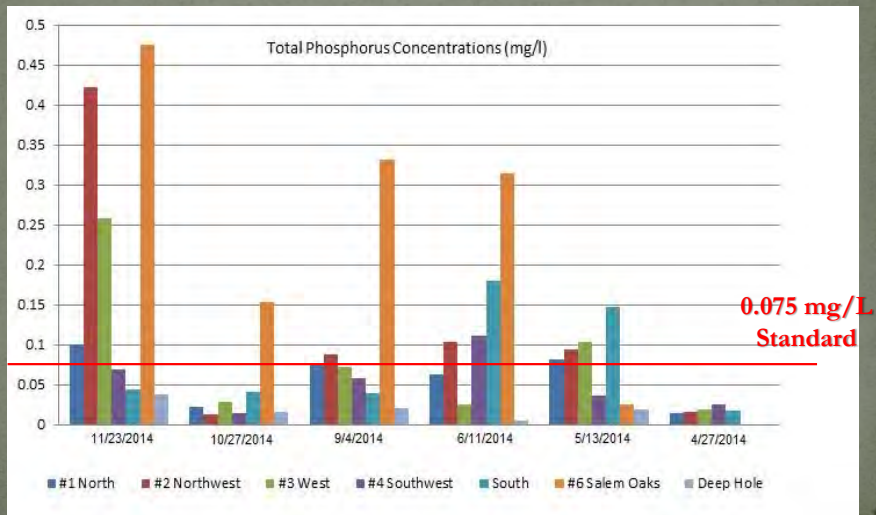
ISSUES AND CONCERNS
 ISSUE 1: WATER QUALITY

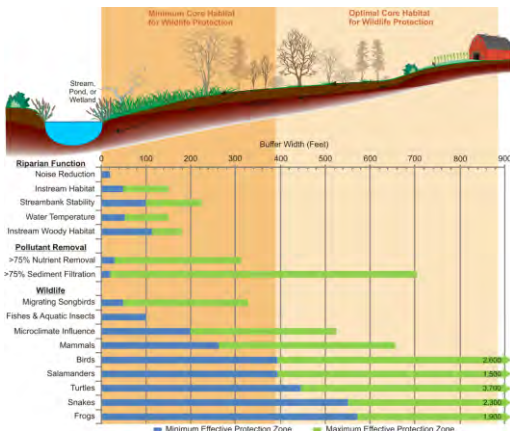
Tributary/Inlet Sampling



ISSUES AND CONCERNS
 ISSUE 1: WATER QUALITY

Tributary/Inlet Sampling





Emphasis on buffer and habitat enhancement within the watershed



ISSUES AND CONCERNS

ISSUE 6: Shoreline Maintenance

"SOFT" SHORELINE PROTECTION TECHNIQUES

Natural Shoreline



Bio-logs



Buffers (Vegetative Strips)



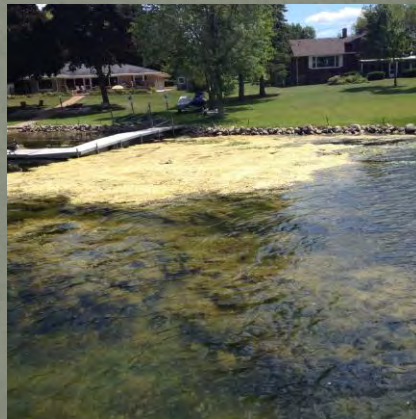
Cattails



Source: Native Landscapes and SEWRPC.

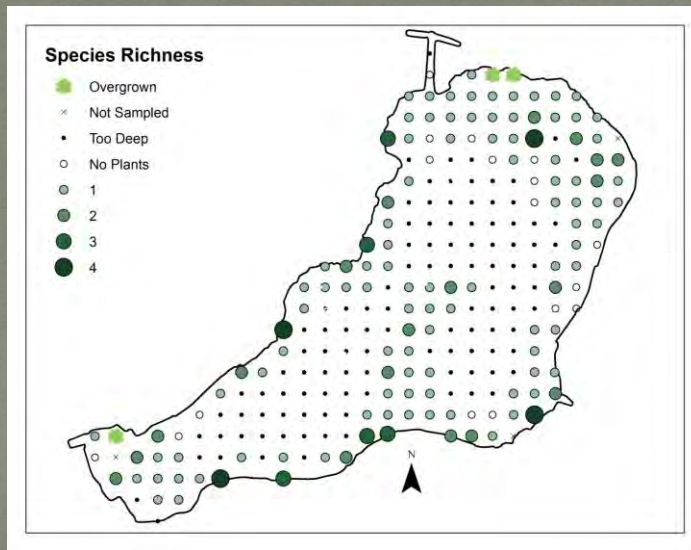
ISSUES AND CONCERNS

ISSUE 4: Aquatic Plant Growth



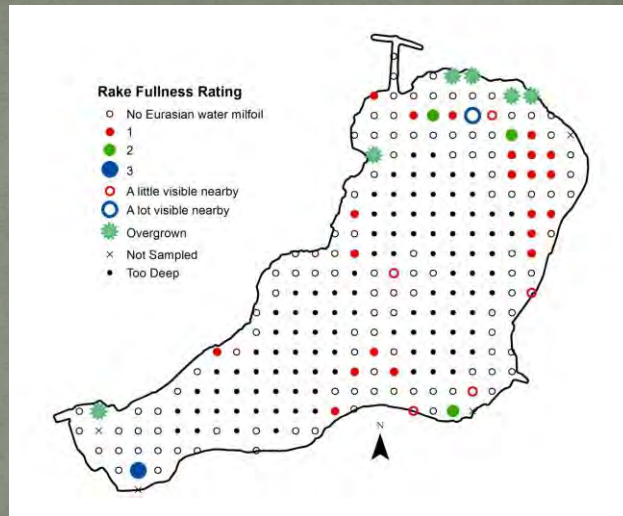
ISSUES AND CONCERNS

ISSUE 4: Aquatic Plant Growth



ISSUES AND CONCERNS

ISSUE 4: Aquatic Plant Growth



ISSUES AND CONCERNS
ISSUE 4: Aquatic Plant Growth

Figure 18

FREQUENCY OF OCCURRENCE OF SUBMERGED
 AQUATIC PLANT SPECIES IN HOOKER LAKE: 2008, 2014

Aquatic Plant Species	2008	2014
<i>Ceratophyllum demersum</i> (coontail)	23.1	61.4
<i>Chara</i> spp. (muskgrass)	46.2	31.5
<i>Elodea canadensis</i> (waterweed)	6.2	11.8
<i>Myriophyllum spicatum</i> (Eurasian water milfoil)	21.5	19.7
<i>Myriophyllum verticillatum</i> (native milfoil)	13.9	--
<i>Najas flexilis</i> (bushy pondweed)	--	2.4
<i>Najas marina</i> (spiny, or brittle, naiad)	7.7	--
<i>Potamogeton crispus</i> (cully-leaf pondweed)	1.5	--
<i>Potamogeton illinoensis</i> (Illinois pondweed)	1.5	--
<i>Potamogeton praelongus</i> (white-stem pondweed)	1.5	--
<i>Potamogeton richardsonii</i> (clasping-leaf pondweed)	4.6	--
<i>Potamogeton zosteriformis</i> (flat-stem pondweed)	15.4	2.4
<i>Stuckenia pectinata</i> (Sago pondweed)	4.6	--
<i>Utricularia vulgaris</i> (bladderwort)	1.5	--
<i>Vallisneria americana</i> (eel-grass/wild celery)	6.2	3.1
<i>Zosterella dubia</i> (water stargrass)	15.4	11.0

NOTE: The Frequency of Occurrence, expressed as a percent, is the number of occurrences of a species divided by the number of samplings with vegetation.


Source: Aron and Associates and SEWRPC.

GoToMeeting Viewer

Level 1 | Zoom: 67% | Webcam

Reduction in TP Load with P Fertilizer Ban for Lake Wingra Watershed

- Annual TP Load 4000 lbs. (SLAMM)
- 24% of TP Load from Lawns (960 lbs)
- 50% of Homeowners Use Fertilizer (480 lbs)
- 50% Reduction in TP Concentration (240 lbs)
- 240/4000 = 0.06

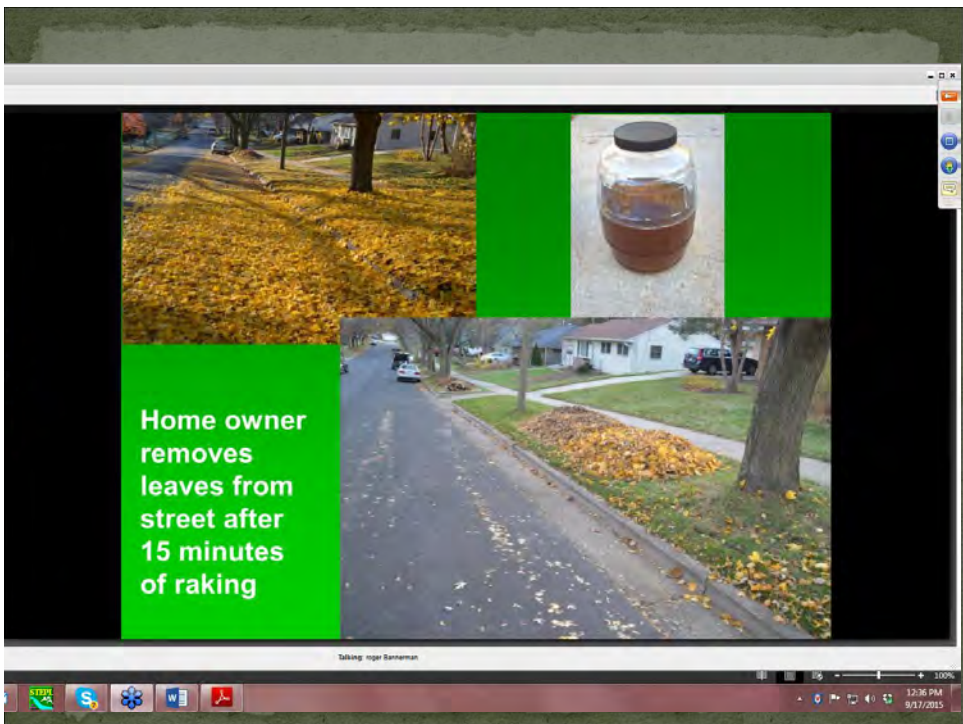
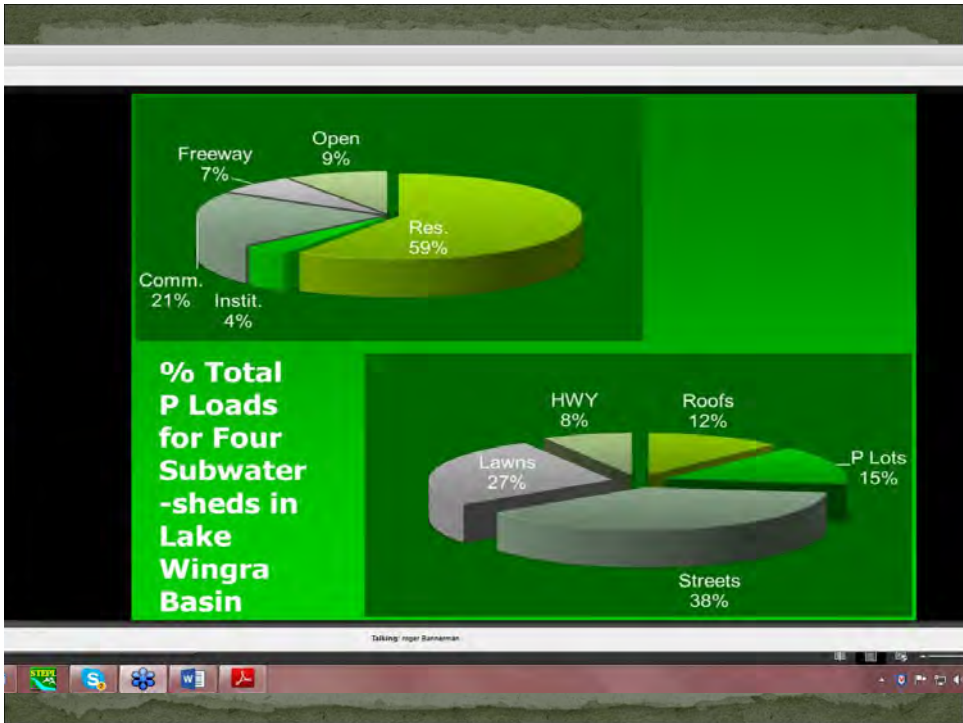


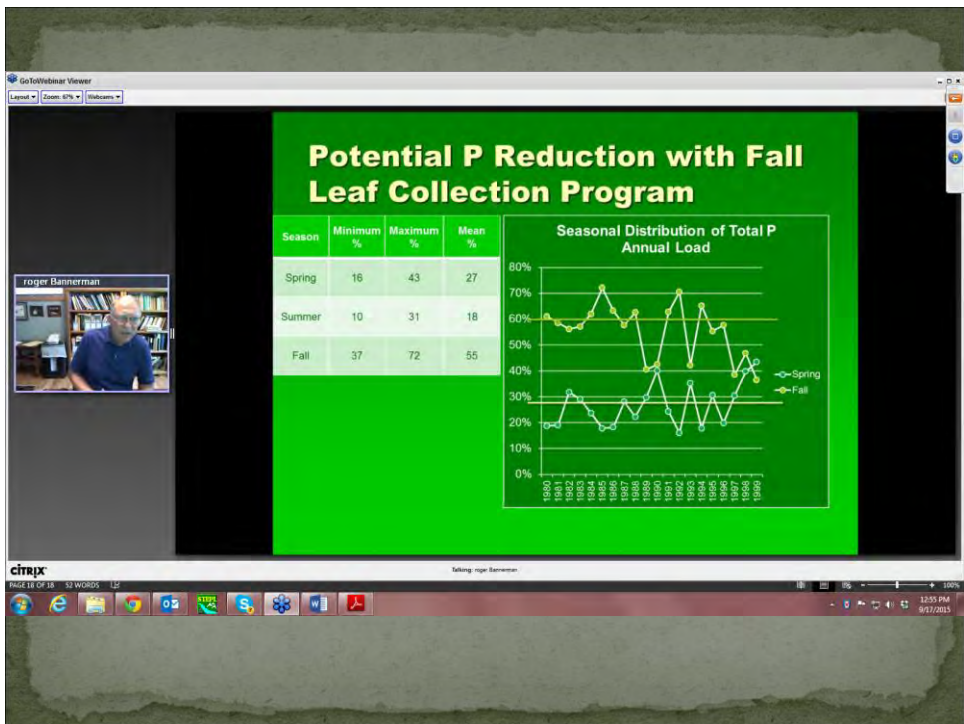
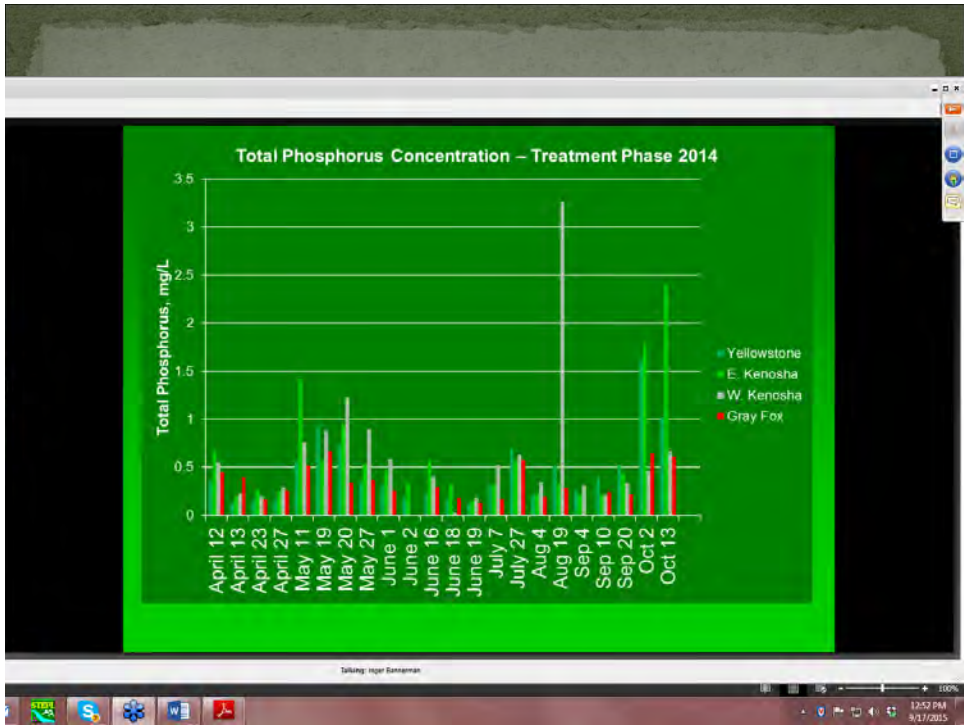
6% Reduction in Annual P Load to Lake Wingra

roger Banerman

Talking: roger Banerman

CITRIX | REMINDERS: 1 | ONLINE WITH MICROSOFT EXCHANGE | 100% | 1:36 PM 8/31/2015





Environmental Planning & Future Challenges: Selected Case Studies in Southeast WI



November 16, 2015

UW-Milwaukee

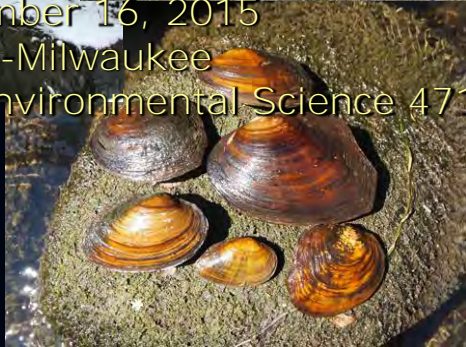
Conservation & Environmental Science 471



SEWRPC

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

Thomas M. Slawski, Chief Biologist
262-953-3263
tslawski@sewrpc.org



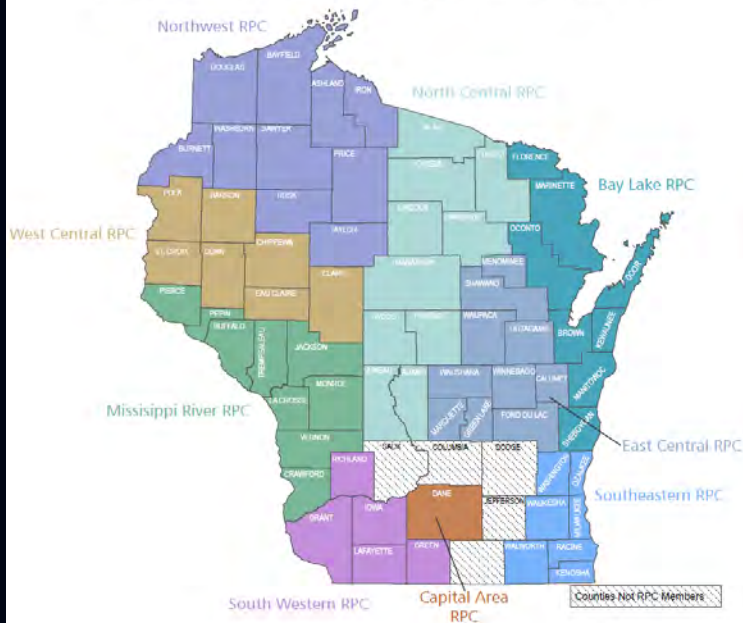
Basic Functions of the Southeastern Wisconsin Regional Planning Commission

(established in 1960)

- Inventory
- Plan Preparation
- Intergovernmental Coordination



Wisconsin Regional Planning Commissions



FUNCTIONS

Under Wisconsin law, regional planning commissions have the following functions:

- 1 conduct all types of research studies, collect and analyze data, prepare maps, charts and tables, and conduct necessary studies,
- 2 make and adopt plans for the physical, social, and economic development of the Region;
- 3 publish and advertise their purposes, objectives and findings, and may distribute reports thereon, and
- 4 provide advisory services on planning problems to the local governmental units within the Region and to other public and private agencies in matters relative to its functions and objectives.

Over the years, the demands on the regional planning commissions (RPCs) have changed. These changes, however, have not altered the basic advisory role of the commissions. The original and traditional role of the commissions was to plan for the physical development of the areas they served. This involved planning issues such as land use, transportation, natural resources, and water and sewer services. While this function has continued to be important, additional program responsibilities have been assumed, including technical assistance in such areas as economic development, grant and loan services, and local government management.

The broad range of functions and services performed by Wisconsin's regional planning commissions is exemplified by the adjoining list of planning and assistance activities. Wisconsin's RPCs are a vital resource with the technical skills and administrative infrastructure already in place to assist local communities, counties and the state in addressing the challenges of today's world. The variations in the services provided are a result of the different needs and levels of financial support provided by each commission's member units of government.

Commissions receive funds through a statutorily authorized charge, State and Federal planning grant programs, and contracts with local governments for special planning services. Local funds are often used by the commissions as a match for Federal and State planning grants, thus maximizing the effectiveness of available funds.

	BIY-LAKE	CAPITOL AREA	EAST CENTRAL	MISSISSIPPI RIVER	NORTH CENTRAL	NORTHWEST	SOUTH CENTRAL	SOUTHWESTERN	WEST CENTRAL
COMMUNITY PLANNING	Capital Improvements Programming	*	*	*	*	*	*	*	*
	Citizen Services	*	*	*	*	*	*	*	*
	Community Development	*	*	*	*	*	*	*	*
	Comprehensive Planning	*	*	*	*	*	*	*	*
	Downtown Improvement	*	*	*	*	*	*	*	*
	Hazard Mitigation Planning	*	*	*	*	*	*	*	*
	Historic Preservation	*	*	*	*	*	*	*	*
	Land Use Planning	*	*	*	*	*	*	*	*
	Local Technical Assistance	*	*	*	*	*	*	*	*
	Public Facilities	*	*	*	*	*	*	*	*
	Public Land Survey Recommendations	*	*	*	*	*	*	*	*
	Rural Development	*	*	*	*	*	*	*	*
Street Naming / House Numbering	*	*	*	*	*	*	*	*	
Urban Service Districts	*	*	*	*	*	*	*	*	
Waterfront - Harbor Planning	*	*	*	*	*	*	*	*	
Zoning Assistance	*	*	*	*	*	*	*	*	
ECONOMIC DEVELOPMENT	Census Information Questionnaire	*	*	*	*	*	*	*	*
	Population Information	*	*	*	*	*	*	*	*
	State Data Center Affiliate	*	*	*	*	*	*	*	*
HOUSING DEVELOPMENT	Business Incubator Program	*	*	*	*	*	*	*	*
	Economic Development	*	*	*	*	*	*	*	*
	Equity Ventures Fund	*	*	*	*	*	*	*	*
	Industrial Development	*	*	*	*	*	*	*	*
	Industrial Site Data	*	*	*	*	*	*	*	*
	International Business Development	*	*	*	*	*	*	*	*
	Loan Funds Administration	*	*	*	*	*	*	*	*
	Loan Funds Packaging	*	*	*	*	*	*	*	*
	Market Assessments	*	*	*	*	*	*	*	*
	Tax Incremental Financing Districts	*	*	*	*	*	*	*	*
Technology Innovations Services	*	*	*	*	*	*	*	*	
Tourism Development	*	*	*	*	*	*	*	*	
GRANTS	CDRI Assistance / Administration	*	*	*	*	*	*	*	*
	Housing	*	*	*	*	*	*	*	*
	Business Development Grants	*	*	*	*	*	*	*	*
	Industrial Parks Grants	*	*	*	*	*	*	*	*
	Outdoor Recreation Grants	*	*	*	*	*	*	*	*
	Public Works Grants	*	*	*	*	*	*	*	*
Other Grant Assistance	*	*	*	*	*	*	*	*	

	BIY-LAKE	CAPITOL AREA	EAST CENTRAL	MISSISSIPPI RIVER	NORTH CENTRAL	NORTHWEST	SOUTH CENTRAL	SOUTHWESTERN	WEST CENTRAL
MAPPING	GIS and Base Mapping	*	*	*	*	*	*	*	*
	Air Quality Management	*	*	*	*	*	*	*	*
INTERNAL RESOURCE PLANNING	Coastal Zone Management	*	*	*	*	*	*	*	*
	Environmental Impact Review	*	*	*	*	*	*	*	*
	Environmental Resources	*	*	*	*	*	*	*	*
	Farmland Preservation	*	*	*	*	*	*	*	*
	Roadplan Management	*	*	*	*	*	*	*	*
	Lakes Management Planning	*	*	*	*	*	*	*	*
	Mining Impact Studies	*	*	*	*	*	*	*	*
	Park and Open Space	*	*	*	*	*	*	*	*
	Resource Commission	*	*	*	*	*	*	*	*
	Resource Recovery	*	*	*	*	*	*	*	*
	Sewer Service Area Planning	*	*	*	*	*	*	*	*
	Solid Waste Management Planning	*	*	*	*	*	*	*	*
	Subdivision - Land Division Assistance	*	*	*	*	*	*	*	*
	Timber Resource Analysis Projections	*	*	*	*	*	*	*	*
	Wastewater Treatment Planning	*	*	*	*	*	*	*	*
Water Supply	*	*	*	*	*	*	*	*	
WATER QUALITY MANAGEMENT / MONITORING	Water Quality Management / Monitoring	*	*	*	*	*	*	*	*
	Watershed Improvement	*	*	*	*	*	*	*	*
	Wetlands Protection Management	*	*	*	*	*	*	*	*
STATE ADMINISTRATION	Governmental Organization Studies	*	*	*	*	*	*	*	*
	Redeveloping Assistance	*	*	*	*	*	*	*	*
	Review of Federally Assisted Projects	*	*	*	*	*	*	*	*
TRANSPORTATION	Shared Staff Services	*	*	*	*	*	*	*	*
	Rikvegan	*	*	*	*	*	*	*	*
	Car / Vanpooling Coordination	*	*	*	*	*	*	*	*
	Elderly and Disabled Transportation	*	*	*	*	*	*	*	*
	Highway Access Control Assistance	*	*	*	*	*	*	*	*
	Port Development	*	*	*	*	*	*	*	*
	Rail Construction and Abandonment	*	*	*	*	*	*	*	*
	Rural Transportation	*	*	*	*	*	*	*	*
	Traffic Engineering Assistance	*	*	*	*	*	*	*	*
	Transportation Improvements Program	*	*	*	*	*	*	*	*
	Transportation Systems Management	*	*	*	*	*	*	*	*
	Transportation Highways	*	*	*	*	*	*	*	*
Transportation - Transit	*	*	*	*	*	*	*	*	

FUNCTIONS, continued

RETURN ON INVESTMENT

By matching local funds with state and federal funds, RPCs are able to create a positive return on investments. In 2010, Wisconsin RPCs were able to collectively match every local dollar with 76 dollars of funding from other sources. In 2011, two of Wisconsin's RPCs were recipients of a new Sustainable Communities Regional Planning grant provided by the US Department of Housing and Urban Development. These two grants alone leveraged nearly 2.5 million dollars.

STRATEGIC PARTNERSHIPS

RPCs have relationships with local units of government, private and non-profit groups, as well as with State and Federal agencies. These relationships have been directed at providing (asson) and assistance between the local and State/Federal levels of government, especially in planning, transportation, economic development and resource conservation. These relationships have allowed RPCs to foster strategic partnerships to address regional issues and opportunities.

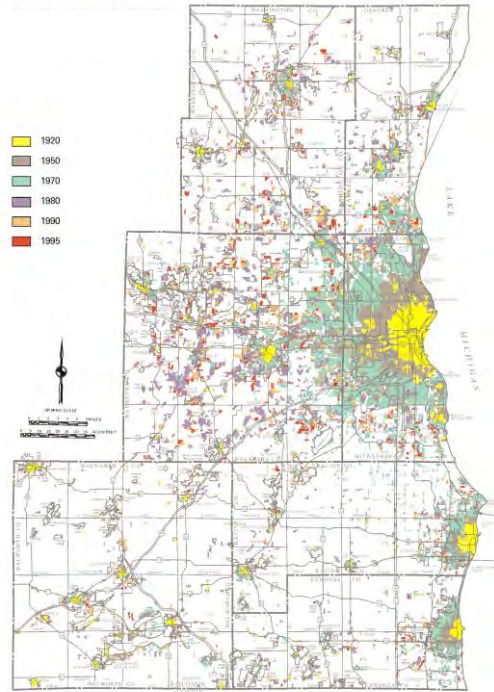
RPCs play a critical role by providing the venue and infrastructure for a broad and multi-jurisdictional discussion of issues and opportunities. Furthermore, by acting as a broker for creating the needed collaborative partnerships to address these issues, RPCs foster efficient and effective solutions.

RPC DESIGNATION

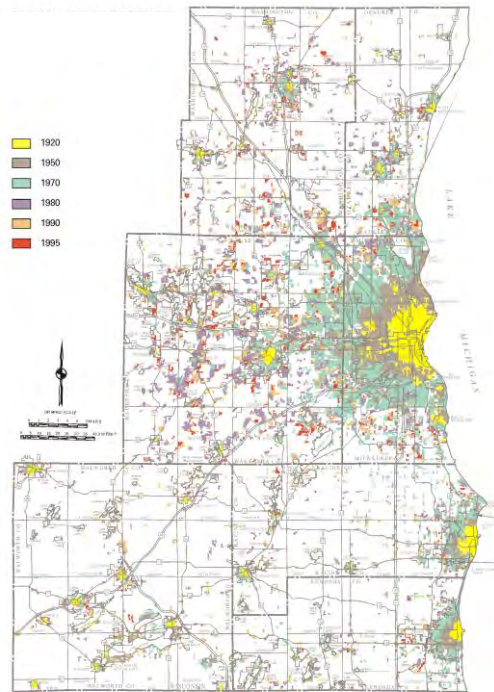
Seven of the commissions are designated or authorized as Economic Development Districts by the U.S. Economic Development Administration for purposes of areawide economic planning and to guide the investment of Federal funds for economic development.

All nine commissions are affiliates of the Wisconsin State Data Center, whereby they provide data services (particularly census data) to local units of government and to the public. In addition, four commissions have been recognized by the U.S. Department of Transportation as Metropolitan Planning Organizations to carry out a comprehensive transportation planning process in the State's urban areas. Two commissions are designated water quality planning agencies.

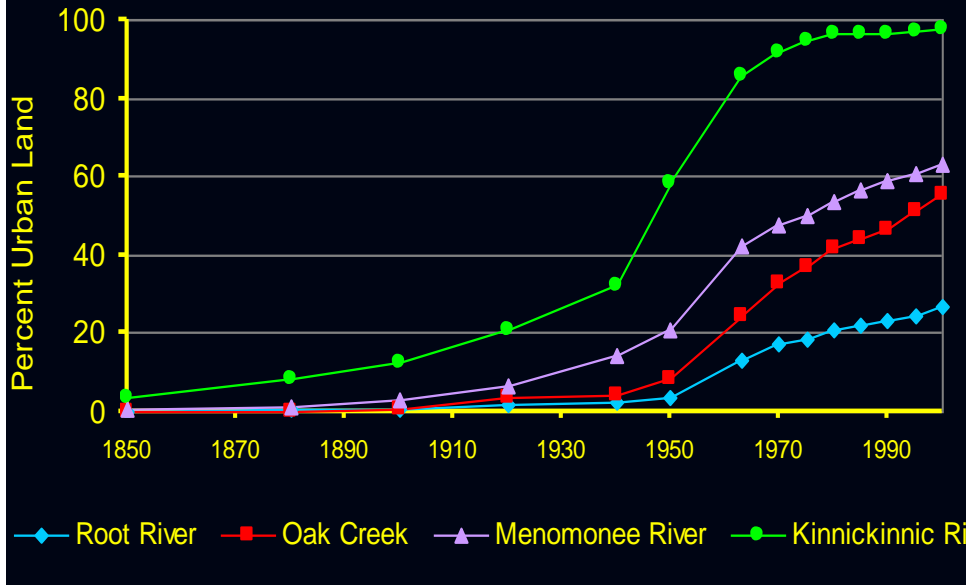
**HISTORIC
URBAN GROWTH IN
SOUTHEASTERN
WISCONSIN
1920-1995**



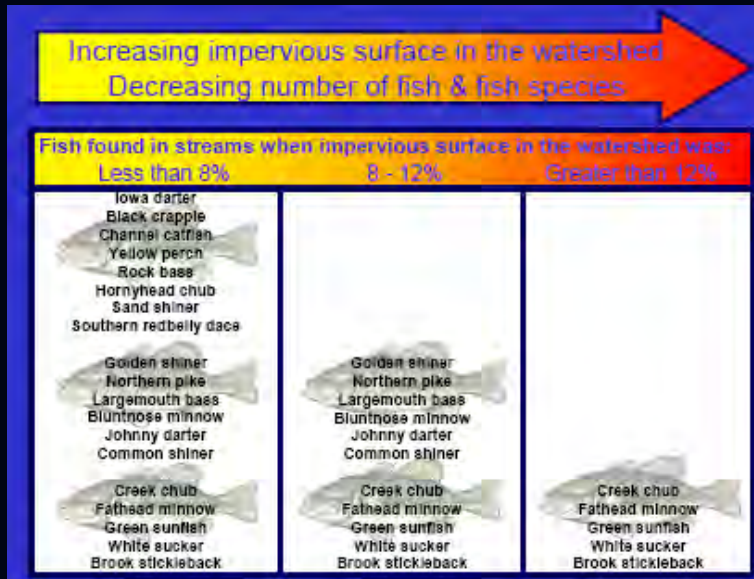
**HISTORIC
URBAN GROWTH IN
SOUTHEASTERN
WISCONSIN
1920-1995**



Historic Urban Growth Among Watersheds: 1850-2000



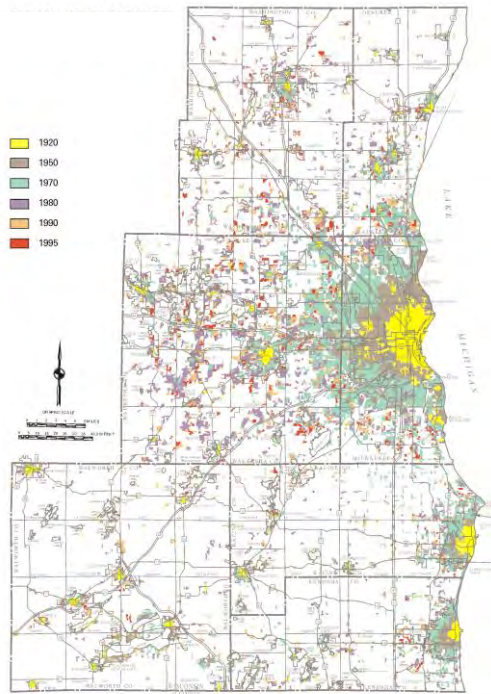
Watershed Urbanization and Changes in Fish Communities in Southeastern Wisconsin Streams



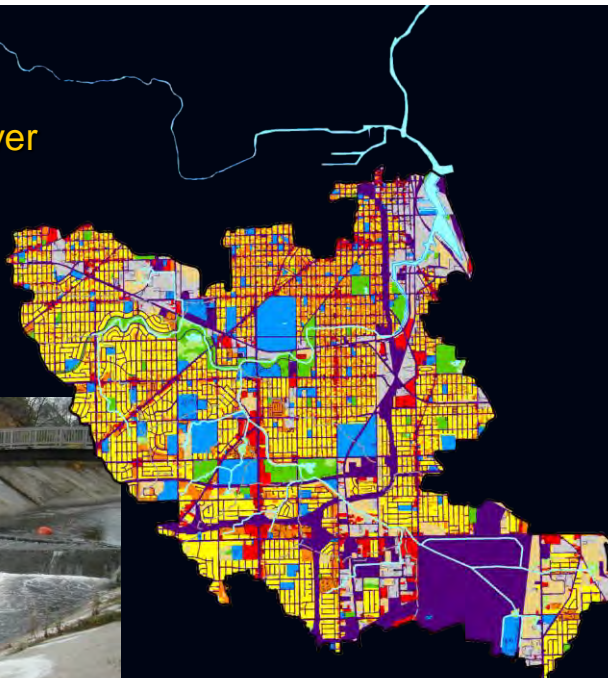
Source: Wang and others, 2000, Journal of the American Water Resources Association, No. 36, Vol 5

HISTORIC URBAN GROWTH IN SOUTHEASTERN WISCONSIN 1920-1995

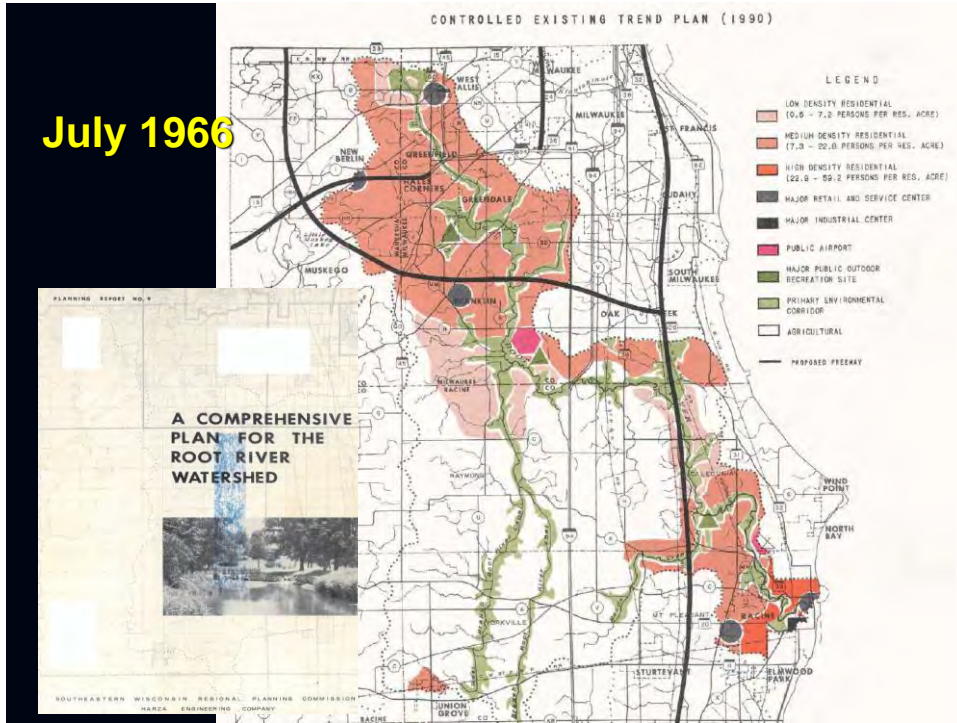
- **Direct Relationship
Between Land Use
and Water Quality
Conditions**
- **Until 1950 Urban
Development
Occurred in
Compact Patterns**
- **After 1950
Development
Pattern Became
More Diffused**



**Kinnickinnic River
Watershed**
93% Urban



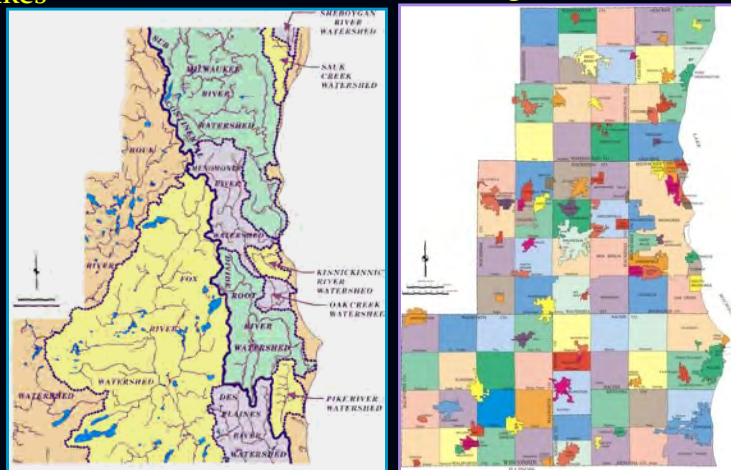
July 1966



Watersheds are the Basis for Water Resources Planning and Management

12 Major Watersheds,
101 Major Lakes

154 general purpose
units of government



Water Resources Management Planning

- Physical Description
- Historical, Existing, and Planned Land Use
- Water Quality
- Aquatic Biota and Ecologically Valuable Areas
- Current Water Use and Water Use Objectives
- Alternative Water Quality Management Measures
- Recommended Management Plan



Environmental Corridors

Key Features of Environmental Corridors

- Lakes, rivers, and streams
- Undeveloped shorelands and floodlands
- Wetlands
- Woodlands
- Prairie remnants
- Wildlife habitat
- Rugged terrain and steep slopes
- Unique landforms or geological formations
- Unfarmed poorly drained and organic soils
- Existing outdoor recreation sites
- Potential outdoor recreation sites
- Significant open spaces
- Historical sites and structures
- Outstanding scenic areas and vistas

Environmental Corridors

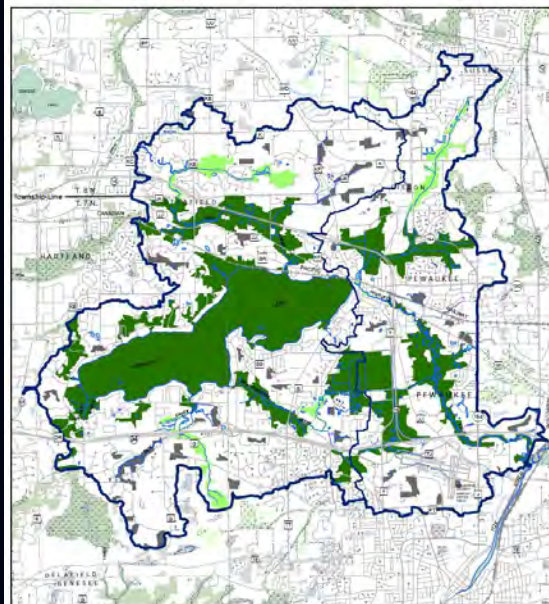
Primary environmental corridors contain concentrations of our most significant natural resources. They are at least 400 acres in size, at least two miles long, and at least 200 feet wide.

Secondary environmental corridors contain significant but smaller concentrations of natural resources. They are at least 100 acres in size and at least one mile long, unless serving to link primary corridors.

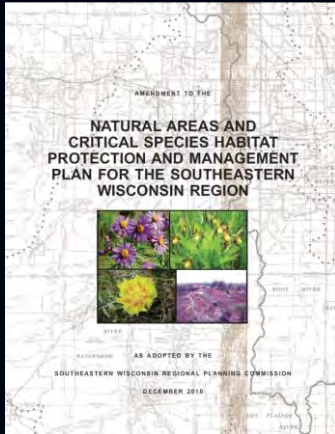
Isolated natural resource areas contain significant remaining resources apart from environmental corridors. They are at least five acres in size and at least 200 feet wide.

Environmental Corridors

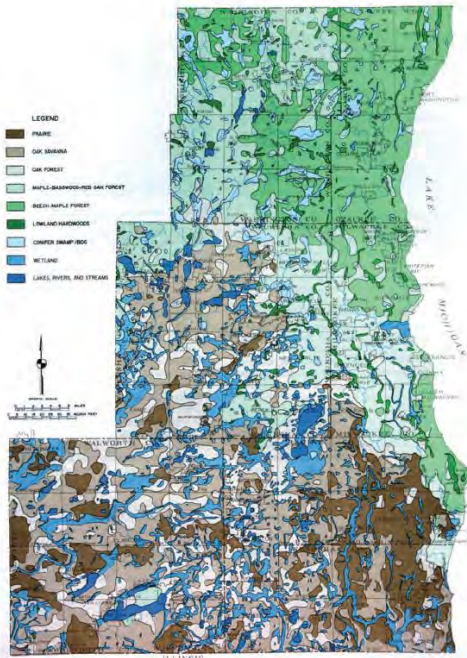
ENVIRONMENTAL CORRIDORS WITHIN THE PEWAUKEE RIVER WATERSHED: 2005 AND 2010



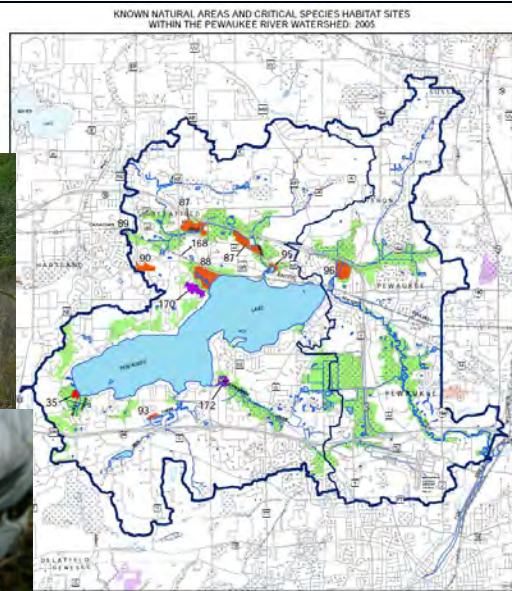
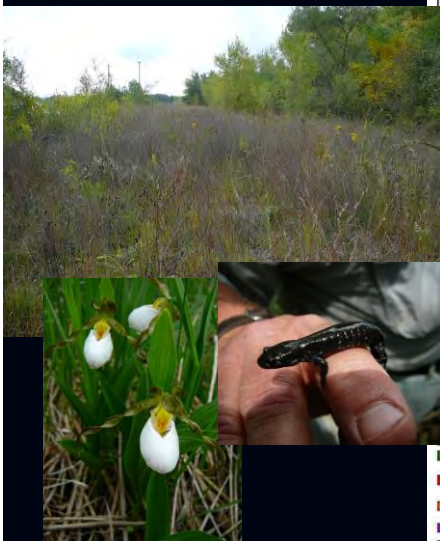
Natural Areas Planning: 2010



PRE-SETTLEMENT VEGETATION OF SOUTHEASTERN WISCONSIN: 1836



Natural Areas Planning: 2010



NATURAL AREA OF STATEWIDE OR GREATER SIGNIFICANCE (NA-1)	NATURAL AREA OF COUNTYWIDE OR REGIONAL SIGNIFICANCE (NA-2)	NATURAL AREA OF LOCAL SIGNIFICANCE (NA-3)	CRITICAL SPECIES HABITAT SITE	PRIMARY ENVIRONMENTAL CORRIDOR	SURFACE WATER	STREAM	WATERSHED BOUNDARY	SUBWATERSHED BOUNDARY
IDENTIFICATION NUMBER (SEE TABLES 1-6 AND 9-7)	Classify outside the watershed boundary are reduced in intensity to show the adjacent extent and distribution of each category.							

Source: SEWRPC.

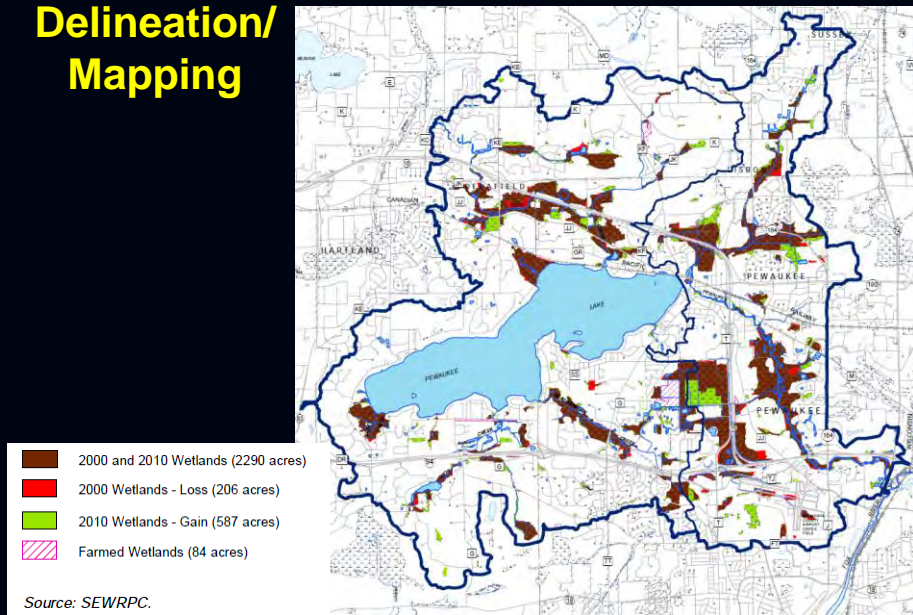
60 **PRELIMINARY DRAFT**

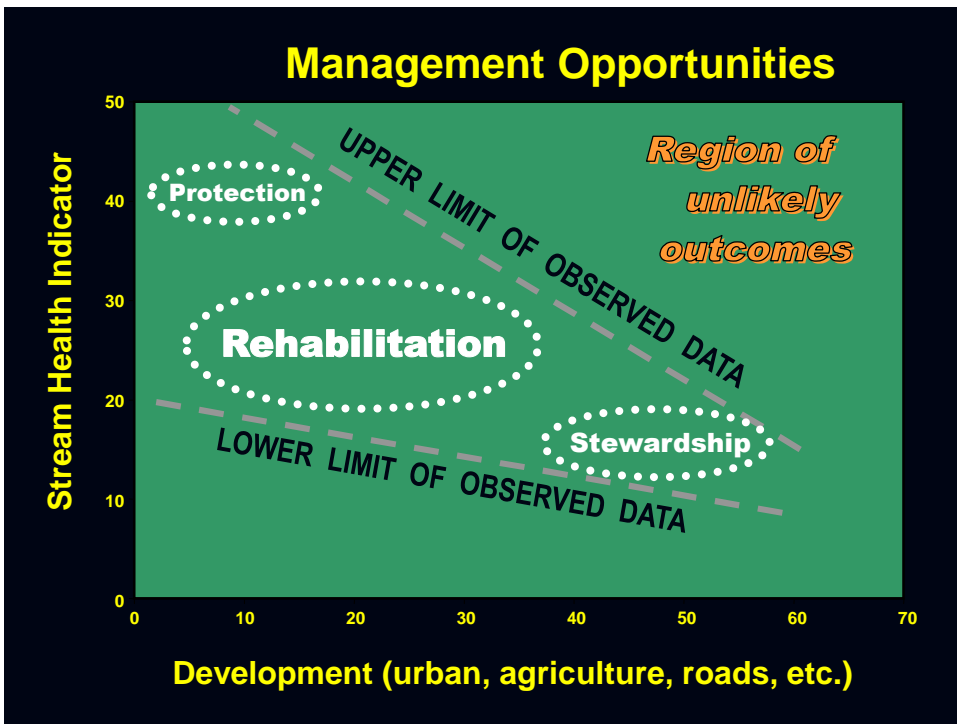
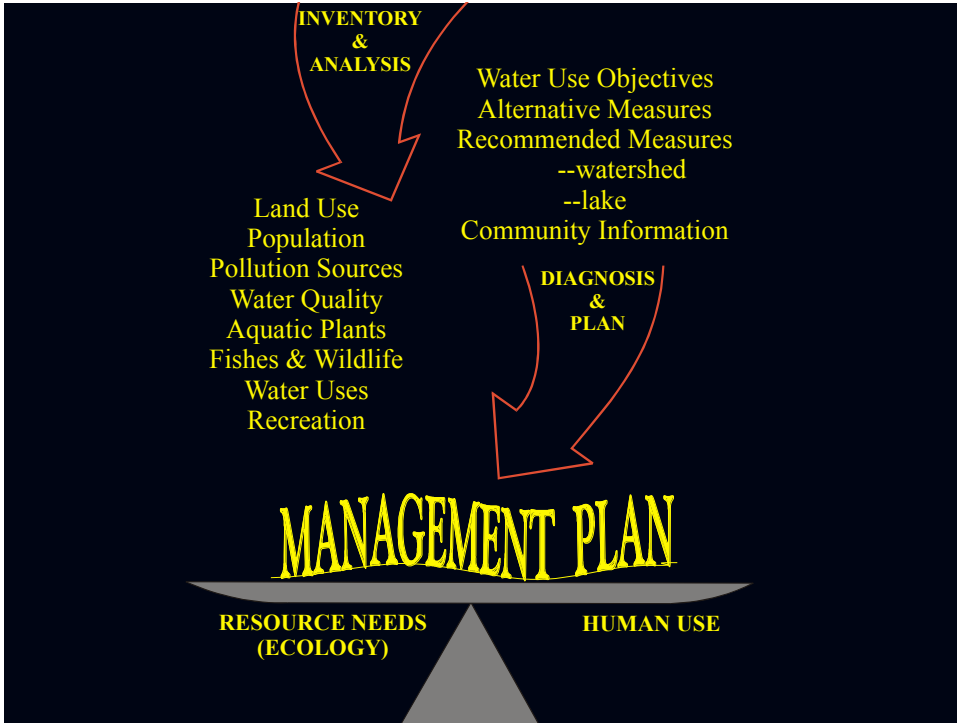
Wetland Delineation/ Mapping



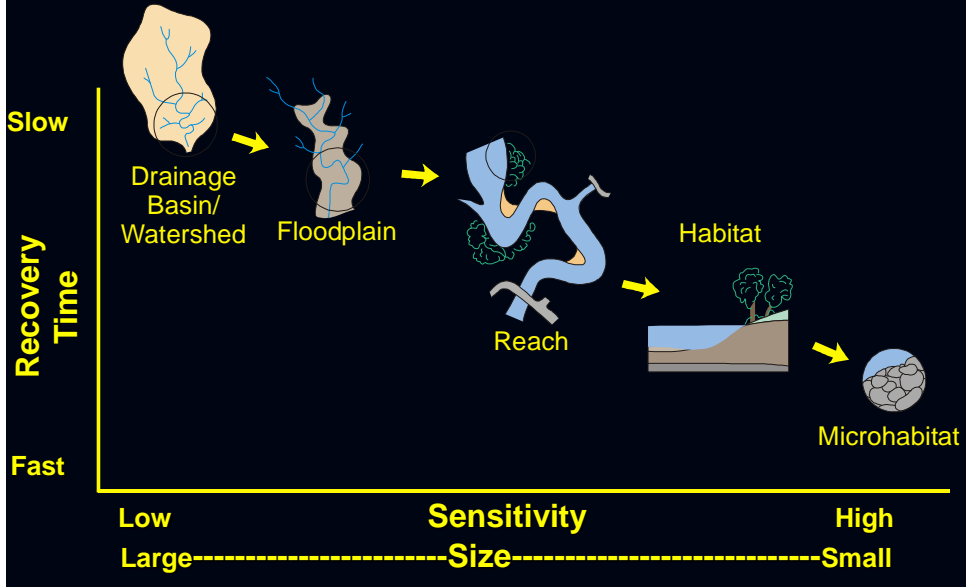
Wetland Delineation/ Mapping

WETLAND LOSSES AND GAINS WITHIN THE PEWAUKEE RIVER WATERSHED: 2000-2010





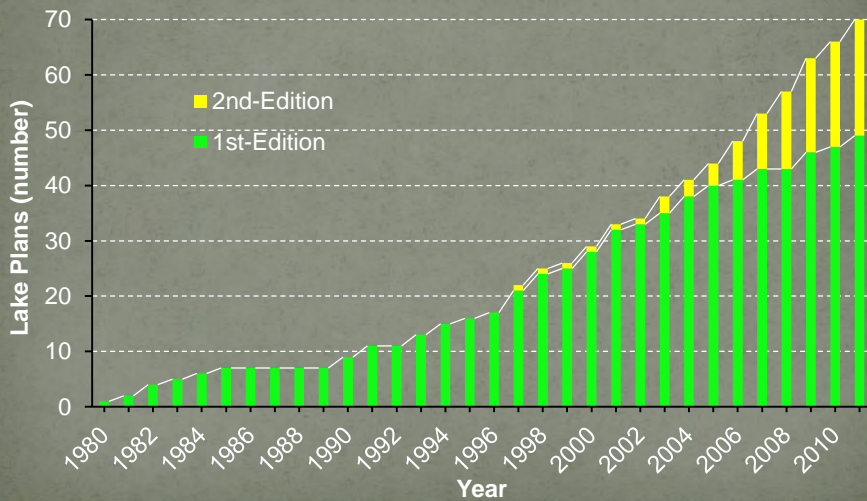
...Scale Matters...



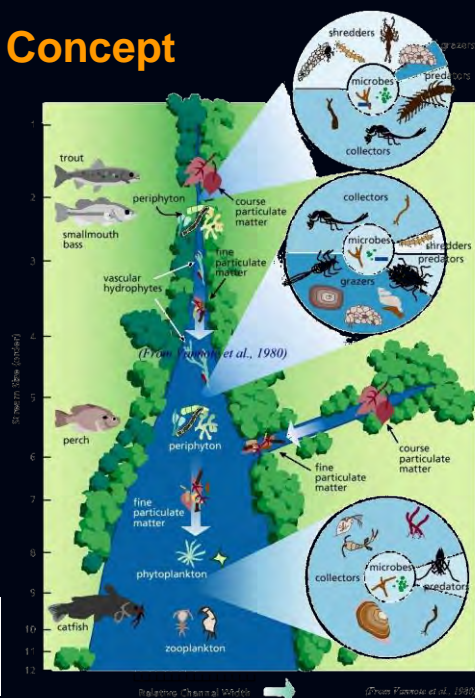
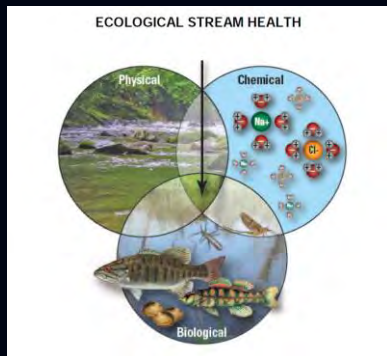
Planning is hierarchical...



Second Edition Plans have accounted for about 30% of total plans from 1980-2011
 (range from 6 to 27 years, mean 15.6 yrs between plans)



River Continuum Concept (Vannote et al 1980)



Modified from D.M. Carlisle and others, The quality of our Nation's waters—Ecological health in the Nation's streams, 1993–2005: U.S. Geological Survey Circular 1391, 120 p., <http://pubs.usgs.gov/circ/1391/>, 2013, and SEWRPC.

Dynamics of an Agricultural Stream Ecosystem

Agricultural practices are diverse, and thus the impacts to stream ecosystems from agriculture are highly variable.



Hydrology Agricultural practices can alter the movement of water in a watershed through (1) subsurface drains, which lower the water table and quickly move water to nearby streams; (2) ditches and straightening of subsurface streams; and (3) irrigation, which supplies available water for crops. These changes can result in more rapid runoff, reduced infiltration during dry periods, and increased transport of sediments and chemicals.



Water chemistry Agricultural chemicals applied to fields can move to streams and groundwater; other sources of chemicals include irrigation water, a waste from several feeding operations. Nutrients—especially nitrogen and phosphorus—in streams can exceed natural levels when fertilizers are applied through the soil or in one of the surface of the ground. Excess nutrients can cause nuisance growths of algae and aquatic plants, which reduce light and oxygen available downstream. Pathogens are applied to control insect damage and growth of insects in fields that can also have aquatic impacts.

Physical habitat Some agricultural practices reduce the quality of stream habitats and have negative effects on organisms. Soil plowing and drainage, however, creates narrow, being space for aquatic organisms. Removal of riparian trees and shrubs results in more sunlight and warmer water temperatures. Soil disturbance from conventional tillage of the soil or heavy grazing can cause erosion, resulting in filling of sediment in the stream channel.



Fish Concentrated agricultural stressors may be considered for spot—such as the central darter (*Carpentaria promelas*)—that grows on algae attached to rocks and other submerged surfaces. Green sunfish (*Lepomis cyanellus*) is tolerant to high turbidity, lower dissolved oxygen, and temperature.



Algae may proliferate in agricultural streams with high nutrient concentrations and available sunlight. *Chlorella* (a genus of green algae that grows in long filaments) and *Zygnema* (a genus of algae that can reach 10-cm-long filaments) occurring in large clumps in flowing water. *Chlorella* may also be a nuisance in streams and ditches. They can contribute to low levels of dissolved oxygen in the water and reduce turbidity.



Macrobenthos Bioturbation by algae or organic matter particles can affect the structure of stream invertebrates, whereas those that are intolerant to high turbidity may decline. Non-growing cyanobacteria (blue-green algae) are filamentous and collect in large mats that can be a nuisance in the water. Some cyanobacteria may form cyanobacteria mats that can be a nuisance in streams.

USGS and Wildlife Service photo by Kelly Bell (left); 2005 State of Tennessee Commission Services photo by Jeff Manning (middle); and photo by Eric Calverley, North Carolina State University (right).

Dynamics of an Urban Stream Ecosystem

Urban development may have significant impacts on stream ecosystems that are often obvious to the casual observer.



Hydrology Urban development may increase the amount of water through a watershed, impervious surfaces (for example, roads, parking lots, and buildings) reflect the sun's radiation and increase runoff into the groundwater system, and the construction of artificial drainage systems (for example, storm drains) may increase runoff to the stream. Rapid runoff and high streamflow may increase the power of the energy of the water flow in the stream, which can increase erosion, sedimentation, and chemical and organic matter inputs.



Water chemistry Urban development may increase the input of complex chemicals into streams, especially from impervious surfaces in urban and suburban areas. These materials may include pesticides, herbicides, and fertilizers that are known to have harmful biological effects.

Physical habitat Urban development can lead to removal of vegetation near a stream, which increases the amount of light reaching the stream and increases the water temperature. Streamflow modification associated with urban development drives changes in stream habitat, including excessive flow velocities that scour the streambanks and cause the streambank.



Native fish communities generally become less diverse with increased urban development. Common carp (*Cyprinus carpio*) is a non-native species, prefer to go bodies of slow or standing water and soft sediments. The fathead minnow (*Pimephales promelas*) is tolerant of dirty, low-oxygen water.



Algae that are tolerant of pollution may increase in abundance with increased urban development. Certain algae tend to decrease and non-photosynthetic algae tend to increase with urban development. Some algae (e.g., *Chlorella*) are tolerant of high turbidity and nutrient-rich conditions of many urban streams. These can be a nuisance by forming thick mats of green algae on the surface of water and rocks.



Macrobenthos that are sensitive to pollution may be lost as a watershed becomes urbanized. More tolerant organisms—such as leeches and insects—may increase in abundance. Leeches, such as the North American freshwater leech (*Murchieleana*), are most common in warm, protected shallow waters where there is little disturbance from currents. Insects (especially a variety of relatively low, diatomic) may be lost.

USGS and Wildlife Service photo by Kelly Bell (left); 2005 State of Tennessee Commission Services photo by Jeff Manning (middle); and photo by Eric Calverley, North Carolina State University (right).

Average and high flow magnitude, high flow frequency, and high flow duration have been associated with changes in aquatic communities.

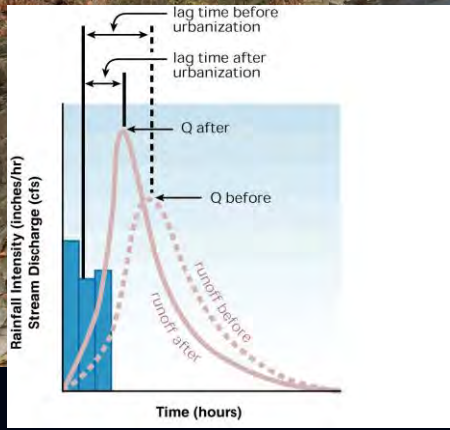


Photo: Alan Cressler, USGS

(USGS, Ecological Health in the Nation's Streams, 1993–2005)

34 Ecological Health in the Nation's Streams, 1993–2005

Dynamics of an Urban Stream Ecosystem

Urban development may have significant impacts on stream ecosystems that are often obvious to the casual observer.

Hydrology: Urban development alters the movement of water through a watershed. Impervious surfaces (for example, roofs, parking lots, and highways) prevent the infiltration of water into the groundwater system and increase runoff into the stream. Flood runoff and high streamflow increase the power of erosion of the water flow in the stream, which can deepen or widen stream channels and cause streambank erosion.

Water chemistry: Urban development may increase the input of complex chemical wastes, typically found runoff from impervious surfaces in individual and collection areas. These wastes may include pesticides, herbicides, and herbicides that are known to have harmful biological effects.

Physical habitat: Urban development can lead to removal of vegetation near a stream, which increases the amount of light reaching the stream and increases the water temperature. Streamflow modification associated with urban development drives changes in stream habitat, including excavation flow velocities that erode the streambanks and lower the streambed.

Chapter 2—Stream Ecology Primer 35

Chlorella spp.
cyanobacteria

Algae that are tolerant of pollution may increase in abundance with increased urban development. Certain algae tend to decrease and nonindigenous algae tend to increase with urbanization. Some algae, such as filamentous algae, can form a thick mat on the surface of water and rocks.

lurch (scud)

Macroinvertebrates that are sensitive to pollution may be lost as a watershed becomes urbanized. More tolerant organisms—such as lurches and scuds—may increase in abundance. Lurches, such as the freshwater American crayfish, are most common in warm, protected shallow waters where there is little disturbance from currents. Scuds (scud) are found at relatively low dissolved oxygen levels.

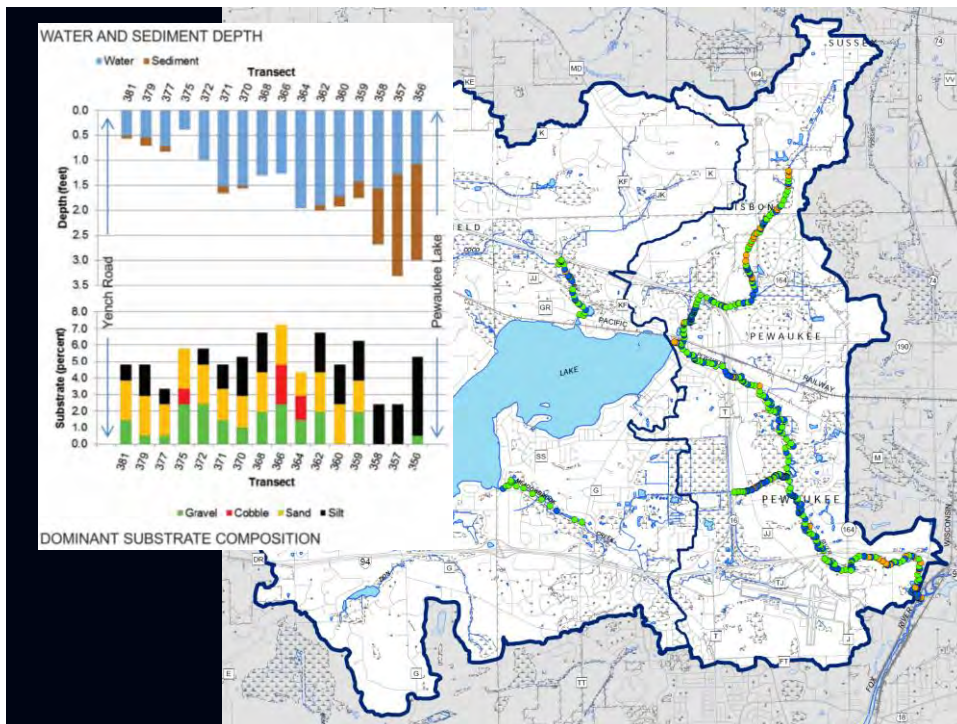
fathead minnow **common carp**

Native fish communities generally become less diverse with increased urban development. Common carp (*Cyprinus carpio*), a non-native species, tends to go from a body of clear or standing water and such inland. The fathead minnow (*Pimephales promelas*) is tolerant of dirty, low-oxygen water.

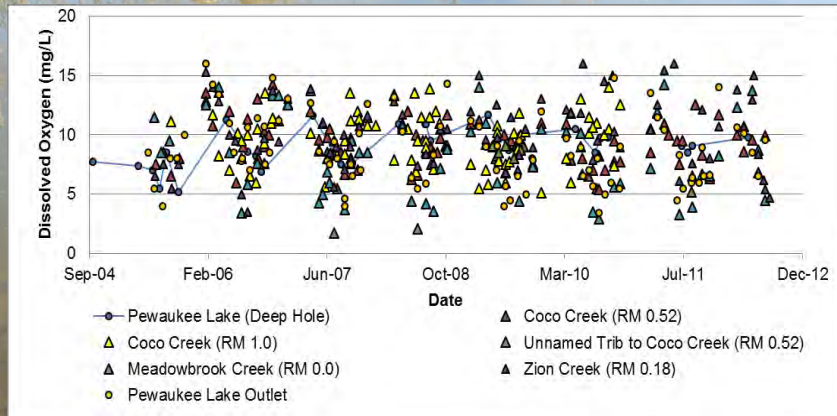
The presence of healthy streams in watersheds with substantial human influence indicates that it is possible to maintain and restore healthy stream ecosystems

Cross Section Survey-Physical data

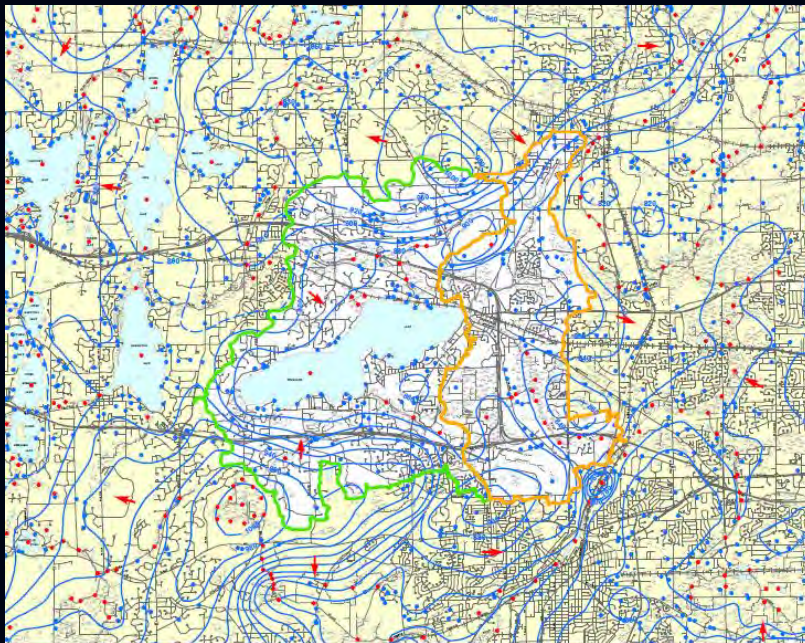
Water width
 Water depth
 Discharge
 Bank height, slope
 Bank erosion
 Instream woody habitat
 Substrate (rocks, gravel, sand, clay)
 Riparian (stream side) buffers
 Channel obstructions/jams
 Trash/debris

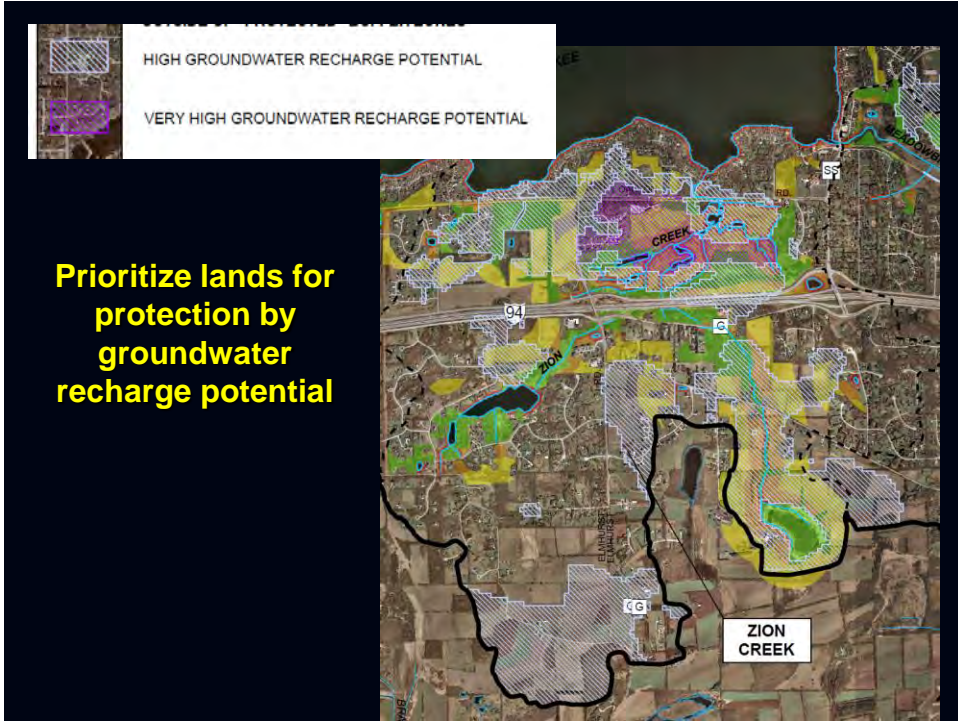


Water Quality-data & Trends



Groundwater data



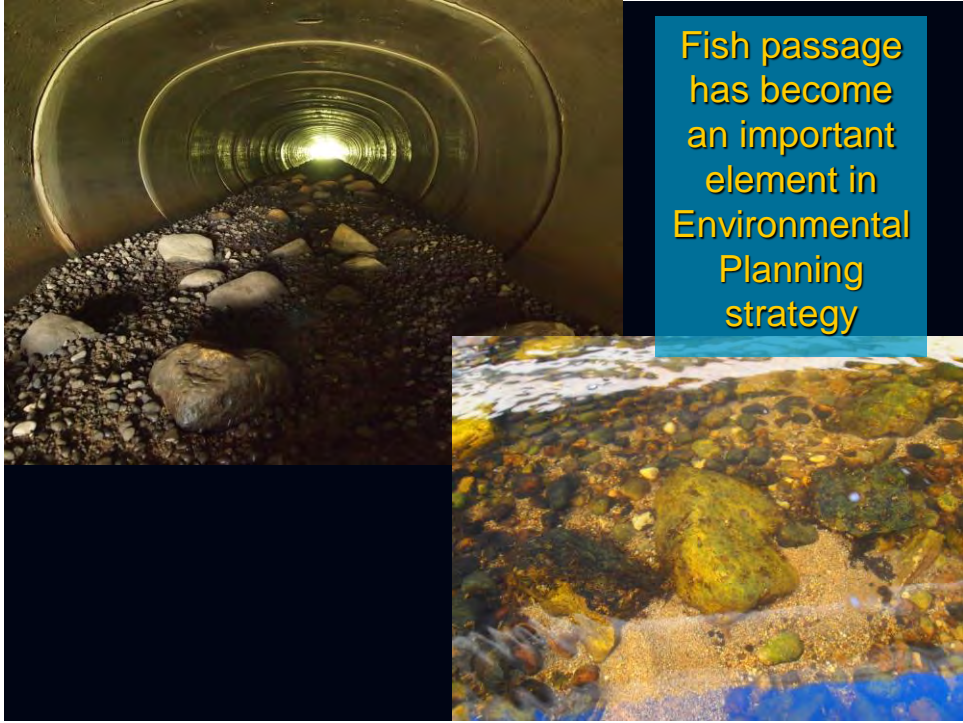


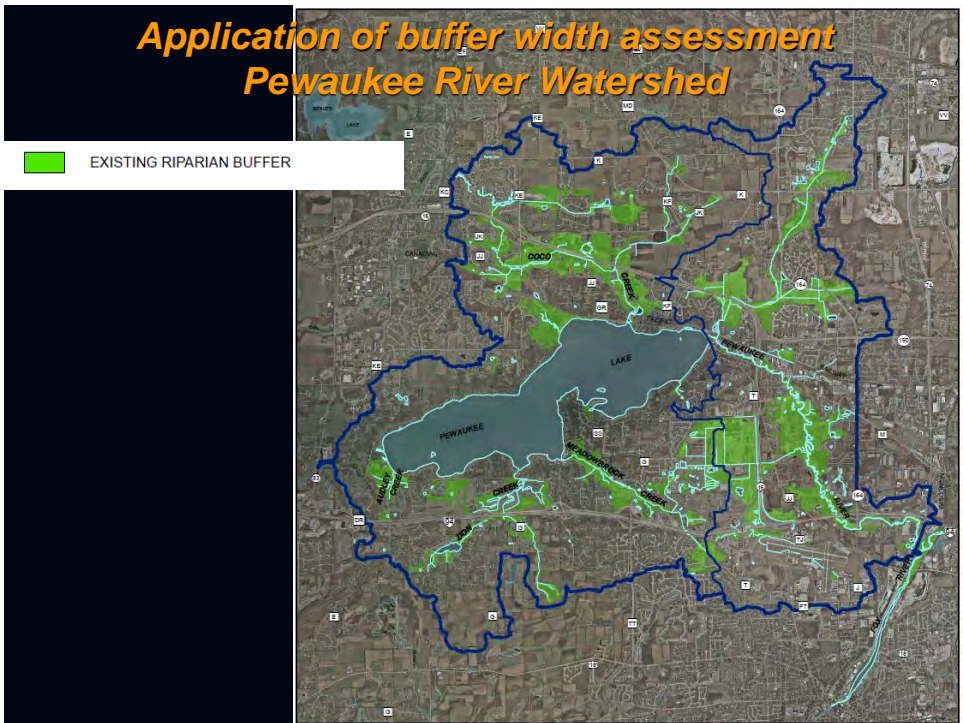
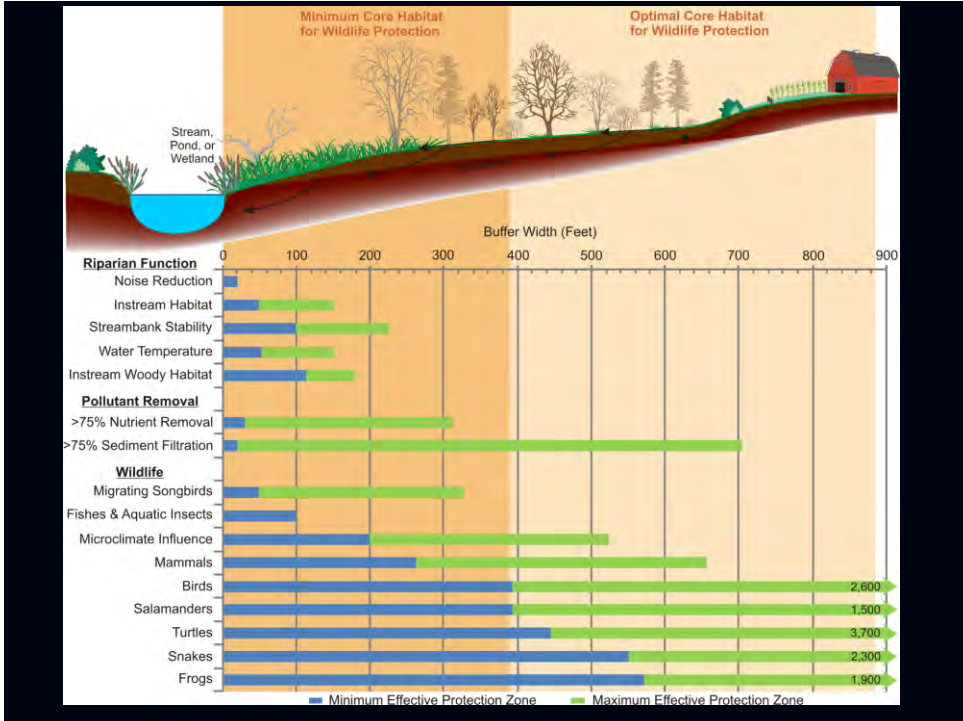
MMSD Kinnicckininic River



Case Study-
WisDOT
Villa Mann Creek
Project



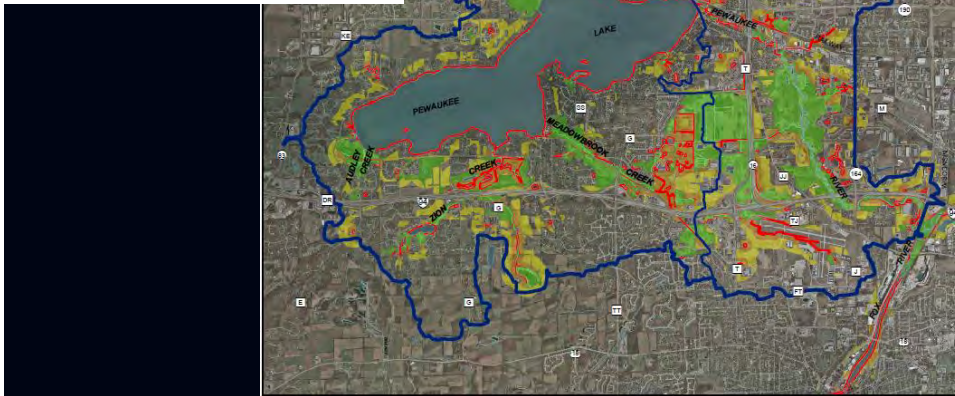




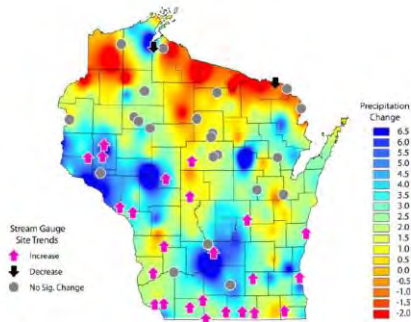
Application of buffer width assessment Pewaukee River Watershed

- EXISTING RIPARIAN BUFFER
- 75 FEET MINIMUM RECOMMENDED BUFFER WIDTH
- 400 FEET MINIMUM CORE HABITAT WIDTH FOR WILDLIFE PROTECTION
- 1,000 FEET OPTIMAL CORE HABITAT WIDTH FOR WILDLIFE PROTECTION

Source: SEWRPC.



River Baseflow Trends
and Precipitation Change 1950 - 2006



Annual Stream and River Flow Trends
and Precipitation Change 1950 - 2006

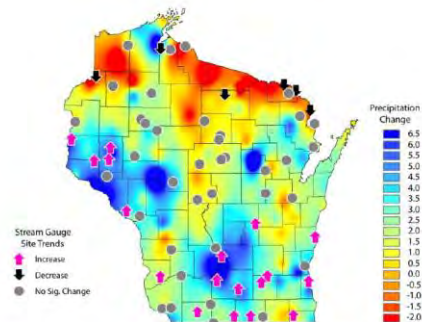


Figure 19. From 1950 to 2006, Wisconsin as a whole became wetter, with an increase in annual precipitation of 3.1 inches. This observed increase in annual precipitation was primarily in southern and western Wisconsin, while northern Wisconsin was drier (Center for Climatic Research & Center for Sustainability and the Global Environment, Nelson Institute, University of Wisconsin-Madison). The southern and western regions of the state had increases in baseflow (left) and annual flow (right) between 1950 and 2006, corresponding to the areas with greatest increases in precipitation (Greb, unpublished data; maps prepared by Eric Erdmann, 2010).



Climate change may alter the volume and timing of water movement through a water cycle.

**“Build ecological resilience”
through fish passage enhancement
creation and/or expansion of riparian buffers
Erosion control enforcement
Protection of groundwater recharge areas**

Sometimes multiple dimensions need to be reconstructed to recreate these *Dimensions of Connectivity*

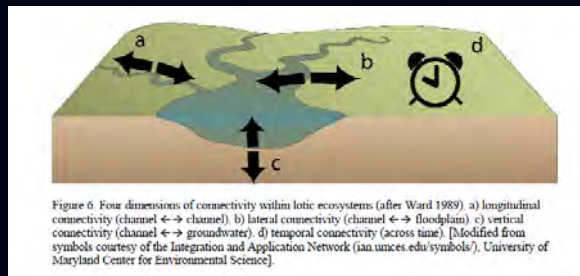
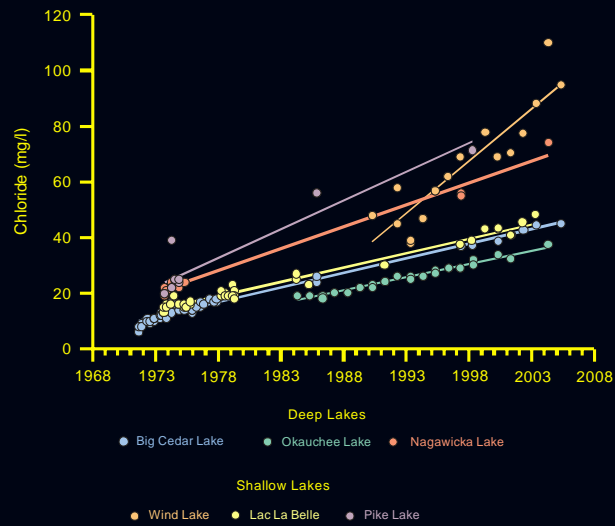


Figure 6 Four dimensions of connectivity within lotic ecosystems (after Ward 1989) a) longitudinal connectivity (channel ↔ channel), b) lateral connectivity (channel ↔ floodplain) c) vertical connectivity (channel ↔ groundwater), d) temporal connectivity (across time). [Modified from symbols courtesy of the Integration and Application Network (ian.umces.edu/symbols/), University of Maryland Center for Environmental Science].

McDonough et al (2011)

Continuing Water Quality Challenges



Our best offense is a good defense!



300-2000
ITEM 1

**PSC AND SSE ANSWERED LETTER REQUESTS
01-01—12-30-2015**

Number	Civil Division	County	Date Received	Date Answered	Location
PSC Requests					
PSC-2015-001	City of Pewaukee	Waukesha	1/2/2015	1/6/2015	CTH M Office Building 07, 19, 14-3 South of CTH M and 1,500 feet east of STH 164
PSC-2015-002	Village of Brown Deer	Milwaukee	1/12/2015	1/15/2015	Lighthouse of Brown Deer, (1) Senior-living Memory Care Facility 08, 21, 03-4 400 feet north of W. Brown Deer Road and west of N. 60th Street
PSC-2015-003	City of Oconomowoc	Waukesha	1/27/2015	1/27/2015	Azura Oconomowoc, (1) Memory Care Facility 07, 17, 04-2 Southeast of George Street and E. Oak Street
PSC-2015-004	City of Glendale	Milwaukee	1/26/2015	1/27/2015	Orthopaedic Hospital of Wisconsin 07, 22, 05-1 475 W. River Woods Parkway
PSC-2015-005	Village of Sturtevant	Racine	1/26/2015	2/23/2015	Enterprise Business Park, (4) Buildings 03, 22, 20-4 Northwest of the Canadian Pacific Railroad and CTH H
PSC-2015-006	City of Glendale	Milwaukee	2/16/2015	3/4/2015	Bender Recreational Complex, (1) Concession Building 08, 22, 30-2 500 Feet west of Baker Road and Bender Road
PSC-2015-007	City of Oak Creek	Milwaukee	2/26/2015	3/4/2015	Emerald Row Apartments 05, 22, 17-1 600 feet south of S. 6th Street and W. Drexel Avenue
PSC-2015-008	City of Wauwatosa	Milwaukee	3/5/2015	3/12/2015	Milwaukee County Research Park, (1) Office Building 07, 21, 29-1 10100 W. Innovation Drive 07, 21, 29-2 (2010 WWI wetland modified into stormwater detention basin after USH 45 On-ramp expansion. Wetland limits undetermined on site.)
PSC-2015-009	Village of Shorewood	Milwaukee	3/13/2015	3/18/2015	(1) Shorewood Metro Market and (1) Mixed-use Building 07, 22, 04-4 Southwest of E. Olive Street and N. Oakland Avenue
PSC-2015-010	City of Oak Creek	Milwaukee	3/23/2015	3/24/2015	Azura, (1) Memory Care Facility 05, 22, 21-2 700 feet north of E. Centennial Drive and east of Mayhew Drive
PSC-2015-011	Village of Summit	Waukesha	3/6/2015	4/7/2015	Aurora Summit Data Center 07, 17, 15-4 South of IH-94 and 2,200 feet east of STH 67
PSC-2015-012	City of Brookfield	Waukesha	3/9/2015	4/8/2015	Lilly Preserve, (1) 24-unit and (2) 26-unit, 3-story Apartment Buildings 07, 20, 11-4 3125 Lilly Road
PSC-2015-013	Village of Pleasant Prairie	Kenosha	4/7/2015	4/21/2015	(1) Kwik Trip Convenience Store and (1) Car Wash 01, 22, 08-1 Northwest of 76th Street and 88th Avenue
PSC-2015-014	City of Franklin	Milwaukee	4/16/2015	4/27/2015	Autumn Leaves, (1) Memory Care Facility 05, 21, 08-4 9201 W. Drexel Avenue
PSC-2015-015	Town of Delafield	Waukesha	4/13/2015	4/29/2015	Clinic/Ambulatory Surgery Center 07, 18, 24-4 N15 W28300 Golf Road
PSC-2015-016	City of Waukesha	Waukesha	4/28/2015	4/29/2015	Hall Automotive Service Center 07, 19, 27-1 North of CTH JJ and 300 feet east of CTH JJ and Silvernail Road 07, 19, 22-4
PSC-2015-017	City of Pewaukee	Waukesha	3/19/2015	5/11/2015	Zilber Industrial I at Ridgeview, (1) Industrial Building 07, 19, 14-3 South of CTH M and 2,000 feet east of STH 164 07, 19, 14-4
PSC-2015-018	City of Burlington	Walworth	3/11/2015	5/11/2015	Aurora Burlington Healthcare, (1) Ambulatory Surgery Center and Professional Office Building 02, 18, 01-1 Southwest of STH 36 and Spring Valley Road
PSC-2015-019	City of Oak Creek	Milwaukee	5/7/2015	5/11/2015	Drexel Town Square, (1) US Bank 05, 22, 17-1 400 feet south of W. Drexel Avenue and west of STH 36
PSC-2015-020	City of Waukesha	Waukesha	5/11/2015	5/22/2015	(1) Industrial Building 07, 19, 34-2 901 Northview Road
PSC-2015-021	Village of Pleasant Prairie	Kenosha	5/11/2015	6/3/2015	Uline Corporate Campus Conference Center 01, 21, 25-2 1,500 feet southwest of 120th Avenue and Uline Drive
PSC-2015-022	Village of Menomonee Falls	Waukesha	5/27/2015	6/2/2015	White Stone Station, (1) Retail Building - (4) Tenants and (1) Other Building 08, 20, 03-1 Southeast of Falls Parkway and Water Street 08, 20, 03-4

**PSC AND SSE ANSWERED LETTER REQUESTS
01-01—12-30-2015**

Number	Civil Division	County	Date Received	Date Answered	Location
PSC-2015-023	Village of Mt. Pleasant	Racine	5/21/2015	6/8/2015	(1) Chick-fil-A Restaurant 03, 22, 13-4 5315 Washington Avenue
PSC-2015-024	Village of Germantown	Washington	5/18/2015	6/15/2015	(1) Memory Care Facility 09, 20, 28-1 Southwest of Bernies Way and Virginia Avenue
PSC-2015-025	City of Mequon	Ozaukee	6/11/2015	6/18/2015	Children's Hospital of Wisconsin Mequon Clinic 09, 22, 30-1 Southwest of Market Street and STH 167
PSC-2015-026	City of New Berlin	Waukesha	6/11/2015	7/7/2015	Prospect Creek Shopping Center, (1) Arby's, (1) Panera Bread, and (1) Mini Strip Mall 06, 20, 27-1 Southwest of W. Beloit Road (CTH I) and Moorland Road (CTH O)
PSC-2015-027	Village of Caledonia	Racine	6/23/2015	7/7/2015	Olympia Brown School 04, 23, 17-4 South of 5 1/2 Mile Road and Novak Road
PSC-2015-028	Village of Pleasant Prairie	Kenosha	2/11/2015	7/8/2015	Uline H2 Office Building 01, 21, 25-4 West of 120th Avenue and 2,000 feet north of 116th Street
PSC-2015-029	Village of Slinger	Washington	7/16/2015	7/21/2015	Hillside Terrace Apartments, Phase II, (3) 8-family Buildings 10, 19, 15-3 West of the terminus of Cedar Bluffs Way and 500 feet south of Cedar Bluffs Drive and Cedar Bluffs Way
PSC-2015-030	City of Waukesha	Waukesha	6/30/2015	7/22/2015	(1) Kwik Trip Convenience Store 07, 19, 21-3 Southwest of Golf Road and N. Grandview Boulevard
PSC-2015-031	City of Oak Creek	Milwaukee	7/15/2015	7/23/2015	Southfield II, (5) Multi-family Apartment Buildings 05, 22, 06-4 Northwest of W. Birdsong Drive and S. 13th Street
PSC-2015-032	City of Racine	Racine	7/13/2015	8/3/2015	Knapp Elementary School 03, 23, 20-2 2701 17th Street
PSC-2015-033	City of Pewaukee	Waukesha	7/10/2015	8/12/2015	Prairie Grass, (3) Multi-family Apartment Buildings 07, 19, 20-1 N17 W268 E. Fieldhack Drive
PSC-2015-034	City of Delavan	Walworth	7/28/2015	8/4/2015	Recycling Facility 02, 16, 16-2 East of the terminus of Woolsey Street and 1,250 feet southwest of Hobbs Drive and Mound Road
PSC-2015-035	Village of West Milwaukee	Milwaukee	7/30/2015	8/4/2015	(1) Multi-tenant Commercial Building 07, 21, 36-3 1310 Miller Park Way
PSC-2015-036	City of Wauwatosa	Milwaukee	7/9/2015	8/4/2015	The 2100, (1) Multi-family Building 07, 21, 20-2 2100 N. Mayfair Road
PSC-2015-037	City of Greenfield	Milwaukee	7/29/2015	8/5/2015	(1) Meijer Grocery/Retail Building and (1) Convenience Store 06, 21, 23-3 Northeast of S. 60th Street and W. Layton Avenue
PSC-2015-038	Village of Sussex	Waukesha	8/4/2015	8/5/2015	(1) Taco Bell and (1) Bank 08, 19, 22-3 700 feet west of CTH V V and Prospect Drive
PSC-2015-039	City of Oak Creek	Milwaukee	8/5/2015	8/7/2015	Z1 At Creekside, (1) Industrial Building and Future Building Addition 05, 22, 30-4 West of S. 13th Street and 500 feet north of W. Lois Lane
PSC-2015-040	City of Hartford	Washington	8/11/2015	8/18/2015	Just Perfect Rentals, (2) Industrial/Storage Buildings 10, 18, 17-3 South of W. State Street and N. Wacker Drive
PSC-2015-041	City of Oak Creek	Milwaukee	8/11/2015	8/19/2015	Drexel Town Square, Pet Store/Retail Building 05, 22, 17-1 Southwest of S. Delco Drive and W. Drexel Avenue
PSC-2015-042	City of Port Washington	Ozaukee	8/20/2015	8/21/2015	New Port Vista, Phases 3 and 4 which includes (12) 6-unit, Multi-family Buildings 10, 22, 04-2 South of E. Sauk Road and Woodridge Lane
PSC-2015-043	Town of Geneva	Walworth	8/20/2015	8/26/2015	Walworth County Department of Public Works Vehicle Maintenance Facility 02, 17, 04-3 W4097 CTH NN
PSC-2015-044	Village of Grafton	Ozaukee	8/26/2015	8/28/2015	Village Pointe Commons, (1) Assisted Living Campus Building and (4) Condominium Buildings 10, 21, 25-2 East of 1st Avenue and W. Oak Street
PSC-2015-045	City of Glendale	Milwaukee	1/6/2015	9/3/2015	Glendale Manor/Braeburn Meadows, (1) Existing Residence, (8) Single-family Residential Lots, and (2) 22-Unit Community Based Residential Facilities 08, 22, 18-3

**PSC AND SSE ANSWERED LETTER REQUESTS
01-01—12-30-2015**

Number	Civil Division	County	Date Received	Date Answered	Location
					500 feet northeast of N. Range Line Road and W. Good Hope Road
PSC-2015-046	Village of East Troy	Walworth	9/8/2015	9/10/2015	East Troy High School, (3) Building Additions 04, 18, 19-3 3128 Graydon Avenue
PSC-2015-047	Village of Wales	Waukesha	9/9/2015	9/18/2015	Kettle Moraine High School and Wales Elementary School 06, 18, 04-2 Southwest of Oak Crest Drive and USH 18 06, 18, 04-3
PSC-2015-048	City of Waukesha	Waukesha	9/22/2015	9/28/2015	Meijer Development, Lots 2 and 3 06, 19, 14-2 Southeast of E. Sunset Drive and Tenny Avenue
PSC-2015-049	City of West Bend	Washington	9/24/2015	9/28/2015	Delta Defense Headquarters, (1) Building 11, 19, 26-3 Lots 1 and 2 of West Bend Corporate Center
PSC-2015-050	City of Brookfield	Waukesha	9/14/2015	9/30/2015	Hidden Lake Preserve, (3) 4-unit, (2) 27-unit, (1) 46-unit Multi-family, and (1) Single-family Building 07, 20, 13-2 South of Applegate Lane and W. Burleigh Road
PSC-2015-051	Town of Brookfield	Waukesha	9/14/2015	10/7/2015	The Corners of Brookfield - Retail Mall Complex 07, 20, 29-3 Southeast of Marcus Drive and W. Bluemound Road
PSC-2015-052	City of Hartford	Washington	9/21/2015	10/7/2015	(1) 10-unit and (6) 12-unit Apartment Buildings 10, 18, 21-4 820-860 E. Loos Street
PSC-2015-053	City of St. Francis	Milwaukee	9/30/2015	10/7/2015	(1) Office Building 06, 22, 15-3 2040 E. St. Francis Avenue
PSC-2015-054	Village of Pleasant Prairie	Kenosha	9/22/2015	10/7/2015	LakeView Corporate Park-Site 52, (1) Office/Warehouse 01, 22, 29-1 Southwest of 104th Street and 88th Avenue
PSC-2015-055	Village of Shorewood	Milwaukee	9/28/2015	10/8/2015	Shorewood Senior Apartments, (1) Building 07, 22, 09-1 East of the Milwaukee River and 400 feet south of E. Capitol Drive
PSC-2015-056	City of Pewaukee	Waukesha	10/6/2015	10/8/2015	SafeLite Auto Glass, (1) Building 07, 19, 23-3 W238 N1650 Rockwood Drive
PSC-2015-057	City of Lake Geneva	Walworth	10/7/2015	10/8/2015	Shoppes on 50, (1) Multi-tenant Retail/Restaurant 02, 18, 31-2 351 Peller Road
PSC-2015-058	Village of Hales Corners	Milwaukee	10/8/2015	10/9/2015	Forest Ridge Apartments (Senior Community) Addition - 51-units of (28)1 Bedroom and (23) 2 Bedroom 06, 21, 31-4 11077 W. Forest Home Avenue
PSC-2015-059	Village of Mt. Pleasant	Racine	10/5/2015	10/16/2015	(1) Industrial Building 03, 22, 18-3 Southeast of SE Frontage Road and proposed Glove Drive
PSC-2015-060	Village of Sussex	Waukesha	10/5/2015	10/16/2015	(1) Kwik Trip Convenience Store and (1) Car Wash 08, 19, 22-3 700 feet southwest of CTH V V and Prospect Drive
PSC-2015-061	Village of Pleasant Prairie	Kenosha	10/8/2015	10/19/2015	Z1 at Lakeview Corporate Park, (1) Building 01, 22, 21-4 North of 102nd Street and west of 78th Avenue
PSC-2015-062	City of Kenosha	Kenosha	10/8/2015	10/19/2015	Zilber Industrial 3, (1) Industrial Building 02, 22, 32-4 South of 58th Place and 95th Avenue
PSC-2015-063	City of Glendale	Milwaukee	10/15/2015	10/21/2015	Residence Inn By Marriott, (1) 4-story, 83-room Hotel 08, 22, 20-1 Northeast of I-43 and W. Green Tree Road
PSC-2015-064	City of Oak Creek	Milwaukee	7/9/2015	10/27/2015	(1) Public Elementary School and (1) Existing Residential Home 05, 22, 07-3 2200 W. Drexel Avenue
PSC-2015-065	City of Oak Creek	Milwaukee	10/23/2015	11/3/2015	Secondary School 05, 22, 16-3 Northeast of E. Puetz Road and S. Howell Avenue
PSC-2015-066	City of Delafield	Waukesha	11/10/2015	11/11/2015	Heritage Delafield, (1) 3-story Senior Apartments including 2-story Memory Care Building 07, 18, 04-1 2975 Village Square Drive
PSC-2015-067	Village of Saukville	Ozaukee	11/16/2015	11/18/2015	Aisle Logic, (1) Commercial Building 11, 21, 26-2 591 N. Dekora Woods Boulevard
PSC-2015-068	City of Wauwatosa	Milwaukee	11/24/2015	12/8/2015	St. Camillus, (1) 20-Bed Community House and (1) Community Based Residential Facility 07, 21, 29-3 South of W. Wisconsin Avenue and 300 feet east of N. 103rd Street

**PSC AND SSE ANSWERED LETTER REQUESTS
01-01—12-30-2015**

Number	Civil Division	County	Date Received	Date Answered	Location
PSC-2015-069	City of Greenfield	Milwaukee	11/24/2015	12/8/2015	The Glen At Greenfield, (12) Buildings 06, 21, 18-3 East of S. 116th Street and 400 feet north of W. Howard Avenue
PSC-2015-070	Village of Germantown	Washington	11/24/2015	12/14/2015	Saxony Village, (1) Clubhouse and (6) 2-Story Apartment Buildings (190 total units) 09, 20, 22-4 200 feet south of Main Street and Park Avenue
PSC-2015-071	City of Milwaukee	Milwaukee	12/7/2015	12/10/2015	Westin Hotel 07, 22, 28-3 550 N. Van Buren Street
PSC-2015-072	Village of Mukwonago	Waukesha	12/9/2015	12/17/2015	Fairwinds, (2) 16-unit Multi-family Buildings 05, 18, 22-4 Northwest of CTH EE and CTH NN
SSE Requests					
SSE-044-14	Village of Mukwonago	Waukesha	12/18/2014	1/6/2015	Gateway Business Park 05, 18, 36-3 05, 18, 36-4 (01/06/15 Signed Letter E-Mailed)
SSE-001-15	City of Cedarburg Village of Grafton	Ozaukee Ozaukee	1/5/2015	1/27/2015	Pine Ridge Subdivision 10, 21, 26-1
SSE-002-15	City of Glendale	Milwaukee	1/6/2015	9/3/2015	Glendale Manor/Braeburn Meadows 08, 22, 18-3
SSE-003-15	City of Mequon	Ozaukee	1/9/2015	1/27/2015	Wauwatosa Road (STH 181) 09, 21, 28-1 09, 21, 28-4
SSE-004-15	City of Waukesha	Waukesha	1/22/2015	2/2/2015	Sanitary Sewer Extension along Big Bend Road Between E. Garfield Avenue & E. Rivera Drive 06, 19, 14-2
SSE-005-15	City of Pewaukee	Waukesha	1/28/2015	2/2/2015	Meadowbrook Road (CR G) Sanitary Sewer Extension 07, 19, 17-3 07, 19, 18-4
SSE-006-15	Village of Grafton	Ozaukee	2/3/2015	2/18/2015	Falls Road Rehabilitation/Blackhawk Drive - Port Washington Road 10, 22, 29-3 10, 22, 30-2
SSE-007-15	Village of Pleasant Prairie	Kenosha	2/11/2015	7/8/2015	Uline H2 Office Development 01, 21, 25-4
SSE-008-15	Village of Sturtevant	Racine	2/11/2015	2/18/2015	Enterprise Business Park 03, 22, 20-3 03, 22, 20-4
SSE-009-15	City of Delafield	Waukesha	2/11/2015	2/18/2015	Valley Road Sewer Extension 07, 17, 12-4
SSE-010-15	City of Muskego	Waukesha	2/16/2015	2/26/2015	Aster Hills Estates 05, 20, 24-1
SSE-011-15	Village of Hartland	Waukesha	2/17/2015	6/18/2015	Four Winds West Subdivision 08, 18, 27-4
SSE-012-15	City of Glendale	Milwaukee	2/17/2015	2/26/2015	Bender Recreational Complex 08, 22, 30-2
SSE-013-15	Town of Summit	Waukesha	3/6/2015	3/30/2015	Aurora Summit Data Center 07, 17, 15-4
SSE-014-15R	City of Burlington	Racine	3/6/2015	3/25/2015	Utility and Street Improvements, Phase 1 (TID #5) 03, 19, 31-3 03, 19, 31-4 (2nd Letter Received via E-Mail 04/16/15 - 2nd Letter Answered 05/05/15 - 02,18,01-1 / 02,19,06-2)
SSE-015-15	City of Brookfield	Waukesha	3/5/2015	4/1/2015	Lilly Preserve (Lilly Road & Burleigh Road) 07, 20, 11-4
SSE-016-15	Village of Pleasant Prairie	Kenosha	3/13/2015	4/1/2015	Heritage Valley Sewer 01, 22, 17-2 01, 22, 18-1
SSE-017-15	City of Cedarburg	Ozaukee	3/16/2015	4/6/2015	Park Ridge Subdivision 10, 21, 33-1
SSE-018-15	City of Waukesha	Waukesha	3/18/2015	4/7/2015	Meijer Store - Tenny Avenue & Sunset Drive 06, 19, 14-2
SSE-019-15	City of West Bend	Washington	3/26/2015	4/15/2015	East Interceptor Phase 1 11, 20, 17-3 11, 20, 18-4
SSE-020-15	City of Whitewater	Walworth	3/30/2015	4/20/2015	George Street Reconstruction 04, 15, 04-2
SSE-021-15	City of Waukesha	Waukesha	3/30/2015	4/7/2015	Big Bend Road/Tenny Avenue (Smart Property) 06, 19, 14-2 06, 19, 14-3
SSE-022-15	Village of Mukwonago	Waukesha	3/30/2015	4/20/2015	Orchards Subdivision 05, 18, 35-3
SSE-023-15	Village of Mukwonago	Waukesha	4/1/2015	4/20/2015	Premier Woods Apartment Complex 05, 18, 35-3 05, 18, 35-4
SSE-024-15	Village of Germantown	Washington	4/6/2015	5/5/2015	Prairie Glen II 09, 20, 25-1 (Prairie Glen II Subdivision)

**PSC AND SSE ANSWERED LETTER REQUESTS
01-01—12-30-2015**

Number	Civil Division	County	Date Received	Date Answered	Location
SSE-025-15	City of Pewaukee	Waukesha	3/19/2015	5/5/2015	Zilber Industrial I 07, 19, 14-3 07, 19, 14-4
SSE-027-15	Village of Sussex	Waukesha	4/10/2015	6/18/2015	Sussex Town Center 08, 19, 22-3
SSE-028-15	City of Oak Creek	Milwaukee	4/16/2015	6/3/2015	Lakefront Redevelopment, (1) Park Shelter 05, 22, 24-3
SSE-029-15	City of Brookfield	Waukesha	5/8/2015	5/19/2015	The Corridor development 07, 20, 28-4 07, 20, 33-1
SSE-030-15	Village of Germantown	Washington	5/18/2015	6/15/2015	Memory Care Facility 09, 20, 28-1
SSE-031-15	Village of Mt. Pleasant	Racine	5/21/2015	6/8/2015	Racine Shopping Center, Chick-fil-A 03, 22, 13-4
SSE-032-15	City of Mequon	Ozaukee	5/22/2015	6/22/2015	The Enclave at Mequon Preserve, Phase 1 09, 21, 28-1 09, 21, 28-4
SSE-033-15	City of Brookfield	Waukesha	5/26/2015	7/22/2015	Elmbrook Estates Subdivision, 46 Lots 07, 20, 02-2
SSE-034-15	Village of Mt. Pleasant	Racine	6/1/2015	7/22/2015	Mt. Pleasant Corporate Center 03, 22, 18-2
SSE-035-15	City of Milwaukee	Milwaukee	6/22/2015	7/22/2015	Milwaukee County Zoo Otter Exhibit/Restroom 07, 21, 29-3
SSE-036-15	Village of Grafton	Ozaukee	6/16/2015	7/23/2015	Village Pointe Commons, Assisted Living 10, 21, 25-2
SSE-037-15	Village of Sussex	Waukesha	7/17/2015	7/29/2015	Woodside Ridge Subdivision 08, 19, 14-3
SSE-038-15	City of Pewaukee	Waukesha	7/10/2015	8/12/2015	Prairie Grass, (3) Multi-family Apartment Buildings 07, 19, 20-1
SSE-039-15	Village of Mt. Pleasant	Racine	6/15/2015	8/19/2015	CTH V Public Sewer from STH 20 to CTH C 03, 22, 08-3 03, 22, 17-2 (Phase 1 letter requested 6/15/15 and approved 8/19/15, Phase 1 - Part 2 requested 8/27/15 and approved 9/3/15, Phase 1 - Part 3 requested 12/3/15 and approved 12/7/15)
SSE-040-15	City of Wauwatosa	Milwaukee	7/9/2015	8/4/2015	The 2100 Urban Residence 07, 21, 20-2
SSE-041-15	City of Franklin	Milwaukee	7/20/2015	8/6/2015	Horizon - Franklin 2 Lot CSM, (2) Single-family Residences 05, 21, 21-4
SSE-042-15	City of Waukesha	Waukesha	7/29/2015	8/10/2015	E. Sunset Drive Forcemain Replacement 06, 19, 11-3 06, 19, 11-4
SSE-043-15	Village of Sussex	Waukesha	8/3/2015	8/21/2015	Sussex Preserve, Single-family Subdivision 08, 19, 27-4 08, 19, 34-1
SSE-044-15	City of Mequon	Ozaukee	7/29/2015	8/18/2015	Highlander Estates, 111 Lot Single-family Conservation Subdivision 09, 21, 28-2 09, 21, 28-1
SSE-045-15	City of Port Washington	Ozaukee	8/20/2015	8/21/2015	New Port Vista, Phases 3 and 4, (12, Six-Family Residential Buildings) 10, 22, 04-2
SSE-046-15	City of Milwaukee	Milwaukee	8/21/2015	8/25/2015	Century City Redevelopment 08, 21, 12-1
SSE-047-15	City of Cedarburg Town of Cedarburg	Ozaukee	8/21/2015	9/15/2015	The Glen at Cedar Creek Subdivision 10, 21, 23-2 10, 21, 23-3
SSE-048-15	Town of Salem	Kenosha	8/27/2015	9/2/2015	Salem Business Park, Phase 1 01, 20, 27-3 01, 20, 27-4
SSE-049-15	Town of Somers Village of Somers	Kenosha Kenosha	8/31/2015	9/25/2015	Industrial Park 02, 22, 22-3 02, 22, 21-3
SSE-050-15	City of Lake Geneva	Walworth	9/15/2015	9/29/2015	Whitetail Preserve, (2) 6-unit and (2) 8-unit Multi-family Buildings 02, 18, 31-3
SSE-051-15	City of Brookfield	Waukesha	9/14/2015	9/30/2015	Hidden Lake Preserve 07, 20, 13-2
SSE-052-15	Town of Brookfield	Waukesha	9/14/2015	10/7/2015	The Corners of Brookfield, Retail Mall Complex 07, 20, 13-2
SSE-053-15	City of West Bend	Washington	9/17/2015	10/7/2015	Rusco Drive Utility Extension Project 11, 19, 25-3
SSE-054-15	City of Oak Creek	Milwaukee	10/7/2015	10/9/2015	(1) Existing Residential Home, (1) Elementary School, and Future Development off 20th Street Extension 05, 22, 07-3 05, 22, 07-4
SSE-055-15	City of Hartford	Washington	10/8/2015	10/22/2015	Meadowdale Drive, Hillcrest Drive, and Lee Road 10, 18, 32-1 10, 18, 28-3

**PSC AND SSE ANSWERED LETTER REQUESTS
01-01—12-30-2015**

Number	Civil Division	County	Date Received	Date Answered	Location
SSE-056-15	Village of Somers	Kenosha	10/14/2015	10/26/2015	Festival Foods 02, 22, 22-4
SSE-057-15	City of Oak Creek	Milwaukee	7/9/2015	10/27/2015	(1) Elementary School and (1) Existing Single-family Residence 05, 22, 07-3
SSE-060-15	City of Elkhorn	Walworth	11/12/2015	11/16/2015	Existing West Side Elementary School, (2) Additions 03, 16, 36-3
SSE-061-15	Village of Somers	Kenosha	11/23/2015	12/3/2015	Market Square Apartments, (14) Apartment Buildings and (1) Outbuilding 02, 22, 27-1
SSE-062-15	City of Greenfield	Milwaukee	11/24/2015	12/8/2015	The Glen At Greenfield, (12) Buildings 06, 21, 18-3
SSE-063-15	City of Oconomowoc	Waukesha	11/24/2015	12/8/2015	Prairie Creek Ridge - Addition No. 1 08, 17, 27-1
SSE-064-15	Village of Germantown	Washington	11/24/2015	12/14/2015	Saxony Village, (6) 2-Story Multi-family Apartments (190 Units) and (1) Clubhouse 09, 20, 22-4
SSE-065-15	Village of Mukwonago	Waukesha	12/9/2015	12/17/2015	Fairwinds, (2) 16-unity Multi-family Buildings 05, 18, 22-4
SSE-066-15	Village of Grafton Town of Grafton	Ozaukee Ozaukee	12/16/2015	12/30/2015	River Bend Road and Lift Station 10, 22, 30-2