

Root River Watershed Restoration Plan: Report on Chapter VI (partial), “Recommended Plan”

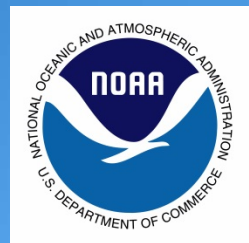
Presentation to the Root River
Restoration Planning Group
February 26, 2014

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Southeastern Wisconsin Regional
Planning Commission

Partners and Funding Agencies



Municipalities and Counties of the Root River Watershed



The plan is being documented in:

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

Report Chapters

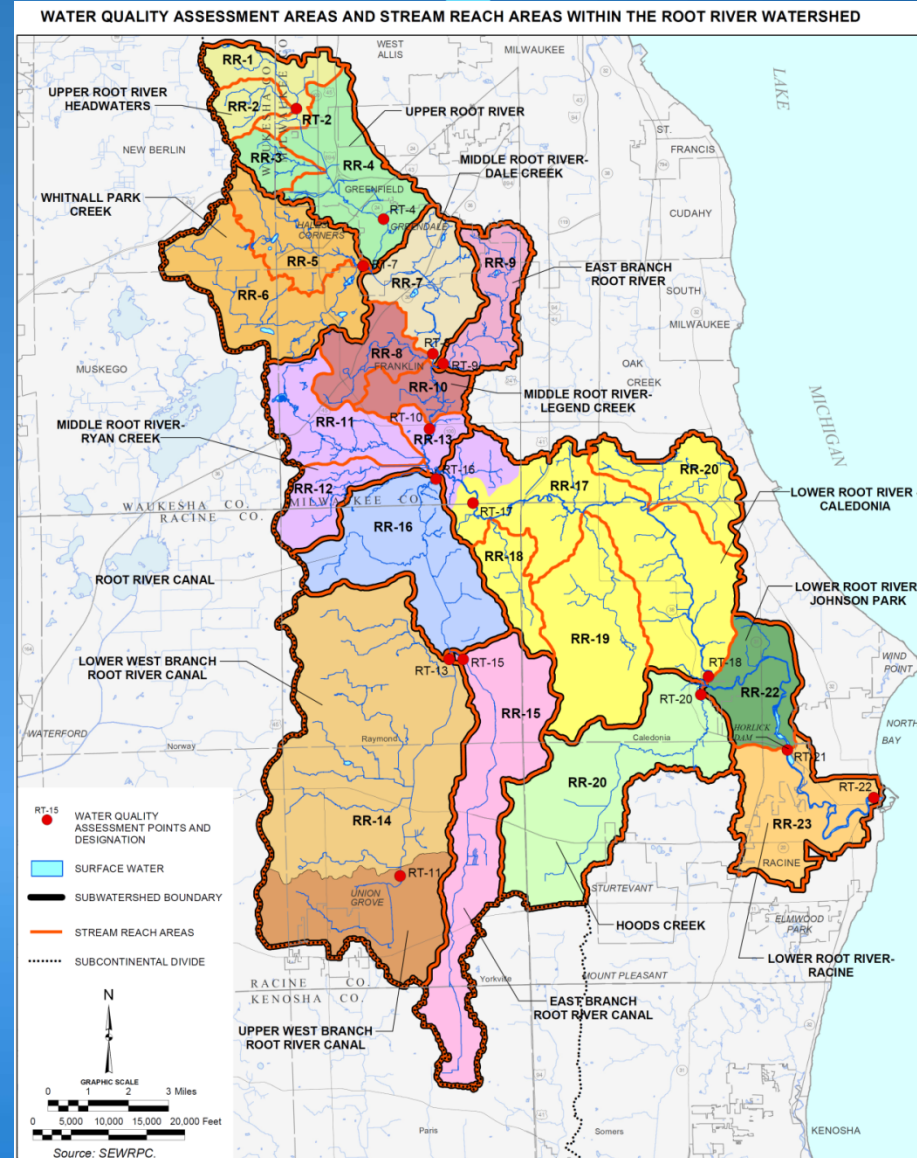
- I. Introduction
- II. Summary of recommendations of the 2007 regional water quality management plan update (RWQMUP) for the Root River and evaluation of implementation to date
- III. Inventory of relevant plans, programs, and initiatives
- IV. Characterization of the watershed
- V. Description of targets to be achieved and alternative management measures
- VI. **Recommended watershed restoration plan**
- VII. Implementation strategies



Chapter VI-Recommended Plan

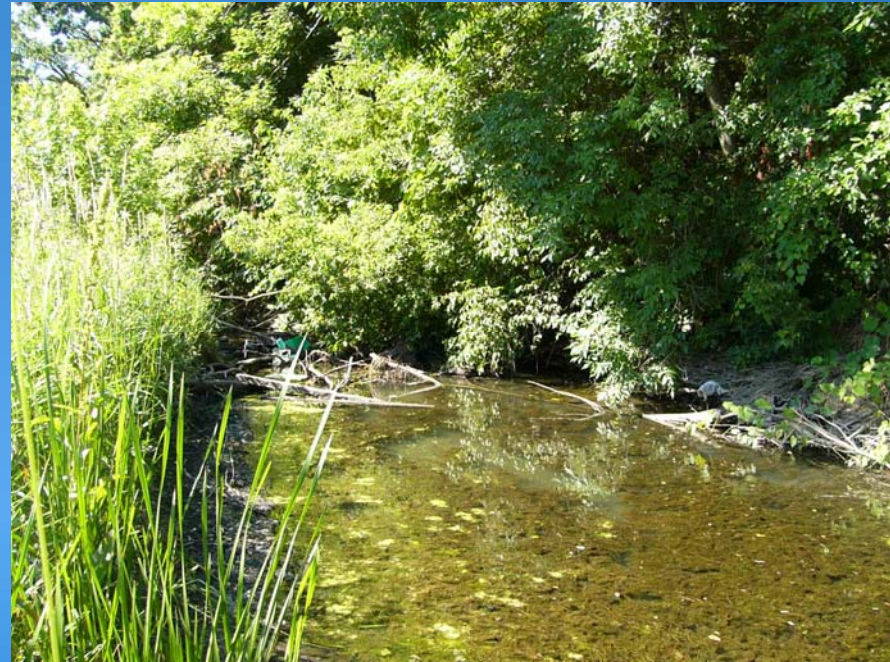
Water Quality Modeling

- Watershed water quality model developed under 2007 RWQMPS
- Simulated instream water quality conditions (concentrations) at multiple locations
- Total suspended solids, total phosphorus, and fecal coliform indicator bacteria



Water Quality Modeling

- Modeled instream pollutant concentrations under recommended plan conditions can be compared with water quality criteria/standards
- Root River WRP recommendations are consistent with RWQMPSU recommendations
- Therefore, RWQMPSU model is a useful tool in estimating effects of WRP recommendations on improving water quality



WRP Focus Areas

Focus area

Recommendation Category

1. Water quality

- Reduce stormwater runoff pollution
- Reduce point source pollution
- Water quality monitoring

2. Recreational use and access

- Reduce bacteria levels
- Water-based recreation
- Trail

3. Habitat

- Instream and riparian

4. Racine County Flooding and Horlick Dam

- Flooding and stormwater
- Alternatives for dam

Recommendations to Reduce Point Source Pollution



Recommendations to Reduce Point Source Pollution

1. Refine unrefined sanitary sewer service areas in the watershed
 - a. Areas served by MMSD in Cities of Greenfield, Milwaukee, and West Allis and Villages of Greendale and Hales Corners
 - b. Portion of Yorkville Sewer Utility District
2. City of Racine and Village of Union Grove maintain and operate wastewater treatment plants

Recommendations to Reduce Point Source Pollution

3. Municipalities in watershed construct and maintain local sewer systems
 - a. Milwaukee County: All municipalities in the watershed, all of which are served by MMSD
 - b. Racine County: City of Racine; Villages of Mt. Pleasant, Sturtevant and Union Grove; Caledonia East and West Utility Districts; Mt. Pleasant Utility District No. 1; Yorkville Sewer Utility District No. 1
 - c. Waukesha County: Cities of Muskego and New Berlin (served by MMSD)

Recommendations to Reduce Point Source Pollution

4. Detailed facilities planning to establish what new facilities would be needed to serve areas in the Villages of Caledonia and Mt. Pleasant added to the Racine and environs planned sewer service area in 2007
5. Abandon the Yorkville Sewer Utility District wastewater treatment plant when it reaches the end of its useful life and connect its service area to the sewerage system tributary to the Racine plant

Recommendations to Reduce Point Source Pollution

6. Municipalities operating local sewerage systems evaluate the need to reduce clearwater infiltration and inflow into sewers and implement Capacity, Management, Operations, and Maintenance (CMOM) programs
7. Eliminate all points of sewerage flow relief in sewerage systems

Recommendations to Reduce Point Source Pollution

8. Continue the operation of the privately-owned wastewater treatment plant serving the Fonk's Mobile Home Park
 - a. Upgrade the plant as necessary
 - b. Formulate level of treatment through Wisconsin Pollutant Discharge Elimination System (WPDES) permitting process
9. Regulate wastewater treatment plant and industrial discharges to surface waters through WPDES program, with effluent concentrations controlled to acceptable levels through WPDES process

Wastewater Treatment Plants

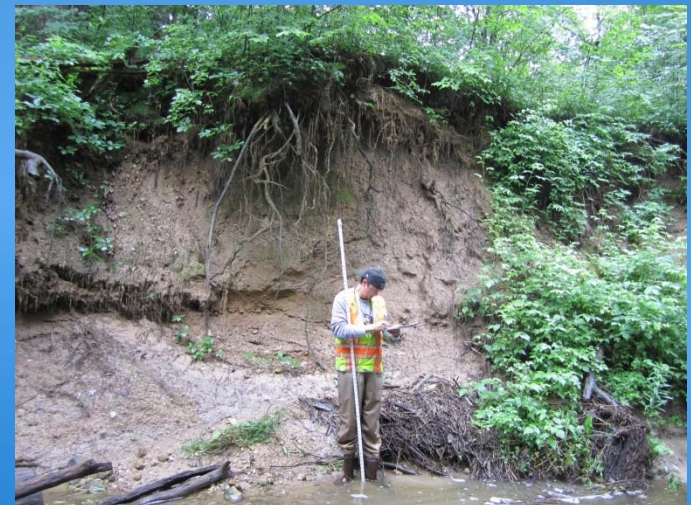
- WPDES permits for 3 plants in watershed do not require disinfection of effluent
- Disinfection would only have a small effect on fecal coliform indicator bacteria concentrations in receiving waters
- Expense of providing disinfection would be considerable (estimated \$2.4 million capital cost for the Union Grove plant)
- Addition of disinfection is not recommended

Water Quality Monitoring Recommendations



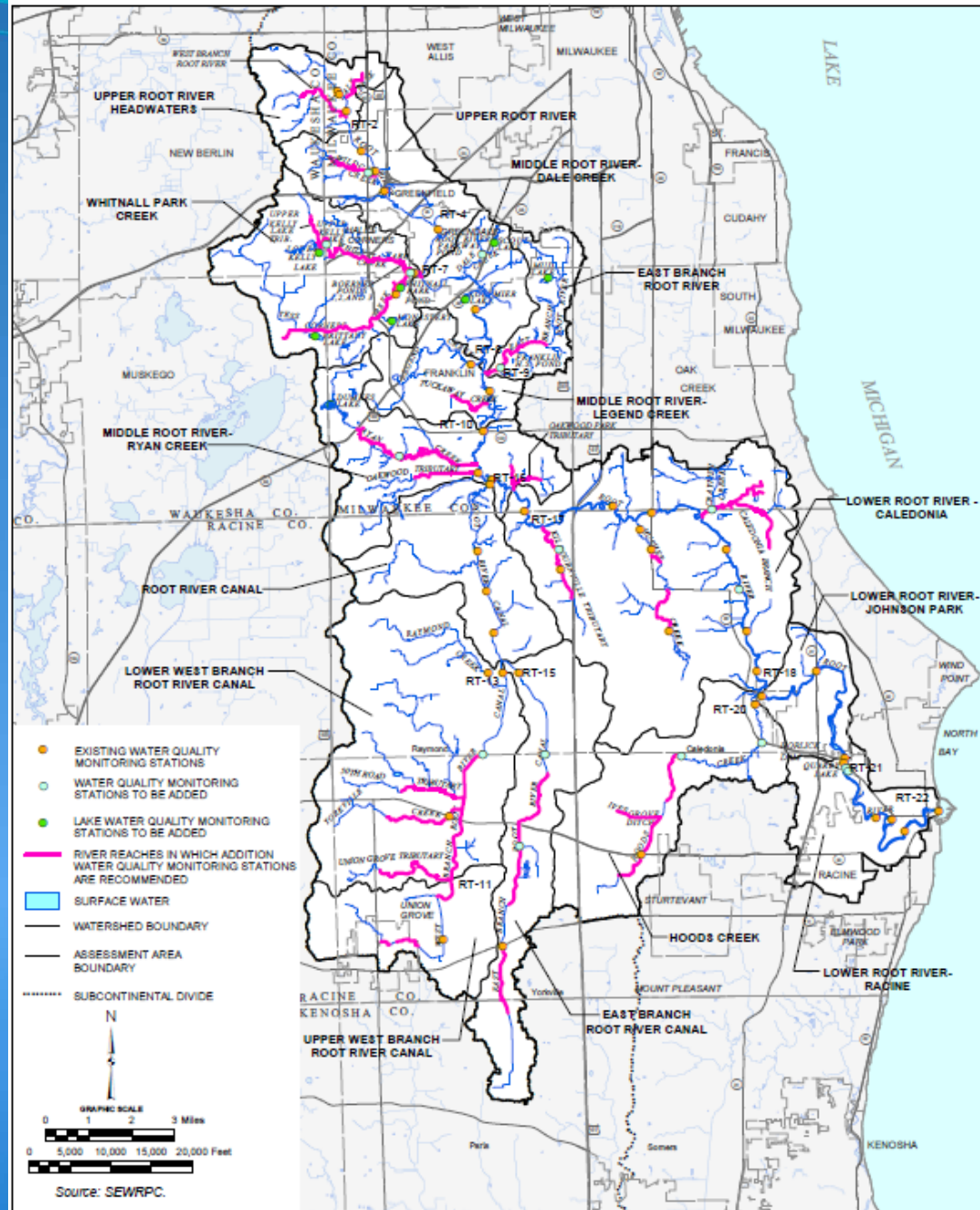
Water Quality Monitoring Recommendations

- Maintain current water quality monitoring activities
- Expand water quality monitoring activities to fill data gaps
- Periodically analyze monitoring data and report results



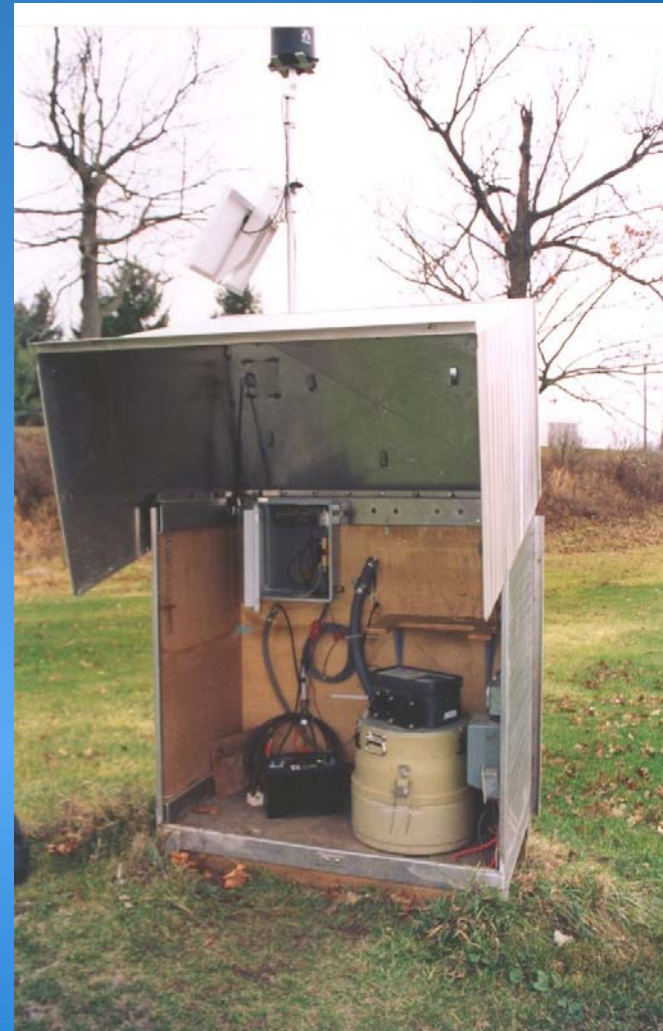
Existing (2010 - 2012) water quality monitoring stations are shown in orange

Map VI-MON-1
RECOMMENDED WATER QUALITY MONITORING STATIONS FOR THE ROOT RIVER WATERSHED



Maintain Existing Monitoring Activities

1. Continue current USGS stream gaging program in the watershed
 - a. Four gages
2. Continue existing MMSD Root River survey monitoring program
 - a. Six stations
3. Continue joint MMSD/USGS biological and toxicity sampling program
 - a. Two stations



Maintain Existing Monitoring Activities

4. Continue City of Racine Health Department current stream monitoring program
 - a. 18 stations
 - b. Sample weekly at stations within City of Racine (9 stations)
 - c. Sample every two weeks at other stations (9 stations)
5. Continue monitoring fecal indicator bacteria at the beach at Quarry Lake during the swimming season
 - a. Two stations

Maintain Existing Monitoring Activities

6. Continue WDNR biological monitoring program
 - a. 42 macroinvertebrate stations
 - b. 12 fish stations
 - c. Monitor trout and salmon at the Root River Steelhead Facility

7. Continue WDNR monitoring of water chemistry at Johnson Park
 - a. One station

Maintain Existing Monitoring Activities

8. Continue University of Wisconsin-Extension Water Action Volunteers water chemistry and biological monitoring
 - a. Four stations
9. Continue Kelly Lakes Association/Citizen Lake Monitoring Network monitoring of Upper Kelly Lake
 - a. One station

Expand Monitoring Activities

1. Establish at least one monitoring station on 16 tributary streams not currently monitored
 - a. Sample for water chemistry and bacteria every two weeks
 - b. 50th Road Tributary, Caledonia Branch, Crayfish Creek, Dale Creek, East Branch Root River, Hale Creek, Ives Grove Ditch, Kilbournville Tributary, Oakwood Park Tributary, Oakwood Tributary, Scout Lake Tributary to Dale Creek, Tuckaway Creek, Union Grove Tributary, West Branch Root River, Wildcat Creek, Yorkville Creek

Expand Monitoring Activities

2. Establish at least two monitoring stations on three tributary streams not currently monitored
 - a. Sample for water chemistry and bacteria every two weeks
 - b. Ryan Creek, Tess Corners Creek, Whitnall Park Creek



Expand Monitoring Activities

3. Establish two additional monitoring stations on four tributary streams that are currently monitored
 - a. Sample for water chemistry and bacteria every two weeks
 - b. East Branch Root River Canal with one station upstream of Fonk's Mobile Park wastewater treatment plant
 - c. Hoods Creek with one station upstream of the confluence with Ives Grove Ditch
 - d. Husher Creek with one station upstream of CTH G
 - e. West Branch Root River Canal with one station upstream of the Union Grove wastewater treatment plant

Expand Monitoring Activities

Several agencies are capable of conducting the monitoring expansion in Recommendations 1-3

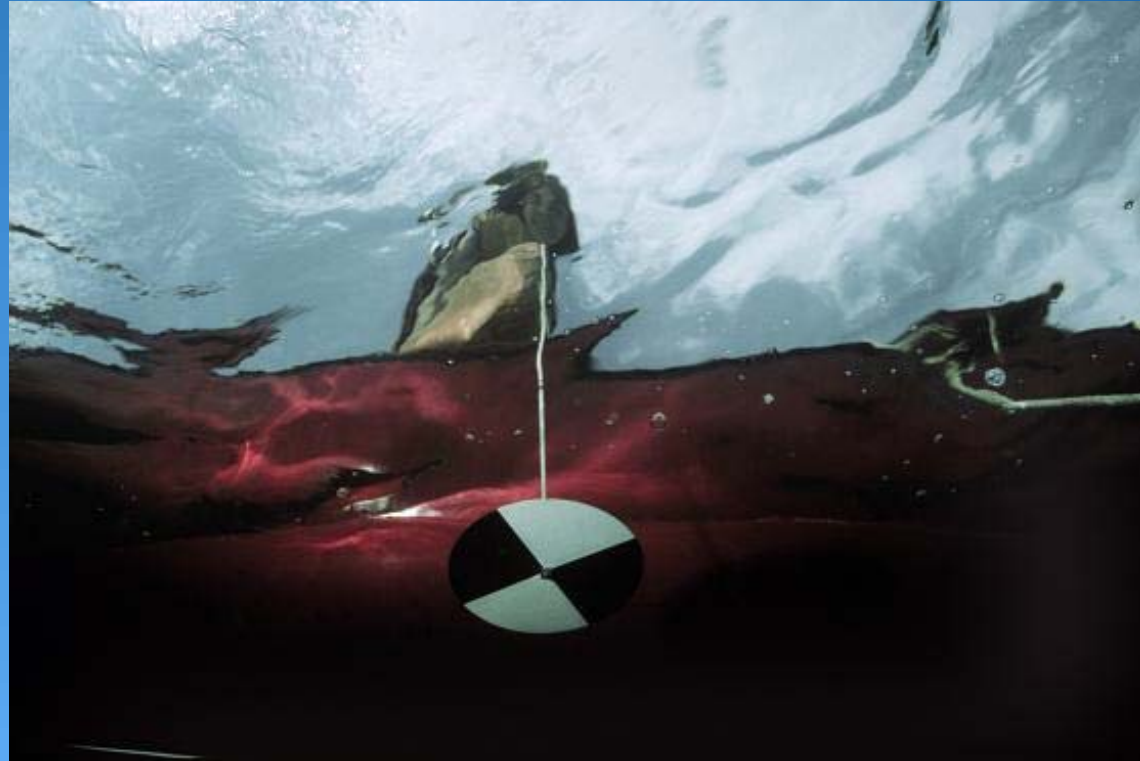
- MMSD
- WDNR
- UWEX WAV Program
- City of Racine Health Department
 - The reductions in sampling frequency recommended for their existing program would allow them to pick up these additional stations for about the same amount of staff effort

Expand Monitoring Activities

4. Establish monitoring stations on eight lakes and ponds that are not currently monitored
 - a. Secchi depth every two weeks
 - b. Total phosphorus and chlorophyll-*a* at least once per year
 - c. Brittany Lake, Dumkes Lake, Koepmier Lake, Lower Kelly Lake, Monastery Lake, Mud Lake, Scout Lake, Whitnall Park Pond
 - d. Wisconsin Citizen Lake Monitoring Network, Kelly Lakes Association, Park Department Staff, or Park Friends Groups could monitor

Expand Monitoring Activities

5. Expand monitoring at Quarry Lake
 - a. Secchi depth every two weeks
 - b. Total phosphorus and chlorophyll-*a* at least once per year



Expand Monitoring Activities

5. Establish two to four continuous monitoring stations in watershed with telemetry to transfer the data
 - a. Establish at existing USGS stream gages
 - b. Monitor water temperature, dissolved oxygen, specific conductance, turbidity, flow
 - c. Highest priority at W. Grange Avenue and W. Ryan Road



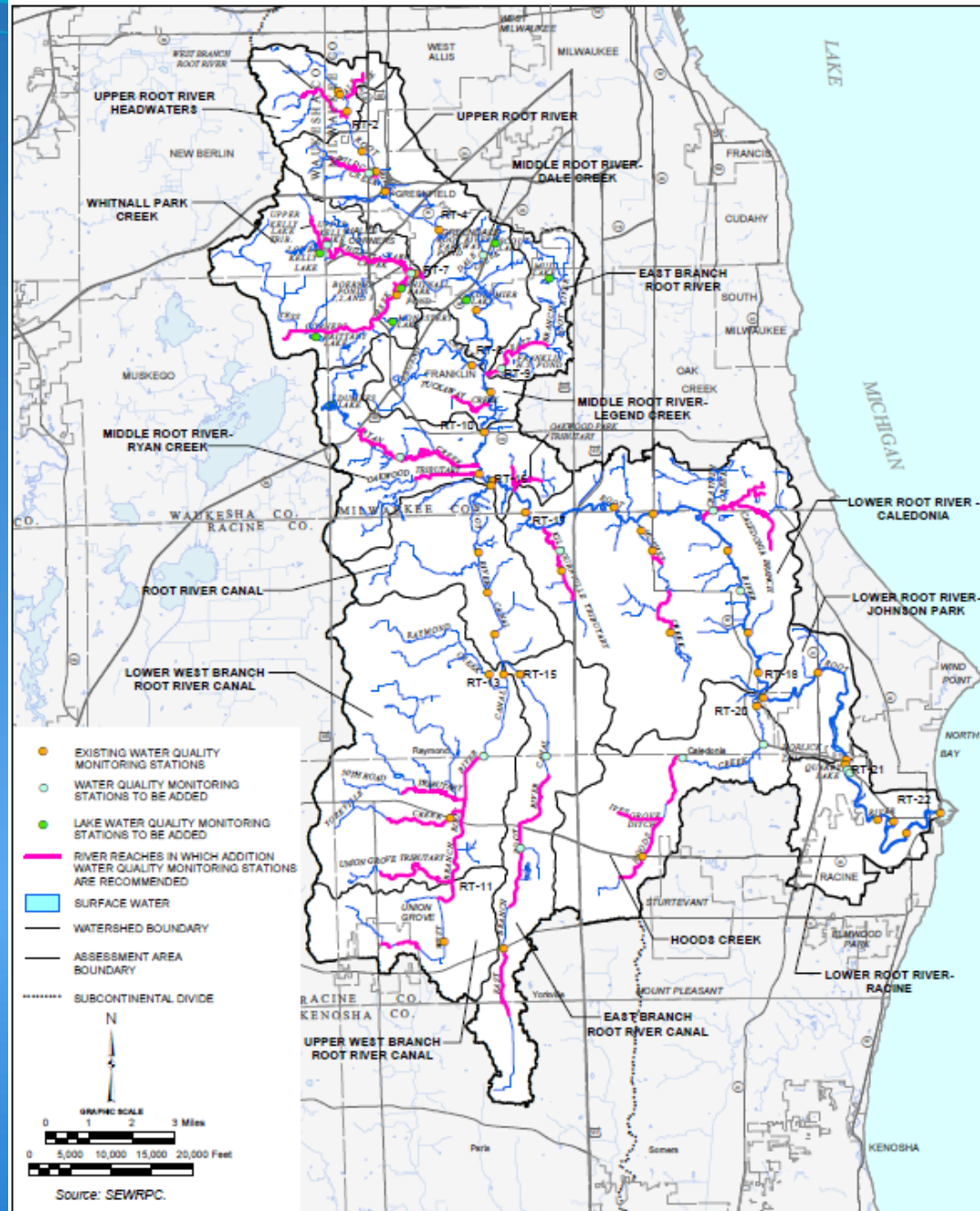
Expand Monitoring Activities

7. Survey the watershed for freshwater mussels every 10 years
 - a. Could be conducted by WDNR or a consultant.



RECOMMENDED WATER QUALITY MONITORING STATIONS FOR THE ROOT RIVER WATERSHED

- Orange = existing stream monitoring stations
- Blue = recommended stream monitoring station
- Green = recommended lake monitoring station
- Pink = stream reach to establish monitoring station



Periodically Analyze Monitoring Data and Report Results

1. Monitoring data should be collated, analyzed, and placed into context at intervals no greater than once every 10 years.
2. Make results available to the public and to agencies and organizations involved in management of the watershed

Monitor Plan Implementation

1. Track implementation of the recommendations of the watershed restoration plan
2. Designate organization(s) to oversee monitoring of implementation
3. All organizations acting to implement the watershed restoration plan report the initiation and completion of projects to the organization(s) overseeing monitoring of plan implementation

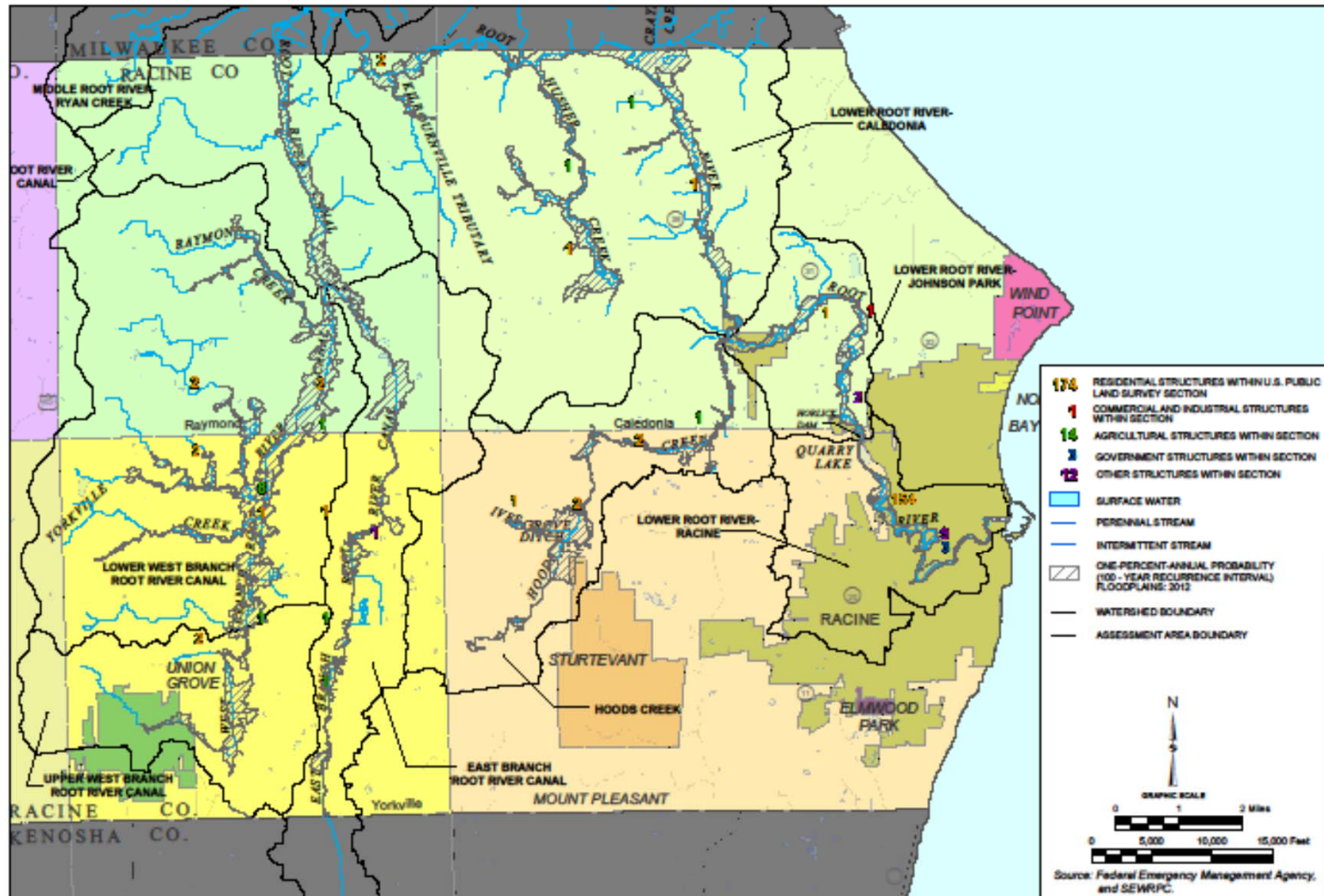
Racine County Flooding Recommendations



Racine County: Buildings in the Floodplain

Map IV-48

NUMBER OF STRUCTURES WITHIN FLOOD HAZARD AREAS BY CIVIL DIVISION
IN THE RACINE COUNTY PORTION OF THE ROOT RIVER WATERSHED: 2012



Racine County Flooding Recommendations

1. Root River Mainstem in City of Racine

- Consider working with FEMA and WDNR to conduct flood mitigation planning under the RiskMAP program

2. Flooding of Roadways in the County

- Identify roadways that could overtop during flooding using 2012 FEMA flood insurance study or updated flood profiles developed in the future under RiskMAP
- Consider bridge and culvert modifications to provide adequate hydraulic capacity to meet road overtopping standards

Racine County Flooding Recommendations

3. Scattered Buildings in the Floodplain Throughout the Watershed in Racine County

- Determine the most cost-effective combination of nonstructural approaches
- Request that nonstructural alternatives be given primary consideration under future FEMA RiskMAP activities
- Seek funding to evaluate nonstructural flood mitigation alternatives

Racine County Flooding Recommendations

4. Stormwater Runoff Problems

- Affected municipalities, stormwater utility districts, and/or Racine County Drainage Board prepare stormwater management plans
- These plans provide
 - Minor stormwater management system with capacity for runoff from the 10-percent-annual-probability (10-year) event
 - A major stormwater management system with capacity of runoff from the 1-percent-annual-probability (100-year) event
 - An emergency overflow route to convey the peak rate of runoff to receiving streams during events with probabilities less than 1 percent

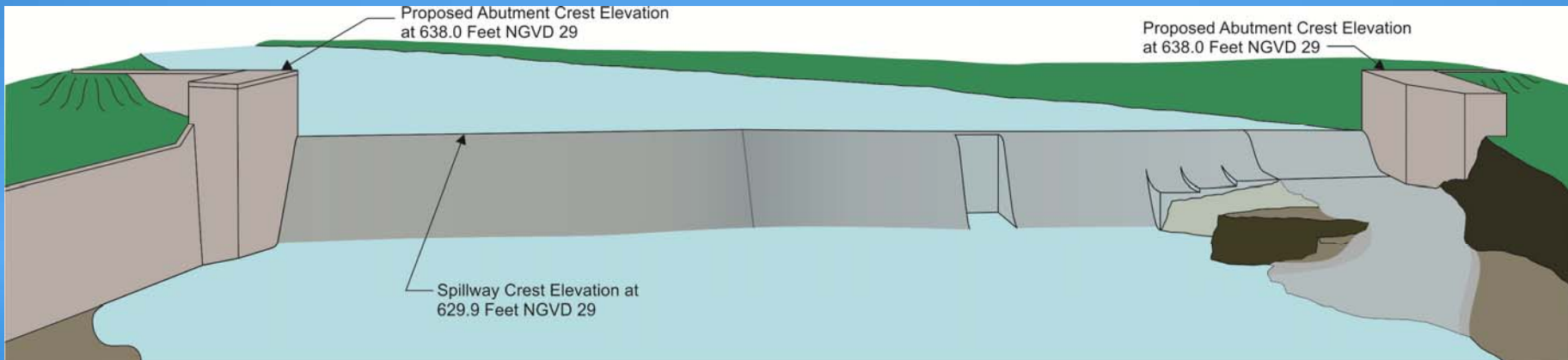
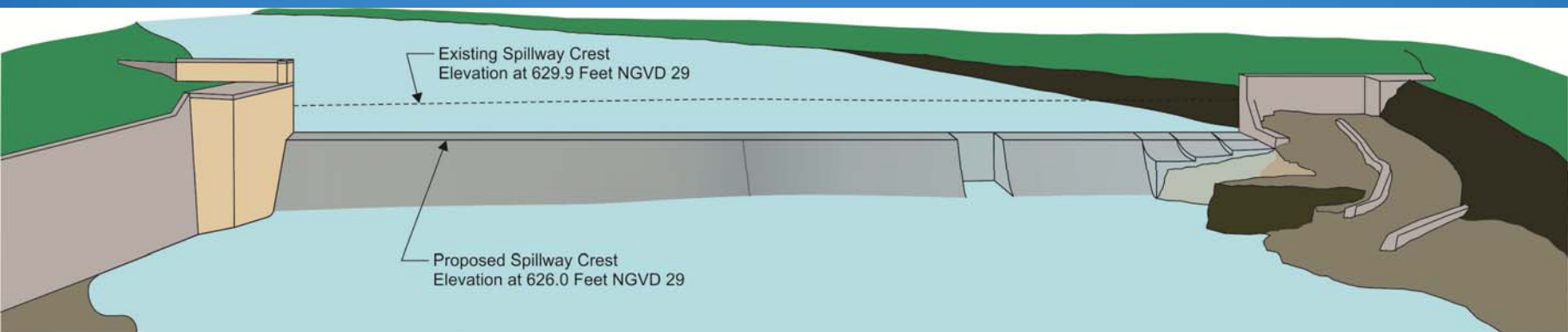
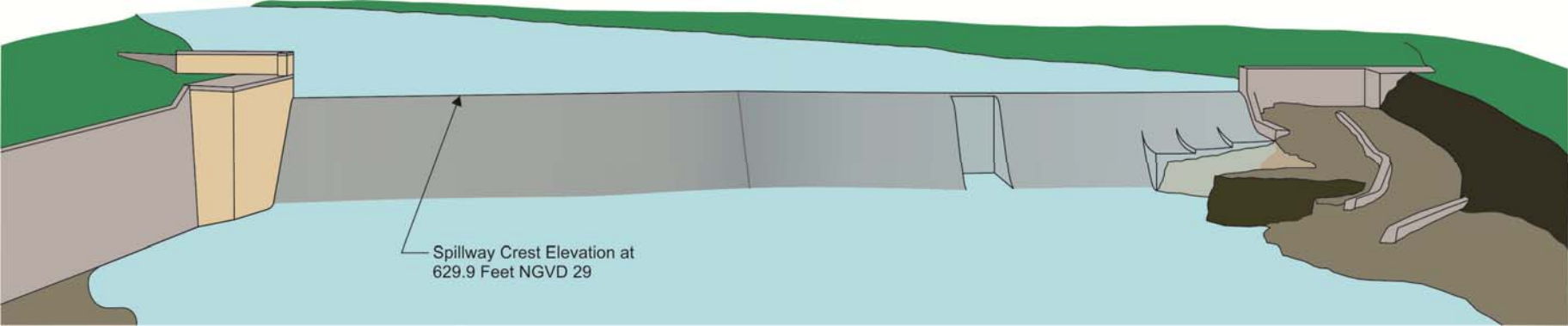
Horlick Dam



Horlick Dam

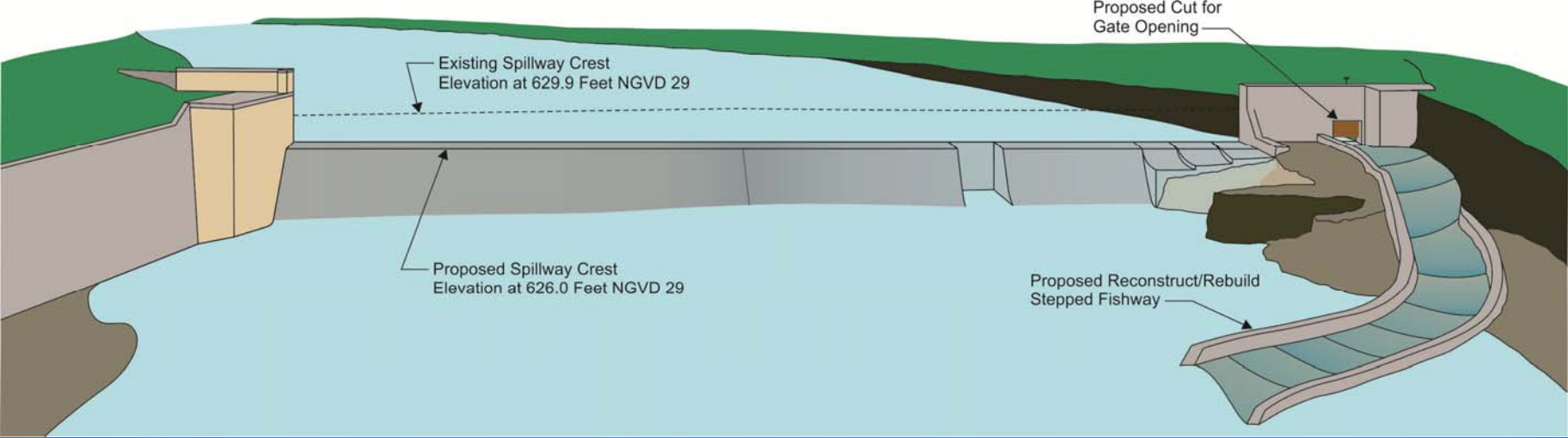
- Five Alternatives

1. Full notch of current dam spillway for 0.2-percent-annual-probability flood capacity
2. Lengthen current dam spillway and raise abutments for 0.2-percent-annual-probability flood capacity
3. Modify current fishway in addition to Alternative 1 changes
4. Complete notch of current dam spillway
5. Full removal of dam

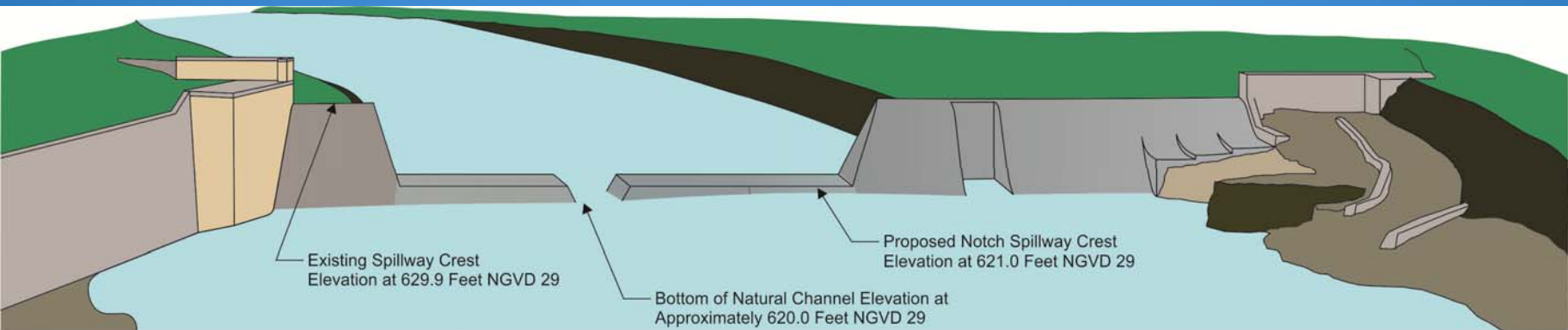


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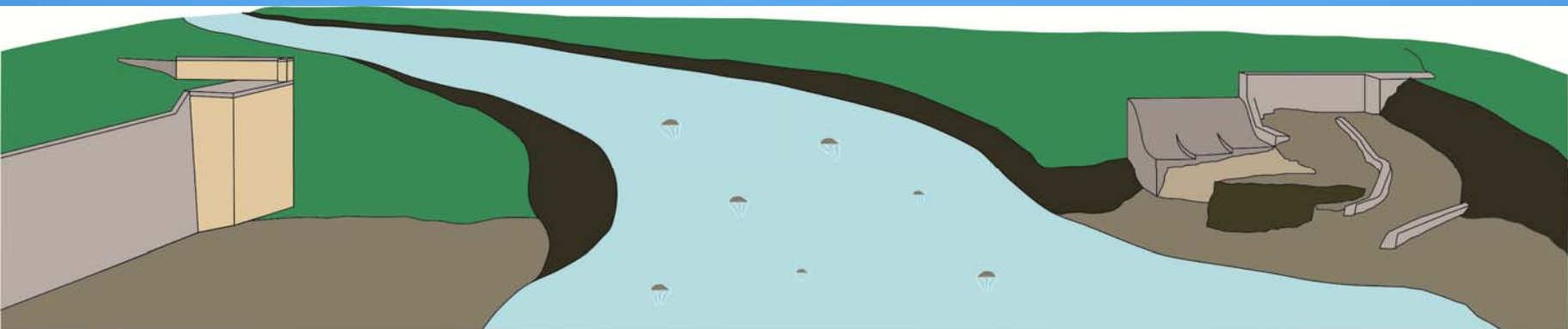
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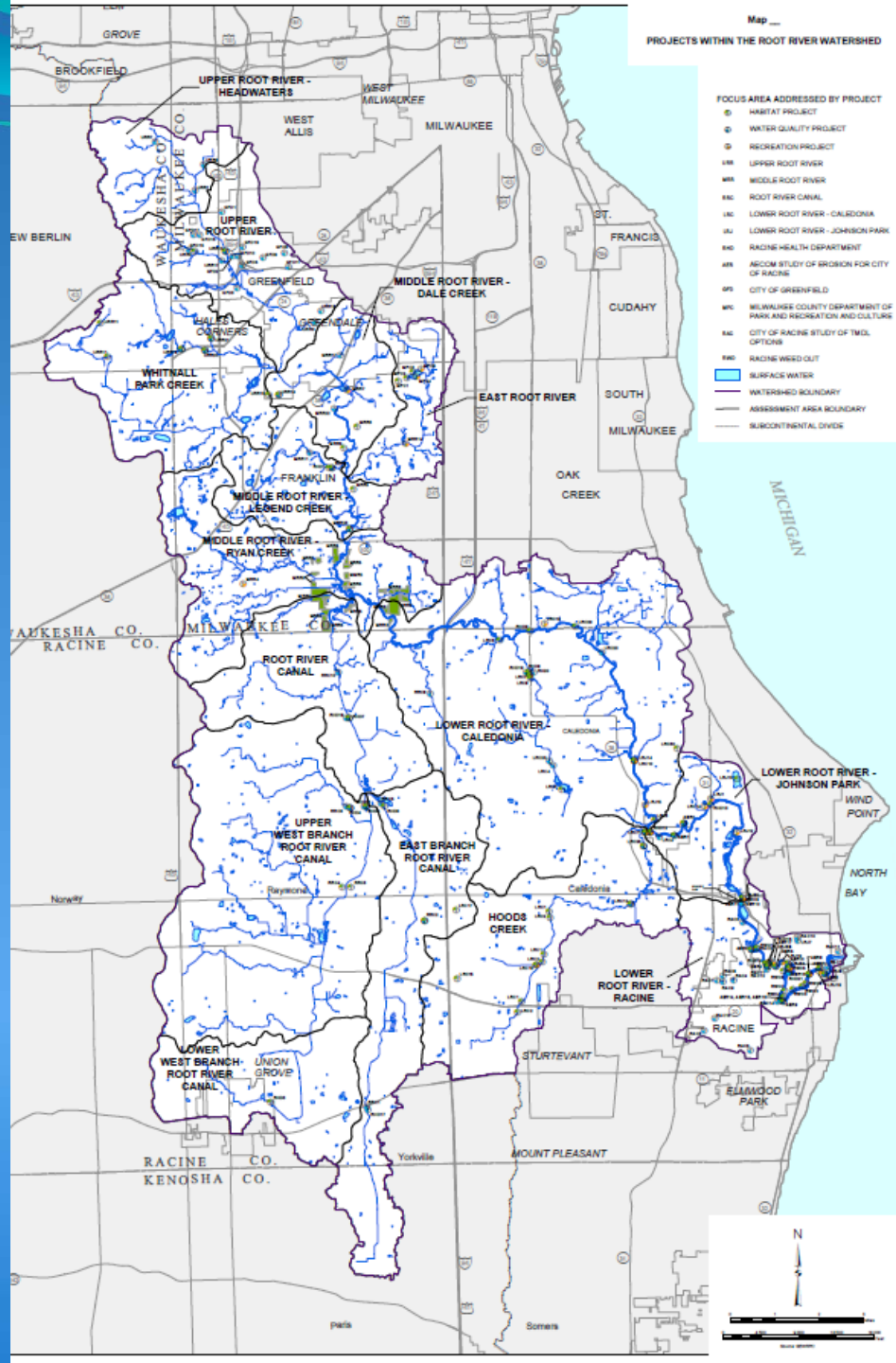
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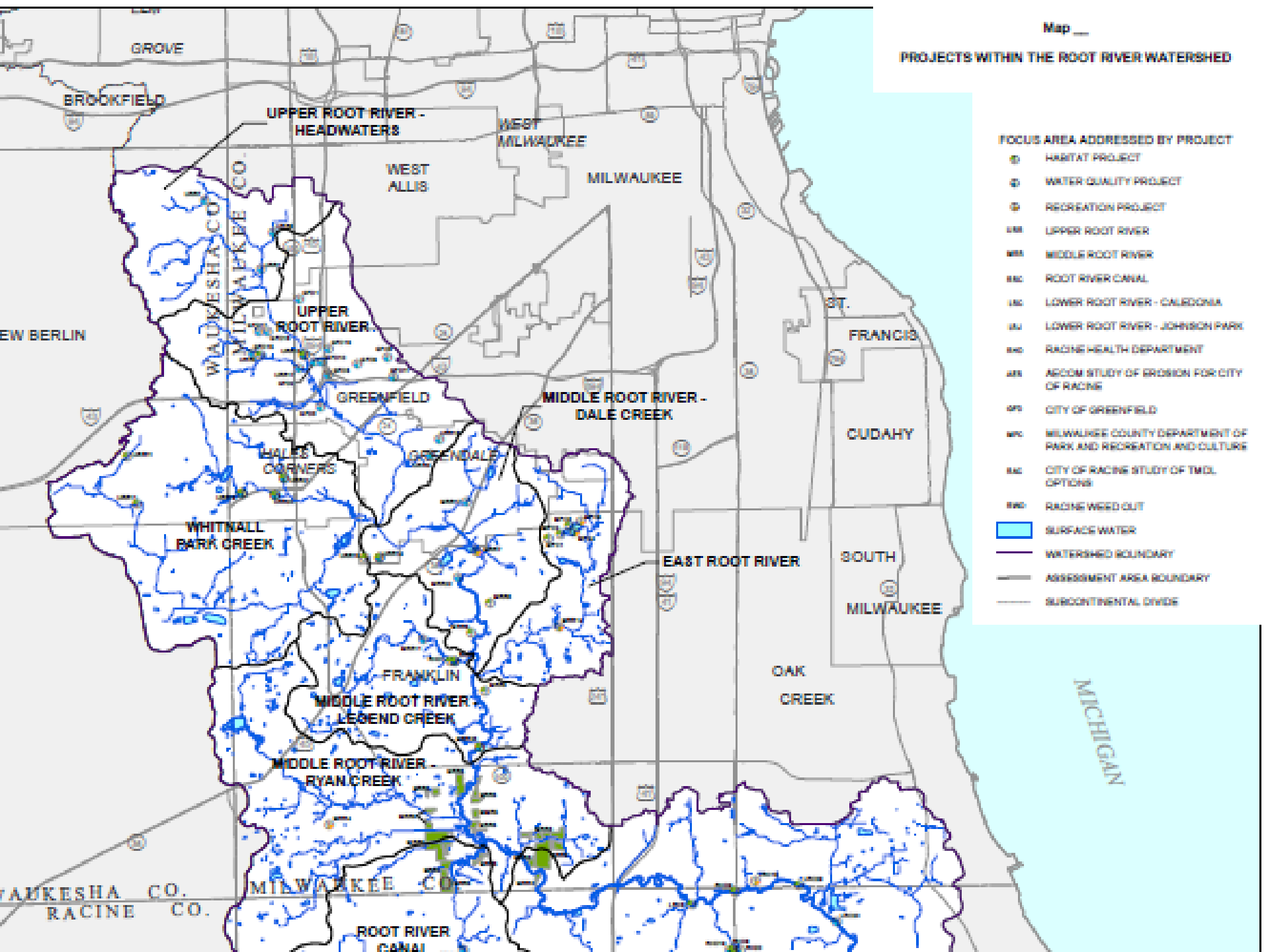
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Projects

- Blue = water quality
- Green = habitat
- Orange = Recreational Use and Access



PROJECTS WITHIN THE ROOT RIVER WATERSHED



FOCUS AREA ADDRESSED BY PROJECT

- ① HABITAT PROJECT
- ② WATER QUALITY PROJECT
- ③ RECREATION PROJECT
- UR UPPER ROOT RIVER
- MR MIDDLE ROOT RIVER
- RC ROOT RIVER CANAL
- LR LOWER ROOT RIVER - CALEDONIA
- LP LOWER ROOT RIVER - JOHNSON PARK
- RHD RACINE HEALTH DEPARTMENT
- ARJ ARJOM STUDY OF EROSION FOR CITY OF RACINE
- CF CITY OF GREENFIELD
- MPC MILWAUKEE COUNTY DEPARTMENT OF PARK AND RECREATION AND CULTURE
- RCO CITY OF RACINE STUDY OF TMDL OPTIONS
- RWC RACINE WEED CUT
- SURFACE WATER
- WATERSHED BOUNDARY
- ASSESSMENT AREA BOUNDARY
- SUBCONTINENTAL DIVIDE



Table VI-Proj

SITE-SPECIFIC MANAGEMENT MEASURES FOR THE ROOT RIVER WATERSHED

ID Number (see Map VI-Proj-1) ^a	Focus Areas Addressed	Site Information			Management Action	Annual Pollutant Reductions			Responsible Party	Costs (dollars)		Potential Funding Sources	Potential Technical Assistance	Schedule
		Location	Municipality	Owner		TSS (pounds)	Total Phosphorus (pounds)	Fecal Coliform Bacteria (trillion cells)		Capital	Annual O&M			
GFD-01	Water Quality	Northeast of W. Morgan Avenue and S. 106th Street	City of Greenfield	Milwaukee County	Installation of stormwater pond with 0.5 acre permanent pool	8,000	.. ^b		City of Greenfield	231,000				
GFD-02	Water Quality	Northwest of W. Coldspring Road and S. 104th Street along Root River	City of Greenfield	Milwaukee County	Installation of stormwater pond with 0.3 acre permanent pool	4,200	.. ^b		City of Greenfield	160,000				
GFD-03	Water Quality	East of I-43/US-45 Intersection near north end of W. Spring Green	City of Greenfield	Milwaukee County	Installation of stormwater pond with 0.3 acre permanent pool	3,800	.. ^b		City of Greenfield	146,000				
GFD-05	Water Quality	Intersection of I-43 and US-45	City of Greenfield	State of Wisconsin	Installation of stormwater pond with 0.3 acre permanent pool	4,400	.. ^b		City of Greenfield	153,000				
GFD-06	Water Quality	Northwest of W. Coldspring Road and S. 84th Street at St. John School	City of Greenfield		Installation of stormwater pond with 0.6 acre permanent pool	14,000	.. ^b		City of Greenfield	569,000				
GFD-09	Water Quality	Southwest of W. Coldspring Road and S. 92nd Street, Wisconsin Electric Power	City of Greenfield	We Energies	Installation of stormwater pond with 0.2 acre permanent pool	4,400	.. ^b		City of Greenfield	202,000				
GFD-10	Water Quality	Northwest of W. Coldspring Road and S. 100th Street on drainage right-of-way	City of Greenfield	City of Greenfield	Installation of stormwater pond with 0.4 acre permanent pool	6,800	.. ^b		City of Greenfield	132,000				
GRF-11	Water Quality	East of S. 84th Street and north of I-43	City of Greenfield	Milwaukee County	Installation of stormwater pond with 0.4 acre permanent pool	7,800	.. ^b		City of Greenfield	196,000				
GRF-15	Water Quality	Northwest of W. Howard Avenue and S. 116th Street along Root River	City of Greenfield	City of Greenfield	Installation of stormwater pond with 0.3 acre permanent pool	4,200	.. ^b		City of Greenfield	104,000				
GFD-16	Water Quality	North of W. Beloit Road along Wildcat Creek near S. 119th Street	City of Greenfield	City of Greenfield	Installation of stormwater pond with 1.0 acre permanent pool	16,200	.. ^b		City of Greenfield	310,000				
GFD-17	Water Quality	Northeast of W. Howard Avenue and S. 116th Street along the Root River	City of Greenfield	City of Greenfield	Installation of stormwater pond with 0.2 acre permanent pool	3,400	.. ^b		City of Greenfield	112,000				
GFD-19	Water Quality	East of I-894 north of W. Coldspring Road In Wisconsin Electric Power Company right-of-way	City of Greenfield	We Energies	Installation of stormwater pond with 1.9 acre permanent pool	37,000	.. ^b		City of Greenfield	1,321,000				
LRC-01	Habitat	Hoods Creek—entire length	Village of Mt. Pleasant	Various	Reiterate Village master plan recommendation for minimum development setback of 150 feet from tributaries and 75 feet from other navigable streams	--	--	--	Village of Mt. Pleasant					
LRC-02	Habitat	Hoods Creek—entire length	Village of Mt. Pleasant	Various	Remainder channelized stream reaches, address tile drainage	--	--	--	Private landowner					
LRC-03	Habitat	Nicholson Wildlife Refuge	Village of Caledonia	Village of Caledonia	Remove invasive plants species, restore site	--	--	--	Village of Caledonia					
LRC-04	Water Quality	Husher Creek south of 5 Mile Road	Village of Caledonia	--	Add water quality monitoring station	--	--	--	City of Racine Health Department or WAV Program					
LRC-05	Habitat	Unnamed tributary flowing north into the Root River	Village of Caledonia		Stream rehabilitation, naturalization, or bank stabilization project to address severe erosion along 75-linear foot section of tributary	90,000 ^c	.. ^b							

PRELIMINARY DRAFT – WORK IN PROGRESS

Next Steps

- Complete formulating recommendations
- Develop implementation plan
- Tie up loose ends

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

