

## Chapter I

# INTRODUCTION

### PURPOSE OF THE PLAN

The health of a river system is usually a direct reflection of the use and management of the land within its watershed. Human activities within a watershed affect, and are also affected by, surface and groundwater quality and quantity and habitat conditions. In the Root River watershed the effects of human activities on water quality often tend to overshadow natural influences. The Root River, its tributaries, and associated wetlands are an important warmwater resource located in Kenosha, Milwaukee, Racine, and Waukesha Counties in southeastern Wisconsin that has historically shown and continues to show signs of degradation. The problems of this watershed typify those found in areas experiencing changing land use patterns and water resource-related problems and have a direct effect on the property and general welfare of the residents of the watershed. The purpose of this plan is to provide a set of specific, targeted recommendations that can be implemented over the period from 2014 through 2018 to address improvements relative to a set of focus issues related to conditions within the watershed with the overall goal of restoring and improving the water resources of the Root River watershed.

This watershed restoration plan represents a second-level plan for the management and restoration of water resources in the Root River watershed. It was prepared in the context of the Southeastern Wisconsin Regional Planning Commission's (SEWRPC) regional water quality management plan update for the greater Milwaukee watersheds (RWQMPU),<sup>1</sup> which was prepared in coordination with, and largely incorporates, the Milwaukee Metropolitan Sewerage District's (MMSD) 2020 facilities plan.<sup>2</sup> This plan builds upon the findings and recommendations of the 2007 SEWRPC RWQMPU to provide specific, targeted recommendations to address four focus issues: water quality, recreational access and use, habitat conditions, and flooding. The applicable planning, objectives, principles, and standards applied under the RWQMPU, and set forth in Chapter VII and Appendix G of SEWRPC PR No. 50,<sup>3</sup> are also adopted for use under this watershed restoration planning effort.

The Root River Watershed Restoration Plan is designed to assist local units of government, State and Federal agencies, nongovernmental organizations, and private landowners in identifying actions that will restore and

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<sup>1</sup>SEWRPC Planning Report No. 50 (PR No. 50), A Regional Water Quality Management Plan Update for the Greater Milwaukee Watersheds, December 2007.

<sup>2</sup>Milwaukee Metropolitan Sewerage District, MMSD 2020 Facilities Plan, June 2007.

<sup>3</sup>SEWRPC Planning Report No. 50, op. cit.

Figure 1

**THE ROOT RIVER IN THE ROOT RIVER PARKWAY, VILLAGE OF GREENDALE, WISCONSIN**



Photo Courtesy Donna Pelikan Boxhorn.

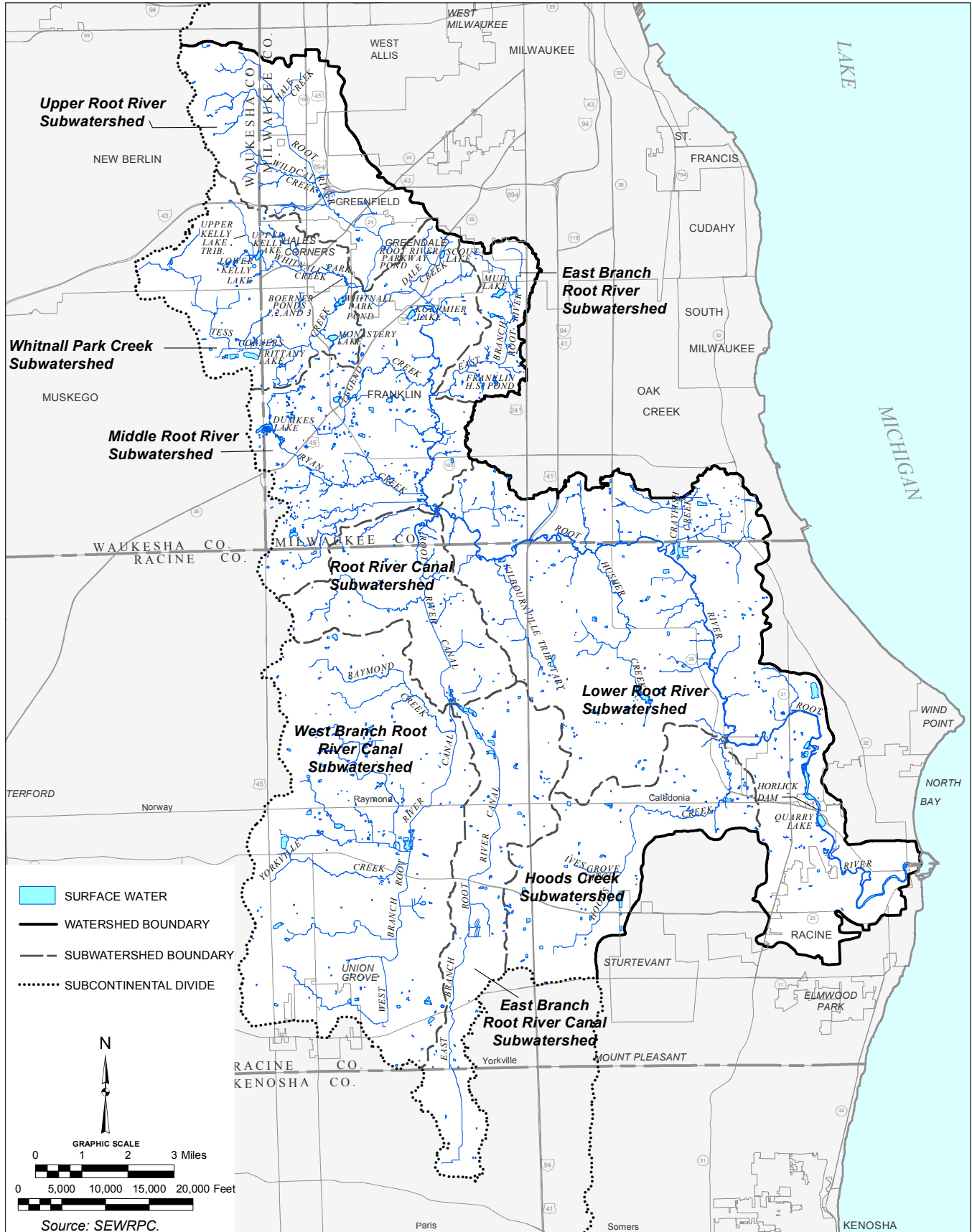
benefit the natural assets of the watershed. By implementing the actions identified in this plan, results will be achieved that preserve, restore, and enrich the natural environment. This watershed restoration plan should serve as a practical guide for the management of water resources within the Root River watershed and for the management of the land surfaces that drain directly and indirectly to this body of water over the period from 2014 through 2018.

## **BACKGROUND**

The Root River watershed is located in the east central portion of the Southeastern Wisconsin Region and covers an area of approximately 198 square miles. The Root River is shown in Figure 1. The mainstem of the Root River originates in the City of New Berlin in eastern Waukesha County and flows approximately 44 miles in a southerly and easterly direction to its confluence with Lake Michigan in the City of Racine in Racine County. Tributaries of the Root River extend into Kenosha, Milwaukee, Racine, and Waukesha Counties. The watershed lies east of the subcontinental divide, thus its rivers and streams flow to Lake Michigan. The boundaries of the watershed, together with the locations of the main channels of the Root River and its principal tributaries, are shown on Map 1. While the Root River watershed contains no lakes with surface areas of 50 acres or more, it does contain several named lakes and ponds.

Map 1

**SURFACE WATER WITHIN THE ROOT RIVER WATERSHED: 2012**



The watershed contains a mixture of urban and rural land uses. While urban development exists throughout much of the watershed, it is principally concentrated in the northern portion in Milwaukee and Waukesha Counties and in the southeastern portion of the watershed in and around the City of Racine. In 2000 urban development represented about one-third of the area of the watershed, with the remaining two-thirds of the watershed being in rural land uses.

Nineteen civil divisions lie wholly or partially within the Root River watershed. These are shown on Map 2. These civil divisions are an important factor that must be considered in the planning process because they form the basic foundation of the public decision-making framework within which intergovernmental, environmental, and developmental problems must be addressed. In addition to the civil divisions, the Root River watershed also contains several special-purpose units of government. Portions of the watershed are contained within three agricultural drainage districts. These districts are organized to drain lands for agricultural and other purposes. Also, four stormwater utility districts have been established for the purpose of managing stormwater runoff in the Village of Caledonia and the Towns of Dover, Raymond, and Yorkville.

The Root River watershed provides several recreational values. Much of the land adjacent to the mainstem of the Root River consists of environmental corridors that are contained within parks or natural areas. The watershed provides opportunities for fishing, hunting, boating, wading, canoeing, kayaking, wildlife watching, and scenic viewing. The section of the Root River downstream from Horlick Dam supports a rich trout and salmon fishery that is linked to Lake Michigan. This fishery is based upon stocking of these species by the Wisconsin Department of Natural Resources (WDNR). Historically, the Root River and its tributaries provided habitat for a number of fish species, including species considered threatened by the State of Wisconsin, such as longear sunfish, redbfin shiner, and river redhorse, and species of special concern in the State, such as lake chubsucker, least darter, and redbside dace.

A number of problems have been identified in the Root River watershed which restrict its potential uses and threaten its ecological integrity.<sup>4</sup> The upper section of the mainstem of the Root River and two major tributary streams, the Root River Canal and the West Branch of the Root River Canal, are considered impaired pursuant to the Federal Clean Water Act because they often exhibit concentrations of dissolved oxygen that are below the levels necessary to support fish and other aquatic organisms. Surface waters in much of the watershed exhibit high concentrations of bacteria that indicate contamination with fecal material, especially during the months of May through October when many people are actively engaged in outdoor recreation activities. Upstream from Horlick Dam, the watershed supports a poor quality fishery. This fishery contains relatively few species, is trophically unbalanced, contains few top carnivores, and is dominated by species that are tolerant of poor water quality. Streambed and streambank erosion have been found to occur in those sections of the mainstem of the Root River and those tributary streams which have been examined. Terrestrial habitat within the watershed is highly fragmented. Aquatic and terrestrial exotic invasive species are present at many locations and may be displacing native species and degrading habitat. Finally, members of the public are seeking greater access to the River and its riparian areas for recreational uses.<sup>5</sup>

## **PLANNING PROCESS**

The Root River watershed restoration plan was developed in response to a request from Racine County, the MMSD, the Southeastern Wisconsin Watersheds Trust, Inc. (Sweet Water), and the Root-Pike Watershed

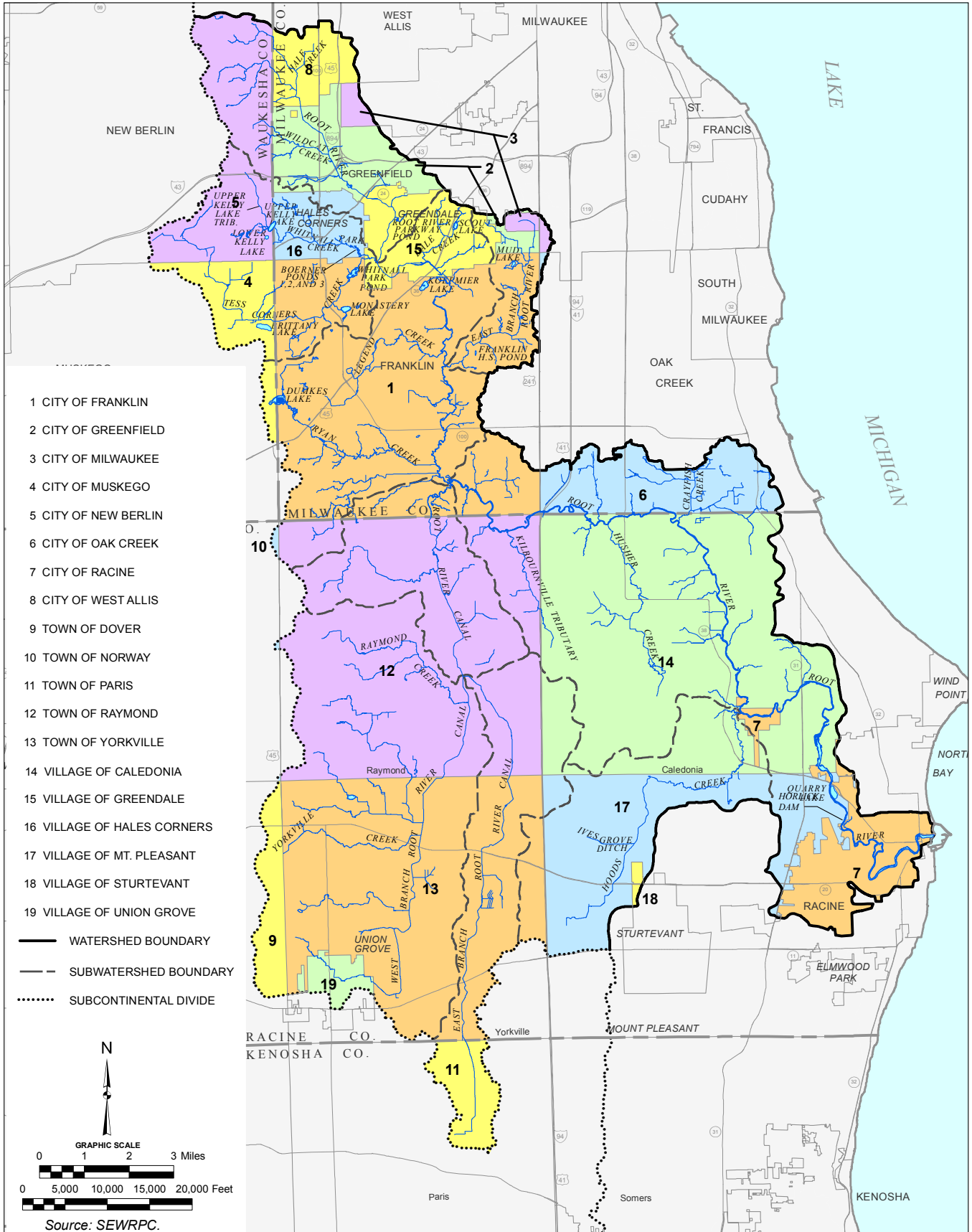
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<sup>4</sup>*SEWRPC Technical Report No. 39, Water Quality Conditions and Sources of Pollution in the Greater Milwaukee Watersheds, November 2007.*

<sup>5</sup>*Root River Council and River Alliance of Wisconsin, Back to the Root: An Urban River Revitalization Plan, July 2008.*

Map 2

CIVIL DIVISIONS WITHIN THE ROOT RIVER WATERSHED: 2012



Initiative Network (Root-Pike WIN). Prior to making this request, these entities helped form the Root River Restoration Planning Group (RRRPG)—which includes representatives from Sweet Water, Root-Pike WIN, MMSD, Racine County, other county and municipal governments that are wholly or partially located in the watershed, the WDNR, nongovernmental organizations, and other groups and individuals representing a broad range of interests within the watershed. The RRRPG held four meetings during 2010 and early 2011 to investigate the need and potential for developing a watershed restoration plan for the Root River watershed and to initiate the planning process. The planning effort was led by Sweet Water and Root-Pike WIN through the RRRPG. Funding for the planning effort was provided by Racine County, MMSD, the Wisconsin Coastal Management Program, and the Fund for Lake Michigan.

### **Focus Areas**

Focus areas are those general themes related to the critical concerns of the watershed. An individual focus area reflects a set of issues and problems related to one another through some desired use or state that the public has for the resource. Thus, these focus areas constitute a linkage between conditions in the watershed and the use by the public of water resources.

This watershed restoration plan is centered on four focus issues: water quality, recreational use and access, habitat conditions, and flooding. These themes are derived from three sources. First, they reflect the findings of the 2007 update of the regional water quality management plan for the greater Milwaukee watersheds.<sup>6</sup> As previously noted, the RWQMPS identified several problems in the Root River watershed that restrict potential uses of the resource and threaten its ecological integrity. Second, the focus issues reflect the findings of other recent planning efforts which have indicated interest in greater access to the Root River and its tributaries for recreational uses.<sup>7</sup> Third, they reflect general themes that emerged from the results of an online survey of, and prioritization by, interested parties including elected officials, State and local government staff, nongovernmental organizations, landowners, and residents.

### ***Survey of Interested Parties***

As part of its investigation of the need and potential for developing a Root River watershed restoration plan, the RRRPG asked staff from the University of Wisconsin-Extension to develop and conduct a survey to identify and prioritize issues to be addressed in a potential plan. This survey was designed as a two-part online survey and was implemented on the internet through an online survey service. The first part of the survey asked the respondents two types of questions. This part included initial questions to establish the relationship of the respondents to the watershed. These questions were followed by a series of open-ended questions that sought to identify major issues in the watershed related to surface water quality, natural areas, wildlife habitat, and outdoor recreation. The second part of the survey asked respondents to prioritize the issues identified in the first part and to choose from among the identified issues the five most important issues that they believed a watershed restoration plan should address.

Notice of the survey was sent by electronic mail to all persons who had previously participated in meetings of the RRRPG, representatives of all county and municipal governments in the watershed, persons working on land and water management-related issues in the watershed, and representatives and members of nongovernmental organizations working in the watershed. Separate notices were sent for each part of the survey. The notices explained the purpose of the survey and how respondents could access and complete it. Each notice also included a request that persons receiving it forward it to other persons with an interest in the watershed.

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<sup>6</sup>*SEWRPC Technical Report No. 39*, op. cit.

<sup>7</sup>*See, for example, Root River Council and River Alliance of Wisconsin*, op. cit.

The first part of the survey was conducted over the period from December 3 through 15, 2010. There were 32 respondents to this part of the poll. Of these respondents, 22 indicated that they live in the watershed; 20 indicated that they work in the watershed; and 17 indicated that they engage in outdoor recreation in the watershed. Only two respondents indicated that they fish in the watershed. The persons taking this part of the survey gave 318 separate responses to the issue-identification questions. Upon examination, similar and related responses were grouped to yield 43 issues. These are listed in Table 1. It should be noted that the issues identified in this part of the survey vary in their level of generality. In addition, it is recognized that there are interrelationships among the identified issues and that several of the issues that were identified can be considered aspects or components of other identified issues.

The second part of the survey asked respondents to rate each of the identified issues by relative importance, with a rating of 1 indicating the most important issues facing the watershed and a rating of 5 indicating the least important issues. This part of the survey also asked respondents to choose from among the identified issues the five most important issues that they believed a watershed restoration plan should address. Part two of the survey was conducted over the period from January 5 through 19, 2011. There were 61 responses to this part of the survey. The responses were used to develop three rankings of the issues. First, the issues were ranked based upon the mean rating given in response to the first question. Second, the issues were ranked based upon the number of responses to the first question rating each issue as first or second (assigned a value of 1 or 2, respectively). Third, each issue was ranked by the number of responses to the second question that placed it in the top five issues to be addressed. To examine the agreement among these ranking schemes, the issues in each scheme were assigned to five groups based upon ranks within the analysis, with the six top-ranked issues in each analysis assigned to the top group, the next six issues assigned to the next group, the next six issues assigned to the next group, the next 10 issues assigned to the next group, and the lowest-ranked 15 issues assigned to the last group. The groups are shown by color in Table 1, with the top-ranked group indicated by purple, the next group indicated by blue, the next group indicated by green, the next group indicated by orange, and the lowest-ranked group indicated by red. As shown in Table 1, the results of these three ranking schemes largely agree with one another, with the 12 most highly ranked and the 15 lowest-ranked issues being almost identical among the three analyses.

The focus areas for the watershed restoration plan were developed by examining the 15 highest ranked issues identified in the survey to determine whether there were any general themes uniting them. Four general themes emerged. The presence of water quality, stormwater runoff, nonpoint source pollution, and nutrients among the top 15 issues indicated that water quality was one general theme. The presence of habitat loss and fragmentation, access to the River, the quality of the fishery, and deterioration of parkland among the top issues indicated that recreational use was a second general theme. The presence of erosion of bed and bank, wetland loss, woodland loss, riparian buffers, habitat loss and fragmentation, and deterioration of parkland indicated that the condition of the habitat was a third general theme. Finally, the presence of flooding among the top issues, along with the expressed interest of local units of government in Racine County, indicated that flooding was a fourth general theme.

### **Plan Development and Review**

The Root River watershed restoration plan was developed through a collective effort on the part of a number of agencies and organizations under the overall direction of the RRRPG, Sweet Water, and Root-Pike WIN. The agencies and organizations involved include the City of Racine Health Department, the WDNR, the University of Wisconsin-Extension, the counties and municipalities of the Root River watershed, and the Southeastern Wisconsin Regional Planning Commission (SEWRPC). The plan was developed under the guidance of the RRRPG and Root River Watershed Restoration Plan Advisory Committee. The Advisory Committee was created specifically for the purpose of reviewing draft plan chapters during plan development. Its membership was drawn from the participants of the RRRPG and includes elected and appointed officials, agency personnel, and citizens knowledgeable in land and water resource matters. The membership and activities of the Advisory Committee are documented in Appendix A.

Table 1

**RANKING OF ISSUES IDENTIFIED IN THE ROOT RIVER ISSUE SURVEY**

Issue	Question 1 Mean Rating	Question 1 Rated 1 or 2 (percent)	Question 2 Issue in Top Five
1. Water quality	1.52	90.2	29
2. Erosion of streambeds and banks	1.70	85.0	20
3. Flooding	1.70	81.7	12
4. Stormwater runoff	1.71	89.7	14
5. Wetland loss	1.72	83.3	16
6. Nonpoint source pollution	1.75	81.4	20
7. Woodland loss	1.75	80.0	8
8. Development/impervious surface	1.80	76.7	10
9. Nutrients/manure/fertilizer	1.80	80.0	12
10. Riparian buffers, the lack of or insufficiency of	1.80	81.7	16
11. Habitat loss/fragmentation	1.82	78.3	16
12. Education and public awareness, need for	1.87	78.7	14
13. Access to the river and riparian areas	1.93	69.5	12
14. Fishery quality	1.95	75.0	4
15. Deterioration of parkland	1.97	72.9	0
16. Flow issues (too much or too little)	1.98	75.0	4
17. Illicit discharges	2.00	75.0	3
18. Garbage, trash in streams and riparian areas	2.03	73.8	7
19. Groundwater recharge reductions	2.04	64.0	6
20. Farming	2.05	69.5	3
21. Invasive/nonnative species	2.05	74.6	8
22. Green infrastructure, need for	2.07	62.1	6
23. Channelization/bank modification	2.07	66.7	5
24. Brownfields	2.08	71.7	5
25. Sedimentation/siltation of channels	2.11	73.2	10
26. Pesticides	2.20	65.0	3
27. Horlick dam (removal of)	2.26	62.8	4
28. Fish passage barriers	2.26	56.1	4
29. Road salt	2.28	69.0	1
30. Prairie loss	2.34	59.3	0
31. Bridge restoration	2.45	58.9	2
32. Fish consumption advisories	2.53	44.8	3
33. Stream width	2.54	54.0	0
34. Climate change	2.71	42.4	1
35. Off-road vehicle-related damage	2.79	38.5	1
36. View loss	2.87	35.2	1
37. Navigational obstructions	2.91	38.2	2
38. Absentee landowners	3.05	32.4	0
39. Recreational instruction	3.13	27.8	0
40. Privacy for recreation	3.15	23.6	0
41. Overgrown vegetation/trees	3.15	23.7	0
42. Traffic noise	3.38	19.6	0
43. Feral pet-related damage	3.38	20.0	0

NOTE: Issues are ranked by order of importance as indicated in responses to the Root River issue survey. In each analysis issues are grouped by rank with purple indicating issues that were regarded as being the most important. The groups colored blue, green, orange, and red represent groups of issues assigned progressively less importance in the responses to the survey.

<sup>a</sup>Question 1 was the first question in the second part of the survey. It asked interested persons to rate the importance of addressing each issue in the Root River watershed from 1 to 5, with 1 being the most important and 5 being the least important.

<sup>b</sup>Question 2 was the second question in the second part of the survey. It asked interested persons to identify the five issues that should be addressed by a watershed restoration plan.

Source: University of Wisconsin-Extension and SEWRPC.



Advisory Committee meetings were held on May 2, 2012; August 1, 2012; November 7, 2012; February 6, 2013; May 1, 2013; August 7, 2013; and October 2, 2013. The Committee reviewed each chapter of the plan in draft form and provided comments and recommendations, which were addressed in the final plan. In addition, presentations were made to the RRRPG summarizing the content of draft chapters and reporting on progress. As draft chapters of the plan were completed, copies were placed in downloadable form on the SEWRPC website. This website also included a webpage on which members of the public could ask questions and submit comments on the draft plan. Copies of presentations to the RRRPG by SEWRPC staff were also placed on this website. This website could also be accessed through links on the Root-Pike WIN and Sweet Water websites.

## **PLAN FORMAT AND ORGANIZATION**

This report documents a watershed restoration plan for the Root River watershed for the period from 2014 through 2018. It is organized into seven chapters.

Following this initial introductory chapter, the second chapter summarizes and describes the recommendations of the RWQMPU as they relate to the Root River watershed, indicates how these recommendations relate to the focus areas of this plan, and evaluates the implementation status of the recommendations.

Chapter III sets forth an inventory and review of recent and ongoing watershed management programs and initiatives in the Root River watershed that are related to the focus areas of this plan. This review describes those plans, programs, and initiatives that have recently been undertaken or are currently ongoing by State and local governments and private entities with a view toward integrating into the watershed restoration plan those efforts that are consistent with and complement the plan's focus areas.

Chapter IV presents a characterization of the features of the Root River watershed. This characterization represents a refinement and updating of the inventories presented in the RWQMPU,<sup>8</sup> including analysis of water quality data collected by the City of Racine Health Department, under a project funded by the Fund for Lake Michigan, and consists of a focused inventory and analysis of those watershed characteristics most relevant to the four focus issues. This characterization includes discussion of physical conditions of the surface water system, existing surface water quality, and habitat and biological conditions in the Root River watershed. In addition it presents information on the natural and man-made features of the watershed, including a description of the natural resource base and environmentally sensitive areas, land use data, and demographics.

Chapter V provides a description of both the development of targets to be achieved by the end of the watershed restoration plan's implementation period and alternative management actions to meet these targets. The targets developed are short-term goals or steps related to the focus issues that must be implemented to meet the long-term goals established in the RWQMPU. Establishing targets breaks the long-term goals into manageable pieces, helps determine the specific steps necessary to achieve a goal, and facilitates the development of measures to track progress. For each target developed, this chapter identifies specific actions, in the form of activities or projects that define the management measures needed to meet the target.

Chapter VI presents the watershed restoration plan recommended to guide activities over the five-year period 2014 through 2018. This chapter presents the management efforts selected to meet the targets identified in the previous chapter. For each recommended action, it also identifies the primary land uses that the action addresses and prioritizes those geographical areas and locations in the watershed where the action should be implemented. This chapter also identifies as foundation actions those actions upon which the success of other management measures depends.

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<sup>8</sup>SEWRPC Technical Report No. 39, op. cit.

Chapter VII presents implementation strategies designed to assist the implementing entities in converting the plan into actions, policies, and programs. The chapter also presents guidance on prioritizing the recommendations for implementation. In addition, the chapter identifies the agencies responsible for implementing elements of the plan, presents estimates of the resources—such as technical and financial assistance—required to implement elements of the plan, and identifies potential sources of such resources.