SUMMARY NOTES OF THE OCTOBER 2, 2013 MEETING OF THE ROOT RIVER WATERSHED RESTORATION PLAN ADVISORY GROUP

INTRODUCTION

The October 2, 2013, meeting of the Root River Watershed Restoration Plan Advisory Group was convened at Franklin City Hall at 9:15 a.m. The meeting was called to order by Susan Greenfield, Executive Director of the Root-Pike Watershed Initiative Network (Root-Pike WIN). Attendance was taken by circulating a sign-in sheet.

In attendance at the meeting were the following individuals:

Advisory Group Members	
Susan Greenfield, Co-Chair	Executive Director, Root-Pike Watershed Initiative Network
Jeff Martinka, Co-Chair	Executive Director, Southeastern Wisconsin Watersheds Trust, Inc. (Sweet Water)
Michael G. Hahn, Secretary	Chief Environmental Engineer, Southeastern Wisconsin Regional Planning Commission
Joseph E. Boxhorn	Senior Planner, Southeastern Wisconsin Regional Planning Commission
Chris Clayton	Urban River Restoration, River Alliance of Wisconsin
Timothy Detzer	Environmental Engineer, Milwaukee County Department of Architecture, Engineering, and Environmental Services
Alan V. Jasperson	Secretary-Treasurer, Racine County Board of Drainage Commissioners
Julie L. Kinzelman	Laboratory Director/Research Scientist, City of Racine Health Department
Michael A. Luba	NR Basin Supervisor, Wisconsin Department of Natural Resources
Christopher Magruder	Community Environmental Liaison, Milwaukee Metropolitan Sewerage District
Wendy McCalvy	Board of Directors, Caledonia Conservancy
Monte G. Osterman	Supervisor, Racine County Board of Supervisors
Aaron W. Owens	Planner, Southeastern Wisconsin Regional Planning Commission
Ronald J. Romeis	Assistant City Engineer, City of Franklin
Brian Russart	Natural Areas Coordinator, Milwaukee County Parks and University of Wisconsin-Extension
Chad Sampson	County Conservationist, Racine County
Thomas M. Slawski	Principal Specialist-Biologist, Southeastern Wisconsin Regional Planning Commission
Melissa H. Warner	Commissioner, Village of Caledonia Storm Water Utility District
Andrew D. Yencha	Natural Resources Educator, University of Wisconsin-Extension
Guests	
Matthew T. Magruder	Systems Data Technician, Milwaukee Metropolitan Sewerage District

Ms. Greenfield welcomed the attendees to the meeting and thanked them for their participation and commitment to the process of developing the watershed restoration plan. She noted that the draft chapters to be reviewed were posted on the Southeastern Wisconsin Regional Planning Commission (SEWRPC) website.

Ms. Greenfield announced the completion of a watershed brochure for the Root River watershed. She explained that this brochure was developed by the University of Wisconsin-Extension and the City of Racine with assistance from Root-Pike WIN, Sweet Water, the Wisconsin Department of Natural Resources (WDNR), and SEWRPC, with funding provided by the Fund for Lake Michigan. She noted that the City of Racine provided funding for printing. She offered to provide copies of the brochure and brochure holders to any Advisory Group members who would like to distribute them.

Mr. Hahn informed the Advisory Group that the format of the December 4, 2013, meeting of the Root River Restoration Planning Group (RRRPG), which has served as a public outreach forum for this planning process, will be different from the format followed at previous RRRPG meetings. He explained that while SEWRPC staff will present a summary of progress on the plan, the main focus of this meeting will be to gather local knowledge of the watershed about issues, problems, and sites for projects from those who attend. He continued that this will be done by breaking the attendees out into groups addressing different portions of the watershed. He added that each group will indicate on maps the locations of specific problems and potential projects. He noted that it would be helpful if those Advisory Group members who are able could attend this meeting to contribute their local knowledge and help with the breakout groups. He added that each group will include a SEWRPC staff member. He asked that Advisory Group members notify him by October 11, 2013, as to whether they are interested in participating in this meeting.

Mr. Hahn stated that SEWRPC staff will meet with County and municipal staffs to consult about ideas for targeted projects.

REVIEW OF SUMMARY NOTES FROM AUGUST 7, 2013, MEETING OF THE ROOT RIVER WATERSHED RESTORATION PLAN ADVISORY GROUP

At Ms. Greenfield's request Mr. Hahn addressed the summary notes from the August 7, 2013, meeting of the Advisory Group.

Mr. Hahn stated that after the August 28, 2013, public meeting, which dealt with alternative measures relative to Horlick dam, he received an electronic mail message from Julie Anderson, Racine County Public Works and Development Director on behalf Racine County Executive James Ladwig, asking that an additional alternative for the dam be developed. He explained that this alternative would consist of maintaining the dam spillway crest at its current elevation and raising the dam structures on either side of the spillway. He noted that SEWRPC staff developed that alternative, which was attached as Exhibit E to the summary notes from the August 7, 2013, Advisory Group meeting.

Mr. Hahn described the additional alternative presented in Exhibit E. He explained that under this alternative, the spillway of the dam would be extended into the former fishway and the tops of both abutments would be raised and short earthen embankment sections would be constructed at each abutment. He added that this would involve reconstruction of both abutments. He stated that this would maintain the impoundment at its current normal water level, and that the flood profiles associated with this alternative would be similar to the existing flood profiles. He added that most of the other impacts associated with this alternative are the same as the existing condition. He stated that the systems-level planning cost of this alternative is estimated to be $978,000.

Mr. Hahn stated another consideration relevant to consideration of this alternative is that the only vehicular access for 15 homes and three condominium buildings located west of the impoundment is along Old Mill Drive. He explained that under current conditions, the one- and 0.2-percent-annual-probability floods would be expected to overtop this road. He noted that under the conceptual alternatives that were previously presented, the one- and 0.2-percent-annual-probability flood profiles would be reduced sufficiently to avoid overtopping Old Mill Drive. He added that this would not be the case under the conceptual alternative presented in Exhibit E. He concluded that the costs presented for this alternative include the cost of raising Old Mill Drive to eliminate roadway overtopping during the one- and 0.2-percent-annual-probability floods.

Mr. C. Magruder asked whether water would leave the impoundment over the crest of the dam under the new alternative conditions. Mr. Hahn replied that it would.

Mr. Yencha noted that original Alternative 4, which involves removal of the dam includes annual maintenance costs. He asked what these costs are for. Mr. Hahn replied that under that alternative, the abutments and the wall along the streambank adjacent to the hotel would be retained and would require periodic maintenance.

Mr. Osterman asked whether this newly-developed alternative has been shared with the Racine County Executive. Mr. Hahn answered that it had been.

Mr. Osterman asked whether the impact of this alternative on the hotel property was examined. Mr. Hahn replied that the last paragraph of Exhibit E indicated that this would need to be examined in greater detail, if this alternative were to be selected for further review.

Mr. Martinka asked whether the new alternative is preferred by the Racine County Executive. Mr. Hahn replied that the County Executive wanted to know whether it is feasible and to have it presented in context with the other alternatives. Mr. Osterman noted that this alternative was requested in response to questions from citizens and County Board Supervisors.

No other questions or comments were offered on the summary notes, and they were approved by consensus of the Advisory Group.

REVIEW OF PARTIAL PRELIMINARY DRAFT CHAPTER IV, "CHARACTERIZATION OF THE WATERSHED," OF SEWRPC COMMUNITY ASSISTANCE PLANNING REPORT NO. 316 (CAPR NO. 316), "*A RESTORATION PLAN FOR THE ROOT RIVER WATERSHED*"

Mr. Hahn noted that development of Chapter IV, "Characterization of the Watershed," is an ongoing process that would continue for the near future as additional information becomes available and is incorporated and as text is drafted for the habitat focus area.

Mr. Hahn asked Mr. Boxhorn to begin the review of the "Macroinvertebrates" subsection of the "Biological Conditions of the Root River Watershed" section of the partial preliminary draft of Chapter IV.

Ms. Warner noted that students at Washington Park High School (WPHS) in Racine have conducted a macroinvertebrate survey in the Root River and asked whether their data were included in the analyses presented in the subsection. Mr. Boxhorn replied that he was unaware of the existence of those data and asked how fine the taxonomic identifications were in the WPHS survey. He explained that the Hilsenhoff Biotic Index requires that the organisms be identified to genus and species level. He continued that the identifications made using the Water Action Volunteers (WAV) protocol go only to class and order level. He added that if the WPHS survey used the WAV protocol, it would be difficult to integrate its data into the data set examined in the subsection. Mr. Yencha commented that he believes that the WPHS survey followed the WAV protocol.

[Secretary's Note: Given that the organisms in the WPHS were not identified to a taxonomic level that would allow them to be integrated into the macroinvertebrate data set analyzed in Chapter IV, the SEWRPC staff decided not to pursue obtaining the WPHS macroinvertebrate data.]

Ms. Greenfield asked whether the macroinvertebrate surveys conducted by Craig Helker of the WDNR during 2011 were included among the data in the subsection. Mr. Boxhorn replied that Mr. Helker's data represented about one half of the data shown on Map IV-Macroinvert-2.

Mr. Osterman commented that the improvement in the macroinvertebrate community that occurred at the site of the stream restoration along Kilbournville Tributary at CTH G seems to have occurred very quickly. Mr. Boxhorn replied that because of their short life cycle, he would expect to see a response in the macroinvertebrate community before a seeing a response in the fish community. He explained that many of the species assessed in the macroinvertebrate surveys complete their life cycle within one year. He added that this means that three or four years represent the passage of three or four generations of these organisms in the stream. Mr. Slawski gave a short description of the stream restoration project that was conducted at this site. Ms. McCalvy asked where the restoration site is relative to the Seven Mile Fair. Mr. Slawski replied that the site is located to the west of the Seven Mile Fair. Ms. Warner asked whether the project site is in Raymond or in Caledonia. Mr. Slawski replied that it is located in both municipalities.

Mr. Osterman asked whether a short presentation could be developed on this stream restoration project and the response of the macroinvertebrate community as an example of a successful project. He noted that such a presentation would help to demonstrate to the public and to public officials the importance of these types of projects. Mr. Hahn suggested that the final planning meeting of the RRRPG in 2014 would be a good time for this presentation. Mr. Martinka and Ms. Greenfield suggested that this might be a good presentation of the 2014 Clean Rivers/Clean Lake conference.

There was a discussion of the need for an outreach component in the plan. Items discussed included who outreach should be targeted toward, when outreach should be conducted, and the other activities to which it could be linked.

Ms. Warner asked whether Table H-1 in Appendix H includes an indication of the pollution tolerance or intolerance of the different macroinvertebrate species listed. Mr. Boxhorn replied that the table does not include this information. He added that as a general rule of thumb, mayflies, stoneflies, and caddisflies (Orders Ephemeroptera, Plecoptera, and Trichoptera, respectively) are generally considered to be intolerant of organic pollution.

Ms. Kinzelman asked whether the differences in the Hilsenhoff Biotic Index (HBI) shown in Figures IV-Macroinvert-2 and IV-Macroinvert-3 are statistically significant. Mr. Boxhorn replied that this is difficult to assess, because this index does not conform to the assumptions of the statistical models.

Ms. McCalvy asked for a description of what the HBI values in Figure IV-Macroinvert-4 indicate. Mr. Boxhorn explained that the HBI is an index based upon the macroinvertebrate community's response to loadings of organic pollution and the resulting reductions in the concentration of dissolved oxygen. He added that lower values of the HBI indicate better conditions while higher values of the HBI indicate worse conditions.

Mr. Romeis asked whether there would be value in overlaying the macroinvertebrate analysis with water quality study results. Mr. Boxhorn replied that this would be difficult because biochemical oxygen demand, the constituent the HBI is most closely related to, are available only for the Milwaukee Metropolitan Sewerage District's (MMSD) water quality sampling sites. He added that even when macroinvertebrate data and water quality data were collected at the same sites, they were often collected on different days.

Ms. Greenfield asked who is conducting macroinvertebrate studies. Mr. Boxhorn replied that the data are mostly from the WDNR. Mr. C. Magruder added that MMSD and the U.S. Geological Survey (USGS) collected fish and macroinvertebrate data near two gaging stations in the District's service area. He added that he can provide the data.

[Secretary's Note: Commission staff have discussed these macroinvertebrate data with staff from the USGS. USGS staff indicated that they would provide these data. As of the date of these summary notes, Commission staff have not yet received of the data.]

Ms. Greenfield asked whether the plan will recommend locations for further macroinvertebrate studies. She emphasized that it would be helpful to have recommendations regarding where to sample, when to sample, and how frequently to sample. Mr. Boxhorn replied that he intended to recommend establishing a series of stations for regular fish and macroinvertebrate sampling. He added that as part of this recommendation, he will assess the locations and level of effort. He noted that the ideal would be to coordinate fish, macroinvertebrate, and water quality sampling. Ms. Kinzelman noted that the City of Racine assisted Mr. Helker with the WDNR fish and macroinvertebrate sampling. She commented that while they tried to coordinate the dates and locations of sampling, they found that it can be very difficult to collect fish, macroinvertebrate, and water quality data at the same time. Mr. Boxhorn concurred, adding that the characteristics that define a good sampling location differ depending upon whether sampling is being conducted for macroinvertebrates, fish, or water quality.

Mr. C. Magruder commented that as a result of the recommendations for biological monitoring included in the 2007 SEWRPC regional water quality management plan update, MMSD in partnership with the USGS has been conducting biological monitoring on a three-year cycle at 14 locations in the District's service area.

At Mr. Hahn's request Mr. Boxhorn reviewed the other wildlife subsection.

Ms. Warner suggested that the Audubon Society members could assist with the bird inventories. In reference to Table H-3, Mr. Russart asked whether it was necessary to indicate that resident bird species also winter in the area. Mr. Osterman inquired whether it is necessary to note that resident bird species also breed in the area.

[Secretary's Note: The rationale for identifying these categories separately is to identify those species in which different portions of the population are present at different times and conditions. An example of this is the Canada goose. Some of these geese are resident in the watershed all year. Others are present during the breeding season, breed in the watershed, and migrate to the south during the winter. Still others pass through the watershed during the spring and fall migrations. Because of this the designations were retained.

Following the meeting, Ms. Warner sent an electronic mail communication containing comments on the bird inventory from Eric Howe of the Hoy Audubon Society. Mr. Russart also sent an electronic mail with comments regarding the bird inventories. These communications are attached as Exhibit A.

Additions and corrections submitted by Mr. Howe and Mr. Russart were made to Table H-3. The revised table is attached as Exhibit B.]

Mr. Russart noted that the plant "cream gentian" has been found in Franklin State Natural Area and asked whether it is included in the inventories of endangered and threatened species. Ms. McCalvy noted that it also occurs on Caledonia Conservancy Property.

[Secretary's Note: Cream gentian is included in the inventories of endangered, threatened, and special concern species given in Table IV-8 under the name yellow gentian (*Gentiana alba*), an alternative common name for this species.]

Mr. Russart suggested that higher levels of invasive species and the linear nature of remaining habitats be added to the description of the impacts of land use changes on wildlife that is given in the last paragraph of the other wildlife section.

[Secretary's Note: The following sentence was added to the end of the first full paragraph on page 7:

"Some additional factors impacting wildlife and wildlife habitat that have resulted from conversion of land and changes in land use include higher levels of invasive species populations and the linear configuration of the remaining wildlife habitat."]

At Mr. Hahn's request, Mr. Boxhorn reviewed the subsection on the Root River recreational use surveys.

Mr. Romeis asked what recreational opportunities are available in Franklin and other areas upstream of the portion of the River examined in the recreational use surveys. Ms. Greenfield asked whether there are canoe and kayak rentals in the upper portions of the watershed. Mr. Boxhorn replied that he is not aware of any. He noted that Wehr Nature Center does not rent canoes or kayaks. Mr. Romeis asked whether there will be an assessment of the potential for the River to support recreation. Ms. Kinzelman noted that the municipalities will be interested in the recreational opportunities created under the plan.

[Secretary's Note: The section of the Root River that was surveyed to assess recreational use was chosen for three reasons: First, there are well established recreational corridors along upper reaches of the River. The surveys sought to assess recreational use along reaches of the River where recreational corridors are not as well connected. Second, the primary question the surveys were intended to answer was the extent to which the navigable portions of the River are being used for boating, including canoeing and kayaking. The judgment of the SEWRPC staff is that water levels and flows in the River are such that it is generally not usable by boats in sections upstream from the Milwaukee-Racine County Line. Third, the reach surveyed is the section of the River in which recreational opportunities would potentially be impacted by alternative measures for Horlick dam. The surveys were conducted in order to ascertain what those impacts might be.]

Mr. Yencha noted that the biggest limitation to canoeing in the upper reaches of the River is the low flow conditions that are present. He added that the opportunities to expand paddling are located downstream of the IH-94 crossing. Ms. Warner commented that an acquaintance of hers paddled the River from County Line Road to Linwood Park and encountered many impediments to navigation.

At Mr. Hahn's request, Mr. Owens and Mr. Slawski presented data from a survey of stream channel conditions and habitat conditions in Hoods Creek.

[Secretary's Note: Mr. Owen's and Mr. Slawski's presentation is attached herein as Exhibit C.]

Mr. Owens explained that the Hoods Creek data are being presented in order to give the Advisory Group an example of the types of data being collected in the field surveys of the Creek and the mainstem of the Root River.

Ms. Greenfield asked whether Reach 3 is the section of Hoods Creek that the proposed River Network project would address. Mr. Sampson replied that this project area was within Reaches 2 and 3. He noted that downstream of these reaches, the stream is very flashy. Mr. Owens concurred, noting that he experienced flashiness of this stream this summer during data collection. Mr. Sampson noted that drainwater management projects in this area would control and store water to limit stream flashiness. He indicated that he had applied for funding from the Fund for Lake Michigan for this project, but did not receive a grant. He suggested that funding might be available through Natural Resources Conservation Service programs.

Ms. Greenfield stated that the Village of Mt. Pleasant has conducted some design engineering for a project on Hoods Creek.

[Secretary's Note: A consultant to the Village performed a hydraulic analysis on Hoods Creek. This analysis has been provided to Commission staff.]

Mr. Clayton asked whether the agricultural areas of the Hoods Creek subwatershed consist of row cropped fields with drain tiles. Mr. Sampson replied that these areas consist of high quality cropland and vegetable farms with dense drain tile systems. He added that buffers are being installed along the stream, but they will not provide much water control because of the drain tiles. Mr. Boxhorn asked whether these farms are irrigated. Mr. Sampson replied that they are. Mr. C. Magruder commented that the runoff from these fields will contain dissolved nutrients.

Mr. Owens noted that the field surveys found considerable woody debris in the channel in downstream sections -- Reaches 1 and 2 -- of the Creek. He added that there was little woody debris in upstream sections. Ms. Greenfield asked whether debris jams might be contributing to flooding adjacent to the stream. Mr. Slawski replied that it is possible that they are. Ms. Warner noted that Village of Caledonia Assistant Engineer Tony Bunkelman has received several complaints regarding debris jams in Reach 1 of Hoods Creek and might be interested in the steam channel condition data. Ms. Greenfield suggested that Village of Mt. Pleasant Director of Engineering Bill Sasse and Mr. Sampson might also be interested in these data. Mr. Slawski replied that data sharing with other interests in the watershed will be important.

> [Secretary's Note: Geographic Information System files and related materials from the inventories conducted for the Root River watershed restoration plan will be available for municipalities and other interested parties.]

Mr. Sampson asked why data collection along Hoods Creek ended at the STH 20 crossing. Mr. Slawski replied that the stream is small at this point and there were other areas in the watershed that needed to be inventoried.

Ms. Greenfield suggested holding a meeting to communicate the plan to major funders.

Mr. Osterman announced that the Root River Council is hosting a showing of the movie "Rock the Boat," which is about the resurgence of the Los Angeles River, on Wednesday, October 16, 2013, from 6:00 p.m. to 8:00 p.m. at the Golden Rondelle Theater in Racine.

DATE AND TIME OF NEXT MEETING

Ms. Greenfield thanked everyone in attendance for their participation and noted that the next Root River Restoration Planning Group (stakeholder group) meeting will be held at 5:30 p.m. on October 30, 2013, at Boerner Botanical Gardens in the Village of Hales Corners.

ADJOURNMENT

There being no further business, the meeting was adjourned by unanimous consent at 12:05 p.m.

ROOT RIVER WRP SUMMARY NOTES 10/02/2013 MTG (00213926).DOC
300-1104/300-1106
MGH/JEB
10/10/13, 11/6/13

Exhibit A: Email from Melissa Warner, email and attachment from Brian Russart. (Joe can provide.)
Exhibit B: Table H-3 from Appendix H (#213694)
Exhibit C: Owens/Slawski presentation (#214055)

Exhibit A

Boxhorn, Joseph E.

From: Melissa Warner <melissa.warner3@sbcglobal.net>
Sent: Wednesday, October 02, 2013 1:42 PM
To: Eric Howe
Cc: Rick Fare; Helen Pugh; Jennifer Wenzel; Boxhorn, Joseph E.
Subject: Re: Birds found in Root River Watershed.

Hi, Eric -

I will put you in touch with Joe Boxhorn at SERPC...he is the one putting this list together for the report. His E-dress is on the cc line above. Whatever you two figure out to use is fine with me. On general princlples, I would like a SEWRPC report to be as accurate and complete as possible.

Thanks, Eric!

Melissa
On Oct 2, 2013, at 8:51 AM, Eric Howe wrote:

Another misprint is for Rusty Blackbird. They are not a year round resident (R) anywhere in WI. (Breed in Canada). Migrant (rare in winter) is correct.

Sent from my iPhone

On Oct 2, 2013, at 8:25 AM, Melissa Warner <melissa.warner3@sbcglobal.net> wrote:

> Thanks! I'll see what I can do...If this list is going to be part of a major watershed restoration plan, then I think it needs to be corrected.
>
> Melissa
> On Oct 2, 2013, at 7:10 AM, Eric Howe wrote:
>
> Hi, Melissa.

I hope the following doesn't sound too nit picky ☺ but here's a very quick run down below. I imagine this list is outdated (e.g. in some of the common names for birds, distribution, breeding status) and could literally have dozens of corrections. Though the more I look it, it could potentially have a hundred corrections if one were to observe the current day breeding/wintering/migrant statuses.

I understand, historically, it may be difficult to know the exact location of the bird sightings so I assume that is why they are listing a species' presence at the county level versus if the species was ever known to reside or currently resides within the actual boundaries of the Root Water Watershed.

A few examples of county level records listed are highly unlikely within the actual watershed, the species are most likely recorded on open water of Lake Michigan (or mouth of harbor):

- "Oldsquaw" (should be called Long–tailed Duck) may winter on the open water of Lake Michigan (unlikely to be found on small inland waterways)
- Harlequin Duck (unlikely to be found on small inland waterways)
- Any of the Scoter species listed (unlikely to be found on small inland waterways)

This is just a few of the items I noticed, there's likely a lot more (especially breeding, winter, resident, migratory status) that would take more time to delve into.

Names of birds:
Oldsquaw – now called Long–tailed Duck
American Widgeon --> American Wigeon
Rock Dove is now called Rock Pigeon
Sharp-tailed Sparrow is now Nelson's Sparrow
Northern (Baltimore) Oriole is just Baltimore Oriole
Spelling of Common Redpoll (missing an 'l')
Spelling of Blackpoll Warbler (not Blackpole)
Solitary Vireo and Blue-head Vireo should be lumped together, current name is Blue-head Vireo

There's several species listed as "B" breeding which are not current (or highly unlikely anymore).

- Upland Sandpiper in Racine (no current records)
  Common Raven is listed for Milwaukee (maybe in 1800s but no more), presence only as a rare migrant now.
  Northern Goshawk – listed a resident (not in present day, it is a migrant)

Miscellaneous (at least at the county level). Note, several if these may include uncommon/rare species:

- RB Merganser – does winter in Racine County (lakefront), listed only as a migrant

- Eared Grebe (rare migrant) – it's listed for Milwaukee Co., but not Racine Co. (it has been seen (eBird record) at Nicholson Wildlife Refuge in the c.a. 80s
- Piping Plover – not listed for Racine, migrant (North Beach, Myers Park)
- Purple Sandpiper – it's listed as "B" for Racine County – wow, they are breeders in the high arctic – should be listed as a migrant only
- American Pipit – no status listed for Racine Co., should be listed as "M" (migrant). Could be found throughout watershed in appropriate habitat during migration.
- Water Pipit - Anthus spinoletta – this could be a misprint – Water Pipits breed in the mountains of southern Europe and southern temperate Asia across to China.(perhaps someone meant the American Pipit instead)
- White-eyed Vireo – not listed for Racine Co., it's been noted at several locations as a migrant (e.g. private land, Colonial Park, Cliffside Park)
- Cerulean Warbler, Kentucky Warbler, Yellow-throated Warbler - not listed for Racine Co., they've been noted at locations as a migrant (e.g. private lands, Colonial Park)
- Prothonotory Warbler - not listed for Racine Co., it's been noted in the watershed at several locations as a migrant (e.g. several Root River locations, e.g. Colonial Park)
- Worm-eating Warbler (ditto) rare migrant (Colonial Park)
- Bell's Vireo (noted in Racine County in June 2013, but in the Pike River Watershed)
- Alder Flycatcher (not listed for Racine) – probable breeding noted for Cliffside Park
- Pileated Woodpecker (at the very least a rare migrant in Racine County)
- Several gulls listed are not listed for Racine as migrants (but this would be for the lakefront area – likely similar for Milwaukee) Thayer's, Franklin's, Great and Lesser-blacked…)
- Bald Eagle (migrant throughout county, breeding in Burlington area)
- American Black Duck (listed as a breeding (perhaps historically) highly unlikely here in Racine Co present day)
- Cattle Egret (not listed for Racine Co – migrant noted at various locations, perhaps not the watershed itself)
- Ruffed Grouse (unlikely breeding in present day Milwaukee County)
- Shorebirds not listed as migrants for Racine (Willet, Red Knot, Hudsonian Godwit, Whimbrel)
- Long-eared Owl (not listed, migrant for Racine Co.)
- Broad-winged Hawk (besides a migrant, could be a probable breeder)
- Nelson's and LeConte's Sparrow should be listed as migrants for Racine County.
- Harris's Sparrow should be listed as a migrant (e.g. Nicholson WR and another private residence in watershed)
- Henslow's Sparrow, listed as a migrant but it is a breeder in western Racine Co.
- Loggerhead Shrike (could be listed as migrant) has been noted on Racine lakefront. Several rare/accidental western species are listed for Milwaukee Co but not for Racine (doesn't really matter, but for the sake of historical presence, it's out of date or incomplete).
- White-throated Sparrow (noted as breeder for Milwaukee/Waukesha – unlikely in recent decades).
- Both crossbill species, should be noted as migrants in Racine Co.

I understand this may be an older list, but eBird could be consulted for updated presence (both a species' presence temporarily throughout the year as well as a more pinpointed location in many cases)

-----Original Message-----
From: Melissa Warner [mailto:melissa.warner3@sbcglobal.net]
Sent: Tuesday, October 01, 2013 11:16 PM
To: Rick Fare; Helen Pugh; Eric Howe; Jennifer Wenzel
Subject: Birds found in Root River Watershed.

Hi, birders!

Would you care to weigh in on this list of Birds that have been/are found in Root River Watershed?

http://www.sewrpc.org/SEWRPCFiles/Environment/RootRiverWshedRestorationPlan/capr-316-appendix-h-draft.pdf

table h-3 is birds.

Melissa=

Boxhorn, Joseph E.

From: Brian.Russart@milwcnty.com
Sent: Thursday, October 10, 2013 4:27 PM
To: Boxhorn, Joseph E.
Subject: Root River info
Attachments: 201310101626.pdf

Hey Joe,

Just wanted to follow-up and send some of my bird comments for Appendix H.

MILWAUKEE COUNTY PARKS
BRIAN RUSSART
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Milwaukee County Department of Parks, Recreation & Culture
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Exhibit B

Table H-4

AMPHIBIANS AND REPTILES KNOWN OR LIKELY TO OCCUR IN THE COUNTIES COMPRISING THE ROOT RIVER WATERSHED

Scientific (family) and Common Name	Scientific Name	Kenosha County	Milwaukee County	Racine County	Waukesha County
Amphibians					
Proteidae					
Mudpuppy[a,b]	*Necutrus maculosus maculosus*	X	X	X	X
Ambystomatidae					
Blue-Spotted Salamander	*Ambystoma laterale*	X	X	X	X
Eastern Tiger Salamander	*Ambystoma tigrinum tigrinum*	X	X	X	X
Spotted Salamander	*Ambystoma maculatum*	- -	X	- -	X
Salamandridae					
Central Newt	*lotophthalmus viridescens louisianensi*	X	X	X	X
Plethodontidae					
Four-Toed Salamander[a,b]	*Hemidactylium scutatum*	X	X	X	X
Bufonidae					
American Toad	*Bufo americanus americanus*	X	X	X	X
Hylidae					
Blanchard's Cricket Frog[b,c]	*Acris crepitans blanchardi*	X[d]	X[d]	X[d]	X[d]
Cope's Gray Tree Frog	*Hyla chrysoscelis*	X	X	X	X
Gray Tree Frog	*Hyla versicolor*	X	X	X	X
Northern Spring Peeper	*Hyla crucifer crucifer*	X	X	X	X
Western Chorus Frog	*Pseudacris triseriata triseriata*	X	X	X	X
Ranidae					
Bullfrog[a]	*Rana catesbeiana*	X	X	X	X
Green Frog	*Rana clamitans melanota*	X	X	X	X
Northern Leopard Frog	*Rana pipiens*	X	X	X	X
Pickerel Frog[a,b]	*Rana palustris*	X	X	X	X
Wood Frog	*Rana sylvatica*	X	X	X	X
Reptiles					
Chelydridae					
Common Snapping Turtle	*Chelydra serpentina serpentina*	X	X	X	X
Kinosternidae					
Musk Turtle (Stinkpot)	*Sternotherus odoatus*	X	X	X	X
Emydidae					
Blanding's Turtle[b,e,f]	*Embydoidea blandingii*	X	X	X	X
Midland Painted Turtle	*Chrysemys picta marginata*	X	X	X	X
Western Painted Turtle	*Chrysemys picta belli*	X	X	X	X
Trionychidae					
Eastern Spiny Softshell	*Trionyx spiniferus spiniferus*	X	X	X	X
Smooth Softshell Turtle[a,b]	*Apalone mutica mutica*	- -	X	- -	- -
Western Spiny Softshell	*Apalone spinifera hartwegi*	- -	X	X	X
Colubridae					
Butler's Garter Snake[b,e,f]	*Thamnophis butleri*	- -	X	X	X
Chicago Garter Snake	*Thamnosphis sirtalis semifasciata*	X	X	X	X
Eastern Garter Snake	*Thamnophis sirtalis sirtalis*	X	X	X	X
Eastern Hognose Snake[a]	*Heterodon platyrhinos*	X	- -	X	X

Scientific (family) and Common Name	Scientific Name	Kenosha County	Milwaukee County	Racine County	Waukesha County
Colubridae (continued)					
Eastern Milk Snake	*Lampropeltis triangulum triangulum*	X	X	X	X
Eastern Plains Garter Snake	*Thamnophis radix radis*	X	X	X	X
Midland Brown Snake	*Storeria dekayi wrightorum*	X	X	X	X
Northern Red-Bellied Snake	*Storeria occipitomaculata occipitomaculata*	X	X	X	X
Northern Ribbon Snake[c]	*Thamnophis sauratis septentrionalis*	- -	X[c]	- -	- -
Northern Ringneck Snake[a]	*Diadaphis punctatus edwardsii*	- -	X[d]	- -	X
Northern Water Snake	*Nerodia sipedon sipedon*	X	X	X	X
Queen Snake[b,c]	*Regina septemvittata*	X	X[d]	X[d]	X[d]
Smooth Green Snake	*Opheodrys vernalis vernalis*	X	X	X	X
Western Fox Snake	*Elaphe vulpine vulpine*	X	X	X	X
Western Ribbon Snake[b,c]	*Thamnophis proximus proximus*	- -	- -	X	- -

[a]*Identified as a special concern species in Wisconsin.*

[b]*Species of greatest conservation need based upon the State of Wisconsin's wildlife action plan.*

[c]*Identified as endangered in Wisconsin.*

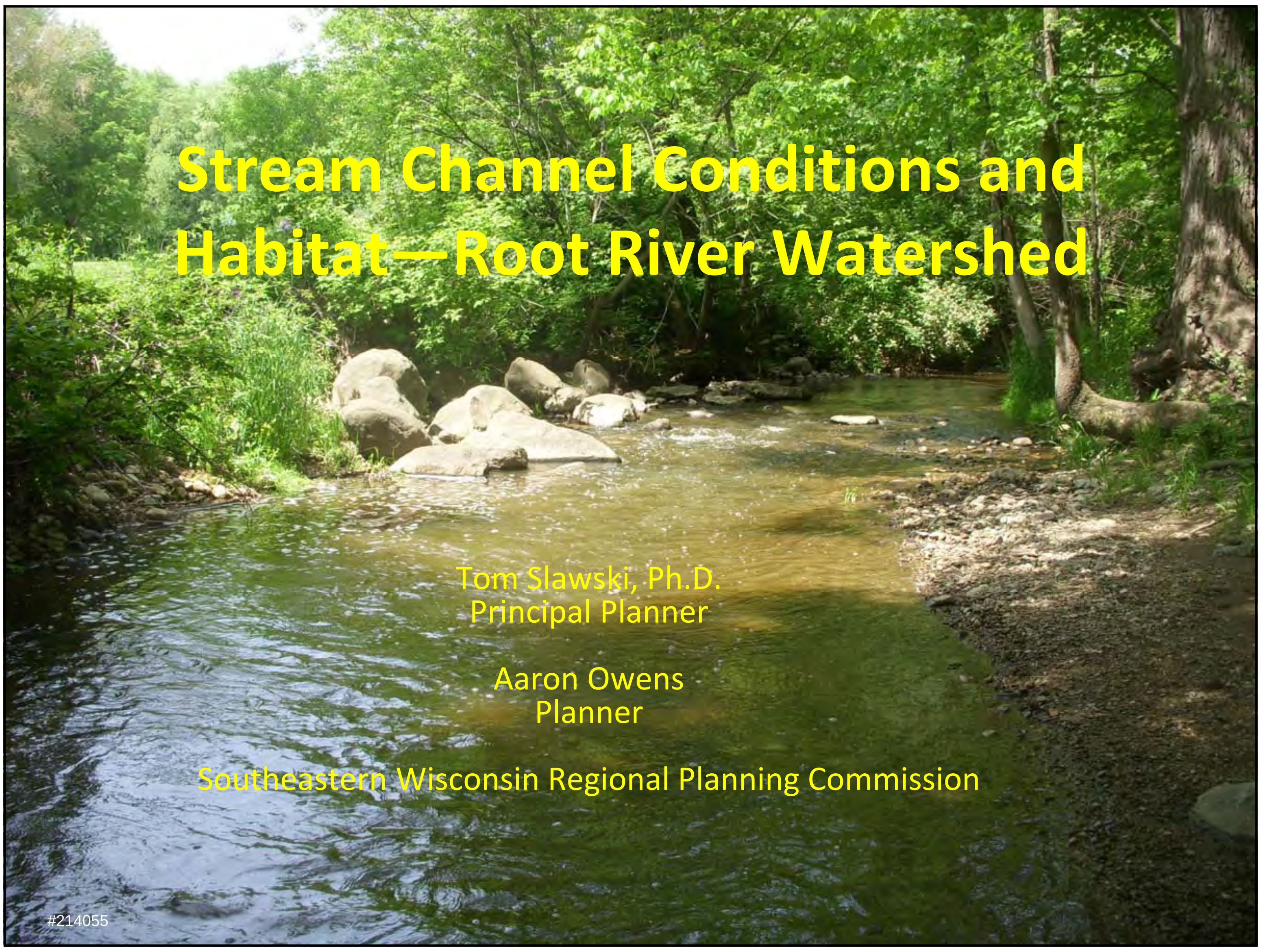
[d]*Likely to be extirpated from the County.*

[e]*Identified as threatened in Wisconsin.*

[f]*This species has been proposed for delisting. As of July 3, 2013, the State Natural Resources Board and Governor Walker have approved the proposed delisting, and the proposal is being reviewed by the Wisconsin Legislature.*

Source: Gary S. Casper, Geographical Distribution of the Amphibians and Reptiles of Wisconsin*, 1991; Rebecca Christoffel, Robert Hay, and Lisa Ramirez,* Snakes of Wisconsin*, 2000; Wisconsin Department of Natural Resources; and SEWRPC.*

Exhibit C



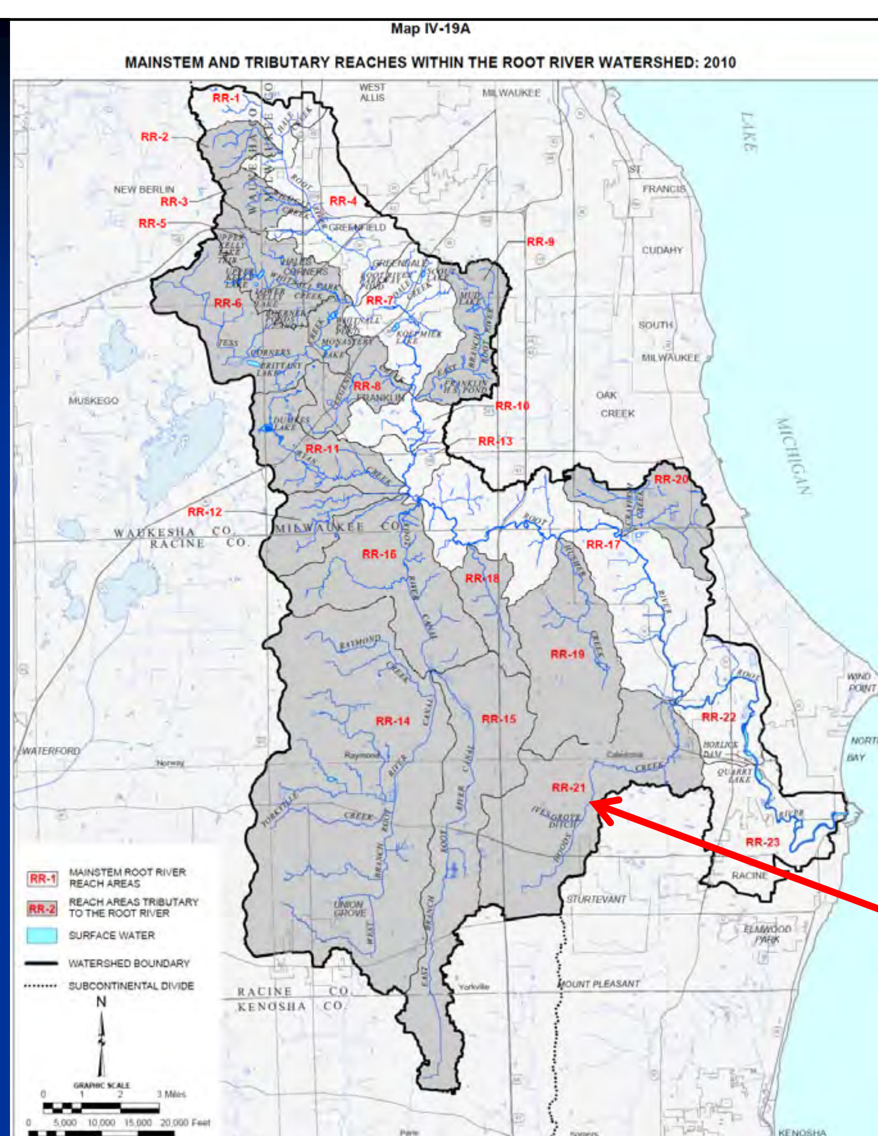
Stream Channel Conditions and Habitat—Root River Watershed

Tom Slawski, Ph.D.
Principal Planner

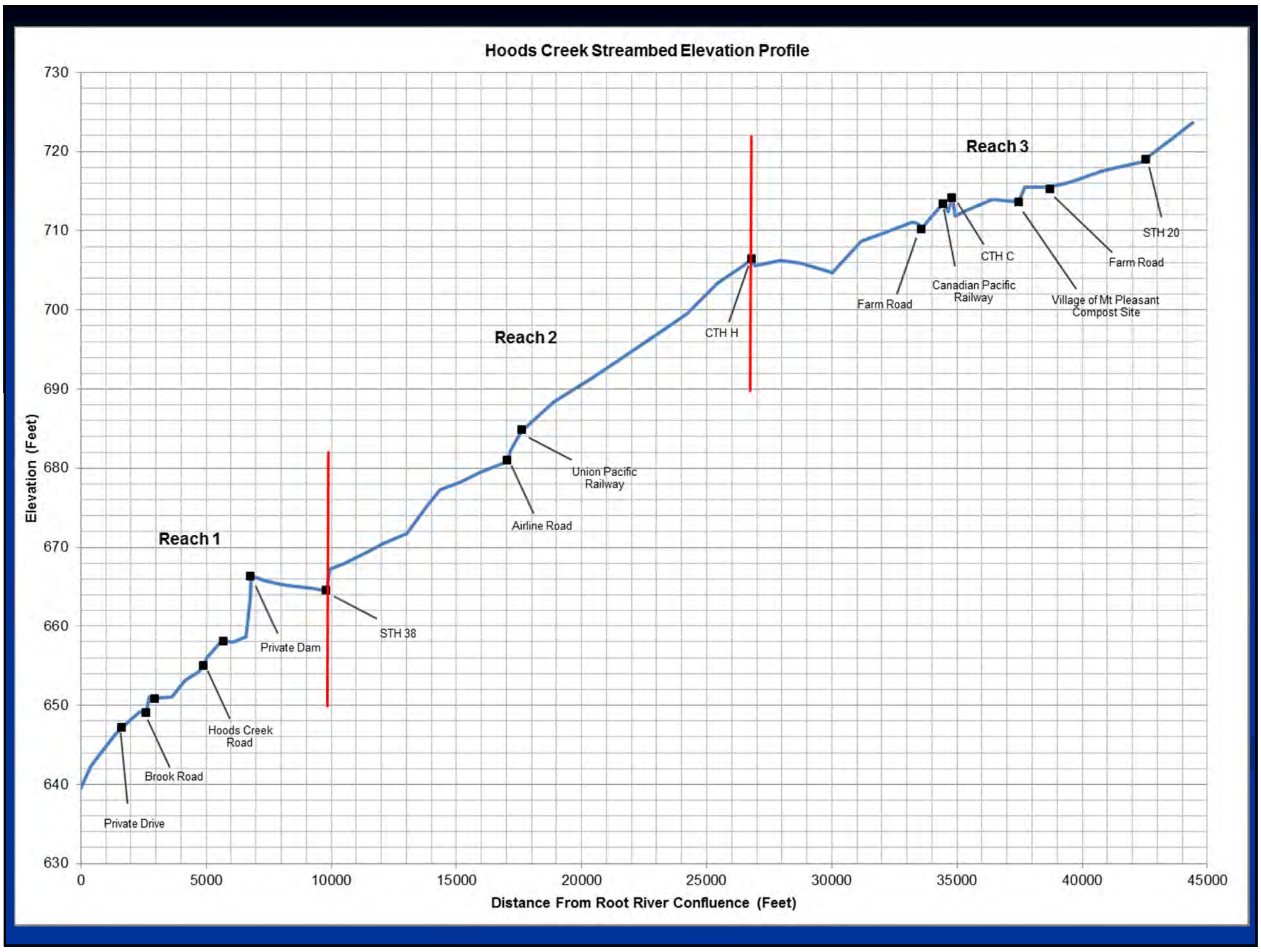
Aaron Owens
Planner

Southeastern Wisconsin Regional Planning Commission

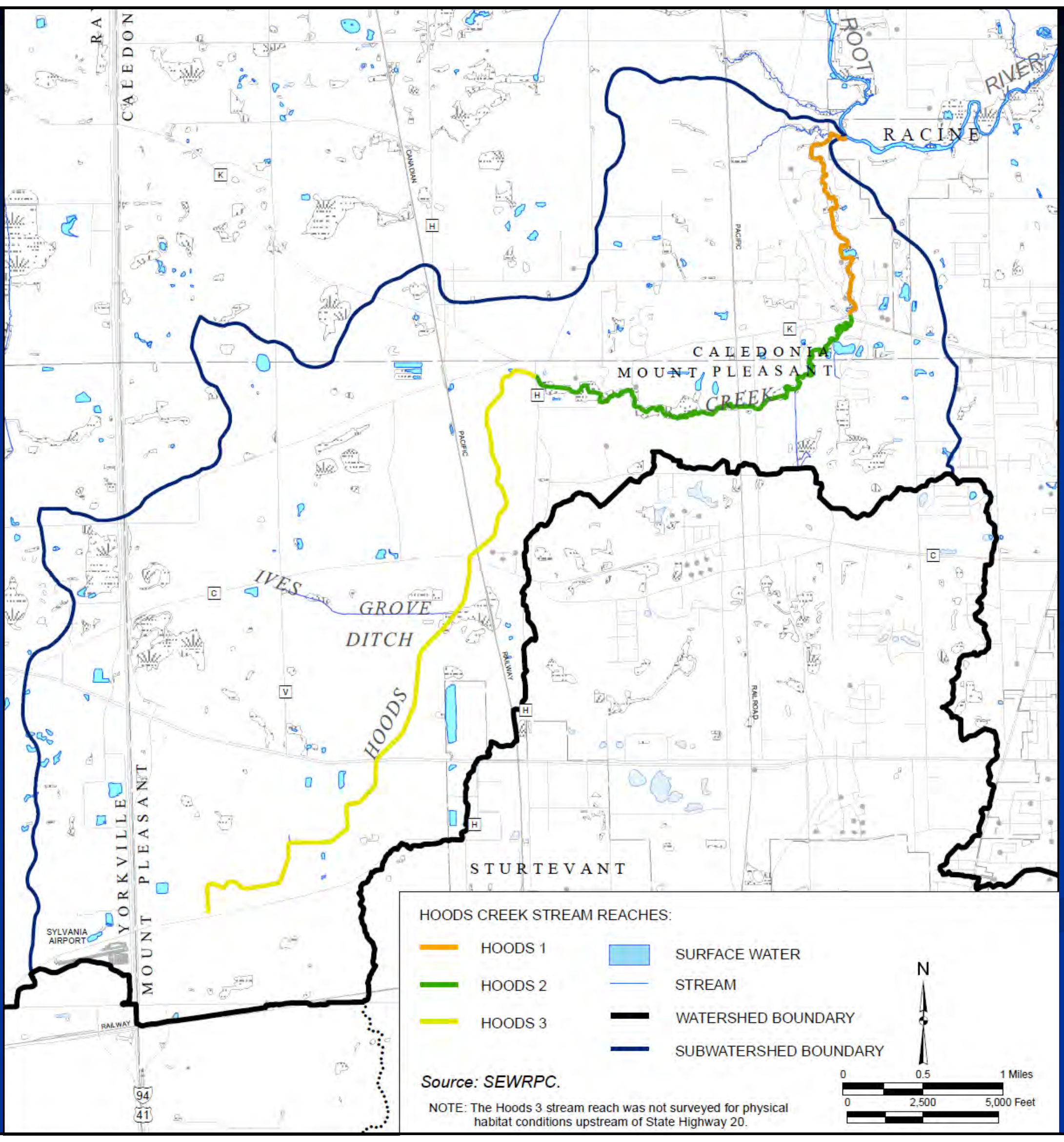
#214055



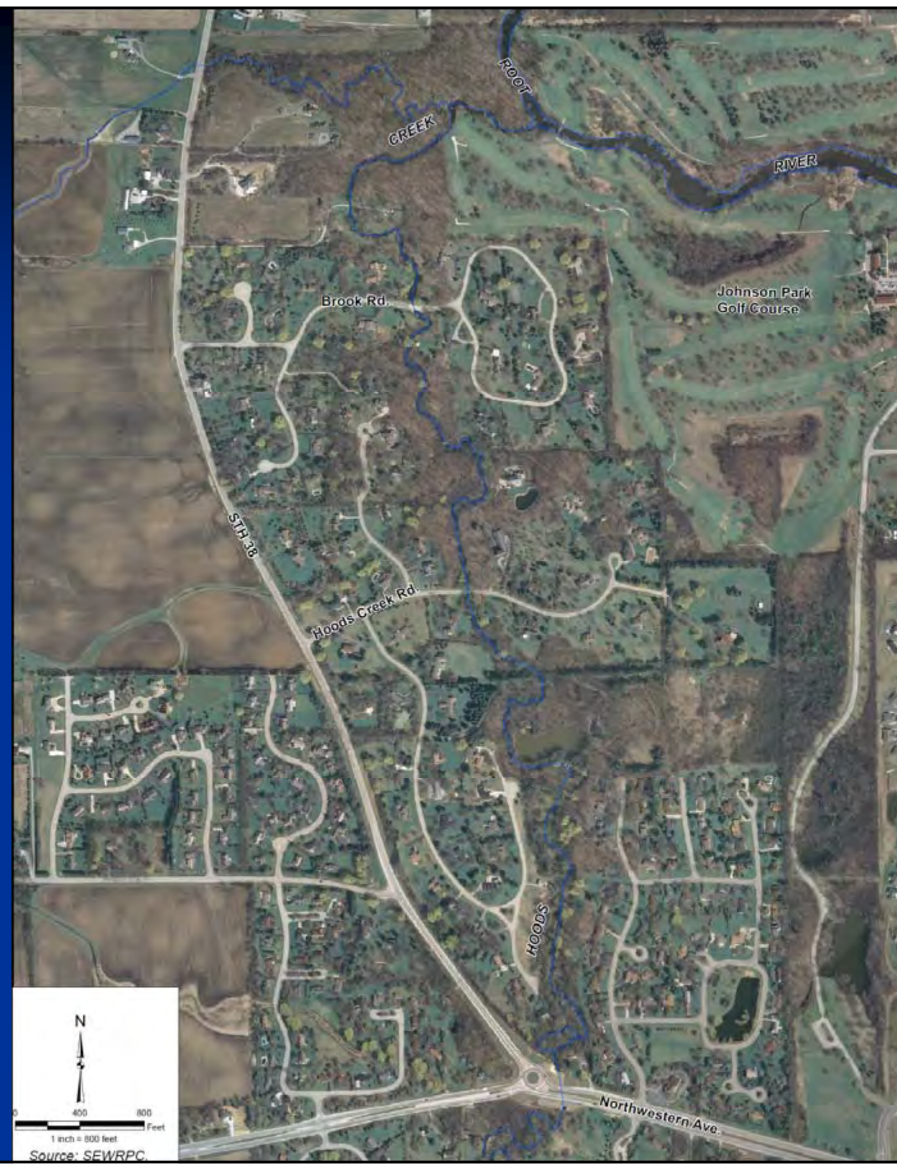
Hoods Creek Subwatershed
(Reach Area 21)



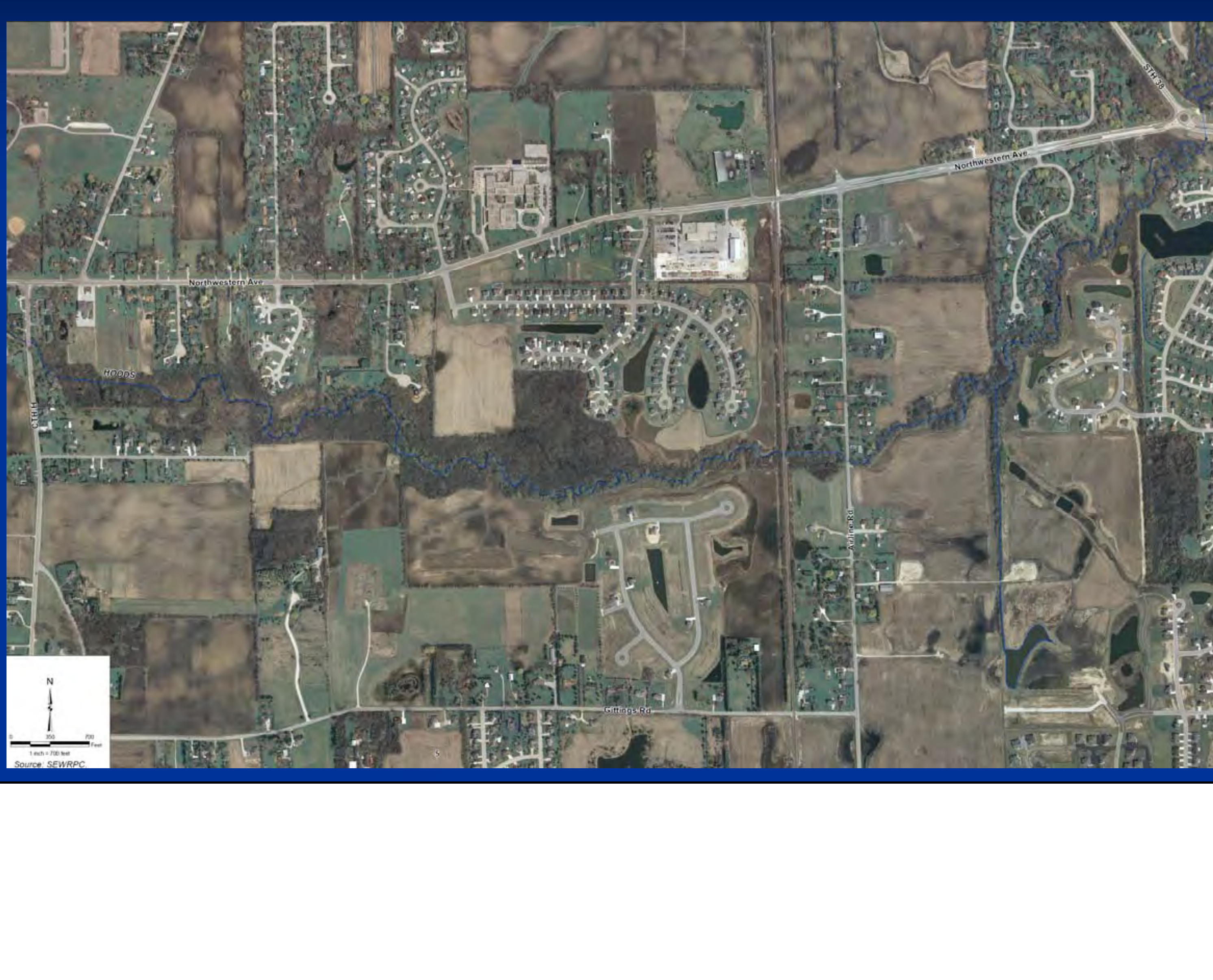
Hoods Creek Stream Survey



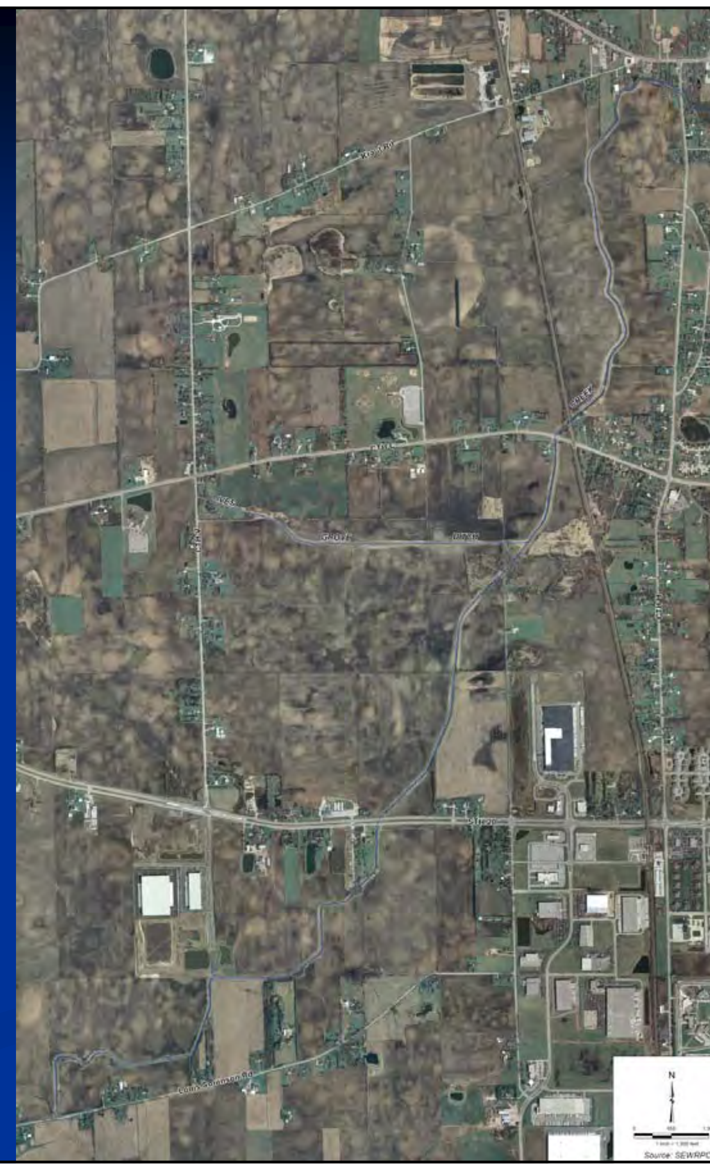
Aerial Extent of Hoods Creek-Reach 1



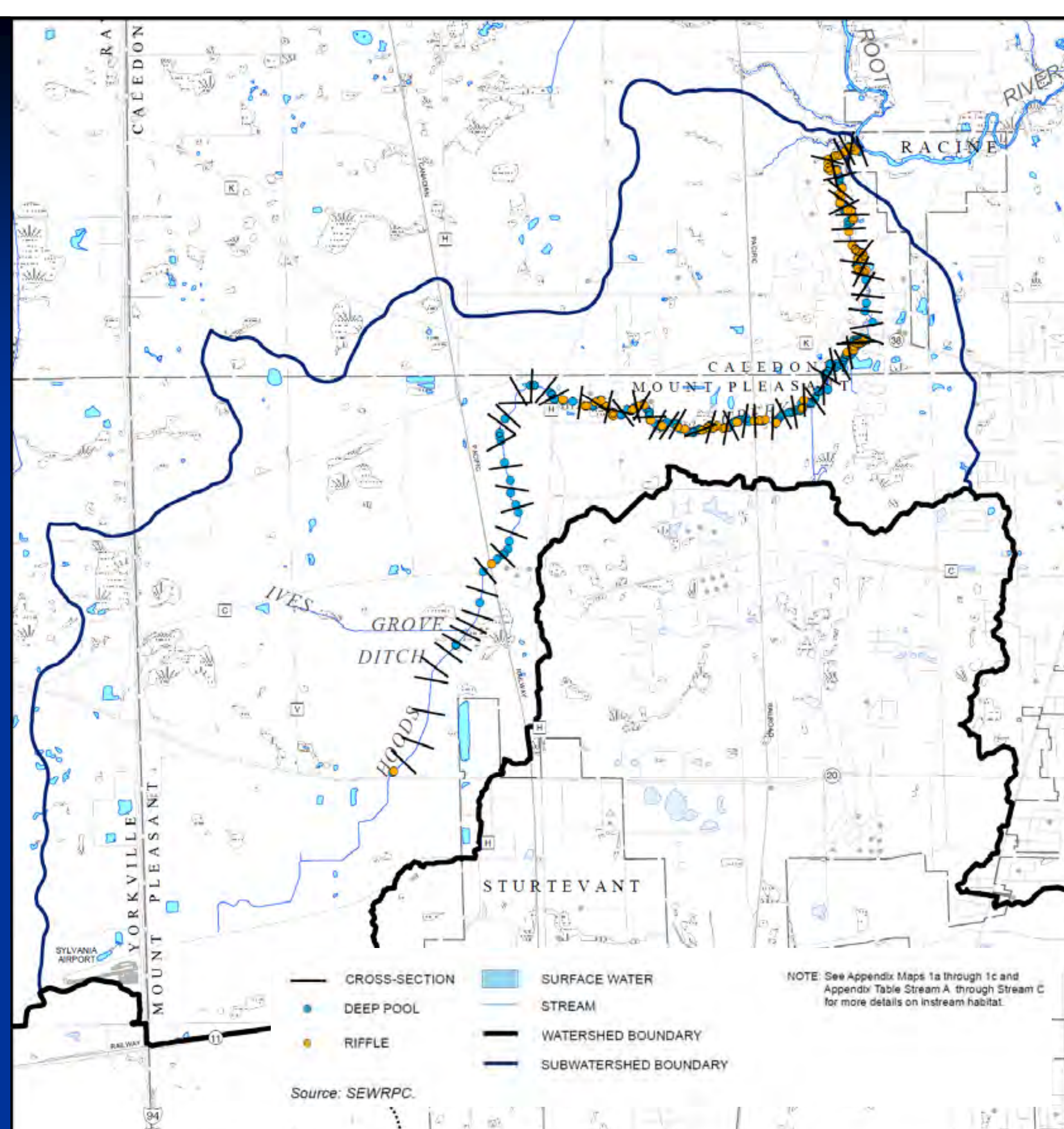
Aerial Extent of Hoods Creek-Reach 2

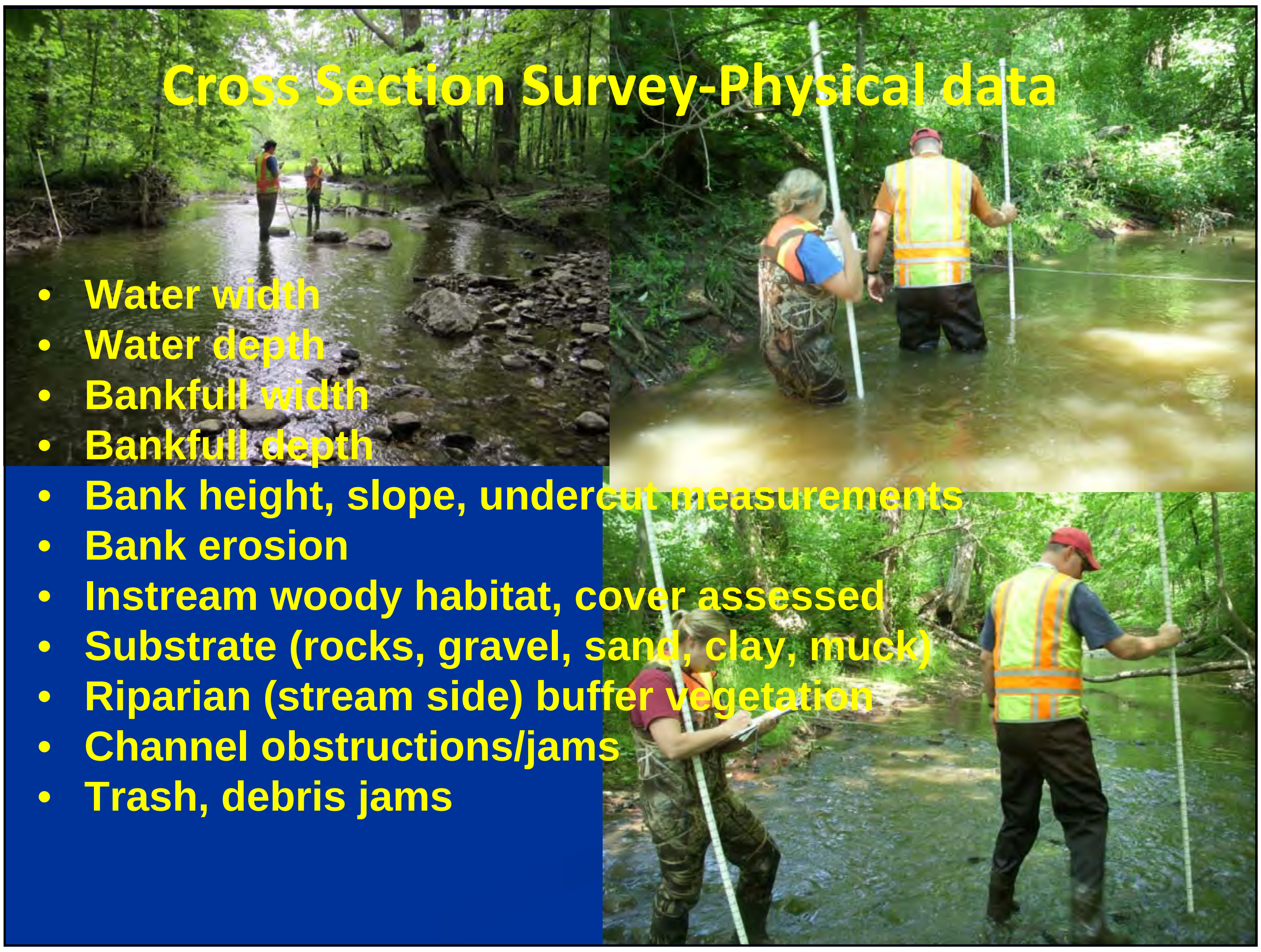


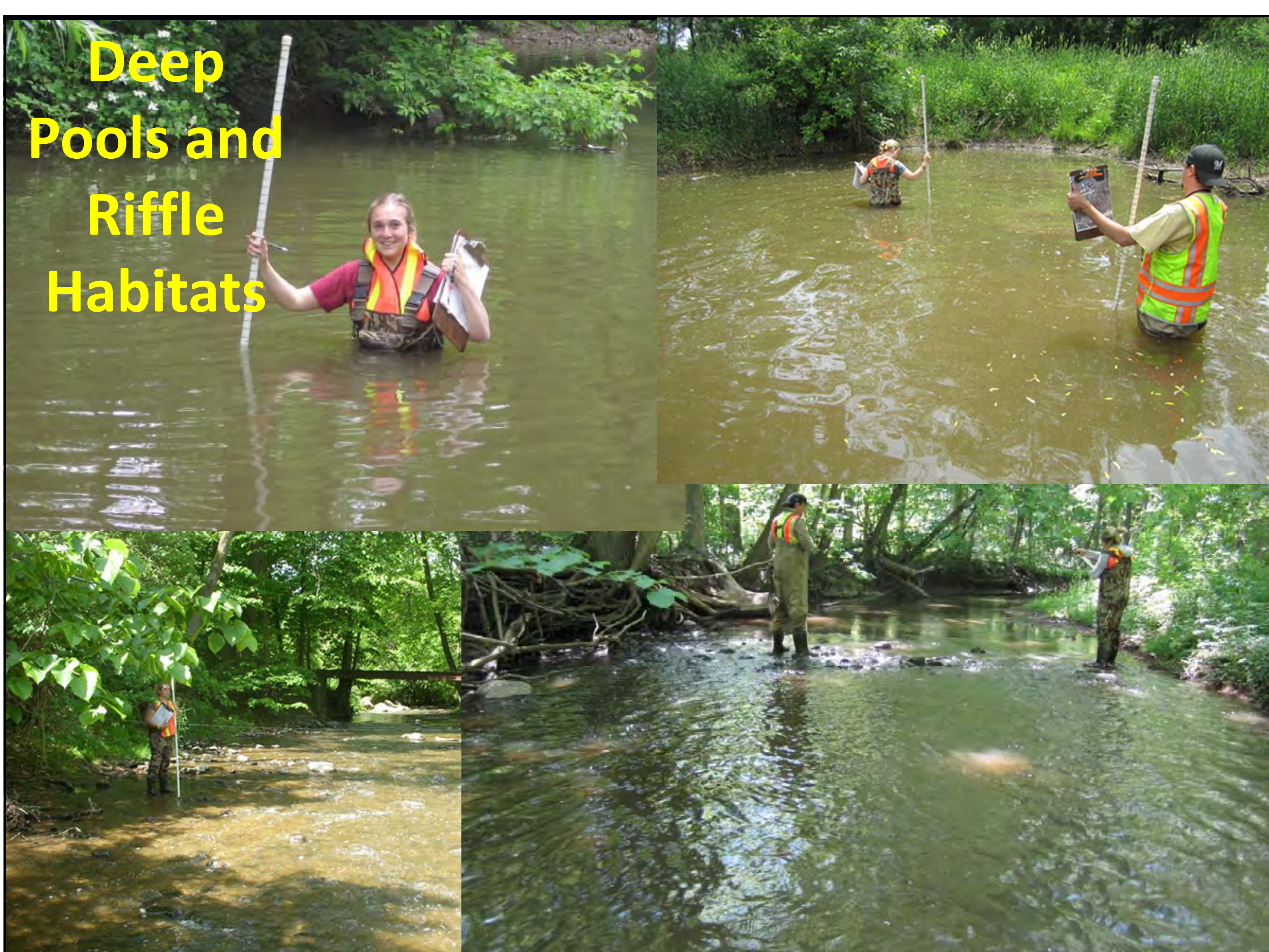
Aerial Extent of Hoods Creek- Reach 3



Cross Sections, Pools, and Riffles Surveyed



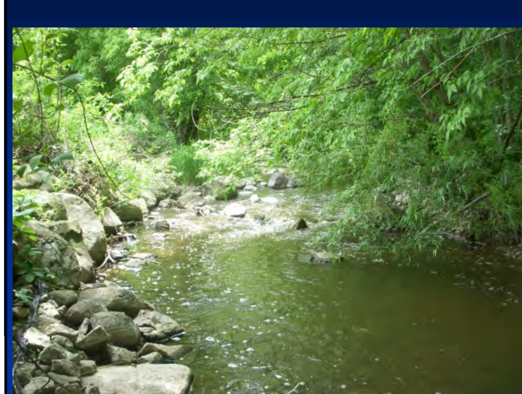

Cross Section Survey-Physical data
• Water width
• Water depth
• Bankfull width
• Bankfull depth
• Bank height, slope, undercut measurements
• Bank erosion
• Instream woody habitat, cover assessed
• Substrate (rocks, gravel, sand, clay, muck)
• Riparian (stream side) buffer vegetation
• Channel obstructions/jams
• Trash, debris jams

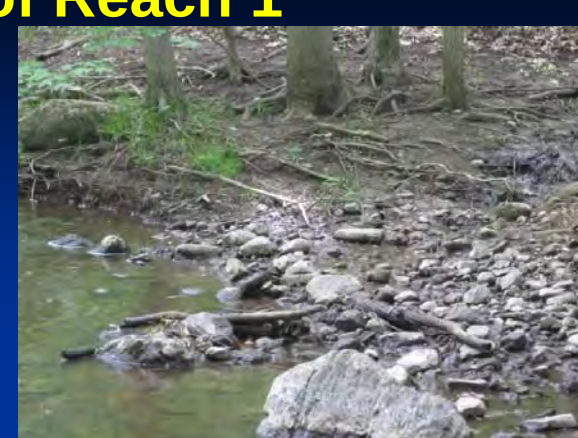

Deep Pools and Riffle Habitats

Typical Cross-Sections of Reach 1

- 1.8 miles
- 21 cross-sections
- 30 pools per mile
- 22 riffles per mile
- Average width 22.9 feet
- 2.3 ft average pool depth
- 0.4 ft average riffle depth
- 0.1 ft average sediment depth

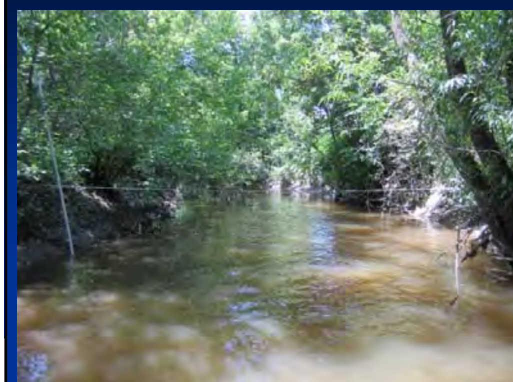
Typical Substrates of Reach 1

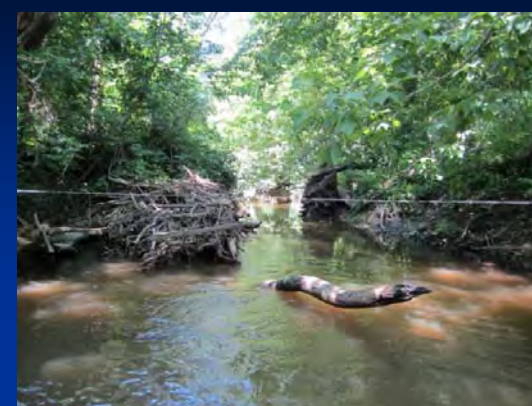




- Highest compositions of large boulders, cobbles, and gravels
- Lowest compositions of silt
- Avg Sed Depth: 0.1 feet

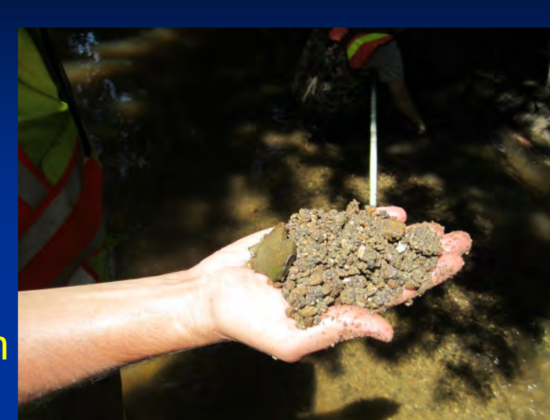
Typical Cross-Sections of Reach 2



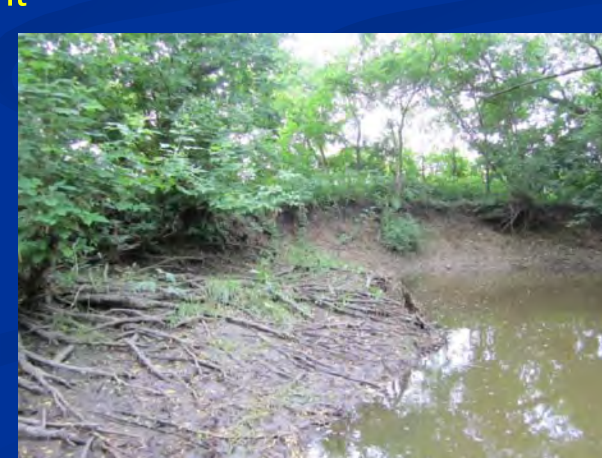


- 3.3 miles
- 29 cross-sections
- 31 pools per mile
- 10.8 riffles per mile
- 17.3 ft average wetted width
- 2.8 ft average pool depth
- 0.5 ft average riffle depth
- 0.1 ft average sediment depth

Typical Substrates of Reach 2



- Not as many large boulders
- Cobbles, gravels are prevalent
- Greater composition of silt/sand mixture
- Average sediment depth: 0.1 feet
Max: 0.7 feet

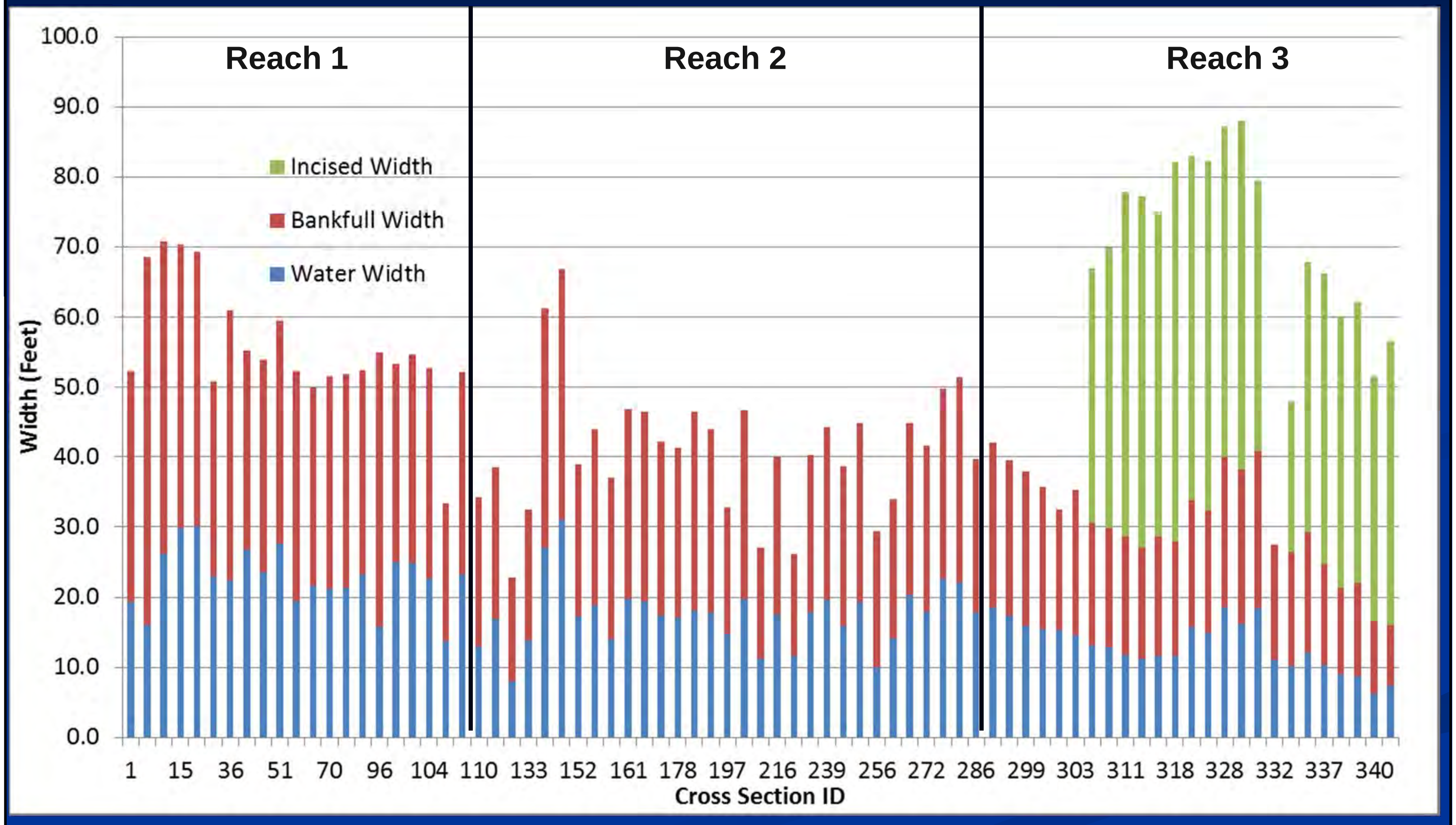


Typical Cross-Sections of Reach 3

- 3.0 miles surveyed
- 27 cross-sections
- 11 pools per mile
- 2.3 riffles per mile
- 13.6 ft average wetted width
- 2.6 ft average pool depth
- 0.6 ft average riffle depth
- 0.4 ft average sediment depth

Typical Incised Channel of Reach 3

Wetted Widths, Bankfull Widths, and Incised Widths



Typical Substrates of Reach 3

- 0.4 ft average flocculent sediment depth
- 2.9 ft max sediment depth
- Highest composition of silt
- Silt/sand/gravel mixtures

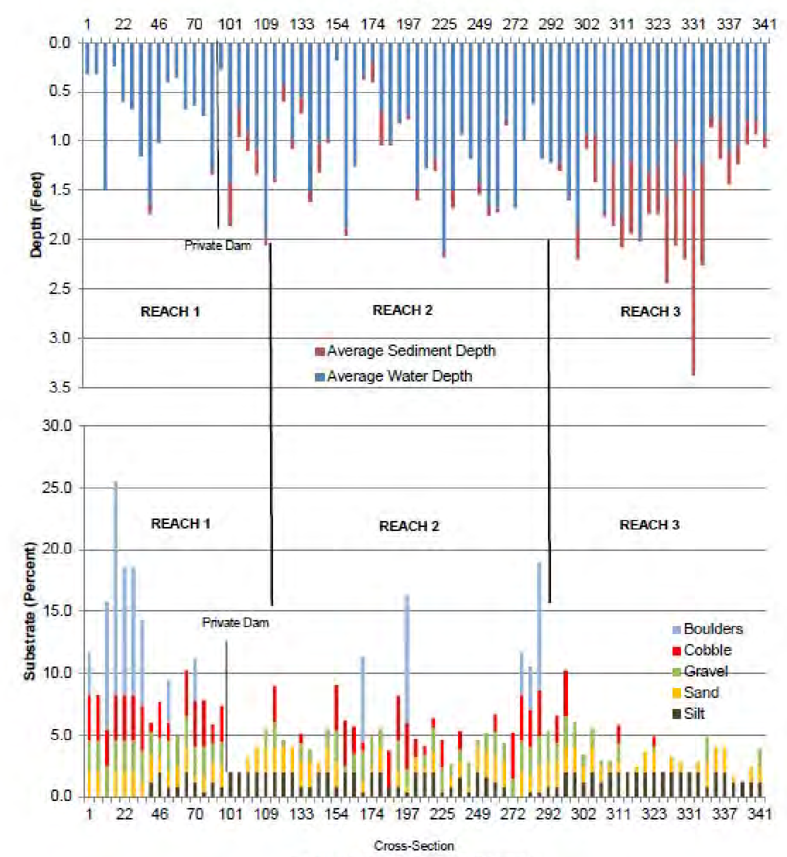
Figure IV-Channel Conditions-2

- Mean water depth, sediment depth, and dominant substrate composition among cross sections
- Water depths fluctuate, but generally increase from downstream to upstream
- Sediment depths greatest in Reach 3 where land uses are dominated by agriculture, minimal riparian buffer protection
- Dominant substrates trend from more course substrates (gravel, cobble, boulder) to finer substrates (silt, sand) to as you move from downstream reaches to upstream reaches

Figure IV-Channel Conditions-2

MEAN WATER DEPTH, SEDIMENT DEPTH, AND DOMINANT SUBSTRATE COMPOSITION AMONG CROSS-SECTIONS WITHIN HOODS CREEK: 2013

WATER AND SEDIMENT DEPTH



DOMINANT SUBSTRATE COMPOSITION

NOTE: See Appendix Maps 1a through 1c and Appendix Table Stream A through Stream C for more details on in-stream cross-sections.

Source: SEWRPC.

Table IV-Channel Conditions-1

- Summary of physical habitat characteristics, substrates types, cover types, obstructions, and trash among stream reaches

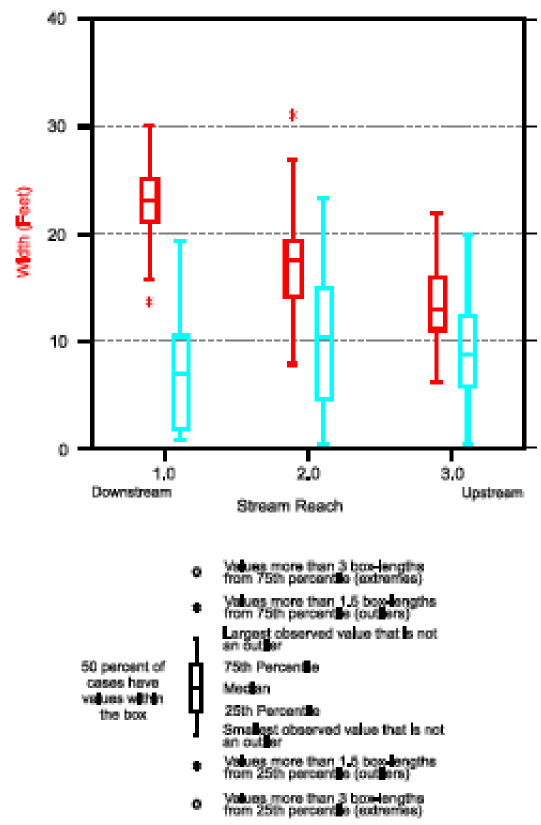
Table IV-Channel Conditions-1

PHYSICAL HABITAT CHARACTERISTICS OF STREAM REACHES WITHIN HOODS CREEK: 2013

Parameters	Hoods Creek		
	Hoods-1	Hoods-2	Hoods-3
Transects			
Number of Transects	21	29	27
Transects (number per mile)	12	8.7	9.0
Habitat			
Composition			
Number of Pools per mile	30.3	31.3	11.0
Number of Riffles per mile	22.3	10.8	2.3
Pool/Riffle Ratio	1.4	3.0	4.7
Average Width (feet)	22.9	17.3	13.6
Standard Deviation	4.3	4.7	3.9
Depth[a]			
Average Pool Depth (feet)	2.3 (53)	2.8 (104)	2.6 (33)
Standard Deviation	0.7	0.8	0.6
Residual Pool Depth (feet)			
Standard Deviation			
Average Riffle Depth (feet)	0.4 (39)	0.5 (36)	0.6 (7)
Standard Deviation	0.1	0.2	0.3
Average Run Depth (feet)	1.0 (17)	1.2 (28)	1.3 (26)
Standard Deviation	0.5	0.5	0.4
Substrate			
Flocculent Sediment Depth			
Average Depth (feet)	0.1	0.1	0.4
Maximum Depth (feet)	1.7	0.7	2.9
Composition[b]			
Silt (percent)	48.6	64.8	84.8
Sand (percent)	69.5	60.7	64.0
Gravel (percent)	73.3	55.2	36.0
Cobble (percent)	59.0	37.2	16.0
Boulder (percent)	18.1	4.1	3.2
Bedrock (percent)	0.0	0.0	0.0
Clay (percent)	11.4	13.8	1.6
Peat (percent)	0.0	0.0	0.0
Cover			
Undercut Banks			
Deep (percent >1.0 feet)	0	4	4
Moderate (percent >0.5 and ≤1.0 feet)	0	4	11
Shallow (percent <0.5 feet)	0	0	0
None (percent)	100	92	85
Amount of Cover			
High Abundance (percent)	14	10	7
Moderate Abundance (percent)	52	45	52
Low Abundance (percent)	33	45	41
None (percent)	0	0	0
Woody Debris			
High Abundance (percent)	29	21	0
Moderate Abundance (percent)	29	52	7
Low Abundance (percent)	42	27	33
None (percent)	0	0	60
Macrophytes			
High Abundance (percent)	0	0	33
Moderate Abundance (percent)	9	0	48
Low Abundance (percent)	29	10	15
None (percent)	62	90	4

Figure IV-Channel Conditions-3

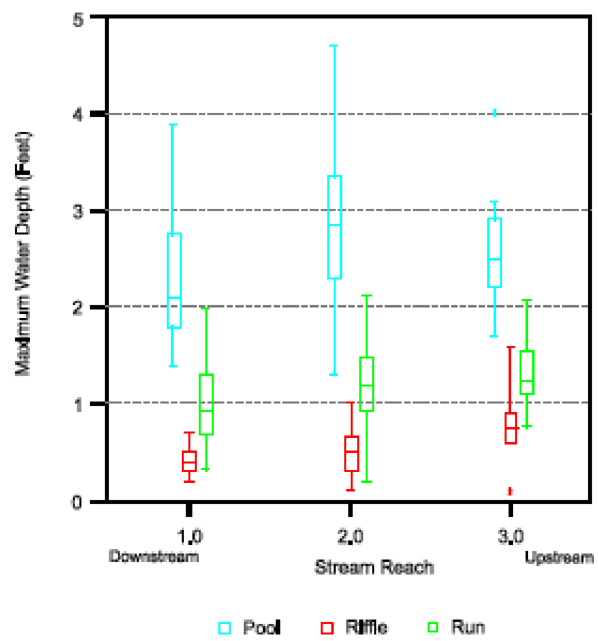
STREAM WIDTH AND MAXIMUM DEPTH AMONG REACHES IN HOODS CREEK: 2013



Source: SEWRPC.

Figure IV-Channel Conditions-4

MAXIMUM WATER DEPTH AMONG HABITAT TYPE AND REACHES IN HOODS CREEK: 2013



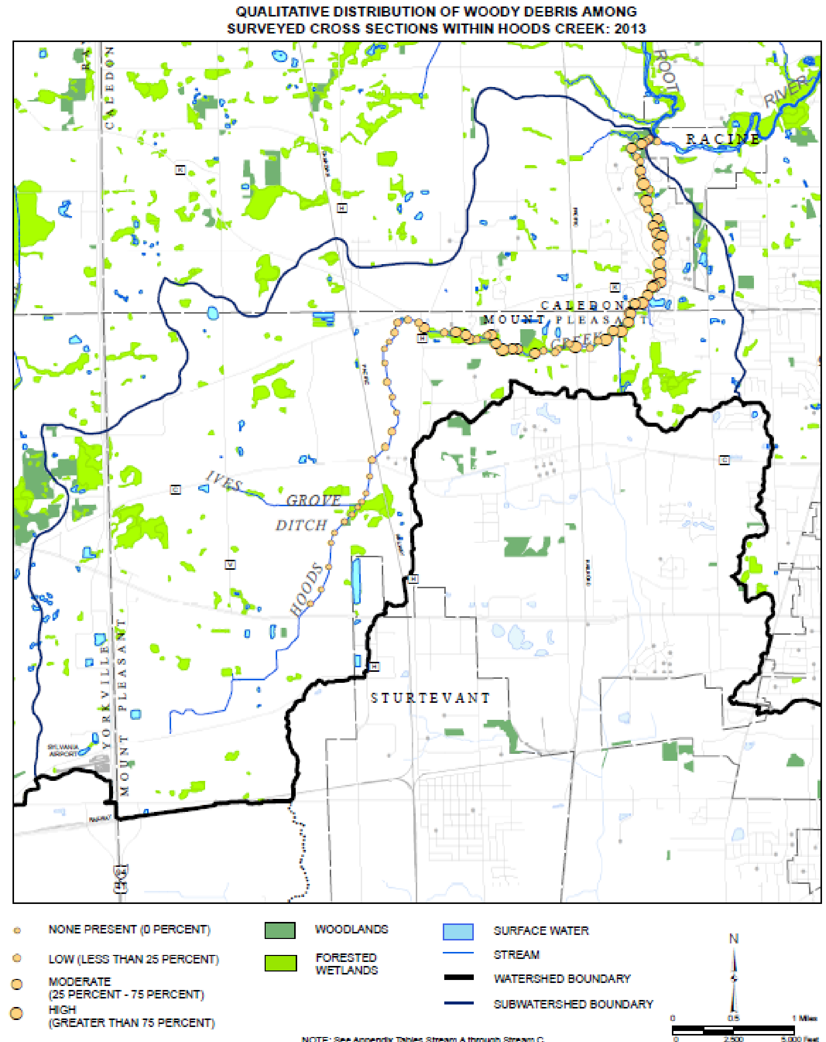
Source: SEWRPC.

Map IV-
Habitat Conditions-3

QUALITATIVE DISTRIBUTION OF WOODY DEBRIS AMONG SURVEYED CROSS SECTIONS WITHIN HOODS CREEK: 2013

Map IV-Habitat Conitions-3

QUALITATIVE DISTRIBUTION OF WOODY DEBRIS AMONG SURVEYED CROSS SECTIONS WITHIN HOODS CREEK: 2013



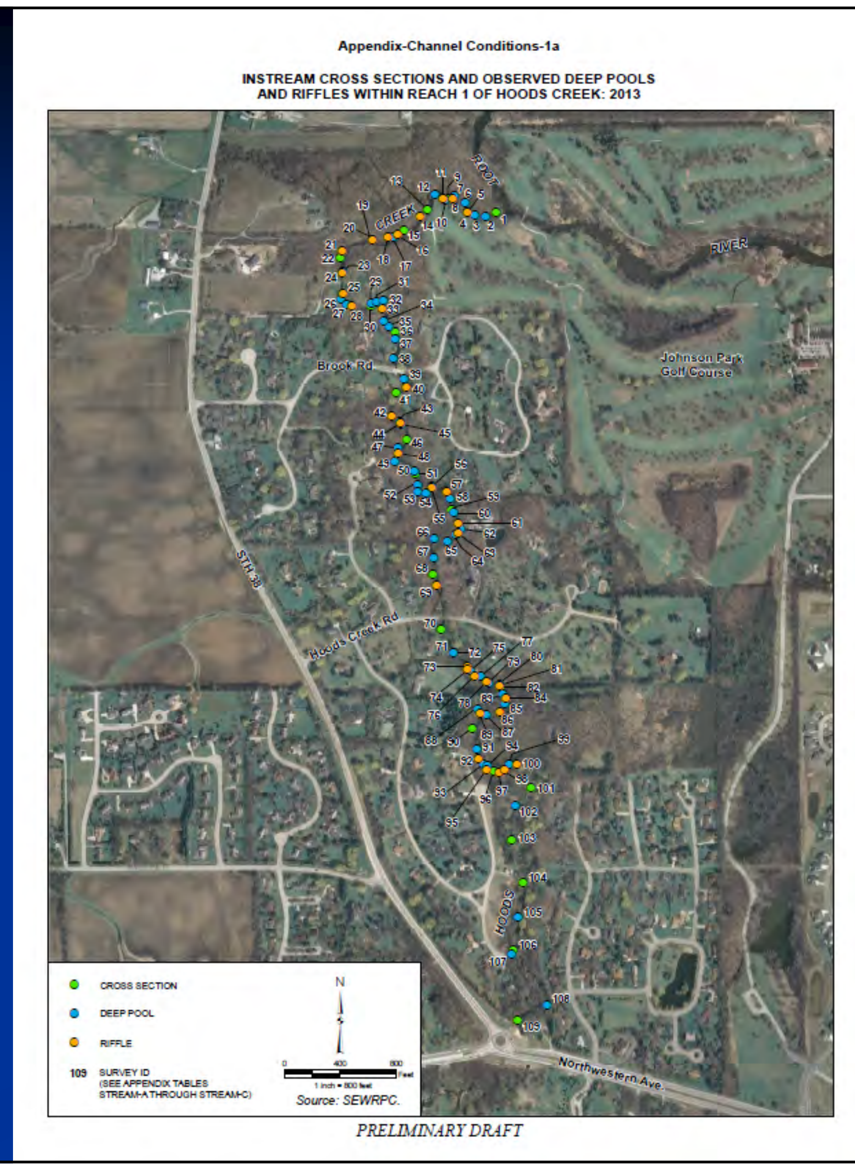
Source: SEWRPC.

NOTE: See Appendix Tables Stream A through Stream C for more details on instream habitat.

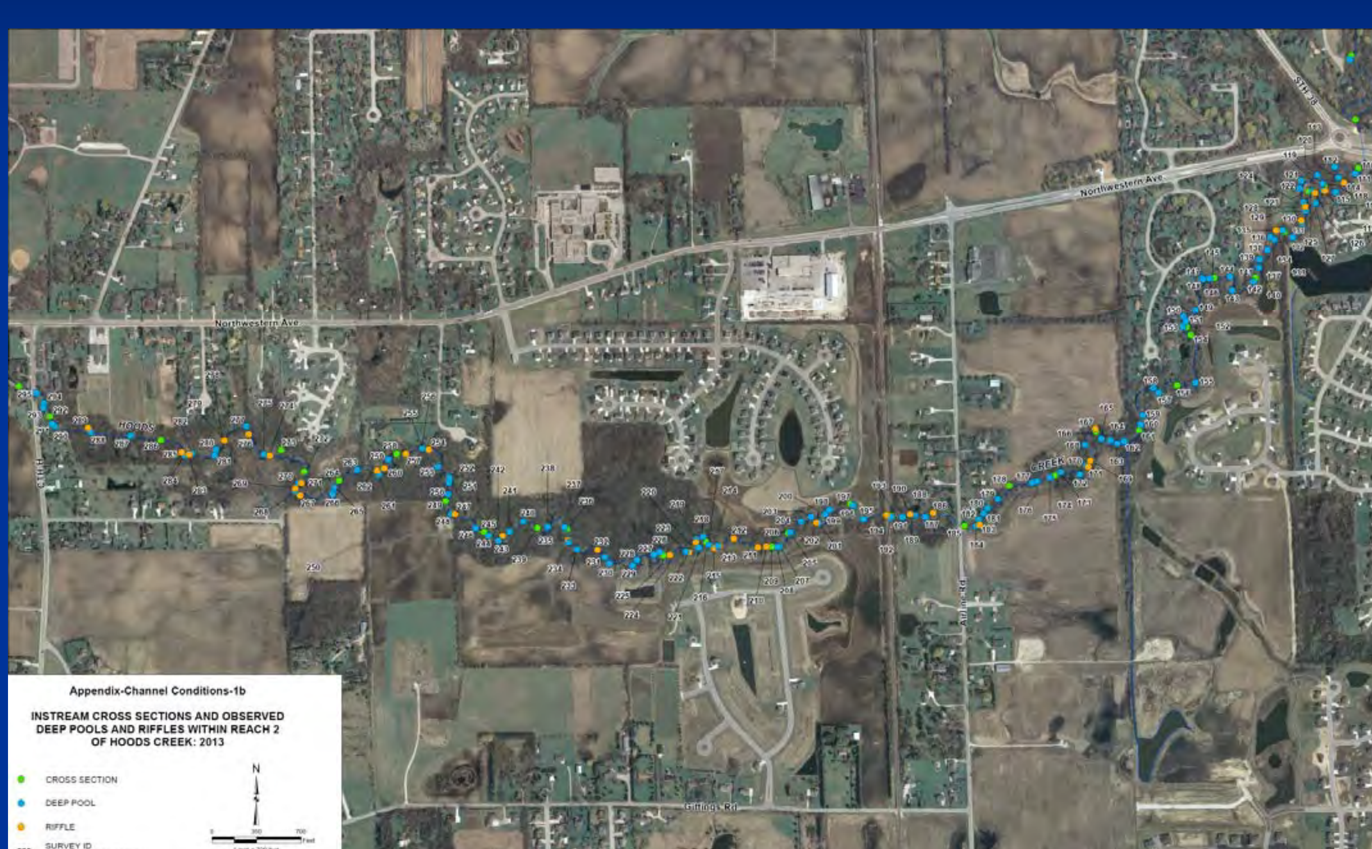
PRELIMINARY DRAFT

Appendix Map
Channel Conditions-Map 1a

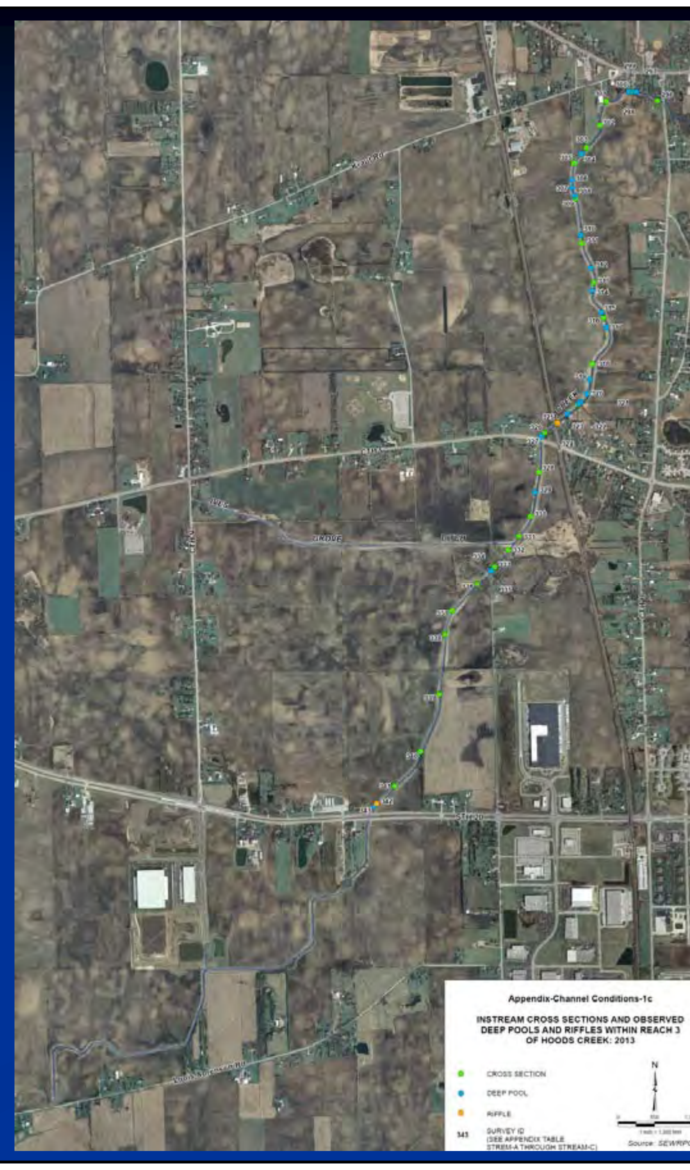
- Detailed view of cross sections, deep pools, and riffles within each stream reach.
- Survey ID corresponds to details of each cross section, pool, and riffle documented in Appendix Tables Stream-A through Stream-C



Appendix Map
Channel Conditions-Map 1b



Appendix Map
Channel Conditions-Map 1c



PRELIMINARY DRAFT

Appendix-Stream-A

QUANTITATIVE INSTREAM COVER CHARACTERISTICS AMONG HABITAT TYPES WITHIN THE ROOT RIVER WATERSHED: 2013

Reach	Survey ID[a] (see Maps 1a through 1c)	River Mile	Sample Date	Longitude[b]	Latitude[b]	Habitat Type	Water Velocity	Amount of Cover (rank)	Woody Debris (rank)	Macrophytes (rank)	Algae (rank)	Shading (rank)
Hoods Creek 1	1		4-Jun-13	2573543.7677	290090.4468	Riffle	Fast	1	1	0	1	2
Hoods Creek 1	2		4-Jun-13	2573466.5618	290060.9662	Deep Pool						
Hoods Creek 1	3		4-Jun-13	2573390.2952	290071.2660	Deep Pool						
Hoods Creek 1	4		4-Jun-13	2573335.1975	290091.8260	Riffle						
Hoods Creek 1	5		4-Jun-13	2573335.4144	290093.9094	Deep Pool						
Hoods Creek 1	6		4-Jun-13	2573320.8304	290159.6641	Deep Pool						
Hoods Creek 1	7		4-Jun-13	2573244.3385	290211.3038	Deep Pool						
Hoods Creek 1	8		4-Jun-13	2573229.2447	290191.4823	Riffle						
Hoods Creek 1	9		4-Jun-13	2573200.4321	290194.8698	Run	Moderate	2	1	0	1	3
Hoods Creek 1	10		4-Jun-13	2573177.1975	290186.1464	Deep Pool						
Hoods Creek 1	11		4-Jun-13	2573160.9476	290190.3754	Riffle						
Hoods Creek 1	12		4-Jun-13	2573105.5536	290221.6539	Deep Pool						
Hoods Creek 1	13		4-Jun-13	2573051.0252	290116.2682	Run	Moderate	2	1	0	0	1
Hoods Creek 1	14		4-Jun-13	2572998.1159	290063.6978	Riffle						
Hoods Creek 1	15		4-Jun-13	2572884.5725	289968.2915	Riffle	Moderate	1	2	1	0	3
Hoods Creek 1	16		4-Jun-13	2572839.8383	289934.9077	Riffle						
Hoods Creek 1	17		4-Jun-13	2572810.0175	289914.3425	Deep Pool						
Hoods Creek 1	18		4-Jun-13	2572771.5389	289918.0331	Riffle						
Hoods Creek 1	19		4-Jun-13	2572659.4085	289901.9629	Deep Pool						
Hoods Creek 1	20		4-Jun-13	2572659.4085	289901.9629	Riffle						
Hoods Creek 1	21		4-Jun-13	2572442.7190	289816.7239	Riffle						
Hoods Creek 1	22		4-Jun-13	2572428.7623	289771.7827	Run	Moderate	2	2	0	1	3
Hoods Creek 1	23		6-Jun-13	2572449.1343	289675.9227	Deep Pool						
Hoods Creek 1	24		6-Jun-13	2572440.9585	289664.6212	Riffle						
Hoods Creek 1	25		6-Jun-13	2572448.8883	289517.4108	Riffle						
Hoods Creek 1	26		6-Jun-13	2572435.7508	289480.9244	Deep Pool						
Hoods Creek 1	27		6-Jun-13	2572476.2872	289439.9438	Deep Pool						
Hoods Creek 1	28		6-Jun-13	2572511.5607	289423.3969	Riffle						
Hoods Creek 1	29		6-Jun-13	2572651.4154	289450.5960	Deep Pool						
Hoods Creek 1	30		6-Jun-13	2572647.9643	289426.2142	Run	Slow	2	1	0	0	1
Hoods Creek 1	31		6-Jun-13	2572688.3245	289452.8549	Deep Pool						
Hoods Creek 1	32		6-Jun-13	2572735.9363	289461.8043	Deep Pool						
Hoods Creek 1	33		6-Jun-13	2572728.0055	289407.4826	Riffle						
Hoods Creek 1	34		6-Jun-13	2572738.3779	289315.3400	Deep Pool						
Hoods Creek 1	35		6-Jun-13	2572775.4254	289284.0488	Deep Pool						

NOTES: Color shades correspond to the following aquatic habitat types: Pool, Riffle, Run

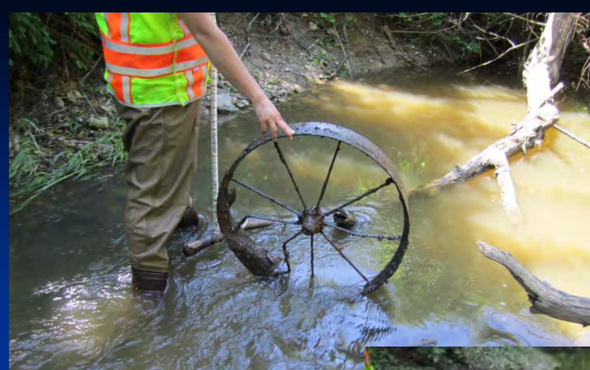
Variable rank numbers are defined as follows: 0 = None or Nearly Absent (< 5.0 percent), 1 = Low Abundance (5 to 25 percent), 2 = Moderate Abundance (25 to 75 percent), and 3 = High Abundance (greater than 75 percent).

[a] *Cross-section surveys were not conducted in every pool or riffle habitat location, however maximum pool depths and average depths across a riffle were recorded.*

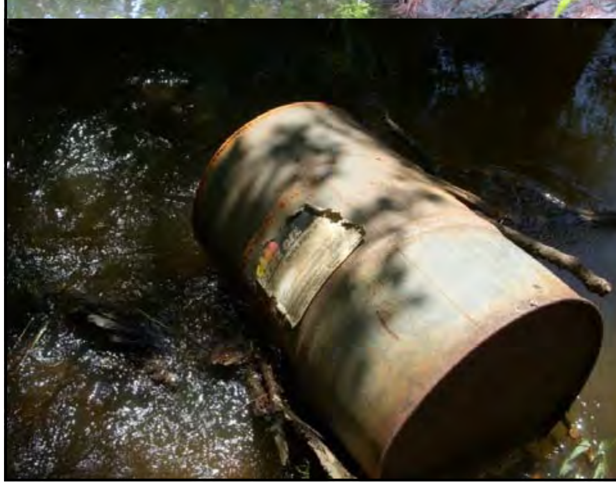
[b] *These coordinates are in North American Datum (NAD) 1927 State Plane Wisconsin South Federal Information Processing Standard (FIPS) 4803.*

Trash in Channel

- 22 large trash items
- 12 tires

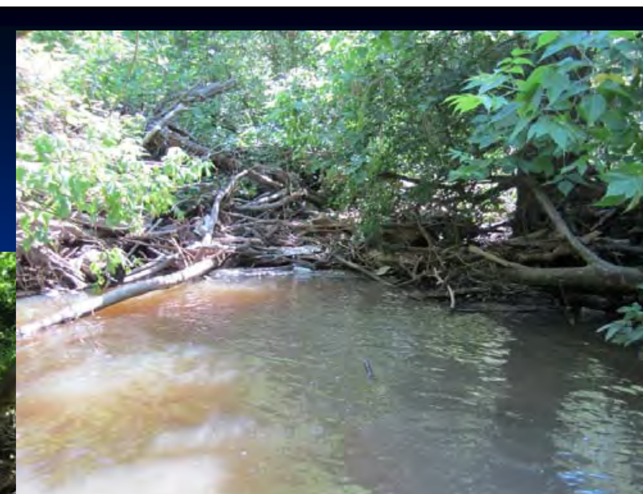
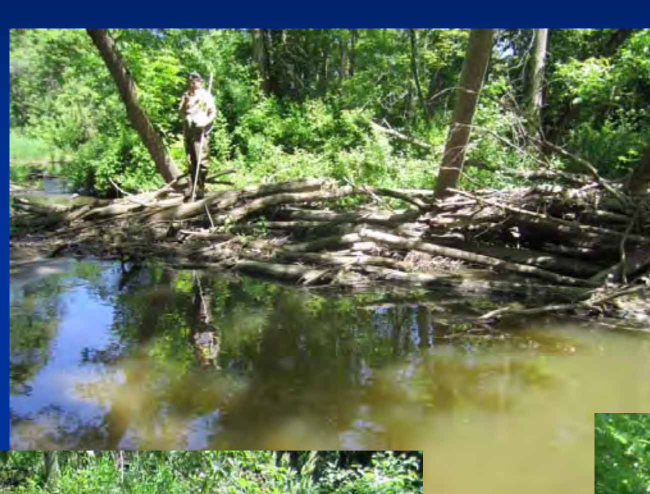
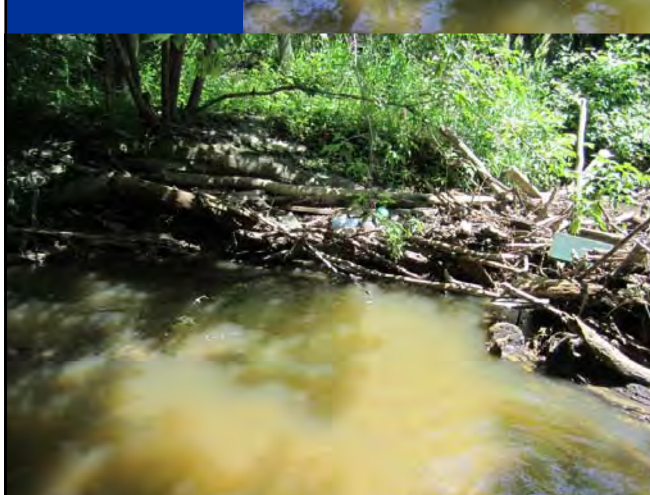
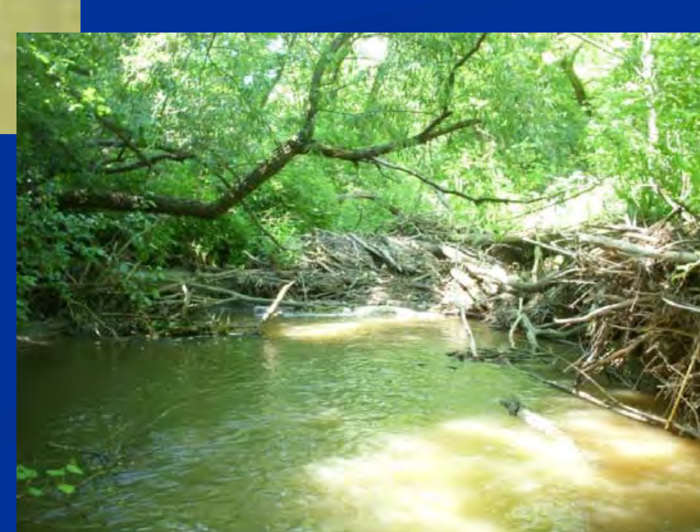




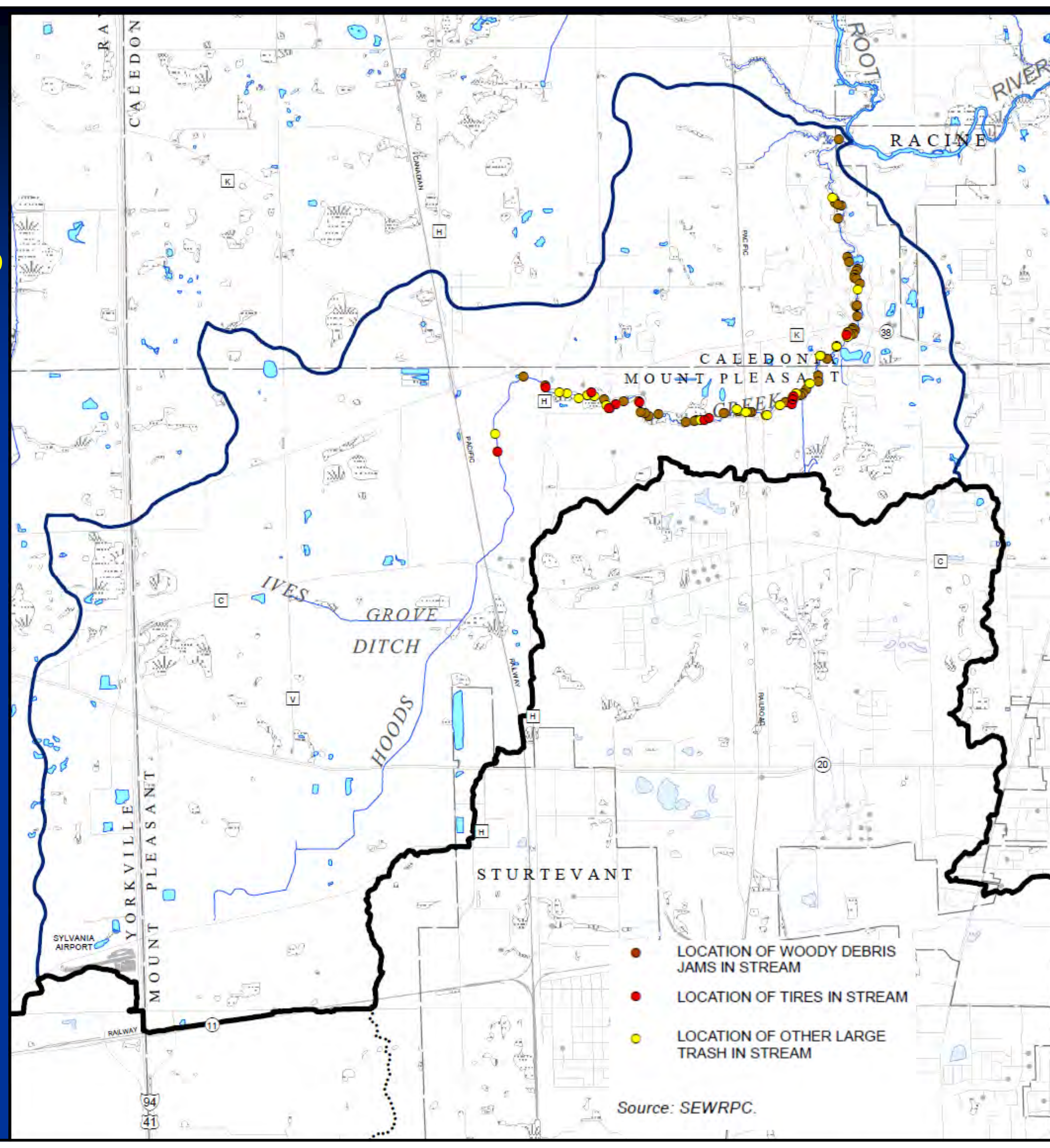
Woody Debris Jams

- 17 Reach 1
- 40 Reach 2
- 1 Reach 3

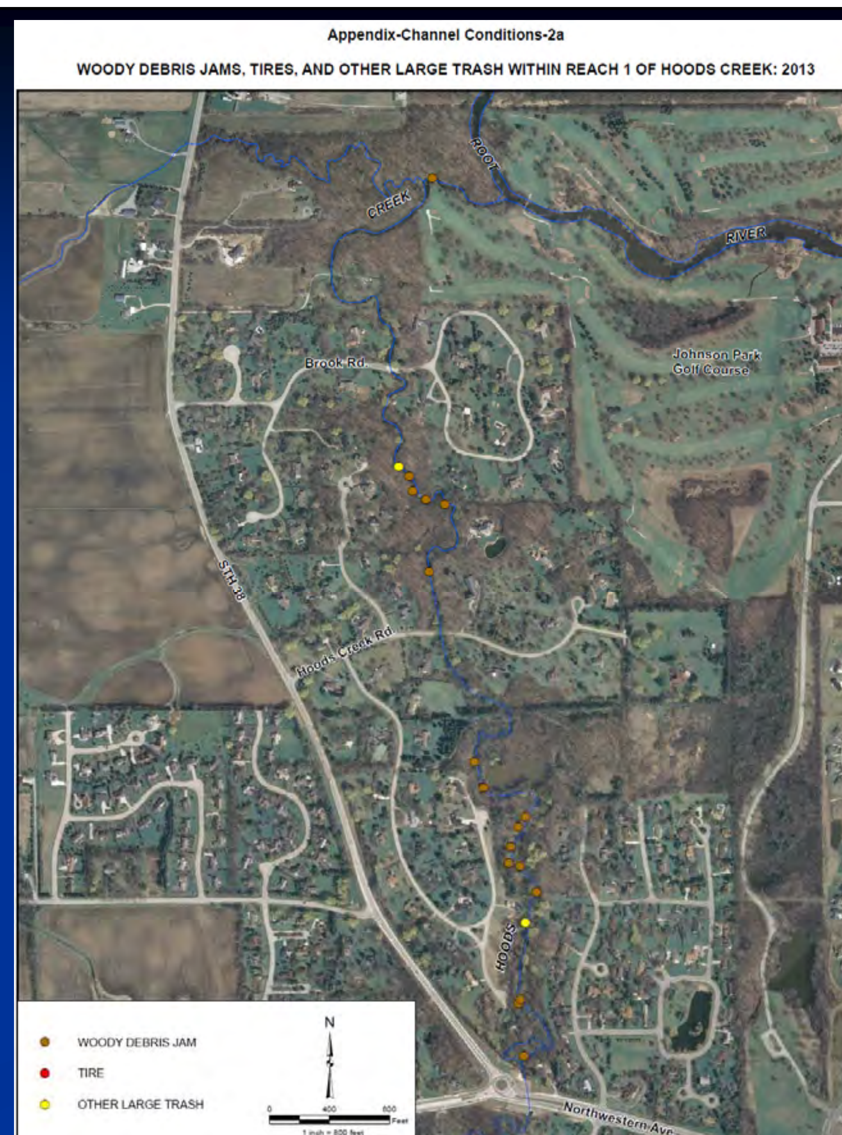
Map IV-
Channel Conditions-3

WOODY DEBRIS JAMS, TIRES, AND OTHER LARGE TRASH OBSERVED WITHIN THE HOODS CREEK CHANNEL



Appendix Map
Channel Conditions-Map 2a

- 17 woody debris jams
- 2 large trash items

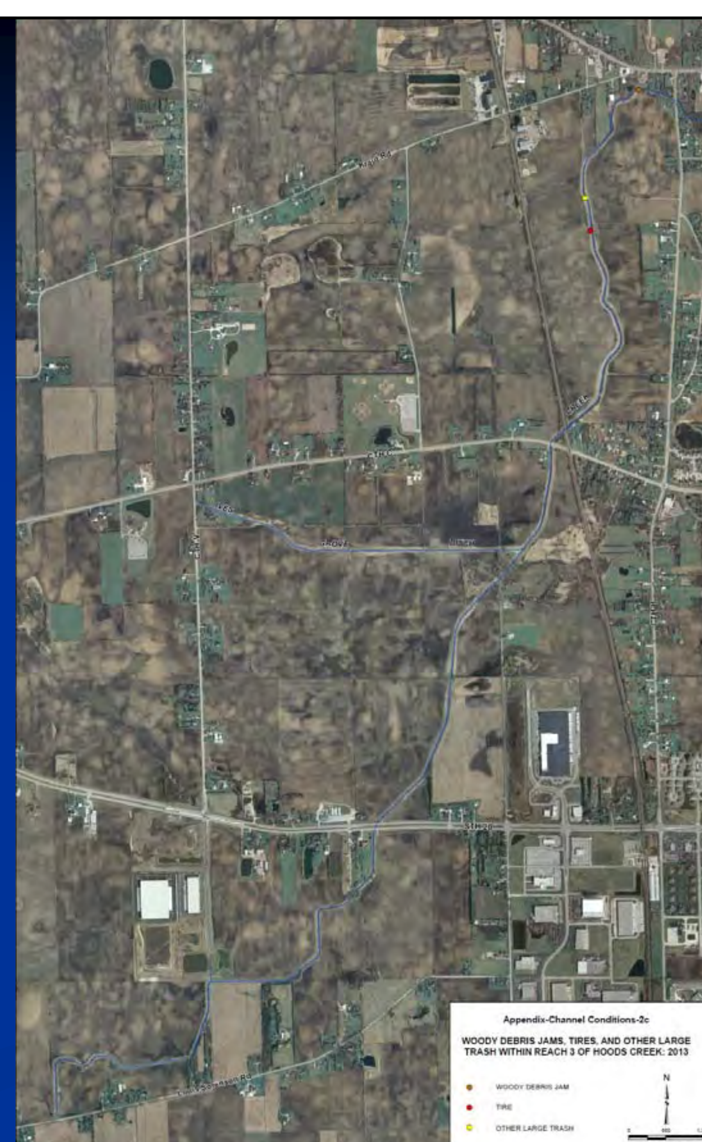


Appendix Map
Channel Conditions-Map 2b

- 40 woody debris jams
- 11 tires
- 19 other large trash items

Appendix Map
Channel Conditions-Map 2c

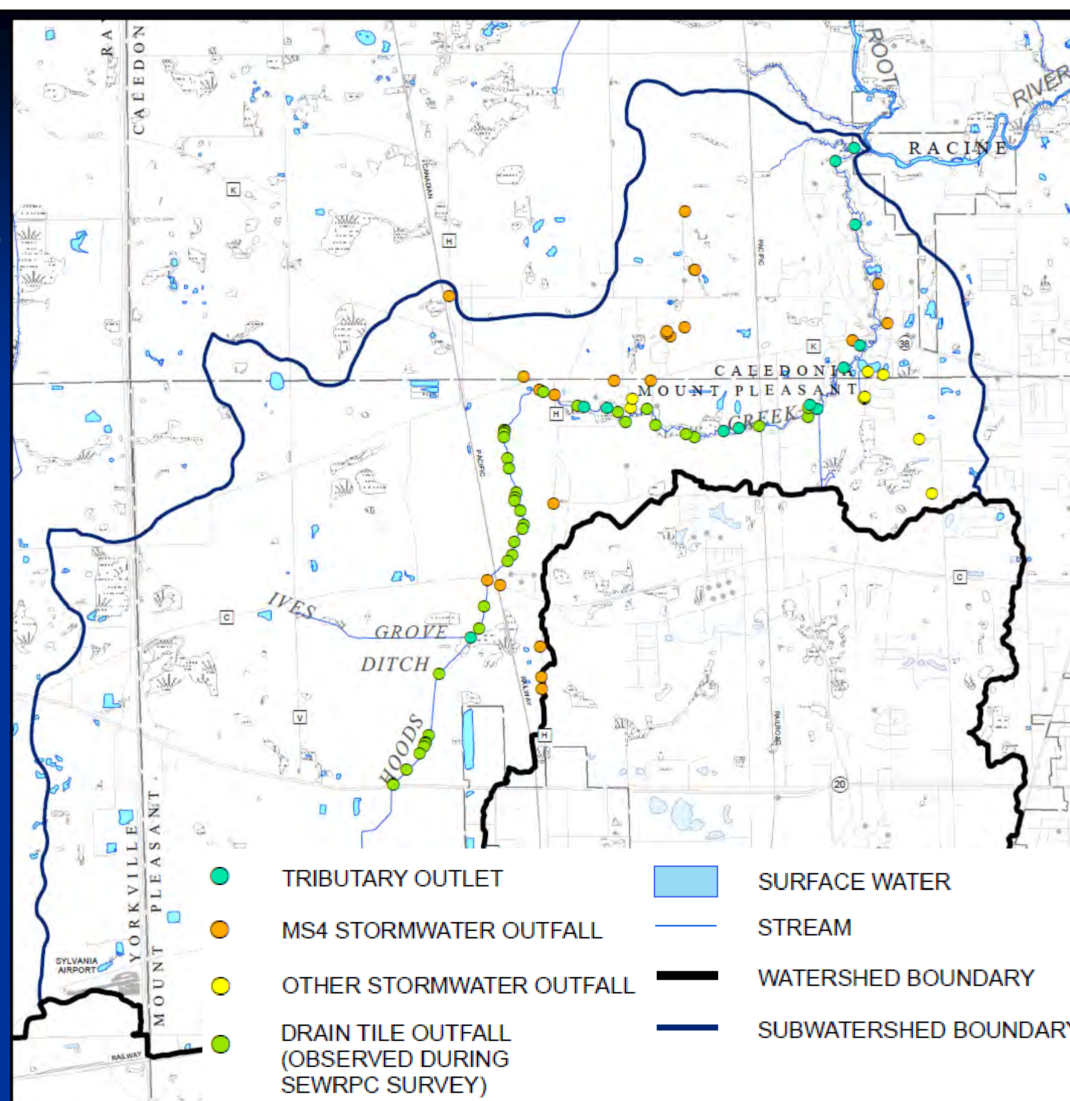
- 1 woody debris jam
- 1 large trash item



Hoods Creek Outfalls

Map IV-
Channel Conditions-5

TRIBUTARY OUTLETS, STORMWATER OUTFALLS, AND DRAIN TILE OUTFALLS WITHIN THE HOODS CREEK SUBWATERSHED



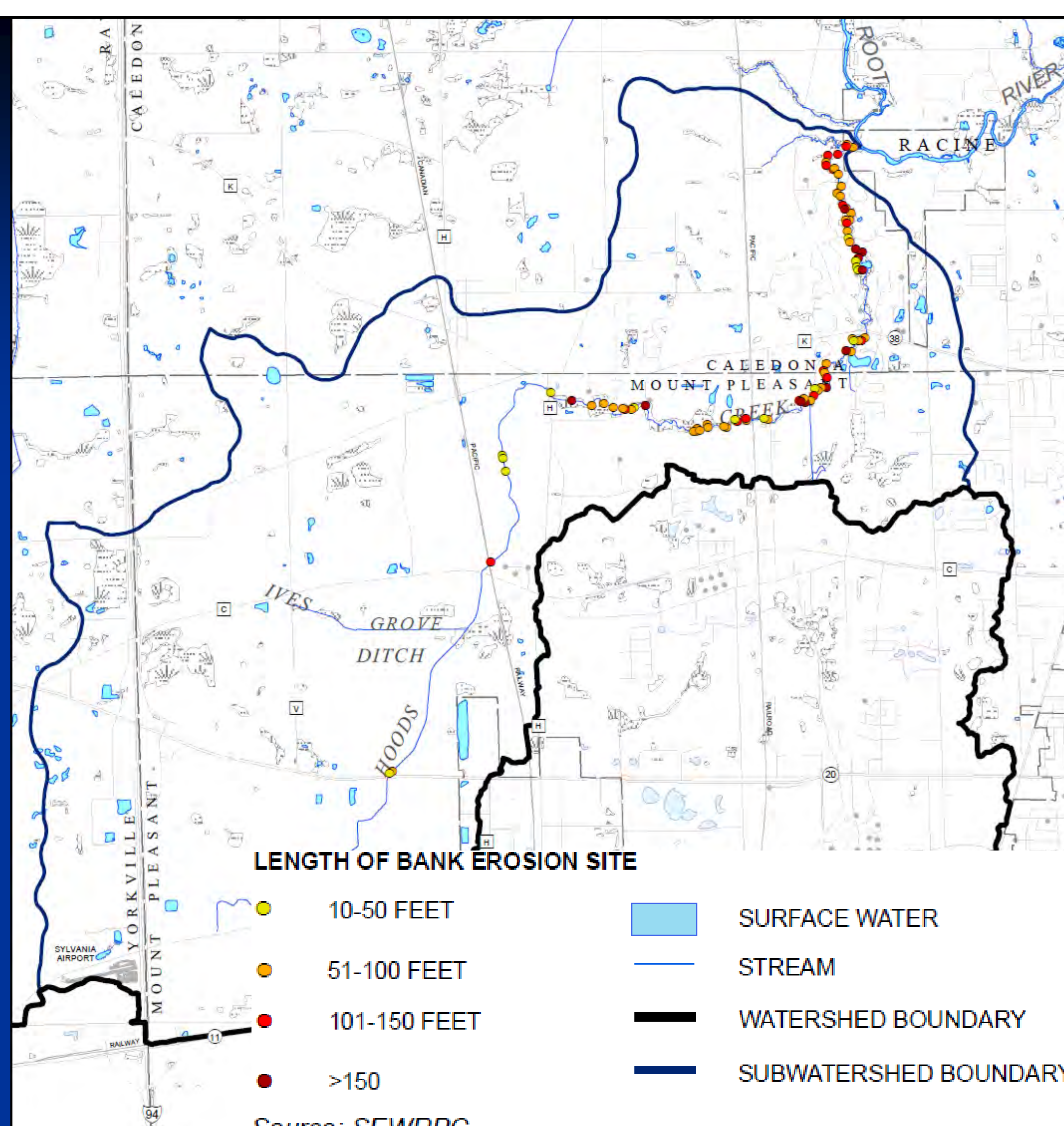
Source: SEWRPC.

Hoods Creek Erosion

Map IV-
Channel Conditions-4

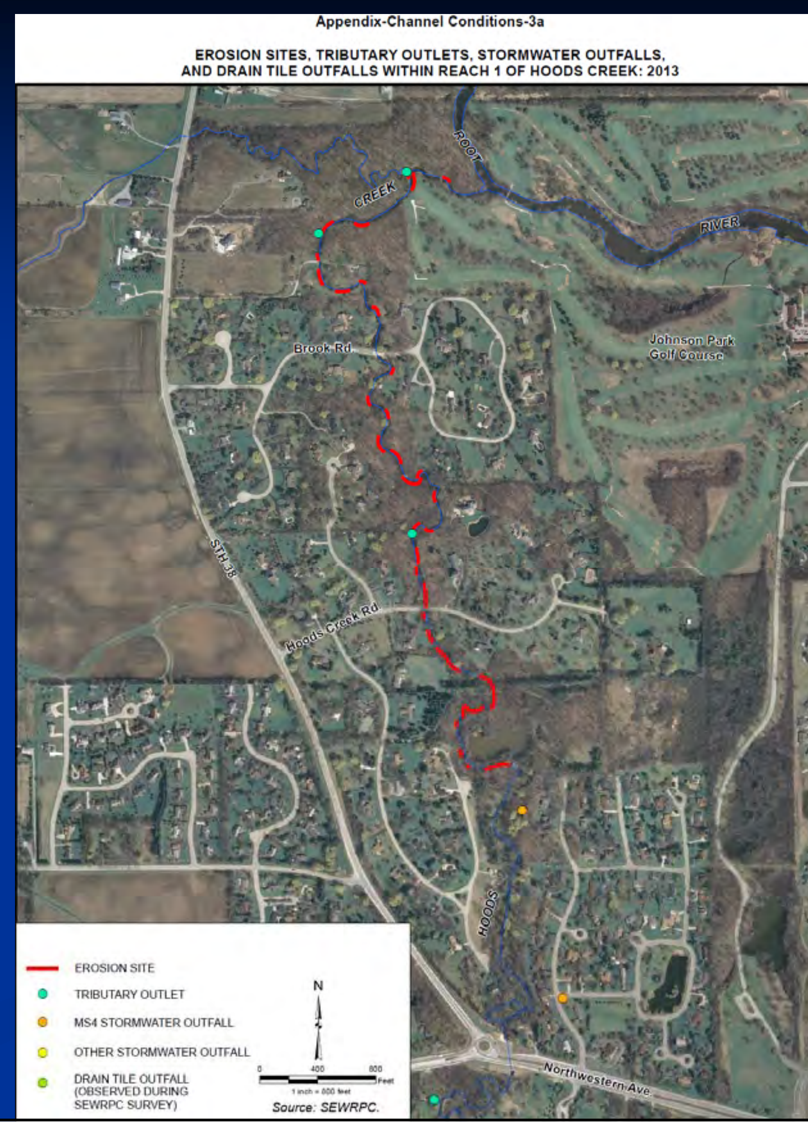
BANK EROSION SITES ALONG HOODS CREEK

- Color coded by length of erosion site



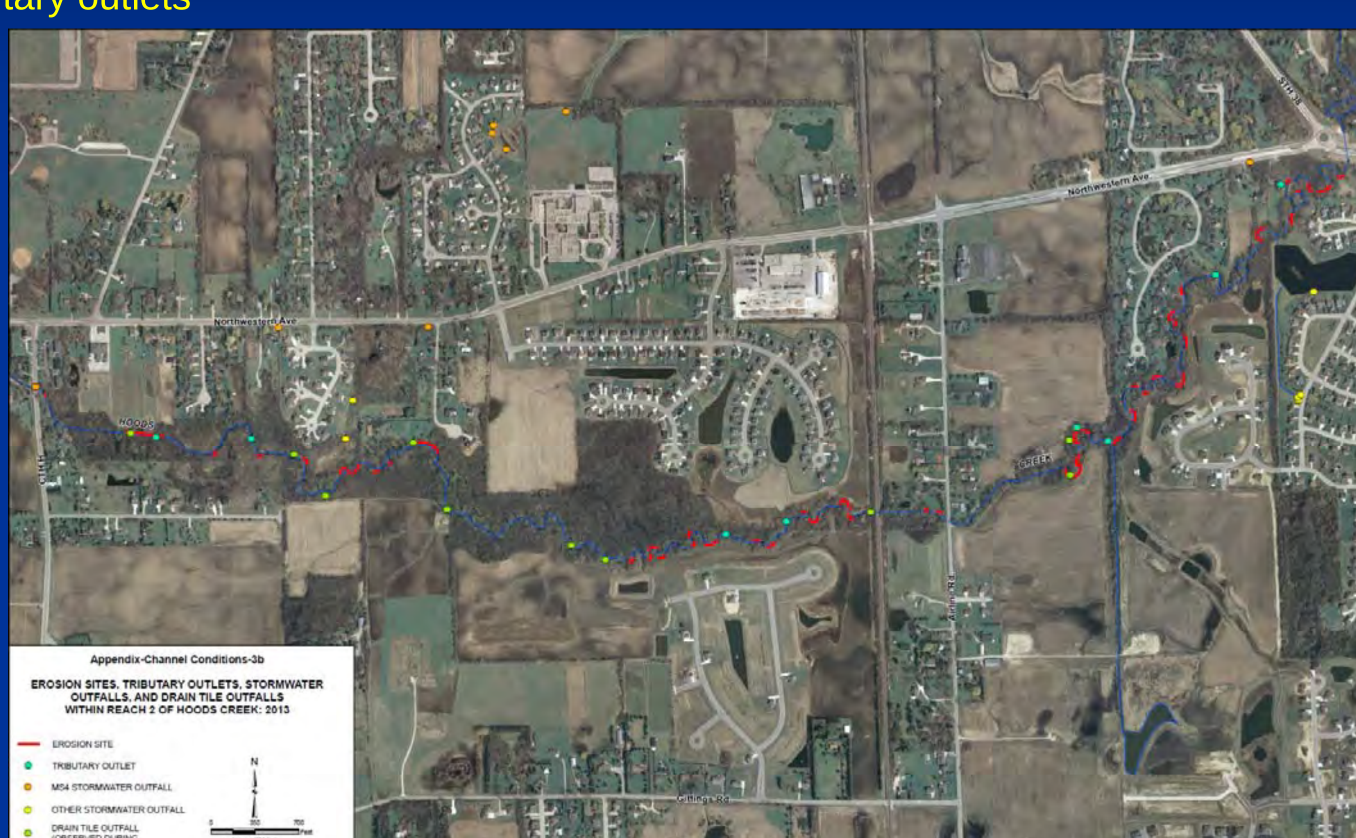
Appendix Map
Channel Conditions-Map 3a

- Combines tributary outlets, stormwater outfalls, drain tile outfalls, along with erosion line features.
- Show length of bank erosion and possible association with outfalls.
- 31 erosion within Reach 1
- 3 tributary outlets



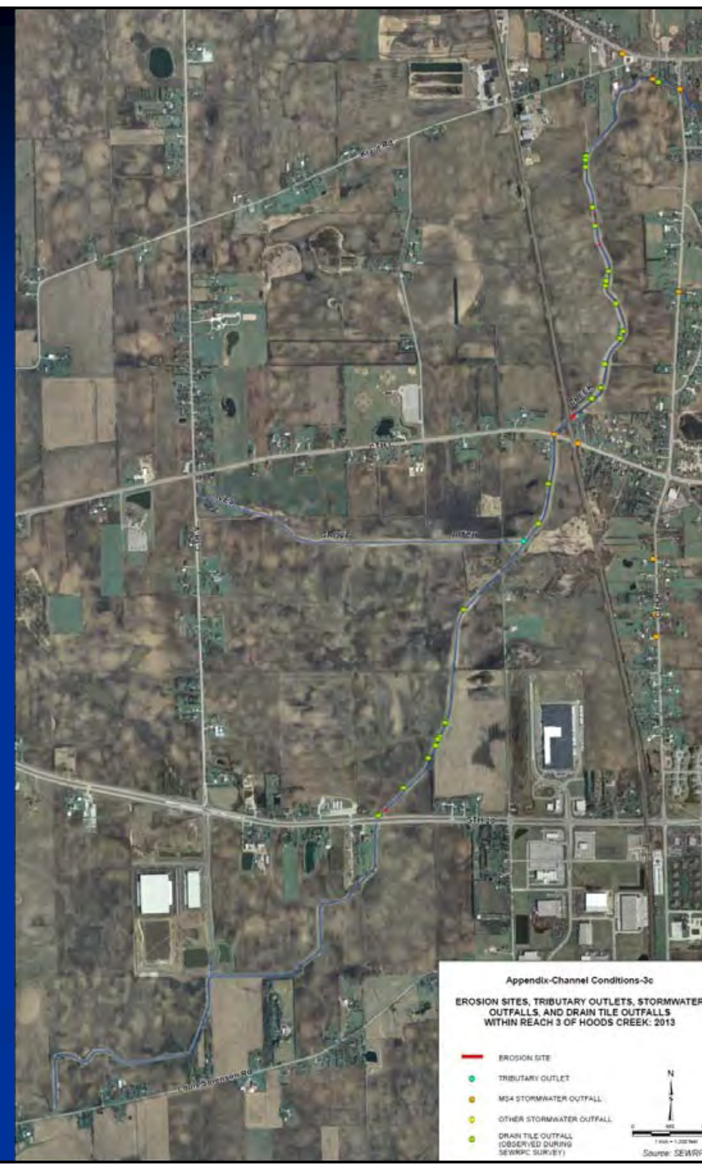
Appendix Map
Channel Conditions-Map 3b

- 46 erosion sites
- 10 drain tile outfalls
- 8 tributary outlets

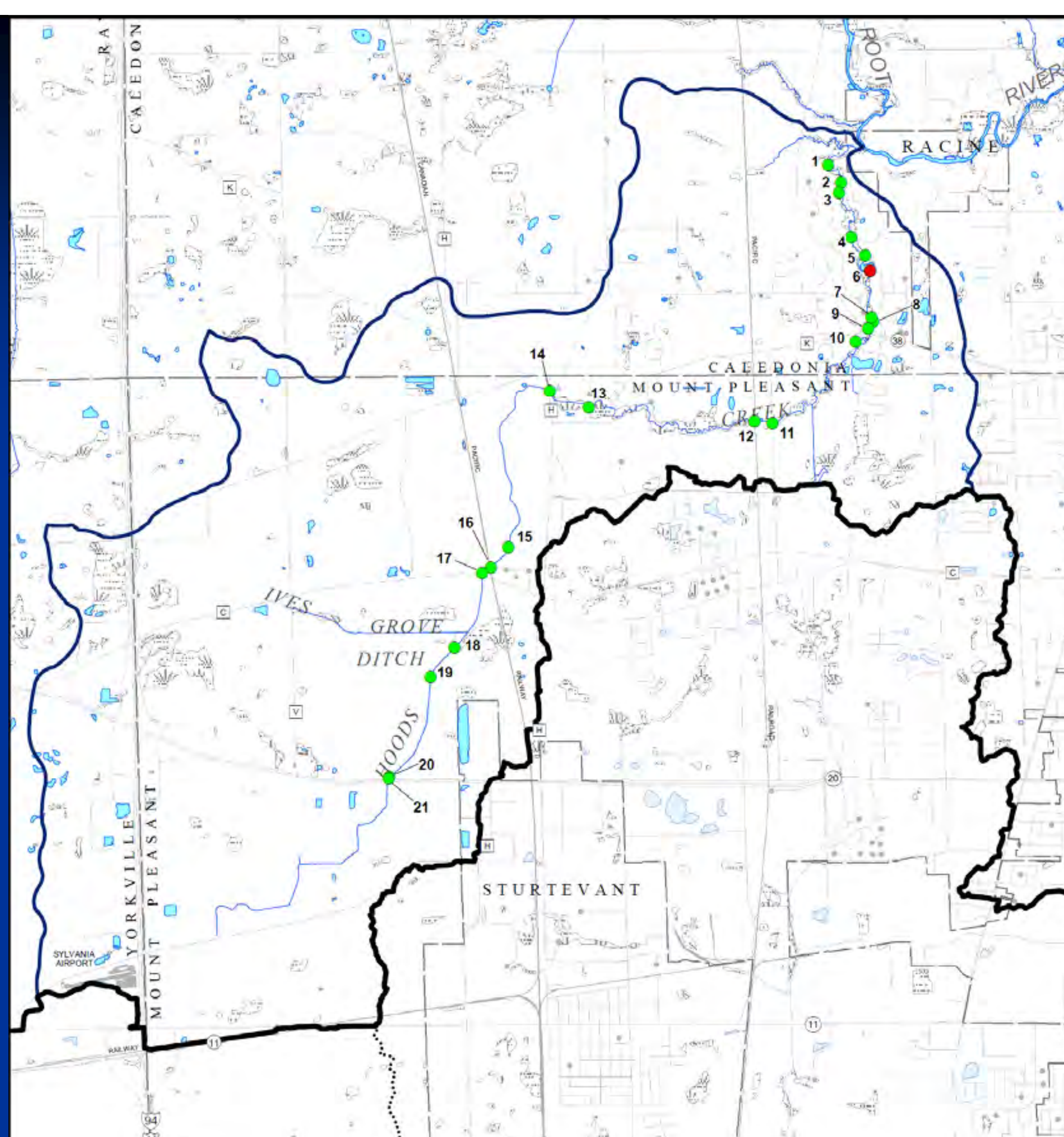


Appendix Map
Channel Conditions-Map 3c

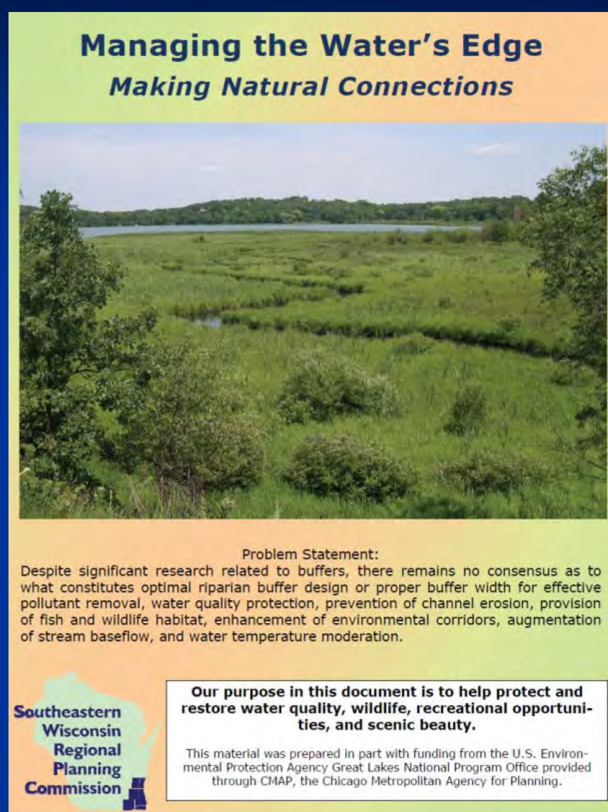
- 5 erosion sites
- 1 tributary outlet (Ives Grove Ditch)
- 27 drain tile outfalls



Stream Crossing & Dam Inventory



Riparian Buffer Series:


Managing the Water's Edge

Making Natural Connections

Problem Statement:

Despite significant research related to buffers, there remains no consensus as to what constitutes optimal riparian buffer design or proper buffer width for effective pollutant removal, water quality protection, prevention of channel erosion, provision of fish and wildlife habitat, enhancement of environmental corridors, augmentation of stream baseflow, and water temperature moderation.

Southeastern Wisconsin Regional Planning Commission

Our purpose in this document is to help protect and restore water quality, wildlife, recreational opportunities, and scenic beauty.

This material was prepared in part with funding from the U.S. Environmental Protection Agency Great Lakes National Program Office provided through CMAP, the Chicago Metropolitan Agency for Planning.

http://www.sewrpc.org/SEWRPCFiles/Environment/RecentPublications/ManagingtheWatersEdge-brochure.pdf

In prepration


Continuity along Stream Corridors

Making Natural Connections

Problem Statement:

"Balancing the needs of community development, economic growth, and transportation systems with equally important environmental and outdoor recreation needs can pose important challenges in stream corridors; fragmentation, or disconnections in the stream environment and associated habitat, degrades quality of life for both people and watershed systems."

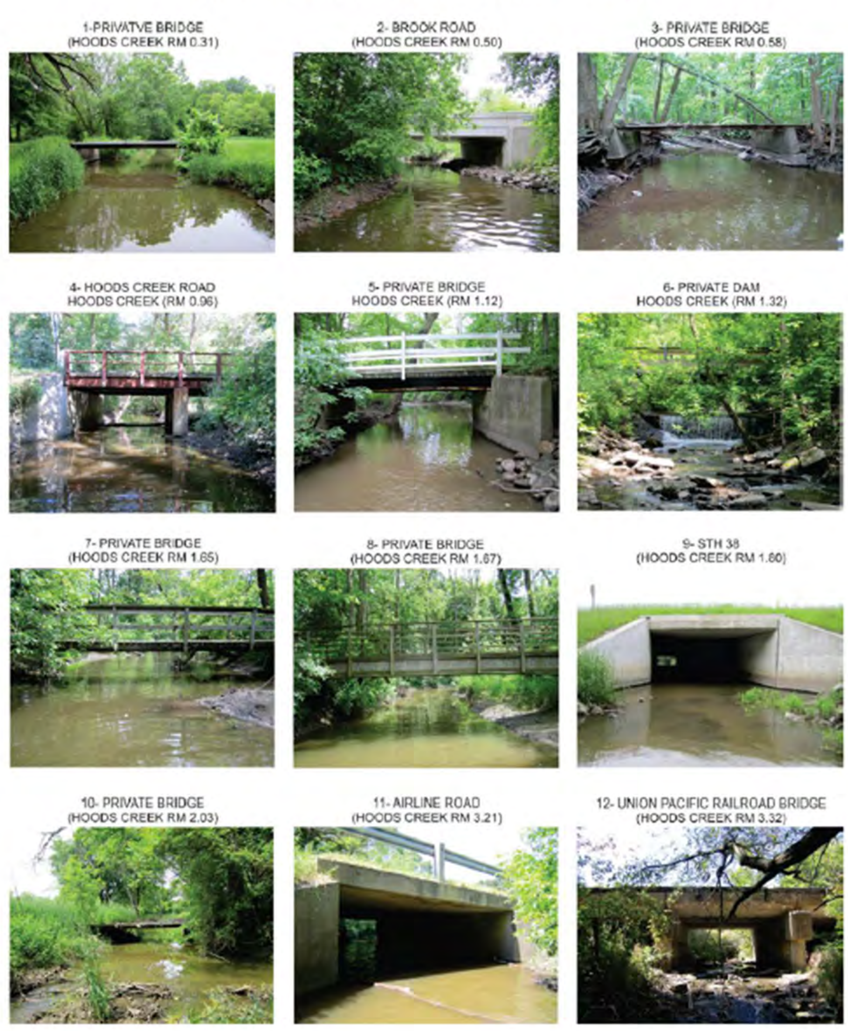
Southeastern Wisconsin Regional Planning Commission

Our purpose in this document is to highlight some concepts to address issues associated with stream crossings and their affects on water quality, water movement, fisheries passage, flooding, and riverside communities.

Preparation of this publication was funded in part by the U.S. Environmental Protection Agency, Great Lakes National Program Office, Lake Michigan Watershed Academy.

Figure IV-Channel Conditions-5

STREAM CROSSINGS AND DAMS ALONG HOODS CREEK: 2013



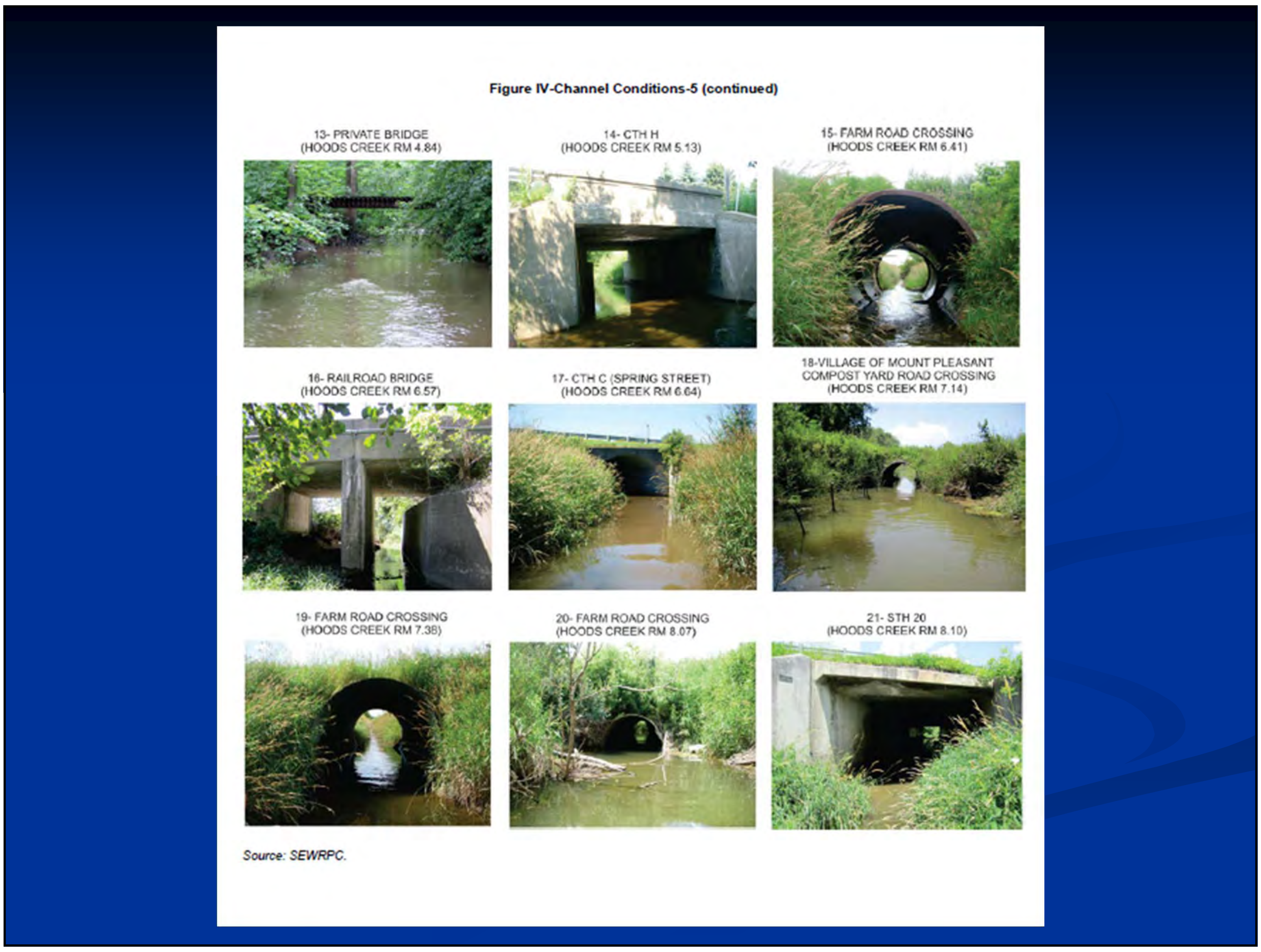


Figure IV-Channel Conditions-5 (continued)
13- PRIVATE BRIDGE (HOODS CREEK RM 4.84)
14- CTH H (HOODS CREEK RM 5.13)
15- FARM ROAD CROSSING (HOODS CREEK RM 6.41)
16- RAILROAD BRIDGE (HOODS CREEK RM 6.57)
17- CTH C (SPRING STREET) (HOODS CREEK RM 6.64)
18-VILLAGE OF MOUNT PLEASANT COMPOST YARD ROAD CROSSING (HOODS CREEK RM 7.14)
19- FARM ROAD CROSSING (HOODS CREEK RM 7.38)
20- FARM ROAD CROSSING (HOODS CREEK RM 8.07)
21- STH 20 (HOODS CREEK RM 8.10)
Source: SEWRPC.

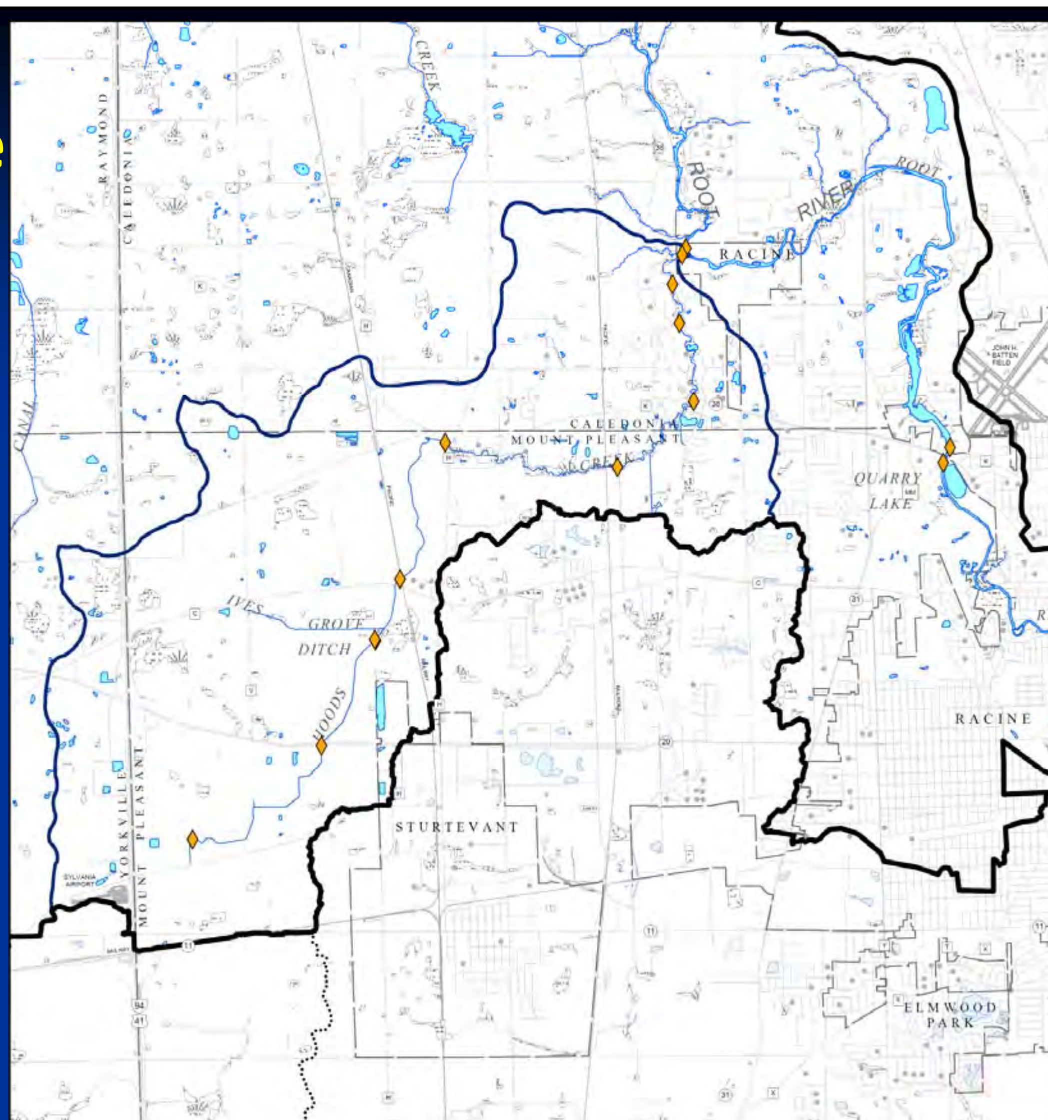

Fish passage issues?

Table 1. Criteria for determining passability of road crossings.

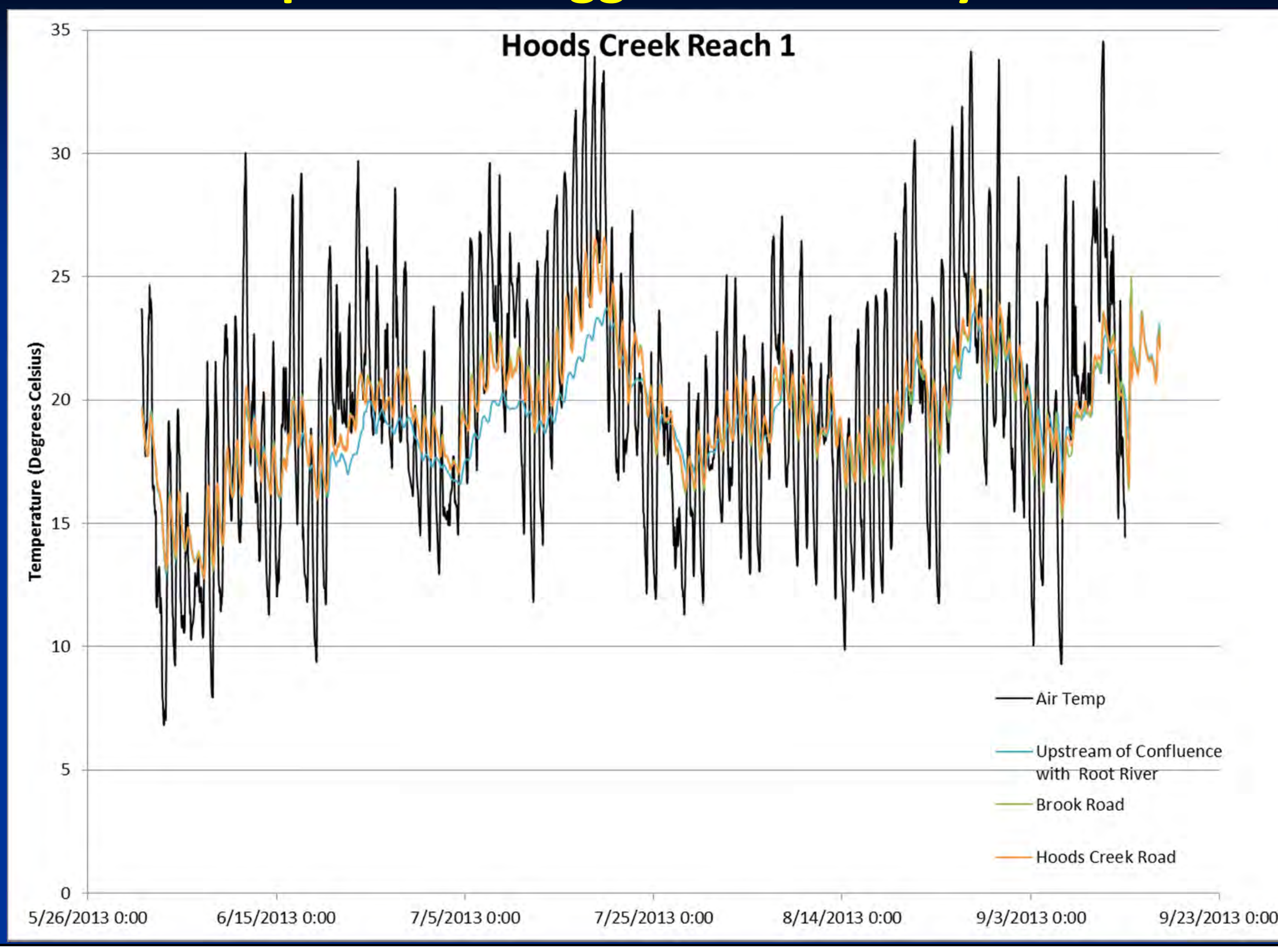
Passability = 0 (Most species and life stages cannot pass at most stream flows.) The outlet of the structure is perched, or The ratio of the structure water depth to the stream water depth is less than 0.1, or The water velocity in the structure is greater than 3 ft/s during baseflow.
Passability = 0.5 (Some species and/or life stages cannot pass at most stream flows.) The water depth in the structure is less than 0.2 feet, or The water velocity in the structure is 2-3 ft/s during baseflow, or The structure is longer than 30 ft and does not have natural substrate through its entire length.
Passability = 0.9 (Barrier at high flows.) The constriction ratio (structure width/bankfull stream width) is less than 0.5, or There is a scour pool below the structure.
Passability = 1 (No passage problem.) The outlet of the structure is not perched, and The water depth in the structure is greater than 0.2 feet, and The ratio of the structure water depth to the stream water depth is greater than 0.1, and The water velocity in the structure is less than 2 ft/s during baseflow, and The constriction ratio is greater than 0.5, and There is no scour pool below the structure, and The structure is longer than 30 feet and has natural substrate through its entire length, or The structure is shorter than 30 feet and may not have natural substrate through its entire length.

Source: Wisconsin Department of Natural Resources

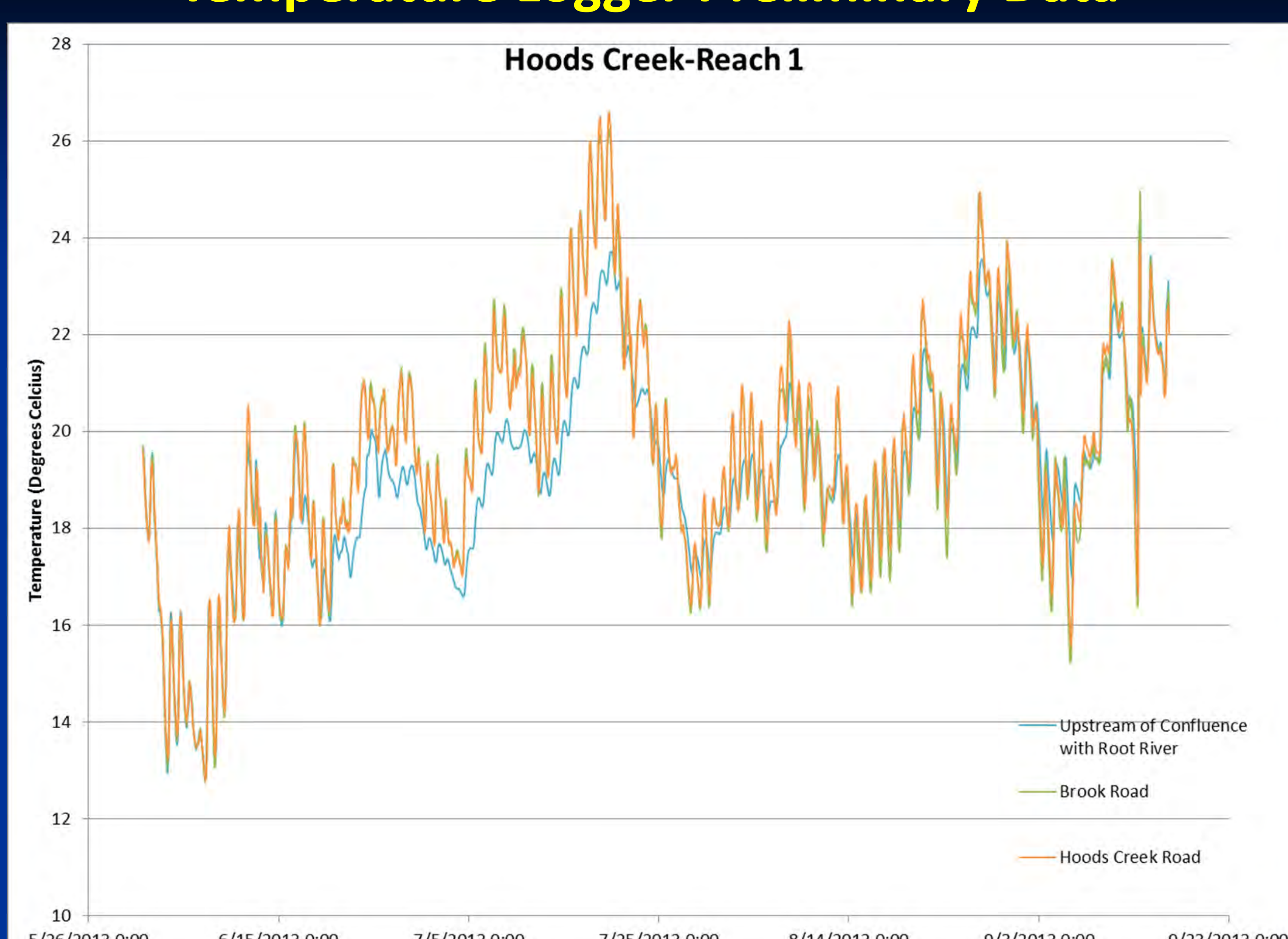
Temperature Logger Locations



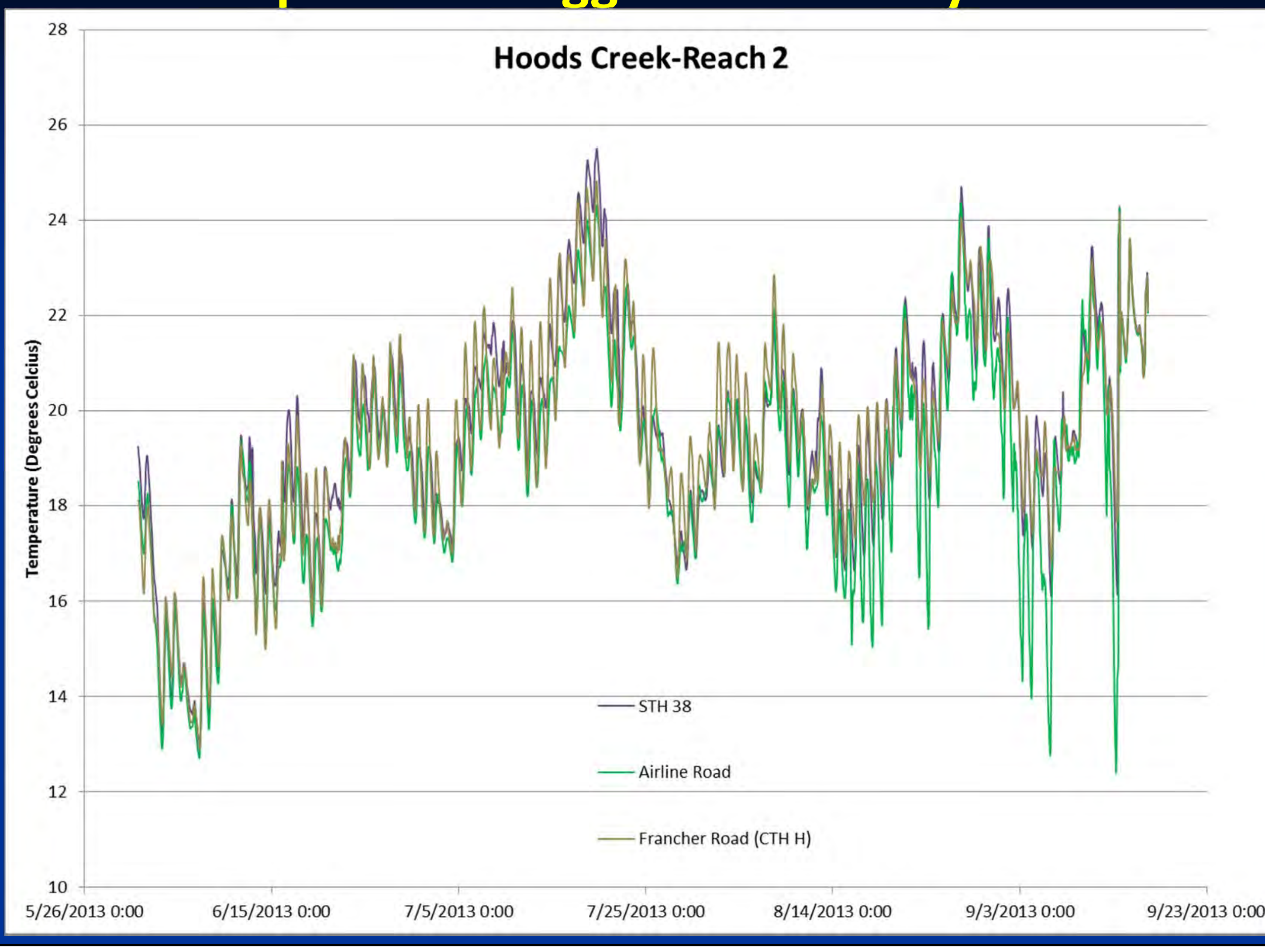
Temperature Logger Preliminary Data



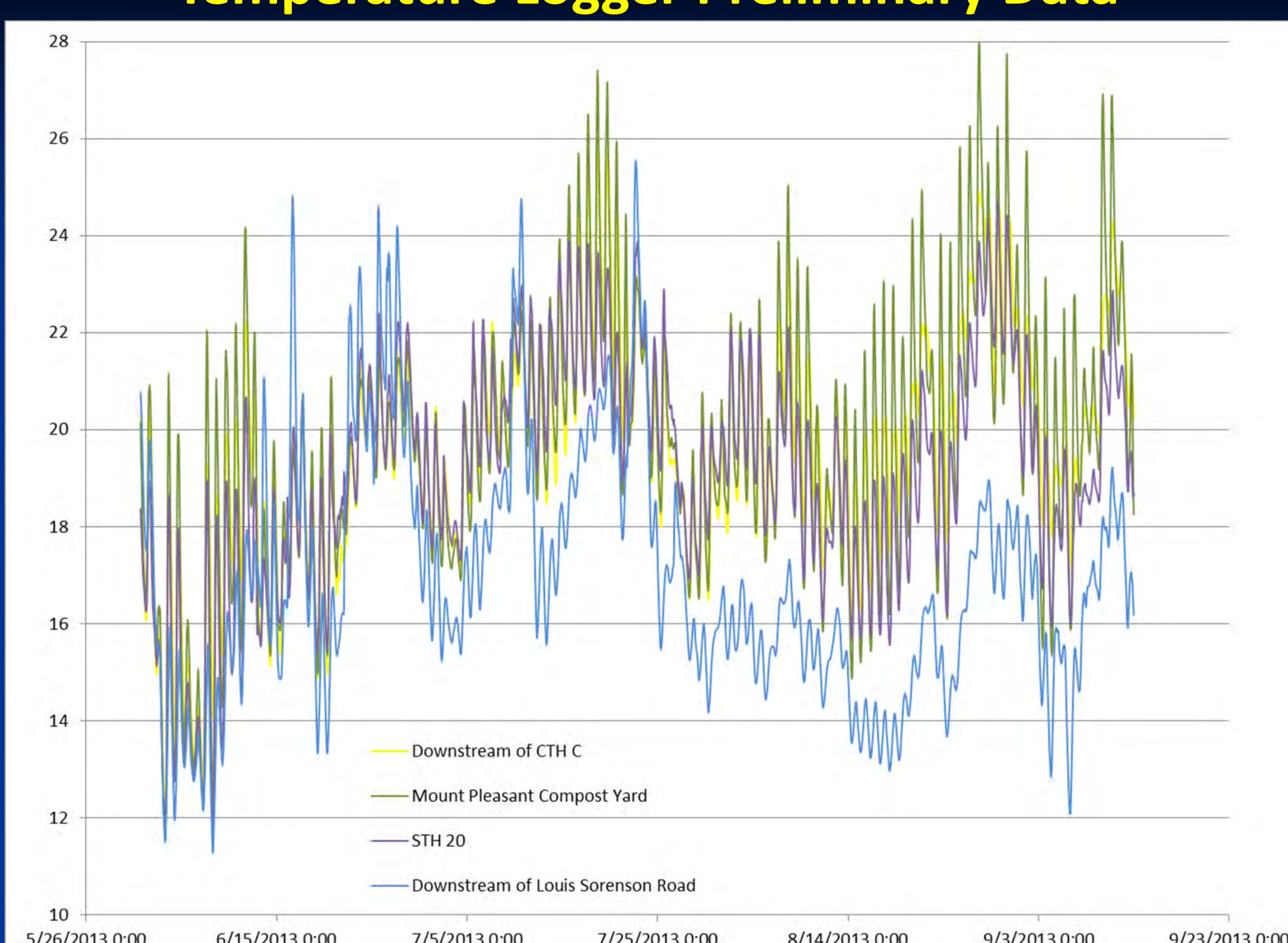
Temperature Logger Preliminary Data

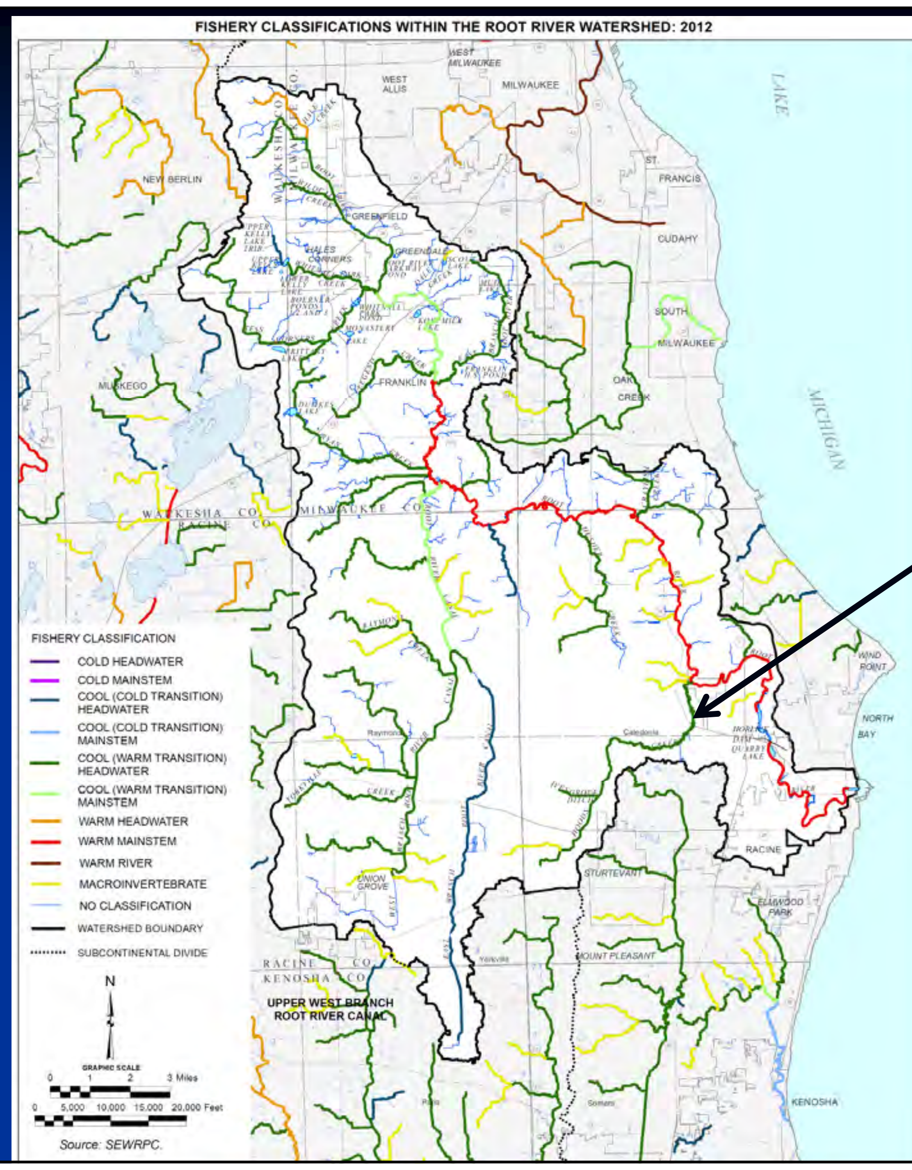


Temperature Logger Preliminary Data



Temperature Logger Preliminary Data



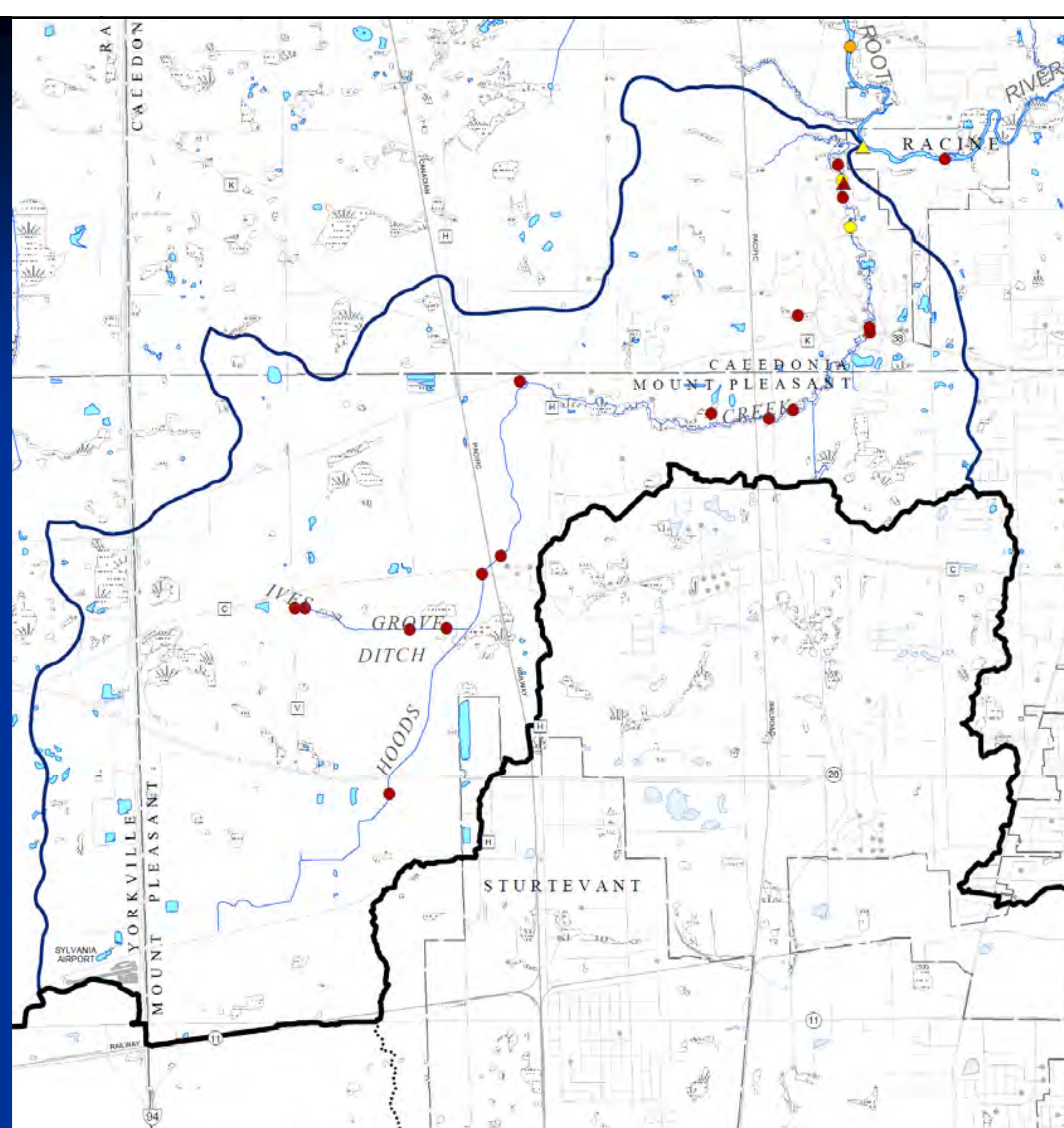


Hoods Creek

Cool (warm water transition) Headwater

Fisheries Conditions Within and Near the Hoods Creek Subwatershed

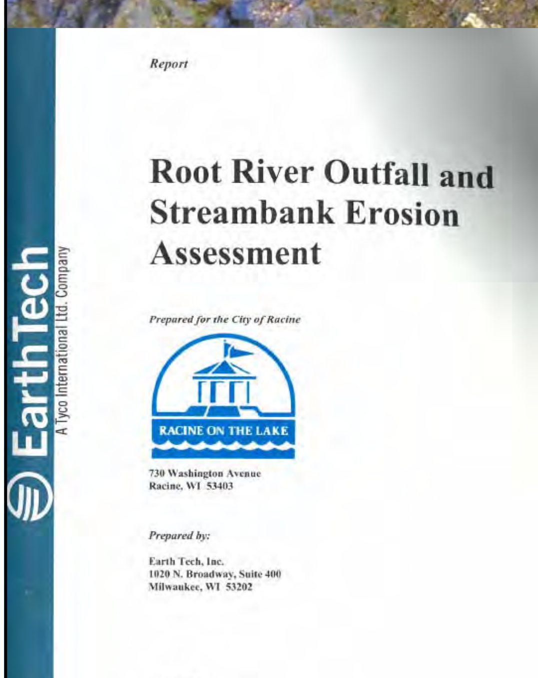
(as reported in TR-39)



Fisheries Conditions Within and Near the Hoods Creek Subwatershed
(as reported in TR-39)

Root River Mainstem Survey

Merging sets of physical data collected from several sources:


Report

Root River Outfall and Streambank Erosion Assessment

Prepared for the City of Racine

RACINE ON THE LAKE

730 Washington Avenue
Racine, WI 53403

Prepared by:

Earth Tech, Inc.
1020 N. Broadway, Suite 400
Milwaukee, WI 53202

January 2005

EarthTech
A tyco International Ltd. Company

KENOSHA·MILWAUKEE·OZAUKEE·RACINE·WALWORTH·WASHINGTON·WAUKESHA
SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

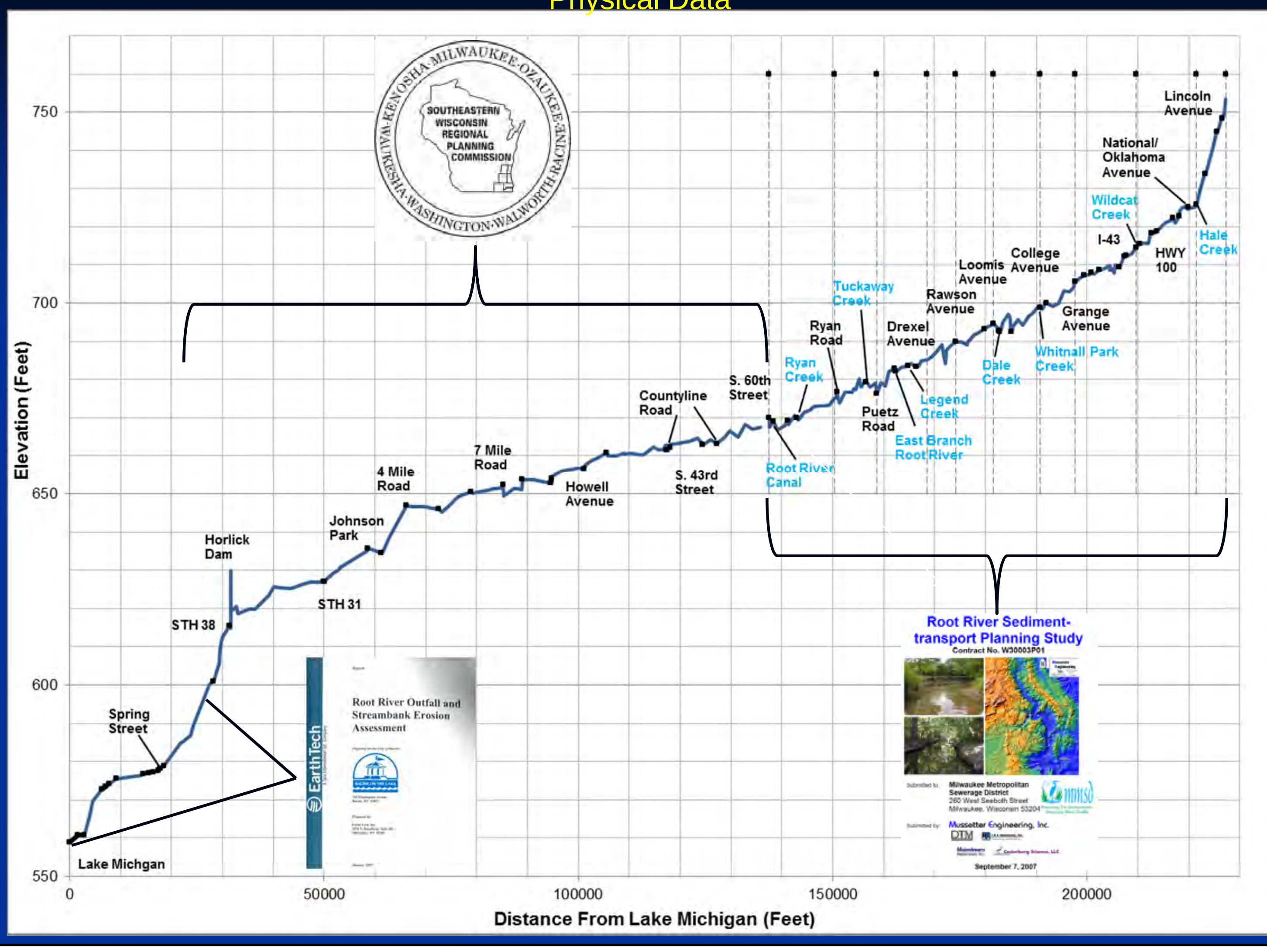

Root River Sediment-transport Planning Study
Contract No. W30003P01

Submitted to: Milwaukee Metropolitan Sewerage District
260 West Seeboth Street
Milwaukee, Wisconsin 53204

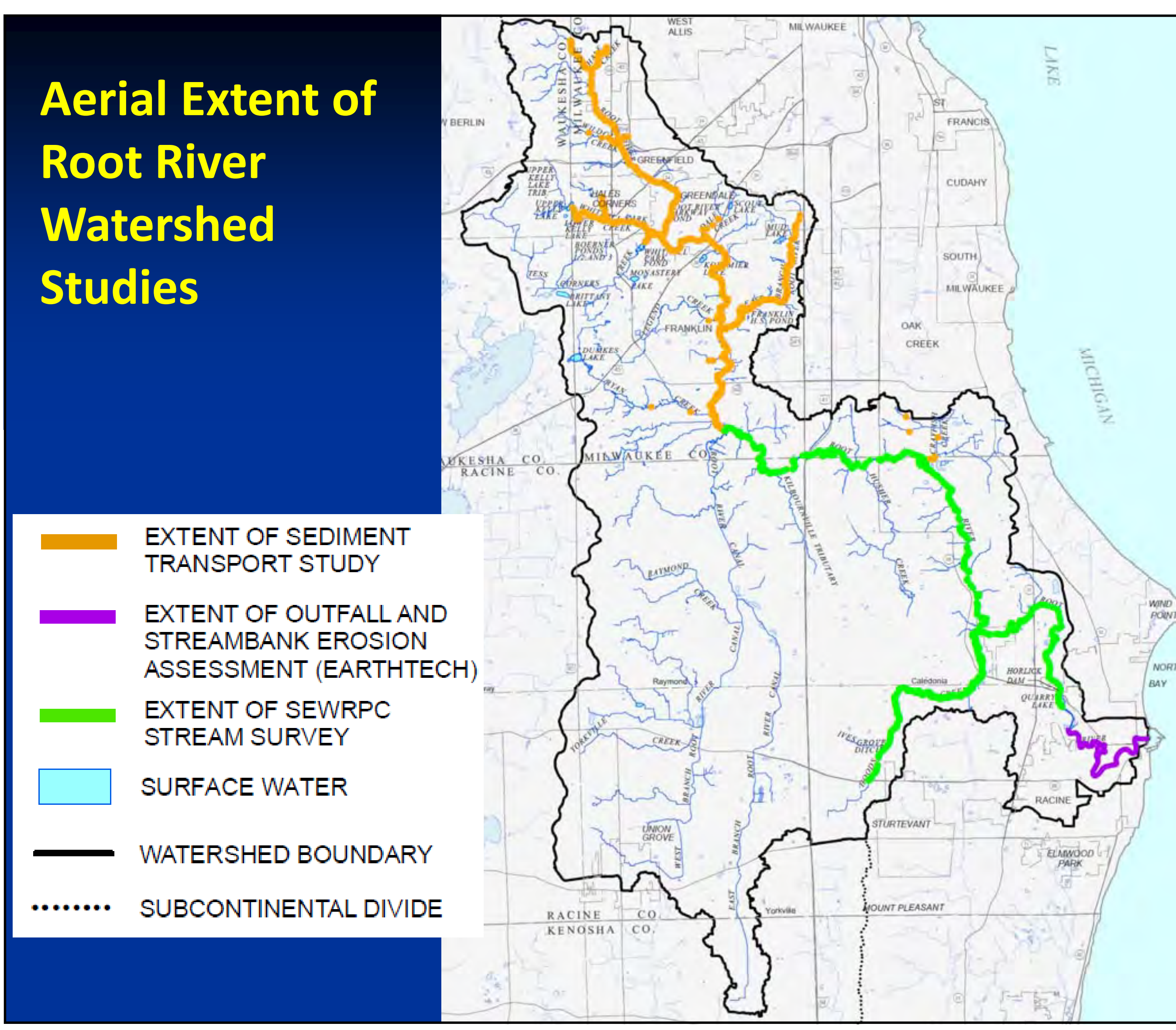
Submitted by: Mussetter Engineering, Inc.
DTM
Mainstream Restoration, Inc.
Cedarburg Science, LLC

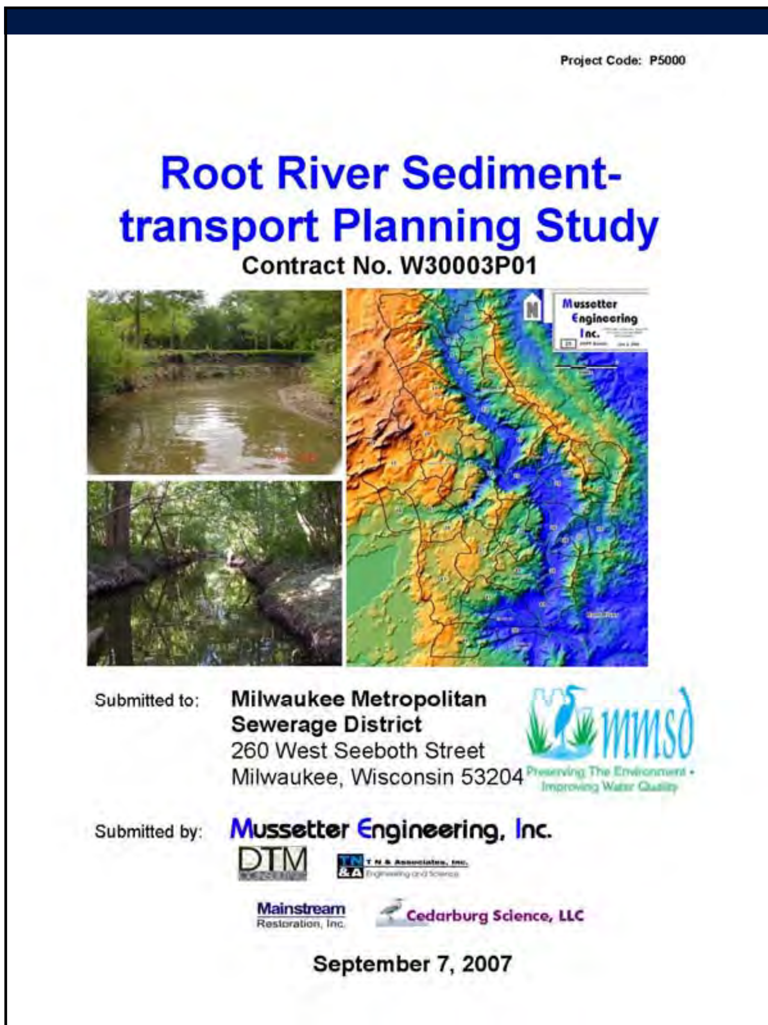
September 7, 2007

Approximate Channel Bottom Elevation Profile for the Root River Mainstem and Sources of Physical Data



Aerial Extent of Root River Watershed Studies

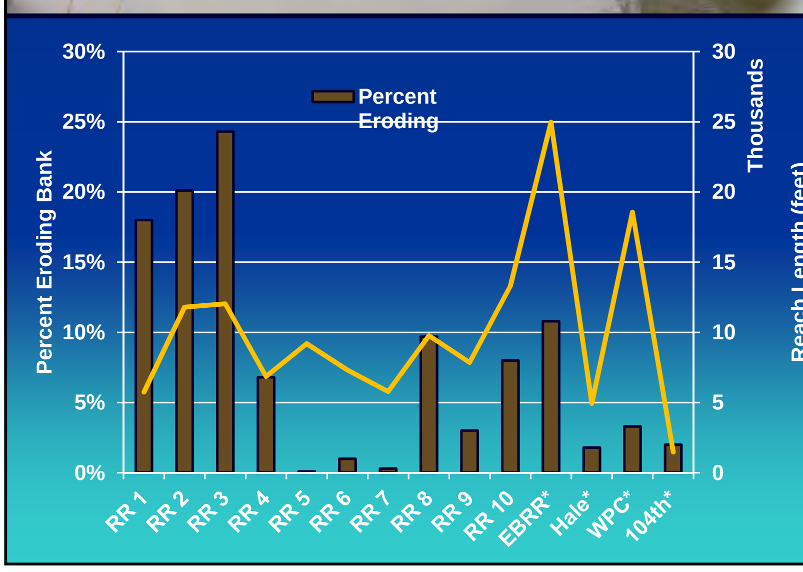


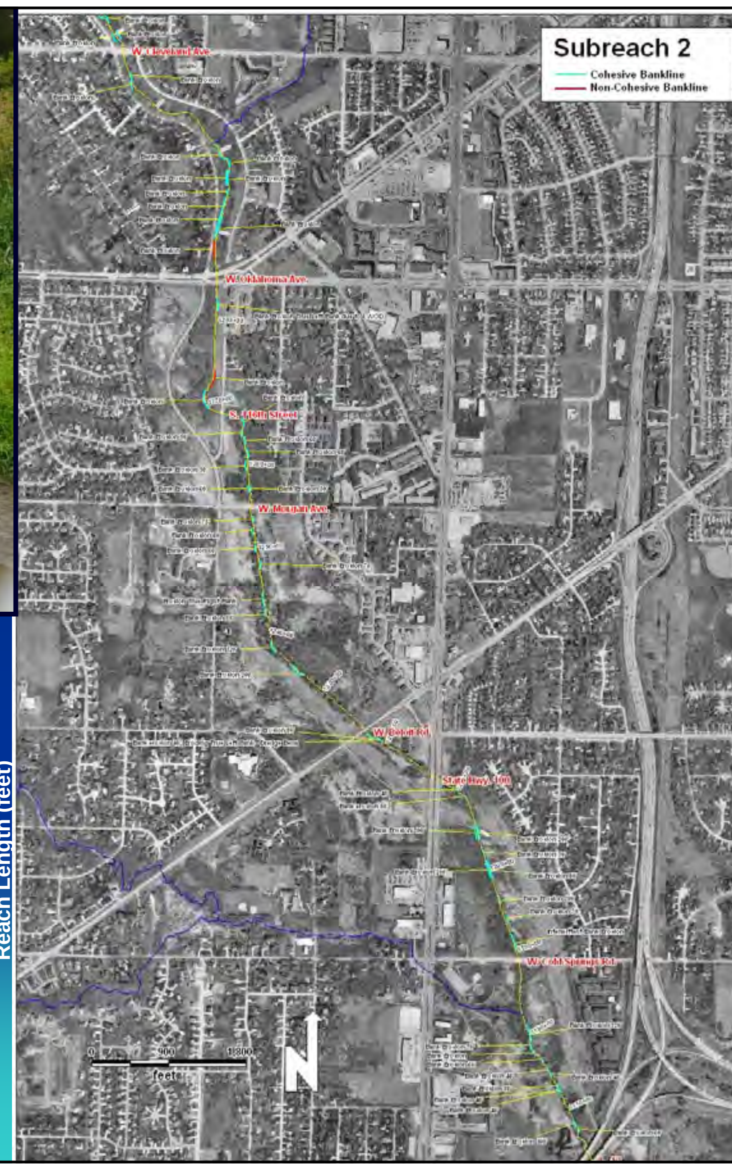


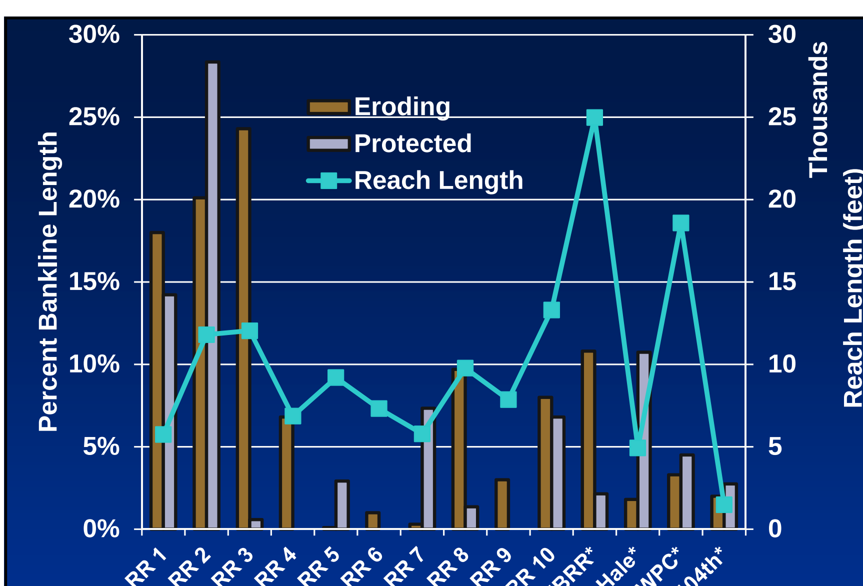
TETRA TECH

Root River Watershed

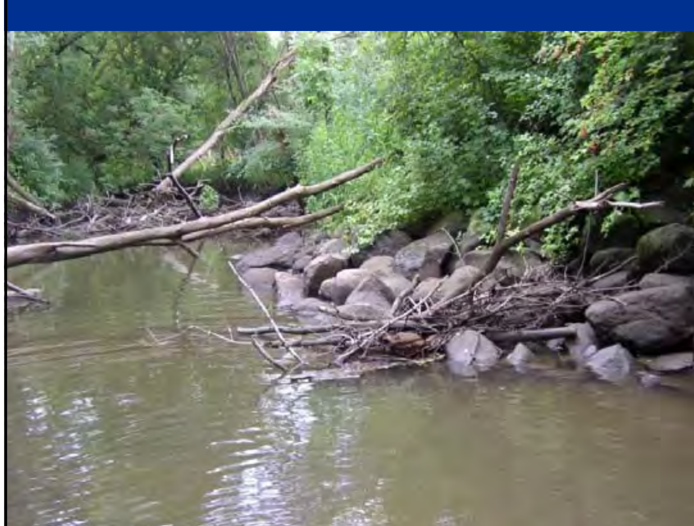
Root River Bank Erosion



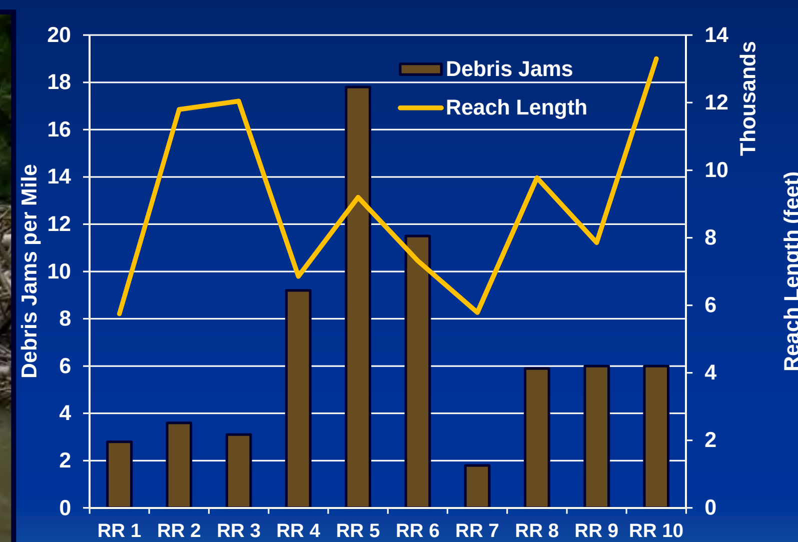




Root River Bank Protection

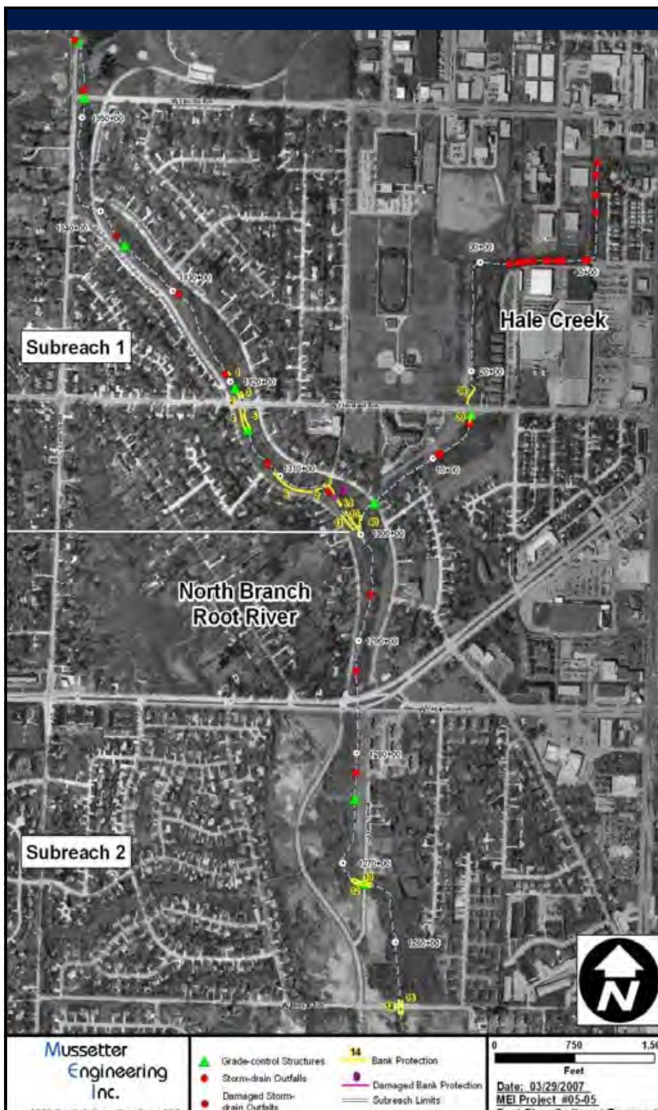


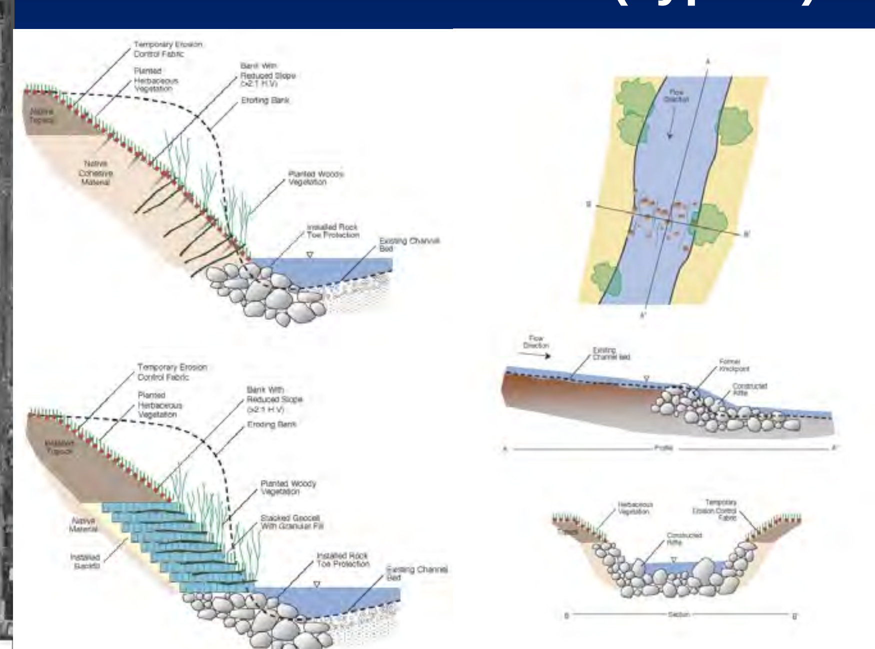
Root River
Woody Debris



TETRA TECH

North Branch
Root River
Infrastructure Improvement Recommendations (Typical)





TETRA TECH

earthtech

engineering and technology for the planet.

Report

Root River Outfall and Streambank Erosion Assessment

Prepared for the City of Racine

RACINE ON THE LAKE

730 Washington Avenue
Racine, WI 53403

Prepared by:

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January 2005

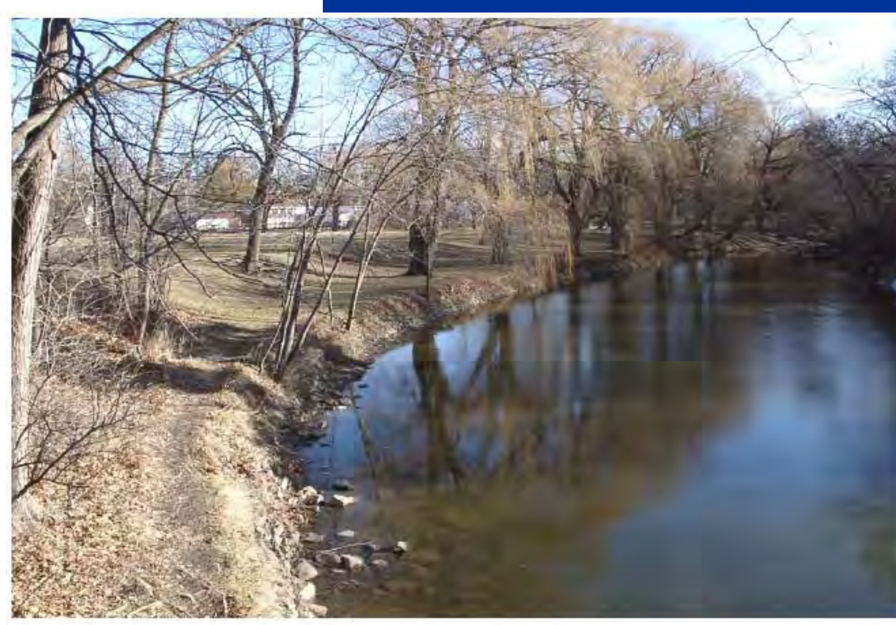


Photo 10. Looking upstream at right bank on left branch around Island Park. (R13sa2)

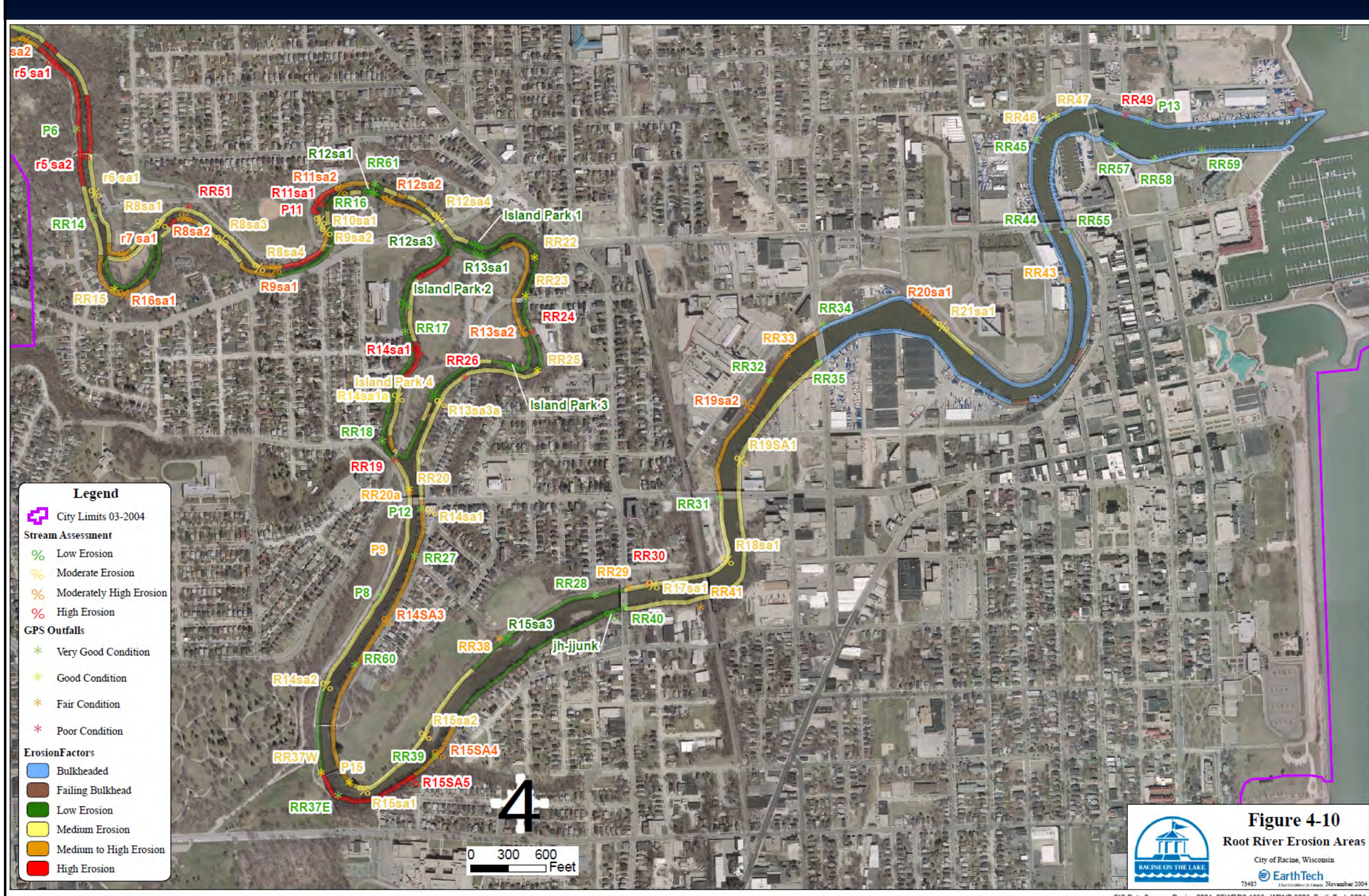


TABLE 5-1

ALTERNATIVE STABILIZATION PRACTICES

INSTREAM PRACTICES
Vanes or J-Hook Vanes
Cross Vanes
STREAMBANK TREATMENT
Bank Shaping and Planting
Branch Packing
Brush Mattresses
Coconut Fiber Roll
Dormant Post Plantings
Vegetated Gabions
Joint Plantings
Live Cribwalls
Live Stakes
Live Fascines
Log, Rootwad, and Boulder Revetments
Riprap
Stone Toe Protection
Tree Revetments
Vegetated Geogrids

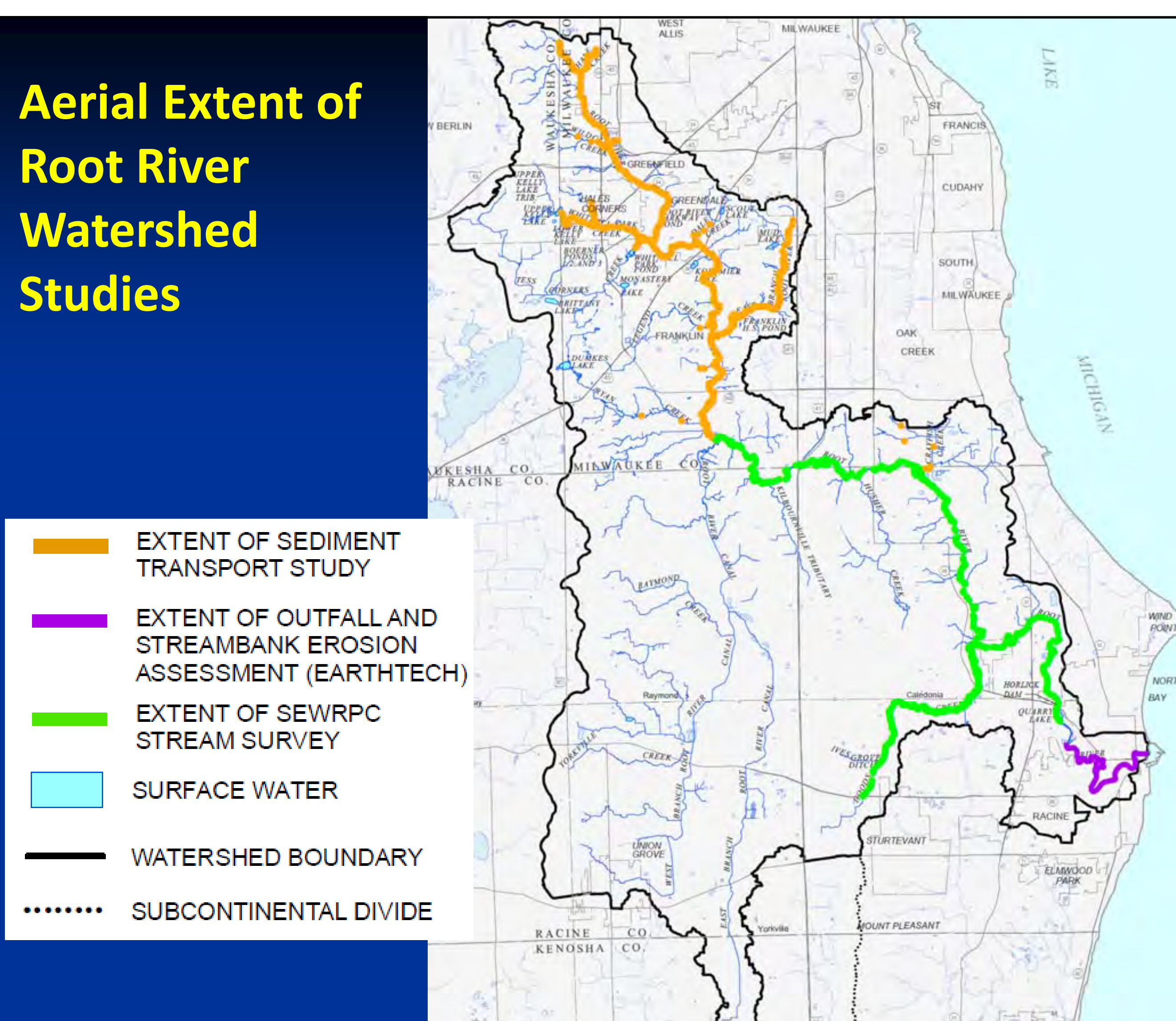
TABLE 4-3

VISUAL OBSERVATIONS

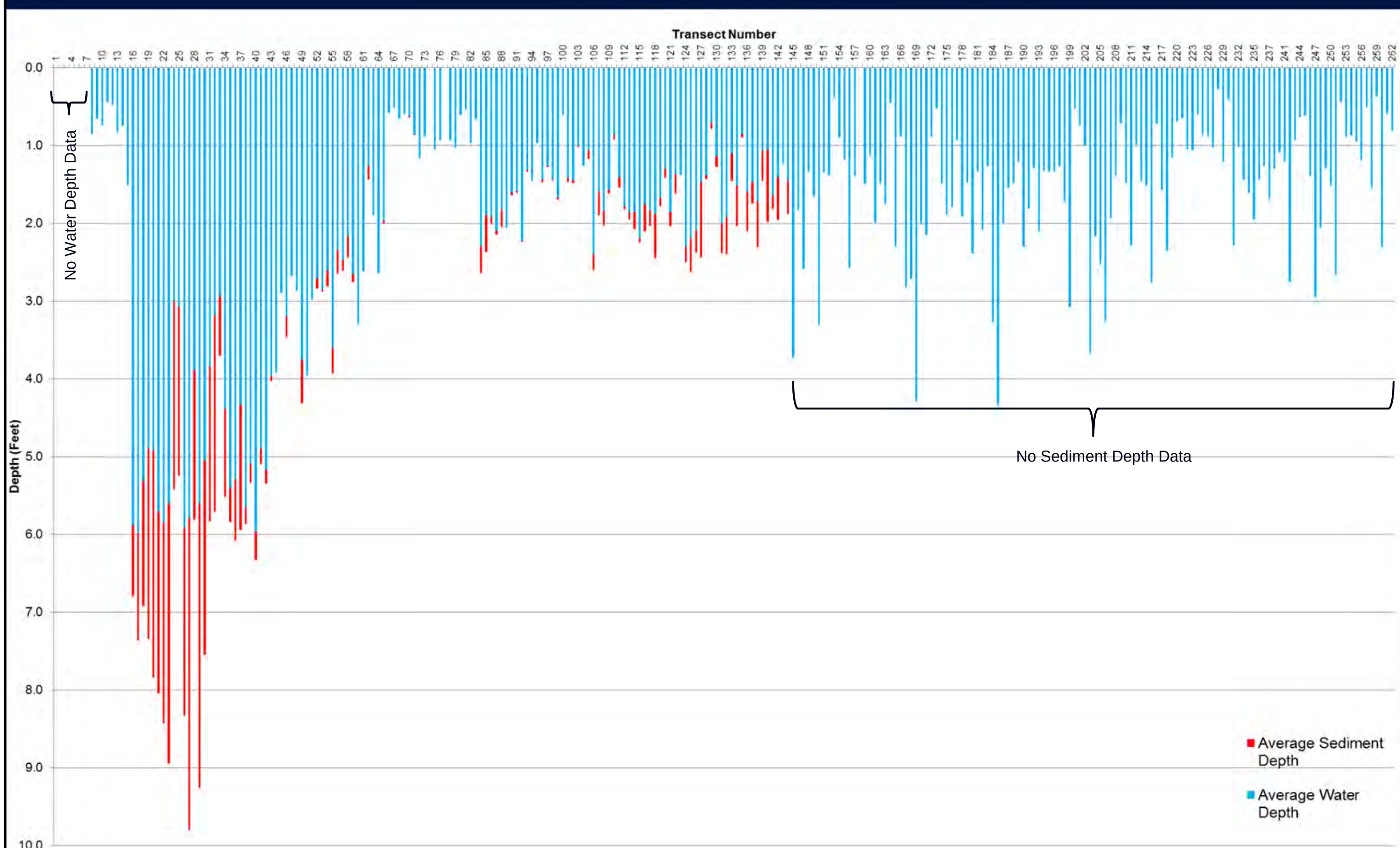
Location	Visual Observations
R19sa1	4
R19sa2	4
R20sa1	8
R21sa1	4
R22sa1	0
R22sa2	0
R23sa1	12
R23sa2	8
R23sa3	8
R23sa4	12
R23sa5	8
R23sa6	8
r3 sa1	4
r4 sa1	8
r4 sa2	8
r5 sa1	12
r5 sa2	12
r6 sa1	4
r7 sa1	4
R8sa1	4
R8sa2	4
R8sa3	8
R8sa4	4
R9sa1	8
R9sa2	8

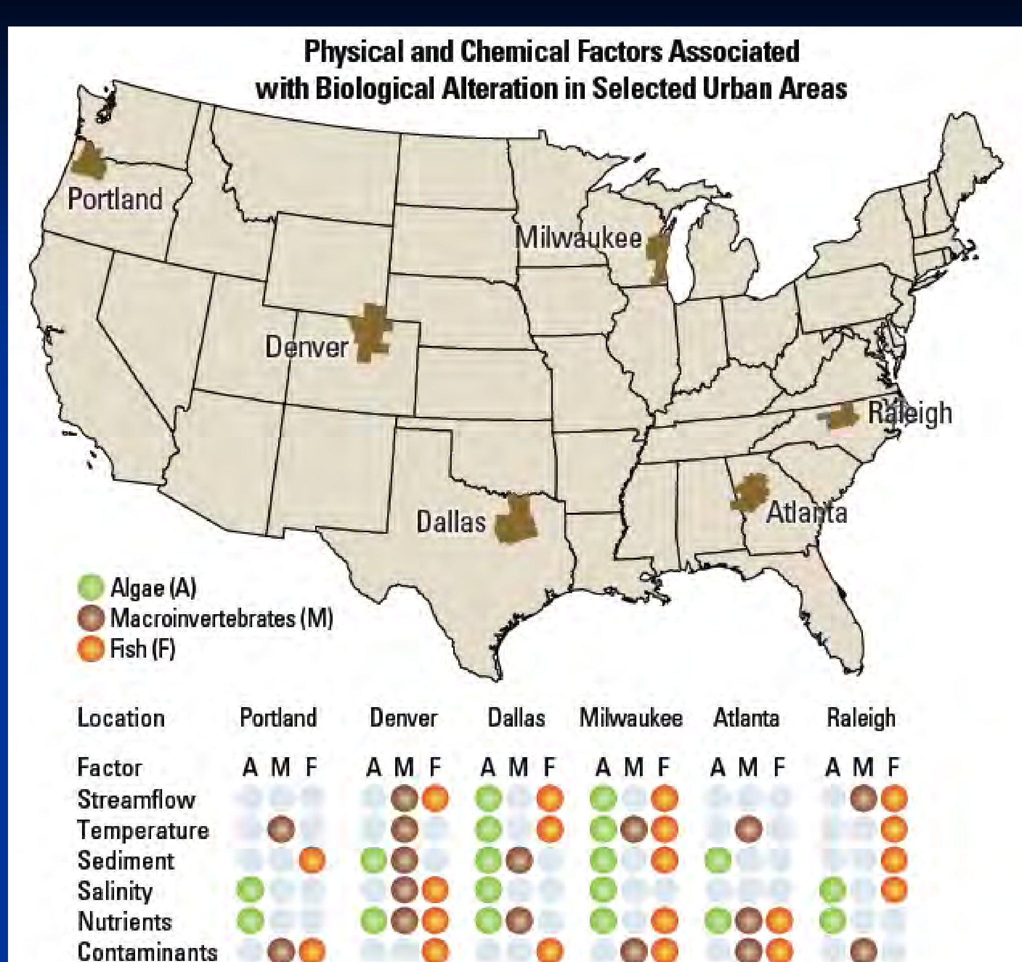
Red = High Erosion
Orange = Moderate to High Erosion
Yellow = Moderate Erosion
Green = Low Erosion

Aerial Extent of Root River Watershed Studies



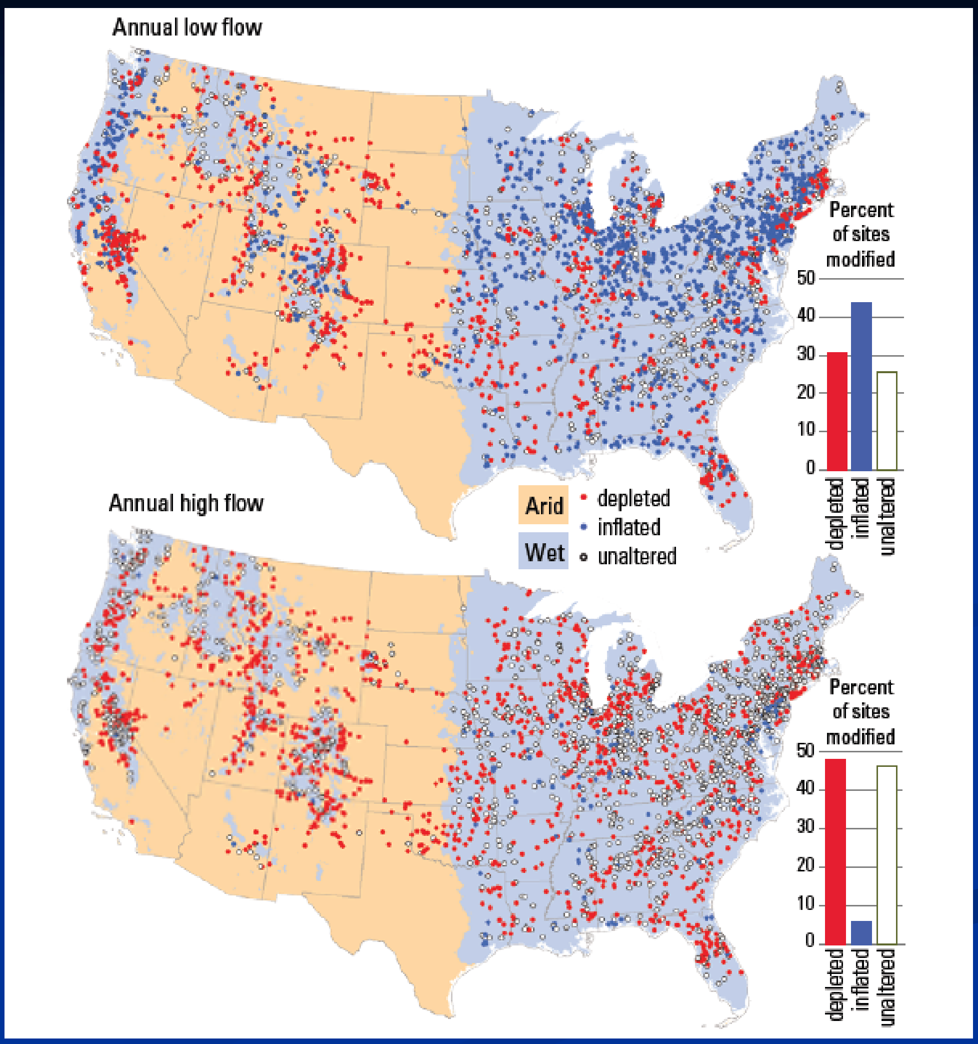
Mean Water Depths and Sediment Depths Among Cross-Sections within the Root River





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

Streamflow Modifications



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

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

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

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

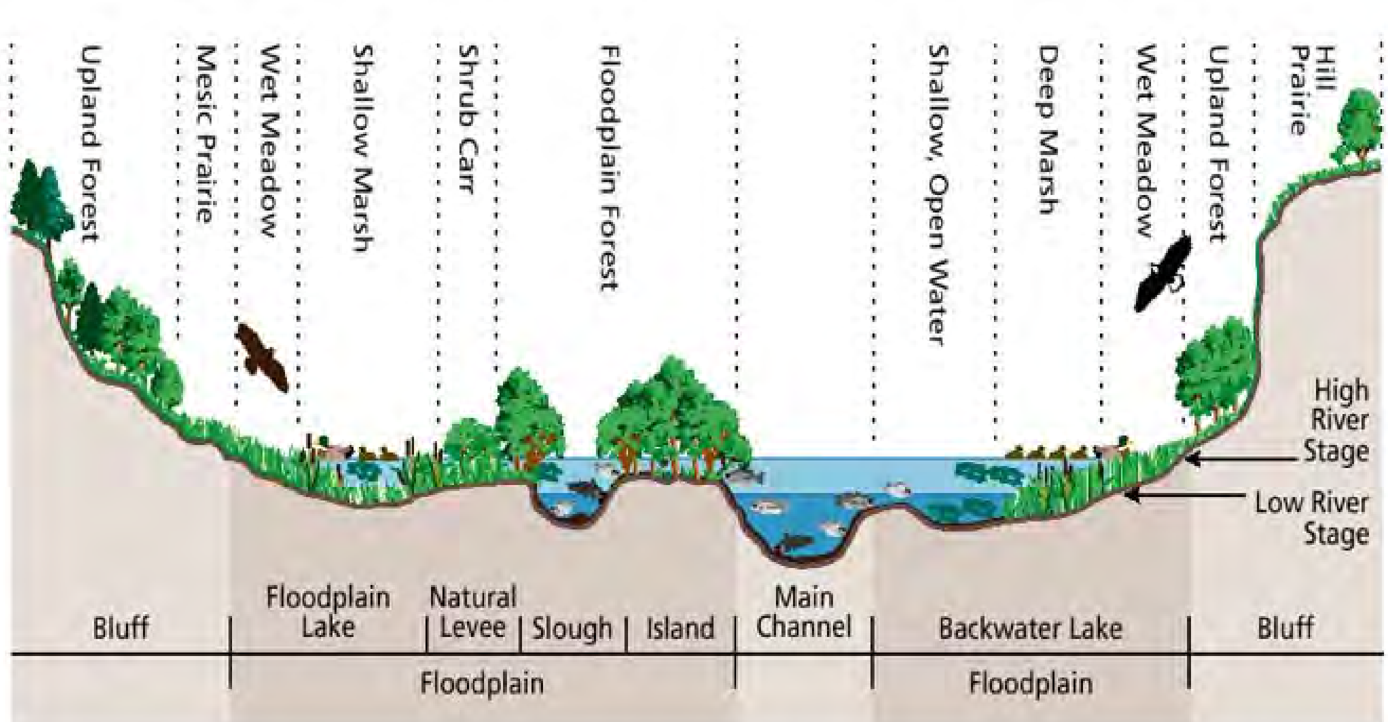
Dynamics of a Natural Stream Ecosystem

Chapter 2—Stream Ecology Primer 31

Highlights of Major Findings and Implications

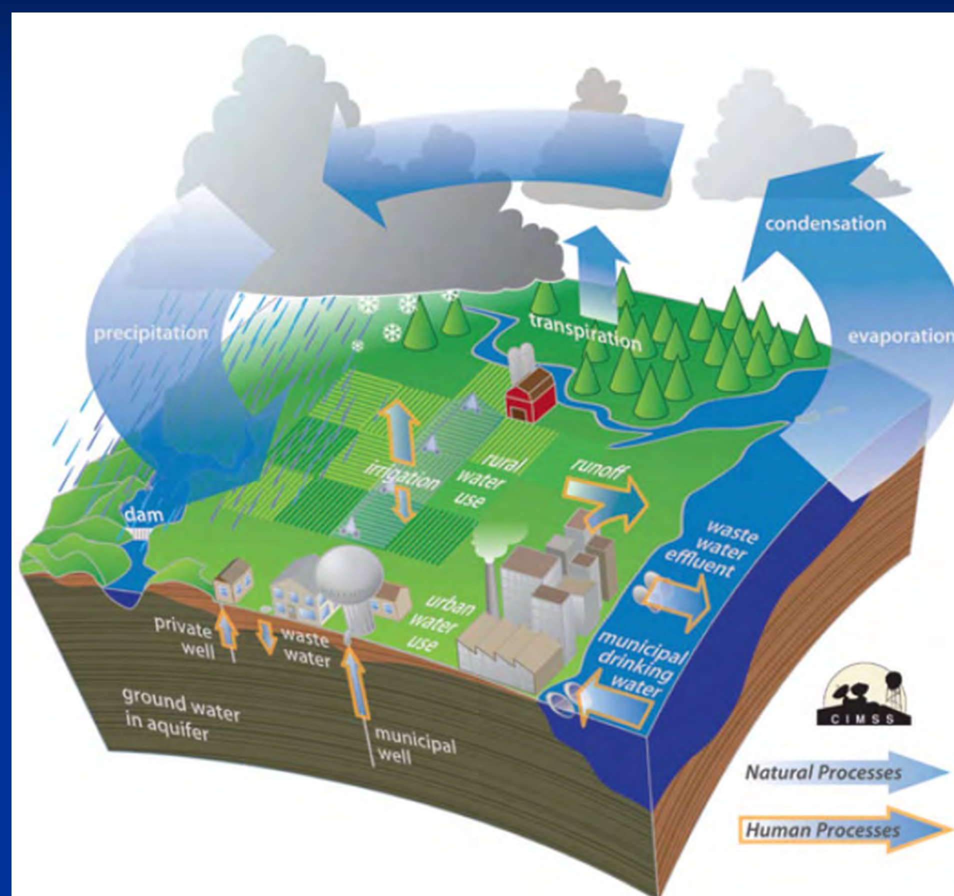
- The presence of healthy streams in watersheds with substantial human influence indicates that it is possible to maintain and restore healthy stream ecosystems. Such streams can also offer insights into how stream health can be maintained amid anticipated changes in land use or restored when stream health has deteriorated as a result of human actions.
- Assessments that are limited to a single biological community are likely to underestimate the effects of land and water use on stream health. Assessments of multiple biological communities increase our ability to detect streams with diminished health and provide a more complete understanding of how land and water use influence stream health.
- Water quality is not independent of water quantity because flows are a fundamental part of stream health. Because flows are modified in so many streams and rivers, there are many opportunities to enhance stream health with targeted adjustments to flow management.
- Efforts to understand the causes of reduced stream health should consider the possible effects of nutrients and pesticides, in addition to modified flows, particularly in agricultural and urban settings.
- Stream health is often reduced due to multiple physical and chemical factors. Assessments and restoration efforts should therefore take a multifactor approach, wherein a number of factors—and their possible interactions—are considered. Understanding how these multiple factors influence biological communities is essential in developing effective management strategies aimed at restoring stream health.

Riparian Buffer Width & Continuity

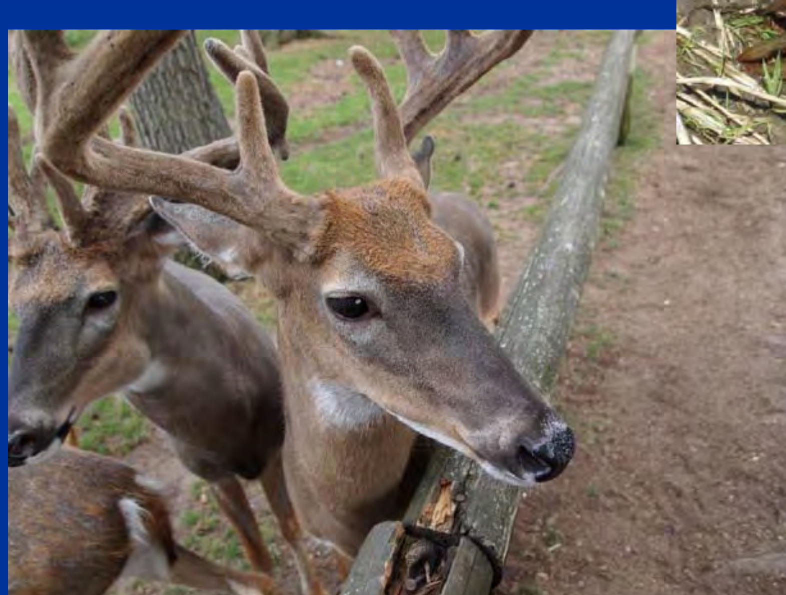


(From Sparks, Bioscience, 1995)

Streamflow Modifications

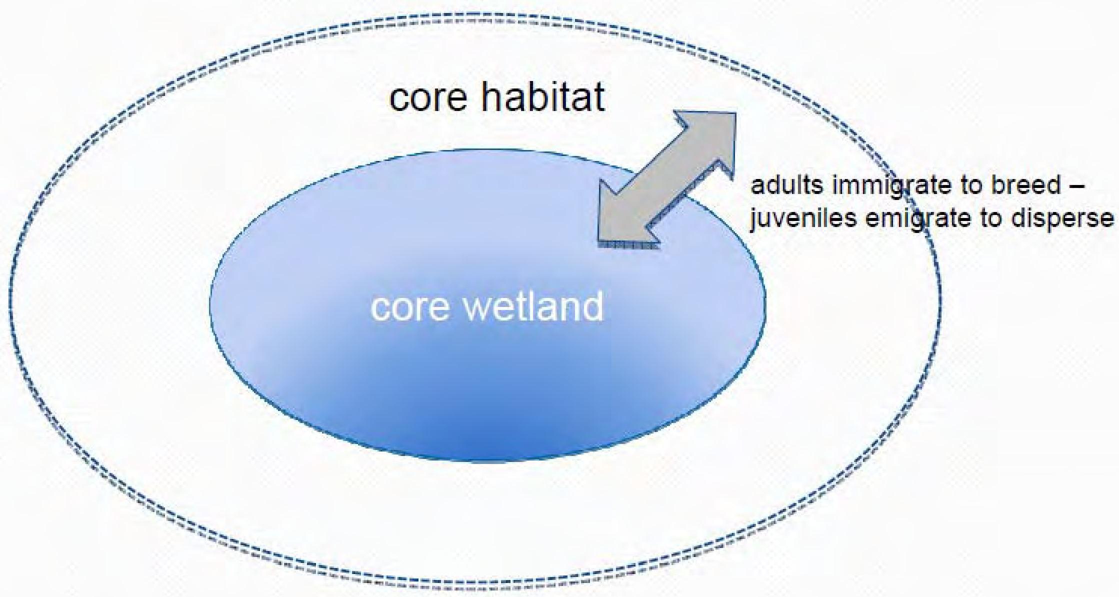


How much width do we need?



How much width do we need?

Core habitat – a defined area of critical habitat for a species



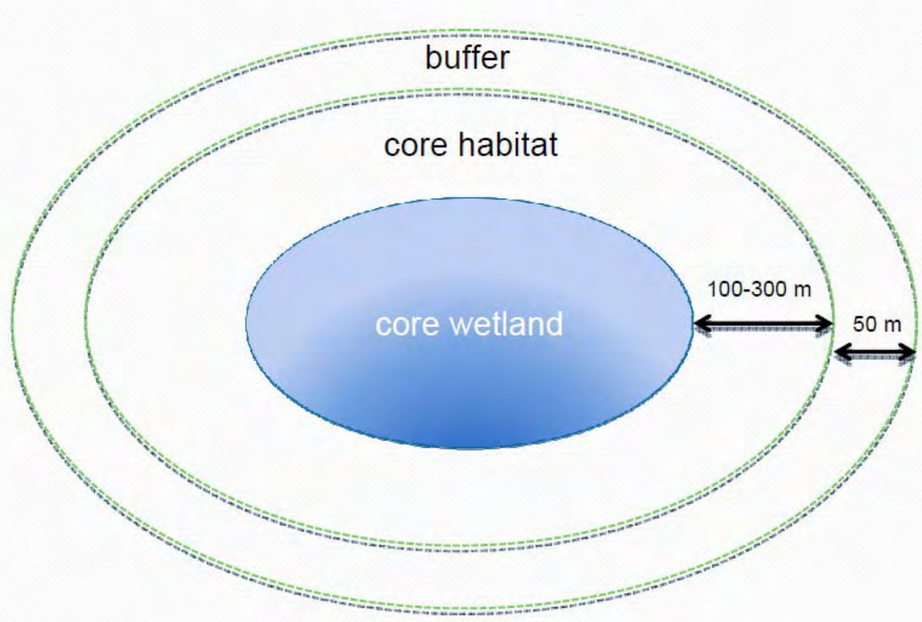
e.g., terrestrial habitat for amphibians surrounding a wetland

Source: Semlitsch & Bodie, 2003, Biological Criteria for Buffer Zones around Wetlands and Riparian Habitats for Amphibian and Reptiles

Management Criteria

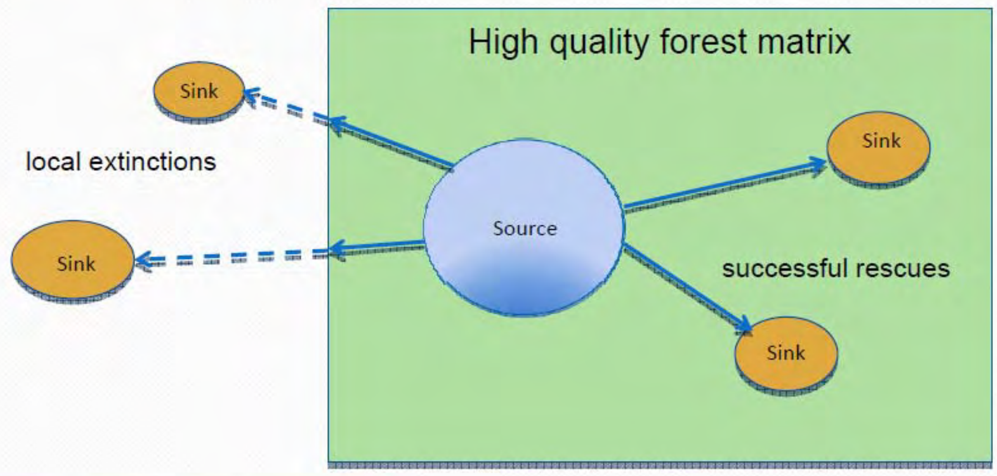
Amphibian Core Habitat = 100 – 300 meters

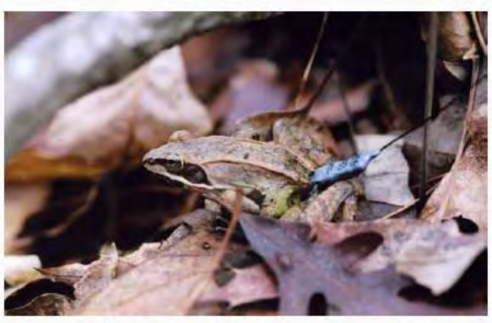
Buffer = 50 meters



Source: Semlitsch & Bodie, 2003, Biological Criteria for Buffer Zones around Wetlands and Riparian Habitats for Amphibian and Reptiles

Criteria for Terrestrial Core Habitat and Importance of Connectivity for Amphibians

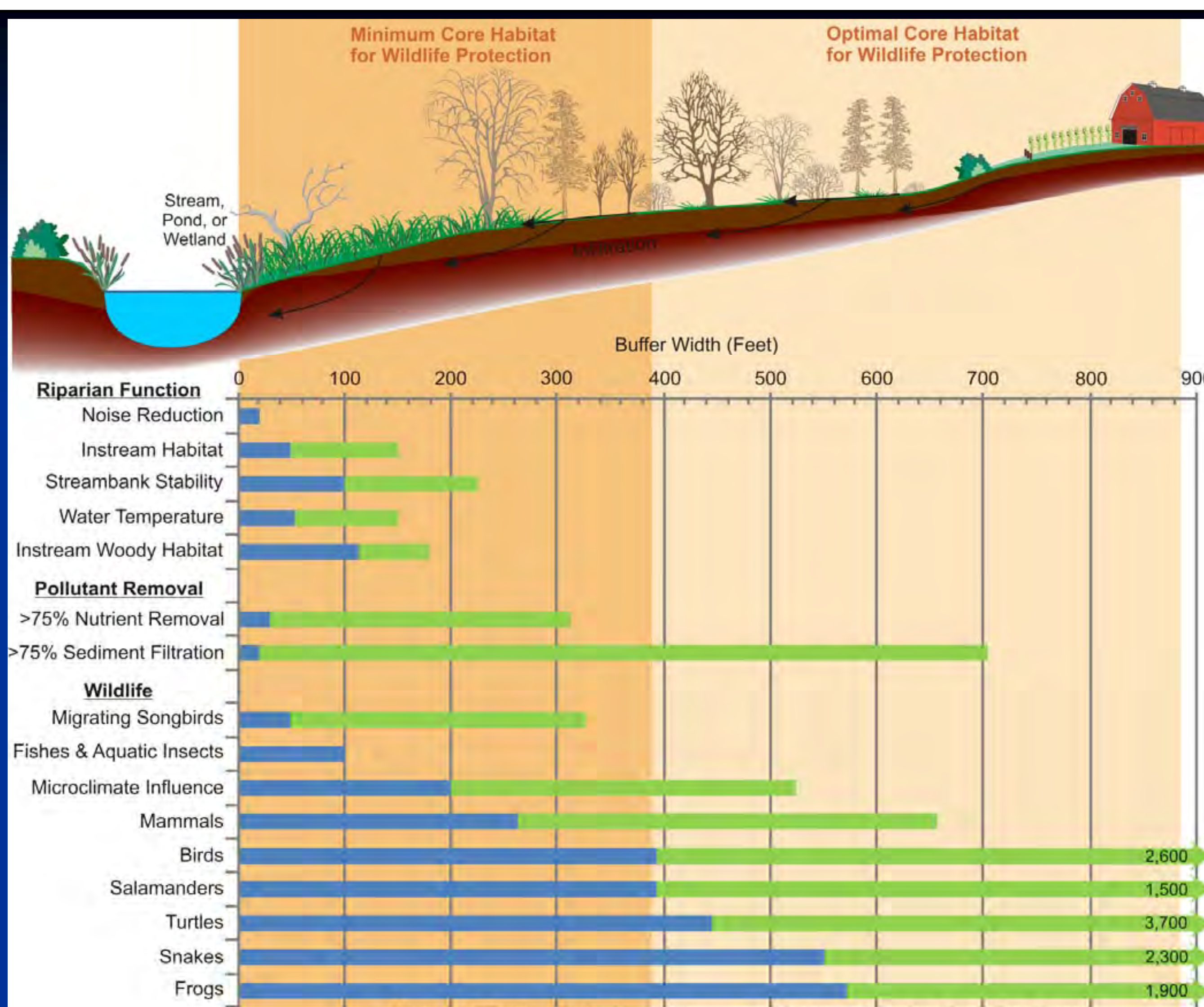




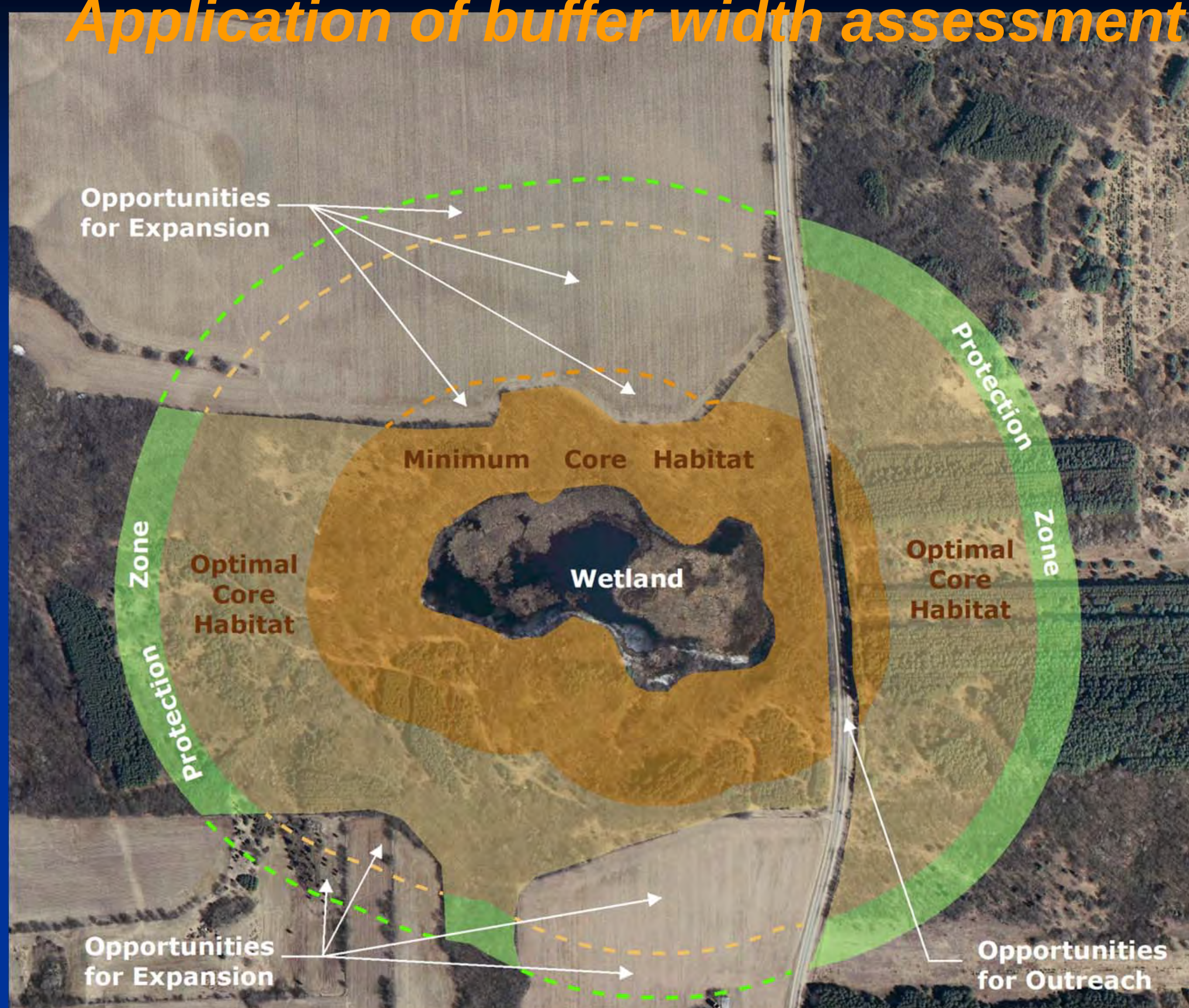
Wood frogs require immigration from source populations!

Raymond D. Semlitsch and **Tracy A.G. Rittenhouse**
University of Missouri / University of Wisconsin

http://www.wisconsinwetlands.org/WetlandBufferSymposium/Semlitsch.Ray.pdf



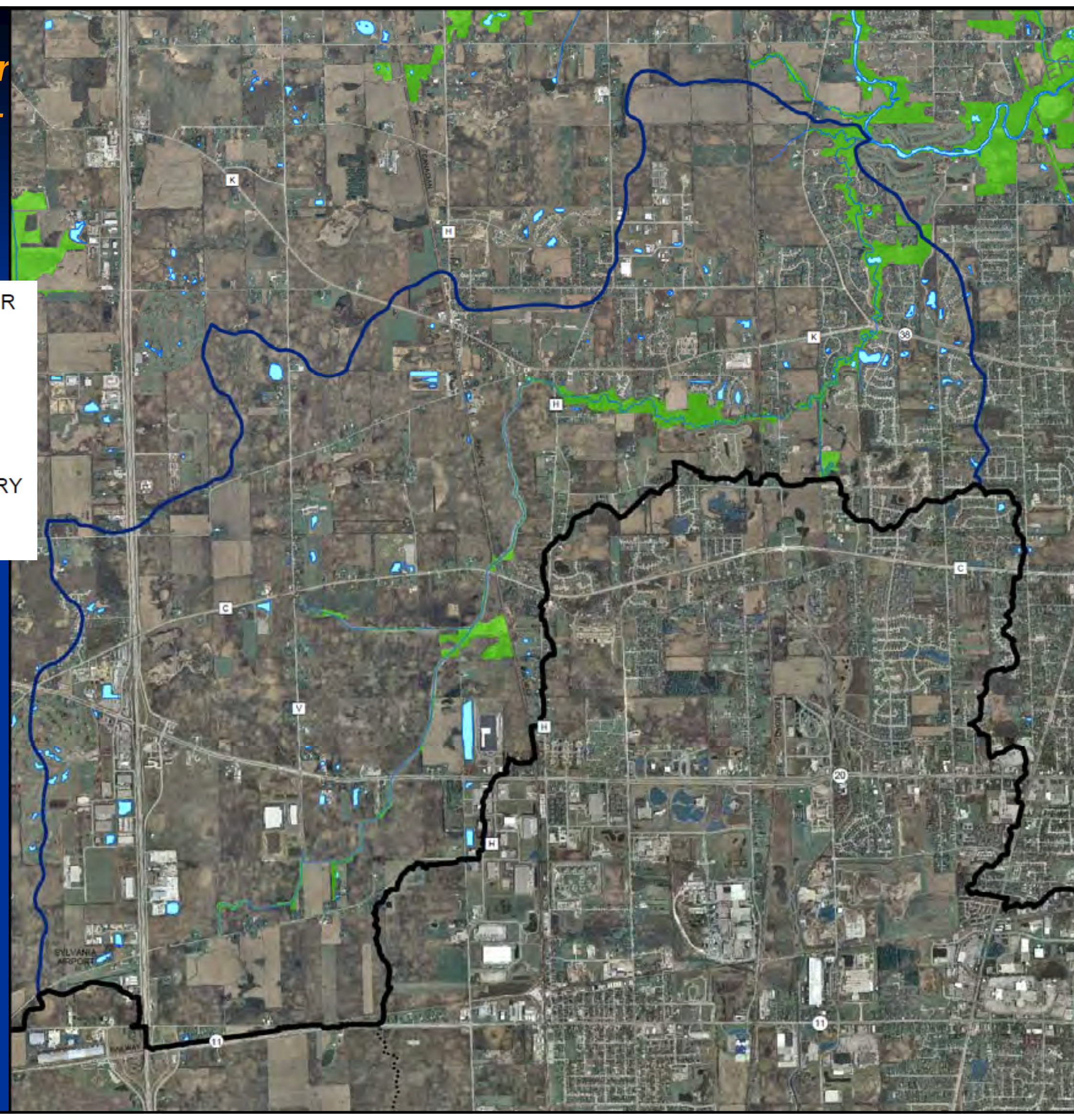
Application of buffer width assessment



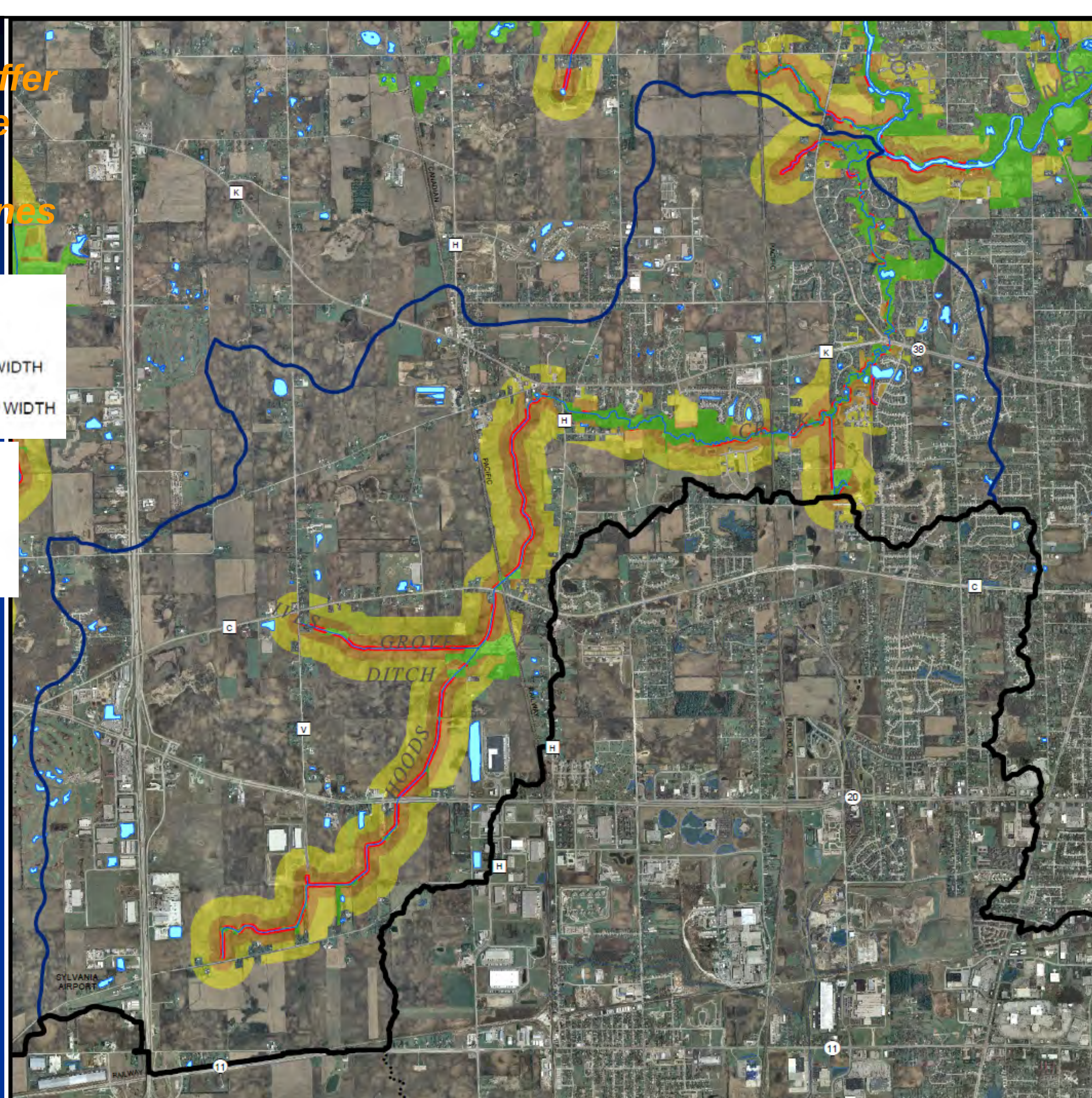
See http://www.sewrpc.org/SEWRPC/Environment.htm

Stream Buffers get complicated

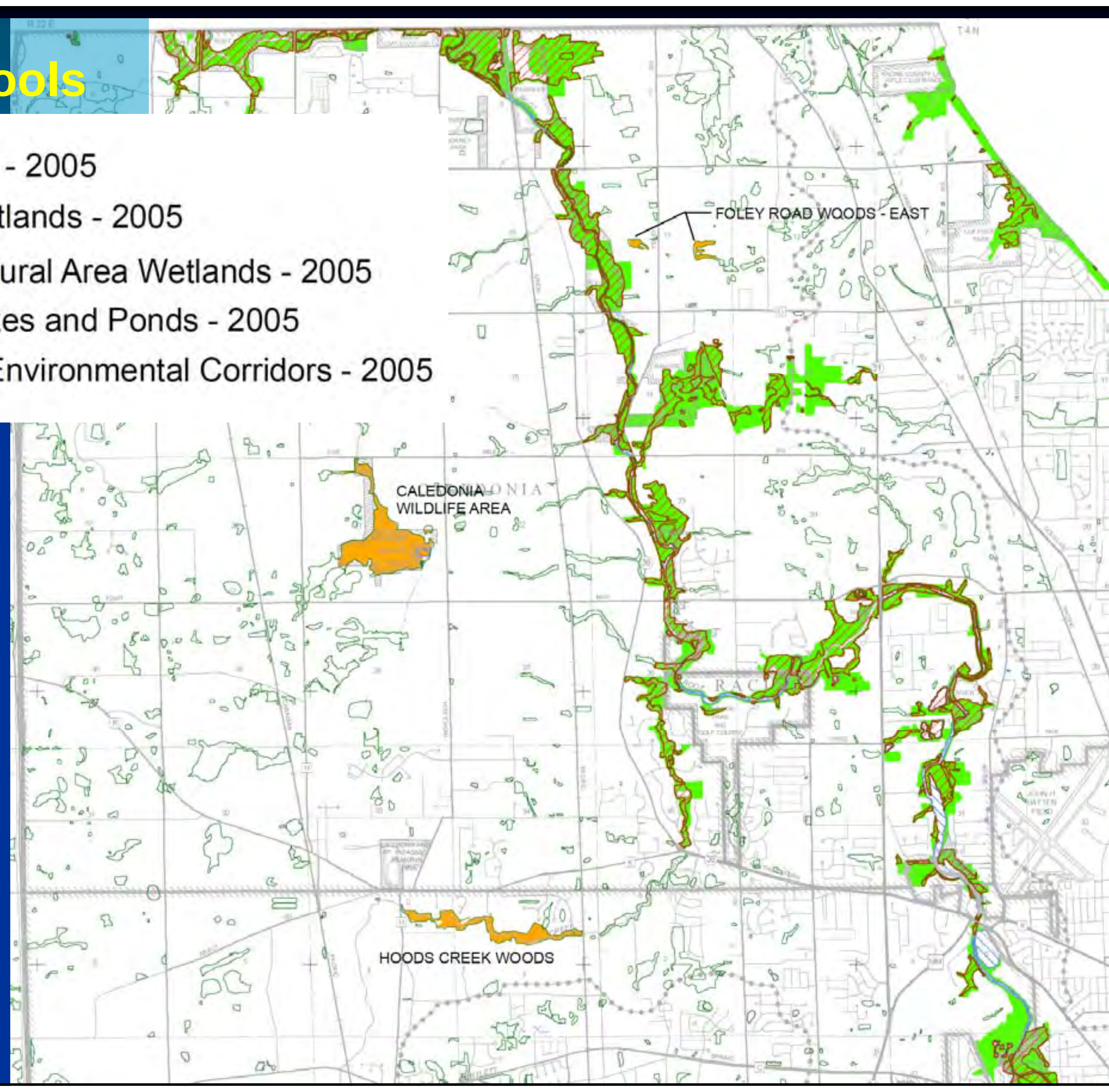
Application of buffer width assessment – Hoods Creek Subwatershed



Existing Riparian Buffer and Potential Core Habitat Protection Buffer Zones



Wetland Tools

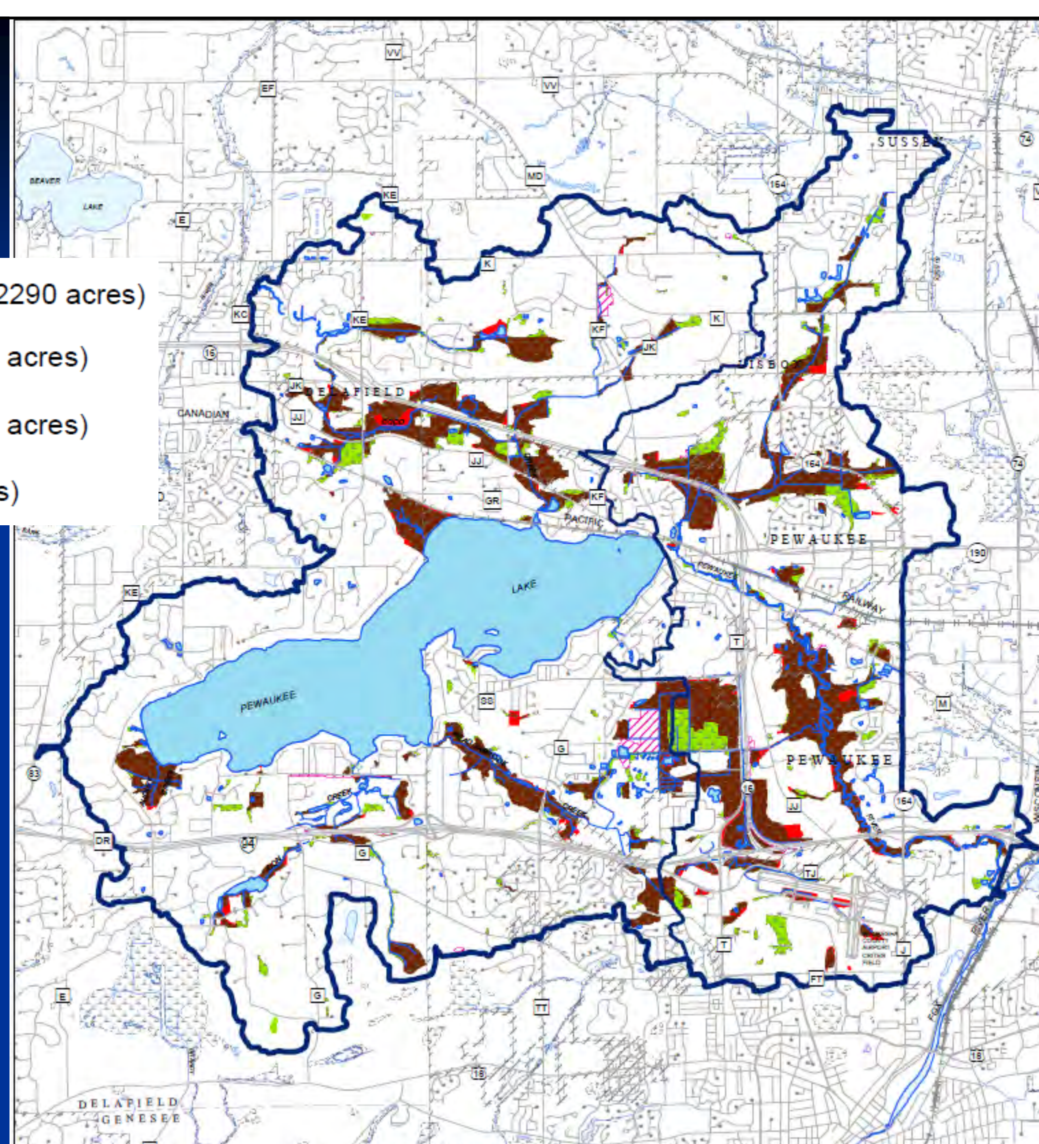


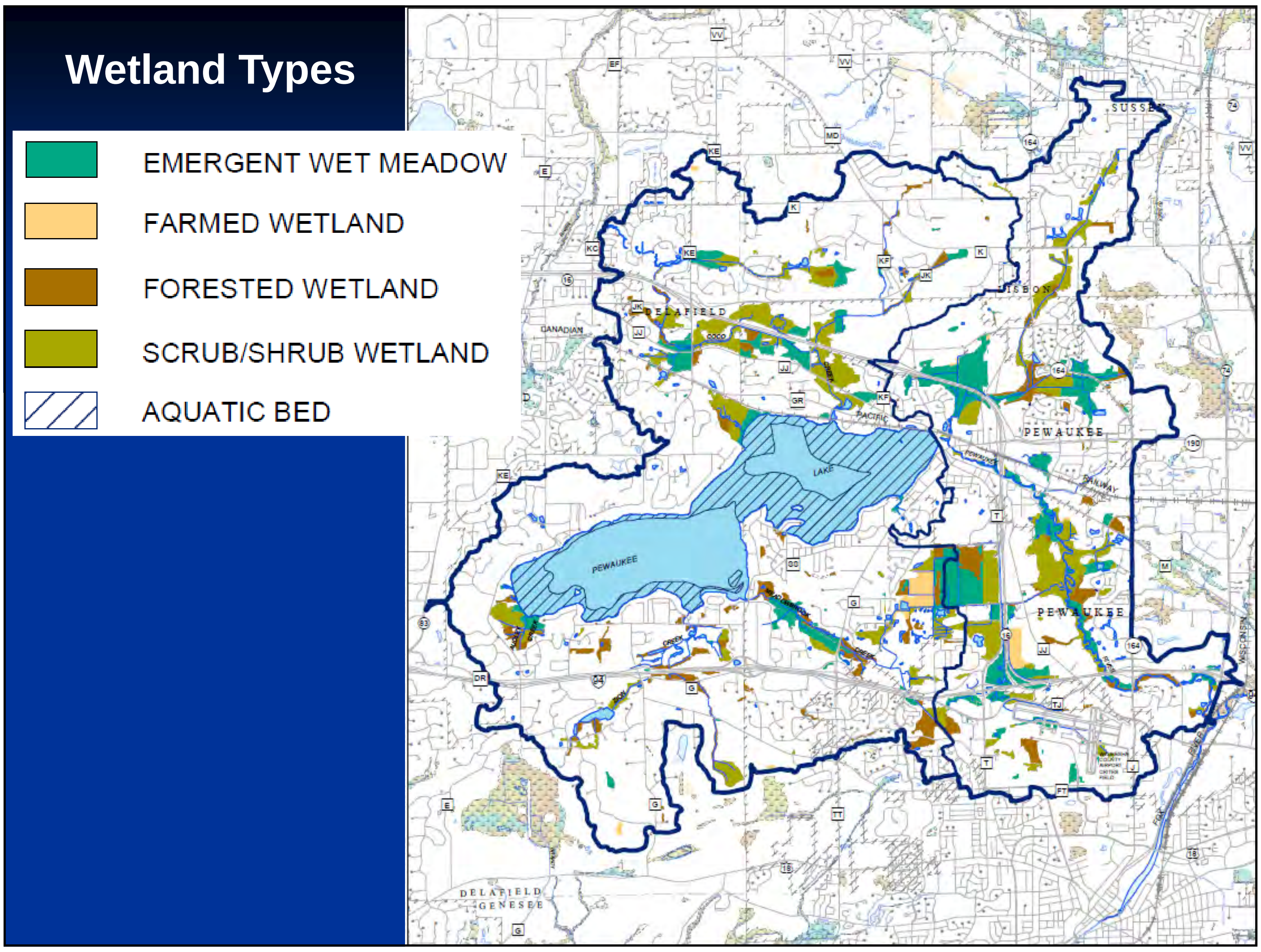
- Wetlands - 2005
- ADID Wetlands - 2005
- ADID Natural Area Wetlands - 2005
- ADID Lakes and Ponds - 2005
- Primary Environmental Corridors - 2005

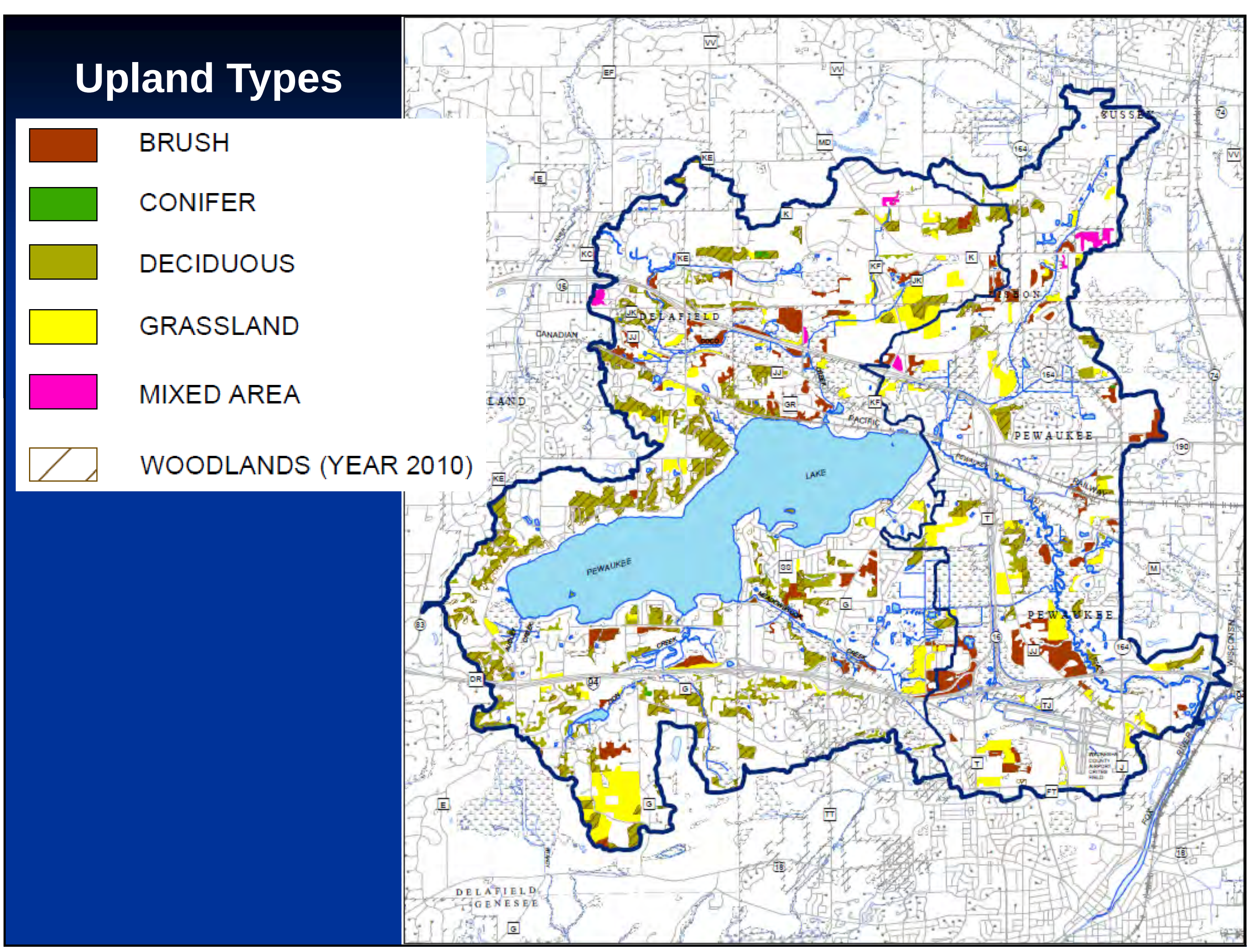
Protected vs Vulnerable lands

Wetland Losses And Gains: 2000-2010

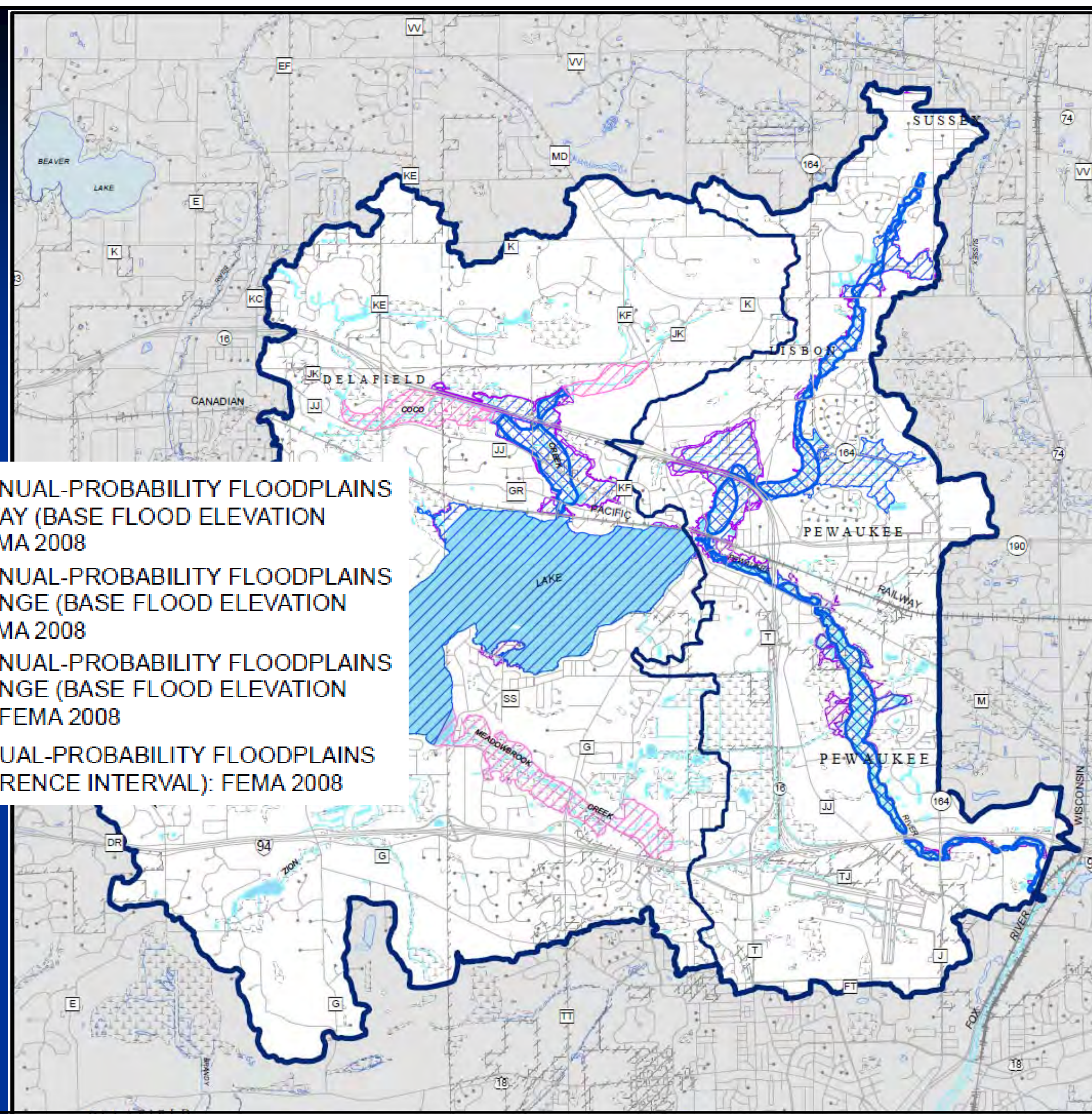
- 2000 and 2010 Wetlands (2290 acres)
- 2000 Wetlands - Loss (206 acres)
- 2010 Wetlands - Gain (587 acres)
- Farmed Wetlands (84 acres)




Wetland Types
EMERGENT WET MEADOW
FARMED WETLAND
FORESTED WETLAND
SCRUB/SHRUB WETLAND
AQUATIC BED

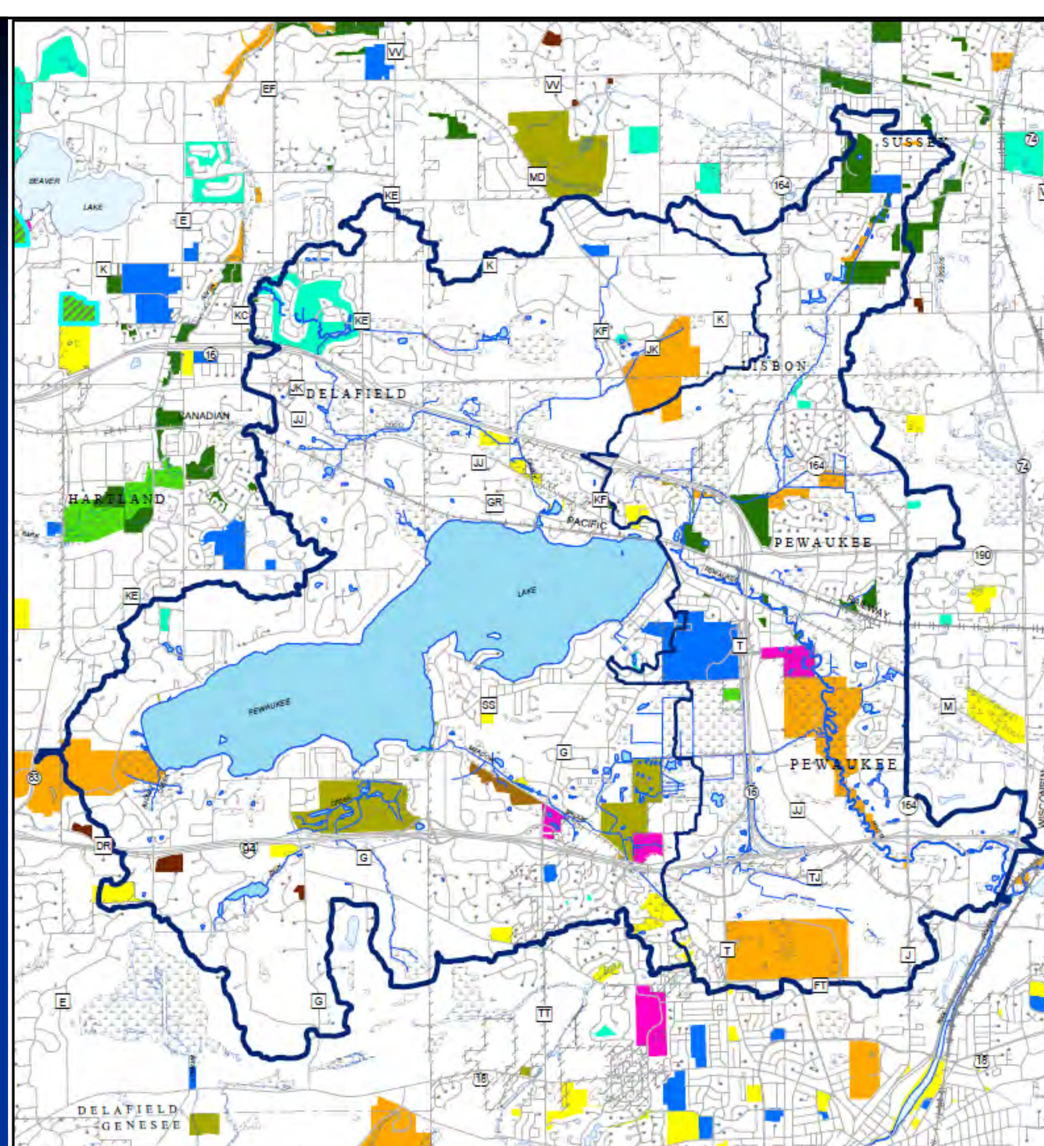

Upland Types
BRUSH
CONIFER
DECIDUOUS
GRASSLAND
MIXED AREA
WOODLANDS (YEAR 2010)

Protected vs Vulnerable lands

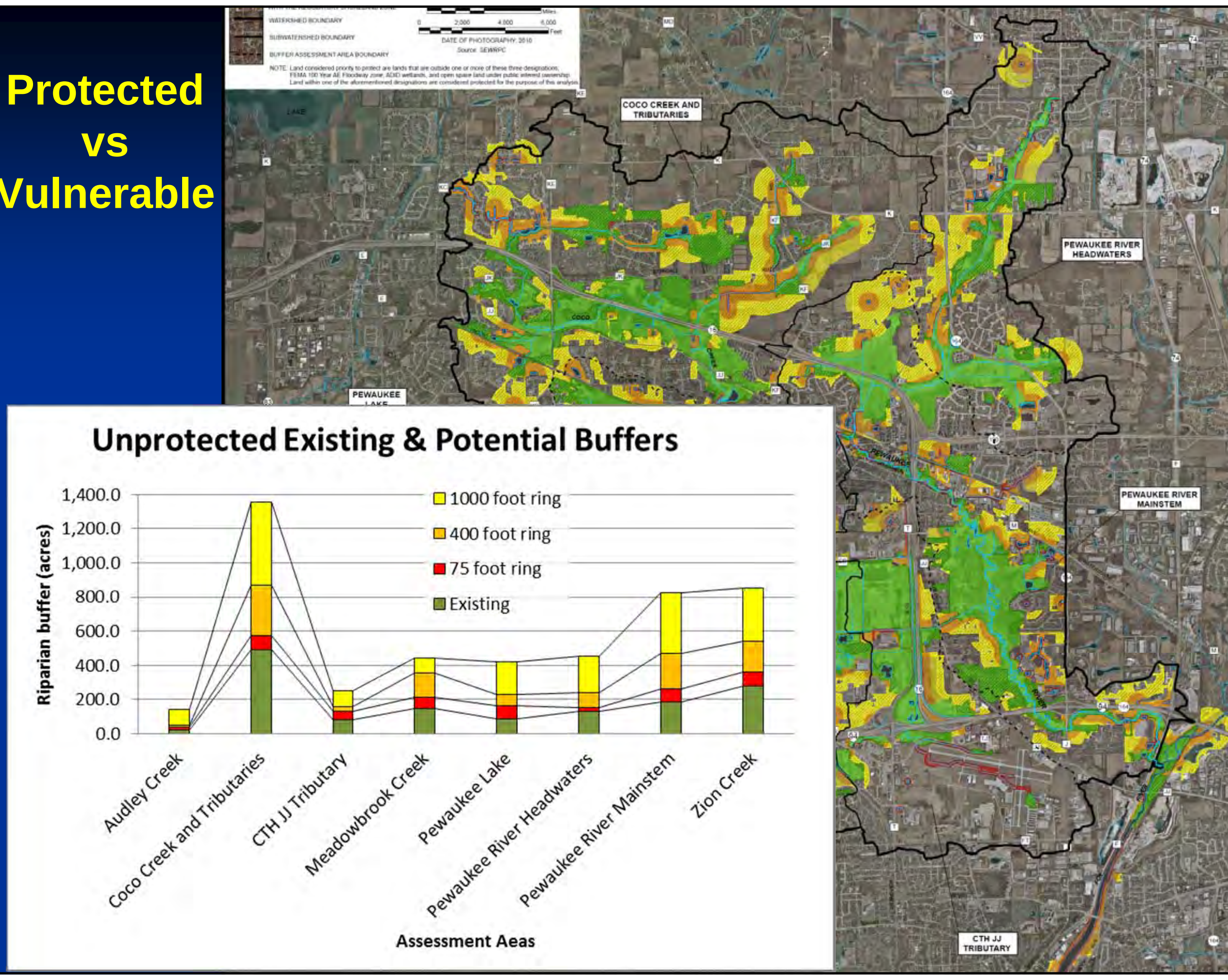


Protected vs Vulnerable lands

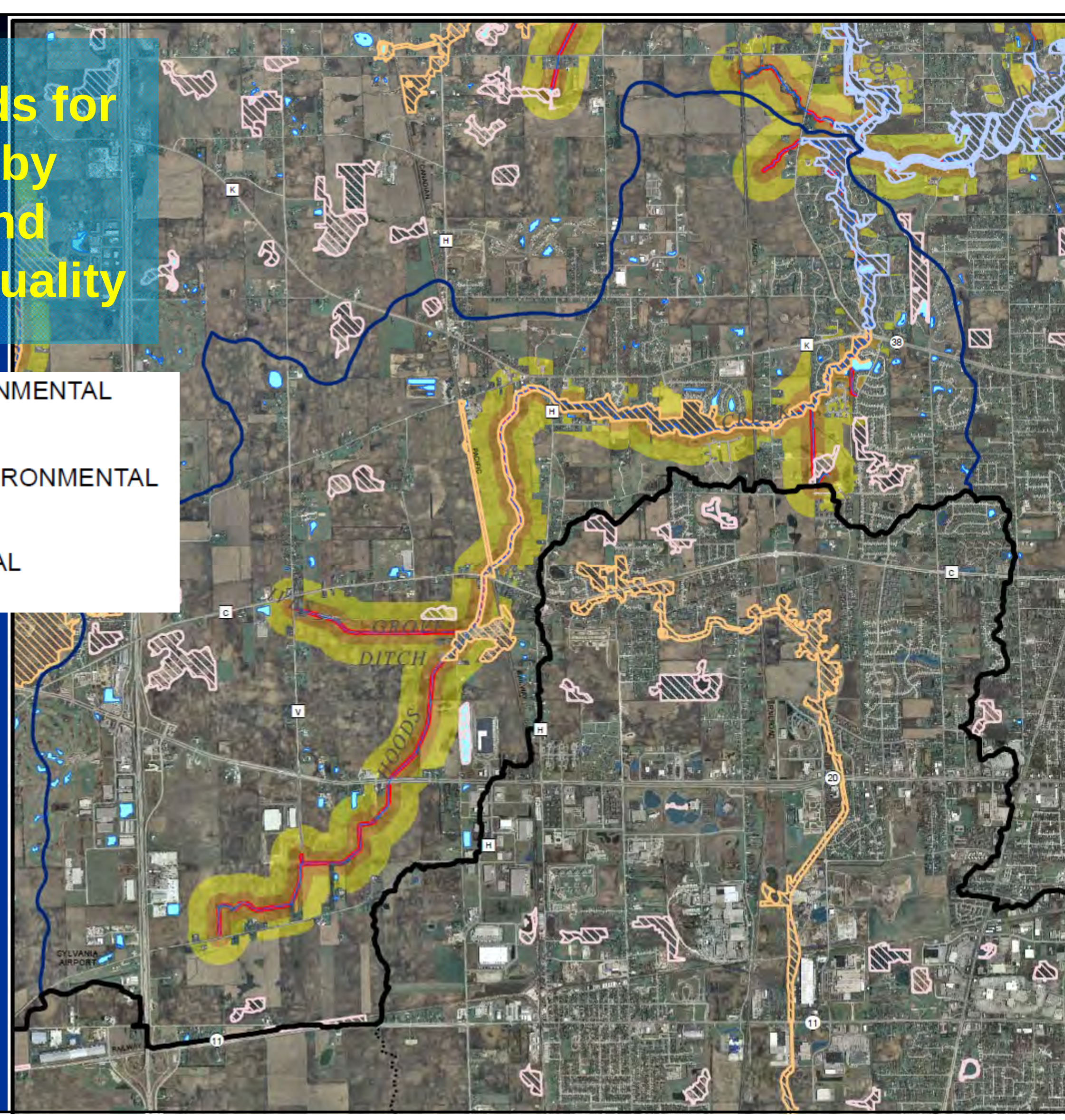
Open space lands in public & private protection



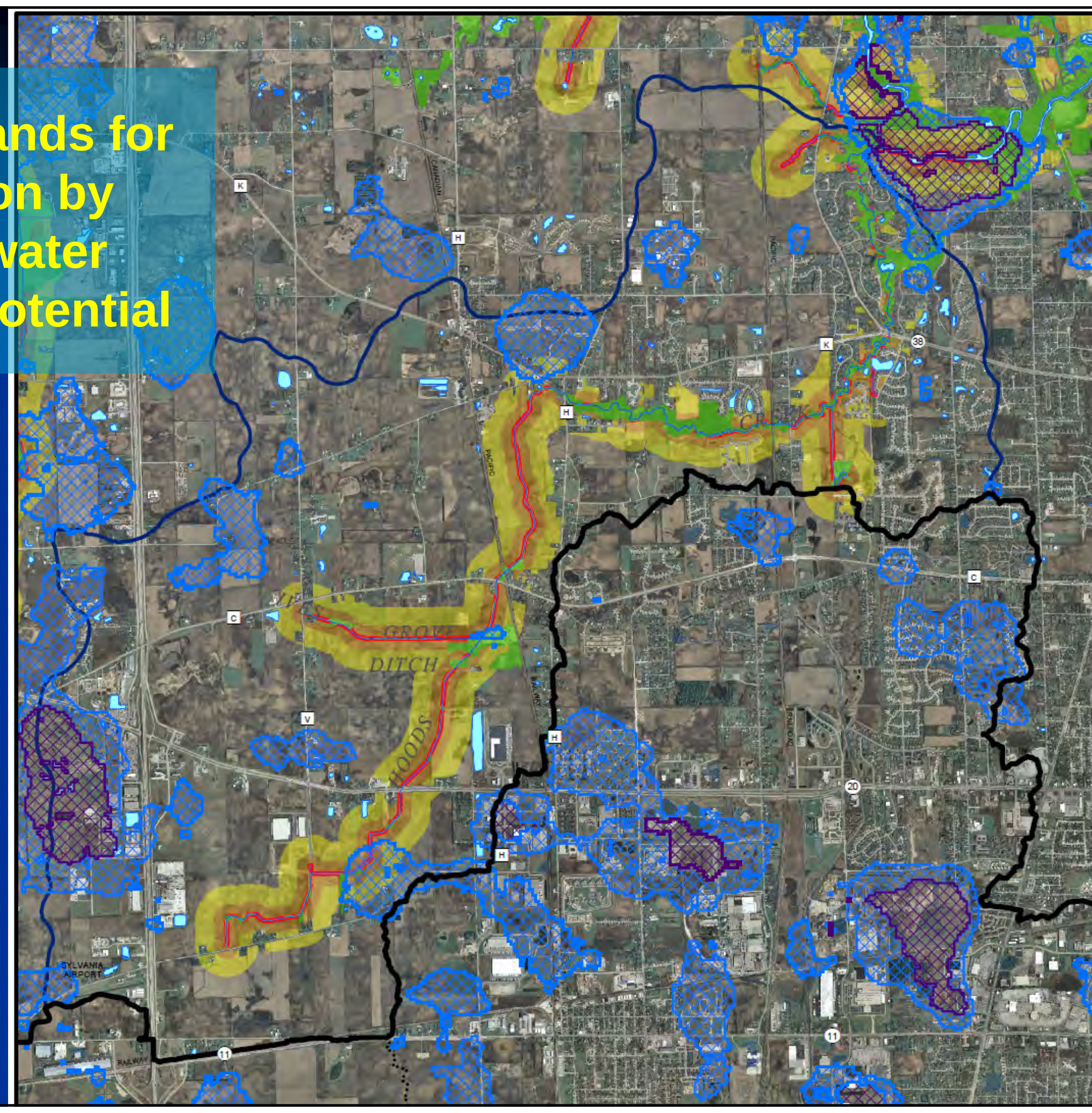
Protected vs Vulnerable



Prioritize lands for protection by corridor and natural area quality



Prioritize lands for protection by groundwater recharge potential

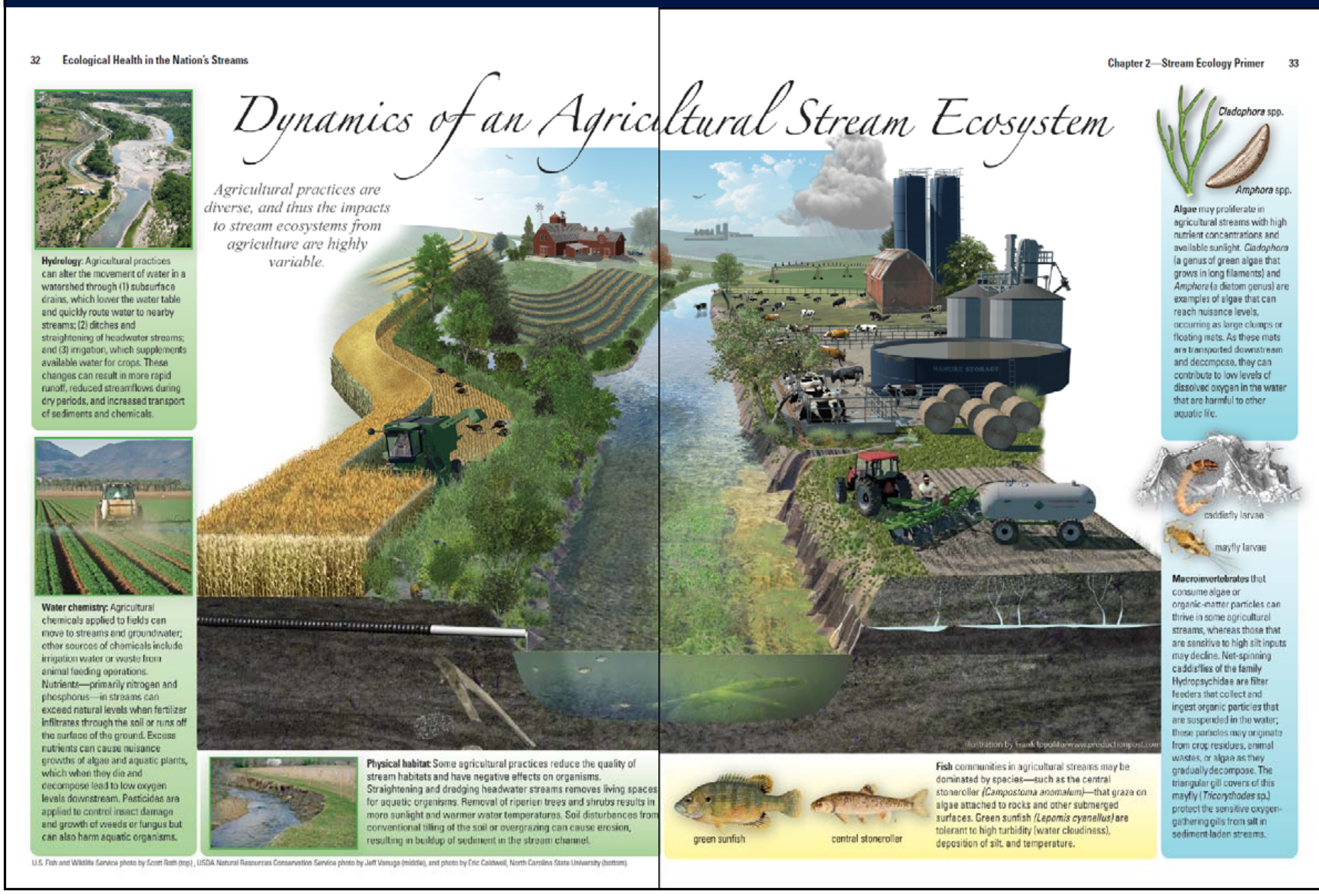


Southeast Wisconsin Buffer Project: Technical Advisory Committee

Merritt Frey
River Habitat Program Director, River Network

Chad Sampson
County Conservationist
Racine County Land Conservation

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



32 Ecological Health in the Nation's Streams

Chapter 2—Stream Ecology Primer 33

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 route water to nearby streams; (2) ditches and straightening of headwater streams; and (3) irrigation, which supplements available water for crops. These changes can result in more rapid runoff, reduced streamflows 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 or waste from animal feeding operations. Nutrients—primarily nitrogen and phosphorus—in streams can exceed natural levels when fertilizer infiltrates through the soil or runs off the surface of the ground. Excess nutrients can cause nuisance growths of algae and aquatic plants, which when they die and decompose lead to low oxygen levels downstream. Pesticides are applied to control insect damage and growth of weeds or fungus but can also harm aquatic organisms.

Physical habitat: Some agricultural practices reduce the quality of stream habitats and have negative effects on organisms. Straightening and dredging headwater streams removes living spaces for aquatic organisms. Removal of riparian trees and shrubs results in more sunlight and warmer water temperatures. Soil disturbances from conventional tilling of the soil or overgrazing can cause erosion, resulting in buildup of sediment in the stream channel.

green sunfish

central stoneroller

Fish communities in agricultural streams may be dominated by species—such as the central stoneroller *(Campostoma anomalum)*—that graze on algae attached to rocks and other submerged surfaces. Green sunfish *(Lepomis cyanellus)* are tolerant to high turbidity (water cloudiness), deposition of silt, and temperature.

Cladophora spp.

Amphora spp.

Algae may proliferate in agricultural streams with high nutrient concentrations and available sunlight. *Cladophora* (a genus of green algae that grows in long filaments) and *Amphora* (a diatom genus) are examples of algae that can reach nuisance levels, occurring as large clumps or floating mats. As these mats are transported downstream and decompose, they can contribute to low levels of dissolved oxygen in the water that are harmful to other aquatic life.

caddisfly larvae

mayfly larvae

Macroinvertebrates that consume algae or organic-matter particles can thrive in some agricultural streams, whereas those that are sensitive to high silt inputs may decline. Net-spinning caddisflies of the family Hydropsychidae are filter feeders that collect and ingest organic particles that are suspended in the water; these particles may originate from crop residues, animal wastes, or algae as they gradually decompose. The triangular gill covers of this mayfly (*Tricorythodes* sp.) protect the sensitive oxygen-gathering gills from silt in sediment-laden streams.

Illustration by Frank Ippolito/www.productionpost.com

U.S. Fish and Wildlife Service photo by Scott Roth (top), USDA Natural Resources Conservation Service photo by Jeff Vanuga (middle), and photo by Eric Caldwell, North Carolina State University (bottom).

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

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

Chapter 2—Stream Ecology Primer 35

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, roads, parking lots, and buildings) restrict the infiltration of precipitation into the groundwater system, and the construction of artificial drainage systems (for example, storm drains) quickly moves runoff to the stream. Rapid runoff and high streamflow increase the power or energy of the water flowing in the stream, which can deepen or widen stream channels and cause streambank erosion.

Water chemistry: Urban development may increase the inputs of complex chemical mixtures typically found in runoff from impervious surfaces in industrial and suburban areas. These mixtures may include pesticides, nutrients, and hydrocarbons 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 erode the streambanks and scour the streambed.

common carp

fathead minnow

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

Cladophora spp.

cyanobacteria

Algae that are tolerant of pollution may increase in abundance with increased urban development. Diatom algae tend to decrease and nondiatom algae tend to increase with urbanization. Some algae-like bacteria and nondiatom algae, such as cyanobacteria or the green algae genus *Cladophora*, may increase in abundance to nuisance levels in the sunlight- and nutrient-rich conditions of many urban streams. These can be seen as long bands or strands of green slime on the surface of water and rocks.

leech

isopod

Macroinvertebrates that are sensitive to pollution may be lost as a watershed becomes urbanized. More-tolerant organisms—such as leeches and isopods—may increase in abundance. Leeches, such as the North American freshwater leech *Macrobdella decora*, are most common in warm, protected shallows where there is little disturbance from currents. Isopods (Isopoda) are tolerant of relatively low dissolved oxygen levels.

U.S. Geological Survey photos by Martin Gurtz (top and middle) and Wetland Studies and Solutions, Inc., photo (bottom).

Appendix Map
Channel Conditions-Map 3b

- 46 erosion sites
- 10 drain tile outfalls
- 8 tributary outlets

Thank you