IOWA RIVER
WATER TRAIL PLAN

Embracing the river

JOHNSON AND LOUISA COUNTIES • IOWA 2018

Embracing the river

IOWA RIVER WATER TRAIL PLAN

MAY 2018

ACKNOWLEDGMENTS

This Water Trail Plan written by Mimi Wagner of Iowa State University, John Wenck of Iowa Department of Natural Resources and Julie Ohde of Pathfinders RC&D. Lucas Buscher and Carol Williams of Iowa State University contributed research, analysis and editing. Julie Ohde provided local information, oversaw initial communication between Iowa Department of Natural Resources and the local project entities, and drafted the first version of each chapter. Dr. James Pease and EarthView Environmental Inc contributed technical data used in development of Chapter 1. Johnson and Louisa County Conservation Board staff provided leadership and local support of the project throughout the process.

The following individuals provided technical expertise, review and/or and data interpretation:

Heath Delzell, John Olson, Stephen Hopkins, Katy Reeder, Nate Hoogeveen, Jennifer Kurth,Kathryne Clark, Brandon Harland, Bruce Ehresman, Pat Schlarbaum, Jason Palmer and Ken Krire of Iowa Department of Natural Resources

Jerry Neppl and James Martin of Iowa Division of Agriculture and Land Stewardship

Richard Cruse, Daryl Herzmann, Stephen Dinsmore, Robin McNeely and Carol Williams of Iowa State University

Gregg Hadish of USDA Natural Resources Conservation Service

Special thanks for the information, review and feedback provided by the Van Buren County Trails Association; City of Iowa City; City of Columbus Junction; City of Wapello; Office of State Archaeologist; The Nature Conservancy, Iowa; Iowa Natural Heritage Foundation.

A Regional Steering Group advised and contributed technical materials to recreation development and resource conservation planning phases:

Mark L. Anderson	Office of State Archaeologist
Art Bettis	University of Iowa Professor, Earth & Environmental Sciences
Brad Freidhof	Johnson County Conservation, Program Manager
Greg Gelwicks	Iowa DNR, Fisheries Research Biologist
Larry Gullett	Johnson County Conservation, Director
Katie Hammond	Louisa County Conservation Board Director
Doug Harr	Iowa Audubon, President
Lisa Hein Programs	Iowa Natural Heritage Foundation, Senior Director for Conservation
Leo Keller	US Army Corps of Engineers Rock Island, Hydrologist in Water Quality and Sedimentation Section
Louise Mauldin	US Fish and Wildlife Service, La Crosse Fish and Wildlife Conservation Office, Midwest Fisheries Center
Vance Polton	Iowa DNR Natural Resource Technician
Kelly Schott	Meskwaki Natural Resource Coordinator, Sac & Fox Tribe of the Mississippi in Iowa
Josh Spies,	The Nature Conservancy, Eastern Iowa Field Office

Initiated and funded by the Iowa General Assembly and Governor Kim Reynolds

REVISION DATE: MAY 2018

Project Steering Groups in each county provided valuable insight and direction throughout all planning phases:

LOUISA COUNTY

Mallory Smith	City of Columbus Junction
Mary Johnson	Village of Fredonia
Brett Shafer	City of Wapello
Bonita Grooms	City of Oakville
Katie Hammond	Louisa County Conservation, Director
Ron Knopik	US Fish and Wildlife Service
Sally Flatland	U.S. Fish & Wildlife Service Refuge Manager
Al Bohling, Jr.	Tri-Rivers Conservation Foundation, Chair
Ron Durbin	Louisa County Trails
Denise Schieffer	Equestrian trail group or representative
Rondalyn Weyrick	Landowner
Pam Jackson	Landowner, Paddler
Lisa Wilson	Paddler
Paul Mayes	Resident
Merle Unkrich	Resident, Iowater Volunteer
Lana Artz-McComb	Louisa County Conservation Naturalist
Elizabeth Kling	Louisa County Conservation Board

JOHNSON COUNTY

Juli Seydell Johnson	City of Iowa City Parks & Recreation
Larry Gullett	Johnson County Conservation Director
Brad Freidhof	Johnson County Conservation Program Manager
Bill Waldie	Johnson County Conservation Board
Larry Wilson	Johnson County Conservation Board
Janelle Rettig	Johnson County Conservation Board
Mel Schlachter	Friends of the Iowa River
Dr. Gene Drazil	Landowner landowner
Lois Albrecht	Paddler / Trail User-paddler/ trails
Michael Zahs	Avocational historian, Resident
Rick Hollis	Bird Watcher, Resident
Kate Giannini	Johnson County
Becky Soglin	Johnson County
Kristopher Ackerson	City of Iowa City
Joan Morgan	Johnson County Historical Society Representative

Included but did not participate:

Bilotta, Joseph E, Campus Planning Director, University of Iowa

David Patton, University of Iowa Recreational Services

CONTENTS

IOWA DEPARTMENT OF NATURAL RESOURCES

GOVERNOR KIM REYNOLDS
LT. GOVERNOR ADAM GREGG
ACTING DIRECTOR BRUCE TRAUTMAN

August 7, 2018

One might think water trails are only for paddlers, but Iowa has learned that while paddling might be a good way to experience them, water trails benefit multiple user groups, municipalities, agencies, organizations, and the economy, improving the quality of life for Iowans across the state.

The DNR's work through water trail planning and development provides exciting opportunities that are ushering in a new legacy of enjoyment, respect, and care for the navigable waters of our state. It's rekindling the connection between people's interactions with the landscape and their respect and understanding of the water resource. We are connecting Iowans to the streams in their backyards and enhancing the appearances downtown riverside communities.

Once forgotten in years past, Iowa's navigable waters are beginning to take center stage. As they do, there is a need to bridge the divides among multiple user groups, offer opportunities for listening, brainstorming, and strategizing that results in sensible decisions for the waters that connect local communities. What works for one water trail might not work for another, and what works in one community might not work in another.

But that's what good planning does. Our strong commitment to local listening and our increased technical understanding of project feasibility will lead to plans that will serve to improve the quality of life of individuals and positively impact the local economies of Iowa communities for generations to come.

Sincerely,

Bruce Trautman
Acting Director
Iowa Department of Natural Resources

CHAPTER 1
EXISTING CONDITIONS

IOWA RIVER WATER TRAIL

CONTENTS

CHAPTER 1
EXISTING CONDITIONS

Paddling the 72-mile Iowa River Water Trail in Johnson and Louisa counties is to experience two very different rivers. While spectacular scenery, diverse habitat and sacred sites exist both and above the confluence of the Iowa and Cedar rivers, the geology, vegetation, wildlife and water is vastly different.

This river distinguishes itself in other ways as well. This segment of the river is downstream of the lowermost barrier to upstream fish passage—it is connected to the Mississippi River and is unimpeded by dams. As a result, unique fish species are found here that aren't present upstream. And nearly 71,000 acres of permanently protected land, often wetland and slough areas, exist within 10 miles of the water trail, one of the largest amounts of any state water trail. This segment was designated a state water trail in 2011 by the Iowa Department of Natural Resources (DNR). The first 20 miles is a rocky-bottomed river with many twists and turns while the last 20 is a wide, braided, sandy-bottomed river with just a few large sweeping bends. This planning linked historic river features and events to inspire both future conservation and recreation elements. Opportunities abound to interpret today's river resources through the lens of past river users and promote new types of recreational experiences.

An Introduction to Designated State Water Trails & this Chapter

Preparation of this existing conditions chapter included all of the most recent research related to recreation on the Iowa River, current access and launch inventory protocols, and established cultural and historic resource data sets. Anecdotal information on river use and conditions were provided by staff from Johnson County Conservation Board, Louisa County Conservation Board, the City of Iowa City, the City of Wapello and local paddlers.

Rivers become known as water trails when people paddle on them and begin to organize amenities to support paddling such as parking areas and launches. Water trails, in turn, also support uses beyond paddling. River edge amenities also engage anglers, those relaxing near the river, hunters, and students studying the ecosystem. We know that river recreation also has a substantial impact on the Iowa economy. A 2009 study by the Center for Agricultural and Rural Development (CARD) at Iowa State University estimated overall economic impact from recreation on the fifty largest rivers in the state for the year. Results concluded that recreational river use by Iowans supported over 6,350 jobs, $824 million in retail sales and $130 million of personal income.

The status of “state-designated” is reserved for water trails that represent the best paddling experiences in each region of the state. Not every county in Iowa will have a state-designated water trail. A set of Iowa criteria established in 2010 is applied to guide classification of state designated segments. This experience classification system allows paddlers to match water trail routes with their ability level. These criteria also help water trail managers, sponsors and trail volunteers select a classification assignment for each segment based on their management resources and abilities.

The careful assignment of experience classification is one of the most important steps in water trail development. In addition to meeting paddler expectations, a segment’s experience classification is also a driver for development and infrastructure funding. One of the most important outcomes of this Existing Conditions chapter is to establish the experience classification of the water trail as it exists today and recommend alternative strategies for the future of the water trail.

Development and management of this water trail is a collaborative effort between the two water trail sponsors, Louisa and Johnson County Conservation Boards. Other agencies managing accesses on the trail have taken less active roles in trail development but are engaged in the process. The Iowa River Friends, a statewide group focused on the Iowa River watershed, continues to be an advocate and active partner. The water trail sponsors and local steering committees will use the information included in this chapter to develop a vision for the future development and management and work together to implement this vision.

The River Itself

The Iowa River is a tributary of the Mississippi River that begins in Hancock County, Iowa. This segment of the Iowa River was classified a “meandered” stream in original public land surveys completed before Iowa received statehood. Meandered status generally allows river users access on-foot to channel bottoms and streambanks up to the ordinary high water mark. The geographic limits of this study include the river segment between Sturgis Ferry Access in Iowa City and its confluence with the Mississippi River *(Figure 1)*. This segment is 72 river miles in length and includes Johnson, Washington and Louisa counties. The watershed area draining into the study segment of the Iowa River is approximately 12,620 square miles.

The river is used for canoeing, kayaking, motorized boating, swimming, fishing, hunting and tubing. Four livery services exist near the water trail though none offer boat delivery or shuttle services on the entire water trail. University of Iowa Recreation Services in Iowa City rents canoes and kayaks to the public. Fin and Feather H2O at Terry Trueblood Recreation Area, also in Iowa City, rents canoes, kayaks and standup paddleboards but only for use within the park on its 95.5-acre Sand Lake. Liveries in Muscatine and Burlington, both approximately 22 miles away from the water trail, rent canoes and kayaks. The Muscatine business also rents trailers and car top carriers while the Burlington business also shuttles customers between the Wapello and Ferry Landing accesses.

Iowa River Friends is a statewide, membership-based group centered in Iowa City and dedicated to “enjoying, protecting and improving the Iowa River watershed.” The group hosts events, promotes river resource events put on by other groups and leads river cleanups. They hosted four river cleanups in the Iowa City area, a legislative forum on water quality and an interpretive event between the years of 2011-2014.

According to the Iowa Rivers and River Corridors Recreation Survey (Iowa State University 2010), the Iowa River was the destination for more visits in 2009 compared to any other river in the region *(Table 1)*. Compared to other rivers in the region, however, fewer users reported fishing and hunting while a greater percentage reported trail use. The Iowa River also had the smallest percentage of reported trips that included use of some form of boat in the region.

Figure I
Accesses on the Iowa River range from developed, urban parks to remote, stand-alone rural locations.

River Segment	Trips Reported to River in 2009	Fishing	Hunting	Boat with Motor	Kayak or Canoe	Swim, Tubing, Play in Water	Trails	Camping	Relaxing, Picnicking	Wildlife Watching
Iowa R.: Sturgis Ferry to Mississippi River (47)	761	30.2%	0.9%	17.3%	13.5%	7.1%	74.1%	15.9%	63.1%	47.4%
Cedar R.: Cedar Rapids to Iowa River (54)	685	36.8%	20.6%	25.1%	16.5%	14.2%	53.6%	20.6%	62.3%	48.9%
Skunk R.: North Skunk River confluence to Mississippi River (43)	316	63.9%	7.0%	42.7%	19.3%	14.2%	26.9%	31.6%	54.1%	38.6%
Lower Des Moines R.: Black Hawk Access to Mississippi River (26)	463	48.8%	3.2%	15.3%	4.3%	11.4%	32.2%	19.9%	48.2%	46.9%
Mississippi R. Muscatine to the Skunk River mouth (72)	621	56.8%	9.2%	46.4%	46.4%	31.2%	40.6%	24.2%	61.0%	28.0%

Table 1
*Recreational Use Reported on Southeast Iowa Rivers**
**Source: Iowa Rivers and River Corridors Recreation Survey 2009 (Iowa State University)*

WATER TRAIL EXISTING CONDITIONS

The 72 miles of water trail are divided by river access points into seven segments for the purposes of this planning *(Table 2)*. The water trail passes through one large city, Iowa City, with a population of 67,862 (2010 U.S. Census) as well as 4 additional downstream communities with populations ranging from 173 to 2,067: Riverside, Fredonia (River Forks Access), Columbus Junction and Wapello (Schwob Landing).

The river is sinuous between Sturgis Ferry Park and River Junction Access. The straight-line distance is 10.5 miles but the paddling distance is nearly double that length. The English River flows into the Iowa just below River Junction. The river widens from an average of 250 feet to more than 300 feet beginning at this point and has fewer, broader bends. The Cedar River joins the Iowa at river mile 30 of the water trail. The Cedar is a larger of the two rivers so the volume increases significantly and the character of river changes at the confluence. It becomes straighter and wider, with average widths of more than 700 feet. There are more islands continuing downstream as the channel meanders within the river bed.

In several places the floodplain is disconnected from the river by levees. In Johnson County, a levee half-mile downstream of Sturgis Ferry Park was completed in 2015 in response to damages from the flood of 2008. The levee protects a mobile home park and several commercial buildings. Multiple agricultural levee districts are in place in Louisa County, mainly protecting crop land and rural homes. The levee district at the confluence of the Iowa and Mississippi rivers also protects the City of Oakville. An additional levee offers protection to the City of Columbus Junction.

While there are no dams on the water trail, flow in the river is artificially controlled by a dam located 10 miles upstream from the start of the water trail. The purpose of the Coralville Lake dam is to moderate flow in the Iowa River and provide flood control in the river corridor. The reservoir also provides numerous recreation opportunities. Operation of the dam, managed by the U.S. Army Corps of Engineers, can impact paddling conditions. Water inflow and release rates typically match in non-flood conditions. However, release rates can be reduced during drought conditions to maintain reservoir levels, which make low-flow conditions even lower than natural drought conditions downstream of the dam. During flood conditions either in Iowa or elsewhere in the Mississippi River basin, more or less water than natural conditions may be released as levels in the reservoir approach the flood-control pool elevation. Paddlers encountering low flow conditions are required to pull boats across exposed sand bars in which adds time to the trip. At other times, the water levels may be higher than expected when paddlers reach the river.

Many fallen trees and large debris exist along the banks, but none of the logjams observed during a 2015 reconnaissance float blocked more than 30% of the channel. While logjams may create minor paddling hazards, the width of the river generally makes it easy to navigate around them. Considerable currents exist at the confluence of the Cedar and Iowa Rivers near River Forks Access. These currents as well as bridge abutments require navigation and skill to avoid. There are other bridges and abandoned abutments that need to be passed by with care including the bridge just downstream of Hills Access and the one just upstream of Schwob Landing in Wapello. Exiting the river at Ferry Landing Recreation Area can also be difficult due to piles of rip rap deposited within the channel. This debris is likely relocated from upstream streambanks during high flows. Experienced paddlers perceive these hazards as avoidable due to the width of the river. However, in some places the wide and open channel also lacks shade on sunny days, contributing to the effort it takes to make it down the river. A combination of low water, hot temperatures and a long excursion can result in an unpleasant experience for those not expecting it.

Segment	Segment Distance	Dams	Logjams >30%	Rapids	Stream wide Fences	Paddling Use Volume*	Beginner Friendly
Sturgis Ferry Park to Hills Access	9.5	0	0	0	0	Heavy	
Hills Access to River Junction Access	9.8	0	0	0	0	Moderate	
River Junction Access to River Forks Access	24.0	0	0	0	0	Light	
River Forks Access to Highway 61 Access	10.1	0	0	0	0	Light	
Highway 61 Access to Schwob Landing	3.8	0	0	0	0	Light	
Schwob Landing to Cappy Russell Access	10.0	0	0	0	0	Light	
Cappy Russell Access to Ferry Landing Recreation Area	5.5	0	0	0	0	Light	Yes

Table 2
Iowa River Water Trail Segments, Johnson, Louisa and Washington Counties
**Use volume estimates are relative only to other segments in the county and were generated by anecdotal observations*

Water Trail Access Points

There are eight existing public accesses on water trail, all in Johnson and Louisa County *(Table 3)*. Two privately-owned river accesses also exist and have the appearance of being public. A private launch between River Junction and River Forks accesses, near river mile 46, resembles a public launch. It is signed with the name “Up Docks” and is located near a cluster of homes and cabins. The second private access is located in Louisa County near river mile 41. The access is located less than 50 feet from County Road X Avenue and is used by local residents as though it were a public access. The land is owned by Bonnie Jean Conrad. The Conrad access includes an excavated launch with gravel surface and concrete waste rubble placed along the bank. Parking spaces have been cleared in the road right of way. Other private river accesses exist but are clearly associated with one cabin/home and paddlers would not be likely to assume they are public ramps.

A range of public facilities and use opportunities are available at water trail access points *(Table 4)*. Hills is the only access with a full range of public facilities including drinking water. Camping is allowed at five of the eight accesses while three have no amenities at all.

Land managers visit the accesses for maintenance purposes such as mowing and parking lot grading. Frequency of visits range from once or twice per week in warm weather months to monthly during the winter. Land managers stated that boat ramps are cleared of silt and debris as soon as possible after flood waters recede. Parking lots and access roads receive rocking and grading as needed. Mowing is done on a regular basis. A signage inventory and plan has not been completed for this water trail. However, many way finding signs are present on highways most bridges have official water trail signs for river users.

Facility Where Access is Located	Access ID	Access Owner & Manager*	Launch Type	Streambank Height
Sturgis Ferry Park	72	City of Iowa City	Motorized Boat Ramp	10
Hills Access	63	Johnson CCB	Motorized Boat Ramp	4
River Junction Access	53	Johnson CCB	Motorized Boat Ramp	6
River Forks Access	29	Louisa CCB	Motorized Boat Ramp	4
Hwy 61 Access	19	Louisa CCB	Unimproved Carry Down	3
Schwob Landing	16	City of Wapello	Motorized Boat Ramp	5
Cappy Russell Access	6	Louisa CCB	Motorized Boat Ramp	2
Ferry Landing Recreation Area	0	USACE	Motorized Boat Ramp	2

Table 3

Water Trail Access Ownership and Basic Characteristics

**CCB = County Conservation Board; USACE = United States Army Corps of Engineers*

Facility Where Access is Located	Water Trail Access ID	Restrooms	Amenities at Launch	Distance from river to drinking water (ft.)	Camping
Sturgis Ferry Park	72		None	-	
Hills Access	63	Yes, vault	Picnic tables	90	Yes
River Junction Access	53	Yes, vault	Picnic tables	-	Yes
River Forks Access	29		Bench	-	Yes*
Hwy 61 Access	19		None	-	
Schwob Landing	16		None	-	
Cappy Russell Access	6		None	-	Yes*
Ferry Landing Recreation Area	0	Yes, vault	Picnic tables	-	Yes

Table 4

Water Trail Access Amenities

**Primitive camping allowed. No services provided.*

Recreational Conditions Related to the Water Trail

Average vertical streambank heights on this water trail range between 2 and 10 feet at access points *(Table 3)*. The fairly low gradient channel, particularly downstream of its confluence with the Cedar River, transports an enormous amount of sediment. High streambanks make developing low gradient river access points difficult without large amounts of earthwork. Launch surfaces on streams of this nature also often become clogged with silt and other debris following high flows, requiring clearing.

Many of the existing river accesses in the county pose challenges for use *(Table 5)*. Launches that are too steep (generally those exceeding 15% with the exception of the push-in section) pose use limitations for the elderly and others, including small children and those with disabilities. Walking or carrying a paddle craft down a launch grade that is overly steep can also be compounded by a surface that is either too smooth or loose (leading to slipping) or rough (leading to tripping).

The angle of the launch as it relates to the river alignment often becomes a determining factor for the amount of sediment deposition resulting on it. Those built perpendicular (90 degrees) to the channel also generally collect the most sediment and debris. Launches built on the outside bend of rivers are also very vulnerable to damage and destruction when lateral channel migration occurs.

The Highway 61 Access in Louisa County is undeveloped and has never been a formal, constructed access. The launch site is a vertical sand and soil depositional streambank. The ability to access and use this launch is dependent on water levels. According to 2016 Iowa Flood Center mapping, this access location is inundated with more than 8 feet of water at the 10-year recurrence level (10% Annual Chance) flood. The Highway 61 bridge will be re-designed and constructed in the next 5 – 10 years. Final design plans were not available at the time of this planning.

Several other river launches and parking areas are also located on land that is extremely low in the river channel including River Forks, Cappy Russell and Ferry Landing Recreation Area. This type of location is a limiting factor in the number of days they can be accessed and used. Locations such as this also typically result in higher annual maintenance costs such as regarding and gravel re-surfacing.

Facility Where Access is Located	Access ID	Parking Stall Count	Distance Between Parking & River (ft.)	Path Slope Max.%	Vehicle Access to River is Possible	Launch Slope Max. %	Launch Angle to River (degrees)	Existing Experience Classification of Access
Sturgis Ferry Park	72	18	85	0	Yes	15	45	Recreational
Hills Access	63	8	74	0	Yes	15	45	Recreational
River Junction Access	53	4	22	0	Yes	20	45	Recreational
River Forks Access	29	16	62	6	Yes	12	45	Recreational
Hwy 61 Access	19	10	5	NA	No	NA	NA	Challenge
Schwob Landing	16	12	18	0	Yes	22	80	Recreational
Cappy Russell Access	6	20	50	0	Yes	14	90	Recreational
Ferry Landing Recreation Area	0	8	74	10	Yes	11	90	Recreational

Table 5
Water Trail Access & Launch Relating to Use and Maintenance. Yellow-shaded cells indicate conditions recommended for enhancement.

River Management Conditions on the Iowa

The majority of law enforcement adjacent to the water trail, with the exception of DNR enforcement, is conducted by the Johnson, Louisa and Washington county sheriff offices. Iowa City and Wapello have city police who are called to the accesses in their respective towns, but all incidents on the river itself are considered county jurisdiction.

The Johnson County Sheriff's Office uses an 800 MHz digital communication system. The digital system is used county-wide by all public safety responders including natural resources enforcement who have been provided with radios by the county. Communication with entities not on the 800 MHz system is via point-to-point VHF radio.

The Louisa County Sheriff's office uses an analog system that is primarily VHF radio but also includes UHF. All other Louisa County law enforcement, fire and rescue (except natural resources) use the same system. The DNR enforcement officer can monitor Louisa County operations and Louisa County dispatcher can communicate with DNR on two separate frequencies. However, most communication between dispatch and DNR is by cell phone.

The Washington County Sheriff's office uses a system that is primarily VHF radio but also includes UHF. All other Washington County law enforcement, fire and rescue (except natural resources) use the same system. The DNR enforcement officer can monitor Washington County operations and Washington County dispatcher can communicate with DNR on two separate frequencies. However, most communication between dispatch and DNR is by cell phone. Washington County also uses MACH (Mobile Architecture for Communications Handling), an Internet communications architecture that allows public safety agencies to share information, including real-time location of all personnel on the system. Natural resources law enforcement is provided by Iowa DNR District 4. Currently, two conservation officers are assigned to Johnson County (one mainly serves in Iowa County but also covers Johnson), one officer is in Louisa County and another officer covers Washington County (along with Keokuk County).

Emergency services are provided by fire and rescue departments from eight communities on or near the river as well as the Johnson County Dive Team and Washington County Rescue. Iowa City has a professional fire and rescue department. Hills, Riverside, Lone Tree, Conesville, Columbus Junction, Wapello and Oakville have volunteer departments. A dive team from Muscatine (about 18 miles from Highway 61 Access) can be called in to Louisa County through mutual aid. Johnson, Louisa and Washington county emergency management offices help with coordination between agencies.

In Johnson County, all fire and rescue departments along with the Johnson County Sheriff's department have basic water rescue training. Fire and rescue in Iowa City as well as the Johnson County Dive Team have training in swift water and ice rescue. Riverside Fire and Rescue has ice rescue training. Washington County Rescue has training in rope and ice rescue training. Johnson County Conservation has two rangers who respond to calls at their accesses but do not have training. In Louisa County, Wapello Fire and Rescue has training in general water rescue and ice rescue. All DNR officers have training in general water rescue, swift water rescue and use of sonar. All fire and rescue departments except Conesville have boats, including the sheriff departments in Johnson and Louisa counties as well as the Johnson County Dive Team and Washington County rescue. Each department has the equipment needed to support its specialized training which may include ropes, throw-ables, ice rescue suits, and sonar imaging.

There were 23 drowning deaths on the Iowa River in Johnson County between 1992 and 2016, nine of which involved alcohol and/or drugs (Johnson County Coroner, personal communication, 2017). Of the 6 deaths related to boating, three occurred on the river as a result of a low-head dam while the other three occurred on Coralville Lake. The most recent boating-related drowning on the Iowa River was recorded in 1994.

The frequency of calls to law enforcement and rescue officials for medical assistance or boating accidents on the Iowa River has been low in all three counties with an average of one per year by the departments answering these calls. Boating accidents and/or rescues usually involve a medical emergency unrelated to boating. During periods of very low water, however, river users sometimes call law enforcement for assistance because they consider themselves stranded. This is either because they have been on the water much longer than expected or because it has gotten dark and they are unprepared. Both Louisa and Johnson counties utilize local media to notify the public that dangerously high water levels exist on the river. The Ferry Landing Recreation Area Access is blocked with a gate when the Mississippi River gauge at Lock & Dam 17 (MET) reaches 14.0 feet.

Agencies reported the following concerns regarding river rescue:

- Difficulty locating people who called 911 from the river because of few landmarks. General concern was expressed that this problem could increase if the volume of unprepared users increases
- Concerns about the lack of public roads access to some segments of the river. The counties currently do not have emergency plans for access to these segments that are coordinated with local landowners.
- Need for improved communication between Louisa County dispatch and USFWS and USACOE regarding closure of the gate at Ferry Landing Recreation Area during high water.

As stated earlier, aligning how a river is managed with the type and volume of water trail users is a key goal of the state water trails program. Generally, Iowa DNR finds that the greater the volume of use and the shorter the segment length, the greater need exists for management of people and river conditions. Both types of management are important and needed. River condition management includes the level of ongoing removal of large woody debris snags and the maintenance of launches; Appendix A aligns the level of river management expected for the four types of experience classification on state-designated water trails. People management can include littering and disruptive behavior, as well as illegal activities such as vandalism, alcohol consumption while paddling, and trespassing; Appendix B aligns people management elements suggested for experience classifications.

Current river and people management of this water trail most closely aligns with the Recreational experience classification with the exception of one segment. Several issues relating to river use and safety were identified during the water trail planning process. These issues included the need to develop emergency access routes to the river, a system to assist river users in communicating their location to county 911 and improved communication between the Army Corps of Engineers regarding locked gates at Ferry Landing Recreation Area.

Existing Water Trail Experience Classification

Current river and people management of this water trail most closely aligns with the Recreational experience classification with the exception of one segment. The River Junction to River Forks segment is classified as a Challenge segment due to its 24 mile length. The water trail is neither overly difficult nor set up to match the criteria developed for beginning paddler experience, confidence, and/or those not physically strong and agile. Appendix C, Water Trail Experience Classification Summary, summarizes key elements from the classification criteria (Wagner and Hoogeveen 2010).

The most heavily used portions of the water trail are those nearest Iowa City where high populations exist although access to the river in this area is the least developed. There are few amenities at rural accesses beyond parking and the launch. None of the accesses on this water trail are constructed specifically for use by special needs populations (including the elderly and those with small children).

Social Considerations

Johnson and Louisa county conservation boards sought designation of the water trail in 2011 and serve as the water trail sponsors. Five of the eight accesses are county conservation board areas. Three communities with water accesses, Iowa City, Columbus Junction and Wapello, have been active in this planning and are also supportive of the water trail. Iowa River Friends are also supportive of the water trail, were active in developing this chapter and will be an important partner in future efforts.

Landowner input concerning development of the water trail has been mixed. Landowners attending a meeting held in Iowa City were very supportive of the effort and excited about the opportunities it offered. At a meeting in Wapello, three landowners expressed concerns about trespassing by paddlers and increased littering but other landowners at the meeting were supportive of the water trail. There have been no other concerns from the general public about the water trail.

Context of the River

PHYSICAL CONDITIONS ON THE IOWA

How a river moves over the landscape across time is of interest to landowners, historians, and researchers, as well as the general public. The Iowa River water trail has one of the highest amounts of measured change in channel location from the mid- 1800's to present of any river studied for potential designation in 2014 - 2016. Two types of data were included in this analysis including aerial photograph reconnaissance and a planform comparison of channel alignment changes in the past thirty years.

Channel Conditions

Several quantitative methods for estimating channel change are available even with limited data. Historic maps provide the earliest suggestions of river alignment in Iowa. However, river alignment on early maps can't be quantitatively compared with later aerial photography because the maps were drawn with much different accuracy standards. For example, Government Land Office (GLO) surveyors of the mid-1800's as well as the 1875 Andreas Atlas preparers were required to verify the river crossing locations only at section lines (Anderson 1974). However, important generalizations can be made about historic channel shifts and the extent of modifications despite this comparison limitation.

The GLO mapping survey for Johnson and Louisa counties was completed between 1837 and 1842. River alignment on section lines from this survey was compared with those on the 1875 Andreas Atlas to provide context for changes during the first fifty years following Euro-American settlement. Aerial photography was used to compare channel alignment between 1939 and 2010. Lastly, the GLO and 1875 alignments were compared with 2010 aerial photography.

The average lateral channel movement on section lines for the Iowa River during this time is 0.17 miles of shift per section line (one mile increments)—the third highest average change of any of the 12 rivers studied.

A quantitative comparison of aerial photography from 1980 and 2010 also identified an active, naturally meandering channel. The river is largely left to naturally respond to changes in the watershed as well as with climate. Alignment of the river channel today represents an irregular meander pattern (Rosgen 2014). Numerous instances of downstream meander migration were identified, some resulting in lateral shifts of up 150 feet on outside bends.

Figure 2 illustrates downstream meander migration between the 1930's and 2010. Natural channel migration occurs as the river system works to dissipate energy associated with its water as it adjusts to changes in precipitation, sediment inputs and channel slope. Channel slope for the Iowa River near its confluence with the Mississippi is likely less steep compared to upstream segments. Low channel slopes are associated with a higher degree of meandering.

A comparison of the 1837-1842 GLO survey and 2010 aerial photography identified much larger changes in river planform, including multiple instances of meander cutoff. Formally known as avulsions, channel cutoffs occur when a portion of the channel, usually a bend, is rapidly abandoned during high flows in favor of a shorter, higher gradient channel route. An interesting and historically significant example straddles the boundary between Johnson and Louisa counties, just east of the curve on 250th Street stretching to where the river crosses the southern border of section 5 *(Figure 3)*. The avulsion occurred sometime between 1840's and 1930's. The segment of channel cut off by the avulsion included a feature

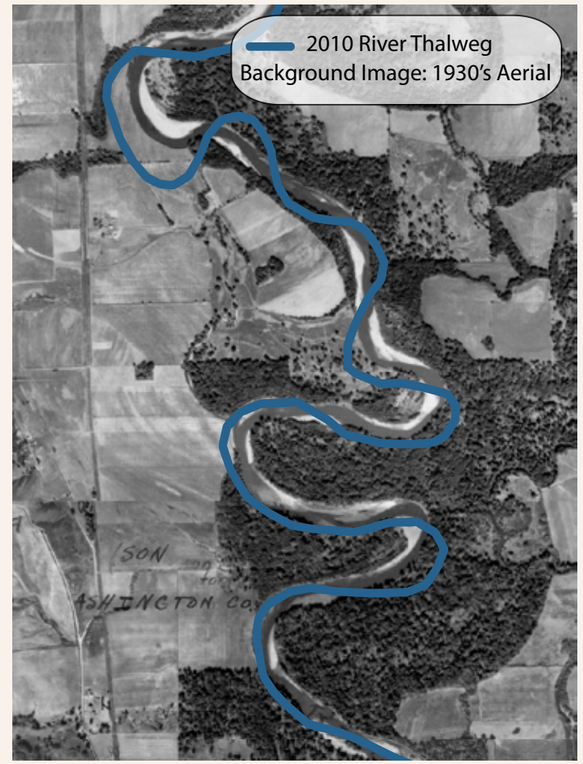


Figure 2
Downstream channel migration is found on many segments of the Iowa River. As the river naturally meanders, the meanders also move downstream exhibiting the planform seen in this graphic.

named “Buttermilk Falls.” This set of rapids was well-known for the hazard it created for steamship pilots. The abandoned section of channel retains water even today and is considered sovereign land because it is the former active channel bottom of a meandered stream.

The Iowa River in Johnson, Washington and Louisa counties appears to be relatively free of alteration or channelization. The river segment upstream of Brookwood Drive in Iowa City may have been channelized prior to the 1930’s, but the modification was minor. A more obvious alteration exists at the river section immediately surrounding Hills Access east of the community of Hills.

The segment of the river near Hills is interesting also from a channel change standpoint. The river is 0.9 miles shorter in length today compared to the 1840’s *(Figure 4)*. The river changed course drastically at some point between the 1840’s and 1930’s, including a lateral migration of miles to the east. Then, at some point between 1970 and 1980, likely as a result of flood damage and reconstruction of the 520th Street road crossing, the channel was straightened and moved 0.4 miles back to the west.

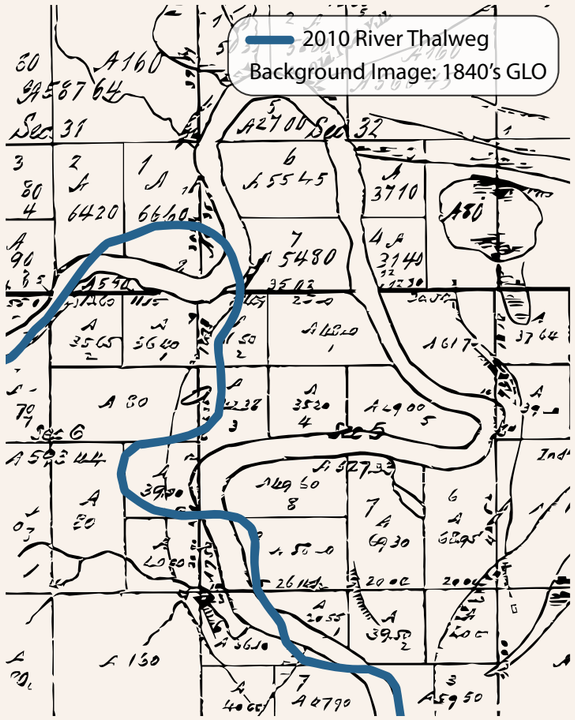


Figure 3
A meander cutoff shortens the length of a river segment by cutting the overall distance of a river. This example of avulsion reduced the channel length by 2.4 miles.

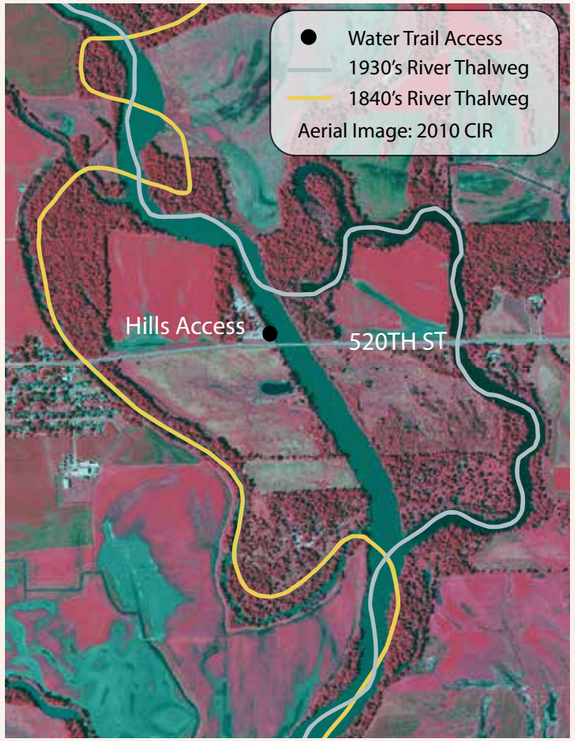


Figure 4
While a majority of the Iowa River is allowed to naturally migrate, this segment near the community of Hills illustrates straightening.

Streambank Conditions

There is moderate to severe erosion on much of the streambank. The most severe erosion typically occurs where there is minimal perennial riparian vegetation.

While the Iowa River channel has shifted a great deal compared to the mid-1800’s, there has been less change in sinuosity and length since 1980 *(Table 6)*. The total study length is only slightly more than 1% longer today compared to its 1980 length suggesting the river is fairly balanced in terms of channel stability. Likewise, sinuosity overall has only increased measurably in only one segment.

Segment	Straight Line Length (mi.)	1980 Length (mi.)	2010 Length (mi.)	% change in length between 1980 – 2010	1980 Sinuosity
Sturgis Ferry Park to Hills Access	6.18	9.47	9.53	+1%	1.5
Hills Access to River Junction Access	4.70	10.01	10.24	+2%	2.1
River Junction Access to River Forks Access	19.47	24.81	25.05	+1%	1.3
River Forks Access to Highway 61 Access	9.09	10.07	10.17	+1%	1.1
Highway 61 Access to Schwob Landing	2.67	4.09	4.09	0%	1.5
Schwob Landing to Cappy Russell Access	9.01	10.73	10.69	0%	1.2
Cappy Russell Access to Ferry Landing	5.11	5.03	5.26	+5%	1.0

Table 6
River Channel Calculations for Iowa River, Johnson and Louisa Counties

Riparian Landcover Conditions

The edge or transition between an aquatic ecosystem and its upland area is known as the riparian zone. Riparian areas are linear in shape and occur along the margins of all water bodies including wetlands, lakes and rivers. The vegetation or other cover on the land surface in the riparian zone is considered the riparian land cover. Land cover in a riparian area has a strong influence on water quality, streambank condition, the rate of lateral channel migration and habitat both on the land and in the adjacent aquatic area. Research consistently shows that perennial riparian land cover such as trees, shrubs and native grasses are more beneficial for all ecosystem services compared to development or annual row crop land cover. Row crop activity at the top of tall and steep streambanks cause further instability in streambank soils and often exacerbate eroding streambank conditions. This is due to the nature of annual vegetation root systems and the use of heavy agricultural machinery near the fragile edge of the streambank.

A riparian area is often referred to as a "buffer" when perennial land cover is present. Landowners often intentionally establish perennial vegetation buffers near stream edges for conservation purposes. In other cases, vegetation buffers establish naturally because the area is not cropped. The optimal width of riparian buffer vegetation is dependent upon its intended goals. Common buffer designs range from a minimum of 100' to greater than 500' depending on the purpose of the buffer and watershed conditions (Bentrup 2008). Of the 12 corridors studied in 2014 for potential designation, the Iowa River water trail was among those with the highest percentage of wetland vegetation acres in the buffer area.

Riparian areas within 100' of the top of streambanks on both sides of the Iowa River were evaluated using land cover data from the 2016 cropping year to better understand the presence or absence of perennial buffer vegetation *(Figure 5)*. The water trail corridor was divided into segments based on river access points. Land cover in each of the seven segments was divided into five types: annually-cultivated crops, perennial grass and alfalfa, forest or predominantly tree cover, wetlands, and other (pavement, buildings, barren and gravel). Acres of each land cover type were calculated for each segment and the total acres of each are shown in *Table 7*.

	Sturgis Ferry Park to Hills Access	Hills Access to River Junction Access	River Junction Access to River Forks Access	River Forks Access to Hwy 61 Access	Hwy 61 Access to Schwob Landing	Schwob Landing to Cappy Russell Access	Cappy Russell Access to Ferry Landing Recreation Area
Annually Cultivated Crops	23.9 (10.6%)	13.2 (5%)	28.2 (5%)	3.8 (1%)	0 (0%)	1.6 (1%)	0 (0%)
Perennial Grass & Alfalfa	28.6 (12.6%)	24.2 (10%)	91.9 (16%)	29.3 (11%)	1.2 (1%)	8.1 (3%)	1.3 (1%)
Forest	86.6 (38.2%)	91.7 (38%)	195.5 (33%)	6.0 (2%)	0 (0%)	1.2 (0%)	0.3 (0%)
Wetland	48.9 (22%)	110.2 (46%)	254.4 (43%)	214.3 (80%)	127.6 (94%)	252.3 (88%)	198.4 (99%)
Other	38.7 (17%)	1.4 (1%)	22.6 (4%)	14.8 (6%)	6.8 (5%)	24.3 (8%)	0 (0%)
Totals	226.7 (100%)	240.6 (100%)	592.6 (100%)	268.2 (100%)	135.6 (100%)	287.4 (100%)	200.1 (100%)

Table 7

Land between River Forks Access and Ferry Landing Recreation Area had the least amount of annually cultivated land cover in the 100' buffer either side of the channel. 2016 crop year acres for each land cover type are shown below as well the total percent of each type within a water trail segment.

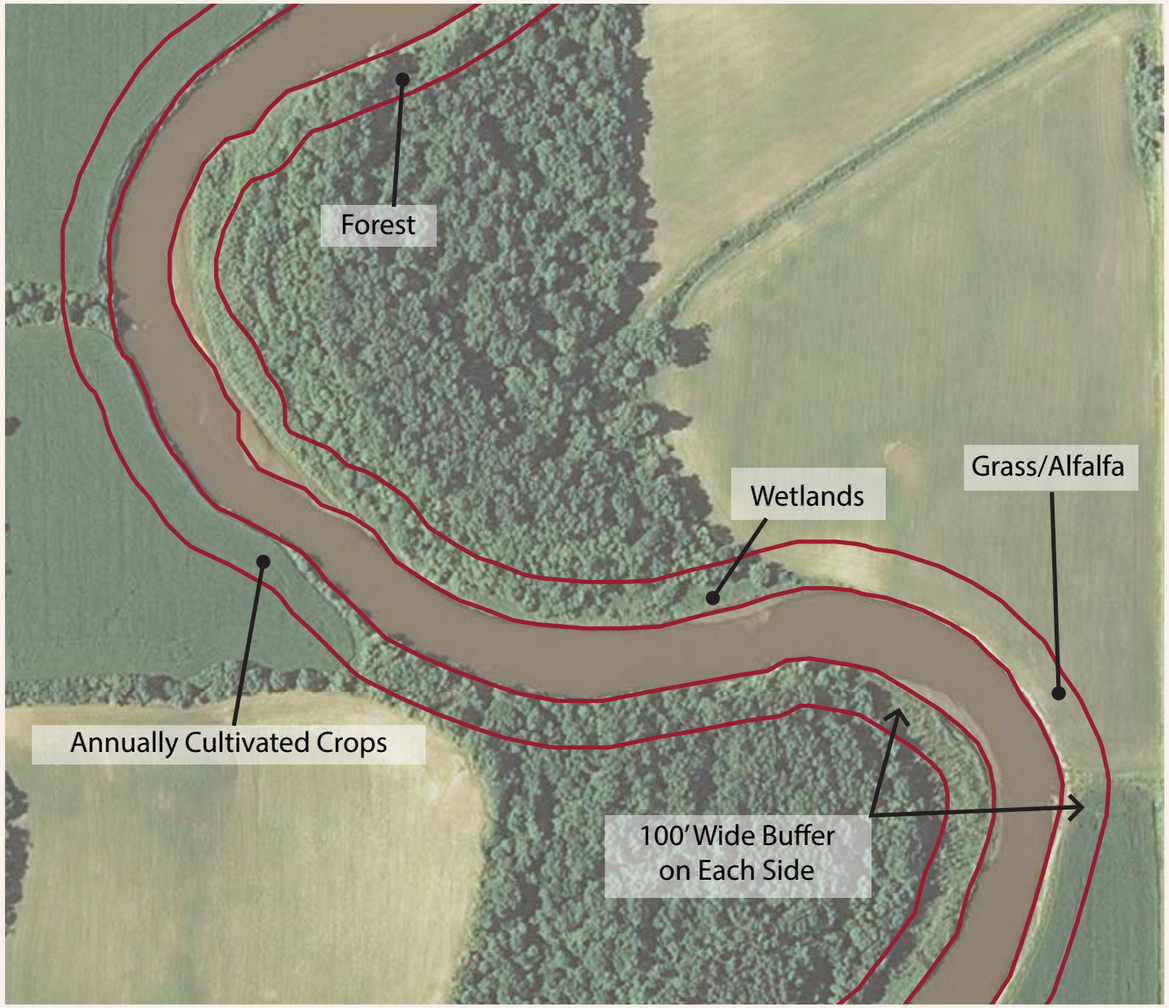


Figure 5

Red lines illustrate the top of the streambank and a distance approximately 100' away from the edge. Landcover inside these lines was identified for the length of the water trail. A perennial buffer is present on 96% of the acres included in this 100' buffer Iowa River water trail.

Segments on the Iowa River Water Trail contained one of the highest percentages of wetlands and one of the lowest percentages of grassland acres compared to other rivers studied. All seven segments except one, Sturgis Ferry to Hills, are comprised of at least 91% perennial land cover.

Looking at the water trail corridor as an entire unit, 90% of the total acres in the first 100' on either side of the channel are perennial land cover while 4% are annually cultivated crops *(Figure 6)*. Of all the water trail segments, the Sturgis Ferry to Hills Access segment includes the highest percentage of annually cultivated crops on the water trail with 11%.

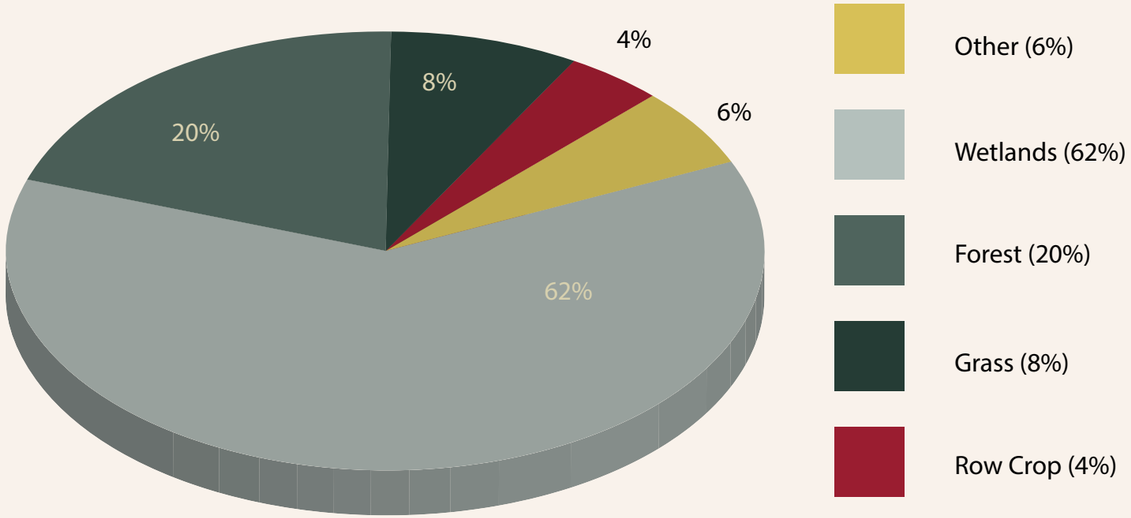


Figure 6
Ninety percent of the stream edge acres along the water trail are comprised of perennial land cover, which is helpful for soil stabilization, wildlife habitat and views from the water.

Water Quality Conditions

Discussions about water quality nearly always focus on the concentrations of various elements such as dissolved oxygen, nutrients and pesticides. In addition to these chemical characteristics, physical and biological characteristics also factor into the quality of streams, rivers, and lakes. Physical characteristics are the ones we generally can see, smell or taste such as the temperature or the turbidity (cloudiness) of the water. Biological characteristics include the presence or absence of bacteria as well as the diversity of aquatic insects and fish species. It is increasingly recognized that other physical factors such as wide and shallow channels, channel beds dominated by fine sediments, bed and streambank instability, and fragmentation by culvert crossings or dams can limit biological diversity. Measuring water quality involves comparing the concentrations of selected chemical, physical and biological elements with state standards that define water's suitability for a particular beneficial use such as swimming, aquatic life protection, drinking water source, or fish consumption. Aquatic life in a stream segment is also assessed using rigorous biological monitoring methods that allow ranking of biological quality. Water quality standards are important because they help identify many types of water quality problems. Standards are particularly helpful in assessing and solving water quality problems stemming from point sources of pollution including municipal wastewater discharges, industrial operations and mining sites. Standards do not currently exist in Iowa for nonpoint source pollutants such as nutrients and sediment.

Impaired Waters

According to Section 303(d) of the federal Clean Water Act, a beneficial use of a water body is considered "impaired" when the water in the river segment or lake is sampled and fails to meet any one of the standards set to protect that beneficial use. Federal regulations require that all states compile and submit to EPA a list of waters considered "impaired"; this list is updated with new data every two years. States must prepare a water quality improvement plan for all Section 303(d)-impaired waters to show how the impaired beneficial use can again be fully supported. Only when additional monitoring shows that the all standards are met and the beneficial use is again fully supported can the impairment be removed. In practice, Iowans are swimming, fishing, and boating waters whether or not they meet the water quality standards.

Nearly all segments of the Iowa River in Johnson and Louisa counties are included on Iowa's 2012 List of Impaired Waters *(Figure 7)*. Eleven tributaries in Johnson or Louisa counties draining into the water trail study segment are also included on the list (Muddy, Ralston, Old Man's, Picayune, an unnamed tributary to Snyder, Prairie, Honey, Short, and Otter creeks and the English and Cedar rivers).

All impaired segments of the Iowa River included in this study are due to high levels of indicator bacteria (E. coli). Tributaries listed as impaired are either due to high levels of indicator bacteria or biological monitoring results or both of these factors. The degree of impairment due to bacteria in the segment of the Iowa River between the Coralville dam and University of Iowa (UI) campus is very slight. The lowest levels of bacteria in Iowa rivers occur below the federal flood control reservoirs (such as Coralville, Red Rock and Saylorville). However, there are enough tributaries within this assessment segment of the Iowa River (such as Clear Creek and Muddy Creek) that the river picks up just enough indicator bacteria to exceed the bacterial impairment thresholds at the Army Corps monitoring station in the lower portion of the segment on the UI campus.

The Muddy Creek tributary, although it remains on the impaired waters list, is an excellent example of the water quality improvement process. Beginning in 2006, poorly treated wastewater from North Liberty resulted in sewage sludge and high levels of ammonia, which resulted in an impaired designation. Since then, North Liberty has upgraded and changed their wastewater treatment process. Volunteer monitoring beginning in 2011 observed that the accumulations of sewage sludge in pools had been eliminated and that water quality conditions were improving. The creek remains on the impaired waters list, however, due to the lack of current monitoring that confirms the improved conditions.

Figure 7
A majority of the water trail is listed on Iowa's 303d List, as well as many tributaries draining into the water trail.

Contaminant Sources

Iowa DNR lists a total of 138 contaminant sources within 0.3 miles of the Iowa River in Johnson and Louisa Counties *(Table 8)*. Contaminant sources include potentials for contamination of water resources based on the type of operation.

Several closed municipal landfill sites exist in Iowa City adjacent to the Iowa River. One of these sites, now known as Mesquakie Park (misspelling intentional), was located on 64 acres of land south of today's McCollister Boulevard. The site of Mesquakie Park was included in land originally deeded to the Meskwaki and Sauk Tribes by the U.S. Government which is likely the reason this name was assigned. The landfill was actually a dump site due to the fact that the site wasn't lined, compacted, capped, managed or monitored. The municipal dumpsite began operation around 1964 and closed in 1971 (Gerhardt 1974). The site of a second municipal dump, City Garage Dump, is now known as Sturgis Ferry Park and contains a river access. Both sites were given their "park" names as dump operations were drawing to a close. Initial design ideas in the 1970's focused on developing a linear riverfront park although this idea was not pursued. The EPA Superfund Branch conducted an assessment of both dump sites in late 1988 and early 1989. Monitoring wells at Mesquakie Park detected chromium and lead at levels exceeding drinking water standards, and iron and manganese exceeding Secondary Drinking Water Standards (Damman 2015). Additionally, heavy metals arsenic, barium, chromium, copper, iron, lead and manganese were all found to be leaching from the buried refuse. No clean up or remediation of the refuse has occurred or is planned. Meskquakie Park does not appear in City of Iowa City park maps and is no longer being considered for use as a public natural area. The land is now used as the city's transportation department's staging area.

Contaminant Source Type	Total Within 0.3 miles of River*
Contaminated Sites	2
Hazardous Materials Spill	20
Land Application Site	2
Large Quantity Hazardous Waste Gen.	1
Leaking Underground Storage Tanks	26
Other Hazardous Waste	1
Solid Waste Facility	1
Tier II Chemical Storage	5
Underground Storage Tank	33
Unsewered Community	2
Wastewater Outfall	35
Wastewater Treatment Facility	10

Table 8

Contaminant sources include locations from which contaminants are known to exist. The list does not imply contamination of surface or groundwater has occurred.

**Source: Iowa Department of Natural Resources, 2011*

Water Quality Initiatives

Communities, county and state entities have been successful in obtaining more than $27 million in the past 15 years in funding and low interest loans to address water quality issues in the Johnson County portion of the water trail's watershed. Successful funding has targeted both agricultural and urban non-point as well as urban point source pollution sources. The largest portions of funding and low interest loans awarded in the watershed address urban point and non-point source pollution issues. A total of $20.9 million in the form of a low interest loan were awarded to North Liberty for wastewater treatment plant upgrades. An additional $2,472,400 was awarded for urban stormwater treatment practices in North Liberty, Coralville, Kalona and in Johnson County. Grant awards for practices and professional planning addressing agricultural non-point source pollution totaled $1,416,047 for work in Deer Creek, Sub-sub Clear Creek, Rapid, Price and English Creek watersheds. Lastly, Lake Macbride State Park received nearly $3 million in grants to address water quality enhancement for the lake. Lastly, Kent Park Lake, an impaired water body in Kent Park, is undergoing watershed and lake restoration to enhance water quality conditions. Costs for the total watershed improvement-related work, including lake restoration, is budgeted at $3.5 million with $1.7 million potentially coming from outside sources.

Ecoregion & Drainage Basin

This segment of the Iowa River Water Trail is situated within two ecoregions, the Upper Mississippi Alluvial Plains and the Rolling Loess Prairies ecoregions *(Figure 8)*. Nearly the entire study segment is located in the Upper Mississippi Alluvial Plains ecoregion; only one other state-designated route, the Odessa Water Trail, exists in this ecoregion. The Rolling Loess Prairies ecoregion contains four additional designated water trails: Des Moines, Middle and Wapsipinicon rivers, and Lake Red Rock.

The concept of "ecoregions" is used to characterize and group geographic areas with similar climate, soils, and topography. Together, these three elements result in specific plant and animal patterns and form distinct ecological patterns unique to each eco-region.

The Upper Mississippi Alluvial Plains ecoregion is smooth to irregular in topography and river channels within the ecoregion have undergone drastic changes in the last 100 years. Large reaches of the river have been channelized and numerous low dams with locks have been constructed upstream from St. Louis. The potential natural vegetation of oak-hickory forest, northern floodplain forest, and tall grass prairie has all but been replaced. Soils are deep, silty and clayey alluvium (Chapman et al. 2002).

Loess deposits on well-drained plains and open low hills characterize the Rolling Loess Prairies. Loess deposits tend to be thinner than 25 feet in depth. Potential natural vegetation is a mosaic of mostly tall grass prairie and areas of oak-hickory forest (Chapman et al. 2002).

The drainage basin or watershed area draining into this segment of the Iowa River Water Trail includes 8,077,101 acres *(Figure 9)*. Only seven percent of the watershed (602,611 acres) is located in Johnson and Louisa counties. A majority of the watershed acres (67%) was annually cultivated cropland in 2013 *(Table 9)*. Developed areas, including roads, neighborhoods and buildings, totaled 9.5% of the watershed.

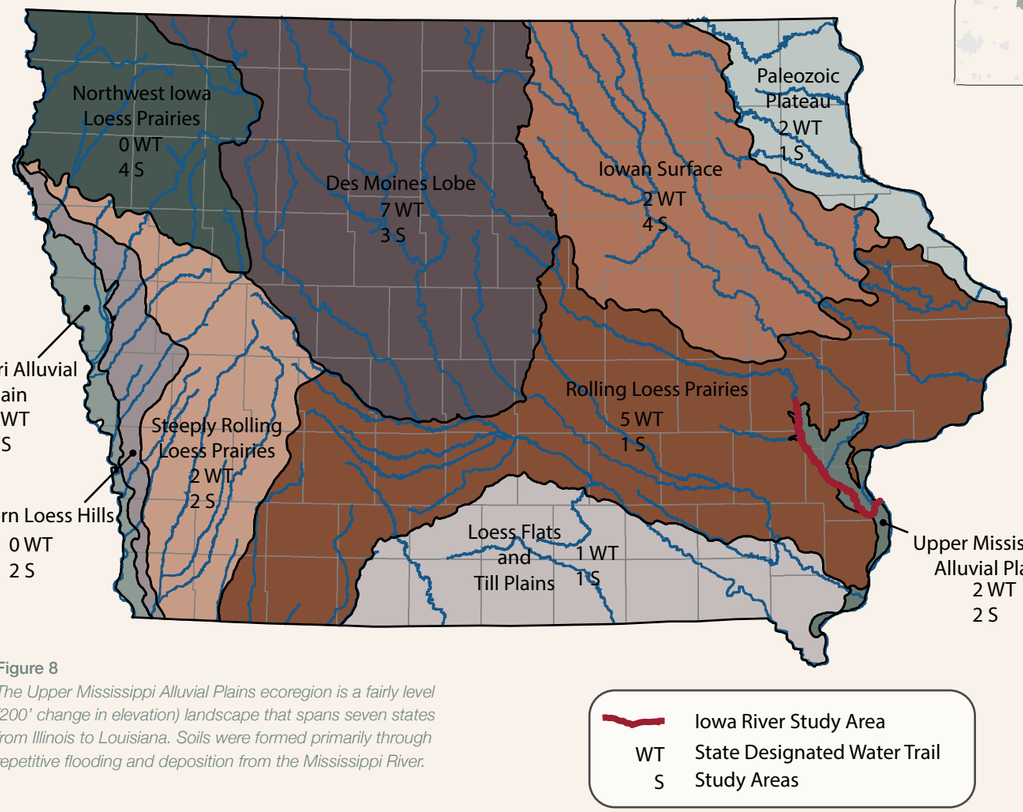


Figure 8

The Upper Mississippi Alluvial Plains ecoregion is a fairly level (200' change in elevation) landscape that spans seven states from Illinois to Louisiana. Soils were formed primarily through repetitive flooding and deposition from the Mississippi River.

Figure 9

The study segment is located in the bottom portion of the watershed. Therefore, this portion of the river is influenced by the entire watershed.

Land Cover Type	2013 Acres*
Annually Cultivated Crops	5,432,276
Grassland, Pasture, Alfalfa	1,346,153
Forest, Woodland, Shrubland	344,763
Wetlands	186,280
Developed Land	767,629
TOTAL ACRES IN WATERSHED	8,077,101

Table 9

Land cover from the 2013 crop year was used to characterize the watershed that supplies the Iowa River Water Trail in Johnson and Louisa counties. The proportions of land cover types are very typical compared to other rivers studied in 2014.

** Land Cover Source: USDA National Agricultural Statistics Service, Cropland Data Layer 2013*

GEOLOGIC RESOURCES

The Iowa River Water Trail is located in a region with unique landforms including Pleistocene aged terraces, outwash areas and eoloian deposits. The 323-mile Iowa River has its beginnings in Hancock County located in north central Iowa. During the Wisconsinan glacial period, the Iowa River was the primary drainage for the eastern portion of the ice sheet and carried millions of gallons of water to the southeast part of the state where it eventually merged with the Mississippi River (Anderson 2014).

North of Iowa City, the river flows through bedrock-controlled topography, which limits the extent of its flood plain. South of Iowa City, and for the entire length of the river trail, there is less bedrock and the river flows through a very broad flood plain. The current channel is small in comparison to its valley. This is a result of the massive volume of water carried when the glaciers melted, eroding a much larger valley, and leaving the undersized channel seen today.

CULTURAL AND HISTORIC RESOURCES

Much of what is known about prehistory and early Euro-American settlement in Iowa relies on the professional documentation of archaeological and historic sites maintained by the Office of the State Archaeologist (Anderson 2014). Cultural and historic resource information included in this summary relies heavily on the 2014 OSA Phase IA archaeological reconnaissance survey along water trail corridor (bluff top to bluff top). The investigation compiled and summarized prior archaeological investigations, previously recorded archaeological sites and architectural resources, National Register of Historic Places, known cemeteries, and unrecorded historical properties of possible interest. The purpose of the Phase IA investigation was to develop priority areas for further study due to possible future development and to provide information to assist with development of interpretive materials in the water trail corridor. The Phase IA survey identified 599 recorded archaeological sites and 1,606 architectural resources with associated Iowa Site Inventory numbers. Additionally, 1 structure (smokehouse), 326 buildings, three sites and seven historic districts are listed on the National Register of Historic Places (NRHP).

The state inventory of sites, however, is only part of the picture. Many additional primary and secondary sources are also available that add much to the story of this segment of the Iowa River. The small sampling of information in this chapter is offered as a starting point for further research and discussion.

Prehistoric Cultures and First Nations

The Iowa River provided access to the interior of what is now Iowa for thousands of years *(Figure 10)*. The earliest human occupation documented in this area is from the Paleo- Indian period from 9,500 to 7,500 B.C. (Anderson 2014). Various cultures followed over the next ten thousand years as people were drawn to both the river and the abundance of other natural resources within the Iowa River valley.

Of the 504 prehistoric sites identified within the study corridor, 49 were identified as burial mounds. Seven of the prehistoric sites are associated with the Paleo-Indian culture, 50 with the Archaic, 146 Woodland, and 123 Late Prehistoric. The remainder of the sites were either multi-component or were unable to be associated with a specific prehistoric era. More recently, between 1829 and 1839, several Indian village sites existed in the study area. A total of fifteen Sauk and Meskwaki archaeological sites have been identified, including two Meskwaki village sites and Gilbert's Trading Post, which were in use by 1830. Keokuk's Village, located on the Iowa River about 12 miles upstream of the Mississippi, was active from 1829 to 1836. Chief Wapello also had three villages in the study area, one on the Cedar River and two in close proximity to the present town that bears his name (Gourley 1990).

The written history of the area often mentions the use and occupation of the Iowa River Valley by First Nations for years prior to and during euro-American settlement. Four hundred

Figure 10
Effigy Pipe from southeast Iowa, representative of the Hopewell Interaction Sphere. Courtesy of University of Iowa Office of the State Archaeologist.

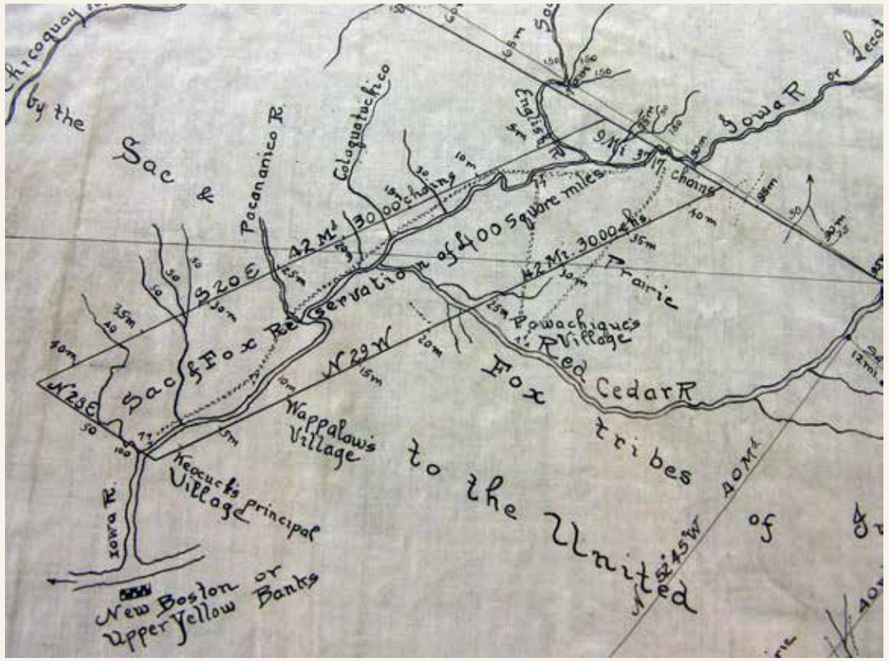


Figure 11
1835 Charles de Ward Map showing Sac and Fox Lands, courtesy of State Historical Society of Iowa, Des Moines Early Transportation on the Iowa River.

square miles, including most of the Iowa River water trail study corridor, was held in reservation through Keokuk's Treaty of September 21, 1832 *(Figure 11)*. Keokuk, a Sauk leader, was recognized by the U.S. as the head chief of the "Sac and Fox Tribe"—which was actually the combined Sauk and Meskwaki tribes *(Figure 12)*. His position as head chief over both tribes and the establishment of the reserve were provided as reward for essentially neutralizing Black Hawk's fight against U.S. encroachment on Indian lands at Saukenuk Village near the confluence of the Rock and Mississippi rivers. Wapello, Poweshiek and Appanoose were Meskwaki chiefs who also had villages in this area during this time.

The entire Iowa River corridor up to its headwaters was an important resource for the Sauk and Meskwaki prior to 1836. The Meskwaki consider the Iowa to be their original home river (Buffalo, personal communication, March 15, 2015). An account of the Sauk and Meskwaki following the Iowa River to its headwaters to hunt buffalo in the summer of 1833 is retold in a February 1935 Palimpsest Article by William Petersen. In 1836 the area included in Keokuk's Treaty was ceded to the U.S. government, and the Meskwaki and Sauk moved to areas west along the Des Moines River.

Figure 12
Portrait of Sauk Chief Keokuk, painted by George Catlin, Courtesy of the University of Iowa, Office of the State Archaeologist

European Settlement

It's not surprising that, like the native cultures before them, the first Euro-Americans traveled and settled along major rivers and their tributaries. Rivers offered banks of timber to build log cabins and hunt wild game, an abundance of fish, and immediate access by flat-boat to downstream markets to sell or trade their surplus commodities, such as cheese, butter, wheat, and maple syrup (Marsh 1925). "Settlers established farms along the Mississippi, Des Moines, Cedar, and Iowa rivers. Most newcomers took up timberland, knowing, as had earlier pioneers, that wood and water were essential for successful settlement" (Schwieder 1996, p. 36).

Early settlers relied on a variety of craft for transporting goods and people. Between the 1830's and 1840's the keel boat—capable of carrying 20 to 40 tons of freight--was the most popular on larger rivers like the Iowa, Cedar, and Des Moines. It was poled by a crew of six to ten individuals. Lewis and Clark used a number of these on their journey up the Missouri in 1805. Keel boats were convenient traveling downstream, but poling them upstream was slow going and took quite an effort. Keel boats were later pushed by steamboats. Todd's Landing near Columbus City and Fredonia were popular ports for keel boats for shipping grain downstream on the Iowa. In fact, a fleet of keel boats named after Mexican War heroes were constructed by Captain Joe Luckett and launched from Todd's Landing in the late 1840s (Weaver 1974). One boat, the General Wadsworth, sank in the Iowa River below the City of Wapello.

The flat-boat was a "roofed craft about forty feet long, twelve feet wide, and eight feet deep [and]…managed by six oars..." (Van Der Zee 1905, p. 193). It was a downstream-only craft that was sold or abandoned at its destination.

In his 1899 article, "Early Steam-boating on the Iowa River," H.W. Lathrop recalls:

In the late forties and early fifties, before the iron horse made his advent here, our merchants were in the habit of building flat boats and keel boats in the winter, and sending out in them on the flood tide in the spring to St. Louis, the pork they bought from the farmers at one dollar and a half to two dollars and a half per hundred, and the corn and wheat at ten to fifteen cents, and thirty-five to fifty cents per bushel. These boats were never returned, but were sold to be used in the Mississippi River trade. In this trade a boat was occasionally sunk with its cargo before reaching the Father of Waters (46).

Because rivers were so important to early transportation and communication in Iowa country, many early laws protected navigation on navigable streams. Action was first taken in 1839 by the Territorial Assembly to improve navigation on a river in the Iowa territory, the Des Moines River. Dams built on the Des Moines and some other rivers during this time were required by law to include a lock system that would maintain navigation (Van Der Zee 1905). These laws remained in effect until the railroad arrived with a more convenient and dependable means of transportation.

Steamboating

Steamboats were by far the major transporters of commodities such as lead and grain by the 1840s. During the period of the heaviest settlement in Iowa, However, steamboats were carrying more people than anything else. "Between 1850 and 1870 steamboats were jammed from stem to stern with immigrants hailing from the four quarters of the Union and from many foreign countries" (Petersen 1941, p. 40). Although steamboats had operated on the Des Moines, Cedar, and Iowa rivers, most other interior streams didn't have the depth to support the draft of most steamboats.

Buttermilk Falls, the natural rapids feature described earlier in this chapter, was a well- known, significant hazard to all craft navigating the Iowa River in southern Johnson County during this time *(Figure 13)*. The falls feature was located "about a mile above where the river leaves the county altogether," and where the channel cuts through, "an ancient bed of 'drift' washing away the clay and leaving the boulders, large and small, scattered thickly along its bed, and the water rushing and foaming through them"(History of Johnson County 1836-1882). The boulders described were likely pre-Illinoian till, between 0.5 and 2.5 million years old based on the geology of this area, (Artz, personal communication, March 3, 2016).

The first steamboat on the Iowa River was the Science and was captained by S.B. Clark. It ascended the Iowa in low water conditions to Wapello in the fall of 1837. Petersen, in his book Iowa: Rivers of her Valleys (1941), relies on both secondary and primary sources to identify ten steamboats that plied the Iowa River in the study area between 1837 and 1866 *(Table 10)*.

It's likely that Petersen's list above is incomplete. In his book, Hail to the Chief: True Tales of Old Wapello, William O. Weaver (1974) identifies 18 additional steamboats that docked at Wapello's port: The Piasa, Herald, Hawkeye, Magnet, Daniel Hillman, Archer, Uncle Toby, Blackhawk, Yankee, Excell, Berlin, Orion, Eureka, General Halleck, Forest Queen, Turtle, Cedar Rapids, and Iola.

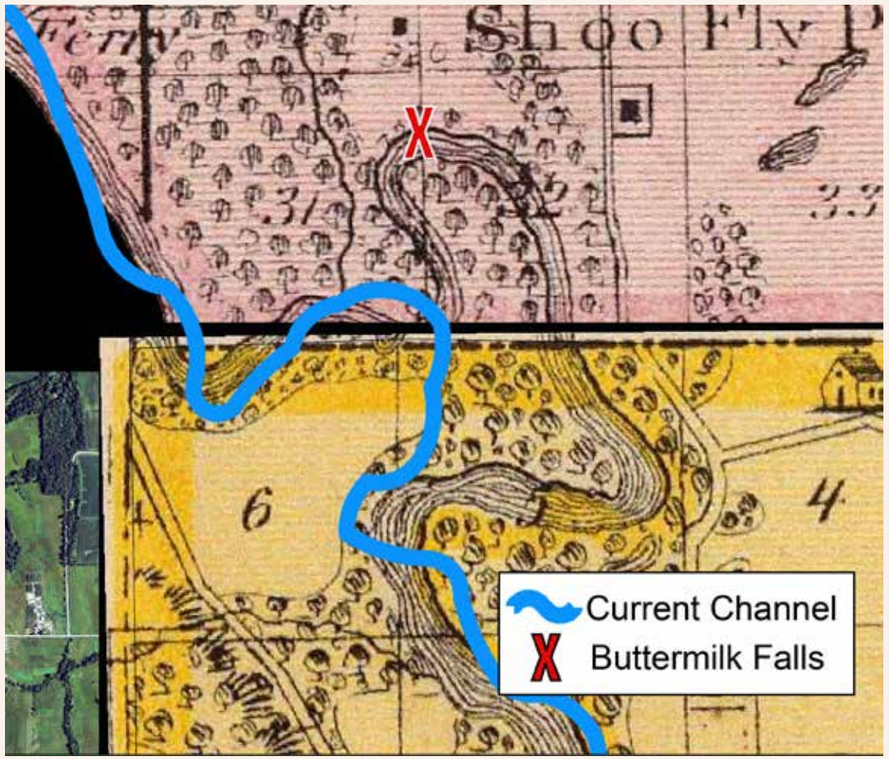


Figure 13
The approximate location of Buttermilk Falls and the active channel of the Iowa River overlaid onto 1875 Andreas Atlas pages for Johnson and Louisa counties.

Steamboat Name	Destination from Mississippi River	Years	Details
Science	Wapello	Fall 1837	1st steamboat on Iowa River; captained by S.B. Clark in low water conditions
Pavilion	Up to Columbus Junction	May 1838	50 passengers and commanded by William Phelps
Ripple	Iowa City	June 20, 1841	Capt. D Jones, eventually joined the Mormon trek west and Ripple never returned to Iowa City (Petersen,150)
Rock River	Iowa City and 12-miles upstream to quarries	Apr 21, 1842	Rock River made two full trips to Iowa city in Apr 1842 with both passengers and freight.
Agatha	Iowa City	March 12, 1844	64 ton stern-wheeler; 119 x 19 feet, 3 foot draft
Maid of Iowa	Iowa City	June 2, 1844; July & September 1844	Capt Daniel Repshell; owned by Joseph Smith and the Mormon Church; first Iowa-built steamboat
Emma	Iowa city	June 22, 1844	66 tons, largest steamer to ascend to Iowa City; 127x18 feet, 3 foot draft
Reveille	Iowa City from Burlington	March 18, 1846	Semi-Weekly visits (2x/wk)
Badger State	Iowa City	1854	"refitted expressly to run on the Iowa River"
Iowa City	Iowa City	1866	Built and launched in Iowa City

Table 10
This list of steamboats that worked on the Iowa River was compiled using Petersen's 1941 publication. Some of these steamers known to have navigated the Iowa River were actually built on the river, such as the steamboat Iowa City (Petersen 1941, p. 148-152).

Ferries, Railroads and Bridges

Rivers presented a number of barriers to early settlement. Immigrants often settled the areas along rivers where it was easiest to cross. Whether crossing the Mississippi or any of the inland streams, early settlers relied heavily on ferry services prior to the construction of bridges. Prior to 1840 there was one reliable ferry service operating on the Mississippi, but by 1846 the "whole eastern border of Iowa became lined with [them]" (Van Der Zee 1905, p. 187). The first bridge across the Mississippi was built in 1855.

The first ferry at Iowa City was operated without a license by Benjamin Miller in the winter of 1838-39. It wasn't until March 6, 1840 that Johnson County Commissioners granted William Sturgis and Luke Douglas the right to operate a ferry at the newly surveyed Territorial capital. License fee was $5 and tolls were: 12.5 cents for footman; 37.5 cents for horse and wagon; 50 cents for yoke of oxen and wagon; 50 cents for one span of horses; 25 cents for man on a horse; 12.5 cents for each additional horse or yoke of oxen; 6.5 cents for each head of cattle in droves; 3 cents per head for each sheep and pig (Petersen 1935).

Additional research to identify the actual location of Sturgis Ferry and how it relates to the current access of the same name would be useful, especially with regard to interpretation. Locating former ferry sites increases our understanding of how early settlers related to rivers and fosters a deeper understanding and appreciation for local history. At least 3 significant former ferry sites have been documented on the Iowa River in Johnson County: an "ancient ferry site" above Buttermilk Falls, Stover's Ferry site one mile below Iowa City; and Folsom's Ferry (Irish 1868, p. 321-323). Other ferry sites certainly existed.

Tension between the development of railroad infrastructure and steamboat travel resulted in multiple government acts that restricted steamboat navigation on the Iowa River. Railroads required bridges and bridges impeded steamboat traffic. These acts opened the door for mill dams and bridges to be built on un-navigable segments. In 1868 a resolution in the State Legislature sought to declare the Iowa River north of Wapello "not navigable". In 1870 an act of Congress was approved declaring the Iowa "not navigable" above Wapello. The first bridge across the Iowa River was completed in 1874 (Petersen 1941, p. 153). In 1894, the segment of the river between Toolesboro and Wapello was declared un-navigable. And finally, in 1930, the U.S. Army Corps of Engineers declared the Iowa River "legally un-navigable except for 3 miles at its mouth" (Petersen 1941, p. 341). Many early bridge sites replaced ferries at the same locations.

Mill Sites Along the Iowa River

The first mills became operational, primarily on the smaller streams, in the state beginning in the 1830s. The mills produced power by harnessing the flowing waters of Iowa's streams. According to the first census in 1840, there were 118 mills operating in Iowa employing a total of 154 people. "By 1870 the Federal census enumerated 502 flour and gristmills and 545 sawmills—or more than a thousand mills in the Hawkeye State" (Petersen 1935, p. 20). The milling industry reached its peak in the 1880s, but the number of mills gradually diminished toward the end of the decade, and by 1930 there were only sixty-three grist mills operating in the state (Swisher 1940). Changes in agriculture production were likely the major cause of the decline in local mills. Local crop production shifted from wheat to production of corn, cattle and hogs. Fires, drought and insect infiltrations also negatively impacted the milling industry (Swisher 1940).

Most mill sites along the Iowa River were built along its tributaries. Swisher notes in his Iowa: Land of Many Mills, "Probably the first, and certainly one of the most serviceable and most widely known mills in the valley of the Iowa River during the early years, was the one built by David Switzer on Clear Creek near the present site of Coralville in Johnson County" as early as 1839 (Swisher 1940, p. 118).

This site and two other mill sites listed below are slightly outside the existing study area, but are significant in respect to the local history and adds to our overall appreciation of how early residents along the Iowa River were not only connected to it but dependent on it, as well.

Another of the first mills built on the Iowa River was Terrell's Mill in 1843 near Iowa City. It operated for more than 50 years as a "three-story frame building 22x40 feet with six runs of burrs" (Swisher 1940, p. 119). Later a wool-carding machine was added. The mill was abandoned, but the dam was given to the University of Iowa. The dam is now known as the "Burlington Street Dam" and is currently being targeted for removal or modification by the City of Iowa City. Because of the site's long history and cultural significance, additional research and documentation would add to the site's interpretive prospects and generate appreciation for the water trail. Modification or removal of this dam would encourage extending the water trail upstream.

In 1843 the Iowa City Manufacturing Company was organized and began construction of what became known to history as the Kirkwood Mill or mill at Coralville—it was fully operational by 1844 *(Figure 14)*. A village or settlement formed around the mill called Clarksville because the mill owner was Ezekiel Clark; it later changed to Coralville. In 1855, Samuel J. Kirkwood, Clark's brother-in-law, purchased a share in the mill and became its active manager. He became known as the "Kirkwood Miller" because he would show up to political meetings covered in flour. Kirkwood eventually became state senator, governor, US senator, and ultimately held the office of Secretary of the Interior under President Garfield. The mill and dam changed owners at least three times during its operation. In addition to a flour mill, the dam also was used for a paper mill, sawmill, woolen mill, and oatmeal mill. As with many of the early grist mill dams, it was converted into a power generating dam with electric plants in 1916. The dam was still generating electricity in 1940 when Jacob Swisher wrote his book Land of Many Mills, but ceased generating electricity in 1968 (Hibbs: Swisher 1940, p.121). In 1977 the Iowa River Power Company opened in the vacant buildings and continues as a popular restaurant today. The City of Coralville has improved the area around the site by installing metal interpretive panels conveniently located along the edges of a pedestrian trail along the river and on the bridge railings of the trail bridge that crosses above the dam.

A grist mill was constructed on the north side of Wapello in 1848 and operated successfully until the 1880s (Swisher 1940). This was one of the only mill sites south of Iowa City,

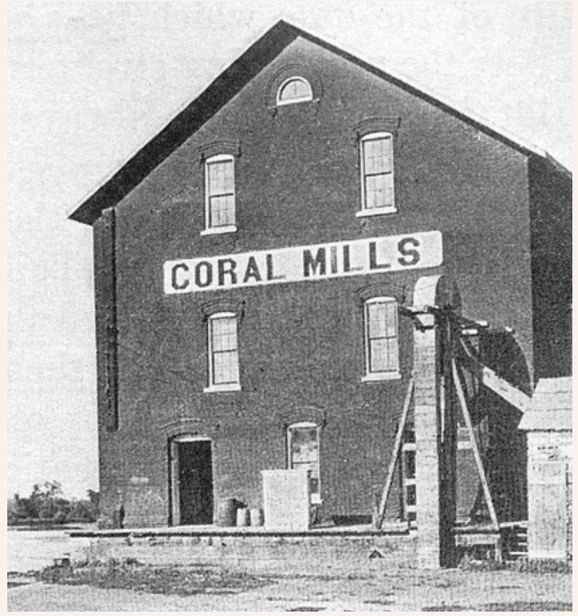


Figure 14
Flour mill at Coralville dam site, rebuilt in brick after fire in 1873; photo postcard courtesy of Bob Hibbs

and while it was built right on the Iowa River, it depended on a lengthy waterway that was converted into a mill race as its power source. The waterway emptied into the Iowa River at the mill site and was “improved” through widening and straightening of the channel *(Figure 15)*. A dam was also built on nearby Long Creek that diverted its water into the constructed mill race, increasing the water supply to the mill. The mill race was 5.5 miles in length. An interesting component to the mill operation was the development of a circular reservoir toward the lower end of the mill race that could hold water via a mechanized dam, perhaps most useful during low-water conditions. While the mill is gone, the mill race and reservoir are still visible from aerial photographs. Although there was more than one owner of the Wapello mill, the Druse Family was the noted millwrights and owners for many years (Weaver 1974). Further research would add the interesting history already known of this site, especially since the mill race and reservoir are still physically present.

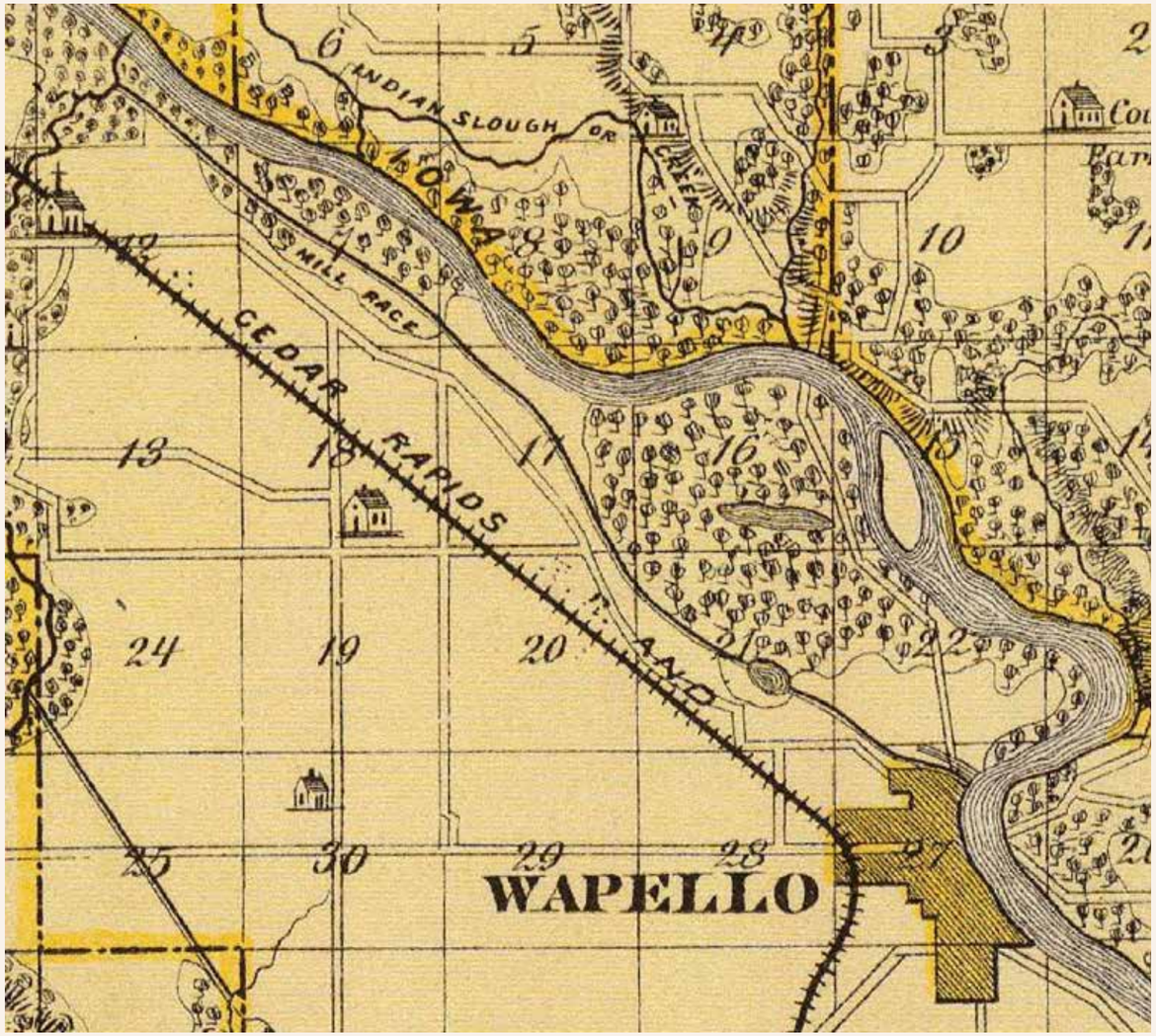


Figure 15
The long mill race and circular reservoir for the Wapello Mill are shown on this 1875 Andreas Atlas map.

Historic Structures

OSA identified 1,606 architectural resources with associated Iowa Site Inventory numbers, of which 38 properties are listed on the National Register of Historic Places (NRHP). Included in this list are Iowa’s Official Territorial Capital and first State Capital (known as the Old Capital Building) as well as the Plum Grove historic site, which was the retirement home of the first territorial governor of Iowa, Robert Lucas and family.

Further Historical Research Recommendations

The above represents just a small assemblage of information confined to just a few areas of interest surrounding the Iowa River study area. Further research is recommended with regard to additional industries that depended on the river for ice, lumber, pearl buttons, pottery, and others. Early recreation should also be researched. Boating, ice skating, and angling were popular recreational activities on and along Iowa’s rivers as early as 1860 if not earlier.

NATURAL RESOURCES

The Iowa River in Johnson and Louisa counties is an area of relatively high value to Iowa wildlife. Multiple special designations have been made by conservation organizations and/or agencies to certain areas within the corridor. These special designations are non-regulatory, and meant to highlight the unique value of the areas designated and to encourage conservation efforts to sustain their value to wildlife and people. Designations include the Southeast Iowa Amphibian and Reptile Conservation Area and multiple Important Bird Areas. Two non-profit organizations which are major contributors to conservation in Iowa, The Nature Conservancy and Iowa Natural Heritage Foundation, have identified this segment of the Iowa River as a conservation priority area.

Aquatic Species

Organisms living in the river ecosystem are one of the most obvious wildlife- related resources associated with a water trail. Various types of standard assessments quantify fish as well as benthic macro invertebrates. Benthic macro invertebrates are organisms without backbones we can see without magnification living on, in or near a river or lake. As described earlier, the aquatic species found living in a water body are directly related to its water quality and riparian condition.

Statewide analysis of the presence/absence of aquatic species was conducted in 2000. This analysis used Iowa's Ambient Water Monitoring data, which includes the highest quality species monitoring and water quality sampling data available. Fifteen years of monitoring data from reference sites were used to generally characterize conditions statewide based on ecoregion areas. From this analysis, the greatest diversity of native fish species and the highest number of macro invertebrate species on average were found in the Iowan Surface ecoregion. The Iowa River is located within the Rolling Loess Prairies and the Upper Mississippi Alluvial Plains ecoregions. Rivers in the Rolling Loess Prairies ecoregion had the highest total number of fish species of any ecoregion in the state.

Fish and benthic macro invertebrate data available for this segment of the Iowa River and its watershed suggest variable habitat conditions *(Figure 16)*. Compared with other state designated water trails, a large number of monitoring sites are located near the Iowa River. Some monitoring occurred because the sites are considered reference sites, meaning they have been selected to represent the best possible conditions in that ecoregion. Other sites were monitored as a part of other studies including academic research.

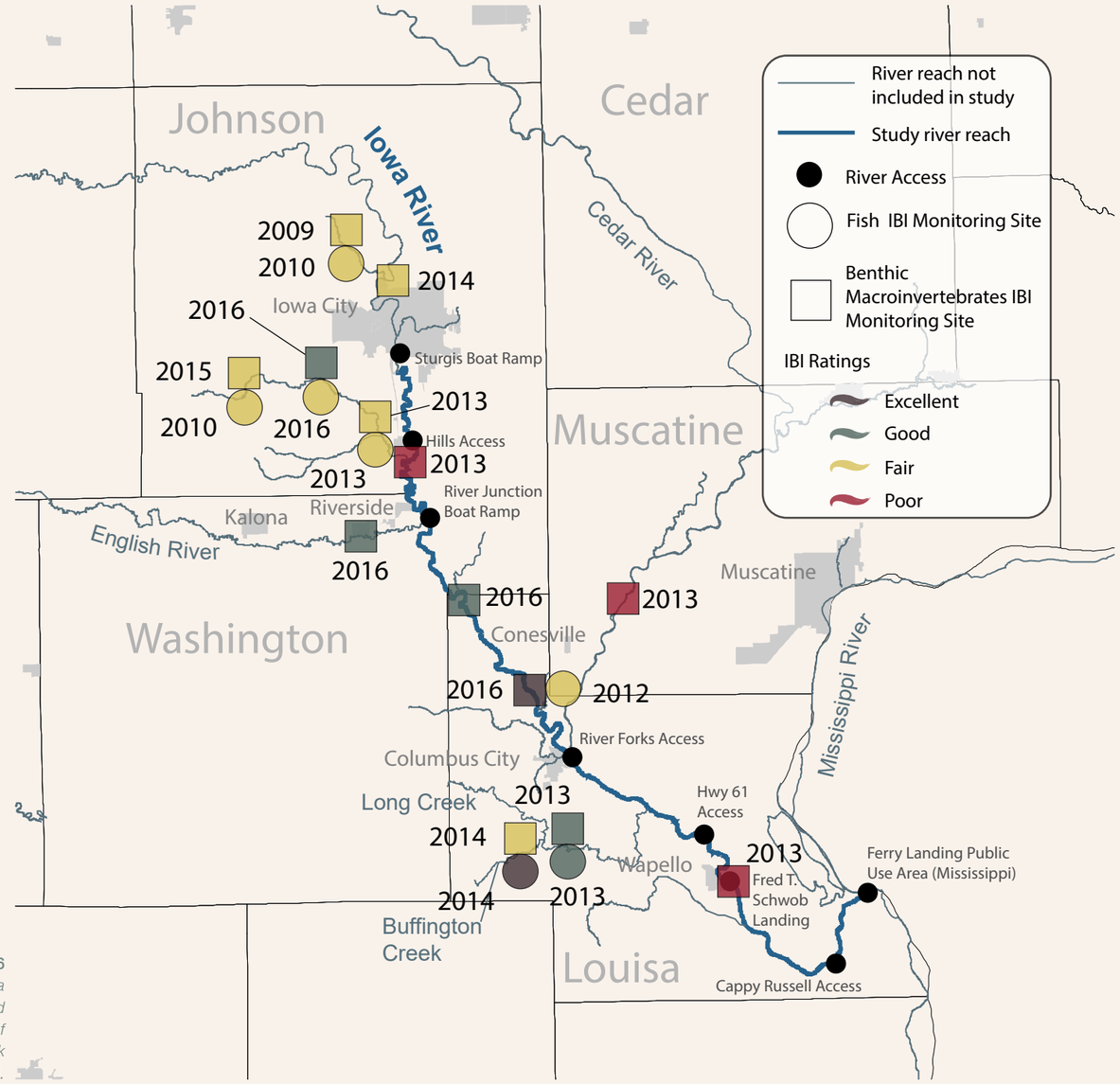
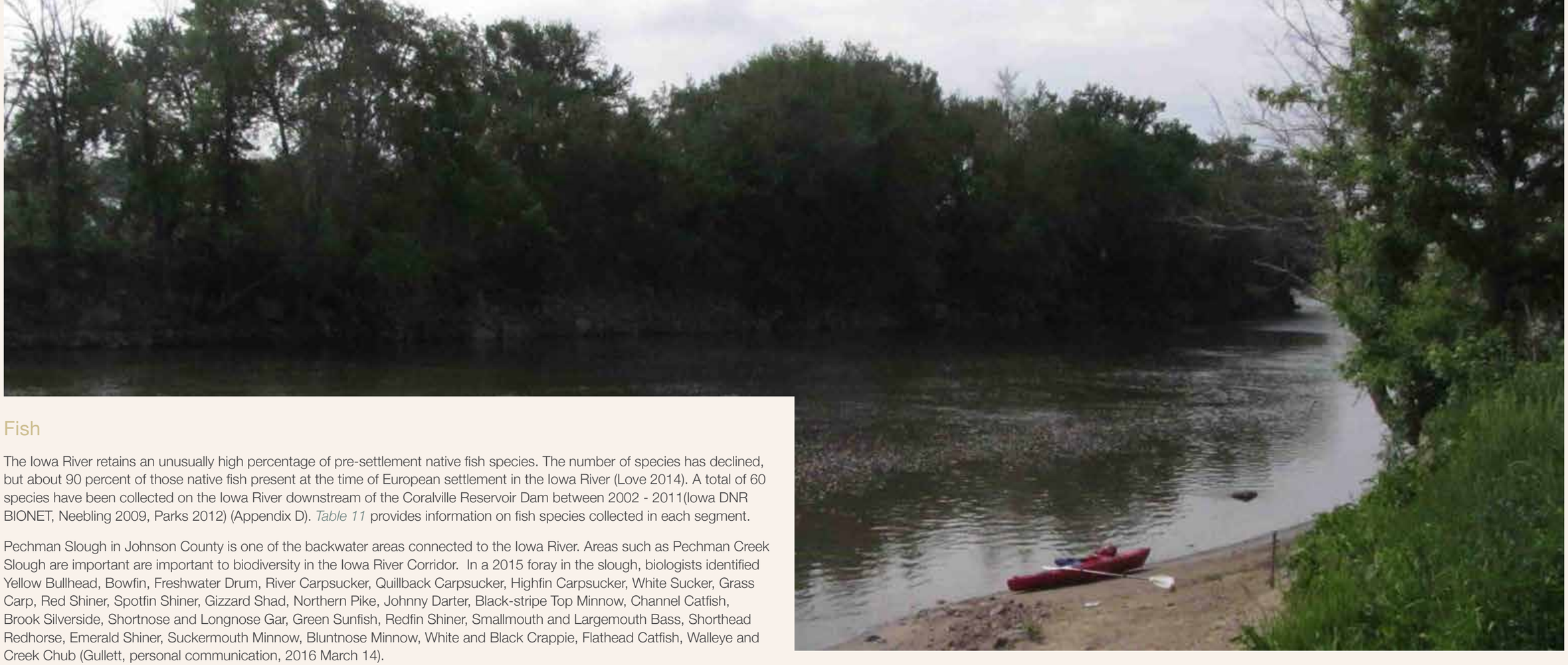


Figure 16

Fish IBI assessment sites do not exist on the Iowa River because it is not a wadeable stream. Reference sites in this watershed sampled since 2009 and shown on this map include one each on Old Mans Creek (3.5 miles northeast of Williamstown), Honey Creek (near its confluence with the Iowa River), Long Creek and Buffington Creek (both approximately 4 miles south of Columbus City).



Fish

The Iowa River retains an unusually high percentage of pre-settlement native fish species. The number of species has declined, but about 90 percent of those native fish present at the time of European settlement in the Iowa River (Love 2014). A total of 60 species have been collected on the Iowa River downstream of the Coralville Reservoir Dam between 2002 - 2011(Iowa DNR BIONET, Neebling 2009, Parks 2012) (Appendix D). *Table 11* provides information on fish species collected in each segment.

Pechman Slough in Johnson County is one of the backwater areas connected to the Iowa River. Areas such as Pechman Creek Slough are important are important to biodiversity in the Iowa River Corridor. In a 2015 foray in the slough, biologists identified Yellow Bullhead, Bowfin, Freshwater Drum, River Carpsucker, Quillback Carpsucker, Highfin Carpsucker, White Sucker, Grass Carp, Red Shiner, Spotfin Shiner, Gizzard Shad, Northern Pike, Johnny Darter, Black-stripe Top Minnow, Channel Catfish, Brook Silverside, Shortnose and Longnose Gar, Green Sunfish, Redfin Shiner, Smallmouth and Largemouth Bass, Shorthead Redhorse, Emerald Shiner, Suckermouth Minnow, Bluntnose Minnow, White and Black Crappie, Flathead Catfish, Walleye and Creek Chub (Gullett, personal communication, 2016 March 14).

Silver Carp, an invasive fish species native to large rivers in Eastern Asia, was first identified in the Des Moines River in 2003. Recent monitoring by ISU fisheries biologists and US Fish and Wildlife service biologists determine that while the fish is present in the study reach, there does not appear to be an overly large population.

River Segment	Fish Species Collected	Fish Species of Greatest Conservation Need
Species present both above and below Burlington Street Dam	32	3
Present only between Coralville Reservoir Dam and Coralville lowhead Dam (only)	5	2
Present only downstream of Burlington Street Dam (only)	28*	12 (includes 1 Threatened Species 1 Endangered Species)

Table 11

The Coralville and Burlington Street dams act as barriers for aquatic species. Fish reported in this table included Iowa DNR BIONET records as well as research from two master's theses (Neebling 2009, Parks 2012).

** Sixteen of these species are generally only found in Iowa's interior rivers downstream of the lowermost barrier to upstream fish passage (Gelwicks, personal communication 2016, March 2)*

Mussels

This segment of the Iowa River had both the greatest diversity of mussel species, the highest number of threatened and endangered species and the largest number of living individuals identified of any river studied for a potential water trail. Iowa DNR and Johnson County biologists have studied the river corridor for mussel presence (Gullett, personal communication 2016, March 14). *Table 12* includes a complete list of mussel species known to exist in the study area.

The Higgins' eye pearlymussel is a state-listed endangered mussel species. The Iowa River was part of the Higgins'eye historic range and is free from zebra mussels which made it an excellent candidate location for reintroduction. The Iowa River was also one of 3 rivers in the state where host fish inoculated with Higgins' eye larvae were re-introduced in 2003. Sexually mature individuals were identified for the first time in 2014 suggesting that the re-introduction has been successful.

Classification	Species
Endangered Species	Higgins' eye pearlymussel, Pistolgrip, Yellow Sandshell
Threatened Species	Butterfly
Species of Greatest Conservation Need	Giant Floater, Lilliput, Fawnsfoot, Hickorynut, Wartyback, Monkeyface, Mapleleaf, White Heelsplitter, Paper Pondshell, Flat Floater
Other Species	Pimpleback, Threeridge, Wabash Pigtoe, Threehorn Wartyback, Deertoe, Fragile Papershell, Pink Heelsplitter, Pink Papershell, Black Sandshell, Fatmucket, Plain Pocketbook, White Heelsplitter, Pimpleback

Table 12

Three of nine state-listed endangered and one of six state-listed threatened species of mussels were documented in 2013 as a part of the statewide mussel survey. This represents the greatest diversity of mussels of any river studied in 2014 for water trail designation.

Amphibians and Reptiles

The nation's first Amphibian and Reptile Conservation Area (ARCA) designation was made in southeast Iowa in 2007. Approximately 93% of this water trail route flows through this conservation area. The area is approximately 470,000 acres of public and privately-owned land in the region nearly synonymous with the Iowa-Cedar Lowland region within the Mississippi River Alluvial Plain landform *(Figure 17)*. A total of 12,957,897 acres of Iowa land drains into this conservation area. This region is Iowa's most diverse in terms of the number of amphibian and reptile species known to be present (Iowa DNR 2012). Eighty-percent of all native amphibian and reptile species in Iowa are known to be present in this area including 15 species included on Iowa's threatened and endangered species lists (LeClere 2013). These animals rely on both aquatic and terrestrial habitat areas adjacent to water bodies particularly savanna landcover which offers both sun and shade for temperature regulation.

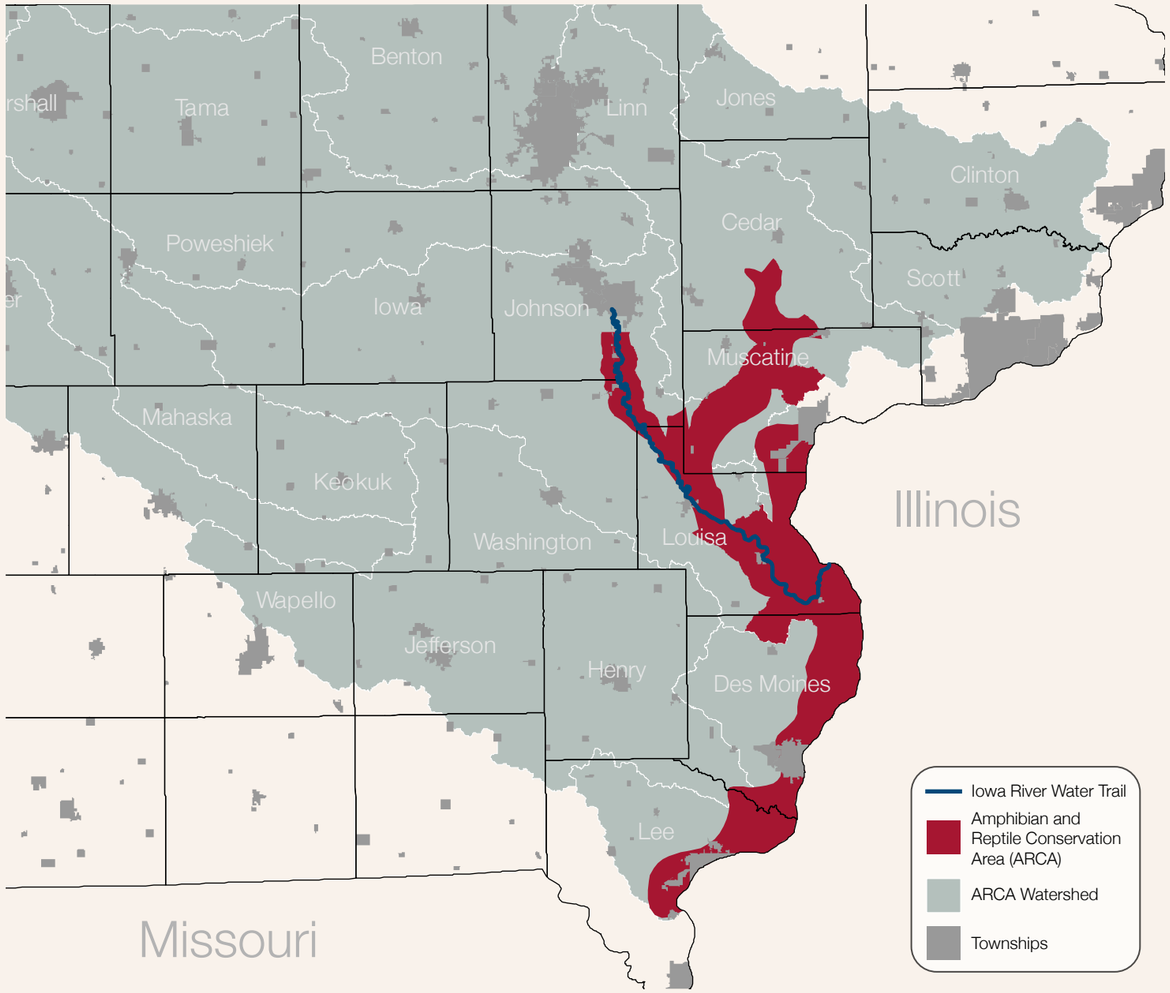


Figure 17
NEEDS TO BE WRITTEN

Birds

Breeding birds are of great interest to many Iowans. The distribution and abundance of birds in Iowa is better understood than any other nongame taxa included in the Iowa Wildlife Action Plan (Iowa DNR 2012). Portions of the study area are denoted as priorities for bird conservation. A number of Important Bird Areas (IBA) intersect with the study area including Mississippi River Pool 19 IBA, Port Louisa Fish & Wildlife Refuge (Mississippi River IBA), and Toolesboro Access/Odessa IBA.

The Breeding Bird Atlas (BBA) is a source of breeding bird data used throughout the United States and Canada. Each atlas project within a state or province uses approximately 20 hours per study block of observation time to record breeding activity over a course of five years. Study blocks include 3-mile by 3-mile blocks systematically selected across the state. These atlas project survey areas record evidence of breeding. The Breeding Bird Atlas has been compiled twice in Iowa with the most recent compilation, BBA II, from 2008 to 2012.

Six study blocks were located on or adjacent to the Iowa River Water Trail route for the BBA II. Four of the six study blocks are located between the Highway 61 Access and the confluence with the Mississippi River. One is located between the Hills and River Junction Accesses and the last is on the east side of the river and centered on the Cone Marsh State Wildlife Management Area. These data reported a total of 119 species present and possibly or likely breeding in these study blocks. Twenty- two percent (26) of these are included on Iowa's Species of Greatest Conservation Need (SGCN) List. Of these several are state-listed in other categories. One of seven endangered species, one of two threatened species and 3 of 4 species of special concern were documented. *Table 13* details all state-listed bird species documented. A full list of species reported in the riparian study blocks is located in Appendix E.

Table 13
Breeding Bird Atlas II documented a total of 119 species of bird species present and either likely or possibly breeding in the riparian areas surrounding this segment of the Iowa River. All 26 species listed below are included on Iowa's Species of Greatest Conservation Need list and some are also state-listed as either endangered, threatened or of special concern.

	Endangered	Threatened	Special Concern	Species of Greatest Conservation Need
Northern Harrier	X			X
Henslow's Sparrow		X		X
Bald Eagle			X	X
Black Tern			X	X
Forster's Tern			X	X
American Bittern				X
American White Pelican				X
American Woodcock				X
Bell's Vireo				X
Black-billed Cuckoo				X
Bobolink				X
Chimney Swift				X
Common Nighthawk				X
Dickcissel				X
Eastern Meadowlark				X
Field Sparrow				X
Grasshopper Sparrow				X
Loggerhead Shrike				X
Northern Bobwhite				X
Prothonotary Warbler				X
Red-headed Woodpecker				X
Sandhill Crane				X
Sedge Wren				X
Willow Flycatcher				X
Wood Thrush				X
Yellow-billed Cuckoo				X

Visual Resources

River users see a variety of scenery near the Iowa River Water Trail. Streambanks are generally vertical with a height range from 2 to 25 feet. Many streambanks are lined with dumped concrete debris for stabilization. A variety of land cover is visible from the water. Views are a combination of industrial landscapes and park land near Iowa City before transitioning quickly downstream of the city to a combination of wooded, cropland and cabins/other residential uses. The majority of views throughout the water trail are of perennial landcover, often bottomland forest. Only 4% of the land at the edge of either streambank contains cropland.

The river itself is wide, especially after the confluence with the Cedar River near Columbus Junction. The first 10 miles downstream of Hills Access are interesting as the river meanders. Connected by a straight line, this 10 mile river distance would barely cover 4 miles. Numerous sandbars exist on inside bends as well as within the channel itself. Paddlers during low water typically must drag their boat in numerous areas, adding time to the trip. One of the greatest visual resources of the Iowa River Corridor are the many backwater sloughs and wetlands found along the edge of the river. Paddling up the creeks that connect the sloughs and wetlands to the river can provide areas of solitude that are rich in wildlife.

There are also major eyesores along the river. Dumped concrete debris on streambanks is particularly prevalent between Hills Access and River Junctions Access. Junk cars and abandoned cabins are visible at various locations throughout the river corridor.

POPULATION AND DEVELOPMENT

This portion of the Iowa River Water Trail is located in an area with one of highest population densities compared with other river areas studied in 2014. The U.S. Census 2010 indicated approximately 443,385 people lived within 25 miles of the study segment. Additionally, U.S. Highway 218 parallels the Iowa River south of Iowa City for approximately eleven highway miles and 21 river miles. Iowa Department of Transportation indicates the annual average traffic on this section of road in 2010 was 19,400 vehicles daily. In contrast, the remaining 51 river miles traverse through a much more remote area in terms of vehicle use. Iowa Highway 92 has 4,230 vehicles daily where it crosses the Iowa River near Columbus Junction and U.S. Highway 61 carries 3,900 vehicles per day at the river crossing north of Wapello.

Road crossings, which act as a public interface for river users and an access point for rescue teams, are limited. A total of seven road crossings exist on the 72 miles of water trail with the exception of roads within 1000 feet of a water trail access point. This is an exceptionally low number of crossings for this segment length.

RESOURCE EXPERIENCES NEAR THE IOWA RIVER

Although paddling is the primary recreational focus for water trails, state-designated routes typically offer a variety of other complementary activities in the vicinity.

Trails

The Iowa River in Johnson and Louisa counties is surrounded by a diverse system of land-based trails including hiking, biking and multi-use options.

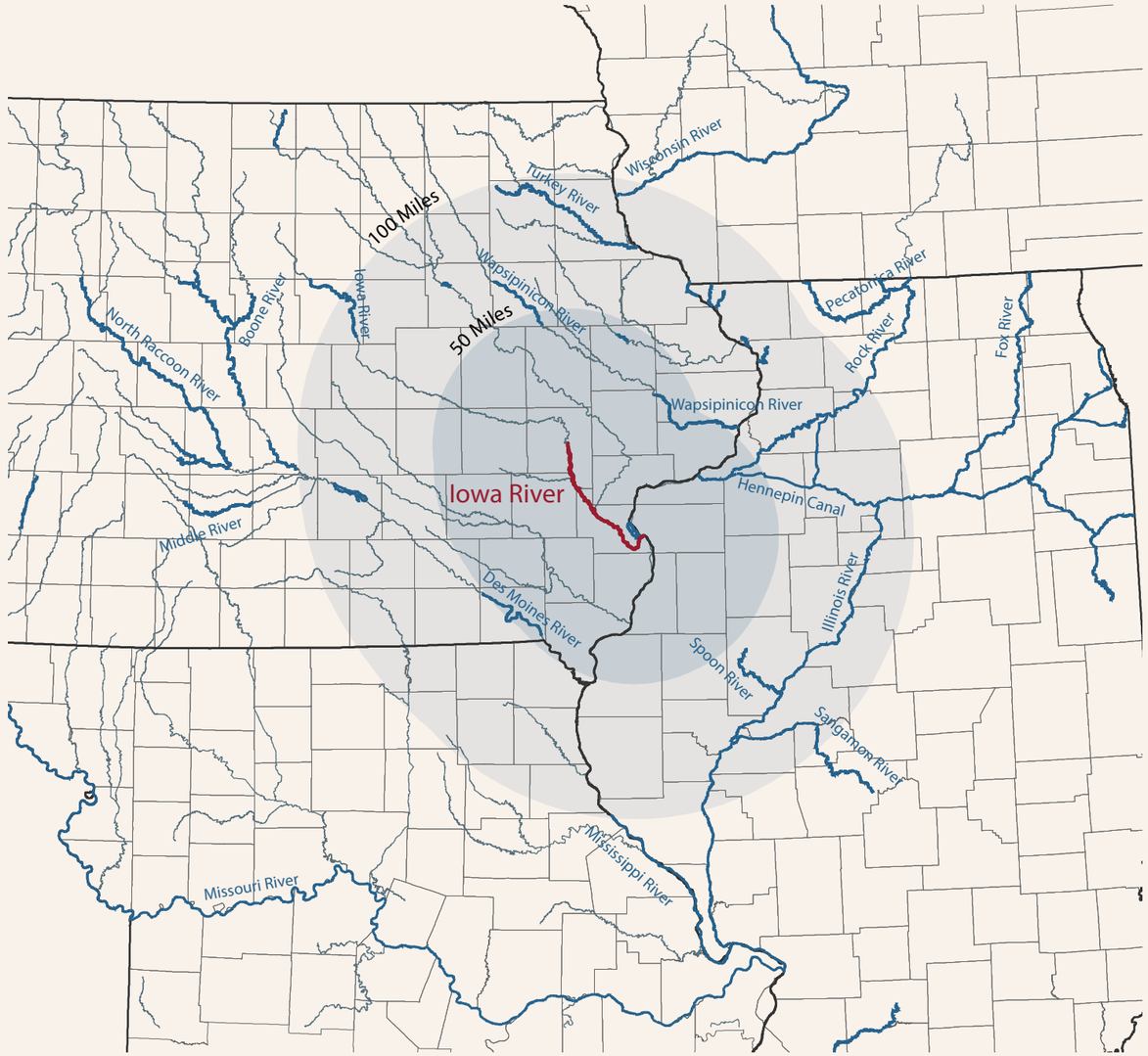
Water Trails

From a paddling standpoint, the Iowa River Water Trail fits in well with other water trails in the region. There are three Iowa-designated trails within 50 miles, as well as two Illinois-designated water trails *(Figure 18)*. The end or bottom of the Iowa River Water Trail is less than one mile from the Toolesboro Access on the Odessa Water Trail, making it possible to combine the two routes with a ¾-mile paddle on the Mississippi River and 500-foot portage across the levee.

Other paddling opportunities exist within a 20-mile radius in addition to the state-designated water trails. Upstream segments of the Iowa River as well as the Cedar River are popular routes as are Sand Lake (in Terry Trueblood Recreation Area), Coralville Lake and Lake McBride. There are also several wetlands on Louisa County public lands with excellent wildlife viewing that are suitable for paddling at some water levels.

Figure 18

Several other state-designated water trail routes are located within 50 miles of the study segment. One of these, the Odessa Water Trail is located adjacent to the Iowa River at its confluence with the Mississippi River.



Corridors and Land Trails

The Iowa City / Coralville metro area and Johnson County have an extensive hiking/biking trail network *(Figure 19)*. The nearest regional system, Hoover Nature Trail, is located to the north and east of the Iowa River in Johnson County. When completed, it will run through six counties and 16 towns between Cedar Rapids and Burlington on abandoned railroad right-of-way. Two disconnected segments of the trail exist in Louisa County *(Figure 20)*; the Louisa County Trails Plan includes completion of the Hoover Nature Trail, however, no active projects exist to complete the Muscatine County portion.

A popular local land trail, the Iowa River Corridor Trail, parallels the river for approximately five miles in Iowa City. Other off-road trails connect the south side of Iowa City to Coralville and North Liberty. There are also mountain bike trails within the city of Coralville and at Coralville Lake.

The Great River Road National Scenic Byway intersects with the water trail in Louisa County. This national scenic byway spans 3,000 miles along both sides of the Mississippi River from the headwaters in the Minnesota north woods to the Gulf of Mexico. Similarly, the Mississippi River Trail (MRT) is a route dedicated to bicycling that follows the Mississippi River through ten states. Both these routes share the same roads in Louisa County. A paved shoulder was recently added to a 16-mile section of the Great River Road/MRT so the trail no longer is on the roadway.

Three pedal-paddle possibilities exist for the Iowa River Water Trail, although the majority of land trail miles are on shared roadways *(Table 14)*.

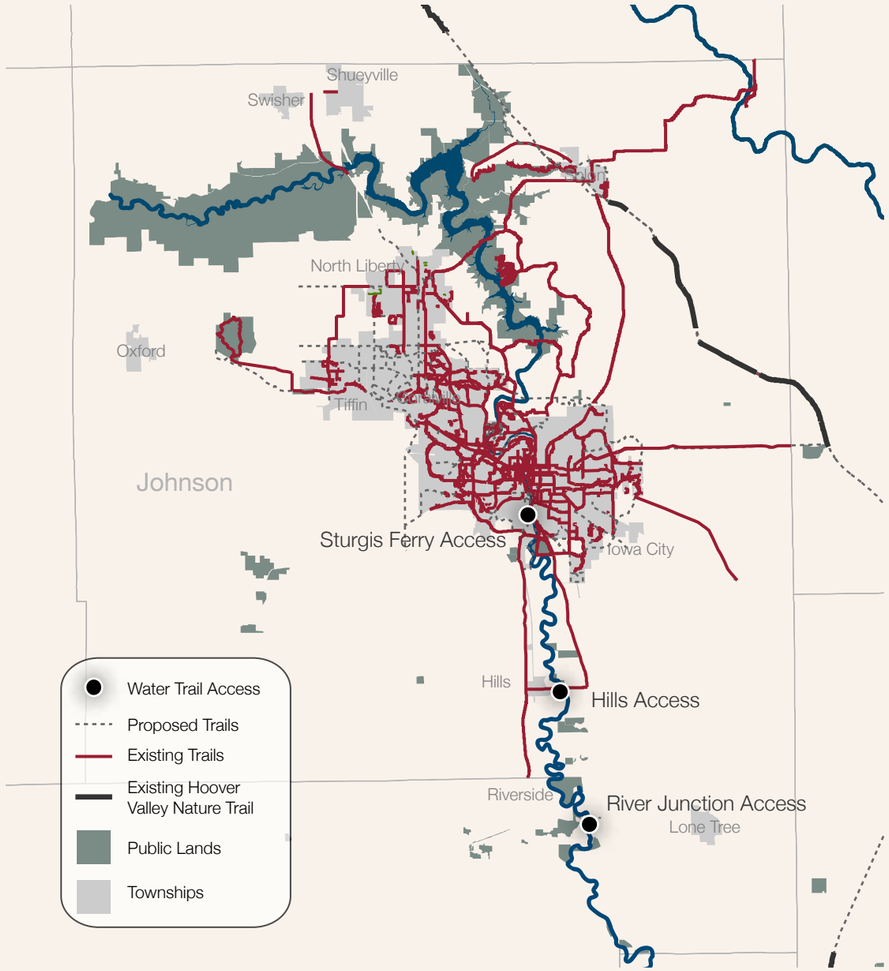
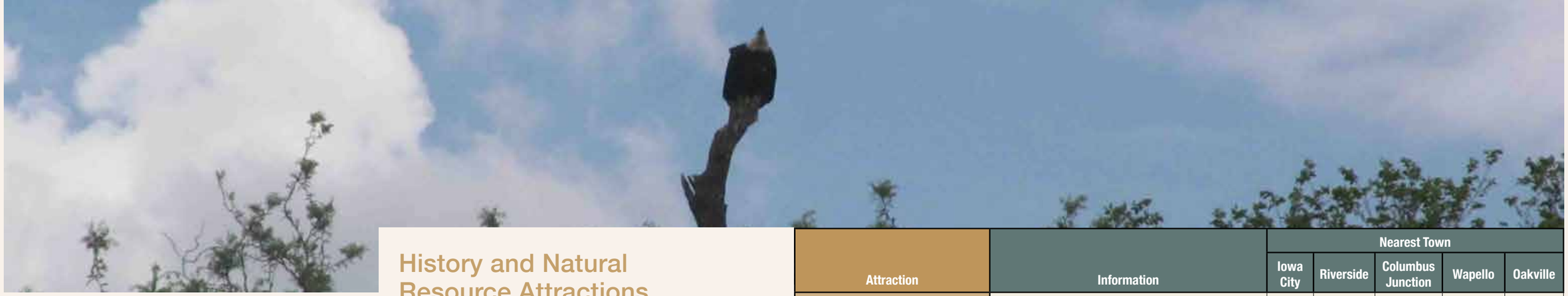


Figure 19
The Iowa City area offers water trail users a very unique connection to the river as well as to other counties and communities.

Water Trail Segment	County	Paddle Distance	Pedal Distance	Surface Types
Sturgis Ferry Park to Hills Access	Johnson	9.5 miles	8 miles	Designated bike lanes, off-road trails, paved shoulders, and one 3/4 mile on- street section
Hills Access to River Junction Access	Johnson	9.8 miles	5.5 miles	Paved shoulders, low-traffic county highway, and ½ mile of gravel
Schwob Landing to Cappy Russell Access	Louisa	10 miles	11 miles	County highway 99, Mississippi River Trail (shared road), ½ mile of gravel

Table 14
Undeveloped pedal-paddle options on the Iowa River.

Figure 20
NEEDS DESCRIPTION



Overnight Accommodations

A broad selection of accommodation types is available within 10 miles of the Iowa River and often much less *(Table 15)*. Iowa City offers the greatest number of options compared to the other access locations. There are no rental cabins available in the area but camping areas are located near most river accesses.

Water Access	Nearest Modern Lodging	Distance From Access	Nearest Camping	Distance From Access
Sturgis Ferry Park	Iowa City (2,840 Rooms)	< 10 mi	Hills Access & Coralville Reservoir (500 Modern & Primitive)	6 mi
Hills Access	Riverside (201 Rooms)	5 mi	Hills Access & Coralville Reservoir (500 Modern & Primitive)	0 mi
River Junction Access	Riverside (201 Rooms)	1 mi	River Junction Access (12 Primitive)	0 mi
River Forks Access	Columbus Junction (24 Rooms)	2 mi	River Forks (Undesignated Primitive Camping Area)	0 mi
			Louisa County Fairgrounds (10 Modern)	2 mi
Highway 61 Access	Wapello (30 Rooms)	2 mi	Papa's Paradise Campground (23 Modern)	2 mi
			Wapello Fairgrounds (10 Modern)	2 mi
			Snively Access Campground (modern)	5 mi
Schwob Landing	Wapello (30 Rooms)	0.4 mi	Wapello Fairgrounds (modern)	1 mi
			Snively Access Campground (30 Modern & Primitive)	4 mi
			Papa's Paradise Campground (23 Modern)	5 mi
Cappy Russell Access	Wapello (30 Rooms)	10 mi	Cappy Russell Access (Undesignated Primitive Camping Area)	0 mi
			4th Pumping Plant Recreation Area (22 Modern & 24 Primitive)	6 mi
Ferry Landing Recreation Area			Ferry Landing Recreation Area (22 Primitive)	0 mi

Table 15
Lodging facilities near Iowa River Water Trail Accesses

History and Natural Resource Attractions

In addition to outdoor recreation, Johnson and Louisa counties have many other attractions for visitors including museums and historic sites *(Table 16)*. Museums of science, culture and history are located near the water trail. Cultural history is interpreted at six museums and historic sites including Iowa's first capitol building, a park commemorating the Mormon Handcart migration and the Herbert Hoover National Historic Site.

Attraction	Information	Nearest Town				
		Iowa City	Riverside	Columbus Junction	Wapello	Oakville
Devonian Fossil Gorge	Fossils and bedrock exposed by floods of 1993 and 2008 below dam at Coralville Lake; exhibits	x				
Coralville Lake Visitor Center	Exhibits about the lake, Iowa River & fossil gorge; information about Coralville Reservoir	x				
University of Iowa Museum of Natural History	Natural history museum on U of I campus	x				
Mormon Handcart Park	Small park and trail with interpretive signs	x				
Johnson County Poor Farm & Asylum	Historic site open for tours	x				
Johnson County Historical Society Museum	Museum with local artifacts	x				
Old Capitol Museum	First capitol building of Iowa	x				
Plum Gove Historic Home	Home of Iowa's first governor	x				
Herbert Hoover National Historic Site	President Herbert Hoover's birthplace, gravesite, library and museum	x				
Kalona Historical Village	1800's village		x			
Walker Park	Park with historic buildings		x			
Lone Tree Museum	2-story home museum		x			
Columbus Community Heritage Center	Museum with local artifacts			x		
Swinging Bridge	Cable bridge originally constructed in 1886			x		
Louisa County Heritage Center	Museum with local artifacts				x	
Port Louisa NWR Headquarters	Interpretive displays, overlook deck, trail				x	
Toolesboro Indian Mounds & Museum	Grounds with two visible mounds, museum, outdoor sign with information about the mounds; State archaeological preserve; National Historic Landmark					x
Oakville Historical Museum	Native American village artifacts excavated near Oakville after 2008 flood and levee break					x
Malchow Mounds State Preserve	State archaeological preserve featuring 60 mounds					x
Littleton Brothers Monument	Black granite monument dedicated to 6 Toolesboro brothers who lost their lives fighting for the Union in the Civil War					x

Table 16
Tourism attractions related to history and natural resources within 10-mile radius of Iowa River Water Trail

Outdoor Recreation on Public Land

More than 64,000 acres of public recreation land is located within 10 miles of the Iowa River Water Trail *(Table 17)* including parks, wildlife areas, trails, green spaces, preserves and a national wildlife refuge. One of Iowa's three federal reservoirs is located on the Iowa River 10 miles upriver from Sturgis Ferry; Coralville Lake and the federal lands surrounding it comprise approximately 8,100 acres. The cities of Coralville and Iowa City have six parks adjacent to the Iowa River, both above and below the beginning of the designated water trail offering a variety of recreational activities.

The Mississippi River, one of the country's most significant natural resources, is the ending point of the Iowa River Water Trail. Port Louisa National Wildlife Refuge, one of seven national wildlife refuges in Iowa, is located near the water trail. The four divisions of the refuge are managed to provide habitat for migratory birds, primarily waterfowl. However, there are also recreational opportunities including fishing, paddling, hiking, biking and wildlife watching. Some areas allow hunting.

Louisa Division of Port Louisa NWR is also part of the Odessa Wildlife Complex, which includes the Odessa Wildlife Management Area. The southern end of the complex is adjacent to the Iowa River, near the confluence with the Mississippi River. This 6,465-acre is located in the Mississippi Flyway and contributes vital habitat for migrating shorebirds, ducks, geese, blackbirds, warblers, sparrow and thrushes. The wildlife viewing opportunities in the complex are excellent throughout the year. The complex is used recreationally for hunting, boating, paddling and fishing.

	Hunting	Fishing	Paddling	Wildlife Viewing	Modern Camping	Primitive Camping	Trails	Features	ADA Facilities
Johnson County Areas, including Iowa City & Coralville									
Waterworks Prairie Park		x	x	x			X	Carry-down access	
Iowa River Landing Wetland Park		X					X		
Peninsula Park		X		X			X	Disc golf, off-leash dog park	
City Park			X				x	Sports fields, Riverside Festival Stage, horseshoe courts, carnival rides, swimming pool	
Terry Trueblood Recreation Area		X	X	X				Boat rentals on Sand Lake, concessions, lodge	
Coralville Dam & MacBride State Park Complex (includes Coralville Lake, Macbride State Park, Hawkeye Wildlife Area, Macbride Nature Recreation Area, Big Grove Preserve)	X	X	X	X	X	X	X		
F. W. Kent Park		X		X	X		X	Environmental ed. center, youth group camp	Shelter, bird blind, Ed Center, fishing dock, restroom
Louisa County Areas									
Wapello Bottoms & Millrace Flats WMA	X	X		X		X			
Indian Slough Wildlife Area	X	X	X	X			X	Equestrian trails	
Cone Marsh WMA	X	X	X	X		X			
Cairo Woods Wildlife Area	X	X		X			X		
Klum Lake WMA	X	X	X	X		X			
Flaming Prairie Park		X		X	X				
Chinkapin Bluffs Recreation Area	X			X			X	Modern amenities, Hoover Nature Trail	Restroom
Odessa Wildlife Complex (includes Odessa WMA, Snively Access & Port Louisa NWR, Louisa Division	X	X	X	X	X	X	X		
Mississippi River Areas (includes Allen Green Refuge, Big Sand Mound Nature Preserve, Mississippi River Islands, Port Louisa NWR, Big Timber Division, Port Louisa NWR, Keithsburg Division	X	X	X	X			X	Open to public for tours/events only	
4th Pumping Station		X			X			Modern amenities	

Table 17

The most significant outdoor recreation areas within 10-mile radius of Iowa River Water Trail include federal, state, county and municipal lands. Facilities listed here include only those associated with the Iowa & Mississippi rivers; additional facilities exist near the study area that are associated with the Cedar River.

Permanently Protected Lands

Slightly more than 15,000 acres of land adjacent or connected to the Iowa River are permanently protected. A total of 70,878 acres of permanently protected land is located within 10 miles of the river *(Table 18)*, the largest amount of any river in our study. Not all of these properties are open to the public. In addition to public land, over 7,000 acres of private land within 10 miles of the river is protected by permanent conservation easement. Data for three types of easements were included in this analysis: Wetland Reserve Program (WRP), Emergency Wetland Reserve Program (EWRP) and Emergency Watershed Protection Program (EWP). A diagram illustrating all permanently protected lands identified in this study is located in Appendix F.

Interpretation Program and Efforts

Louisa and Johnson county conservation board staff have comprehensive environmental education programs and have been hosting paddling events for over 20 years. Eight events related to planning for this water trail study occurred from 2012 through 2014. Events were led by a combination of state experts and local naturalists. Three paddling trips were offered with themes related to freshwater mussels, river wildlife, and Native American life on the river. These trips attracted 36% (68) of all participants. The majority of participants (64% or 120 participants) attended indoor or fixed location events. Themes of these events included: mound-builders culture, Toolesboro Mound and Museum, snakes, and geology.

Interpretive kiosks are located at two locations on the water trail, Hills Access and Schwob Landing. Each includes a map of the entire water trail, a list of accesses and information about resources found along the river. Additionally, local and regional websites with information related to the Iowa River Water Trail include: iowariverfriends.org, naturallylouisacounty.com and louisacountyconservation.com.

	Within 10 miles		Adjoining Iowa River or Incredibly Close
	Iowa	Illinois	Iowa
Public Areas for River Access	22		10
City Parks	2,988		426
County Parks	2,393		426
County Fairgrounds	47		
Federal Lands and Waters	13,309		
Federal Recreation Area	699		
Greenspace	178		
Historical Site (Coralville Heritage Museum, Lucas Home/Plum Grove Historical Site, Mormon Handcart Park)	17		
National Historic Site (Herbert Hoover N.H.S.)	187		
Nature Preserve	525		
National Wildlife Refuge (Port Louisa Divisions, Keithsburg Division in IL)	7,063	1,484	2,620
Public Golf Course	341		
Recreation (bike trails, Hoover Nature Trail, Macbride Nature Recreation Area)	680		128
Research Area (U of I Outdoor Research Area, Finkbine E & W)	318		
State Park	2,034		
State Preserve	36		
State Wildlife Refuge	148		
State WMA (Indian Slough, Cedar Bluffs, Cairo Woods, Swamp White Oak Woodland)	28.987		7,788
WMA (Mississippi River Islands, Hawkeye, Wapello Bottoms, Millrace Flats)	2,718		1,065
Conservation Easements	6,074		2,699
Acres in Permanent Protection by State	69,394	1,484	15,184
Total Land in Permanent Protection within 10 miles of Iowa River Water Trail	70,878		
Total Recreational Land within 10 miles of the Iowa River Water Trail	64,173		

Table 18
Permanently Protected Lands Near the Iowa River, In Acres

Water Trail Potential

This section of the chapter synthesizes findings from earlier sections and suggests future water trail development directions. One goal is to distinguish each designated water trail from others in the state as well as to suggest resource conservation and restoration opportunities appropriate to this location. Included in this section is a water trail theme proposal, discussion of potential recreation improvements on and off river, suggested access improvements to reduce water pollution and enhance habitat at these points, considerations for the route and experience classification, conservation and restoration opportunities, and permitting expectations.

WATER TRAIL THEME

A water trail theme describes the unique experiences a river and its surrounding area offers the public. Themes are used to distinguish one water trail from another for marketing as well as in conservation priorities.

Themes also identify and focus future development efforts on and near the river. The Iowa River has a wonderfully rich story to share with visitors *(Figure 21)*. Its theme is likely to center on its opportunities of contrast—from a dynamic urban experience in Iowa City to remote and rugged wild and nearly road-less sections of the river near its confluence with the Mississippi. Central among other rich experiences here is the ability to visit a region of the state with such rich natural resources.

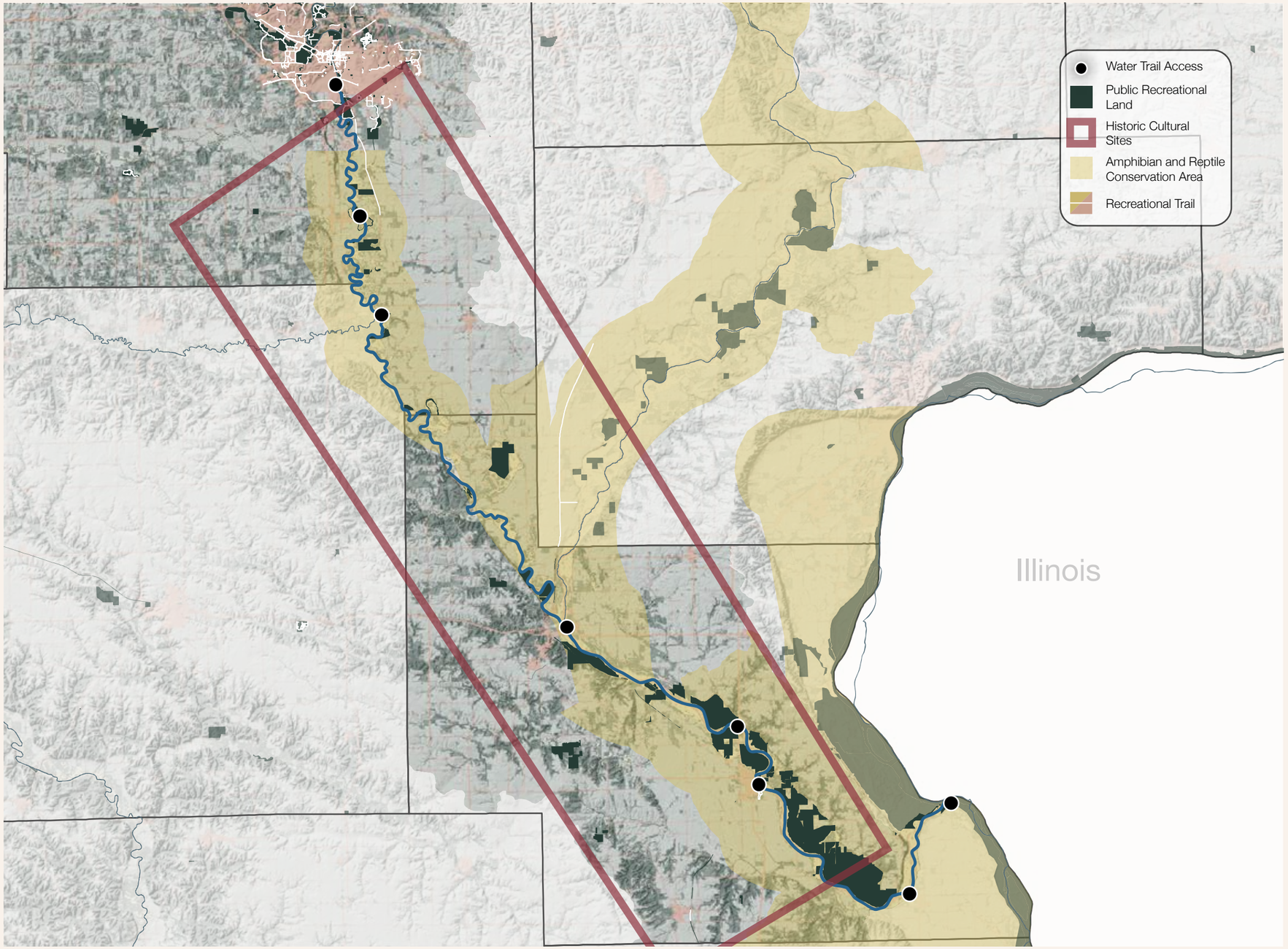


Figure 21
This water trail exposes users to a rich diversity of historic and archaeologic sites, public recreation lands and wildlife habitat.

Background

The Iowa River in Johnson and Louisa counties offers outstanding natural, cultural and recreational resources. The natural resources present, as well as the opportunities for additional future conservation, has drawn the attention of federal, state and local agencies as well as two non-profit conservation leaders in the state. Among those rivers studied for potential water trail designation in 2013-2015, the Iowa has the greatest diversity of amphibians, fish and mussel species. In terms of bird species present, the Iowa River ranks near the top of all those studied for potential designation in terms of the number of bird species breeding in the corridor as well as the number of endangered, threatened and other Species of Greatest Conservation Need. Largely, but not entirely, responsible for these conditions is the 96% perennial cover in the riparian buffer area and the 7,000 acres of permanent conservation easements along the river in these counties; this volume of permanent land cover is unusual for a river of this scale in Iowa.

Many important pre-historic cultural resource sites near the river corridor are already in permanent protection and are available for interpretation, offering outstanding complimentary opportunities to active recreation. Because Euro-American settlement arrived in this region of the state quite early, there is a rich cultural legacy from that era as well.

From a recreation standpoint, a strong overlap exists between the water trail route and the existing land trails in the Iowa City area, allowing users to move from the river's edge to and past the Coralville Reservoir and connecting with the (planned) Hoover Valley Nature Trail. Users of the Hoover Trail will be able to travel through 6 counties between Cedar Rapids and Burlington when it is complete. Paddling options are rich as well, although existing conditions favor paddlers with some paddling experience. The majority of existing liveries exist in the Iowa City area and, combined with that urban experience, this area offers strong potential for the development of a beginning paddler experience.

This water trail presents few hazards for paddlers with some experience controlling their boat and the entire length is dam free. The river's slow and easy pace provides good opportunities for wildlife watching and contemplation. Because of this trail's length and the meandered legal status of the river, this water trail offers opportunities that others do not. Multi-day remote and exploratory trips are already a popular use.

Nearly all the entire reach of the river in Johnson and Louisa counties, except for 5.7 miles in southern Johnson County, is impaired for indicator bacteria. The upstream-most 18 miles of river in Louisa County are also impaired for biological conditions as well. These conditions are fairly common for rivers with large watersheds in Iowa; this segment of the Iowa's watershed drains more than 8 million Iowa acres. However, nine named local tributaries are listed as impaired for either/or bacteria or biological conditions, including the English River and Roff, Picayune, Otter, Muddy, Ralston, Old Man's, Prairie and Short creeks. Five additional unnamed drainages in these counties are also listed as Impaired.

The Water Trail Route

The Iowa River in Johnson and Louisa counties is one of the widest rivers in the state included in the state water trail system. Lowland forests line both sides of the river in many segments of the water trail. These wetland areas are dominated by silver maple and are heavily used by a variety of turtles, snakes, herons, eagles, cormorants and songbirds. Paddlers can be constantly seeing a number of wildlife species. Multiple large river oxbows exist adjacent to the channel and are a haven for wildlife. Merging currents at river confluences can be intimidating for inexperienced paddlers. These confluences, with the Cedar and the Mississippi, can also contain old bridge abutments and other large underwater debris that require navigation to avoid. Large log piles, while uncommon, also present hazards at multiple locations on the water trail. The river is typically wide enough for paddlers to easily navigate around them.

Three potential changes are recommended for future consideration. First, there is strong interest in future expansion of the water trail upstream of Sturgis Ferry Access in Iowa City. The Burlington Street Dam is the primary deterrent from this happening. The dam was the cause of several drownings in the 1990's (Johnson County Medical Examiner) and safe portage around this hazard is difficult. The University of Iowa, owner of the dam, and Iowa City are hopeful that this hazard can be mitigated in the future. Second, the Sturgis Ferry Access, at the upstream-most point of the water trail, will be replaced at a new yet to be determined location downstream of the Burlington Street Dam. The portion of the river included in the designated section of the water trail should be extended to include this new location. Finally, the addition of paddling excursion loops on one more of the large river oxbows is recommended.

Water Trail Experience Classification

Currently the water trail functions as a Recreational classification except for the River Junction to River Forks segment, which matches the Challenge classification. Recreational classification means it is a typical river experience in Iowa and appropriate for people with some paddling experience. The water trail functions well in this classification. However, opportunities exist to enhance use of the river by current users as well as to expand use to new populations *(Figure 22)*.

The Iowa City area is an ideal location for a Gateway classification segment but existing conditions would require enhancement. Future accesses could be designed to provide an ideal shorter river distance for beginners, novices and tubers. Its juxtaposition in Iowa City would provide the service expectations of this experience classification including a general urban context, interpretation and service (including livery rentals). Upgrades would include new Universal Design accesses with special attention to channel conditions and flow patterns. Access locations would ideally be located outside of the former landfills on the river and inside existing parks that include trails and other amenities. Other aspects of this segment of the river add value to its classification as a Gateway segment including cultural and historic interpretation and connection to adjacent land trails. In addition to a Universal designed launch at both ends of the segment, the following upgrades in the spirit of Gateway classifications are also suggested:

- Consider all future changes to these accesses in ways that relate the most strongly to the historic and cultural nature of these places as well as the rich recreational amenities located nearby
- Configure the access experience with as low a slope % as possible; this includes the parking areas, paths to the launch and the launch itself
- Provide drinking water, toilets and basic amenities at each access as possible in locations convenient to river users
- Add interpretive signage, information and other displays concerning geology, history and culture of the region
- Establish or strengthen a river management presence on this segment of the river as well as a communication strategy between river users and land managers

The 24-mile segment between River Forks to River Junction would be an ideal Recreational classification segment if a new access were located at approximately the halfway point. It's possible that existing public land might be suitable for this recreational use. Another possibility is the conversion of the previously mentioned informal access points used by local river users.

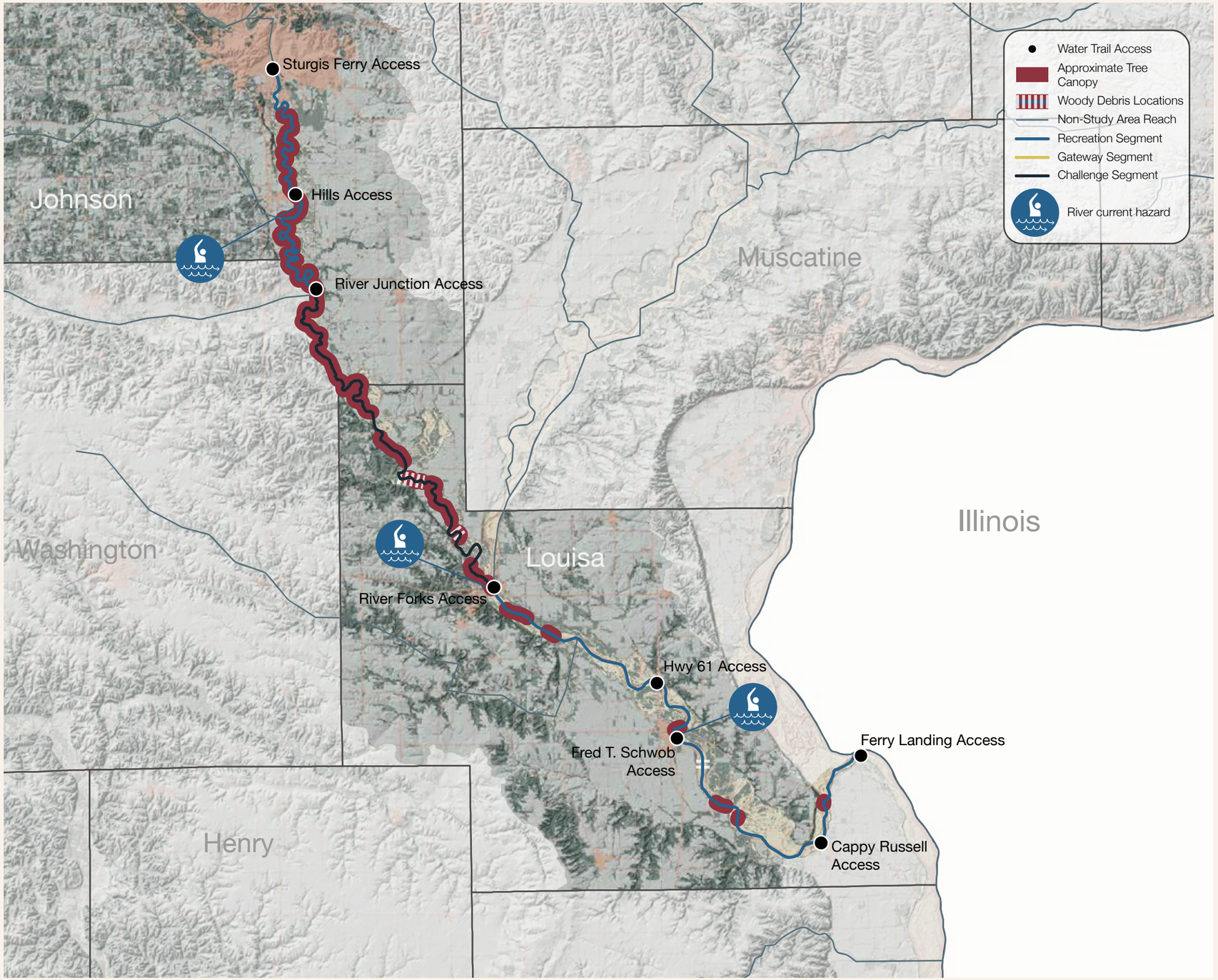


Figure 22
State designated water trail segment are assigned a Use Classification based on the type of experience users will encounter. The existing conditions of this water trail include a combination of Recreational and Challenge segments.

RECREATION DEVELOPMENT POTENTIAL

Water-Based Recreation Potential

Table 19 organizes enhancement opportunities for river use aspects of the water trail. Several already planned improvements connect with water trail access needs identified in this planning process. The most recent planning documents for each park where water trail accesses are located were reviewed in July 2013. The following planned improvements related to on-water recreation were included in these plans:

- Schwob Landing: the city is applying for grant funding to replace boat ramp and make parking lot improvements and is also considering re-opening a closed street to circulation and parking.
- City of Columbus Junction is purchasing land for a new access southeast of the Highway 70 Bridge at river mile 30.3. Plans include parking and a boat ramp. The access will be upstream of the Cedar River confluence and will be linked by a walking trail to amenities in the city, including a convenience store approximately 1/3 mile away.

Neither of these planned changes impact the existing classification of the water trail.

Land-Based Recreation Potential

With more than 64,000 acres of public recreation land within a 10-mile radius of the water trail, there are currently many opportunities for outdoor recreation. Several already planned improvements on public land in the river corridor were identified during the preparation of this chapter. The most recent planning documents for each park where water trail accesses are located were reviewed in July 2013. The following improvements related to off-water recreation were included in these plans:

- Sturgis Ferry Access: city plans to connect the existing hiking/biking trail to Sturgis Ferry Park in the near future
- Johnson CCB has purchased property adjacent to the Iowa River, known as Pechman Creek Delta, between the Hills and River Junction accesses. The acquisition includes a shop and development of an environmental education center is in the planning stage. The 380 acre area provides outstanding opportunities to paddle a delta slough complex about 1.5 miles in length.

Recreational Enhancement	Issue Addressed
Enhance Everyday Management Conditions	
Reinforce capacity for on-water rescue	Emergency staff turn-over is common in Iowa particularly among volunteer organizations. Reinforcing the network of personnel serving the river corridor in Johnson and Louisa counties is a good way to learn of new management challenges and share information between agencies.
Standardize ordinary maintenance at launches	Better communication and agreement by all access owners/managers could result in more efficient and timely removal of sediment and debris from launches and other ordinary maintenance tasks.
Enhance communication between water trail sponsors and access managers	Future coordination of water trail activities and issues would be enhanced with a defined organizational structure and regular communication among access owners/managers; public information is available on 3 separate websites which has the potential to cause confusion to users.
Develop policy/agreement showing responsibilities for each water trail access manager	Access managers need to be aware of their responsibilities as pertains to maintaining signage, amenities and kiosks.
Enhance Water Trail Experience for Current Users	
Upgrade accesses with overly steep launch and path slopes as well as perpendicular alignment to the thalweg	High, vertical streambanks often result in steeply sloped access routes to the water's edge; alternative launch designs and materials could be utilized which would allow people with a greater range of physical abilities to reach the water; launch angles can also be modified at many launches to minimize deposition on the launch surface.
Enhance communication for users before they get to the river	River users will feel better prepared for their experience with updated maps of the river corridor; maps can be printed as well as available to download online. Links to current water levels and information about how to interpret them would also be helpful. One single website representing the water trail is also recommended to reduce confusion.
Update public interpretation	Utilize the resources included in this chapter to produce compelling, varied interpretation of critical issues and resources based on the conditions on this river segment.
Upgrade signage to meet State Water Trail Standards	Not all access signage meets the State Water Trail program standards. Additional bridge signs may also be necessary for wayfinding on the water. Issues include unmarked accesses and very few have signs that can be seen from the water helping paddlers know they have reached the access.
Upgrade access facilities	In addition, restrooms, drinking water, trash receptacles and fishing line recycling tubes are not available at all accesses. Upgrades are recommended to the extent practicable.
Develop paddle-in campsite	The addition of paddle-in, primitive camp sites for adjacent to the river is recommended.
Attract New Paddler & Angler User Populations	
Provide remote paddle-in campsites	Paddle-in camp sites are likely to be popular on the Iowa River, given the resources present and the volume of paddling
Develop Universal-Design Access and Gateway Segment	None of the existing accesses or segments accommodate users with special needs or beginning paddlers. A gateway segment with Universal-Design accesses on both ends is recommended.
Upgrade launches to provide a more paddler-friendly interface	The Iowa River is utilized by many power boats due to its size. Addition of a carry-down launch adjacent to existing accesses with only a motor boat launch is an easy way to ease congestion.
Expand wildlife observation opportunities	Development and signage of optional paddling loops off the water trail into one of more backwater sloughs connected to the Iowa River would offer rich opportunities for solitude, wildlife observation and historic interpretation.
Convert Challenge Segment to Recreational classification	The 24-mile stretch between River Junction and River Forks access accesses is more than most paddlers can travel in one day. Creating a new public access part way will reduce the number of people trespassing to exit the river near the mid-point.
Create new angler opportunities	Create opportunities for angling at new locations, particularly in Iowa City.

Table 19
Three types of recreational river enhancements were identified during planning. Each type and the specific enhancements included in each are detailed in this table.

- City of Iowa City's Downtown and Riverfront Crossings Master Plan identifies a new planned park at the site of the old wastewater treatment plant and modification of the Burlington Street Dam (approximately 1 mile upstream of the beginning of the designated section of the water trail). The dam modification may include a whitewater component
- The Johnson County Metropolitan Bicycle Plan includes additional trail miles between Riverfront Crossings, Sturgis Ferry Park and Terry Trueblood Recreation Area
- Louisa County Conservation is developing the Louisa Interpretive Center at Langwood, organized adult education, a corporate conference retreat center and new individual cabin sites

Basic Riparian Land Improvements Impacting Habitat and Water Quality

Four elements related to water quality are recommended of all river access points in Iowa.

- River accesses, including parking, should be located on sites not prone to frequent flooding
- Low impact stabilization methods should be used to repair sheet and gully erosion occurring at any location on land so additional sediment loading is not occurring as a result of erosion on public land
- Streambank conditions near river access points and other prominent locations should also demonstrate the latest techniques for streambank restoration
- The first 50 feet back from the top of the streambank edge is reserved for a natural (unmown) native perennial buffer. All constructed parking and other features, with the exception of launches and trails, should be located outside of this buffer area; this setback area should be vegetated with natural (unmown) perennial vegetation. Existing parking areas at launches should have a similarly vegetated buffer of at least 40 feet in width

Table 20 summarizes these general conditions for this study area. Yellow cells indicate an enhancement is recommended.

Facility Where Access is Located	Width of Vegetative Buffer Between Parking and River	Erosion Present at Access	Streambank Conditions Adjacent to Launch	Riprap Present at Launch
Sturgis Ferry Park	20’	No	Minor or no erosion	No
Hills Access	8’	No	Minor or no erosion	Yes
River Junction Access	12’	No	Minor or no erosion	Yes
River Forks Access	5’	No	Minor or no erosion	No
Hwy 61 Access	0’	Yes	Very severe erosion	No
Schwob Landing	10’	Yes	Minor or no erosion	Yes
Cappy Russell Access	3’	No	Minor or no erosion	No
Ferry Landing Recreation Area	23’	No	Minor or no erosion	Yes

Table 20

Enhancements that reduce soil erosion and slow overland flow into the river channel at an access also reduce pollutant loading into the river. Yellow cells indicate an enhancement is recommended.

Resource Protection & Restoration Potential

The land and water resources in the Iowa River corridor in Johnson and Louisa counties have numerous significant designations for birds, reptiles and amphibians as well as cultural resources. And a great deal of riparian land is already in permanent protection, particularly in Louisa County. Beyond ownership and designations, however, there is only a small amount of species data and very little long term resource conservation and management planning. Additional conservation and management could help the project area reach even stronger biodiversity goals, particularly as it relates to shifts in climate. Corridor users would benefit from enhanced conservation and protection as well as from focused interpretation that builds knowledge about the unique resources present. The following standards relate to all future development efforts intended to bring people to the river corridor:

- Recreational development actions occur in ways that protect long-term conditions for existing aquatic and terrestrial wildlife, plant communities and river channel function in the area
- Conservation planning and communication is utilized to identify land management actions that are helpful in protecting habitat conditions in the river corridor as well as those that degrade conditions
- Soil is recognized as a living resource capable of facilitating both economic stability and degraded water conditions when erosion in excessive amounts occurs
- Cultural and historic resources are prioritized for conservation, preservation and interpretation

Conservation and Restoration Elements

Multiple conservation and restoration opportunities became apparent from stakeholder input and through research for this chapter. These opportunities and potential partners are described below in *Table 21*; these elements are illustrated in *Figure 23*.

Expected Permitting Considerations

Development projects disturbing streambank, riparian areas, channel bottoms, and/or near-river areas will require review to determine if critical resources will be impacted. The following permitting activities should be expected:

- Phase I: Intensive Archaeological Survey
- Joint Application: a joint permit application is shared between the DNR flood plain development program, the DNR sovereign lands program, and the U.S. Army Corps of Engineers
- Municipal and County Floodplain permitting

Conservation and Restoration Enhancement	Supporting Organizations and Individuals
Enhance River Structure and Function	
Demonstration of stream bank restoration practices to replace riprapped banks; utilize practices that have been demonstrated to successfully function on large rivers	Iowa DNR, Johnson & Louisa CCBs, City of Iowa City
Identify and stabilize streambanks that are threatening road infrastructure	Iowa DNR, Iowa State University, Johnson & Louisa County Engineers
Enhance Aquatic Resource Conditions	
Enhance habitat conditions for mussel, turtle, reptile and amphibian habitat	Iowa DNR, Iowa State University
Identify barriers to fish movement on tributaries and modify	Iowa DNR, Iowa State University
Further research on the causes and sources of water quality impairment in the watershed and included on the 303d list, increased participation in voluntary monitoring	Iowa DNR, Johnson & Louisa SWCD, IOWATER volunteers, University of Iowa, U.S. Army Corps of Engineers
Coordinate with other organizations to enhance water quality conditions on the Iowa River and its tributaries	Johnson and Louisa SWCD, City of Iowa City, Johnson & Louisa CCB
Enhance Terrestrial Resource Conditions	
Use digital modeling to identify critical turtle habitat land areas	Story County Conservation, local interested residents, ISU
Identify potential savanna restoration lands with physical connection to the Iowa River and its tributaries	
Establish a continuous perennial stream buffer for the length of the Iowa River and its tributaries	Story Soil and Water Conservation District, local habitat organizations
Increase in the use of cover crops and other conservation practices to reduce soil erosion from cropland as well as bacteria and nutrient loading in surface water especially in reaches included on the 303d List of Impaired Waters	Story Soil and Water Conservation District
Minimize sheet and gully erosion on public lands adjacent to the river	Johnson & Louisa CCBs, City of Iowa City, Iowa State University
Investigate the 3 closed dumpsites to determine future actions	Iowa DNR, Iowa State University, City of Iowa City
Enhance Cultural and Historic Resource Conditions	
With less than 10% of the river corridor surveyed for cultural resources, additional Phase I survey work and research is necessary for a more complete understanding of early occupation	Office of State Archaeologist
Further investigation, prioritization of state-recorded archeologic and historic resources; pursue permanent protection (from development and exploitation) for priority cultural, historic sites. Doing so allows for their interpretation, future research, and educational opportunities	Iowa OSA, Johnson & Louisa County CCBs
Toolesboro Museum updates and maintenance	Louisa CCB
Pedestrian survey for remnants of early settlements, cabins and cemeteries depicted on the 1875 Andreas Atlas; pursue permanent protection for priority cultural, historic sites. Doing so allows for their interpretation, future research, and educational opportunities	Iowa DNR, local interested residents

Table 21

Three types of conservation and restoration enhancements were identified during planning. Each type and the specific elements included in each are detailed in this table

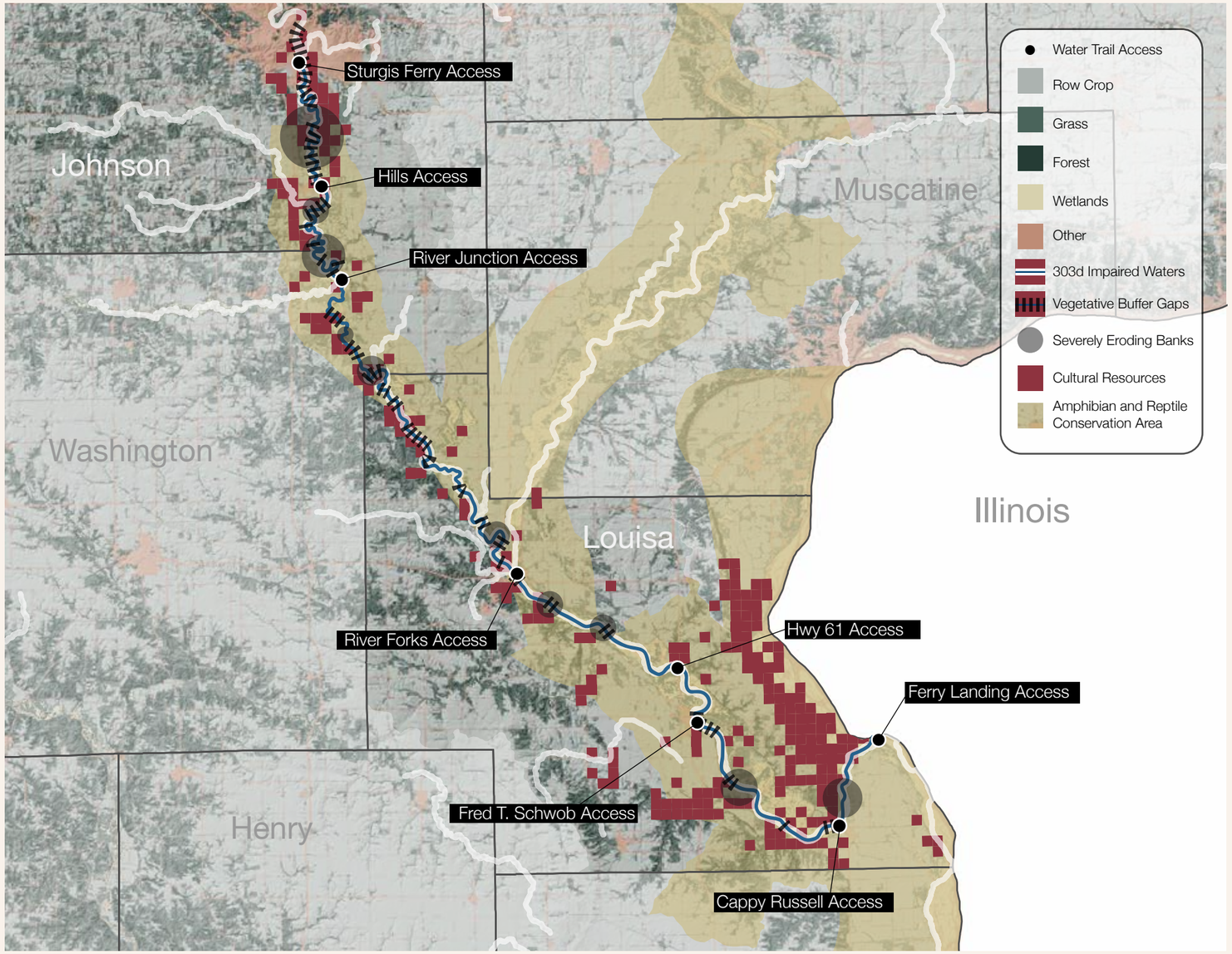


Figure 23

There are abundant enhancement opportunities related to water quality, wildlife habitat and cultural resources on this water trail.

Water Trail Recommendations & Summary

State-designated water trails are as much about other resources and experiences as they are about paddling. The most successful trails integrate and synthesize multiple opportunities at once: working to minimize damage to sensitive aquatic species, such as native mussels, while working to create new habitat; thoughtfully designing restoration practices such as streambank bioengineering to reduce nutrient pollution and increase biodiversity in ways that respect the needs of anglers and boaters; and partnering with local organizations with shared goals for conservation in the watershed and region of the water trail. People are the most important component in taking advantage of these opportunities.

Planning for state-designated trails brings all parties to the table because it is realized that all parties are necessary to protect, conserve, restore and promote resources on the ground. Movement forward from this planning activity is informed by the work of many informed technical specialists, researchers, local stakeholders, water trail program sponsors, and land managers. The future for this river corridor is very optimistic. State water trail staff and funding resources are poised to promote development, conservation and restoration on the river and within its corridor. Other funding sources, such as those promoting biodiversity, cultural resource protection and outdoor education, are more likely to value the integration of multiple resources and the regional focus of the river corridor more than a single resource consideration at one specific location.

The Iowa Water Trail sponsors, Johnson and Louisa County Conservation Boards, and the City of Iowa City have several decisions ahead. Initially they will commit to pursuing whichever experience classifications they believe are most appropriate. This, plus prioritized planning elements, will enable the water trail to competitively acquire funding and other support to reach their goals.

Once the vision is constructed by the water trail sponsor, all communities on the water trail will engage in managing and planning for the future of the water trail to the extent they find it important individually. Future decisions also include how the route will be interpreted and shared with the public, marketing strategies, priorities about preservation, conservation and restoration on the river and in the riparian corridor, and other options laid out in this chapter.

The most important element in any state-designated water trail will always be people. This water trail's ability to integrate and synthesize the resources available in the corridor into an interpreted experience rests entirely on them. Much of the "boots on the ground" work will be performed by paid county, municipal and state staff. Critically important opportunities, however, will require local and regional volunteer leadership.

REFERENCES

Anderson, M. L. 2014, Phase IA Cultural Resource Reconnaissance of the Iowa River and Lake Odessa Water Trails Corridor Through Portions of Johnson, Louisa and Washington Counties, Iowa. Office of State Archaeologist, University of Iowa, Iowa City.

Anderson, P.F. (1974). "General Land Office Research Frequently Asked Questions." Retrieved from URL [http://www.public.iastate.edu/~fridolph/glo/pinfo/info_faq.html].

Bentrup, G. (2008). Conservation Buffers: Design Guidelines for Buffers, Corridors and Greenways. Gen. Tech. Rep. SRS-109. Asheville, NC: Department of Agriculture, Forest Service, Southern Research Station.

Chapman, S. S et. al. (2002) Ecoregions of Iowa and Missouri, USGS. Reston, Va.: U.S. Geological Survey, Denver, CO, USGS Information Services.

Damman, E. (2015, April 15). Mesquakie Park's buried history: After decades of closure, the former dump remains unchecked and unregulated [Blog Post] Retrieved from URL [http://littlevillagemag.com/mesquakie-parks-buried-history-after-decades-of-closure-the-former-dump-remains-unchecked-and-unregulated/].

Gerhardt, R.A. (1974). Hydrogeology of three solid waste disposal sites in the Iowa River floodplain at Iowa City, Iowa (Unpublished master's thesis). University of Iowa, Iowa City.

Gourley, K. E. (1990). Locations of Sauk, Mesquakie, and associated Euro- American sites 1832 to 1845: an ethnohistoric approach (Unpublished master's thesis). Iowa State University, Ames.

History of Johnson County Iowa and its Townships, Cities, and Villages from 1836 to 1882 (1883), Iowa City, Iowa.

Iowa Department of Natural Resources. (2012). Iowa Wildlife Action Plan. Des Moines IA: Iowa Department of Natural Resources.

Iowa State University (2010). Center for Agricultural and Rural Development. Understanding the Usage Patterns and Most Desirable Characteristics of Iowa's Rivers and Streams. Ames: Iowa State University.

Irish, F.M. (1868). History of Johnson County, Iowa (pt. 4). Annals of Iowa, 1868: 302-328.

LeClere, J. B. (2013). A Field Guide to the Amphibians and Reptiles of Iowa. Rodeo NM: Ecouniverse Herpetological Publishing and Distribution.

Love, O. (2014, March 24). Iowa River fish species holding their own: experts doubt any of the lost species will ever return to the Iowa River. Cedar Rapids Gazette. Retrieved from URL [http://www.thegazette.com/2014/03/24/iowa-river-fish-species-holding-their-own].

Marsh, J. (1925). First Iowans Settled by Streams. Annals of Iowa 1925: 229-230.

Neebling, T.E. (2009). Fish assemblages in Iowa's non-wadeable rivers: Relationships with habitat and sampling methods. (Unpublished master's thesis). Iowa State University, Ames.

Parks, T.P. 2012. Fish assemblages in Iowa's nonwadeable rivers: Historic changes in assemblage structure and relationships with natural and anthropogenic environmental characteristics. (Unpublished master's thesis). Iowa State University, Ames.

Petersen, W. J. (1935). Buffalo Hunting with Keokuk. Palimpsest 1935: 33-49.

Petersen, W. J. (1941). Iowa: The Rivers of her Valleys. Iowa City: State Historical Society of Iowa.

Rosgen, D. (2014). Watershed Assessment of River Stability and Sediment Supply (WARSSS) 2nd Edition. Ft. Collins: Wildland Hydrology.

Schwieder, D. (1996). Iowa: The Middle Land. Iowa City: University of Iowa Press.

Swisher, J. A. (1940), Iowa: Land of Many Mills. Iowa City: State Historical Society of Iowa.

USDA, National Agricultural Statistics Service (2013). Cropland Data Layer for the United States. Washington D.C.: United States Department of Agriculture (USDA), National Agricultural Statistics Service (NASS), Research and Development Division (RDD), Geospatial Information Branch (GIB), Spatial Analysis Research Section (SARS).

Van Der Zee, J. (1905). Roads and Highways of Territorial Iowa. Iowa Journal of Politics and History, 1905: 175-225.

Wagner, Mimi, & Nate Hoogeveen. (2010). Developing Water Trails in Iowa. Des Moines: Iowa Department of Natural Resources.

Weaver, W. O. (1974). Hail to the Chief: True Tales of Old Wapello. Wapello, IA: Louisa Publishing CO., LTD.

APPENDICES

Appendix A.
Water Trail Access & River Management Elements Relating to Water Trail Classification

	Gateway	Recreational	Challenge	Wilderness
Accesses	Maintenance plan for at least a pair of accesses cleaned within 1-2 weeks of siltation, or rapidly repaired after flood damage.	Maintenance plan for accesses cleaned within a month of siltation, or rapidly repaired after flood damage.	Maintenance can be sporadic, and may be at a scale volunteers or small work parties can conduct.	
On-Land	Weekly mowing along edges of roadways and pedestrian areas, scheduled resurfacing plans are employed.	Edges of roadways and pedestrian areas mowed approximately monthly.	Any amenities are intentionally kept light and remote -- paddle in campsites may be considered appropriate.	
On-River	Response plan for river-wide tree/debris blockage may be developed.	Only major, river-wide obstructions that become chronic, cannot be easily portaged, and result in temporary "challenge" condition should be addressed.	Woody debris never maintained in a channel.	
Resources	Public launch fees may be considered to support maintenance. Pooled resources among various local and DNR water trail partners to create management / maintenance entities or jointly fund staff is encouraged.	Pooled resources among various local and DNR water trail partners to create management / maintenance entities or jointly fund staff is encouraged.	Cooperative funding can be explored if need arises.	Pooled resources among various local and DNR water trail partners to create management / maintenance entities or jointly fund staff is encouraged. Public launch fees or back-country-type camping permits may be considered.
Water Trail Signage	Sign maintenance: Inspected three times per warm season and replacements made immediately.	Sign maintenance: Inspected two times per warm season and replacements made within a month.	Fewer signs placed; inspected once per year and replacements made within a month.	
	May be eligible for annual maintenance inspection / sign replacement funding.			

Appendix B.
Water Trail User Elements Relating to Water Trail Classification

	Gateway	Recreational	Challenge	Wilderness
River User Safety	Public communication describes river and access conditions as better for novices.	Public communication describes river conditions, and on rivers warns strainers are high potential for hazard.	Public communication describes why river conditions are not appropriate for novices, and on rivers warns strainers are high potential for hazard.	Public communication describes river conditions, length and distance commitments, and on rivers warns strainers are high potential for hazard.
	Emergency action plan is required, and includes egresses including private lane accesses. Plan is communicated among landowners and responders; E911 communication framework for locating distraught users established.	Emergency action plan identified and communicated among landowners and responders; E911 communication framework for locations established.	Communication to public implies they should have skills and equipment in order to commit to segment, some planning for landmark-based communication for locations and rescue methods among emergency responders discussed.	
River User Behavior	Water trail manager locally leads in litter control, etiquette, and safety education and enforcement programs and campaigns. Trash receptacles available at controlled settings.	Water trail manager participates in litter control, etiquette, and safety education and enforcement programs and campaigns.	Leave No Trace ethic is encouraged through materials and literature.	
	Law enforcement presence is moderately visible and law enforcement is briefed in dealing with problem users.	Law enforcement presence is occasionally visible and law enforcement is briefed in dealing with problem users.	Law enforcement presence rarely needed.	
Services	Management of liveries through requiring concessionaire agreements, fees, and conditions placed on operation is strongly encouraged.	Management of liveries through low-cost concessionaire agreements with some conditions placed on operation is encouraged.	Skilled guide services may be more appropriate than standard rental businesses. System to vet guides for use of public access may be considered for public safety.	Guide services may be more appropriate than standard rental businesses.

Appendix C.
Water Trail Experience Classification Summary

	Gateway	Recreational	Challenge	Wilderness
User Expectations	• Most predictable, particularly for those with less experience • A paired launch and landing with ramped, hard-surface or well-maintained compacted aggregate • Slopes generally 12% and accommodating widths of 4' or greater • A readily enjoyable setting that will be attractive to new users • Exposure to few hazards relative to other segment types	• Requires some boat control • Intended for users with some experience • Low-head dam hazard signage present, as needed • Varied settings • Basic level of navigational aid available (maps, signage)	• User expects to manage risk in hands-on ways • Good boat control necessary • Launch and/or parking may be slightly to very difficult to use • Low-head dam hazard signage present, as needed	• Some degree of solitude and wildlife viewing • Paddling endurance and skill required • Launch and parking areas can be very undeveloped in context with the setting • Wayfinding signage not always present at accesses and on-river • Low-head dam hazard signage present, as needed
Typical Development Goals	• Exposing the greatest number of new users to water trails • Appropriate for extended families and groups of friends • Part-day to full-day trip opportunity • Strong emphasis on building user confidence through signage and ultra-easy launch and parking • Launches, parking, trails designed with Universal Design standards • High degree of environmental educational / interpretive opportunity	• Offers a typical Iowa water trail experience • Day-trip opportunity • Family and group experiences • Access points may be less developed compared with Gateway experience • Access surfaces may not be stable	• Day- and multi-day-trip opportunity • Low-impact access development may result in more difficult movement from parking to launch: steep slopes, tight turn on trails, or long distances from parking to launch	• Day and multi-day-trip opportunity • Less development, more restoration and protection of habitats • May include parking in already impacted areas, rustic launches, and rustic remote campsites • Low-impact practices required in all water trails-related construction
Accesses	≤ 6 miles apart	≤ 9 miles on average	Varies	> 9 miles
Amenities such as restrooms, running water, picnic areas, camping	• Often available at accesses • Liveries, shuttle often operating • Wayfinding signage on roadways is more extensive to clearly identify driving route, turns, etc.	• May be available but usually not as developed • Liveries, shuttle desirable	• May be available but usually not • Guided experiences may be encouraged	• Any facilities present, such as remote campsites, are minimal, primitive, and without signage • Guided experiences may be encouraged over rental

Appendix D.
Lower Iowa River Fish Collections

This data compiled and provided by Greg Gelwicks, Iowa DNR 2016

	Threatened	Endangered	SGCN	Between Coralville Reservoir Dam and Coralville lowhead dam	Between Coralville lowhead dam and Burlington St. Dam	Below Burlington St. Dam
Bigmouth Buffalo				X	X	X
Bigmouth Shiner						X
Black Buffalo			X	X	X	X
Bluegill				X	X	X
Blue Sucker*			X			X
Bluntnose Minnow						X
Bowfin*						X
Brassy Minnow						X
Bullhead Minnow				X	X	X
Carmine Shiner			X			X
Channel Catfish				X	X	X
Channel Shiner*			X			X
Common Carp				X	X	X
Common Shiner						X
Emerald Shiner						X
Fathead Minnow						X
Flathead Catfish				X	X	X
Freckled Madtom		X				X
Freshwater Drum				X	X	X
Gizzard Shad				X	X	X
Golden Redhorse						X
Golden Shiner			X		X	
Goldeye*						X
Goldfish				X		X
Grass Carp				X	X	X
Green Sunfish				X	X	X
Highfin Carpsucker				X	X	
Johnny Darter					X	X
Largemouth Bass				X	X	X
Longnose Gar*						X

	Threatened	Endangered	SGCN	Between Coralville Reservoir Dam and Coralville lowhead dam	Between Coralville lowhead dam and Burlington St. Dam	Below Burlington St. Dam
Mimic Shiner*			X			X
Mississippi Silvery Minnow*			X			X
Mooneye*						X
Northern Pike			X	X		
Orangespotted Sunfish				X		X
Quillback Carpsucker				X	X	X
Red Shiner				X		
River Carpsucker				X	X	X
River Darter*			X			X
River Shiner*			X			X
Sand Shiner						X
Sauger*						X
Shoal Chub*			X			X
Shorthead Redhorse				X	X	X
Shortnose Gar*						X
Shovelnose Sturgeon*			X			X
Silver Chub*						X
Silver Redhorse			X		X	X
Slenderhead Darter			X	X	X	X
Smallmouth Bass				X	X	X
Smallmouth Buffalo				X	X	X
Spotfin Shiner				X	X	X
Spotted Bass				X		
Stonecat						X
Suckermouth Minnow			X			X
Walleye				X	X	X
Western Sand Darter*	X					X
White Bass				X	X	X
White Crappie				X	X	X

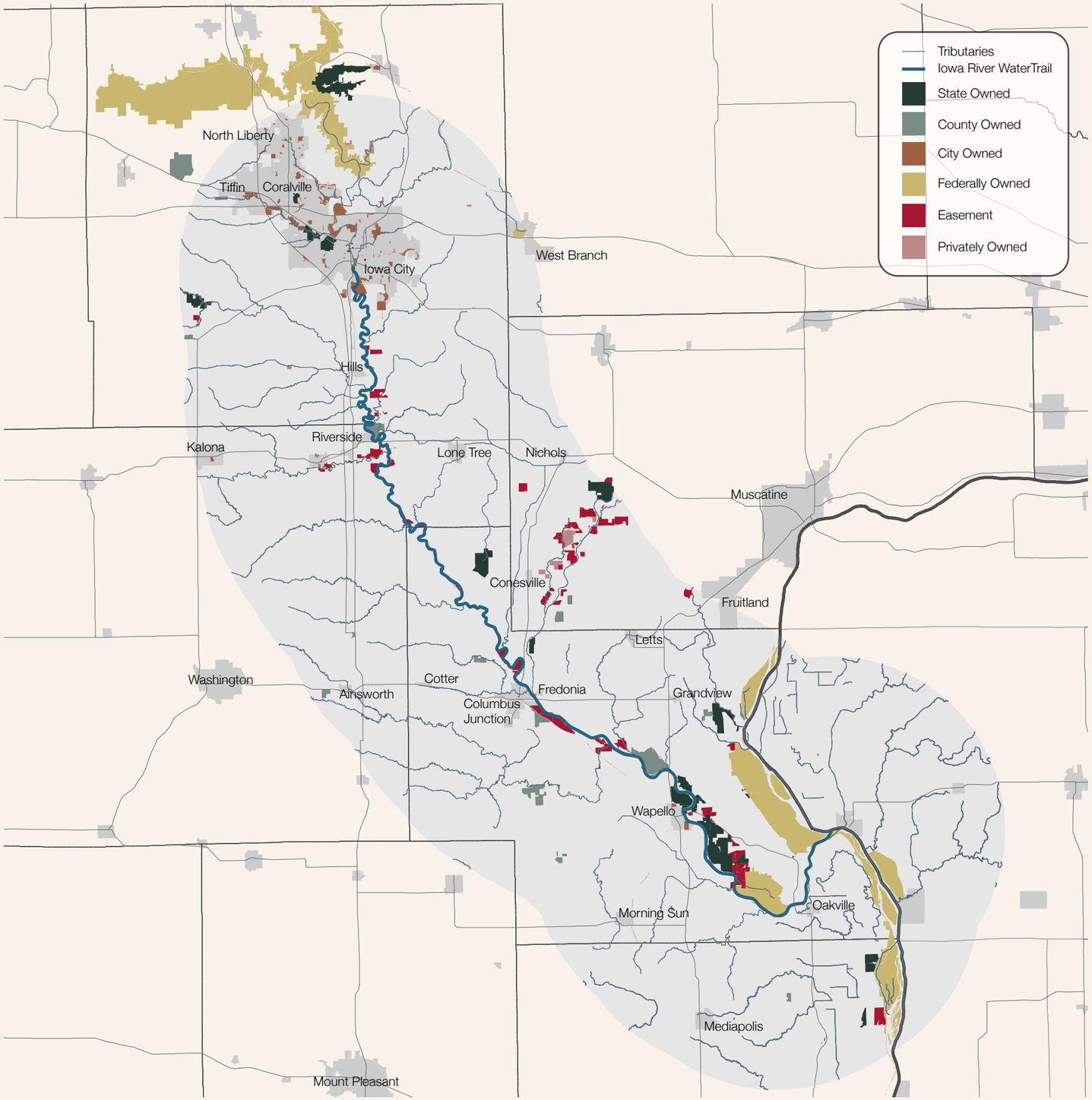
*These species are generally only found in Iowa's interior rivers downstream of the lowermost barrier to upstream fish passage.

Appendix E.
Ninety-three bird species were identified in the riparian study blocks that are not listed as a Species of Greatest Conservation Need (SGCN).

SPECIES

American Coot
American Crow
American Goldfinch
American Kestrel
American Redstart
American Robin
Baltimore Oriole
Bank Swallow
Barn Swallow
Barred Owl
Belted Kingfisher
Black-capped Chickadee
Blue Grosbeak
Blue Jay
Blue-gray Gnatcatcher
Blue-winged Teal
Brown Thrasher
Brown-headed Cowbird
Canada Goose
Carolina Wren
Cedar Waxwing
Chipping Sparrow
Cliff Swallow
Common Gallinule
Common Grackle
Common Yellowthroat
Double-crested Cormorant
Downy Woodpecker
Eastern Bluebird
Eastern Kingbird
Eastern Phoebe
Eastern Screech-Owl
Eastern Towhee
Eastern Wood-Pewee
Eurasian Collared-Dove
Eurasian Tree Sparrow
European Starling
Gray Catbird
Great Blue Heron
Great Crested Flycatcher
Great Egret
Great Horned Owl
Green Heron
Hairy Woodpecker
Hooded Merganser
Horned Lark
House Finch
House Sparrow
House Wren
Indigo Bunting
Killdeer
Lark Sparrow
Mallard
Marsh Wren
Mourning Dove
Northern Cardinal
Northern Flicker
Northern Parula
Northern Rough-winged Swallow
Orchard Oriole
Ovenbird
Pied-billed Grebe
Pileated Woodpecker
Purple Martin
Red-bellied Woodpecker
Red-eyed Vireo
Red-tailed Hawk
Red-winged Blackbird
Ring-billed Gull
Ring-necked Pheasant
Rock Pigeon
Rose-breasted Grosbeak
Ruby-throated Hummingbird
Scarlet Tanager
Song Sparrow
Sora
Spotted Sandpiper
Swamp Sparrow
Tree Swallow
Tufted Titmouse
Turkey Vulture
Vesper Sparrow
Virginia Rail
Warbling Vireo
Western Meadowlark
White-breasted Nuthatch
Wild Turkey
Wilson's Snipe
Wood Duck
Yellow Warbler
Yellow-headed Blackbird
Yellow-throated Vireo
Yellow-throated Warbler

Appendix F. Public Recreation Lands Within 10-miles of the Water Trail



CHAPTER 2
WATER TRAIL VISION

IOWA RIVER WATER TRAIL

CHAPTER 2

WATER TRAIL VISION

State water trails in Iowa are selected to represent the most beautiful, interesting and accessible river conditions in the state. They are as much about other resources and experiences as they are about paddling. The most successful trails integrate and synthesize multiple opportunities at once: working to minimize damage to sensitive aquatic species, create new habitat, thoughtfully designing restoration practices to reduce nutrient pollution and partnering with local organizations that share goals for conservation in the watershed and region. People are the most important component in taking advantage of these opportunities.

The 72-mile reach of the Iowa River between Iowa City and its confluence with the Mississippi River has long drawn the attention of historians, biologists and other scientists, recreationists and nature-lovers. Part of this interest is because it was one of the earliest interior rivers in the state in-habited and used by Euro-American settlers. The segment between Sturgis Ferry Access in Iowa City and Ferry Landing Recreation Area Access at the confluence of the Mississippi River is currently designated as a State Water Trail by the Iowa Department of Natural Resources (DNR) River Programs. This water trail footprint largely remains intact following planning between 2015 and 2018 and the development of this vision, although the designated route will be extended upstream several miles. The state designated part of the water trail will begin at the new Riverfront Crossing Park in Iowa City, a short distance below the Burlington Street Dam. Johnson and Louisa County Conservation boards have agreed to be the water trail sponsor for their county jurisdictions. Communities on the river, Iowa City, Columbus Junction and Wapello have a strong historic connection to the river and are also very engaged in this state water trail. All parties are interested in enhancing recreational use, tourism, conservation and protection of the river corridor.

Water Trail Theme The theme of this water trail centers on the notion of embracing the river. This theme is derived from the rich opportunities residents believe the corridor offers. This water trail already draws thousands of visitors each year to boat, fish, hike, photograph and relax. It was one of the first rivers in Iowa to be designated as a state water trail, in 2011, by the Iowa Department of Natural Resources. The theme of this water trail centers on its opportunities of contrast—beginning in the very urban fabric of Iowa City, the river continues downstream through the small communities and remote countryside of this southeast Iowa region, ending at the Mississippi River, one of the country's most important natural and recreational resources. Cultural, historic and natural resource sites dot the entire route from the top to the bottom of this water trail. The Iowa River Water Trail in Johnson and Louisa counties offers some of Iowa's most diverse biological conditions including breeding birds, amphibians, reptiles, mussels and fish.

To embrace this river refers to developing an understanding of it through experiences as well as committing to care for it. A basic tenet of this water trail is that experiencing it is like experiencing two very different rivers. While spectacular scenery, diverse habitat and sacred sites exist both above and below the confluence of the Iowa and Cedar rivers, the geology, vegetation, wildlife and the water is vastly different. And while history and biology play a defining role in the spirit of this river, local residents

in both counties have broad dreams and goals for further enhancement in the corridor. Opportunities to grow the population of those who use and/or appreciate the river and its adjacent communities and businesses are crafted into nearly every aspect of this water trail vision.

Vision The vision of this water trail centers of resource protection coupled with recreation. The water trail sponsors see one of the primary purposes of the water trail as a means to further conservation on and near the river and to interpret this for users. For example, they are particularly interested in streambank restoration and establishment of a perennial buffer as well as understanding more about the impaired water quality conditions and what can be done to enhance conditions locally. Protection of habitat conditions is important locally for the turtles, amphibians, birds, fish and mussel species living in the corridor. Key to this outcome is the permanent protection and restoration of river edge forests, backwater sloughs, and former savanna landscapes.

From a recreation standpoint, the vision includes additional linkages between people and the river. For example, there is already a strong overlap between with the water trail route and the existing land trails in the Iowa City area, allowing users to move from the river's edge to and past the Coralville Reservoir and connecting with the (planned) Hoover Valley Nature Trail. Along with completing long range trail plans, this the local vision includes greater opportunities for pedal-paddle and equestrian uses. Expansion of the strong environmental education programs already available in Johnson and Louisa counties is also sought. This expansion would complement existing geographically-based formal and traditional education with interpretive social media and learning activities. DNR River Programs is interested in partially supporting this type of enhancement.

The long term vision for this water trail includes an upgrade in the physical infrastructure at the river edge. These upgrades will make river use more convenient as well as extend access to people with limited physical abilities. There are eight existing public river accesses on water trail in Johnson and Louisa counties. The condition of these accesses are primitive and in some cases the infrastructure is highly susceptive to flood damage. Only one, Hills Access, has a full range of public facilities including drinking water. A total of 9 river accesses are included in the vision and four of the existing eight accesses will eventually be removed from the water trail. Most are being replaced at locations more resilient to flooding and erosion. An existing 24-mile segment will be reduced to two 12-mile segments. In addition to physical access and resiliency, the Iowa City area envisions development of a Gateway-style segment of the water trail to encourage new users to explore the river. Two new accesses are planned in Iowa City to facilitate this Gateway segment. The eventual expansion of the water trail upstream of the Burlington Street Dam in Iowa City is strongly supported in Iowa City and Johnson County. Other goals include minimizing maintenance by reducing erosion and deposition from high flows. eventually be removed from the water trail. Most are being replaced at locations more resilient to flooding and erosion. An existing 24-mile segment will be reduced to two 12-mile segments. In addition to physical access and resiliency, the Iowa City area envisions development of a Gateway-style segment of the water trail to encourage new users to explore the river. Two new accesses are planned in Iowa City to facilitate this Gateway segment. The eventual expansion of the water trail upstream of the Burlington Street Dam in Iowa City is strongly supported in Iowa City and Johnson County. Other goals include minimizing maintenance by reducing erosion and deposition from high flows.

Several vision elements will benefit from cooperation and shared funding between Johnson and Louisa counties. A new access planned in northern Louisa County will reduce the 24-mile segment distance between the existing River Junction and River Forks accesses. This specific location was chosen after collaboration between both counties and planners. A unique backwater slough site including a historic site known as Buttermilk Falls extends across both counties. Because the Iowa River is a meandered stream, this area can be used for a public paddling loop adjacent to the water trail. While Louisa County already owns a similar backwater slough, Indian Slough, this would be the first backwater slough adjacent to the Iowa River owned by Johnson County.

CHAPTER 3

RECREATIONAL DEVELOPMENT PLAN

IOWA RIVER WATER TRAIL

CONTENTS

CHAPTER 3
RECREATIONAL DEVELOPMENT PLAN

State water trails in Iowa are examples of important overlaps between people and natural resources. This 72-mile segment of the Iowa River is already an ideal state water trail because the river already draws thousands of visitors each year to boat, fish, hike, photograph and relax.

It was one of the first rivers in Iowa to be designated as a state water trail, in 2011, by the Iowa Department of Natural Resources (DNR). Beginning in the very urban fabric of Iowa City, the river continues downstream through the small communities and remote countryside of this southeast Iowa region, ending at the Mississippi River, one of the country's most important natural and recreational resources. Cultural, historic and natural resource sites dot the entire route from the top to the bottom of this water trail. The Iowa River Water Trail in Johnson and Louisa counties offers some of Iowa's most diverse biological conditions including breeding birds, amphibians, reptiles and fish. For example, because this segment is unimpeded by dams, it is home to more diverse fish species, compared with upstream reaches, because of its connection with the Mississippi River.

River users have direct visual access, and often physical access, to more than 12,000 acres of public recreation lands adjoining or incredibly close to the river. And nearly 71,000 acres of permanently protected land, often wetland and slough areas, exist within 10 miles of the water trail. Very few rivers in Iowa provide this much opportunity.

Paddling this water trail is to experience two very different rivers. While spectacular scenery, diverse habitat and sacred sites exist both above and below the confluence of the Iowa and Cedar rivers, the geology, vegetation, wildlife and the water is vastly different. The first 20 miles of the water trail is a rocky-bottomed river with many twists and turns while the last 20 miles are a wide, braided, sandy-bottomed river with just a few large sweeping bends.

This planning linked historic river features and events to inspire both future recreation and conservation elements. And while history and wildlife play a defining role in the spirit of this river, local residents in both counties have broad dreams and goals for further enhancement in the corridor. Opportunities to grow the population of those who use and/or appreciate the river and its adjacent communities and businesses are crafted into nearly every aspect of this recreational planning chapter. Both Johnson and Louisa County Conservation Boards as well as the communities of Iowa City, Columbus Junction and Wapello are dedicated to the planning elements included in this chapter.

WATER TRAIL EXISTING CONDITIONS

In 2010 the Iowa Department of Natural Resources (DNR) completed “IOWA WATER TRAILS: Connecting People with Water and Resources” (Wagner and Hoogeveen 2010a). This statewide plan was the result of a 2008 mandate for the water trails program. This plan ushered in a new legacy of enjoyment, respect, and care for the navigable waters of Iowa. This recreation development plan adds to that excitement by utilizing the increasing volunteer spirit and local pride communities have for their rivers. The vision for Iowa’s water trails program centers both on expanding recreational experiences as well as protecting and enhancing Iowa’s aquatic and riparian resources. And in addition to providing access to Iowa’s rivers, the vision points to water trails as an entry point for people to become aware of and learn about the challenges facing Iowa’s waterways. Similarly, state water trail plan goals focus on user experiences, natural resource conservation and efficient management.

Recreation planning for state water trails responds to the individual character of each river, the local support present and landscape conditions. Recommended outcomes focus on enhancing both the recreational infrastructure and the experiences of water trail users. The Iowa Water Trails Program recognizes water trail users as all people using the river as well as the adjacent land. On the river itself this includes paddlers and other boaters, anglers, swimmers and tubers. Active and passive users on land adjacent to the river are also included, such as, land trail users, hunters, picnickers and bird watchers, as well as those who enjoy watching the river from their parked car.

State Water Trails Program Goals

GOAL ONE:
Provide positive water trail experiences meeting user expectations

GOAL TWO:
Use water trail development to strengthen natural resources conservation

GOAL THREE:
Adapt water trail development techniques to the waterway’s individual character

GOAL FOUR:
Support public access to water for recreational purposes

GOAL FIVE:
Create a robust, resilient system for developing and experiencing water trails

GOAL SIX:
Encourage education in outdoor settings

GOAL SEVEN:
Support positive water trail experiences by initiating strategies to manage intensively used areas

PROJECT PLANNING AREA

The project area of this plan includes the Iowa River beginning below the Burlington Street Dam in Iowa City and extends to the Iowa's confluence with the Mississippi River *(Figure 1)*. The municipal area of Iowa City is a critically important segment of this water trail. This recreational plan serves three purposes:

- To provide a contemporary summary of all recreational plans near the Iowa River and integrate them with existing and proposed water trail infrastructure
- To develop conceptual plans for infrastructure development and river management to be used by local agencies and organizations for funding and construction
- Ensure that all proposed recreational development elements are consistent with the conceptual framework of the Water Trail Sponsor, DNR River Programs standards and the goals of the local steering group

The goals of this recreation development plan center on enhancing conditions on the Iowa River in ways that support successful, broad-based public access to the river for recreational purposes with infrastructure designs that work with the river system. Because natural resource conservation is a critical element of Iowa's Water Trails Program, it's important that recreational development opportunities enhance the physical condition of the river and cause no further degradation. The following framework elements are used to guide the choice of recreational enhancements as well their design:

- Enhance and support public access to water for recreational purposes
- Minimize limitations to recreational access based on age and physical abilities
- Provide positive water trail experiences meeting user expectations
- Use water trail development to strengthen natural resources conservation
- Reduce routine maintenance needs
- Increase Flood Resilience of recreational amenities at rivers edge

These elements are integrated into later sections of the plan to illustrate how specific elements contribute to the success of the planning.

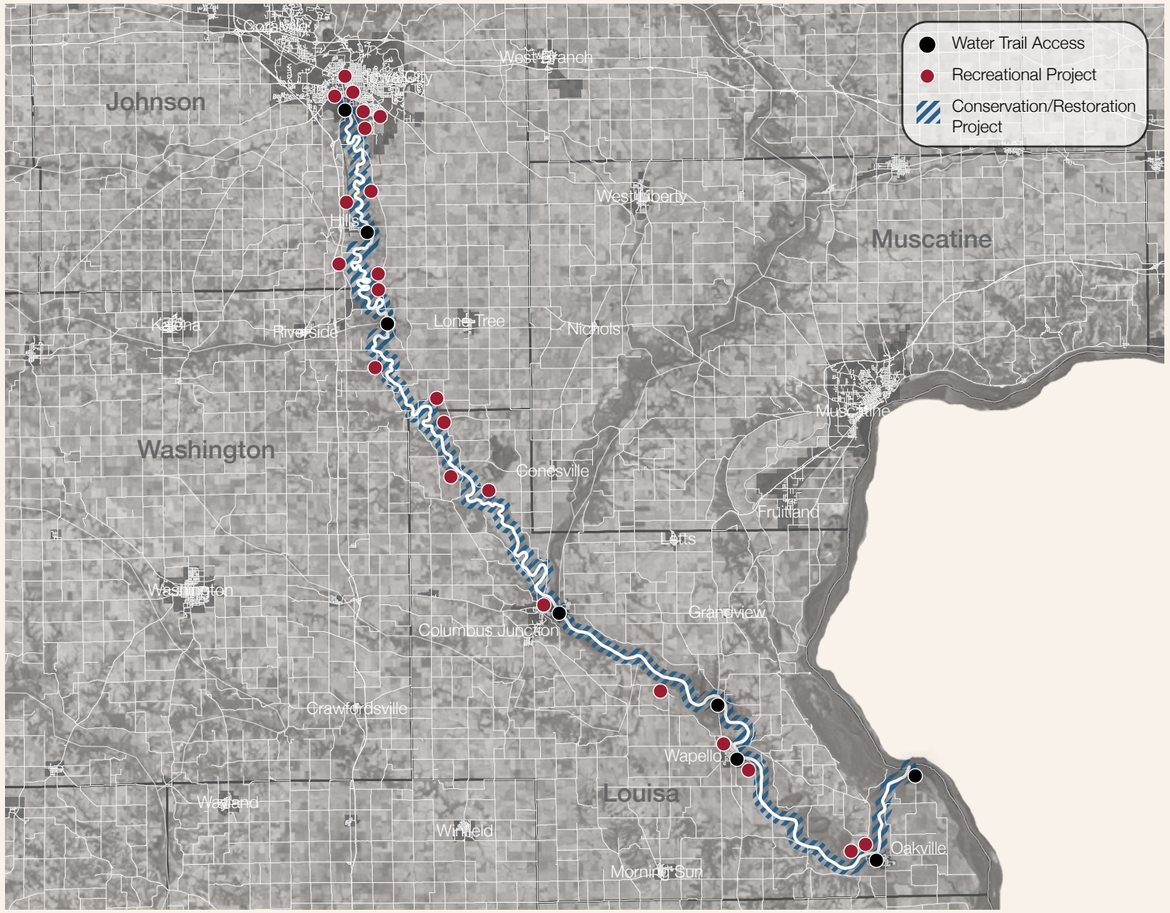


Figure I

This plan included both recommended recreational and conservation projects.

ADMINISTRATIVE RULES & DEFINITIONS

A number of federal, state and local statutes, rules and ordinances apply to recreational river use in Iowa. These rules govern public use of rivers and behavior while on-water. Current interpretation of statutes, rules and codes related to recreation are summarized in *Figure 2*.

Figure 2

Iowa regulations providing the framework for use and behavior of public waters are constantly evolving. These interpretations were updated in 2018 with assistance from the Iowa Attorney General's Office and Iowa DNR staff.

Meandered vs Non-meandered Stream:

Rivers with "meandered" status generally allows river users on-foot access to the channel bottoms and stream banks up to the ordinary high water mark. Note that overnight camping may not be allowed on the sandbars of meandered rivers within state parks due to park use regulations. Alternatively, the stream bed, sandbars and banks of rivers classified as "non-meandered" are considered part of the adjacent property. River users on these "non-meandered" rivers may be allowed to recreate only on the water surface, with additional incidental allowances associated with navigation (see Navigation and Trespass, below) where the bed and banks of the stream are in private ownership. All of the Iowa River in this plan is meandered, but the tributaries are non-meandered. Iowa Code 462A.2, 462.69 IOWA WATER NAVIGATION REGULATIONS; Iowa Attorney General Opinion: Smith to Kremer, State Representative, 2-6-96 (#96-2-3).

Navigation and Trespassing:

Paddlers on Iowa rivers are allowed to portage their boat to safely circumvent a channel blockage or hazard. Users also are allowed to portage their boat on dry sandbars and channel bottoms. Iowa Code 462A.2, 462.69 IOWA WATER NAVIGATION REGULATIONS; Iowa Attorney General Opinion: Smith to Kremer, State Representative, 2-6-96 (#96-2-3). Entering privately owned land next to the river without the express permission of the owner or remaining there after being notified or requested to leave by the owner is considered trespass. Iowa Code 716.7 IOWA DAMAGE AND TRESPASS TO PROPERTY REGULATIONS; Iowa Attorney General Opinion: Smith to Kremer, State Representative, 2-6-96 (#96-2-3).

Tort Liability of Government Subdivisions:

Municipal tort law protects cities, towns, and counties from claims of liability for local units of government when recreational infrastructure on rivers is built to current standards. Iowa Code 670 TORT LIABILITY OF GOVERNMENTAL SUBDIVISIONS.

Iowa's Recreational Use Statute:

Under the Iowa recreational use statute, a landowner is encouraged to open their land and water for public recreational use, (swimming, boating and hunting to name a few) by receiving immunity from liability except for injuries resulting from the landowner's willful or malicious acts, or when a landowner charges a fee for recreational use. Iowa Code 461C PUBLIC USE OF PRIVATE LANDS AND WATERS.

Littering:

Discarding litter onto water or land is prohibited. Additional fines or penalties may exist based on the jurisdiction of the littering incident such as county or municipal-owned property. Iowa Code 455B.363 LITTER.

Motorized Vehicle Use in River:

The use of motorized vehicles, including ATVs, in all parts of certain navigable streams, such as the Des Moines River, is prohibited at all times and conditions. Iowa Administrative Code 461, Chapter 49 provides a list of those navigable streams in which off-highway vehicle use is prohibited. Specific exceptions exist and relate to agricultural access. In meandered streams, motor vehicles shall not be operated on any part of the stream at any time, including on dry sand bars. Iowa Administrative Code 571, Chapter 49 OPERATION OF MOTOR VEHICLES IN MEANDERED STREAMS, NAVIGABLE STREAMS AND TROUT STREAMS; Iowa Code 321I.14.g ALL TERRAIN VEHICLES.

Bicycle Use in Streams:

There is no restriction of bicycle use on the bed or banks of meandered streams (fat bikes, mountain bikes, etc.). Their use on the dry beds of non-meandered streams without permission of the landowner could result in trespass. Iowa Code 716.7 IOWA DAMAGE AND TRESPASS TO PROPERTY REGULATIONS.

Livestock Fences Across Streams:

The owner of the bed of a non-meandered, navigable stream has a right to erect fences, including electric fences, across the stream as necessary to confine livestock on his or her land in a manner that affords boaters safe passage. Methods of affording safe passage typically include setting the wire high over deep water that cattle avoid, or the use of a non-conductive rubber hose over the electric wire to allow river users to raise the wire. It is recommended that fences be flagged as a warning for river users. Iowa Code 657.2(3) WHAT DEEMED NUISANCES and Iowa Attorney General Opinion: Smith to Kremer, State Representative, 2-6-96 (#96-2-3).

Consuming Alcohol and Intoxication:

Operating a motorboat or sailboat while under the influence of alcohol (.08 alcohol blood level or higher), controlled substances, or illegal chemicals is unlawful. In addition, public intoxication may be enforced in public places. Local ordinances may vary in terms of allowing alcohol consumption in public places such as city or county parks. Iowa Code 123.46 CONSUMPTION OR INTOXICATION IN PUBLIC PLACES.

Personal Flotation Devices (PFDs):

All vessels are required to have at least one personal flotation device (PFD) or life vest for each person onboard. PFDs must be readily accessible in an emergency. All children under the age of 13 on a vessel are required to wear a PFD. Iowa Code 462.A WATER NAVIGATION REGULATIONS.

Boat Registration:

Registration is not required for inflatable vessels seven feet or less in length, and canoes and kayaks 13 feet or less in length that have no motor or sail. It is also not required for vessels properly registered in another state and using Iowa waters for 60 days or less. Iowa Code 462A WATER NAVIGATION REGULATIONS.

Figure 2 (cont)

Iowa regulations providing the framework for use and behavior of public waters are constantly evolving. These interpretations were updated in 2018 with assistance from the Iowa Attorney General's Office and Iowa DNR staff.

ASSUMPTIONS AND CONCEPTS

This recreational plan includes concept design for all near-water infrastructure construction. One of the most important recreational development elements in this plan is the upgrade of existing river accesses. River accesses include six functional components: entrance drive, parking surface, launch surface, a pathway connecting the parking surface, and the launch and stormwater infiltration areas *(Figure 3)*. Several assumptions exist in this planning related to natural resource conservation and the goal of working with the river system.

Construction and vegetation clearing on the floodplain, in the floodway and on the river's edge is regulated at the federal, state and local levels. All recreational infrastructure development included in the water trail plan should conform to the minimum standards established by regulation. This is critical because all river access locations are located in either the floodplain or floodway. In addition to federal protection of wetlands and Waters of the U.S., state and local floodplain and Sovereign Lands regulations also exist. The Iowa DNR Water Trail development standards also recommend a minimum 50-foot wide unmown riparian buffer between the top of the streambank and all parking areas.

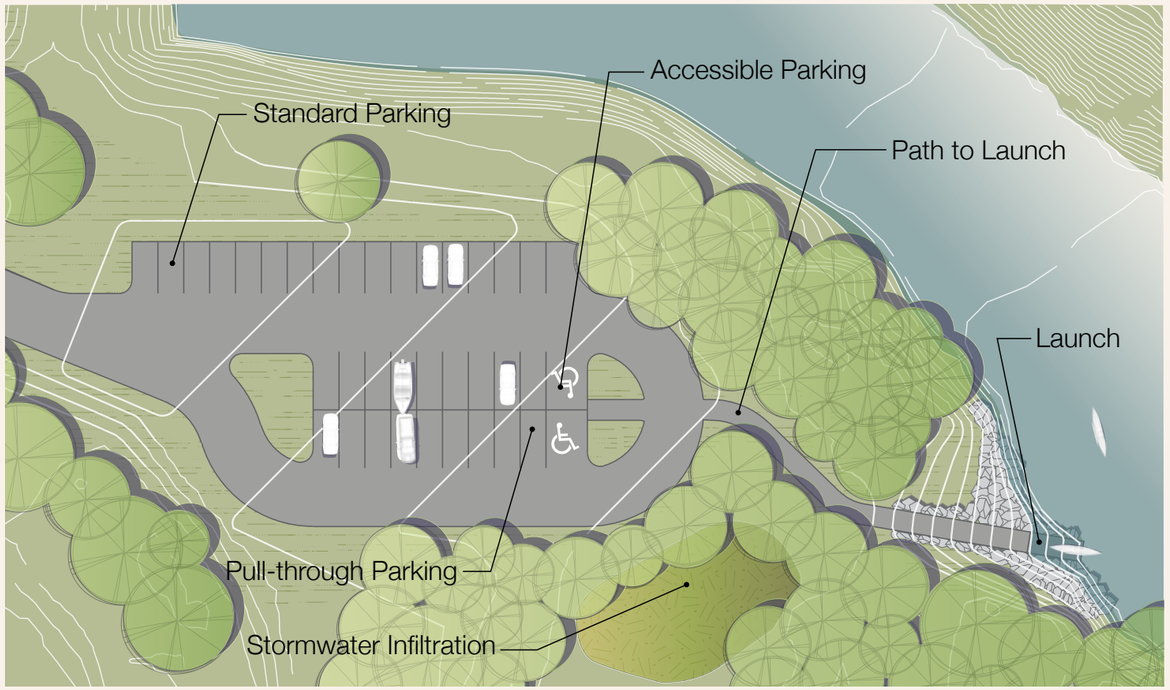
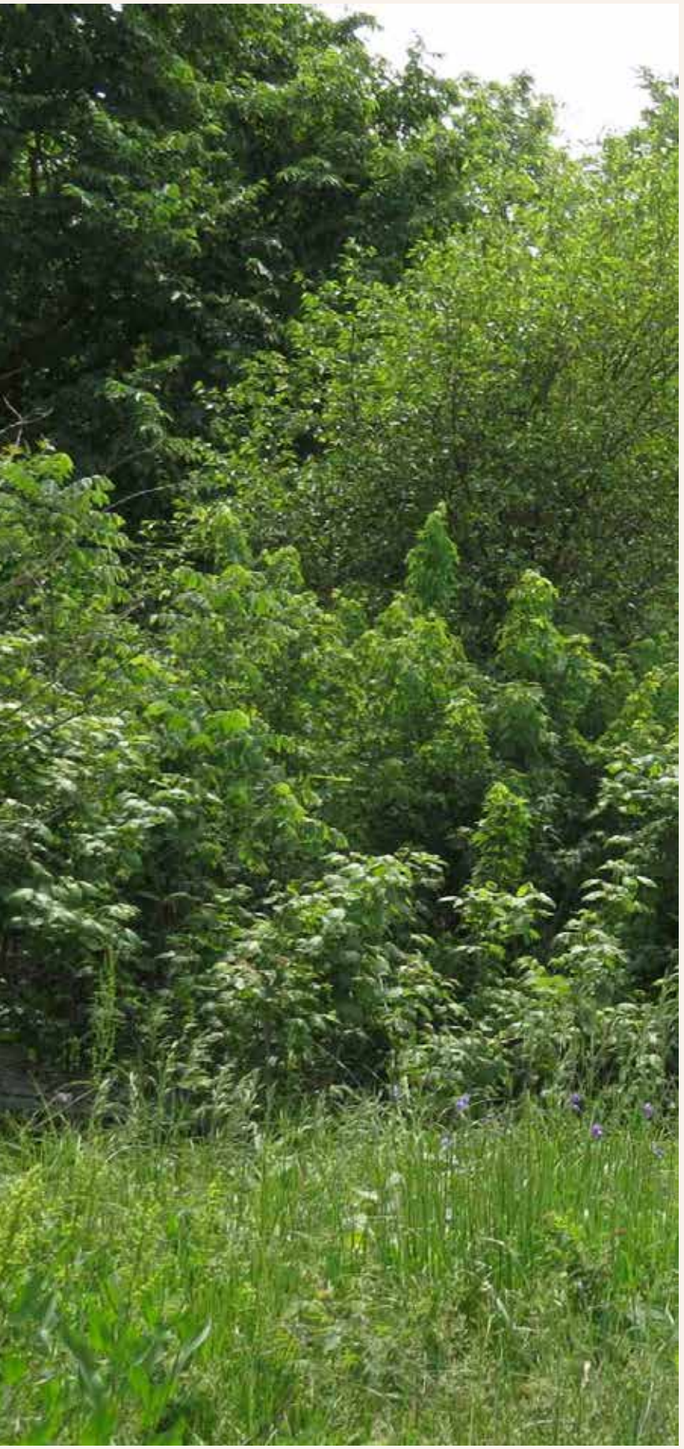


Figure 3

A typical water trail access includes a developed parking area as well as a path connecting it to the actual river launch surface. Surfacing materials may vary from site to site with the exception of the river launch surface which is always concrete.



The Iowa River in Johnson and Louisa Counties

This water trail study segment begins below the Burlington Street dam in Iowa City and extends to the rivers' confluence with the Mississippi River. No dams exist on the water trail itself however, in addition to the Burlington Street Dam, the Coralville Lake Dam is located 10 miles above the beginning of the study segment. Coralville Lake Dam regulates water flow in the Iowa River. The entire 8,082,400-acre drainage basins for both the Cedar and Iowa rivers empty into this water trail *(Figure 4)*.

The Iowa River Water Trail in this study flows through a small area of the Southern Iowa Rolling Loess Prairies ecoregion before entering into the Interior River Lowland ecoregion several miles below Iowa City. The lowest segment of this water trail, beginning at Cappy Russell Access, includes many oxbow lakes and backwater sloughs. The typical channel width of the Iowa River upstream of the confluence with the Cedar River is between 240 and 440 feet. Downstream of the confluence with the Cedar the channel width doubles, ranging from 870 feet to over 3,000 feet wide near its entry into the Mississippi River. The river straightens as it widens with tight meanders above River Junctions and a slow braided river with large islands in the channel near its mouth. Paddling volume is high from Iowa City to the Hills Access, moderate to River Junction and decreases to low through the remaining segments.

A total of 70,878 acres of land are known to be in permanent protection within 10 miles of the study segment of the Iowa; 91% of these acres (64,000) are available for public recreation.

Figure 4
This water trail is located at the downstream-most segment of the Iowa River, one of the largest interior rivers in the state.

IMPLEMENTATION OF THE IOWA RIVER VISION

The majority of the Iowa River in Johnson and Louisa counties will be classified as a Recreational Use classification *(Figure 5)*. The one-mile segment between the two new accesses in Iowa City, once they are constructed, will be classified as a Gateway Use classification. The 24-mile segment between River Junction and River Forks will be classified as a Challenge Use classification until a proposed launch is constructed midway between these two accesses, at which point these segments will be classified as Recreational. A large part of the vision for this water trail is to bring more citizens to the river, giving them easy access not just for paddling but to the river itself for wading, fishing, nature study, and enjoyment. Ensuring all citizens have equal access to the river is also very important to the vision. Another component is educating citizens about different kinds of streambank restoration-- what works and what isn't as successful.

Recreational development in the vision includes physical upgrades or relocations to the most heavily used accesses on the water trail. Also included in the vision is a much more direct connection between recreation and the river in Iowa City. Construction of launches and near-launch amenities will allow people with a broader range of physical abilities to access the river. Other goals include minimizing maintenance by reducing locations prone to flooding.

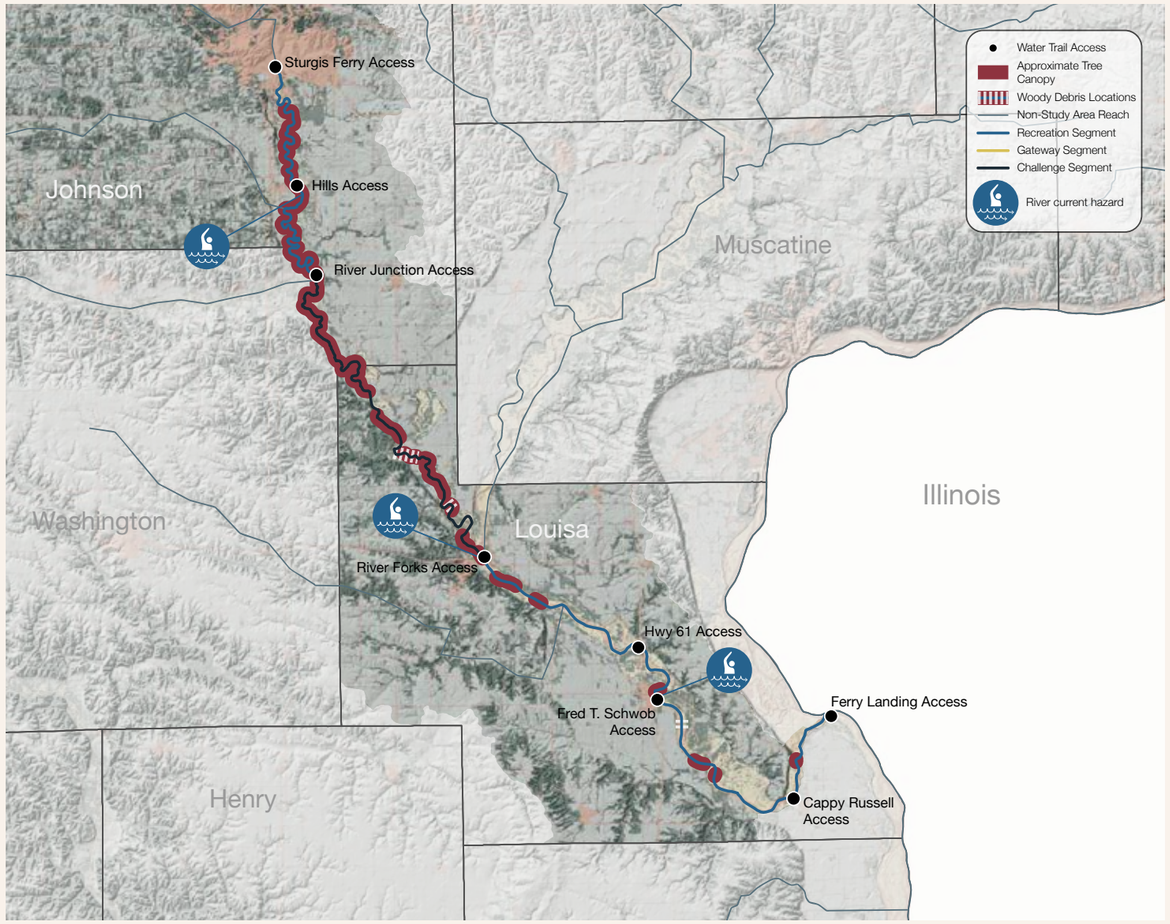


Figure 5
Until the recommended water trail additions included in this plan are constructed, the majority of the river will have a Recreational Use Classification. After recommendations are complete, the water trail will include a Gateway Use Classification and no Challenge Use Classifications.

PLANNING PROCESS

This vision was developed through a two-year planning process integrating stakeholders, agencies, non-profit organizations and landowners. Local participation included steering groups at the county and also statewide levels. County level steering groups composed of individuals with specialized interests and skills were developed in Johnson and Louisa counties each with approximately 15 members. County steering groups included representation from the water trail sponsor, municipal and county staff as well as special interests such as angling, paddling, land trails, conservation, history, business owners and rural landowners. These groups guided the overall development of both the vision and this plan. A statewide steering group included representation from various state agencies, non-profit organizations and university researchers related to the particular resources and issues present in and near this corridor. Technical guidance from the statewide steering group was considered throughout the technical planning process.

The existing conditions surrounding this section of the Iowa River were assessed prior to starting the recreational planning process. Planning for resource conservation and protection took place in conjunction with planning for recreational development. An extensive review period occurred with the Steering Group, Johnson and Louisa County Conservation staff and the Iowa DNR prior to finalization of the plan.

SCOPE OF THE PLAN

Recreation development elements are recommended for both aquatic-based recreation and on-land recreation. Aquatic recreation recommendations include physical upgrades to existing river accesses and, in some cases, relocations of accesses frequently damaged by high water and the development of Universal Design launches. Land-based recommendations include enhanced bicycle – river connections, additional land trail miles for bicycles and equestrians, a paddle-in campsite and additional angler opportunities.

A number of issues related to recreation development emerged that do not include infrastructure but are no less important. Typically, these issues are not site-specific but rather apply to part or the entire study segment. These issues relate to river and user management on the water trail, maintenance of infrastructure and communicating with the public.

Recreational Resources and Needs in the Corridor

EXISTING CONDITIONS

The Iowa River begins in Iowa's Hancock County. It becomes a meandered in Iowa County and this designation continues down to the Mississippi river. This study segment of the Iowa River is already designated as a state water trail in Iowa. The trail begins in Iowa City and ends at its confluence with the Mississippi River in Louisa County. The length of this trail is 72 miles and includes Johnson, Washington and Louisa Counties.

No low-head dams exist in this study segment, however the Burlington Street Dam in Iowa City is located just above the study segment. The river is used for motor boating, canoeing, kayaking, tubing, swimming, fishing and hunting. Use of the river is reported to be much higher near Iowa City with the volume of use decreasing downstream nearer the Mississippi River. Paddle craft rental is limited on the water trail. Two entities rent boats in Iowa City, the University of Iowa Recreational Services and a commercial livery, although neither provides shuttle services.

Several organizations support education and advocacy for this reach of the Iowa River. Iowa River Friends is a non-profit group of citizens dedicated to enjoying, protecting and improving the Iowa River watershed. They promote educational events and forums and provide opportunities to help people enjoy and appreciate the Iowa River. They have promoted annual river clean-ups in the study segment. The Louisa County Trails Council is dedicated to improving hiking, biking, running, and paddling trails in Louisa County.

Nearly 7,800 acres of municipal, county, state and federally-owned public recreational land exists adjacent to the Iowa River Water Trail in Johnson and Louisa Counties *(Figure 6)*. Terry Trueblood Recreation Area and Riverfront Crossings Park are recreational facilities within Iowa City on the water trail. Terry Trueblood is 152-acres in size including a 90-acre lake, a lodge and three picnic shelters. The park is popular with bird-watchers and anglers. City multi-use trails connect the park to the rest of the city. Riverfront Crossings is built on the site of the former Iowa City wastewater treatment plant. The site is currently under construction. The master plan focuses on providing new public open space, river access, trail connections and a variety of active and passive recreation opportunities. Johnson and Louisa counties both manage multiple natural areas along the Iowa River. Johnson County Conservation Board's Pechman Creek Delta is a 380-acre property purchased in 2016. It contains unique backwater slough areas and lowland river savanna. Indian Slough Wildlife Area, owned by Louisa County Conservation Board, is 1,100 acres open to public hunting and nature study of all kinds. Indian Slough marks the northern end of a series of public areas. Wapello Bottoms, Millrace Flats and Odessa Wildlife Management Areas make up over 8,000 acres of public hunting land managed by the Iowa DNR Wildlife Bureau. The 2,606-acre Horseshoe Bend Division of the Port Louisa Refuge is located four miles from the mouth of the Mississippi River and is owned and managed by the U.S. Army Corps of Engineers.

Woody debris is generally not a navigational problem due to the width of the Iowa River in the study segment. Mid-stream sandbars can accumulate debris. These sandbars, when covered with shallow water can cause paddlers to "run ashore" and they must leave their boats to free themselves. In the lower stretches as the Iowa River nears the Mississippi the islands in mid-stream and multiple channels can be disorienting to paddlers.

Beyond on-river experiences the study area has a mix of urban and rural recreational and tourism experiences to offer. The long history of the area is interpreted in many museums in Iowa City including the original State Capitol. A National Historic Landmark, the Toolsboro Mounds and Museum, relates stories of Hopewell culture and their burial mounds which date from 200 B.C to 300 A.D. A wide-variety of lodging options exist especially near Iowa City. Smaller, locally-owned hotels can be found in the cities of Columbus Junction and Wapello. A few Bed and Breakfasts are also available. Modern campsites are available at the Hills Access. The Snively Access Campground, which offers both primitive and modern camping, is located on the shores of Lake Odessa six miles from the river. More abundant lodging choices are offered in Burlington and Muscatine which are located less than 25 miles from the lower segments of the study area.

Nearly 35 miles of bicycle and hiking facilities are located within one mile of the river study segment including bicycle-friendly roads, paved shoulders and off-road trails. An extensive network of bike trails flank the river in Iowa City for over five miles. Cycling is popular south of Iowa City using the bicycle lanes or county-roads with paved shoulders.

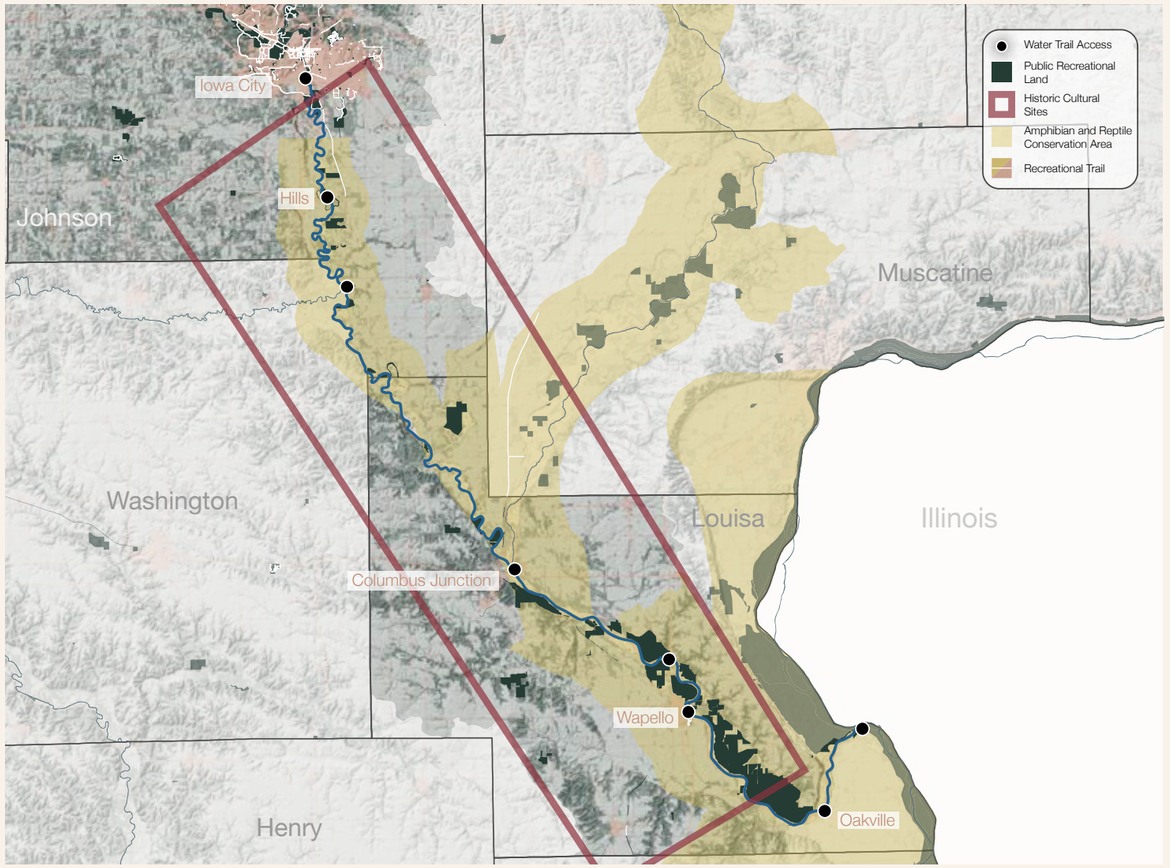


Figure 6
Vast amounts of public recreational land adjacent to the river in the lower reaches, compared to typical Iowa conditions, make this a unique and valuable water trail from both a recreation and conservation standpoint.

WATER TRAIL MANAGEMENT NEEDS

A number of management issues were identified during this planning. And while none of them are emergency situations, enhancement is possible on each one with coordination. River access maintenance is an example. Minimal coordination has occurred between access owners and / or managers prior to the time this plan was developed, particularly between the two counties. Every day and seasonal maintenance practices vary between access owners, providing variable conditions for river users from limited to frequent attention. The following desired water trail management outcomes were identified during planning:

- Increase river management communication and capacity
- Enhance communication between water trail access managers
- Standardize ordinary maintenance at launches
- Reinforce capacity for on-water rescue

Iowa DNR can provide the capacity-building training necessary to achieve these outcomes. These activities are expected to result in stronger relationships with river landowners, an increased efficiency of resources and enhanced user experiences on the river *(Table 1)*.

Elements Included in this Plan	Enhance Everyday Management Conditions	Strengthen Relationship between Land Owners and River Users	Increased Efficiency of Resources and Time	Enhance River Use Experience	Leadership Responsibility For Element
Increase capacity for on-water rescue	X	X		X	WT Sponsor
Enhance communication between water trail access managers	X	X		X	WT Sponsor & Access Managers
Establish a river management presence on the water trail	X	X	X	X	WT Sponsor
Develop management agreements between access managers and DNR	X			X	WT Sponsor / River Programs Staff
Standardize ordinary maintenance at launches	X			X	WT Sponsor & Access Managers

Table I

These recommended capacity-building outcomes are expected to address the water trail management needs identified during this planning.

RIVER-EDGE INFRASTRUCTURE NEEDS

Functional river accesses are available throughout the corridor although their level of development is often minimal. Spacing of accesses is adequate for day trips with the exception of one 24-mile segment between River Junction in Johnson County and River Forks in Louisa County. Paddlers and motor boat users are usually required to use the same launches which can cause time delays and congestion during busy times due to the high volume of use. This plan includes launch infrastructure improvements at six locations on this water trail. Five new accesses are planned and additional capacity is being added to one. Three existing accesses will be removed from the water trail. Sturgis Ferry in Iowa City and Cappy Russell near Oakville will be replaced with new accesses; these accesses will no longer be maintained as a boat launch once construction is complete. The undeveloped Highway 61 Access will no longer be considered an access. Recreational infrastructure upgrades address additional boat launch capacity and access spacing already mentioned as well as other deficiencies identified in *Table 2*; the three accesses to be removed from the water trail are not included in this table.

	Access Number	Inadequate Parking	Lacking Storm Water Management	Over-Steepened Launch Slope	Launch Angle Pointing Upstream or Perpendicular	Stream Bank Restoration	Missing Riparian Buffer	Restroom Access Needed
Riverfront Crossing		Proposed Universal-Design Access						
Napoleon Park		Proposed Universal-Design Access						
Hills	#63		X				X	
River Junction	#53	X	X	X			X	
New Access (unnamed)		Proposed Access in northern Louisa County						
River Forks	#29		X				X	
Toddtown		Proposed Access in Columbus Junction						
Schwob	#16		X	X	X		X	
New Replacement for Cappy Russell (unnamed)		Proposed Access at Hwy 99 Bridge						
Ferry Landing Recreation Area	#0		X		X		X	

Table 2

A combination of new recommended accesses and the upgrade of some existing will result in a total of 10 water trail accesses on this water trail.

The following desired river-edge infrastructure outcomes were developed as a result of this planning:

On-Water Desired Outcomes

- Develop a Gateway-style Experience segment in Iowa City
- Upgrade some access facilities
  - Provide additional water trail experiences on tributaries to the Iowa River and backwater sloughs adjacent to the channel
  - Upgrade launch types to allow vehicles & people to reach water's edge experiences
  - Relocate river accesses built inside the river channel
  - Provide additional carry-down launch capacity

On-water infrastructure recommendations relate strongly to the water trail vision developed locally, Iowa DNR development standards, the Water Trail Sponsor's priorities and natural resource issues in Iowa. *Table 3* organizes desired recreational outcomes and recommended plan elements to illustrate their overlap.

Recommended Recreation Elements	Increase Flood Resilience of recreational amenities at rivers edge	Reduce routine maintenance needs	Support public access to water for recreational purposes	Minimize limitations to recreational access based on age and physical abilities	Use water trail development to strengthen natural resources conservation	Provide positive water trail experiences meeting user expectations
Upgrade overly steep launch and path slopes		X	X	X		X
Upgrade angle of launch & construct new launches on stable river sections	X	X	X		X	
Upgrade parking availability geared for all users at launches		X	X	X		X
Create "Gateway" Water Trail Segment & Universal Design Accesses			X	X		X
Enhance angler experiences			X	X	X	X
Enhance communication with the public						
Update educational interpretation			X		X	X
Increase local river management ability		X	X		X	X

Table 3
Desired recreational outcomes are organized to reflect their relationship to local and statewide issues.

Land-Based Recreational Outcomes

- Complete construction of regional land trail plans particularly those with connections to the river edge
- Develop capacity for a new locally-led equestrian trail
- Enhance angler opportunities
- Increase opportunities for cyclists and hikers to reach the river edge
- Add new walking and bike routes adjacent to the Iowa River
- Develop a remote paddle-in campsite

Communication-Based Recreational Outcomes

- Enhance communication for users before they get to the river
- Expand public interpretation through multiple methods
- Strengthen communication between water trail access managers

RECREATIONAL DEVELOPMENT OVERVIEW

Several site development protocols exist that may differ from traditional recreational construction. Consistent with resource conservation goals and federal, state and local regulations, any existing areas with wetland vegetation in river access areas are to remain undisturbed. All design in stream-edge riparian areas included in this plan minimized the number of mature trees required to be removed and the amount of earthwork. No earthwork, cut or fill, was designed within the channel. Only the minimum amount of earth fill is utilized as necessary to construct parking surfaces with proper slopes and drainage. All drainage from proposed parking areas is directed away from the launch surface. Rather, this drainage is directed laterally from the parking area for infiltration. Lastly, the water quality volume of stormwater runoff from all parking areas is treated on-site using infiltration practices.

Launches included in this plan are designed in conformance with Iowa DNR Water Trail standards (Wagner and Hoogeveen 2010). Construction plans at the design development stage and cost estimates were developed for all access upgrades included in this plan. These documents include preliminary earthwork, stormwater management and site layout plans for all infrastructure, but these plans do not constitute bid documents. Final engineering and construction document development is required prior to bidding for construction of projects.

Recommended recreational elements included in this plan consist of the following types:

- Communication with users: resource interpretation and maps for river users
- On-water recreation infrastructure: Launch upgrades and replacements, parking improvements, new paddling opportunities on backwater sloughs, a paddle-in campsite, angler access
- Land-based recreation enhancements: enhanced connections between the river edge and business opportunities in adjacent communities, and bike/land trail expansion

Several overarching resource conservation and protection considerations also exist. These considerations impact the placement, design and construction of recreational infrastructure. These considerations include enhancement and restoration of a biologically-rich riparian corridor to benefit amphibians, reptiles, fish, mussels and birds. Wetlands are often located in riparian areas and are federally protected. Another resource conservation consideration includes minimizing flood damage to streambanks and developed riparian areas. The protection of cultural resource sites is also critical, including those not yet identified or understood. Lastly, local stakeholders desire to develop this water trail in ways that maintain and protect the prehistoric and historic cultural integrity of the corridor.

Recommended Recreation Development Projects

The landscape of this water trail holds some of the most diverse and rich biological conditions in the state. A strong connection also exists with past cultures and early Iowa history. Each community on this water trail is committed to enhancing connections between river users and their city through new recreational site design. These new designs strengthen the link between land trails and the river. Recommended infrastructure enhancements include traditional elements such as entry points for people entering the river channel and top of bank opportunities such as fishing and trails. Social equity and bike trail dip-in points are examples of innovative elements included.

The river corridor in the study area is divided into three segments based on jurisdictional boundaries *(Figure 7)*. Recommendations are organized by segment and include maps, drawings and text descriptions. Some recommendations span the entire 72-mile study area.

Recommended recreation development projects included in this plan consolidate the most recent comprehensive recreational plans available as well as add recommendations for infrastructure related to use of the river.

The goals of recommended recreation infrastructure proposed near the river are always grounded in resource protection and enhancement including water quality and terrestrial and aquatic habitat. These recommendations were developed locally by the project Steering Group, the municipalities of Iowa City, Columbus Junction, Wapello, as well as Johnson and Louisa County Conservation, US Geological Survey and US Fish and Wildlife Service. The design of infrastructure utilized technical experts from Iowa DNR and Iowa State University.

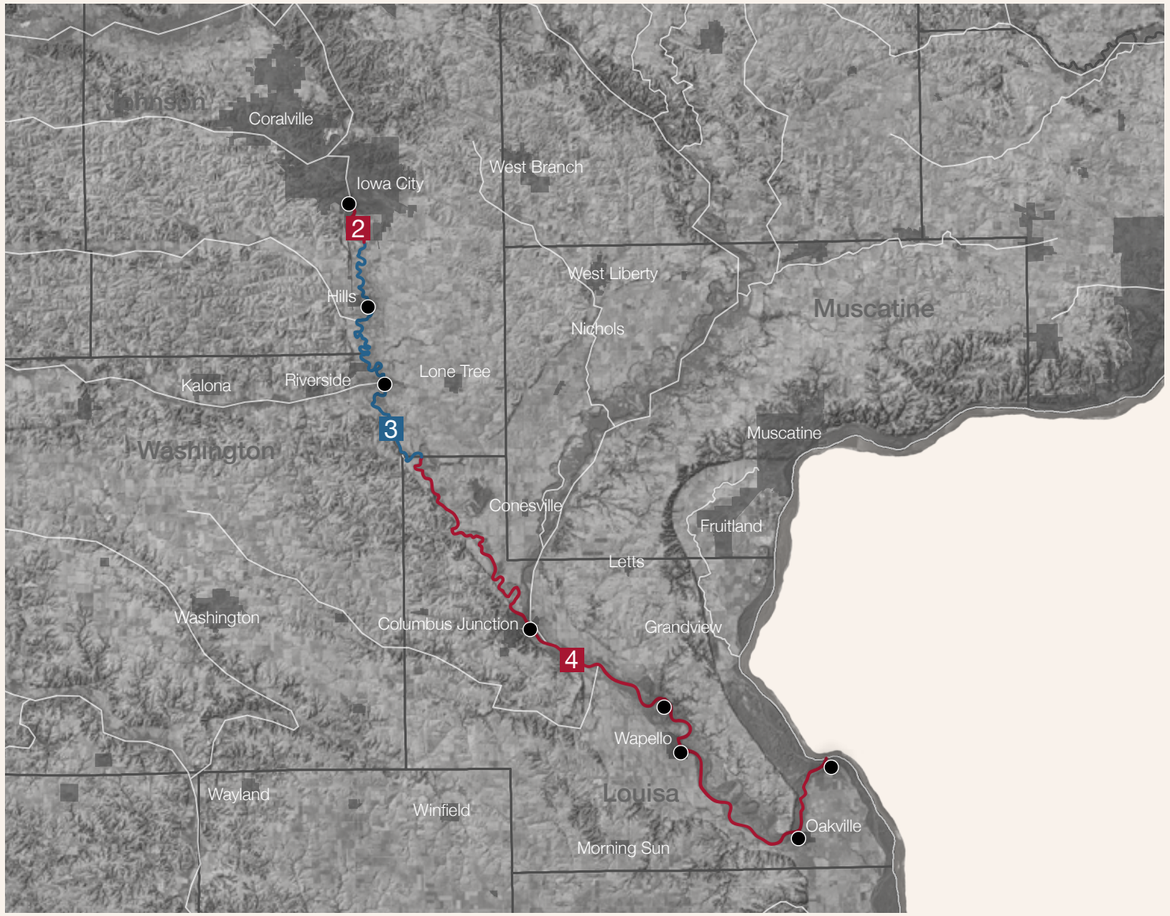


Figure 7
The water trail study area is two smaller segments for planning purposes. The entire reach is also considered a segment.

SEGMENT R1:
RIVER USER MANAGEMENT RECOMMENDATIONS FOR THE ENTIRE CORRIDOR

R1.A
On-Water Rescue Capacity

Enhancing local capacity as it relates to river rescue is a good way to better prepare for unexpected circumstances, learn of new management challenges and share information between agencies. Support and reinforcement of the already existing network of county and municipal emergency personnel serving the river corridor in Johnson and Louisa counties is recommended. Particular emphasis on the future Gateway experience segment as well as the most heavily used segments of the water trail are recommended.

R1.B
Communication to Users

Enhanced communication with users before they get to the river is recommended. River users will feel better prepared for their experience with updated water trail maps; printed maps as well as downloadable pdf online versions are recommended.

R1.C
Enhanced Communication Among Water Trail Access Managers

A formalized system of communication is recommended between County Conservation staff in both counties and other access managers. Regular communication can enhance coordination of water trail activities and issues and can result in more consistent, efficient and timely removal of sediment and debris from launches and other ordinary maintenance tasks.

SEGMENT 1 COST ESTIMATES		
RECOMMENDATION	MAP CODE	COST ESTIMATE
Concessionaire Agreement	R1.A	$0
Communication to Users	R1.B	$0
Enhanced Communication Among Water Trail Access Managers	R1.C	$0


Cedar
Jones
Louisa
Johnson
Washington
Ferry Landing Access
Cappy Russell Access
Hwy 61 Access
Fred T. Schwob Access
River Forks Access
Hills Access
River Junction Access
Sturgis Ferry Access
Water Trail Access
Proposed Plan Element Area
City Limits
Public Lands
N

SEGMENT R2:
RIVERFRONT CROSSINGS TO TERRY TRUEBLOOD RECREATION AREA

EXISTING CONDITIONS

This segment begins just downstream of the Burlington Street Dam in Iowa City and is the most upstream segment of the water trail. It is also the most heavily-used portion of the water trail by paddlers. The first access is a newly designed location within Riverfront Crossing Park. Light industrial areas are located on the west side of the river and a bike trail associated with a narrow band of trees lines the east side. The river travels under Highway 6 and a railroad bridge. The banks are typically high, commonly rising above 10 feet from the normal water level. The streambanks are mostly armored with rock and concrete spoils. Terry Trueblood Recreation Area lies just south of the McCollister Road bridge and signals the end of the urban riverfront edge.

ISSUES AND OPPORTUNITIES

Local residents are interested in eventually extending the water trail upstream of Gateway Hills Park. However, the Burlington Street Dam creates a barrier to this extension. The only existing river access in this segment is the Sturgis Ferry Access which is a small parcel created on a former landfill. The access site is located on a former landfill site adjacent to the Iowa City Airport runway. The location is fairly difficult to navigate to for first-time visitors. The only amenities are picnic tables and the access ramp. Construction on the Sturgis Ferry Access site is not possible due to the landfill site conditions.

The City of Iowa City desires expanded access to the Iowa River. A new park, Riverfront Crossing, is being planned on the east bank of the river near downtown. This new park creates an opportunity for a new access point as well as recreational amenities. Two new river launches are recommended as well as the retirement of the Sturgis Ferry site.

R2.A
Extend Water Trail Upstream of Burlington Street Dam

Extension of the designated water trail upstream to the Coralville Dam is recommended. Mitigation of the Burlington Street Dam would be required for this to happen. The dam is a known hazard to river users and recreationists. Mitigation has been studied and will be expensive to implement due to underground utilities present and the narrow nature of the corridor at this location.

R2.B
Address Social Equity Issues in Access to River

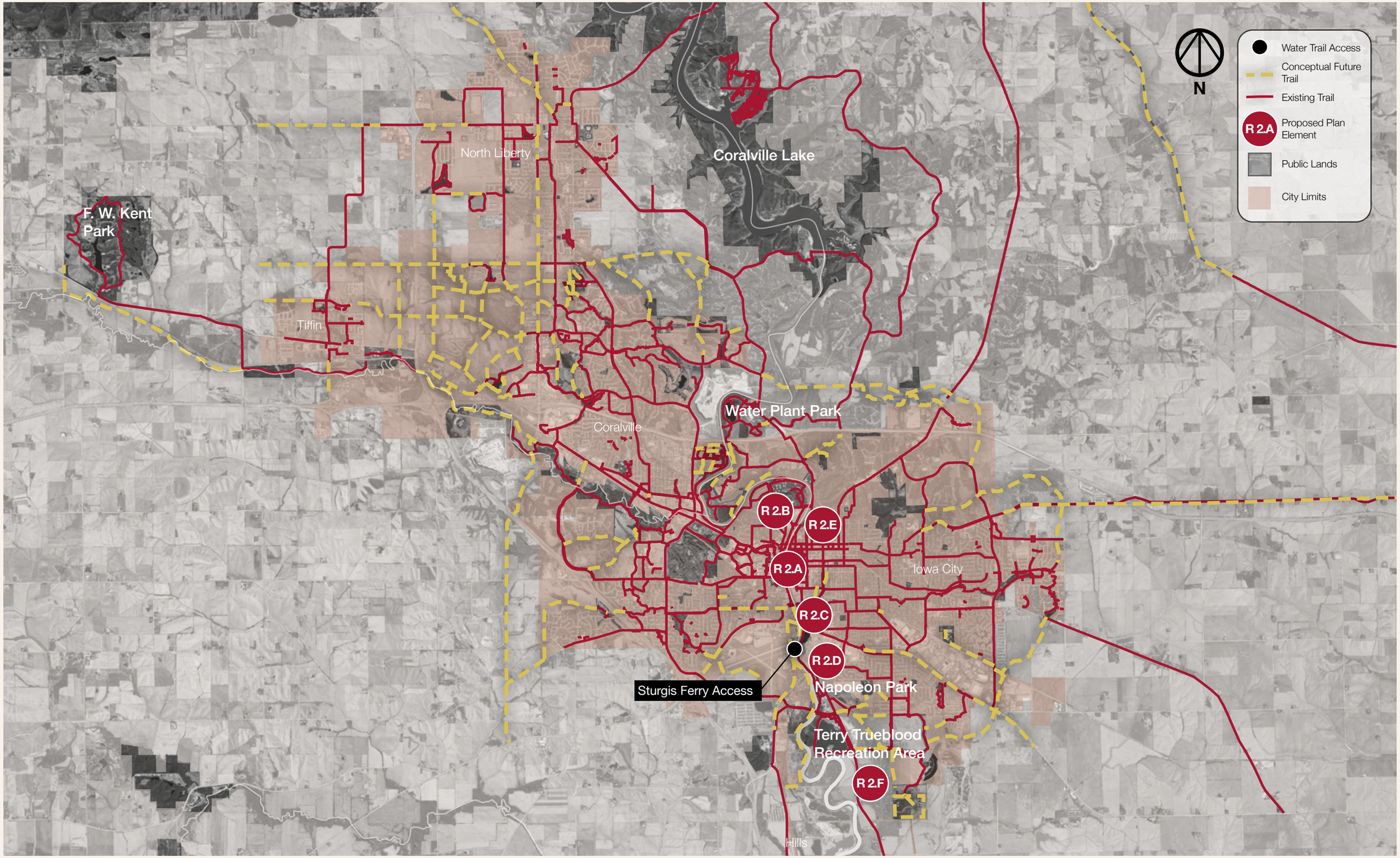
Issues of equitable access to the Iowa River have been identified in Iowa City. As the city strives to be sustainable and accommodating to all residents, they seek equitable access to recreational and well-being benefits commonly associated with riverfront recreation. The extent and locations of this access is under development by the City.

R2.C
New Universal Design River Access at Riverfront Crossings

A universal launch design is recommended at the new 17-acre Riverfront Crossing Park. The site was acquired by the City in 2016. Parking for cars and vehicle-trailers adjacent to the access is also required. Universal design launches are specifically designed to meet current ADA standards for walkways and also include separate but adjacent vehicle and pedestrian loading lanes.

SEGMENT 2 COST ESTIMATES

RECOMMENDATION	MAP CODE	COST ESTIMATE
Extend Water Trail Upstream	R2.A	$0
Address Social Equity	R2.B	$0
New Riverfront Crossings Access	R2.C	$252,300


N
Water Trail Access
Conceptual Future Trail
Existing Trail
R 2.A
Proposed Plan Element
Public Lands
City Limits
F. W. Kent Park
North Liberty
Coralville Lake
Tiffin
Coralville
Water Plant Park
R 2.B
R 2.E
R 2.A
Iowa City
R 2.C
R 2.D
Napoleon Park
Sturgis Ferry Access
Terry Trueblood Recreation Area
R 2.F
Hills

R2.D
New Universal Design River Access at Napoleon Park

A second universal design launch is recommended one mile downstream of Riverfront Crossing Park. A Gateway water trail segment will be designated when both of these accesses are complete. This segment will be approximately one mile in length and will serve paddlers and tubers, especially beginning users or those desiring short trips.

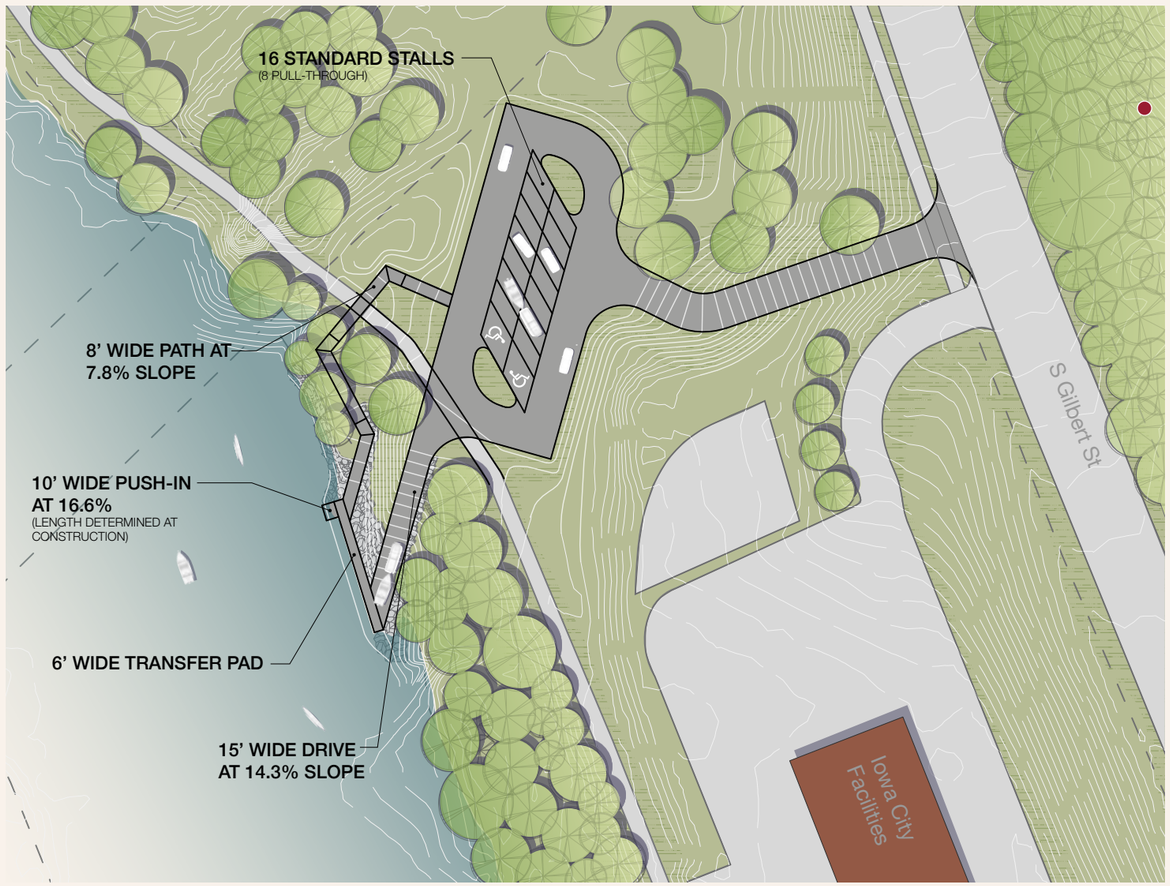
The site of the second universal design launch is recommended near Napoleon Park on South Gilbert Street and on the Iowa River Trail route. This site is contiguous with the City of Iowa City Napoleon Shop location. Parking for 16 cars or 8 trailer-vehicles adjacent to the launch is included in the recommendation.

R2.E
Develop Fishing Access Points

The addition of bank-edge fishing access points in Iowa City are recommended. While the locations of these points are to be determined, it is recommended that pedestrian access and available adjacent parking are considered in selecting locations as well as fish habitat conditions.

R2.F
Develop Dip-In Connection Point for Land Trail Users to Explore the River Edge

The Iowa City bike trail network is well-connected to the Iowa River. Few if any opportunities exist, however, for trail users to stop at the water's edge. A series of dip-in points along the Iowa River are recommended in Iowa City. These points are undeveloped otherwise and allow simple access to the water's edge. Iowa City and its bike trail affiliates will develop the location and frequency of these points.

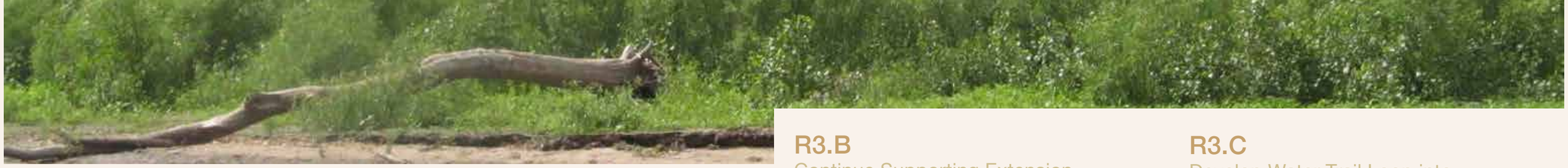


R2.D
The recommended new Universal Design access in Napoleon Park will serve as the lower limits of the recommended Gateway Use Classification segment.

SEGMENT 2 COST ESTIMATES		
RECOMMENDATION	MAP CODE	COST ESTIMATE
Extend Water Trail Upstream	R2.A	
Address Social Equity	R2.B	
New Riverfront Crossings Access	R2.C	$252,300
New Napoleon Park Access	R2.D	$211,700
Develop Fishing Access Points	2D.E	

R2 PERMITTING CONSIDERATIONS

Construction of river accesses and trails in Iowa City will likely require a Phase I archaeological investigation unless previous disturbance of the construction area can be verified.



SEGMENT R3:
TERRY TRUEBLOOD RECREATION AREA TO JOHNSON/LOUISA COUNTY LINE

EXISTING CONDITIONS

There are 26.6 river miles in rural Johnson County, downstream of Iowa City, prior to the boundary with Louisa County. This river segment has a light to moderate level of use by paddlers. There are two accesses within this segment: Hills and River Junction. The river in rural Johnson County winds through bottomland forests of silver maples, cottonwoods and sycamores. Some cabins and houses can be seen from the river as well as agriculture and a mining operation. Streambanks are typically high, commonly rising above 10 feet from the water level. Rip rap or concrete debris exists in many but not all areas. The river form is meandering throughout this segment with outside bends with high banks and low, sand point bars on the inside bend. The sound of cars and trucks from Highway 218, a mile east of the river, is audible.

Hills Access is located within a 40-acre developed park with campground, pit toilets, picnic tables, playground, grills, and drinking water. Comparatively, River Junction Access is more primitive but it does include pit toilets. The access is adjacent to the unincorporated community of River Junction and the confluence of the English and Iowa Rivers. South of River Junction the river begins to straighten slightly. The entire segment feels relatively remote as it flows through riparian floodplain or Wetland Reserve Program easements. Wildlife species are abundant. These segments of the water trail have been classified as “Recreational” segments because they are 8 miles or less in distance and offer the traditional Iowa river experience.

ISSUES AND OPPORTUNITIES

Pechman Creek Delta, a wildlife area owned and managed by the Johnson County Conservation Board is located less than two river miles north of the River Junction Access. It provides an opportunity to enhance the experiences of paddlers as well as a location for a rest stop for bicyclists using the county road. Below River Junction Access, the paddling distance to the next access in Louisa County, River Hills, is 24 miles which exceeds the distance of a day trip for the majority of paddlers. A notable river site during Euro-American settlement, Buttermilk Falls, exists on the Johnson – Louisa county line. A set of rapids existed at this point in the river and was an obstacle to steamboats moving on the Iowa River. The area was also the village site of Black Hawk’s prophet. Totokonok for a short time. The river shifted course sometime between 1875 and 1939 and a large oxbow lake and wetland system now exists at the location of the falls. The site has been identified by both Johnson and Louisa County Steering Groups as a location for future high quality on-water paddling.

R3.A
Develop Pedal-Paddle Opportunities

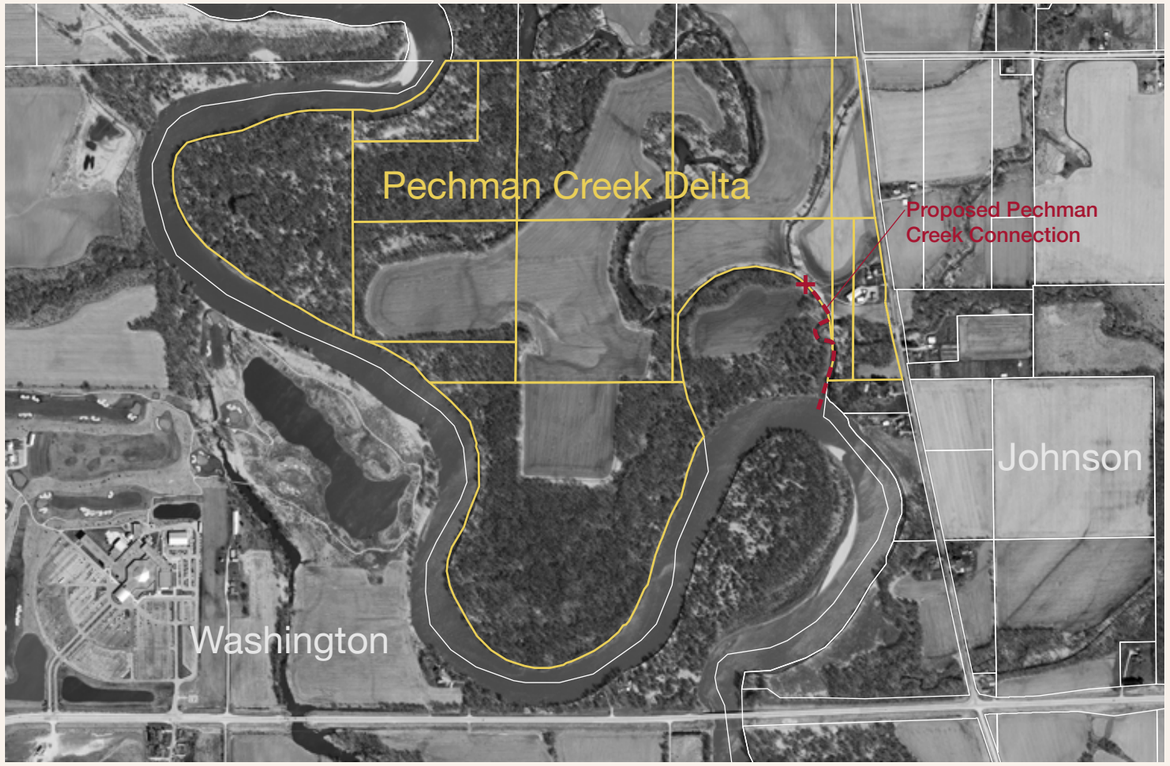
The development of pedal-paddle opportunities downstream of Iowa City in Johnson County are recommended. This activity is when recreationists employ both bicycling and paddling as a round trip activity. These opportunities are becoming common in high quality recreation areas where land trails are in close proximity to the river. In some instances, land trail connections to a river access are needed to enable users to bike up to the river’s edge and launch their paddlecraft. Exact locations for these connections are under development in Johnson County.

R3.B
Continue Supporting Extension and Completion of Planned Regional Land Trails

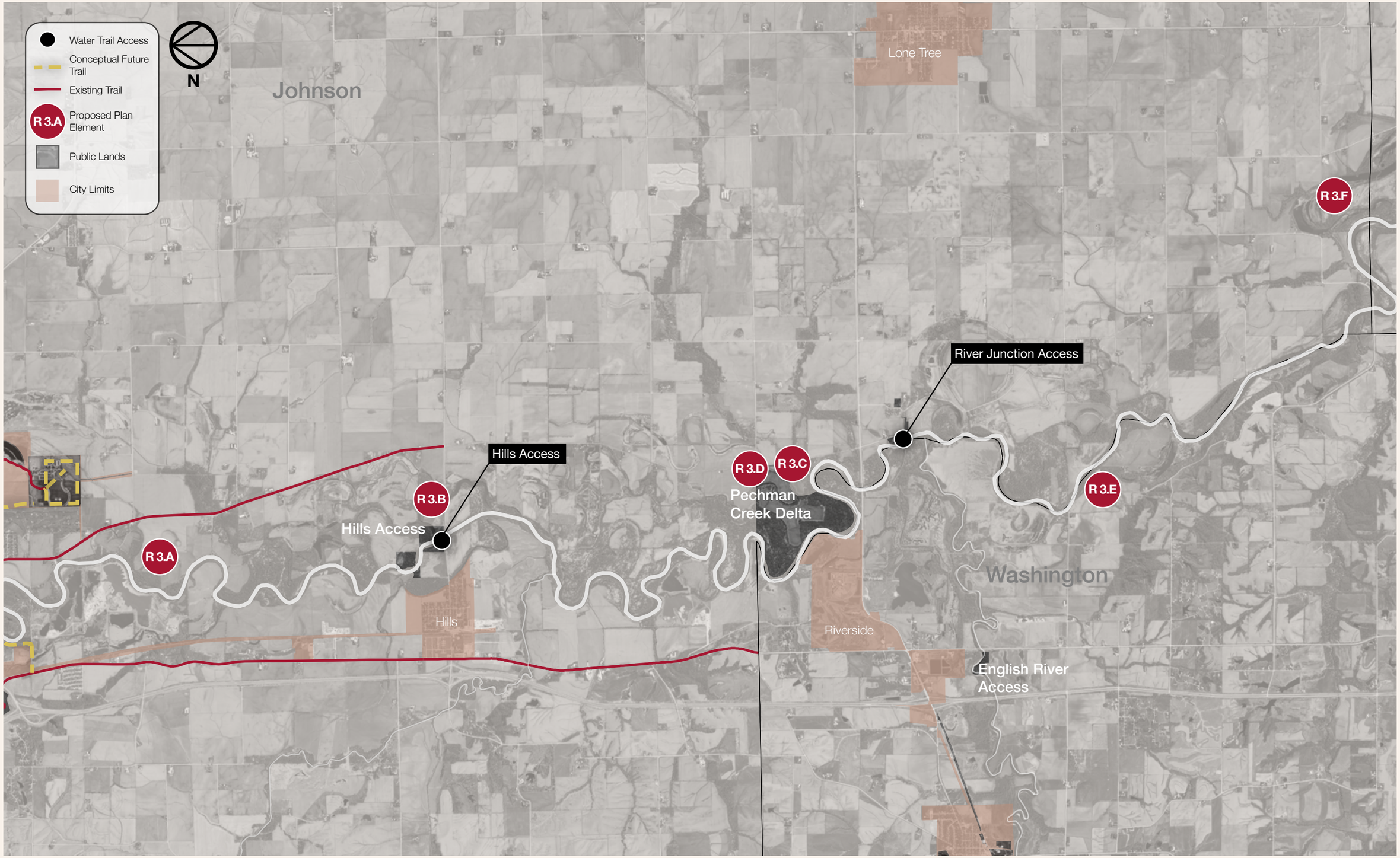
The land trail system adjacent to the Iowa River in Iowa City, known as the Iowa River Trail, is one of the most comprehensive systems adjacent to a state-designated water trail in Iowa. Support of the planned expansion of this trail is recommended. The Iowa River Trail is on the west side of the river through Iowa City until Benton Street where it crosses to the east side. The trail continues south to Terry Trueblood Recreation Area where it currently ends in a loop around the park lake. The long term intent is to extend it south on the west side of the river from Benton Street south to Sturgis Ferry Park, County Fairgrounds and Ryerson Woods.

R3.C
Develop Water Trail Loop into Pechman Creek Delta

The development of a paddling loop between the Iowa River and Pechman Creek Delta is recommended. A 0.2-mile segment of Pechman Creek connects the delta with the Iowa River. A simple launch on Pechman Creek will allow paddlers to use the planned land facilities, including drinking water, and continue paddling into the backwaters.



R3.C
The recommended creek connection between the Iowa River and Pechman Creek Delta will be a unique opportunity to explore a backwater slough area without leaving your kayak or canoe.

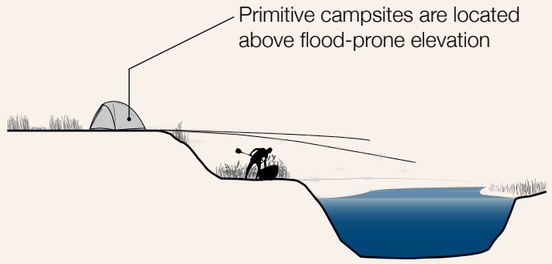

Water Trail Access
Conceptual Future Trail
Existing Trail
R 3.A
Proposed Plan Element
Public Lands
City Limits
N
Johnson
Lone Tree
R 3.F
River Junction Access
Hills Access
R 3.B
Hills Access
R 3.D
R 3.C
Pechman Creek Delta
R 3.E
R 3.A
Washington
Hills
Riverside
English River Access

R3.D
Develop Land Trail Rest Stop with Water Hydrant at Pechman Creek Delta

Many cyclists use Sand Road, adjacent to this conservation area, as a primary biking route. A water hydrant and resting area for their use at Pechman Creek Delta is recommended.

R3.E
Develop a Paddle-In Campsite

Development of a paddle-in campsite is recommended in Johnson County. A location has not yet been selected.

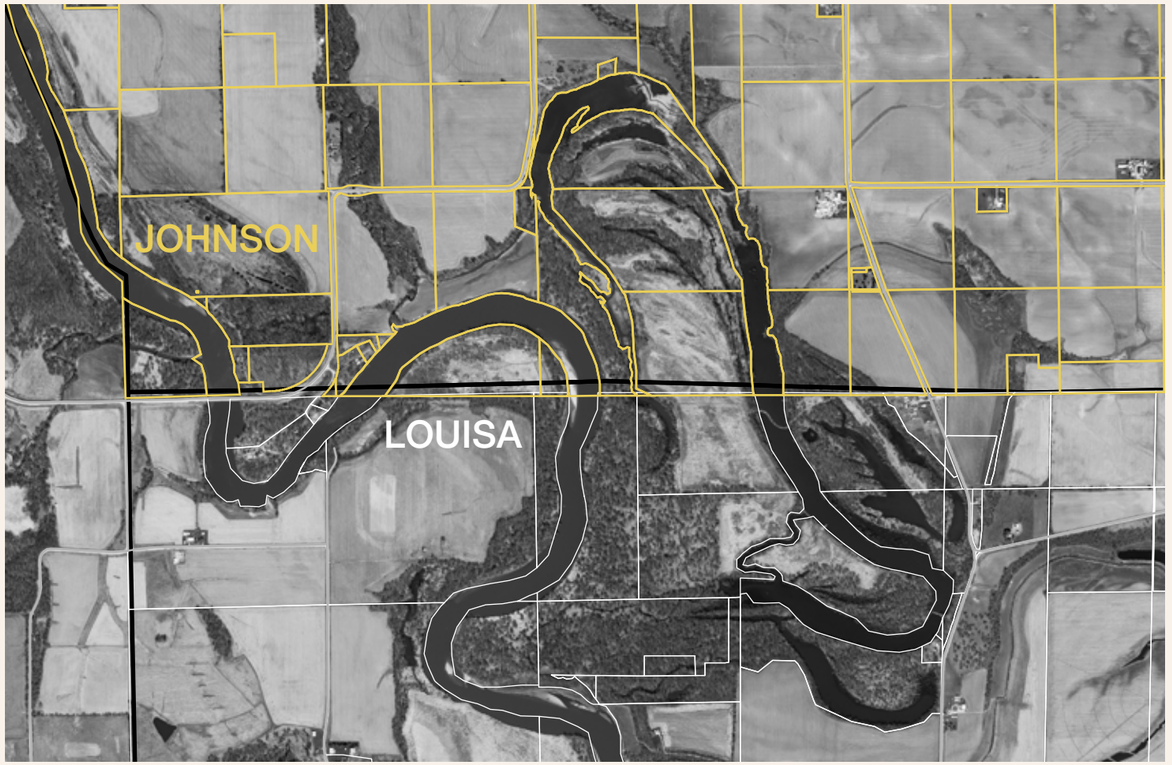


R3.E

Development of a paddle-in campsite is recommended in Johnson County. Although a final location has not been selected, the campsite should be situated on an upper terrace.

R3.F
Develop Water Trail Loop into Johnson County Portion of Buttermilk Falls Slough Site

Development of a backwater paddling experience on the former Buttermilk Falls site is recommended. The site is split between Johnson and Louisa counties. The Buttermilk Falls Slough site is an open water and wetland complex previously occupied by the Iowa River channel. A portion of the open water remains year round while other areas flood with high river flows or precipitation. The slough site itself provides excellent habitat for birds, amphibians and reptiles. Land surrounding the water is privately owned and no public access to the water exists. Therefore, a launch and minimal parking is required to facilitate public access. The most favorable location for this launch is in the Johnson County portion of the site. A direct connection with the Iowa River channel does not appear possible.



R3.F

The backwater slough associated with the historic Buttermilk Falls location offers a great opportunity to explore this type of landscape by boat. A public access launch and parking would be required and most likely located in the Johnson County portion of the site.

SEGMENT 1 COST ESTIMATES		
RECOMMENDATION	MAP CODE	COST ESTIMATE
Develop Pedal-Paddle Opportunities	R3.A	
Complete Planned Regional Land Trails	R3.B	
Develop Water Trail Extension into Pechman Creek Delta	R3.C	
Develop Land Trail Rest Stop at Pechman Creek Delta	R3.D	
Develop a Paddle-In Campsite	R3.E	
Develop Water Trail Loop at Buttermilk Falls Slough	R3.F	

R3 PERMITTING CONSIDERATIONS

Construction of river accesses and trails at new locations in rural Johnson County will likely require a Phase I archaeological investigation unless previous disturbance of the construction area can be verified.

SEGMENT R4:
JOHNSON/LOUISA COUNTY LINE TO MISSISSIPPI RIVER CONFLUENCE

EXISTING CONDITIONS

Forty-seven miles of the Iowa River are included in Louisa County. This segment of the water trail includes five river accesses, none of which have full service amenities such as drinking water and flush toilets. This segment of the river has a low volume of use. The average distance between existing accesses in Louisa County is 7.4 miles. Three of the access sites (River Forks, Cappy Russell and Ferry Landing Recreation Area) are standalone accesses with minimal if any amenities other than a boat launch and undeveloped parking areas. The Highway 61 Access site is not developed as an access; it includes a low maintenance access road and no launch facilities. The area where people would launch is a high, vertical bank location on an unstable depositional surface next to the new Highway 61 bridge. Schwob Landing is located inside Wapello and is heavily used by motor boats.

The Cedar River joins the Iowa River at Columbus Junction just above the River Forks Access. A large Tyson Food Packing Plant and its wastewater treatment facility is located at the confluence on the land between the two river channels.

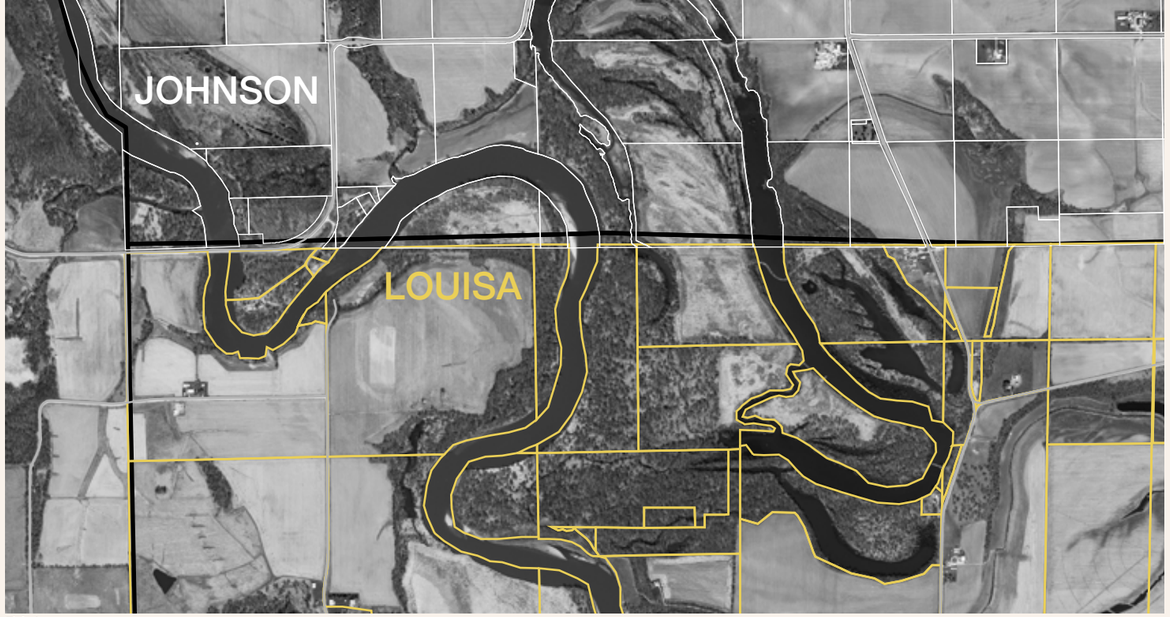
The river setting in Louisa County is generally wild and remote with the exception of the small communities and the Tyson Plant. Some farms and groups of cabins can be seen from the river however the density of these generally decreases as one travels downstream toward the Mississippi River. Nearly all of the adjacent land upstream of Highway 61 is privately owned while large tracts downstream of this point are publicly-owned or in permanent conservation easement. Rich bottomland forest and wetlands are the most common landcover on both sides of the river.

ISSUES AND OPPORTUNITIES

The confluence of the Cedar and Iowa rivers significantly changes the nature of paddling on the Iowa River. Once joined by the Cedar the Iowa River widens, the flow increases, and the river straightens running through a very flat and broad floodplain. Beginning at the Highway 61 bridge, the channel pattern changes once again. The 20 miles between Highway 61 and the Mississippi River has a braided channel pattern with small islands. Many adjacent land parcels are publicly owned or are in permanent conservation easements. Both River Forks and Cappy Russell accesses are located on floodplain benches of the river channel and frequently flood, although both are popular from a recreation standpoint.

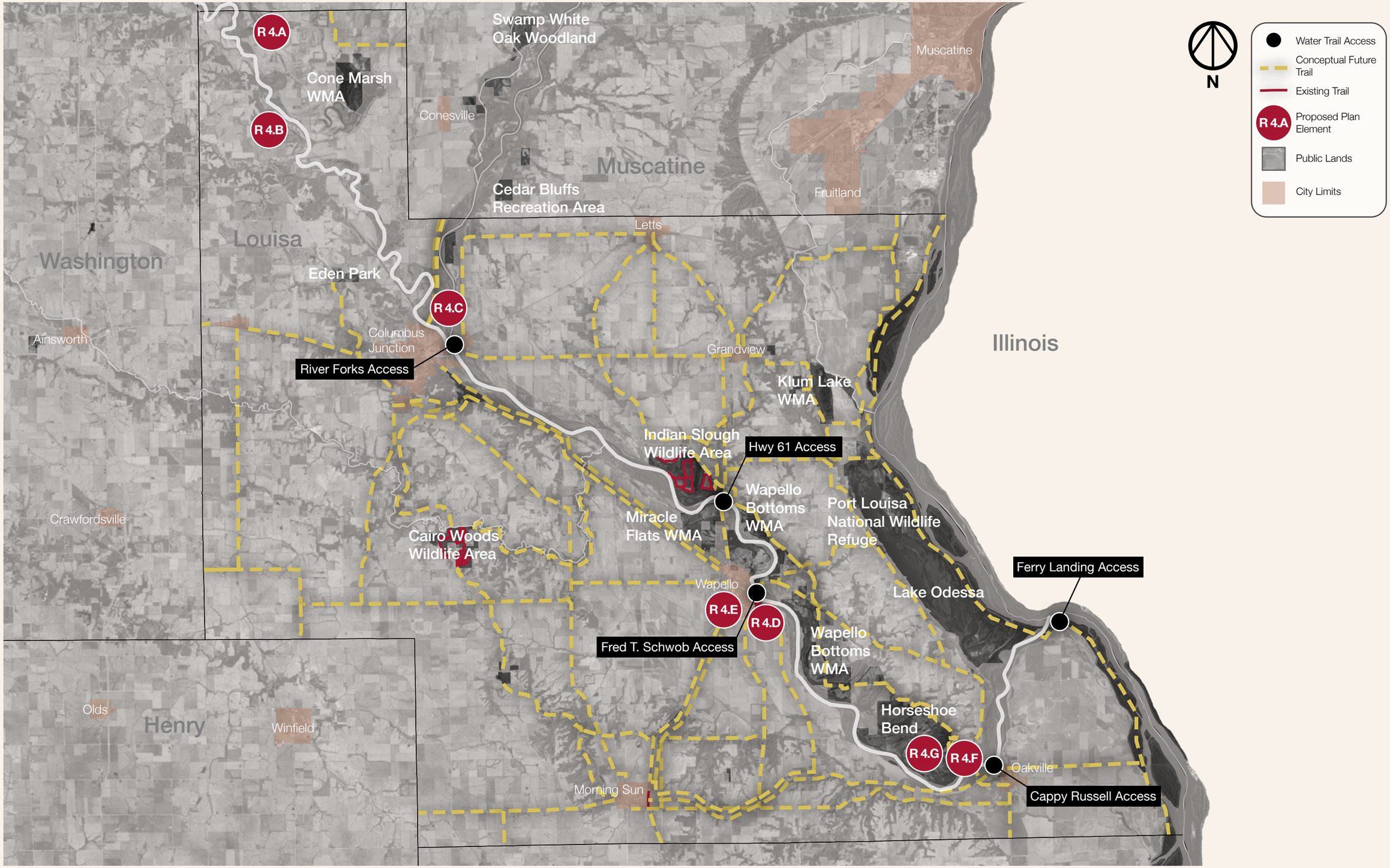
R4.A
Develop Water Trail Loop into Louisa County Portion of Buttermilk Falls Slough Site

Development of a backwater paddling experience on the former Buttermilk Falls site is recommended. This site is split between Louisa and Johnson counties with approximately half of the site in each county. The Buttermilk Falls Slough site is an open water and wetland complex previously occupied by the Iowa River channel. A portion of the open water remains year round while other areas flood with high river flows or precipitation. The slough site itself provides excellent habitat for birds, amphibians and reptiles. Land surrounding the water is privately owned and no public access to the water exists. Therefore, a launch and minimal parking is required to facilitate public access. A direct connection with the Iowa River channel does not appear likely.



R4.A

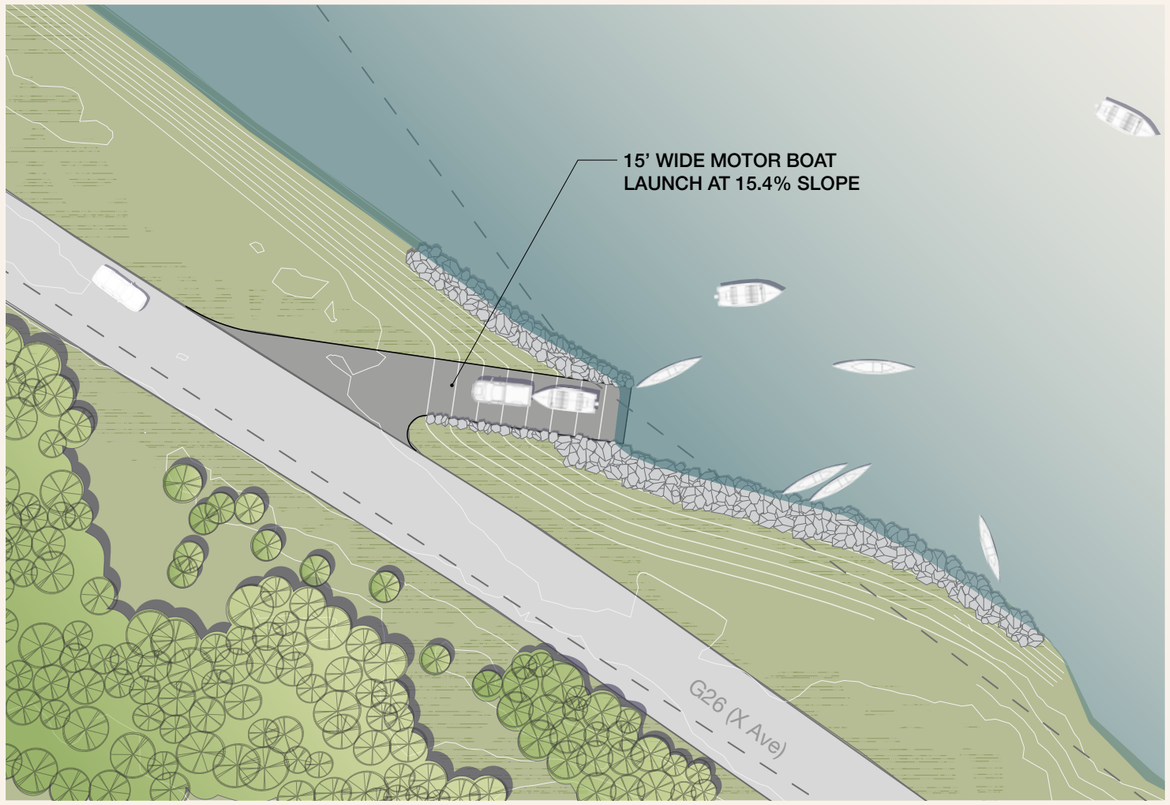
The backwater slough associated with the historic Buttermilk Falls location offers a great opportunity to explore this type of landscape by boat. The public access launch and parking required would most likely located in the Johnson County portion of the site.


R 4.A
Cone Marsh WMA
R 4.B
Swamp White Oak Woodland
Conesville
Muscatine
Cedar Bluffs Recreation Area
Fruitland
Letts
Washington
Louisa
Eden Park
R 4.C
Columbus Junction
Ainsworth
River Forks Access
Grandview
Illinois
Klum Lake WMA
Indian Slough Wildlife Area
Hwy 61 Access
Wapello Bottoms WMA
Port Louisa National Wildlife Refuge
Crawfordsville
Cairo Woods Wildlife Area
Miracle Flats WMA
Ferry Landing Access
Wapello
R 4.E
R 4.D
Fred T. Schwob Access
Lake Odessa
Wapello Bottoms WMA
Horseshoe Bend
Olds
Henry
Winfield
R 4.G
R 4.F
Oakville
Morning Sun
Cappy Russell Access
N
Water Trail Access
Conceptual Future Trail
Existing Trail
R 4.A
Proposed Plan Element
Public Lands
City Limits

R4.B

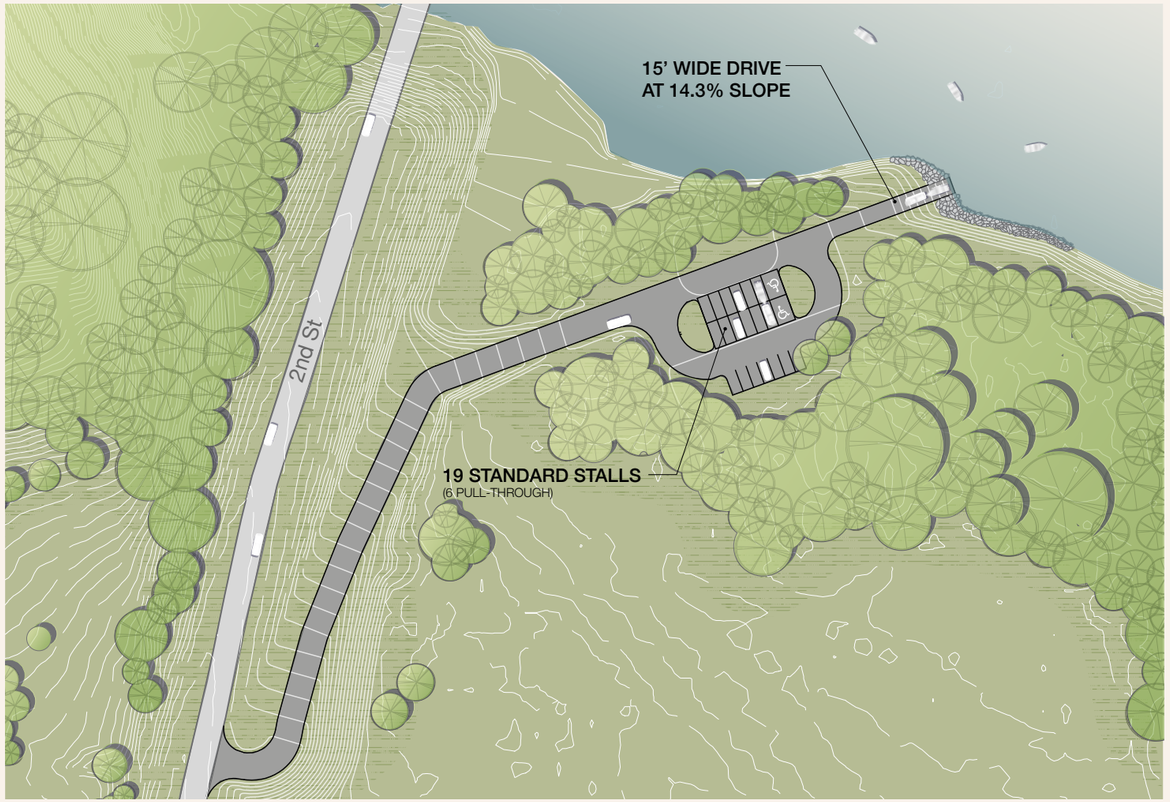
New Motor Boat Access Midway Between River Junction and River Falls Accesses

Construction of a hard-surfaced motor boat launch is recommended near the midway point between River Junction and River Falls accesses. A new access at the recommended location would divide this existing 25-mile segment into two 12.5-mile segments. This location was chosen from four alternatives based on river channel stability, ease of construction and its current use as a private access. This site is located on a low-volume gravel road. Parking for this access, initially, will be limited to parallel parking on the edge of the gravel road. As such, this access will be labeled as an “undeveloped access” on maps. Future recommendations include development of a primitive parking area across the road. The new launch is likely to see high levels of use by both motor boats and paddlecraft.



R4.B

A new motor boat launch is recommended midway between the existing River Junction and River Falls accesses. This access will be considered unimproved on the water trail map until future off-road parking can be constructed nearby.



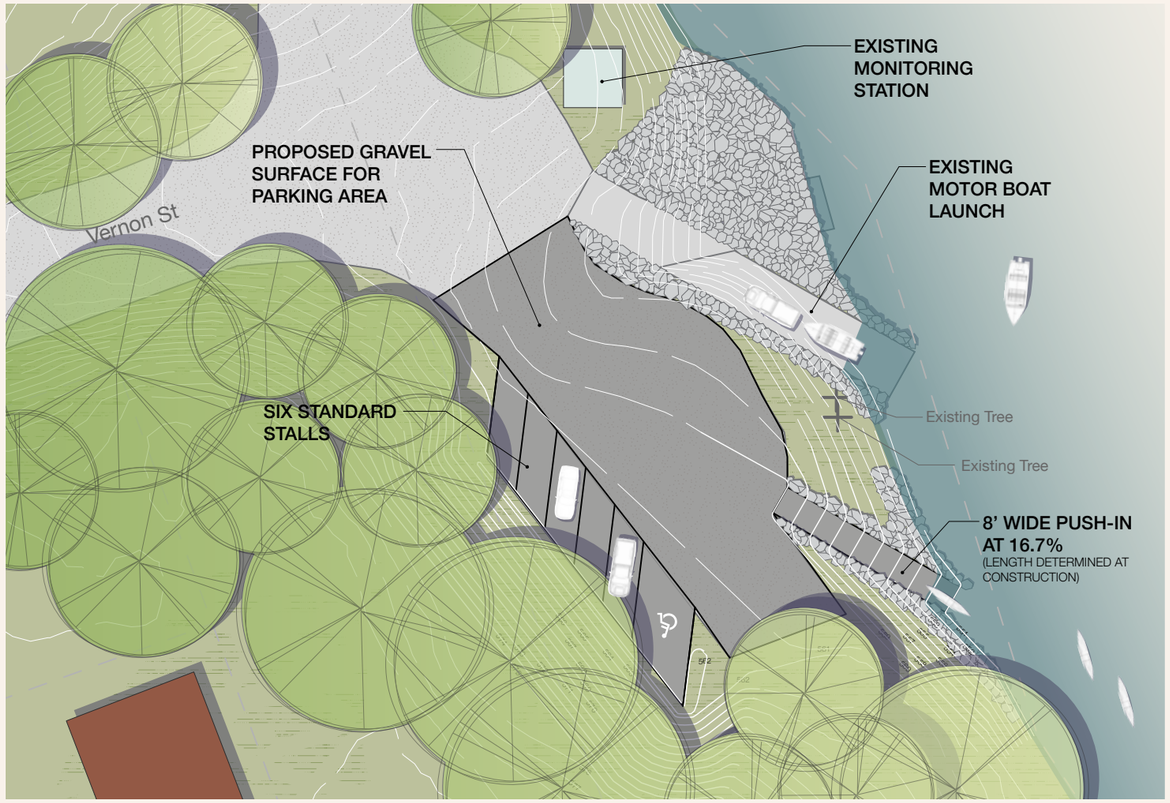
R4.C

The proposed Toddtown Access in Columbus Junction will shift water trail access across the river from the existing River Forks access. The Columbus Junction side of the river will provide multiple types of amenities for river users and a slightly less flood-prone location for the launch.

R4.C

New Motor Boat Access and Parking in Columbus Junction

Construction of a hard-surfaced motor boat launch is recommended in Columbus Junction. This will be the community’s first river access. The nearest existing access is River Forks, across the river in Fredonia. Columbus Junction has purchased land and has grant funding to construct this site. The site will be named Toddtown Access after the adjacent historical settlement of Toddtown. In addition to the motor boat launch, parking for 21 standard vehicle stalls, including 7 pull-through trailered vehicle stalls, is included in the design recommendation.



R4.D

A new carrydown launch is recommended adjacent to the existing Schwob Access in Wapello. The additional launch will reduce waiting time and allow paddlecraft users to avoid the motorboat launch.

R4.D

New Carrydown Access and Formalized Parking in Wapello

Launch and parking upgrades are recommended for the Fred T. Schwob Access in Wapello. Schwob Access is a small site constrained by the river edge and steep topography. The existing site includes a recently reconstructed hard-surfaced motor boat launch and an informal parking area. A new hard-surfaced carrydown launch is recommended at this location to lessen the demand on the existing launch. In its existing condition, because it does not include at least 5 off-road parking stalls, this access does not meet minimum Iowa DOT standards for parking and cannot be signed as an official river access. Re-grading of the site to develop a parking area for at least 5 vehicles is recommended.

R4.E

New Land Trail Adjacent to Iowa River in Wapello

A new land trail is recommended in Wapello connecting the important recreation nodes. This trail will be a great amenity for residents as well as visitors. The land adjacent to the river is already owned by the City. The recommended route is 0.6 miles in length and connects downtown Wapello to Fred T. Schwob Access as well as to L.J. Thompson (South End) Park. Most segments of this conceptual route, but not all, are likely to meet ADA standards.

R4.E

The potential exists for a land trail connecting South End Park and downtown Wapello. Schwob Access is located along this route.

R4 PERMITTING CONSIDERATIONS

Construction of river accesses at new locations in Louisa County will likely require a Phase I archaeological investigation unless previous disturbance of the construction area can be verified. Construction in the immediate area of Fred T. Schwob Access in Wapello does not warrant further archaeological survey.

R4.F
New Replacement Access for Cappy Russell

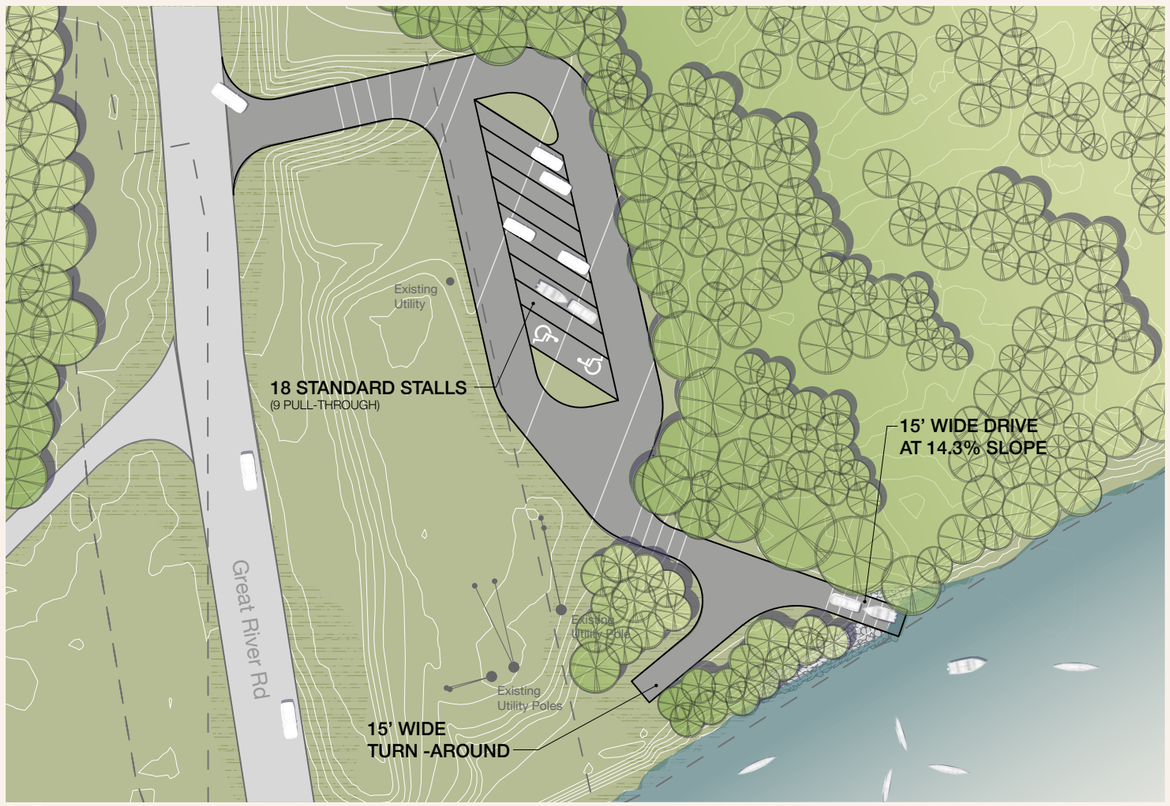
Relocation of the Cappy Russell Access is recommended. This popular launch and parking areas is situated on a low bank of the Des Moines River. As such, the area is frequently underwater and unusable. Following high water, the parking area often requires new rock surface and blading to remove the sediment. Its location on an outside bend is also less stable compared to a straight segment of the river. After analysis of 5 alternative locations within one river mile, a new location has been selected adjacent to the new Highway 99 bridge near Oakville. The new access location is on the north side of the river and adjacent to a USGS river gage. A hard surface motor boat launch is recommended at this location; this will also benefit maintenance of the gage. Parking for 18 vehicles or 9 trailered vehicles is also included in the design recommendations.

R4.G
Plan and Develop Local Capacity for New Equestrian Trail

A new equestrian trail is recommended between the replacement Cappy Russell Access at Highway 99 and Indian Slough Wildlife Area north of Wapello. Planners and the Steering Group are sensitive to the potential erosion impact that horses can have and also that horses are not allowed on some federal and state lands. The 15.6-mile conceptual trail alignment included in this recommendation (of which 8.2 miles are off-road) utilizes both public and private lands, including some road rights of way. Existing parking areas at Indian Slough and the proposed parking for the Cappy Russell replacement access are available for trail users.

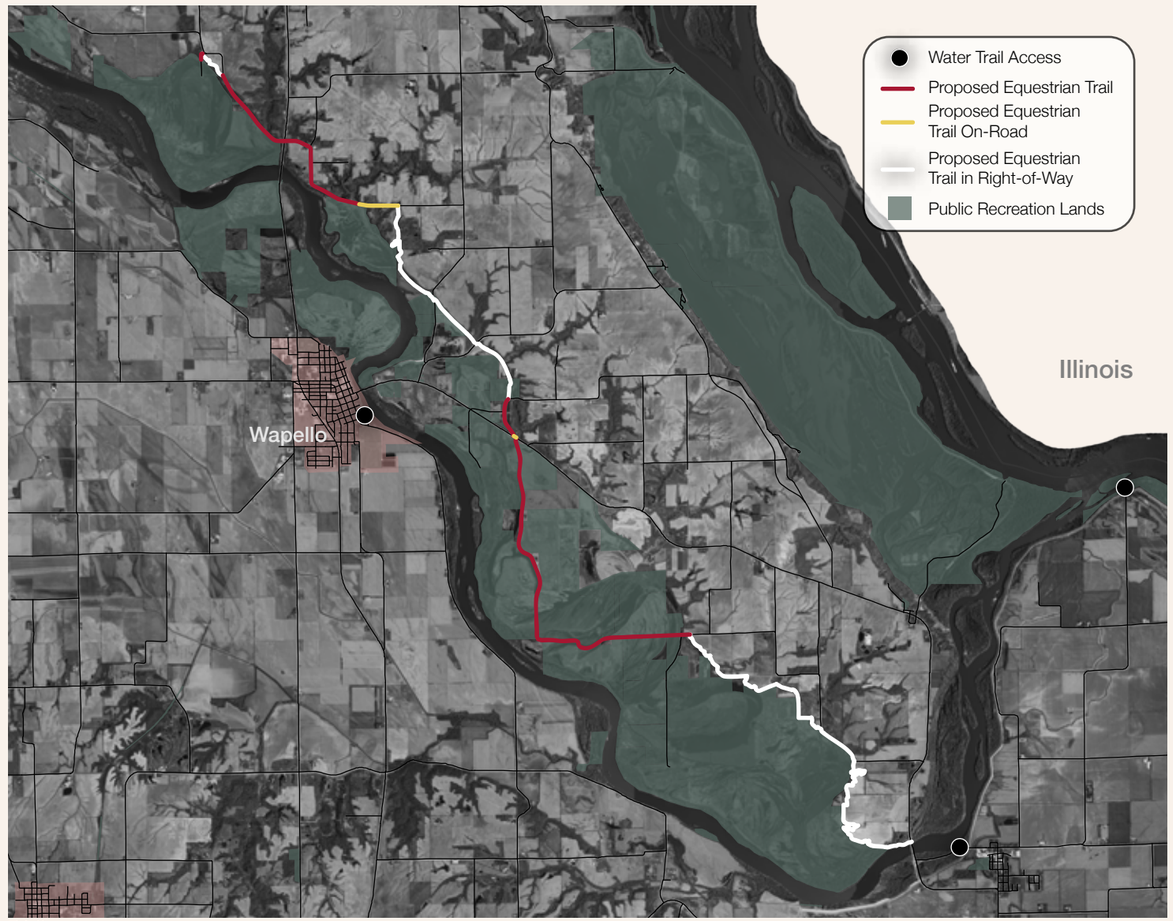
Importantly, the conceptual trail route does not enter the Horsebend Bend Division of Port Louisa Wildlife Refuge, but it does follow its inland border. The conceptual alignment also utilizes (only) the public road right of way through Wapello Bottoms Wildlife Management Area. The route is primarily an upland landscape with some areas on a low terrace (near Indian Slough). The local equestrian community will need to develop capacity to organize the project, gain local support for the trail, fundraise and maintain the trail in order for it to be developed.

SEGMENT 4 COST ESTIMATES		
RECOMMENDATION	MAP CODE	COST ESTIMATE
Develop Water Trail Loop at Buttermilk Falls Slough	R4.A	
New Midway Access	R4.B	$19,161
New Access at Columbus Junction	R4.C	$105,166
New Carrydown Access at Wapello	R4.D	$24,097
Land Trail in Wapello	R4.E	
Replacement Cappy Russell Access	R4.F	$104,315
Build Capacity for New Equestrian Trail	R4.G	



R4.F

The recommended replacement site for Cappy Russell Access elevates the parking and launch infrastructure when compared to the existing access across the river. This improvement will allow use of the river infrastructure over more days of the year.



R4.G

Future consideration of an equestrian trail connecting the new Cappy Russell Access and other public land with existing equestrian trails is recommended. The route shown avoids federal, state and county land where horses are not allowed. Local equestrian interest exists for this trail.

Recreational Development Conclusions

All recommended elements are summarized and organized in Appendix C including the lead entity, partners, location, estimated costs and local prioritization. Resource conservation and protection project elements are also integrated into this Appendix.

PERMITTING CONSIDERATIONS

As with all construction on and near rivers, multiple permits are required prior to any disturbance. The following are expected:

- Local City (Iowa City, Columbus Junction, Wapello) and County ordinances or policies may require permitting processes for developing on a floodplain
- Joint permit application shared between the DNR flood plain development program, the DNR sovereign lands program, and the U.S. Army Corps of Engineers

Additional investigations and permits will likely be required in some locations. These requirements are related to the sensitive nature of the known and not-yet identified cultural resource sites. These restrictions can affect vegetation removal, revegetation techniques and earthwork. As noted earlier in each plan segment, additional investigations and permits are required in some locations. These requirements are related to the sensitive nature of the known and not-yet identified cultural resource sites. These restrictions can affect vegetation removal, revegetation techniques and earthwork.

POTENTIAL PARTNERS AND FUNDING SOURCES

Funding and development of each plan element is the responsibility of the lead jurisdiction (Appendix C) with oversight from the water trail managers. A number of local and state partner organizations and agencies are organized and positioned to assist with development of individual plan elements. Examples of partners include:

- Non-Profit and volunteer organizations such as Iowa City Parks and Recreation Foundation, Tri-Rivers Conservation Foundation, Iowa Natural Heritage Foundation, Iowa Prairie Network, Preservation Iowa, Iowa Ornithologists' Union and Iowa Archaeological Society
- Local and State Agencies including Johnson and Louisa County Soil and Water Conservation Districts, Iowa Department of Transportation, Iowa Office of State Archaeologist, State Historic Preservation Office, Iowa Department of Cultural Affairs, Iowa Department of Natural Resources, Iowa Economic Development Authority

Sections of this resource conservation and protection plan are intended to stand alone for use in funding proposals. Likely funding partners to supplement local funds include federal and state agencies and grant programs such as Resource Enhancement and Protection (REAP), State Water Trail grants, state and federal recreational trails program funding, regional Transportation Enhancements Program funding, statewide Transportation Enhancements Program funding, the Land and Water Conservation Fund, Wildlife Conservation and Appreciation funds from U.S. Fish and Wildlife Service.

REFERENCES

Wagner, M., & Hoogeveen, N. (2010). Developing Water Trails in Iowa. Des Moines, IA: Iowa DNR.

Wagner, M., & Hoogeveen, N. (2010a). Iowa Water Trails: Connecting People with Water and Resources. Des Moines, IA: Iowa DNR.

APPENDIX A. Recreation and Conservation Prioritization

Map Code	Recommendation	Lead Jurisdiction	Local Prioritization	Location	Budget Estimate for River-Related Recommendations	Other Collaborators
R1.A	On-Water Rescue Capacity	Johnson & Louisa County Conservation Boards	1	Corridorwide		Van Buren & Wapello County Sheriffs Offices
R1.B	Communication to Users	Johnson & Louisa County Conservation Boards	1	Corridorwide		Iowa DNR
R1.C	Enhanced Communication Among Water Trail Access Managers	Iowa DNR River Programs	1	Corridorwide		Johnson & Louisa County Conservation Boards
R2.A	Extend water trail upstream of Burlington Street Dam	City of Iowa City	3	Iowa City and upstream		Johnson County Conservation
R2.B	Address social equity issues in access to river	City of Iowa City	1	Iowa City		
R2.C	New universal design access & parking	City of Iowa City	2	Riverfront Crossing Park	$252,304	
R2.D	New universal design access & parking	City of Iowa City	1	near Napoleon Park	$211,732	
R2.E	Develop fishing access points	City of Iowa City	2	TBD		
R2.F	Develop dip-in connections for land trail to explore the river edge	City of Iowa City	3	TBD		
R3.A	Develop peddle-paddle opportunities	City of Iowa City, Johnson County Conservation Board	1	Iowa City to Hills Access		
R3.B	Continue supporting extension and completion of planned regional land trails	City of Iowa City, Johnson County Conservation Board	1	Johnson County		
R3.C	Develop water trail loop into Pechman Creek Delta	Johnson County Conservation Board	1	Pechman Creek Delta		
R3.D	Develop land trail rest stop with water at Pechman Creek Delta	Johnson County Conservation Board	1	Pechman Creek Delta		
R3.E	Develop a paddle-in campsite on the water trail	Johnson County Conservation Board	2	Johnson County		
R3.F	Develop water trail loop into Johnson County portion of Buttermilk Falls slough site	Johnson County Conservation Board	1	Adjacent to Tri-County Bridge Road		Louisa County Conservation Board
R4.A	Develop water trail loop into Louisa County portion of Buttermilk Falls slough site	Louisa County Conservation Board	3	Adjacent to Tri-County Bridge Road		Johnson County Conservation Board
R4.B	New motorboat access	Louisa County Conservation Board	2	Midway between River Junction and River Forks accesses	$19,161	Johnson County Conservation Board
R4.C	New motorboat access and parking at Toddtown site	Columbus Junction	1	Columbus Junction	$105,166	
R4.D	New carrydown access & expanded parking	City of Wapello	2	Fred T. Schwob Access	$24,097	
R4.E	New land trail adjacent to Iowa River connecting downtown Wapello and Fred T. Schwob Access	City of Wapello	1	Wapello		
R4.F	New replacement access for Cappy Russell	Louisa County Conservation Board	1	near Oakville	$104,315	Willing landowner, Louisa County Engineer, USGS
R4.G	Plan and develop local capacity for new equestrian trail	Louisa County Conservation Board	3	Between Wapello and County Road 99		Local equestrian group, willing landowners, USF&W

Category	Recommendation	Lead Jurisdiction	Local Prioritization	Location	Budget Estimate for River-Related Recommendations	Other Collaborators
Water Quality Enhancement	Develop a streambank restoration awareness campaign to discourage use of rip rap & broken concrete reinforcement	Johnson CCB	2	Corridorwide		Iowa DNR
	Establish a low impact streambank restoration demonstration on a highly visible segment of the river	Johnson CCB	2	Napoleon Park to Hills Access		City of Iowa City
	Encourage additional volunteer water quality monitoring on Iowa River and its tributaries	Johnson CCB	1	Watershed in Johnson, Louisa counties		
	Coordinate with the local Soil & Water Conservation District to establish a continuous perennial vegetation buffer on the Iowa River and its tributaries	Louisa CCB	2			
		Johnson County Conservation Board, Louisa County Conservation Board	1	Corridorwide		
	Monitor known landfill sites	City of Iowa City	3	Iowa City		
Cultural Resource Protection	Encourage National Register of Historic Preservation (NRHP) designation for eligible rural sites near the river.	Johnson County Conservation Board, Louisa County Conservation Board	1	Corridorwide		
Habitat Enhancement	Pursue habitat enhancement for mussel species, turtles and amphibians	Johnson County Conservation Board, Louisa County Conservation Board	1	Corridorwide		
	Promote additional in-stream fish habitat improvements	Johnson County Conservation Board, Louisa County Conservation Board	2	Corridorwide		
	Reach out to Iowa River-edge landowners with forested land and backwater sloughs to encourage voluntary permanent protection through easement, with special emphasis on high value savanna habitat for amphibians and reptiles	Johnson County Conservation Board, Louisa County Conservation Board	2	Corridorwide		Johnson & Louisa Soil & Water Conservation Districts
	Continue monitoring Asian carp presence	USFWS	1	Corridorwide		Iowa DNR, state universities
	Coordinate with landowners to modify or remove barriers to fish migration/passage on tributaries to the Iowa River	Johnson CCB	1	Corridorwide		Iowa DNR fish biologists
		Louisa CCB	3	Corridorwide		
	Encourage bird habitat enhancement in river corridor to attract additional species	Johnson CCB	2	Corridorwide		
		Louisa CCB	1	Corridorwide		
Visitor Interpretation	Create an Interpretative Plan particularly geared toward Millennials	Johnson CCB	2	Johnson County		Iowa DNR River Programs
	Create an Interpretative Plan based on significant cultural and historic resources present	Louisa CCB	1	Louisa County		Iowa DNR River Programs

CHAPTER 4

RESOURCE CONSERVATION & PROTECTION PLAN

IOWA RIVER WATER TRAIL

CONTENTS

CHAPTER 4

RESOURCE CONSERVATION & PROTECTION PLAN

Water trails in Iowa are selected to represent the most beautiful, interesting and accessible river conditions in the state. While the Iowa River corridor downstream of Iowa City is unique compared to other Iowa rivers for many reasons, the resource conservation opportunities it offers are truly exceptional.

Water trails in Iowa are selected to represent the most beautiful, interesting and accessible river conditions in the state. While the Iowa River corridor downstream of Iowa City is unique compared to other Iowa rivers for many reasons, the resource conservation opportunities it offers are truly exceptional. Planning and research associated with this project has identified this water trail as having more land in permanent protection adjacent to the river compared to any other water trail studied in the state. Nearly 70,000 acres within 10 miles of the river are in permanent protection, 21% of which are contiguous with the river edge. As discussed in Chapter 1 of this plan, this water trail has the greatest diversity of mussel, aquatic mammals, bird and fish species present compared to other state water trail in Iowa. This river corridor segment also contains the greatest number of known, documented cultural and historic sites (599) compared to all other state water trails.

The relative remoteness of much of the Louisa County portion of the corridor is balanced by the more cultivated and urban portion in Johnson County. The river is truly celebrated both locally and by visitors. Both counties are deeply committed to resource conservation and protection. Beyond the county staff and administration, a strong community has come together in both counties to engage around the issues of resource conservation and protection in this corridor through planning for this project. They realize the value of the interplay between people and the river as well as how the river reflects back on and constructs the identity of this place.

STATE WATER TRAILS IN IOWA

In 2010 the Iowa Department of Natural Resources (DNR) completed “IOWA WATER TRAILS: Connecting People with Water and Resources” (Wagner and Hoogeveen 2010). This statewide plan was the result of a 2008 mandate for the water trails program. This plan ushered in a new legacy of enjoyment, respect, and care for the navigable waters of Iowa. This resource conservation and protection plan adds to that excitement by integrating the local passion and pride the community has for the diverse, high quality natural and cultural resource potential in the corridor. The vision for Iowa’s water trails program balances resource conservation and protection with expanding recreational opportunities. And in addition to providing access to Iowa’s rivers, the vision points to water trails as an entry point for people to become aware of and learn about the challenges facing Iowa’s waterways. Similarly, the state water trail plan goals strongly point to developing water trails in ways that protect aquatic and terrestrial resources. They also commit to partnering with other existing conservation efforts in the water trail watershed and region.

Resource conservation and protection planning for state water trails responds to the individual character of each river, local resources and landscape conditions. Recommended outcomes focus on enhancing both the condition and function of the river and other resources as well as acting as public demonstrations for low-impact restoration and other forms of protection. The Iowa Water Trails Program recognizes water trail users as all people using the river as well as the adjacent land. On the river itself this obviously includes paddlers and other boaters, anglers, swimmers and tubers. Active and passive users on land adjacent to the river are also included such as those scouring streambanks and sandbars in search of historic objects, bird watchers and volunteer water quality monitors as well as those who enjoy watching the river from their parked car.

State Water Trails Program Goals

GOAL ONE:
Provide positive water trail experiences meeting user expectations

GOAL TWO:
Use water trail development to strengthen natural resources conservation

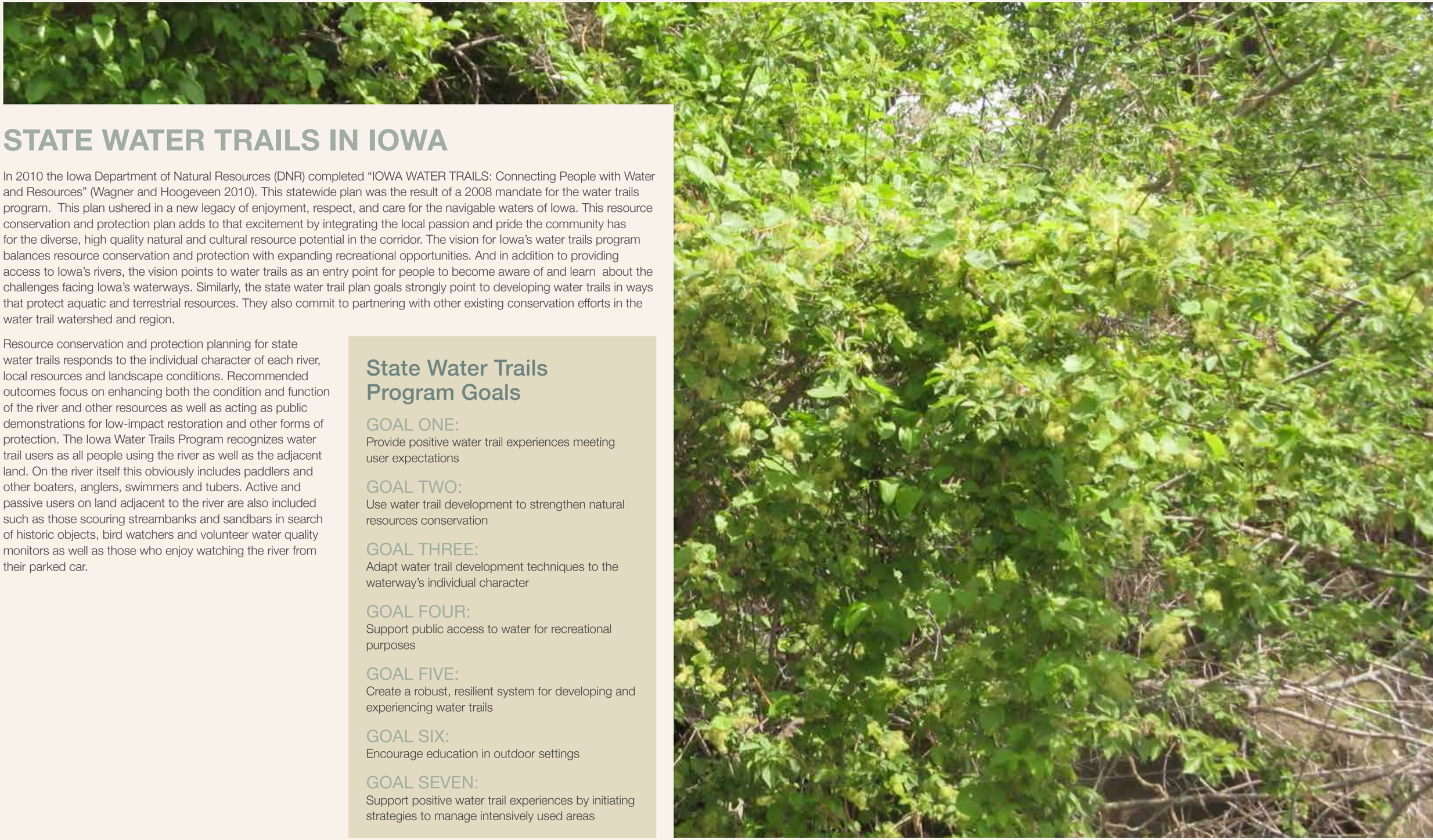
GOAL THREE:
Adapt water trail development techniques to the waterway’s individual character

GOAL FOUR:
Support public access to water for recreational purposes

GOAL FIVE:
Create a robust, resilient system for developing and experiencing water trails

GOAL SIX:
Encourage education in outdoor settings

GOAL SEVEN:
Support positive water trail experiences by initiating strategies to manage intensively used areas



PROJECT PLANNING AREA

The project area of this plan includes the Iowa River beginning in Iowa City on the upstream end to its confluence with the Mississippi River in southern Louisa County *(Figure 1)*. The communities of Iowa City, Columbus Junction and Wapello are critically important nodes on this water trail. Each community is spatially connected to the river and offers amenities for river users. This resource conservation and protection plan serves three purposes:

- Raise awareness about the extent and value of the resources present
- Build a local consensus for resource conservation and protection goals
- Provide guidance for future cultural resource protection and development

The goals of this resource conservation and protection plan center on enhancing conditions on the Iowa River in ways that support broad-based public education and recreation on and near the river. Because a primary purpose of state water trails is to promote recreation, it's important that resource conservation opportunities enhance rather than restrict use.

The following framework elements are used to guide the choice of recommended conservation and protection enhancements:

- Contribute to stable river structure and function
- Work to understand the causes of bacteria and biological water quality impairments so conditions can be enhanced
- Promote aquatic and terrestrial habitat to support diverse biological populations
- Expand what is understood about prehistoric life and culture in the Iowa River valley
- Partner with other organizations and efforts to promote resource conservation goals in the watershed
- Invigorate the opportunities present for outdoor education, tourism and recreation

These elements are integrated into later sections of the plan to illustrate how specific elements contribute to the success of the planning.

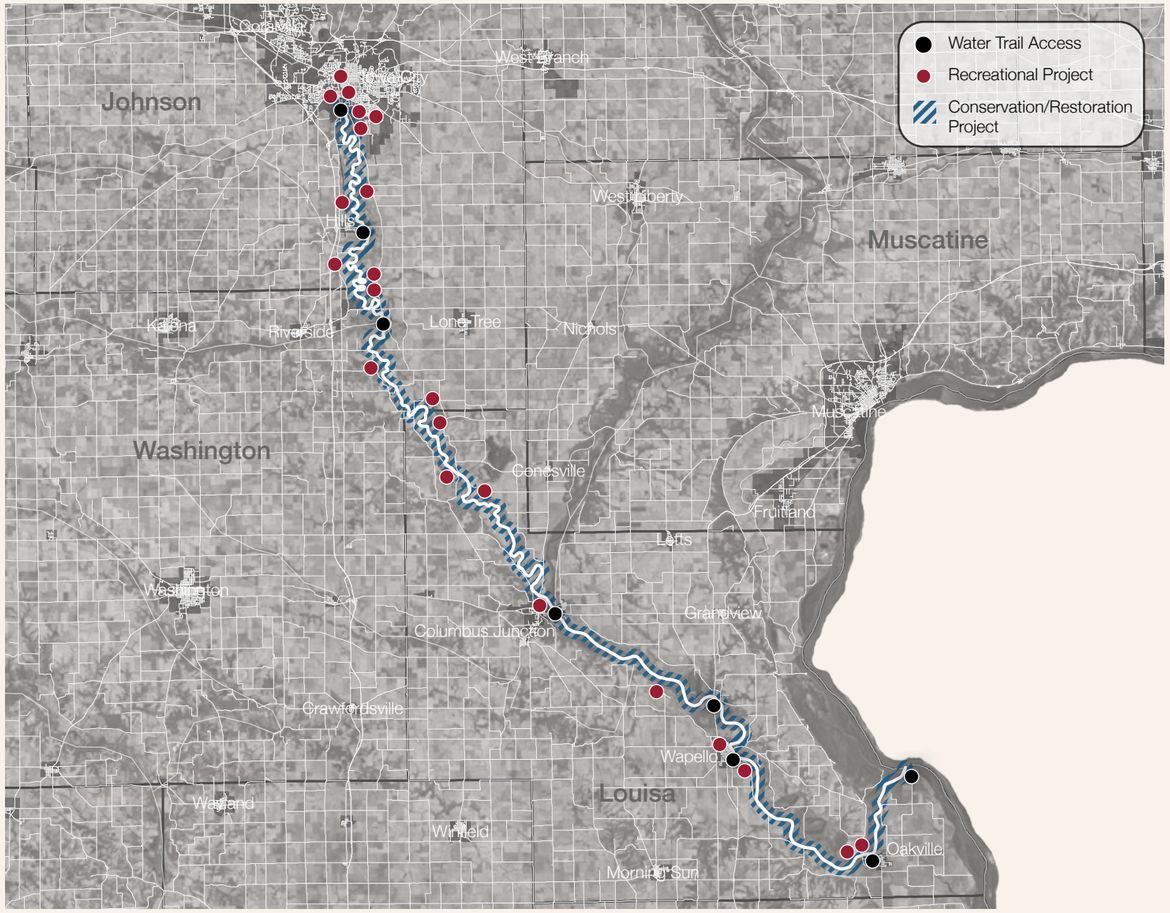


Figure I
Project recommendations for both resource conservation and protection as well as recreational development are distributed throughout the river corridor.

ADMINISTRATIVE RULES & DEFINITIONS

A number of federal, state and local statutes, rules and ordinances apply to conditions of the river and changes planned for it. These rules govern changes that can be made in the floodplain, streambanks and river channel. Current interpretation of statutes, rules and codes related to recreation are summarized in *Figure 2*.

Figure 2
Iowa regulations providing the framework for use and behavior of public waters are constantly evolving. These interpretations were updated in 2018 with assistance from the Iowa Attorney General's Office and Iowa DNR staff.

Cultural Resource Protection:

Additional site improvements or development at some river access points on the Iowa River will likely require a Phase I archaeological investigation due to cultural resources known to exist in the area. See Phase IA Archaeological Reconnaissance of the Iowa River Water Trail Corridor through Portions of Johnson, Washington and Louisa Counties, Iowa (Anderson, M. L., 2014); Section 404 of the Clean Water Act; Section 106 of the National Historic Preservation Act of 1966. Federal transportation funded projects also have additional specific cultural review requirements in Section 4(f) of the Department of Transportation Act of 1966.

Illegal Dumping:

The dumping or depositing of solid waste or debris in rivers, on streambanks, in public areas, and on others' property is illegal. This includes tires, appliances, construction and demolition waste, trash, and hazardous chemicals. Iowa Code 455B.307 Dumping.

Farm Waste:

Farm waste includes machinery, vehicles, and equipment used in conjunction with crop production or with livestock or poultry raising and feeding operations and trees, brush, and grubbed stumps from the same property. Farm waste and farm buildings cannot be dumped or deposited within 100 feet of streams, lakes, ponds, or intermittent streams. IOWA ADMINISTRATIVE CODE 567—100.4(455B).

Floodplain Filling, Changing a Channel, Placement of Rip Rap or Rubble on Streambanks:

A permit is required when floodplain elevation or channel alignment changes are proposed and when rip rap or rubble is proposed. A joint permit application is required that includes federal and state reviews. At the federal level, the U.S. Army Corps of Engineers issues permits under Section 404 of the Clean Water Act. In the state of Iowa, Iowa DNR grants floodplain and sovereign land permits. Iowa Administrative Code 571, Chapter 13; Iowa Administrative Code 567, Chapters 71, 72; Section 404 of the Clean Water Act.

Logjam Clearing:

Large woody debris piles often block parts or all of smaller river channels. Any trees or other large wood that comes to rest on the bottom of a channel is owned by the adjacent landowner. Therefore, modifying log jams for navigation or conservation purposes requires landowner permission. Log jams, while they can be impediments or natural hazards for navigation, also can function as habitat for aquatic species. Fisheries biologists should be involved in decisions about cutting wood in channels, and balanced solutions should be found. Most meandered rivers are sufficiently wide that logjams can be avoided while navigating them, but in the case where modifying a logjam appears desirable, permission from the Iowa DNR is required and a joint application form should be submitted.

Figure 2 (cont)
Iowa regulations providing the framework for use and behavior of public waters are constantly evolving. These interpretations were updated in 2018 with assistance from the Iowa Attorney General's Office and Iowa DNR staff.

ASSUMPTIONS AND CONCEPTS

Several assumptions exist in this plan related to resource conservation and protection. Any land disturbance on the floodplain, even for conservation or restoration purposes, requires great care to avoid damage to existing natural and cultural resource conditions. Construction and vegetation clearing on the floodplain, in the floodway and on the river's edge is regulated at the federal, state and local levels. All conservation plan elements included here should conform to the minimum standards established by regulation when implemented. This is critical because all river access locations are located in either the floodplain or floodway and many in areas known to include cultural resources. In addition to federal protection of wetlands and Waters of the U.S., state and local floodplain and Sovereign Lands regulations also exist. Iowa DNR Water Trail development standards also recommend a minimum 50-foot wide unmown riparian buffer between the top of the streambank and all parking areas.

The Iowa River in Johnson & Louisa Counties

The Iowa River in this study area is a wide and open river with a channel width ranging from 250-300 feet upstream of its confluence with the Cedar River to average widths of more than 700 feet below the confluence. The banks at river accesses are generally steep, ranging from 2 to 10 feet in height with some exceptionally steep bluffs along the water trail that peak above 100 feet on occasion. Flow in this river is artificially controlled at the Coralville Dam to minimize flood damage. In several places the floodplain is disconnected from the river by levees. Paddlers have the opportunity around nearly every bend in the river to observe wildlife near the waters' edge. The Iowa River is a meandered stream so the river bottom and sandbars are held in public trust for the use and enjoyment of the citizens of Iowa, therefore can be used for lunch breaks and

The inherent nature of this section of the Iowa River has always included a rich diversity of habitat and wildlife species. And while the river has changed a great deal in the past three hundred years, much of this richness potential still exists. Since Euro-American settlement, massive amount of soil has eroded due to cultivation and urbanization processes. Drainage and water runoff patterns and processes have also been modified. These changes produced the steep, vertical eroding streambanks visible today particularly in the upper reaches of this water trail. Flood damage has provided opportunities for public buyouts of cropland and residential properties adjacent to the river, particularly in Louisa County. The majority of these buyout properties have become public recreation and conservation lands. A total of 70,878 acres of land within 10 miles of this segment of the Iowa River water trail are permanently protected.

Land on either side of the river channel is most commonly wetland or forest vegetation. Only 10% of the riparian area is in cultivation or development, and the majority of this is in Johnson County. Very little of the river has been channelized and its alignment has not shifted laterally since measured maps have been produced.

Written history of the area often mentions the use and occupation of the Iowa River Valley by First Nations for years prior to and during Euro-American settlement. The entire Iowa River corridor up to its headwaters was an important resource for the Sauk and Meskwaki prior to 1836. The Meskwaki consider the Iowa to be their original home river. Like the native cultures before them, the first Euro-Americans traveled and settled along major rivers and their tributaries. The Office of State Archaeologist identified 504 prehistoric sites and 1,606 architectural resources with associated Iowa Site Inventory numbers *(Figure 3)* (Anderson, M. L. 2014). Thirty-eight properties are listed on the National Register of Historic Places (NRHP).

The nation's first Amphibian and Reptile Conservation Area (ARCA) designation was made in southeast Iowa in 2007 and approximately 93% of this water trail route flows through this conservation area. This region is Iowa's most diverse in terms of the number of amphibian and reptile species known to be present. The Iowa River retains an unusually high percentage of pre-settlement native fish species. The number of species has declined, but about 90 percent of those native fish present at the time of European settlement in the Iowa River

are still present today. Important back water slough areas contribute to this diversity as well as to the high diversity of reptiles and amphibians present. Mussel diversity and abundance are also high compared to other rivers in Iowa. Of the 119 bird species present and possibly or likely breeding in this river corridor, nearly 25% (26) are included on Iowa's Species of Greatest Conservation Need (SGCN) List by the Breeding Bird Atlas Project.

There is an enormous potential for enhancing conservation and protection practices associated with the Iowa River between Iowa City and the Mississippi River. This planning documented significant cultural, historic, geologic, biologic and geomorphic resources in the river corridor that are important to residents of the region. Corridor users would benefit from enhanced conservation and protection as well as from a focused interpretation that builds knowledge about the unique resources present. Increasing the efficiency of conservation and protection strategies in this region by partnering with other organizations is a key element to enhancing public benefits such as flood resilience and water quality enhancement.

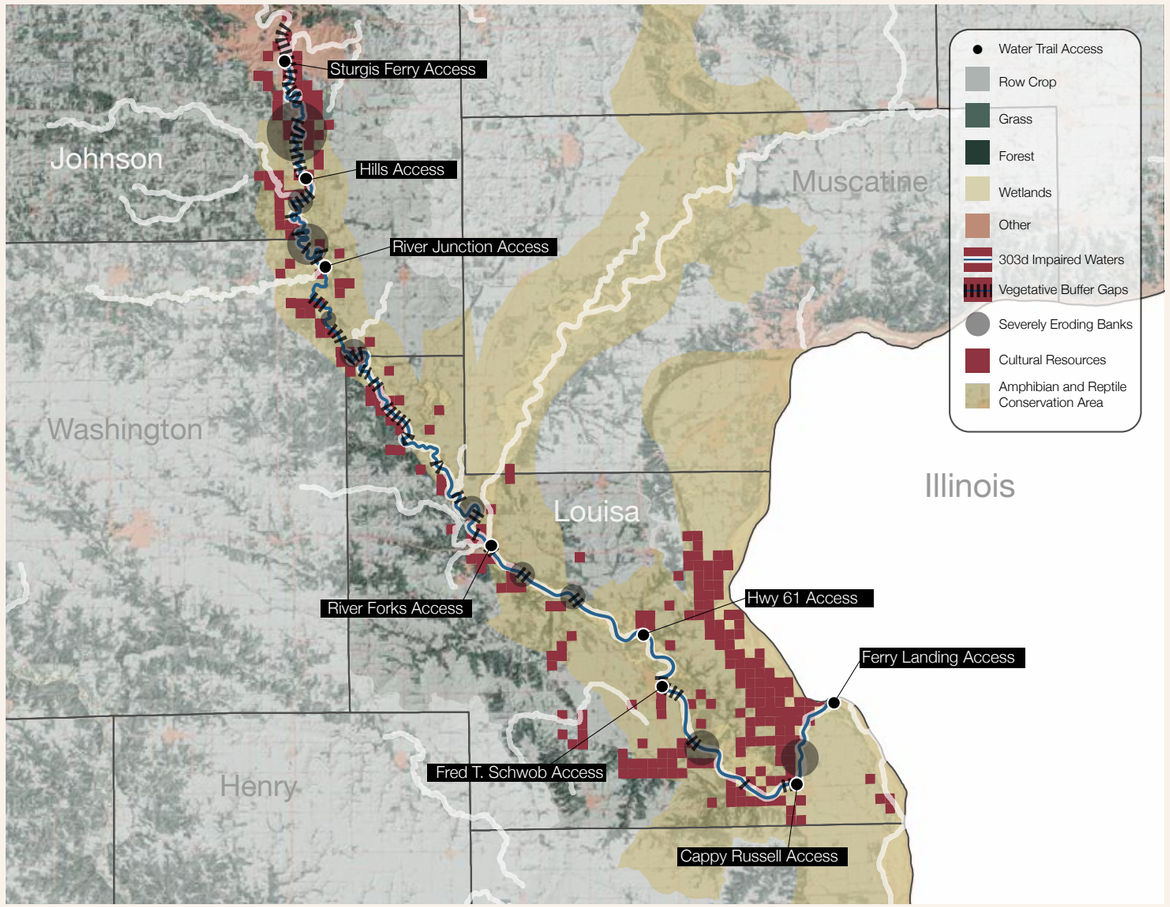


Figure 3
Resource assessment conducted for the existing conditions of this water trail identified strong opportunities for both resource protection and recreation.

IMPLEMENTATION OF THE IOWA RIVER VISION

The Iowa River between Iowa City and the Mississippi River was designated as a state water trail in 2011. An important part of the vision for this water trail is protecting and enhancing the high quality habitat conditions in this corridor. These include a high diversity of birds, fish, turtles and amphibians known to live in the corridor.

Both recreation and conservation elements are included in the area's long term vision associated with the river. Recreation enhancements include upgrading boat launches to facilitate more efficient use and access by a greater proportion of the population. The vision also includes bringing more citizens to the river, giving them easy access not just for paddling but to the river itself for wading, fishing, nature study, and enjoyment. Vision elements related to conservation and protection are largely focused on habitat enhancement in the river corridor. There is also a strong interest in enhancing the impaired water quality conditions on the water trail and in the county. Addressing these concerns requires streambank restoration, riparian buffer establishment, habitat protection and additional water quality monitoring. Many opportunities are also present to enhance and further protect cultural and historic resource in this river region. Lastly, strong interpretation opportunities are present to enhance what is known, interpreted and made publicly available for visitor and resident experience.

PLANNING PROCESS

This vision was developed through a two year planning process integrating stakeholders, agencies, non-profit organizations and landowners. Local participation included steering groups at the county and also statewide levels. County level steering groups composed of individuals with specialized interests and skills were developed in Johnson and Louisa counties each with approximately 15 members. County steering groups included representation from the water trail sponsor, municipal and county staff as well as special interests such as angling, paddling, land trails, conservation, history, business owners and rural landowners. These groups guided the overall development of both the vision and this plan. A statewide steering group included representation from various state agencies, non-profit organizations and university researchers related to the particular resources and issues present in and near this corridor. Technical guidance from the statewide steering group was considered throughout the technical planning process.

The existing conditions surrounding this section of the Iowa River were assessed prior to starting the recreational planning process. Planning for resource conservation and protection took place in conjunction with planning for recreational development. An extensive review period occurred with the Steering Group, Johnson and Louisa County Conservation staff and the Iowa DNR prior to finalization of the plan.

SCOPE OF THE PLAN

Conservation and protection elements are recommended for both the Iowa River channel and its tributaries as well as the riparian corridor and selected upland locations. River channel recommendations relate to conditions in the water and stream channel, particularly those relating to water quality and habitat enhancement. Land-based recommendations relate to two major types, natural resource and cultural resource. Land-based recommendations include conservation and protection of these resources from the top of the bank and extending throughout the Johnson and Louisa counties portion of the watershed in the project area. User-based recommendations relate to education and awareness-building as it relates to conservation and resource protection in the river corridor. *Table 1* summarizes and organizes desired resource conservation and protection outcomes with examples of recommended plan elements to illustrate their relevance.

Elements Included in This Plan	Stable River Structure & Function	Enhanced Water Quality Conditions	Aquatic Habitat Supporting Diverse Mussel and Fish Populations	Terrestrial Habitat Supporting Diverse Bird Populations	Protected Cultural & Historic Resources	Expanded Outdoor Education & Recreation	Expanded Tourism Opportunities
Prepare Forest Management Plan				X	X	X	X
Modify or Remove Dams	X	X	X			X	X
Cleanup Legacy Dumpsites		X		X		X	X
Conduct Studies to Further River Conservation	X	X	X			X	
Streambank Restoration	X	X	X	X		X	X
Establish Perennial Vegetation Buffer	X	X	X	X		X	
Permanently Protect and Designate Significant Cultural & Historic Sites					X	X	X

Table 1
Resource conservation outcomes important locally and in Iowa and included in this plan are organized to reflect their relationship to recommended projects.

Resource Conservation and Protection Needs in the Corridor

EXISTING CONDITIONS

Resource conservation and protection needs include those related to natural resources as well as cultural and historic resources in the river corridor and its watershed. Needs have been identified locally throughout the study area *(Figure 4)*. The Iowa River Water Trail has an enormous watershed compared to other Iowa interior rivers. The drainage basin or watershed area draining into the water trail includes 8,077,101acres *(Figure 5)*. A majority of the watershed acres (67% in 2013) were annually-cultivated cropland. Although this river corridor has been occupied by humans from prehistoric times to the present, the course of the river has changed very little since measured maps and aerial photographs have been produced. However, the river channel has widened since Euro-American settlement and this widening appears to be continuing.

Streambank erosion and existing concrete debris and rubble placed on the streambanks are common issues along the entire study reach. Likely contributors to streambank erosion include a low sediment supply due to interception from the Coralville Dam, and altered seasonal flow regimes due to flood management effects of the dam.

Concerns about the surface water quality exist locally. Nearly all segments of the Iowa River in Johnson and Louisa counties and eleven of its tributaries are included on Iowa's List of Impaired Waters. Communities, county and state entities have been successful in obtaining more than $27 million in the past 15 years in funding and low interest loans to address water quality issues in the Johnson County portion of the water trail's watershed. Successful funding has targeted both agricultural and urban non-point as well as urban point source pollution sources. The largest portions of funding and low interest loans awarded in the watershed address urban point and non-point source pollution issues.

One of the most important conservation needs identified by the Steering Group for this planning is also one of the easiest to address. This area is known as the riparian zone. It is the transition area between the river channel and the upland.

How land is used and managed in this 100'wide riparian area is one of the most important conditions contributing to streambank stability and water quality enhancement for the river. The higher the percentage of perennial land cover, such as forests and non-grazed grassland, the better for water quality and habitat. This section of the Iowa River has only 4% of its riparian corridor in annually cultivated cropland in this first 100' wide area. This is a low percentage compared to other rivers in the state and it provides great incentive to eliminate all cropland in this vulnerable land area. Nearly all of this cropland exists between Iowa City and the River Forks Access. One of the goals and recommendations of this plan is to work with landowners to replace those annually cultivated acres with perennial vegetation.

More than 64,173 acres of public natural areas are within a 10-mile radius of the Iowa River Water Trail. This is one of the highest percentages of public land within 10-miles compared to all state water trails. The majority of those natural areas are state owned. These lands provide an enormous benefit for wildlife and soil conservation as well as recreation.

In addition to the high diversity of fish, amphibians and reptiles previously mentioned, this corridor is home to a large diversity of mussels and birds. This segment of the Iowa River currently has 27documented mussel species, 14 of which are listed as Species of Greatest Conservation Need (SGCN). The Breeding Bird Inventory II identified a total of 119 species in the riparian corridor blocks studied. Of these, 22% (26) of species are included on Iowa's SGCN list. This confirms that the conditions present in the river corridor provide habitat for many bird species that have been identified as critically important for conservation.

Lastly, of extreme importance locally and statewide, are the more than 2000 archaeologic and historic resources mentioned earlier including 38 National Register of Historic Places sites.

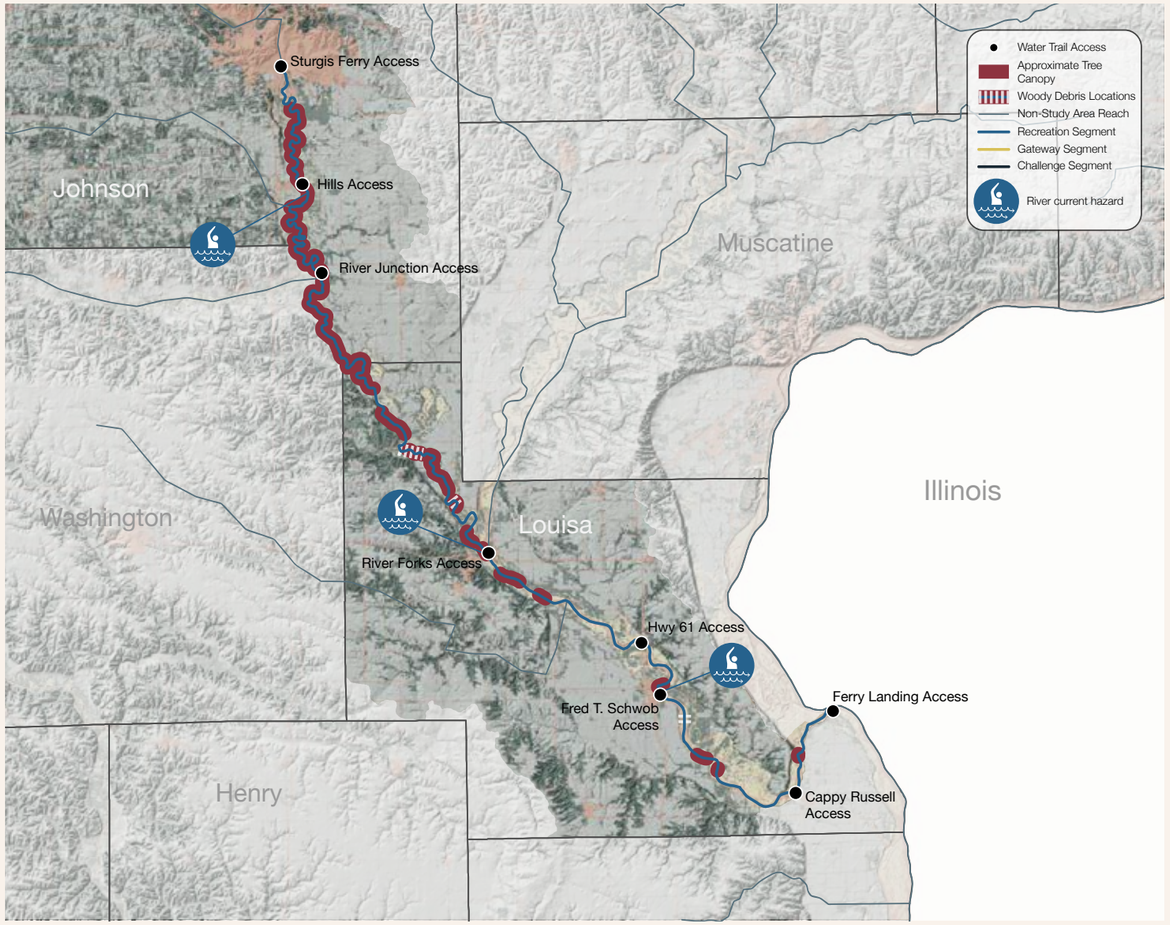


Figure 4
Annual row crops planted up to the top of the streambank are the most common cause of missing riparian buffer acres on this river.

Figure 5
The water trail portion of the Iowa River is located in the lower portion of the river's watershed.

NATURAL RESOURCE CONSERVATION NEEDS

A number of issues were identified during this planning directly related to the river itself. Addressing these issues may also open up opportunities for state river restoration funding as well as funding from other external sources. The following desired outcomes related to the river corridor were identified during planning:

- Enhance water quality conditions in the Iowa River and its tributaries which will serve as a role model to other county watershed areas and attract visitors:
  - Research to identify the causes and sources of water quality impairments in the Johnson and Louisa counties portion of the watershed, and increase participation in voluntary water monitoring
  - Decrease the amount of land loss due to streambank erosion by using low impact, habitat-friendly stabilization methods
  - Coordinate with other organizations to promote conservation and funding for enhancement
- Enhance habitat conditions for wildlife which help support tourism, quality of life and other forms of economic development
  - Establish a continuous perennial stream buffer for the length of the Iowa River and its tributaries
  - Explore permanent protection of existing mature forested riparian land tracts on the Iowa River in private ownership
  - Protect high quality habitat for SGCN turtle species from recreational and other types of development
  - Identify potential savanna restoration lands adjacent to the Iowa River
  - Improve fish habitat in tributaries to the Iowa River

CULTURAL RESOURCE PROTECTION NEEDS

This corridor contains significant cultural and historic sites of national significance. Many of these known resources are already permanently protected because they are owned by municipal, state or non-profit organizations. This is the greatest assurance that they will be available and undisturbed for future generations. The following desired outcomes related to cultural and historical issues were identified during planning:

- Acquire and permanently protect significant cultural sites that are not already secure
- Conduct pedestrian surveys for remnants of schools, houses or farmsteads depicted on the General Land Office Survey
- Enhance the interpretation of these resources and expand access to new populations

Resource Conservation and Protection Overview

The goal of this plan is to conserve existing resources and restore damaged or degraded areas to provide higher quality resource conditions. Six elements of particular importance to this water trail corridor are included: two related directly to specific classes of vertebrate animals, three related to specific types of habitat conservation and one related to cultural and historic resources.

NATURAL RESOURCES

TURTLE CONSERVATION

Proactive planning was utilized in this project to minimize negative impacts to existing high quality habitat areas for turtle species. The negative impacts considered were those that could occur with new recreational development in the riparian corridor such as parking areas, boat launches and recreational trails. Planning focused on three threatened or endangered turtle species in Iowa: Ornate Box (a terrestrial species) and the Yellow Mud and Smooth Softshell (species that live near water). This work updated the 2001Iowa GAP Analysis based on recent high resolution land cover and LiDAR data and updated soils and wetland data.

Detailed maps were produced that estimate a range of habitat quality for each of the three turtle species as well as a map for all Iowa turtle species combined. These maps are the property of Iowa DNR and the results will not be displayed or distributed publicly. Resulting map data were used to verify that areas proposed for recreational development included in this water trail plan were not high quality habitat.

FISH PASSAGE RESTORATION

Many native fish are migratory in terms of spawning and reproduction behavior. Migratory fish are important for angling and also because they are a food source for many other species. When fish are able to make it upstream to spawning grounds on tributaries and successfully reproduce, they can potentially create many eggs each season. The movement of fish on this water trail portion of the Iowa River is unimpeded. However the condition of tributaries to the Iowa River, in terms of fish passage, were unknown at the time of this study.

This planning studied current aerial photography to visually identify potential blockages to fish movement on tributaries to the Iowa River in Johnson and Louisa counties. Two types of blockages, culverts and at-grade crossings, were identified. A total of 141 potential blockages were identified of which nearly 70% were culverts *(Figure 6)*. Nearly every small tributary to the Iowa River include infrastructure that may be blocking passage under certain condition. Tributaries with high densities of potential blockages include Old Womans Creek, Bulgers Run (a tributary of English Creek), Big Slough Creek Smith Creek and Paul Creek. These potential channel blockages require ground-truthing to confirm whether or not they present a blockage to passage. Landowners and government entities owning the infrastructure who are willing to invest in enhancing conditions for native fish will likely require funding and technical assistance. The potential for fish passage expansion is quite large.

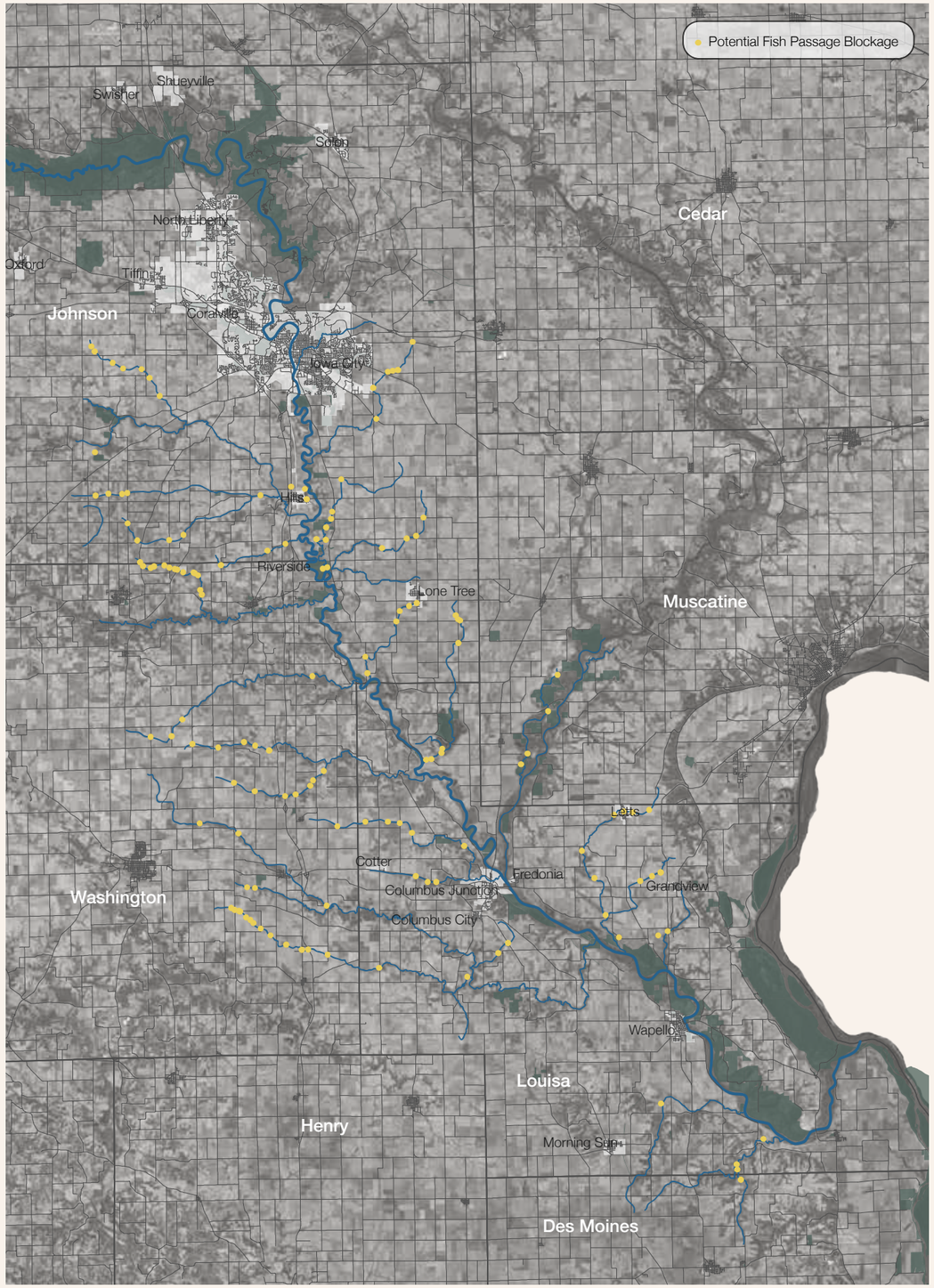


Figure 6
In some cases, channel blockages can be resolved by landowners independently. Other instances, such as culverts under public roads, require coordination with county engineer offices.

SAVANNA RESTORATION

Savanna landscapes are critically important habitat for reptile and amphibian species. The open grown oak structure implicit in savanna landscapes allow animals to move with ease between sun and shade as needed to regulate body temperature. This segment of the Iowa River had hundreds of acres of savanna landscape at the time of the oldest aerial photographs in 1939. Very little of these acres remain in savanna land cover today, although many remain undisturbed in terms of development or annual cropping. Existing forest land cover that transitioned from savanna at an earlier time can still retain the original open-grown oak trees of the savanna. These types of woodland and forest tracts provide the most promising savanna restoration potentials.

This planning compared current aerial photography adjacent to the Iowa River and its major tributaries with images from 1939. Parcels with current forested landcover that also indicated savanna land cover in 1939 were identified. While these land tracts require ground-truthing to confirm the presence of open-grown oaks and landowners interested in restoration, the potential for restoration is quite large. These parcels are represented in Appendix A.

RIVER-EDGE FORESTED LAND AND BACKWATER SLOUGHS

The vast amounts of land acres containing backwater sloughs and forested lands on the edge of the river are critically important habitat on this river. The presence of these landscape features also provide long term stability to the river's form. Many forested tracts are already permanently protected and have little risk of being cleared or negatively altered. Some large tracts are privately owned and management of them is not protected by conservation easements. Many of Iowa's sloughs connected to large rivers such as the Iowa River are at risk due to the high loads of sediment that these rivers carry. Sloughs are at risk for being filled with this silt and their habitat value reduced. Landowners interested in permanent protection would benefit from assistance in creating conservation easements. These potential protection sites are represented in Appendix B.

STREAMBANK RESTORATION

Restoring streambanks and minimizing future streambank erosion is a high priority on this river. Streambank conditions and land cover within the first 100' of the top of the streambank have a strong influence on how resilient the river is to streambank erosion. Soil erosion from streambanks is a pollutant that impairs water quality conditions in the river. Minimizing soil loss on streambanks is an important action item for water quality enhancement.

Broken concrete rubble is often dumped on the banks of this river with the intention of protecting them from further erosion. This disposal of concrete waste can also be perceived as cost effective compared to disposal of the waste in a land fill. While a common practice in the past, this practice is discouraged today because much less aggressive practices are known to be more effective.

Recommended practices to restore streambank stability include reshaping of the vertical bank and placement of a stone or rock toe *(Figure 7)*. The rock toe can be local rock or broken concrete sized to withstand the shear stress of river flow. Due to the dam-controlled water level management on this river, the extent of the rock toe should be determined geomorphically in the field at each site. Generally, the rock will extend only as high as the lowest-growing woody vegetation at the location. Native grass seeding or soil bioengineering practices are utilized above the stone toe.

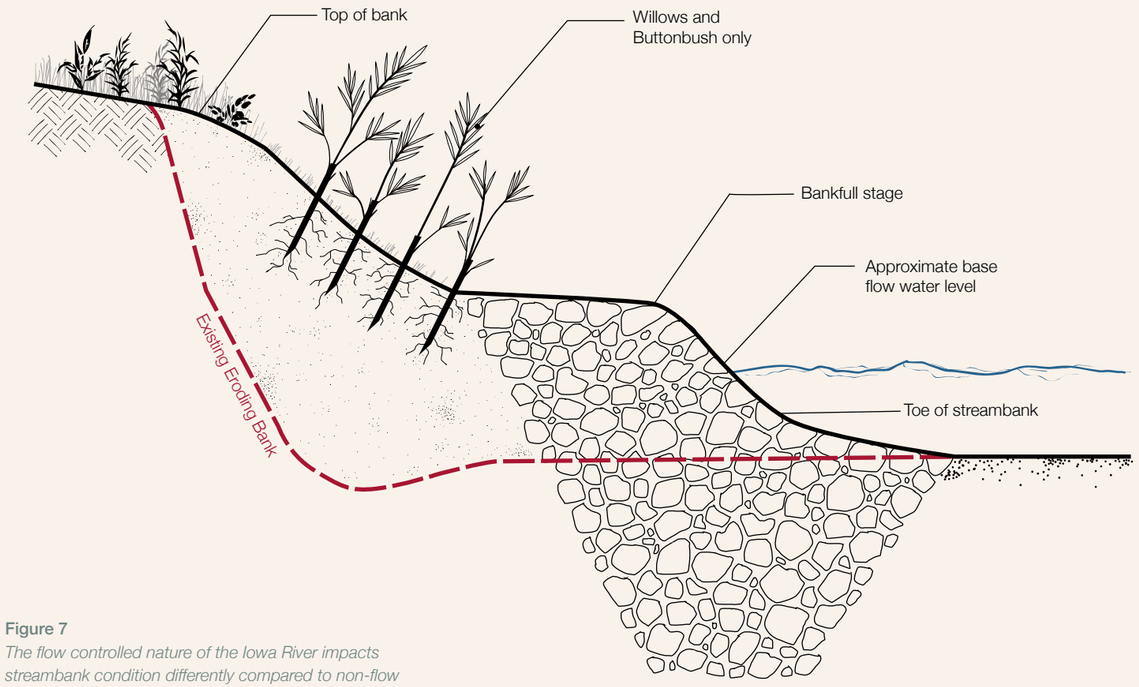


Figure 7
The flow controlled nature of the Iowa River impacts streambank condition differently compared to non-flow controlled rivers in Iowa. This detail is designed to respond to these conditions by incorporating a bankfull bench and rock toe.

RIPARIAN BUFFERS

The first 100' of land at the top of a streambank is incredibly vulnerable to erosion and deposition as water levels in the river fluctuate. This narrow band of land is called the riparian area and it is also highly influential in determining the quality of habitat for animal species in the water as well as those on land. A river edge with perennial vegetation that is undisturbed annually, such as forest or grassland, provides the best opportunity to hold streambank soils in place. Annually cultivated crops planted at the river's edge are the least stable form of soil protection. The roots of deep-rooted woody vegetation, such as floodplain trees, provide an architecture for soils on streambanks. The roots of woody vegetation resist shear stress from river flows and provide strength to hold soil in place much more successfully compared to herbaceous plants such as grasses and crops.

Where annually cultivated cropland exists within the first 100 feet of river edges, it is recommended these areas be replaced with woody perennial plant buffers *(Figure 8)*. Like all recommendations included in this plan, landowners willing to implement these buffers are needed. Recommended riparian buffer plants include only native plant species that are appropriate for the soil conditions present. Buffer plantings are designed in conformance with USDA Natural Resources Conservation Service Conservation Practice Standard 391, Riparian Forest Buffer (USDA NRCS 2014). Specific woody vegetation species included in each buffer conform to Conservation Suitability Group (CSG) for the soil type established by Iowa DNR and NRCS (Iowa DNR 2007).

Figure 8
A forested riparian buffer is recommended to replace annual row crops at the top of streambanks.

CULTURAL AND HISTORIC RESOURCES

This region of the state was one of the first areas settled by Euro-American settlers, and the Iowa River was the transportation corridor that first provided access. This land saw intense activities between the American Indian residents and new settlers. Some critically important sites for both types of cultures remain in private ownership and are vulnerable to destruction and exploitation. These sites have mostly been identified by archaeologists and historians and some are known locally. Other potential sites have yet to be discovered, requiring archaeological surveys and reconnaissance activities. Once identified, these sites require interpretation by their cultural groups so the information can be publicly understood.

SUMMARY OF CONSERVATION AND PROTECTION ELEMENTS

Recommended conservation and protection elements included in this plan consist of the following types:

- River Channel Conservation: streambank restoration, water quality monitoring, in-stream habitat improvements
- Land-Based Natural Resource Conservation: reduction of bacteria and nitrogen loading in the watershed, continuous perennial stream buffer establishment, enhanced habitat development for Species of Greatest Conservation Need (SGCN), and permanent protection of riparian forestland and savanna restoration lands
- Cultural Resource Protection: additional volunteer field studies; permanent protection of vulnerable sites
- User-Directed Conservation Education: upgrades and development of historic structures and sites to expand use; interpretive planning; new museum or interpretative facilities where required to interpret resources and provide access to resources

Recreational development priorities also exist for this same river segment. Planning for recommended recreational enhancements included considerations for resource protection, but the success of final construction depends on sensitivity to the potential presence of resources not already identified. These recommendations include enhancing pedestrian access to the river in Iowa City, completing planned bike trails, establishing a remote paddle-in campsite and pedal-paddle opportunities, developing capacity for a rural equestrian trail and upgrading river access.

The existing public recreational lands and historic sites in the river corridor are important conservation assets to this region. While no further expansion of state, county or municipally-owned land is planned, maintaining the strong working relationship between the agencies, municipalities and organizations is critically important.

Recommended Conservation and Protection Projects

A broad range of resource conservation and protection strategies are recommended to protect and enhance conditions on the Iowa River and its tributaries. The strategies include in-channel, streambank, and inland / upland areas. The entire study area river corridor is considered as a single segment for the purposes of conservation and protection planning; some project elements include both Johnson and Louisa counties while some are only planned for one of the counties *(Figure 9)*. Recommendations are grouped into categories based on the type of resource. Each recommendation includes a text description and many also include maps and figures.

These recommendations were developed jointly with technical experts at Iowa DNR, Iowa Office of the State Archaeologist and Iowa State University and have commitment from Johnson and Louisa county conservation boards as well as the Regional Steering Group agencies. Finally, these recommendations address local, regional, state and national conservation priorities.

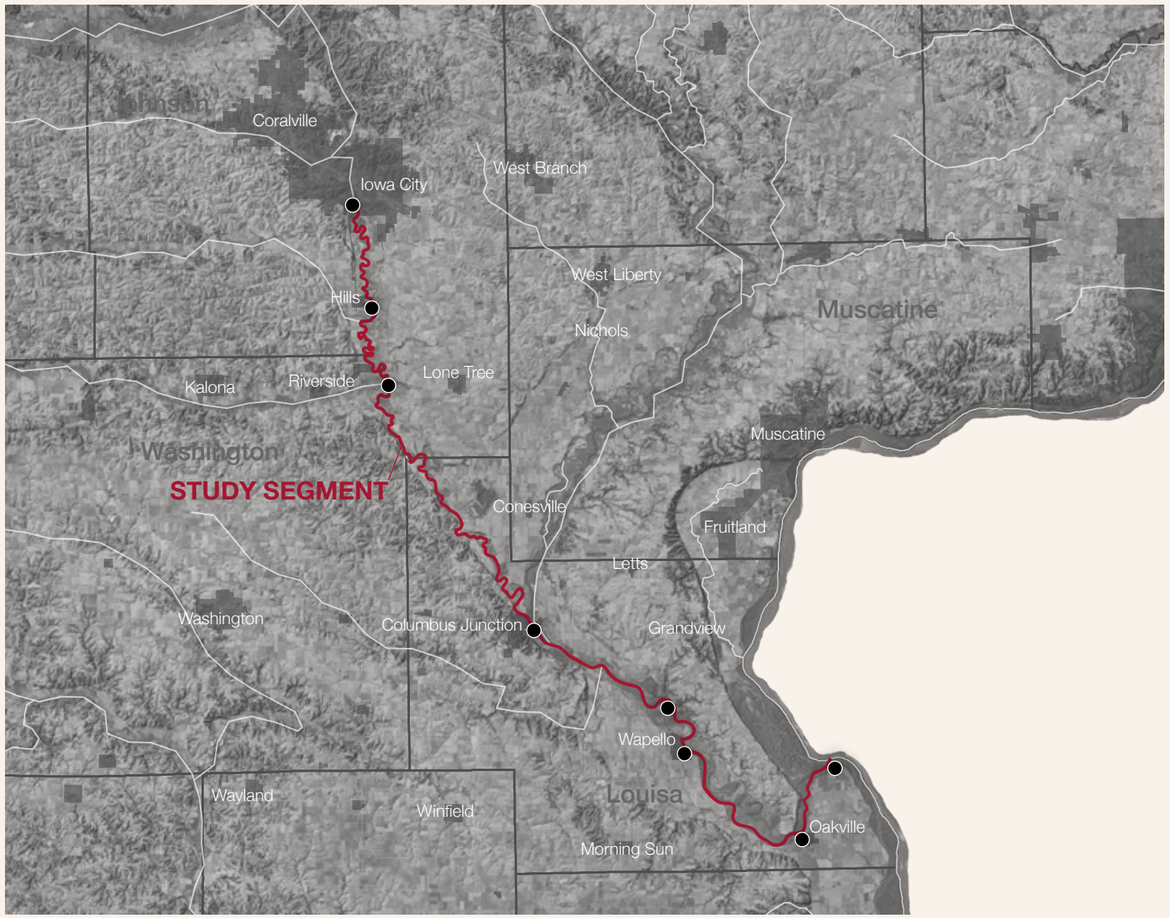


Figure 9

Seventy-two miles of river are included in this water trail plan. While some conservation and resource protection recommendations are confined to one county, the majority span the entire 72 mile segment.

WATER QUALITY ENHANCEMENT-RELATED RECOMMENDATIONS

Develop a Streambank Restoration Awareness Campaign

An awareness campaign is recommended to encourage the substitution of streambank restoration practices rather than the dumping debris on streambanks. Concrete rubble and debris are commonly dumped onto streambanks on the Iowa River in an effort to stabilize the streambanks and dispose of the rubble. When dumped without a permit, this action can be considered illegal dumping. Also, when used to cover an entire streambank, these materials don't allow habitat to develop. In most instances, a rock toe and native trees and shrubs can be substituted with the same stabilization effect and a fraction of the cost of purchasing riprap. The awareness campaign could be targeted toward communities as well as landowners of streambanks.

Establish a Low Impact Streambank Restoration Demonstration

Low impact streambank restoration has been successfully used in Iowa City as an alternative to rip rapping the entire streambank height. Additional demonstration of successful practices and locations in a highly visible segment of the river is recommended. The water trail segment between Iowa City and the Hills Access is recommended due to its high paddler volume; this segment also has a great deal of erosion. The development of professional standard designs and details using these low impact and ecologically friendly methods will be useful in establishing this demonstration. Special consideration is needed in the design of practices on the Iowa River due to the effects of the Coralville Dam on flow conditions and streambank stability. A standard set of details and design guidance will allow local agencies, communities and landowners to source materials, plan costs and implement restoration independently.

Encourage Additional Water Quality Monitoring on the Iowa River and Tributaries

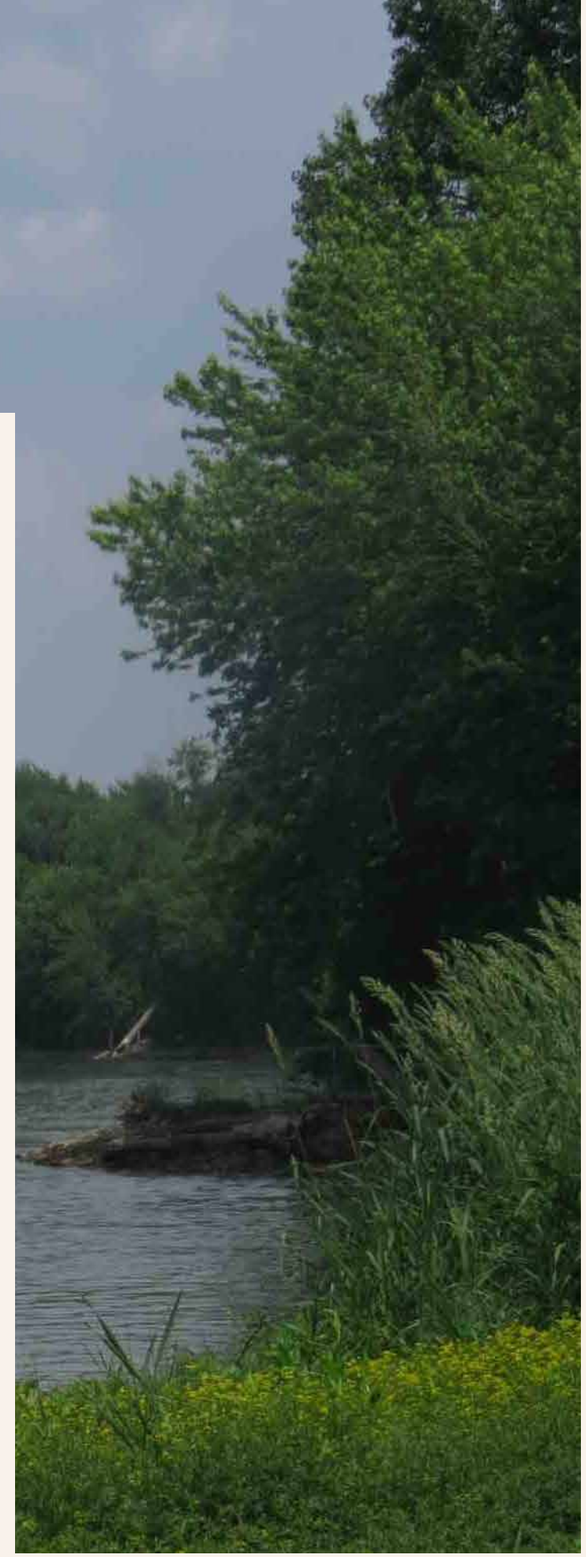
Bacteria concentrations in the river are a concern to local residents. Additional volunteer monitoring on the Iowa River and its tributaries is recommended and will provide a valuable understanding of water chemistry conditions. Volunteer monitoring also builds local knowledge and skills about water quality conditions.

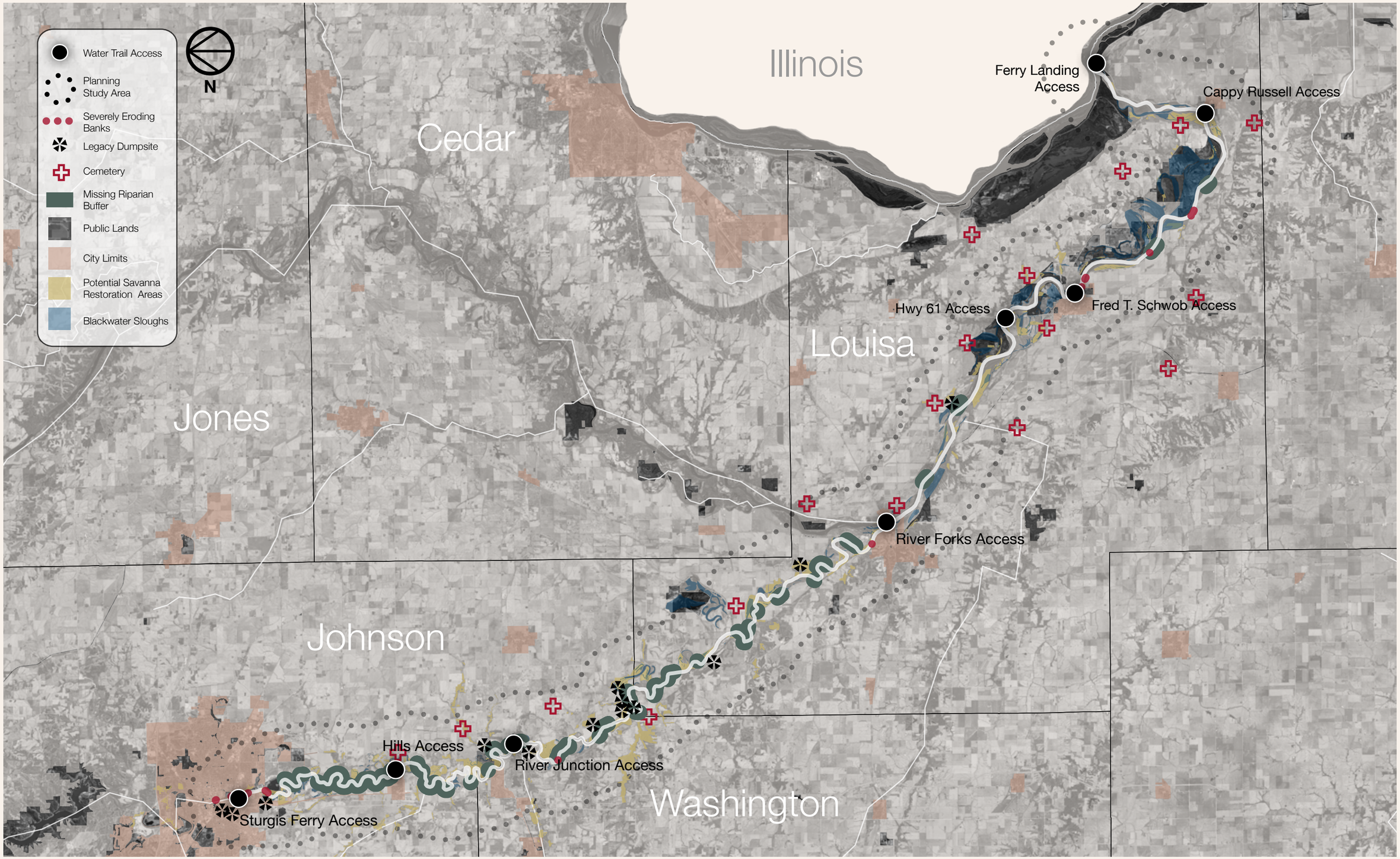
Establish a Continuous Perennial Vegetation Buffer on the Iowa River and its Tributaries

Development of a 100-foot wide perennial stream edge buffer is recommended for the entire 72 miles of the Iowa River Water Trail in Johnson, Washington and Louisa counties. The buffer width is measured beginning at the top of the streambank. A total of 73 acres were measured as missing from this buffer using 2016 cropping data. The majority of missing acres (50.4) are located in Johnson County. Establishment of a Woody Tree and Shrub Mix, comprised of native trees and shrubs along with a temporary seed mix is recommended. This mixture provides diverse habitat for multiple species when it is mature as well as the most successful, natural reinforcement for streambank protection. Perennial buffers provide excellent filtering capability for sheet erosion from adjacent crop fields as well as important bird habitat. Soil and Water Conservation Districts in each county, as well as USDA NRCS offices, have working relationships with many landowners and will be an invaluable partner in completing this recommendation.

Monitor Known Landfill Sites

Additional, continued monitoring of groundwater in the two former landfill sites is recommended. These sites were both located at the edge of the Iowa River and are now known as Mesquakie Park (misspelling intentional) and Sturgis Ferry Park. Both sites operated in the 1960's and early 1970's. The landfills were actually dump sites due to the fact that the sites weren't lined, compacted, capped, managed or monitored. The EPA Superfund Branch conducted an assessment of both dump sites in late 1988 and early 1989. Monitoring wells at Mesquakie Park detected chromium and lead at levels exceeding drinking water standards, and iron and manganese exceeding Secondary Drinking Water Standards. Additionally, heavy metals arsenic, barium, chromium, copper, iron, lead and manganese were all found to be leaching from the buried refuse. No clean up or remediation of the refuse has occurred or is planned.




Water Trail Access
Planning Study Area
Severely Eroding Banks
Legacy Dumpsite
Cemetery
Missing Riparian Buffer
Public Lands
City Limits
Potential Savanna Restoration Areas
Blackwater Sloughs
N
Illinois
Cedar
Jones
Johnson
Louisa
Washington
Ferry Landing Access
Cappy Russell Access
Hwy 61 Access
Fred T. Schwob Access
River Forks Access
Hills Access
River Junction Access
Sturgis Ferry Access

CULTURAL RESOURCE PROTECTION-RELATED RECOMMENDATIONS

Encourage NRHP Designation for Eligible Sites

Identification of National Register of Historic Preservation (NRHP)-eligible sites in the rural part of Johnson County is recommended. These sites include the farmstead archaeological site associated with the NRHP-listed Plum Grove, the residence of Iowa's Territorial Governor Robert Lucas. Seventeen other sites in the corridor have been determined NRHP-eligible by SHPO. These sites have great potential for interpreting the history and culture of this region.

HABITAT-RELATED RECOMMENDATIONS

Pursue Habitat Enhancement for Mussel, Turtle and Amphibian Species

Conserving mussel, turtle and amphibian populations on this portion of the Iowa River is critically important to residents. Recommendations include avoiding areas with highly suitable turtle habitat when locating new recreational infrastructure and other types of disturbance. In-stream and riparian corridor enhancements are also recommended to further support populations of each species in conjunction with Johnson and Louisa County Conservation and Iowa DNR. Riparian corridor enhancement recommendations also includes restoration of savanna-type landscapes at the river's edge.

Promote Additional In-Stream Fish Habitat Improvements

In-stream and riparian corridor enhancements, including mitigating channel blockages, to further support populations are recommended in conjunction with local anglers, Johnson and Louisa County Conservation boards and Iowa DNR. This includes tributaries which are important for seasonal migration and spawning.

Permanently Protect River-Edge Forested Land and Backwater Sloughs

The exploration of various strategies is recommended to voluntarily protect privately-owned existing mature riparian forest tracts adjacent to the Iowa River. Special emphasis on forests with potential for savanna restoration and backwater sloughs is recommended. These landcover types are high value to amphibians and reptiles. Potential strategies include (1) donation or purchase of permanent conservation easements from willing landowners and (2) donation or purchase of fee title from willing landowners.

Continue Monitoring Invasive Carp Presence

Three species of invasive carp (Silver, Bighead and Grass) are known to use the study reach of the Iowa River. Silver carp can pose a significant hazard for boat users, jumping near or into boats and startling boaters although none have been reported on this river to date. Invasive carp are also an ecological threat to the river. In terms of native fish populations, Silver Carp have the potential to cause enormous damage because they feed on plankton required by larval fish and native mussels. This species also competes with native species, such as gizzard shad, which also rely on plankton for food.

Populations of Silver Carp were the highest in April-September and decreasing in subsequent months based on monitoring reports. The US Fish and Wildlife Service, Iowa State University and Missouri Department of Conservation are monitoring the movement of these species on the Iowa River. Continued monitoring is recommended.

Modify or Remove Barriers to Fish Migration on Tributaries to the Iowa River

Enhancing natural reproduction conditions for native fish is critically important to maintaining resilient populations. Further study is recommended to identify and replace infrastructure blocking fish passage on tributaries of the Iowa River. Several types of infrastructure can inadvertently restrict fish passage and thus restrict the spawning experience for fish. These infrastructure include culverts and at-grade crossings. Fish passage can be blocked when a significant drop is present between the elevation of the channel bottom and the lowest elevation of the culvert or crossing, stopping fish from continuing upstream. A total of 141 potential blockages on 35 tributaries have been initially identified in Johnson, Washington and Louisa counties using aerial photography; 45 of these blockages appear as at-grade crossings. Further in-field research is needed as well as outreach with landowners to make them aware.

Encourage Bird Habitat Enhancement

Riparian corridor enhancements that further support bird diversity and abundance are recommended in conjunction with Johnson and Louisa County Conservation Board staff and Iowa DNR. Additional habitat management and development on and off river in the riparian corridor are recommended.

VISITOR INTERPRETATION RECOMMENDATIONS

Create an Interpretative Plan for Johnson County

A professionally prepared interpretive plan is recommended for the Johnson County portion of the river. Johnson County advocates have identified the Millennial generation as critical to the long term interests of the river. An interpretation plan that harnesses current social media technology to engage Millennials is recommended.

Create an Interpretative Plan for Louisa County

A professionally prepared interpretive plan is recommended for the Louisa County portion of the river including the Odessa Wetland Complex. The complexity and richness of the resources present provide a unique opportunity to interpret culture, history and natural resources. Interpretation across a variety of media types and visitor ages is recommended to engage users.

CONSERVATION AND PROTECTION PERMITTING CONSIDERATIONS

Construction for streambank restoration or other activity near the edge of the Iowa River could require a Phase I archaeological investigation unless past disturbance can be verified.

Resource Conservation and Protection Overview

All recommended elements are summarized and organized in Appendix C including the lead entity, partners, location, estimated costs and local prioritization. Resource conservation and protection project elements are also integrated into this appendix.

PERMITTING CONSIDERATIONS

Some recommended conservation and protection plan elements require earthwork and other disturbance. As with all construction on and near rivers, multiple permits may be required prior to any disturbance. The following are expected:

- Local City (Iowa City, Columbus Junction, Wapello) and County ordinances or policies may require permitting processes for developing on a floodplain
- Joint permit application shared between the DNR flood plain development program, the DNR sovereign lands program, and the U.S. Army Corps of Engineers

Additional investigations and permits will likely be required in some locations. These requirements are related to the sensitive nature of the known and not-yet identified cultural resource sites. These restrictions can affect vegetation removal, revegetation techniques and earthwork.

POTENTIAL PARTNERS, FUNDING SOURCES AND LOCAL RESOURCES

Funding and development of each plan element is the responsibility of the lead jurisdiction shown in Appendix C with oversight from the water trail managers. A number of local and state partner organizations and agencies are organized and positioned to assist with development of individual plan elements. Examples of partners include:

- Non-profit and volunteer organizations such as Iowa City Parks and Recreation Foundation, Tri-Rivers Conservation Foundation, Iowa Natural Heritage Foundation, Iowa Prairie Network, Preservation Iowa, Iowa Ornithologists' Union and Iowa Archaeological Society
- Local and State Agencies including Johnson and Louisa County Soil and Water Conservation Districts, Iowa Department of Transportation, Iowa Office of State Archaeologist, State Historic Preservation Office, Iowa Department of Cultural Affairs, Iowa Department of Natural Resources, Iowa Economic Development Authority

Likely funding partners to supplement local funds include federal and state agencies and grant programs such as Resource Enhancement and Protection (REAP), State Water Trail grants, state and federal recreational trails program funding, regional Transportation Enhancements Program funding, statewide Transportation Enhancements Program funding, the Land and Water Conservation Fund, Wildlife Conservation and Appreciation funds from U.S. Fish and Wildlife Service.

REFERENCES

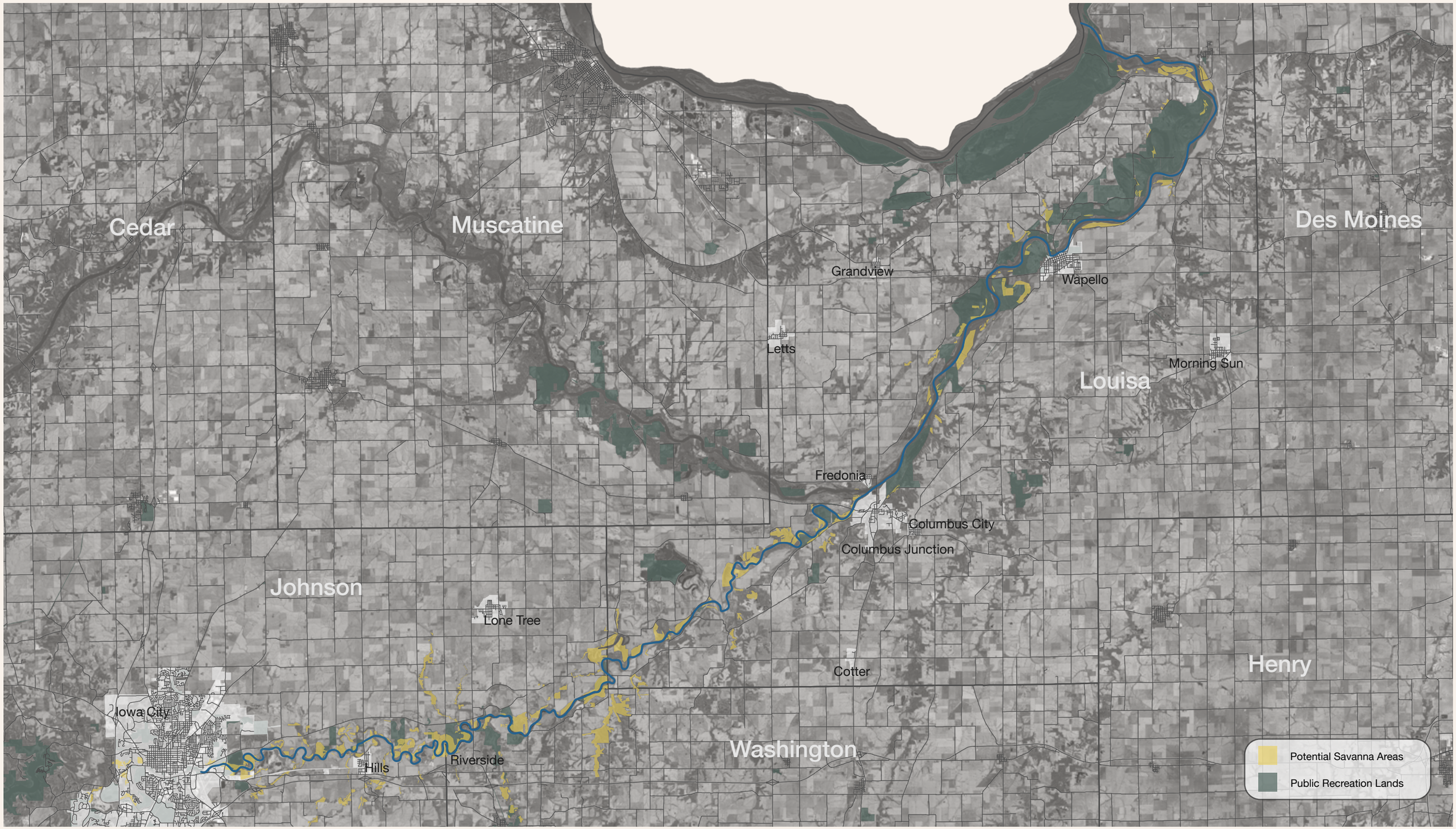
Anderson, M. L. (2014), Phase IA Cultural Resource Reconnaissance of the Iowa River and Lake Odessa Water Trails Corridor Through Portions of Johnson, Louisa and Washington Counties, Iowa. Office of State Archaeologist, University of Iowa, Iowa City.

Iowa DNR (Department of Natural Resources) Bureau of Forestry and Iowa Natural Resources Conservation Service (2007). 2007 Iowa Woodland Suitability Composite. Des Moines: Iowa DNR.

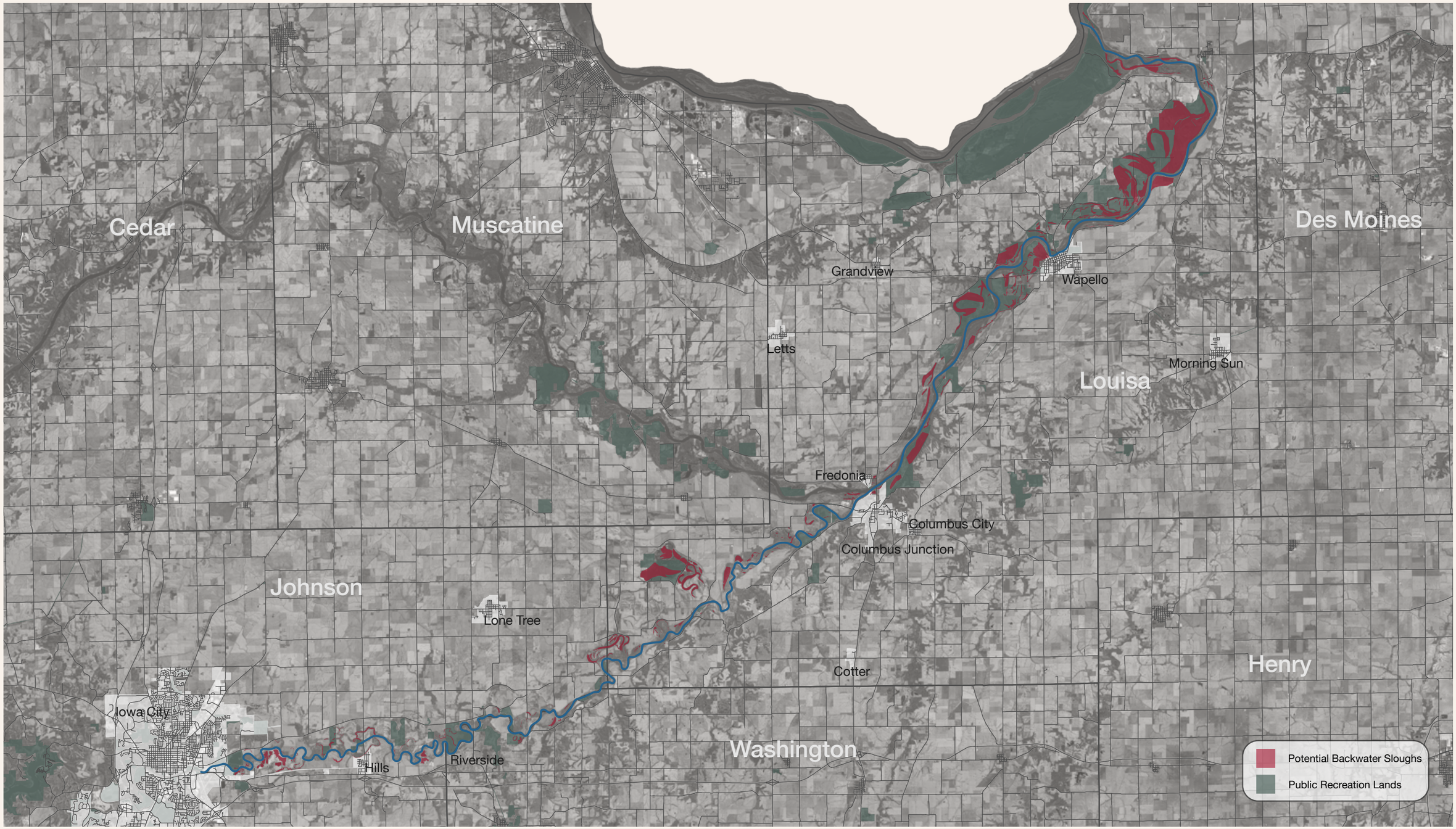
Wagner, M., & Hoogeveen, N. (2010). Iowa Water Trails: Connecting People with Water and Resources. Des Moines, IA: Iowa DNR.

USDA Natural Resources Conservation Service Conservation Practice Standard 391, Riparian Forest Buffer (USDA NRCS 2014).

APPENDIX A. Potential Savanna Restoration



APPENDIX B. River-Edge Forest Land & Backwater Sloughs



APPENDIX C. Conservation and Recreation Prioritization

Category	Recommendation	Lead Jurisdiction	Local Prioritization	Location	Budget Estimate for River-Related Recommendations	Other Collaborators
Water Quality Enhancement	Develop a streambank restoration awareness campaign to discourage use of rip rap & broken concrete reinforcement	Johnson CCB	2	Corridorwide		Iowa DNR
	Establish a low impact streambank restoration demonstration on a highly visible segment of the river	Johnson CCB	2	Napoleon Park to Hills Access		City of Iowa City
	Encourage additional volunteer water quality monitoring on Iowa River and its tributaries	Johnson CCB	1	Watershed in Johnson, Louisa counties		
	Coordinate with the local Soil & Water Conservation District to establish a continuous perennial vegetation buffer on the Iowa River and its tributaries	Louisa CCB	2			
		Johnson County Conservation Board, Louisa County Conservation Board	1	Corridorwide		
	Monitor known landfill sites	City of Iowa City	3	Iowa City		
Cultural Resource Protection	Encourage National Register of Historic Preservation (NRHP) designation for eligible rural sites near the river.	Johnson County Conservation Board, Louisa County Conservation Board	1	Corridorwide		
Habitat Enhancement	Pursue habitat enhancement for mussel species, turtles and amphibians	Johnson County Conservation Board, Louisa County Conservation Board	1	Corridorwide		
	Promote additional in-stream fish habitat improvements	Johnson County Conservation Board, Louisa County Conservation Board	2	Corridorwide		
	Reach out to Iowa River-edge landowners with forested land and backwater sloughs to encourage voluntary permanent protection through easement, with special emphasis on high value savanna habitat for amphibians and reptiles	Johnson County Conservation Board, Louisa County Conservation Board	2	Corridorwide		Johnson & Louisa Soil & Water Conservation Districts
	Continue monitoring Asian carp presence	USFWS	1	Corridorwide		Iowa DNR, state universities
	Coordinate with landowners to modify or remove barriers to fish migration/passage on tributaries to the Iowa River	Johnson CCB	1	Corridorwide		Iowa DNR fish biologists
		Louisa CCB	3	Corridorwide		
	Encourage bird habitat enhancement in river corridor to attract additional species	Johnson CCB	2	Corridorwide		
		Louisa CCB	1	Corridorwide		
Visitor Interpretation	Create an Interpretative Plan particularly geared toward Millennials	Johnson CCB	2	Johnson County		Iowa DNR River Programs
	Create an Interpretative Plan based on significant cultural and historic resources present	Louisa CCB	1	Louisa County		Iowa DNR River Programs

Map Code	Recommendation	Lead Jurisdiction	Local Prioritization	Location	Budget Estimate for River-Related Recommendations	Other Collaborators
R1.A	On-Water Rescue Capacity	Johnson & Louisa County Conservation Boards	1	Corridorwide		Van Buren & Wapello County Sheriffs Offices
R1.B	Communication to Users	Johnson & Louisa County Conservation Boards	1	Corridorwide		Iowa DNR
R1.C	Enhanced Communication Among Water Trail Access Managers	Iowa DNR River Programs	1	Corridorwide		Johnson & Louisa County Conservation Boards
R2.A	Extend water trail upstream of Burlington Street Dam	City of Iowa City	3	Iowa City and upstream		Johnson County Conservation
R2.B	Address social equity issues in access to river	City of Iowa City	1	Iowa City		
R2.C	New universal design access & parking	City of Iowa City	2	Riverfront Crossing Park	$252,304	
R2.D	New universal design access & parking	City of Iowa City	1	near Napoleon Park	$211,732	
R2.E	Develop fishing access points	City of Iowa City	2	TBD		
R2.F	Develop dip-in connections for land trail to explore the river edge	City of Iowa City	3	TBD		
R3.A	Develop peddle-paddle opportunities	City of Iowa City, Johnson County Conservation Board	1	Iowa City to Hills Access		
R3.B	Continue supporting extension and completion of planned regional land trails	City of Iowa City, Johnson County Conservation Board	1	Johnson County		
R3.C	Develop water trail loop into Pechman Creek Delta	Johnson County Conservation Board	1	Pechman Creek Delta		
R3.D	Develop land trail rest stop with water at Pechman Creek Delta	Johnson County Conservation Board	1	Pechman Creek Delta		
R3.E	Develop a paddle-in campsite on the water trail	Johnson County Conservation Board	2	Johnson County		
R3.F	Develop water trail loop into Johnson County portion of Buttermilk Falls slough site	Johnson County Conservation Board	1	Adjacent to Tri-County Bridge Road		Louisa County Conservation Board
R4.A	Develop water trail loop into Louisa County portion of Buttermilk Falls slough site	Louisa County Conservation Board	3	Adjacent to Tri-County Bridge Road		Johnson County Conservation Board
R4.B	New motorboat access	Louisa County Conservation Board	2	Midway between River Junction and River Forks accesses	$19,161	Johnson County Conservation Board
R4.C	New motorboat access and parking at Toddtown site	Columbus Junction	1	Columbus Junction	$105,166	
R4.D	New carrydown access & expanded parking	City of Wapello	2	Fred T. Schwob Access	$24,097	
R4.E	New land trail adjacent to Iowa River connecting downtown Wapello and Fred T. Schwob Access	City of Wapello	1	Wapello		
R4.F	New replacement access for Cappy Russell	Louisa County Conservation Board	1	near Oakville	$104,315	Willing landowner, Louisa County Engineer, USGS
R4.G	Plan and develop local capacity for new equestrian trail	Louisa County Conservation Board	3	Between Wapello and County Road 99		Local equestrian group, willing landowners, USF&W