



# LOWER DES MOINES WATER TRAIL PLAN

VAN BUREN COUNTY • IOWA 2017



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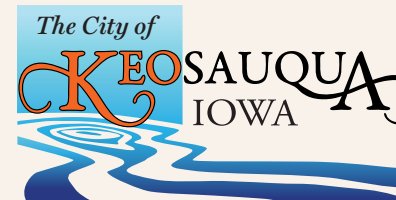
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August 7, 2018

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,

A handwritten signature in blue ink, appearing to read 'Bruce Trautman', is written over a faint circular stamp or watermark.

Bruce Trautman  
Acting Director  
Iowa Department of Natural Resources







# CHAPTER 1 EXISTING CONDITIONS

LOWER DES MOINES WATER TRAIL



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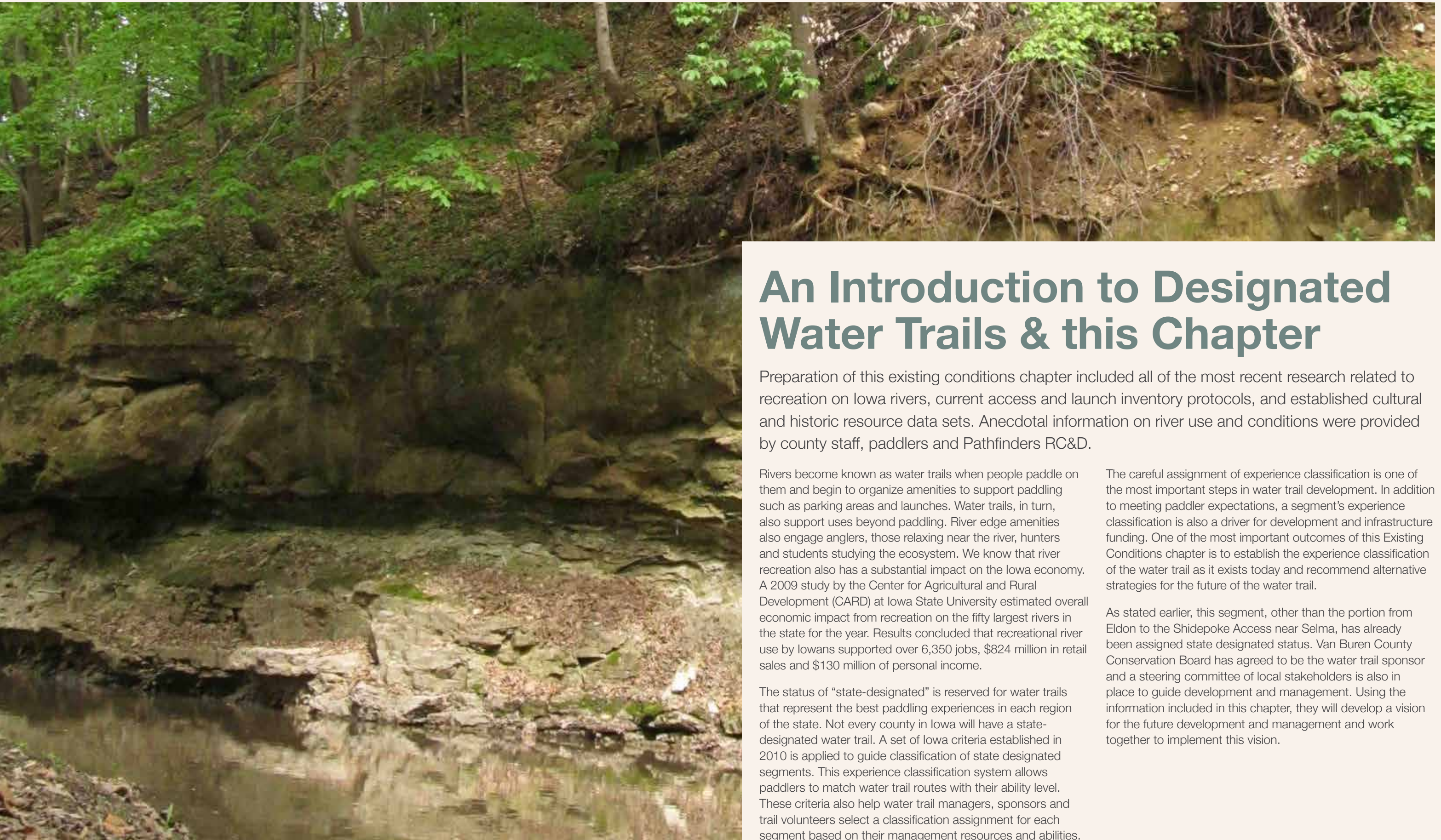


# CHAPTER 1 EXISTING CONDITIONS

**The Des Moines River in Van Buren County was designated a State Water Trail by the Iowa Department of Natural Resources (DNR) River Programs in 2007 at the outset of the state program for water trails.**

This reach of the river had been enjoyed by local paddlers long before state designation. The scope of this project also includes a 4.7 mile undesignated stretch of the Des Moines River between Eldon and Shidepoke. The river from Eldon to Farmington has great potential to connect multiple outdoor recreation groups, tourists, as well as the surrounding communities with multiple indoor and outdoor recreational and educational experiences and opportunities that will directly benefit the local economy. An unprecedented amount of culture and history exist along this particular waterway, offering the opportunity for local promoters to market this particular water trail as a destination water trail.





## An Introduction to Designated Water Trails & this Chapter

Preparation of this existing conditions chapter included all of the most recent research related to recreation on Iowa rivers, current access and launch inventory protocols, and established cultural and historic resource data sets. Anecdotal information on river use and conditions were provided by county staff, paddlers and Pathfinders RC&D.

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.

As stated earlier, this segment, other than the portion from Eldon to the Shidepoke Access near Selma, has already been assigned state designated status. Van Buren County Conservation Board has agreed to be the water trail sponsor and a steering committee of local stakeholders is also in place to guide development and management. Using the information included in this chapter, they will develop a vision for the future development and management and work together to implement this vision.



# The River Itself

The Des Moines River in Wapello and Van Buren counties is classified as a “meandered” stream. The entire Des Moines River was classified as such in original public land surveys completed before Iowa received statehood. Meandered status generally allows river users access on-foot to channel bottoms and stream banks up to the ordinary high water mark. Alternatively, the stream bed and banks of rivers classified as “non-meandered” are considered part of the adjacent property. River users on these “non-meandered” segments may have only the right to float on the water surface, depending on ownership. The Des Moines River is a tributary of the Mississippi River beginning in southwestern Minnesota and joining the Mississippi at Keokuk, Iowa.

The study area includes the state designated water trail portion of the Des Moines River from Selma to Farmington in Van Buren County as well as an additional segment between Eldon and Selma. This additional segment travels through Davis and Wapello counties. The total study route is 44 river miles in length (Figure 1). The watershed area draining into the Des Moines River in these three counties is 14,206 miles.

The river is used for canoeing, kayaking, motorized boating, swimming, fishing, hunting and tubing. Hawkeye Canoe Rental offers canoe/kayak rental as well shuttle service but it is not clear whether the business is presently operating. Villages of Van Buren, the local tourism organization used to organize an annual paddling event called Canoe Van Buren. This successful weekend event drew more than 100 paddlers from across the state each year. All the towns along the river participated as hosts, literally rolling out red carpet at each access and assisting with carrying participants’ canoes up and down the access ramps. Unfortunately, the event had

to be canceled in 2009 and 2010 due to high water levels, which led to the cancellation of the event altogether. The Villages of Van Buren stated that a lot of time and money were spent each year in preparation, planning and marketing the event making it hard to justify doing it another year.

According to the 2009 Iowa Rivers and River Corridors Recreation Survey (Iowa State University 2009) the Lower Des Moines River is the most heavily used river in the immediate area (Table 1). The segment of the river included in this study, however, had 22% fewer trips reported in 2009 compared to the immediately upstream segment. The most popular activities were fishing, relaxing/picnicking, wildlife watching, and surface trail recreation. Kayak or canoe use reported on southeast Iowa rivers were generally quite low relative to other parts of the state. Reported use of boats with motors were proportionately higher in this part of the state, likely due to the greater relative volume of water in rivers in this region of the state.

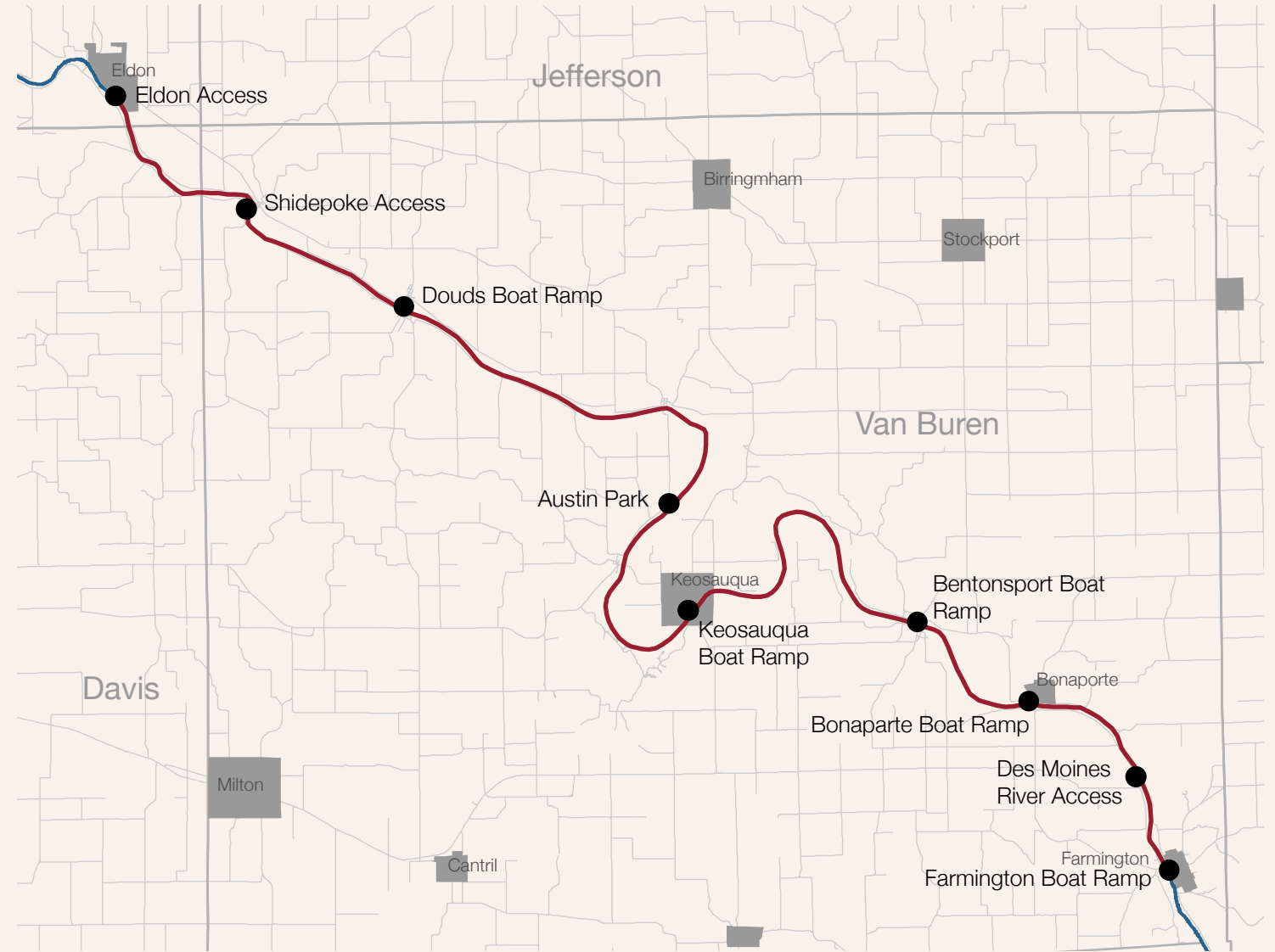


Figure 1  
River accesses on the Lower Des Moines River Water Trail.

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
Lower Des Moines R. (25): Hickory Ridge Access to Black Hawk River Access	597	38.5%	12.6%	19.8%	3.5%	23.1%	53.1%	24.5%	59.6%	44.4%
Lower Des Moines R. (26): Black Hawk River Access to Mississippi River	463	48.8%	3.2%	15.3%	4.3%	11.4%	32.2%	19.9%	48.2%	46.9%
Chariton (20): Entire Length	112	43.8%	10.7%	10.7%	1.8%	22.3%	44.6%	16.1%	37.5%	30.4%
Skunk R.: From North Skunk River to Mississippi River (43)	316	63.9%	7.0%	42.7%	19.3%	14.2%	26.9%	31.6%	54.1%	38.6%
Big Cedar Creek (44): Entire Length	55	9.1%	45.5%	3.6%	7.3%	0.0%	12.7%	0.0%	20.0%	50.9%

Table 1  
Recreational Use Reported on Southwest Iowa Rivers\*  
Cells highlighted in yellow denotes the study area  
\*Source: Iowa Rivers and River Corridors Recreation Survey 2009 (Iowa State University)



# WATER TRAIL EXISTING CONDITIONS

Upstream of Austin Park, the Des Moines River's gradient averages less than 2 feet per mile in the study reach, resulting in a relatively slow river at average flows. The river bottom tends to be sandy. From Austin Park to Farmington, the river moves into a bedrock-controlled valley and the gradient increases to 2.5 feet per mile. The channel bottom materials are more diverse in this area, ranging from sandy to rocky riffles and one rapids at Bonaparte. Turbid water at high flows lead to launch surfaces become clogged with silt and other debris requiring clearing. Water levels fluctuate greatly not just because of precipitation, but also because flows are controlled by the U.S. Army Corps of Engineers at the Red Rock Dam whose primary purpose is flood control, not downstream recreation. This should be considered a factor in planning for the viability of some on-water recreation activities and for user expectations. Several types of minor hazards exist in the study reach. The remnants of two old dams occur just downstream of the Keosauqua and the Bonaparte accesses. Although it is not beginner friendly, the more significant rapids at Bonaparte are fairly low-risk class I. No hazard warning signage exists at either location, and may not be needed. Some fallen trees and large debris exist along the banks, but none of the logjams

observed during a reconnaissance float of the entire study area blocked more than 30% of the channel. During high water the river carries debris, some of which is not visible. In extremely low water conditions (below 1,200 cubic feet per second on the USGS gauge at Keosauqua) paddlers must allow extra time and need to navigate the best path or pull boats across the exposed river bottom. Experienced paddlers perceive these hazards as easily-avoidable due to the width of the river. However, 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 could result in an unpleasant experience.

Asian carp (silver carp, big head carp) are present in this reach and have been known to jump out of the water when startled by boats. Stakeholders reported injuries in the region resulting from impact between boaters and silver carp.

The 44-mile study segment is divided by river access points into eight segments (Table 2). With the proposed addition, the water trail begins at Eldon, and passes through the towns of Keosauqua, Bentonsport, and Bonaparte before ending at Farmington.

Segment	Segment Distance	Hazards				Paddling Use Volume*	Beginner Friendly
		Dams	Logjams > 30%	Rapids	Streamwide Fences		
Eldon Access to Shidepoke Access	4.7	0	0	0	0	Light	Yes
Shidepoke Access to Douds Boat Ramp	4.6	0	0	0	0	Moderate	Yes
Douds Boat Ramp to Austin Park	10.0	0	0	0	0	Moderate	No, due to length
Austin Park to Keosauqua Boat Ramp	5.8	0	0	0	0	High-moderate	Yes
Keosauqua Boat Ramp to Bentonsport Boat Ramp	8.7	0	0	1	0	High-moderate	Sometimes at higher flows
Bentonsport Boat Ramp to Bonaparte Boat Ramp	3.6	0	0	0	0	High-moderate	Yes
Bonaparte Boat Ramp to Des Moines River Access	3.5	0	0	1	0	Light	No because of the rapids
Des Moines River Access to Farmington Boat Ramp	2.3	0	0	0	0	Moderate	Yes

Table 2  
Lower Des Moines River Water Trail Segments, Van Buren and Wapello Counties  
\*Use volume estimates are relative only to other segments and were generated by anecdotal observations



# WATER TRAIL ACCESS POINTS

There is one public access on the Des Moines River in Wapello County and eight in Van Buren County (Table 3). While there are other public lands adjacent to the river in Van Buren County, they do not have accesses.

Van Buren County Conservation Board owns three accesses (Douds, Austin Park, and Bentonsport Boat Ramp), but manages five—the three they own and the two owned by the DNR (Shidepoke and the Des Moines River Access). The towns of Eldon, Keosauqua, Bonaparte, and Farmington each own and manage their own accesses on the river.

Of the nine accesses on the water trail, the accesses at Bonaparte and Austin Park seem to get damaged the most by high water events and ice jams. Van Buren County Conservation Board manages not just the access but the entire six-acre park that once included 15 modern campsites with electricity, drinking water, pit toilets, and other amenities. Because of the frequent damage from high water events and ice outs, the campground is currently managed for primitive camping only.

Other floodplain campgrounds in Iowa have faced similar issues, and their managers' experience should be considered prior to investing further in flood resistant amenities should Austin Park receive greater attention in the water trail plan.

All the launches get silted-in from high water. All land managers indicated that boat ramps are cleared of silt and debris as soon as possible after high water events. Parking lots and access roads are rocked and graded as needed. Mowing is done regularly.

Wayfinding signage on roadways is in the process of being installed by the Van Buren County Engineers office. All accesses, except for Eldon, have current state water trail signage in place. Most bridges have signs on both the upstream and downstream sides with the river distance to the next access indicated. The downstream bridge signs were installed for the benefit of motor boat operators. These signs do not meet current state water trail guidelines because guidelines weren't in place at the time they were produced. Replacing them with signs that meet current guidelines isn't required, but local stakeholders voiced a desire to replace them. A formal agreement that identifies the entities responsible for the maintenance of the signage and accesses, as well as the frequency in which they're inspected and maintained, will be established in 2015.

Facility Where Access is Located	Access ID	Access Owner	Access Manager	Launch Type	Streambank Height
Eldon Access	77	City of Eldon	City of Eldon	Motorized boat ramp	25
Shidepoke Access	72	Iowa DNR	Van Buren CCB	Motorized boat ramp	17
Douds Boat Ramp	67	Van Buren County	Van Buren CCB	Motorized boat ramp	25
Austin Park	57	Van Buren CCB	Van Buren CCB	Motorized boat ramp	15
Keosauqua Boat Ramp	51	City of Keosauqua	City of Keosauqua	Motorized boat ramp	15
Bentonsport Boat Ramp	42	Van Buren CCB	Van Buren CCB	Motorized boat ramp	15
Bonaparte Boat Ramp	38	City of Bonaparte	City of Bonaparte	Motorized boat ramp	15
Des Moines River Access	34	Iowa DNR	Van Buren CCB	Motorized boat ramp	12
Farmington Boat Ramp	32	City of Farmington	City of Farmington	Motorized boat ramp	15

Table 3  
Water Trail Access Ownership and Basic Characteristics



# RED ROCK DAM WATER MANAGEMENT

Water levels in the study segment are artificially controlled by a dam located 68 miles upstream (Lake Red Rock, 2014). The Red Rock Dam and reservoir were constructed from 1960 to 1969 to minimize the impacts of both flooding and extreme drought. The initial cost of the Red Rock Dam and reservoir was \$88,838,600; the estimated damages prevented by it through 2014 have been \$616,975,000 (Perry Thostenson, personal communication June 2015). The U.S. Army Corps of Engineers (USACE) operates the facility in coordination with local and state agencies with water resource responsibilities. Additional objectives include fish and wildlife management and recreation primarily for the lake upstream. Reservoir water volumes typically range from 189,000 acre-feet at normal pool to a maximum of 1,436,000 acre-feet.

The USACE hydrologist use stream flow to anticipate inflows to the lake and make adjustments to release rates to minimize both upstream and downstream flooding; as well as using data provided by NWS for weather analysis, flood, and drought forecasts. Water inflow and release rates typically match in non-flood conditions. 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. In addition, construction for a 36.4-megawatt electricity generating facility began in the fall of 2014, scheduled for completion in 2018. The facility is large enough to supply electrical needs for 18,000 homes. In any case, there is a need for increased communication with the Red Rock Dam managers as Lower Des Moines River water trail management is more fully realized. At minimum, this could result in better communication to users to describe conditions. More fully realized, it could mean negotiation for recreational releases during river events, on summer weekends, or timing of releases on a daily basis. The USACE may revisit the regulation manuals for Red Rock, Saylorville, and Coralville Reservoirs to make these adjustments, as well as working with the Nature Conservancy on the Sustainable Rivers Program.



Bill Blackburn, Van Buren County Trails Association member, standing in front of ice chunk at Austin Park Campground after 2012 ice out.

# RECREATIONAL CONDITIONS RELATED TO THE WATER TRAIL

The nine accesses vary greatly in the amenities found at each site (Table 4) ranging from no amenities to a full complex of improvements including running water, flush toilets, picnic tables, shelters, and playgrounds. Several have boat docks. Those within cities are located within walking distance from many other points of interests including restaurants and shopping.

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.

Facility Where Access is Located	Water Trail Access ID	Restrooms	Other Amenities at or Near Launch	Distance from river to drinking water (ft.)	Camping	Other Points of Interest near Access
Eldon Access	77	No	Dock, Rigging Area		No	
Shidepoke Access	72	No	No Amenities		No	
Douds Boat Ramp	67	No	No Amenities		No	
Austin Park	57	No	Tables, Shelter Playground		Primitive	
Keosauqua Boat Ramp	51	No	Dock, Tables, Benches, Shelter		No	Public restroom, lodging, food & playground within three blocks
Bentonsport Boat Ramp	42	Yes	Vault Toilet		Within 0.25 miles & sometimes accessible directly from the river	Food, shopping, lodging, shelter, pedestrian bridge within three blocks
Bonaparte Boat Ramp	38	Yes	Flush toilet, Tables, Benches, Water, Dock	600	No	Rose garden, restaurant within three blocks
Des Moines River Access	34	No	No		No	
Farmington Boat Ramp	32	Yes	Vault Toilet (SST), Tables, Shelter		No	Restaurant & convenience store within three blocks

Table 4  
Water Trail Access Amenities



Facility Where Access is Located	Distance to Next Access (mi.)	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
Eldon Access (#77)	4.7	11	130	5	Yes	20	45	Recreational
Shidepoke Access (#72)	4.6	10	90	3	Yes	15	75	Recreational
Douds Boat Ramp (#67)	10	8	0	2	Yes	11	75	Recreational
Austin Park (#57)	5.8	7	70	4	Yes	15	80	Recreational
Keosauqua Boat Ramp (#51)	8.7	5	150	4	Yes	18 MB 20 C/K	50	Recreational
Bentonsport Boat Ramp (#42)	3.6	5	60	4	Yes	16	45	Recreational
Bonaparte Boat Ramp (#38)	3.5	4	106	1	Yes	15	75	Recreational
Des Moines River Access (#34)	2.3	5	64	4	Yes	18	50	Recreational
Farmington Boat Ramp (#32)	8.8	7	160	1	Yes	15	75	Recreational

**Table 5**  
*Water Trail Access & Launch Relating to Use and Maintenance. Cells highlighted in yellow indicate conditions where enhancement is desirable. Red highlighted cells indicate conditions do not meet minimum standards required for signage as a water access by Iowa DOT.*

# RIVER MANAGEMENT CONDITIONS ON THE LOWER DES MOINES

All law enforcement activities on the river are considered the jurisdiction of one of the following agencies: the Wapello County Sheriff, Van Buren County Sheriff, Davis County Sheriff or Iowa DNR Conservation officers. In addition, Eldon has a city police department who could be called to an incident at its access. Three DNR officers are assigned responsibility for a portion of the study reach. It's important to note that 92% of the study area is located in Van Buren County with less than 8% of the study area in Wapello and Davis counties.

Eldon Fire & Rescue has specialized equipment and training related to the river. The City of Eldon and Van Buren County Sheriff have boats for rescue. Mutual aid is available from Des Moines County Sheriff, Ottumwa Fire Department and Fairfield Fire Department, all of which have water rescue training and equipment. Van Buren, Wapello and Davis County Emergency Management offices help with coordination between agencies. All law enforcement organizations utilize a county 800 MHz digital communication system. The digital system is used county wide by all public safety responders with the exception of natural resources law enforcement. However,

natural resources law enforcement is currently upgrading to the 800MHz digital communication system and should be operating on the digital frequency by spring of 2015.

Additionally, all six communities with jurisdiction on the river have volunteer fire and rescue departments. Community volunteer departments also have personal boats that could be used for rescue.

There have been few reported incidents related to law enforcement at the accesses and they are not regularly patrolled. Similarly there have been few reported incidents on the river.

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 maintenance of launches and parking areas; 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.

# EXISTING WATER TRAIL EXPERIENCE CLASSIFICATION

All segments of the Lower Des Moines River Water Trail can currently be classified as recreational. This classification is the most common in Iowa. 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. It is also not overly challenging for the average river user.

Appendix C, Water Trail Experience Classification Summary, summarizes key elements from the classification criteria (Developing Water Trails in Iowa 2010).

# SOCIAL CONSIDERATIONS

Communities along the lower Des Moines River have a longer history than most Iowa communities. Some of Iowa's earliest interior enclaves developed as the river allowed for relatively reliable steamboat service here (Haury-Artz, 2014). That history is reflected in unique downtowns with brick and stone buildings now inhabited by restaurants, antique shops, and resident artisans. Some artists' roots are local; others were drawn to set up shop here due to the area's character. The river and associated valley are prominent features in all communities. Some downtowns are more connected to the Des Moines River with city parks or waterfront areas than others. More connected communities include Keosauqua,







## PHYSICAL CONDITIONS ON THE LOWER DES MOINES

Bentonsport, Bonaparte, and Farmington. Less connected would include Douds-Leando, Selma, and Eldon. There may be some potential for improvements to enhance such connections through the water trail efforts.

The water trail sponsor, Van Buren County Conservation Board, supports planning for enhanced conditions on the water trail and for the river generally. The communities with river accesses are supportive of the project but have been minimally involved with the water trail development.

The Villages of Van Buren (VVB), a regional tourism and economic development non-profit organization, supports the local tourism-based economy through marketing of special events, local artisans, businesses, dining, and a diversity of niche lodging opportunities (bed and breakfasts, cabins, a historic hotel, campgrounds, etc.). VVB has organized events that pay tribute to natural and cultural resources, such as Bike Van Buren, the Scenic Drive Festival, and Forest Days. Related to the river, VVB organized and carried out a former annual event, Canoe Van Buren. This event no longer occurs largely due to intensity of managing the event and unreliable flows. VVB has been supportive of the water trail since its inception and will continue to serve an important role in marketing and communication.

The Van Buren County Trails Association initially spearheaded the water trail project, leading to its designation. At that time, volunteers from the organization helped to maintain the accesses and signs. No other groups are working on or advocating for the river.

In listening sessions that led to this report, some landowners expressed concerns about the litter, trespassing and liability issues. However, they were also excited about the opportunities the water trail presented including tourism, economic development and river quality improvements.

The Lower Des Moines in this study area is a wide and open river. The banks are mostly steep, ranging from 12 to 25 feet in height throughout with some exceptional steep bluffs that peak above 100 feet on occasion.

During reconnaissance floats a noticeable shift in the landscape was observed near the midway point between Douds and Austin Park. Upstream of this point the river is mildly scenic with very little relief. The riparian corridor is narrow with sparse trees flanked by gravel roads on each side. Downstream of this point, however, the landscape begins an undulating pattern of hills and valleys that offer scenic views of deeply forested banks and 50 to 100-foot limestone and sandstone bluffs. Smaller bluffs offer bedrock benches that jut out over the river. This pattern continues downstream becoming less dramatic near Bonaparte.

Ten sections of rock outcroppings were mapped during the float of the entire project area; half of these were greater than 150 feet in length. The 5.8 mile segment between Austin Park and Keosauqua contained the largest concentration of rock outcroppings. Fifty-percent of the study area's rock outcroppings were recorded here, with three sections longer than 150 feet. This concentration occurred along Lacey Keosauqua State Park (Figure 3). Ironically, the state park is not connected to recreation on the river due to a lack of access or linkages such as hiking trails from the water.

The two segments between Bonaparte and Farmington offer less dramatic views though some hills and wooded banks are present. Geodes are also found on rock bars, riverbeds, and near the mouths of tributaries flowing into the Des Moines River from Bonaparte and its downstream reaches. Upstream of Bonaparte riverbeds consist of scattered erratic boulders, sand, silt, cobble, and solid bedrock. Floating the river at low levels requires good navigation skills, but allows one to see bedrock bars and glacial erratics that would normally be submerged at higher flows.



Sandstone and limestone bluffs at Lacey Keosauqua State Park.



**Figure 3**  
Limestone ledge along the Lower Des Moines River between Douds and Austin Park offers excellent lunching opportunities during low water conditions.  
\*Photo credit to Gregg Stark



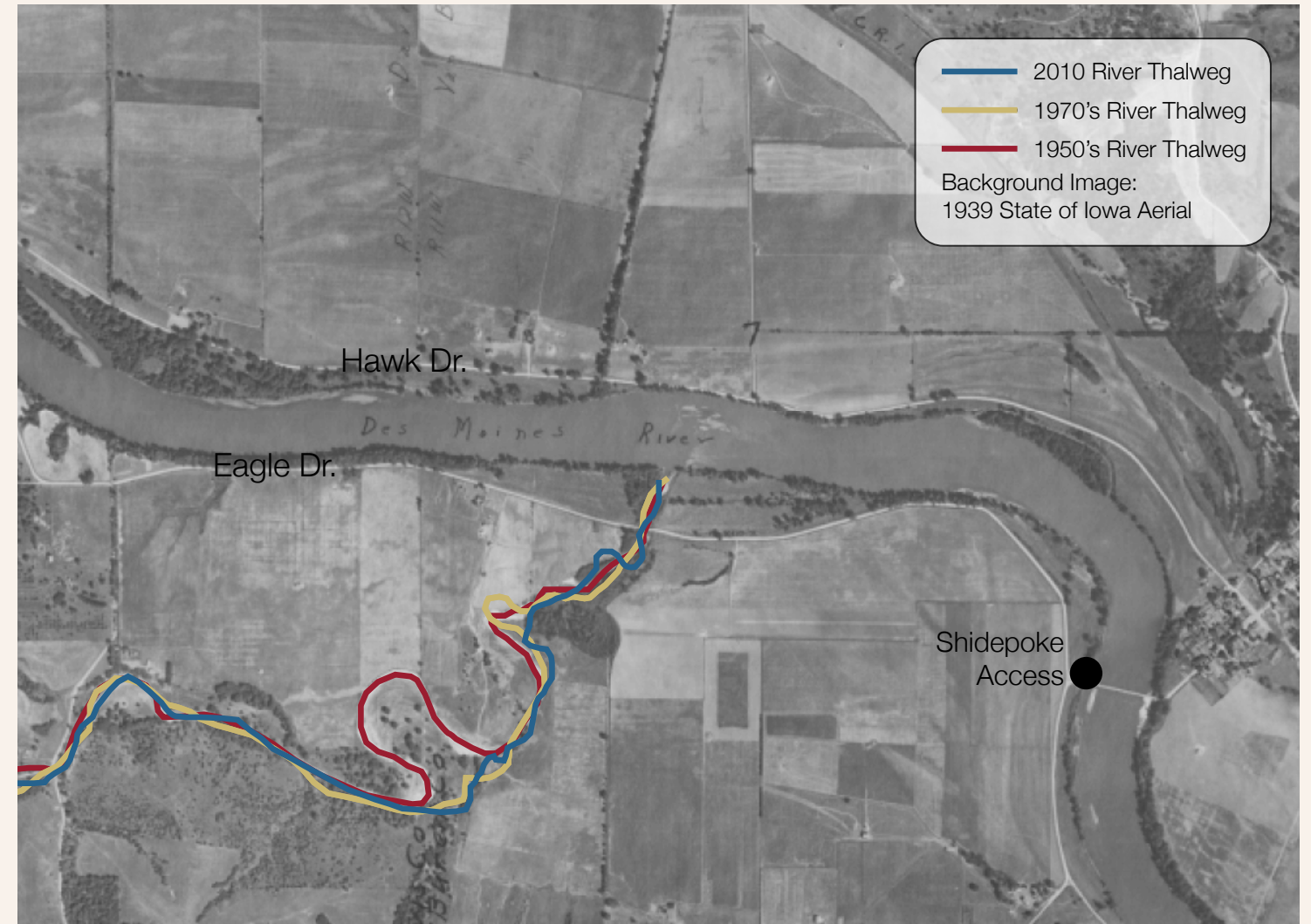
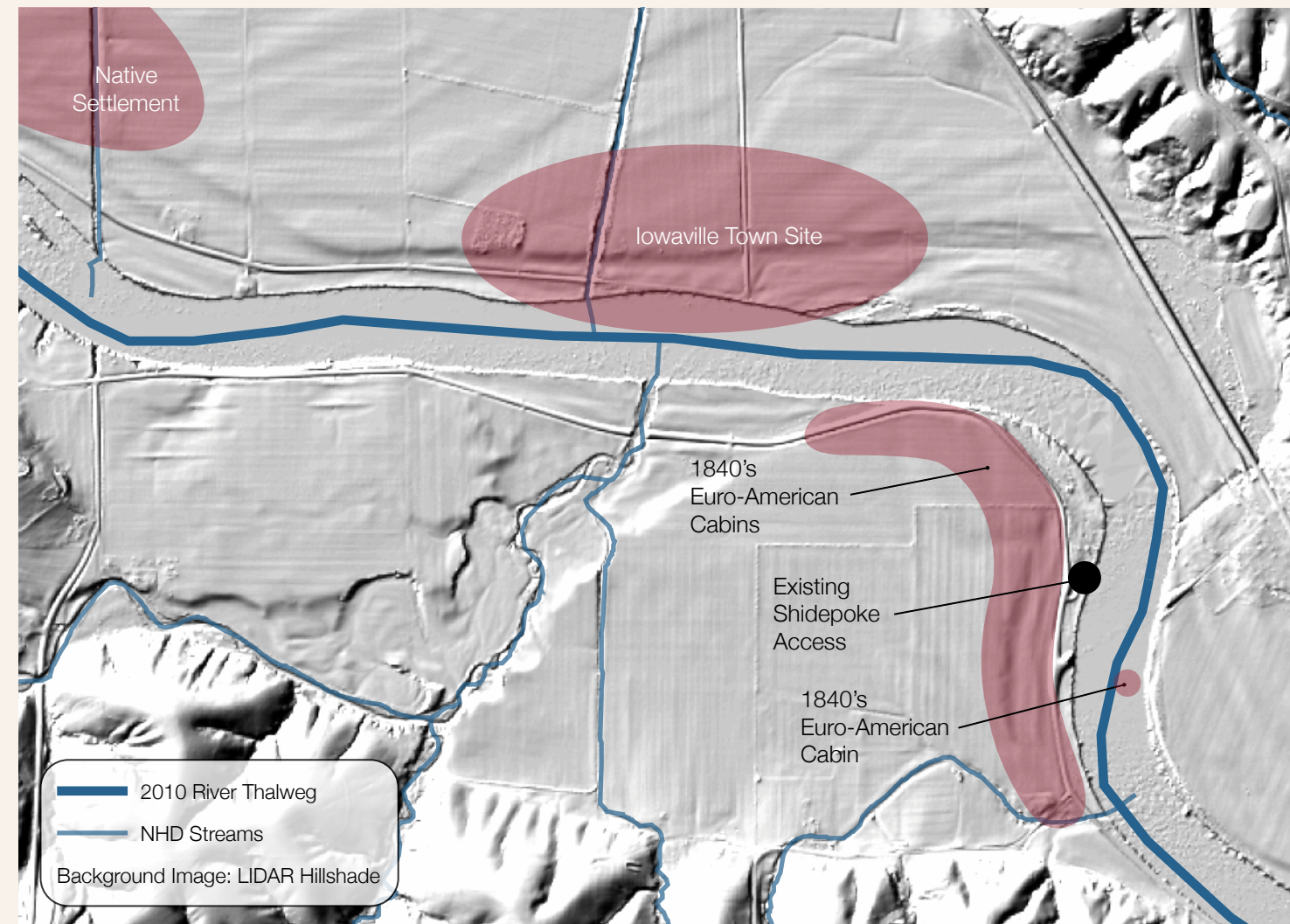
# CHANNEL CONDITIONS

How a river moves over the landscape across time is of interest to landowners, historians, researchers, as well as the general public. 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, 2008). However, important generalizations can be made about

historic channel shifts and the extent of modifications despite this comparison limitation.

The GLO survey data and the 1875 Andreas Atlas for Van Buren and Wapello counties were used to provide context for changes between the mid-1800's and 1939. The GLO mapping survey for Van Buren and Wapello counties was completed between 1835 and 1849 (Anderson, 2008). GLO maps were also compared using aerial photography between 1939 and 2010.

**Figure 2**  
At least one Euro-American cabin location included in the GLO map is now located inside the Des Moines River channel, a result of slight channel migration as well as channel widening.



**Figure 3**  
Vesser Creek displays a channel alignment change pattern common in intensively cultivated floodplains in Iowa. Curving meanders are replaced with much shorter and straighter river segments, increasing water velocities and often resulting in channel downcutting. Background Image 1939 State of Iowa Aerial.

The Lower Des Moines study area has the least amount of measured planform change from the mid-1800's to present of any river that is being studied. The average lateral channel movement on section lines for the Lower Des Moines study area during this time is only 0.01 miles of shift per river segment—the lowest average of any of the 12 rivers studied.

No major changes in channel planform occurred anywhere in the study area between 1980 and 2010 based on a quantitative comparison of aerial photography. The largest lateral movement identified occurred between the mid-1800's GLO survey and the 1875 Andreas Atlas near the present day Shidepoke Access (Figure 2). Both sides of the river were used as cabin sites by mid-1800's Euro-American settlers. The significant pre-historic and historic village site of lowaville is also located near this area. The outside bend of the Des Moines River shifted .07 miles during this time. While this is a relatively small lateral shift, it is the largest found in the entire

study segment. The lateral migration, as well as channel widening in general, displaced at least one former cabin location. Fortunately the channel alignment near the lowaville site has remained relatively constant.

Changes on tributaries to the Des Moines River in this study area are more representative compared to other watersheds, however. The most downstream segment of Vesser Creek, near the unincorporated town of Selma and Shidepoke Access, is representative of many tributaries (Figure 3). The 1930's and 1950's aerial photography depict an irregularly curving planform channel. By the 1970's, a large bend on the river was replaced by a much shorter and straighter section either by human-induced or natural avulsion. Smaller bends were also replaced by shorter, straighter segments after the 1970's. Land recovered by all the channel alignment shifts was replaced with annually cultivated crops.





## STREAMBANK CONDITIONS

Streambanks markedly vary in character as well as height throughout this 44-mile stretch of river. The majority of the streambanks observed while inventorying the segments showed moderate erosion on both sides of the river. Height ranged between 2 feet at the low end to as much as 25 feet at the high end. The streambanks were mostly stable where there were rock outcroppings of limestone or large tracks of forested lands along the river's edges. In some places small shacks or houses were seen very near the edges of the streambanks with minimal protection. Patches of concrete or tires are placed here and there with what appear to be unsuccessful attempts to control erosion. In some areas there is no perennial cover and moderate to extensive erosion is present.

Some of the relative stability of the lower Des Moines River valley can be explained by earlier observations of bedrock containment of the channel and its valley downstream of

Douds. This prevents both lateral migration, and down cutting into the bed. Likely contributors to streambank erosion include a low sediment supply due to interception from the Red Rock Dam, and altered seasonal flow regimes due to flood management effects of the dam. Local factors, such as vegetation disturbance along stream banks or thinning of the riparian corridor, also likely contribute.

While the Lower Des Moines River Water Trail study area has high, eroding streambanks at some locations, the lack of change in river channel planform and sinuosity in the past 30 years suggest that flow conditions as a result of the Red Rock dam are not incredibly destabilizing to the streambanks. Both channel length and sinuosity in the study area have changed almost imperceptibly between 1980 and 2010. The length of the river channel as measured by its thalweg was slightly shorter in 2010 compared with 1980, a total of 0.17 miles (Table 6) while sinuosity is unchanged.

Table 6

River Channel Calculations for Lower Des Moines River in Wapello and Van Buren Counties.

Segment	Straight Line Length (mi.)	1980 Length (mi.)	2010 Length (mi.)	% change in length between 1980 – 2010	1980 Sinuosity	2010 Sinuosity
Eldon to Shidepoke	4.13	4.85	4.83	0%	1.2	1.2
Shidepoke to Douds	4.40	4.58	4.60	0%	1.0	1.0
Douds to Austin	9.70	10.22	10.17	0%	1.1	1.0
Austin to Keosauqua	5.16	5.96	5.94	0%	1.2	1.2
Keosauqua to Bentonsport	8.13	8.92	8.90	0%	1.1	1.1
Bentonsport to Bonaparte	3.50	3.67	3.67	0%	1.0	1.0
Bonaparte to Des Moines	3.36	3.43	3.43	0%	1.0	1.0
Des Moines to Farmington	2.34	2.43	2.42	0%	1.0	1.0

## 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 landcover. Landcover 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 landcover such as trees, shrubs and native grasses are more beneficial for all ecosystem services compared to development or annual row crop landcover. Row crop activity at the top of tall and steep streambanks, such as those on the Des Moines River, cause

further instability in streambank soils and often exacerbate eroding streambank conditions. This is due both to the nature of annual vegetation root systems as well as heavy farm machinery driving on streambank edges.

A riparian area is often referred to as a “buffer” when perennial landcover 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,

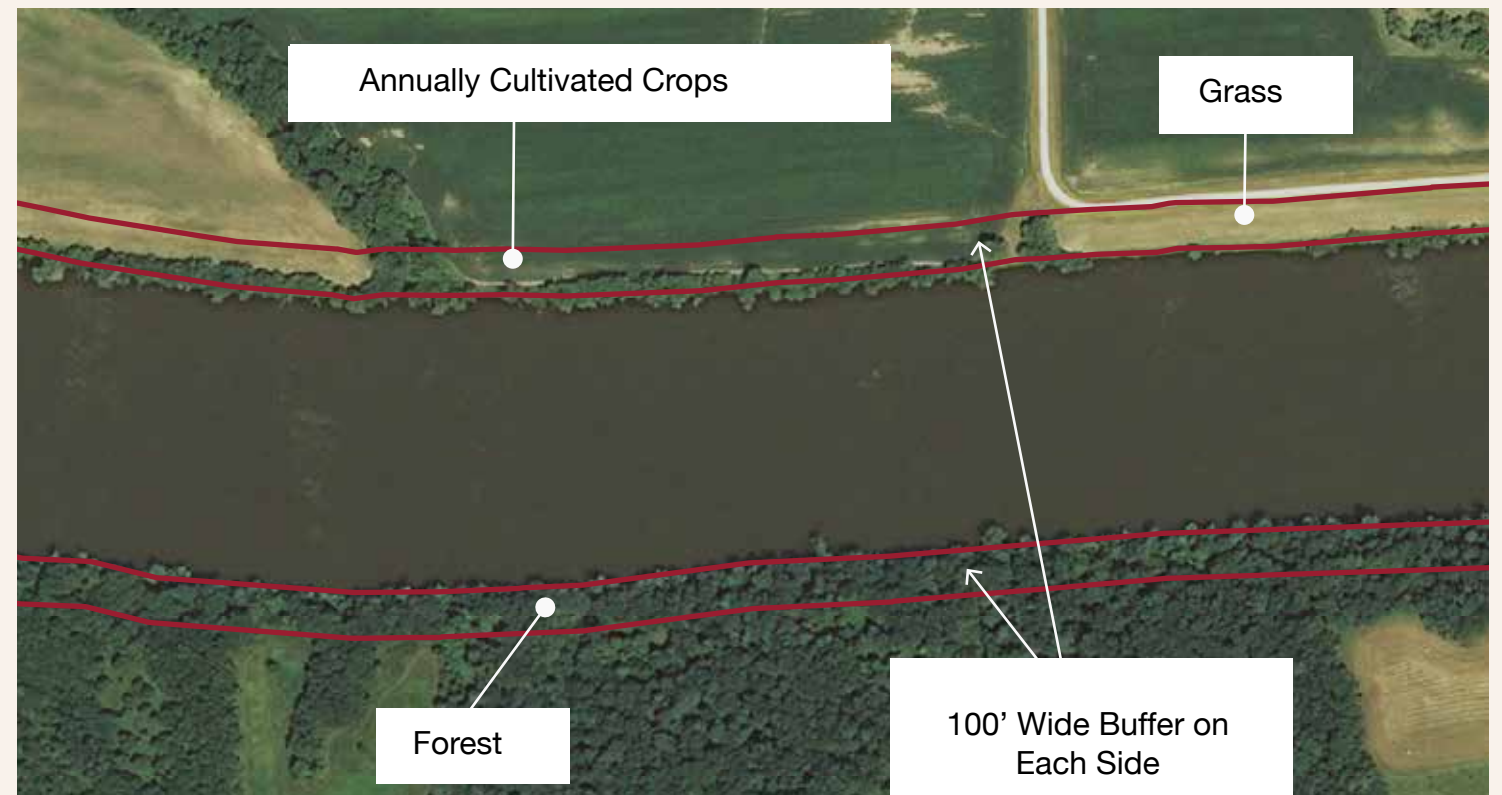


Figure 4

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 87% of the acres included in this 100’ buffer on all water trail segments.





2008). Existing riparian buffer conditions on this section of the Des Moines River are variable. Of the riparian area that does not include roadways, more is perennial vegetation - appropriate for buffering - rather than annually cultivated crops. However, of the 12 corridors studied in 2014 for potential water trail designation, this section of the Des Moines was among those with the highest percentages of both annually cultivated crop landcover and roadways in the riparian area.

Riparian areas within 100' of the top of streambanks on both sides of the Des Moines River were evaluated using landcover data from the 2013 cropping year to better understand the presence or absence of beneficial riparian buffer vegetation (Figure 4). The water trail corridor was divided into segments based on river access points. Landcover in each of the eight 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 landcover type were calculated by

segment and the total acres of each are shown in Table 7.

All eight segments contain at least 80% perennial landcover and one short segment, from the Des Moines River Access to the Farmington Access, has 97% perennial cover. Of all the water trail segments, the Douds Access to Austin Park segment includes the highest percentage of annually cultivated crops within the buffer area, with 19%.

Looking at the water trail corridor as an entire unit, 28% of the riparian area includes roads or developed areas ("Other" landcover category) (Figure 5). This percentage is the highest of all 12 areas studied. Roads are often located on one or both sides of the river at least partially within the 100' distance from the top of the streambank. Urban development in Eldon, Keosauqua, Bonaparte and Farmington also contribute to this high percentage of non-buffering landcover. Excluding the "Other" category, 87% of the total acres in the 100' buffer are perennial landcover while 13% are annually-cultivated crops.



	Eldon Ramp to Shidepoke Access	Shidepoke Access to Douds Access	Douds Access to Austin Park	Austin Park to Keosauqua Ramp	Keosauqua Ramp to Bentonsport Park	Bentonsport Park to Bonaparte Ramp	Bonaparte Ramp to Des Moines River Access	Des Moines River Access to Farmington Access
Annually Cultivated Crops	20.47 (17%)	17.21 (16%)	47.06 (19%)	20.01 (14%)	27.85 (13%)	7.57 (9%)	2.17 (6%)	1.63 (3%)
Perennial Grass & Alfalfa	27.04 (23%)	8.98 (8%)	7.20 (3%)	5.66 (4%)	6.21 (3%)	2.49 (3%)	1.39 (2%)	2.03 (3%)
Forest	28.61 (24%)	27.08 (25%)	149.02 (60%)	81.60 (58%)	110.20 (52%)	57.90 (66%)	13.13 (16%)	50.83 (78%)
Wetland	20.89 (18%)	1.85 (2%)	4.10 (2%)	10.33 (7%)	19.80 (9%)	5.94 (7%)	2.39 (3%)	.70 (1%)
Other	20.09 (17%)	53.93 (49%)	41.34 (17%)	24.13 (17%)	47.32 (22%)	14.03 (16%)	64.41 (77%)	9.76 (15%)
Totals	117.11 (100%)	109.04 (100%)	248.72 (100%)	141.73 (100%)	211.38 (100%)	87.94 (100%)	83.49 (100%)	64.94 (100%)

Table 7

The Douds Access to Austin Park segment had both the highest number of acres of riparian area of any water trail segment as well as the highest percentage of annually cultivated crops in the buffer area. 2013 Crop year acres for each landcover type are shown below as well the total percent of each type within a water trail segment.

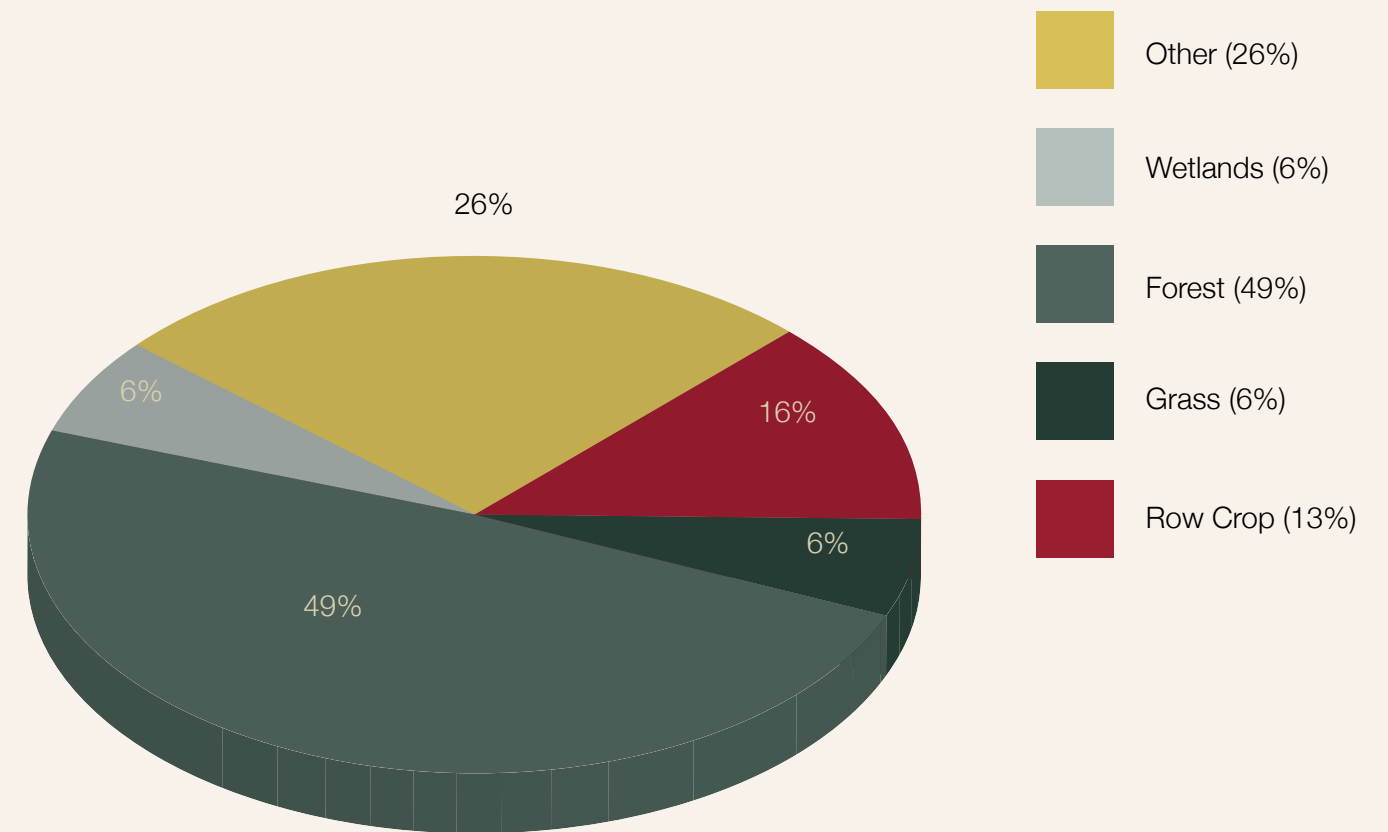


Figure 5

Eighty-percent of the stream edge acres along the water trail include perennial landcover which is helpful for soil stabilization, wildlife habitat and views from the water.

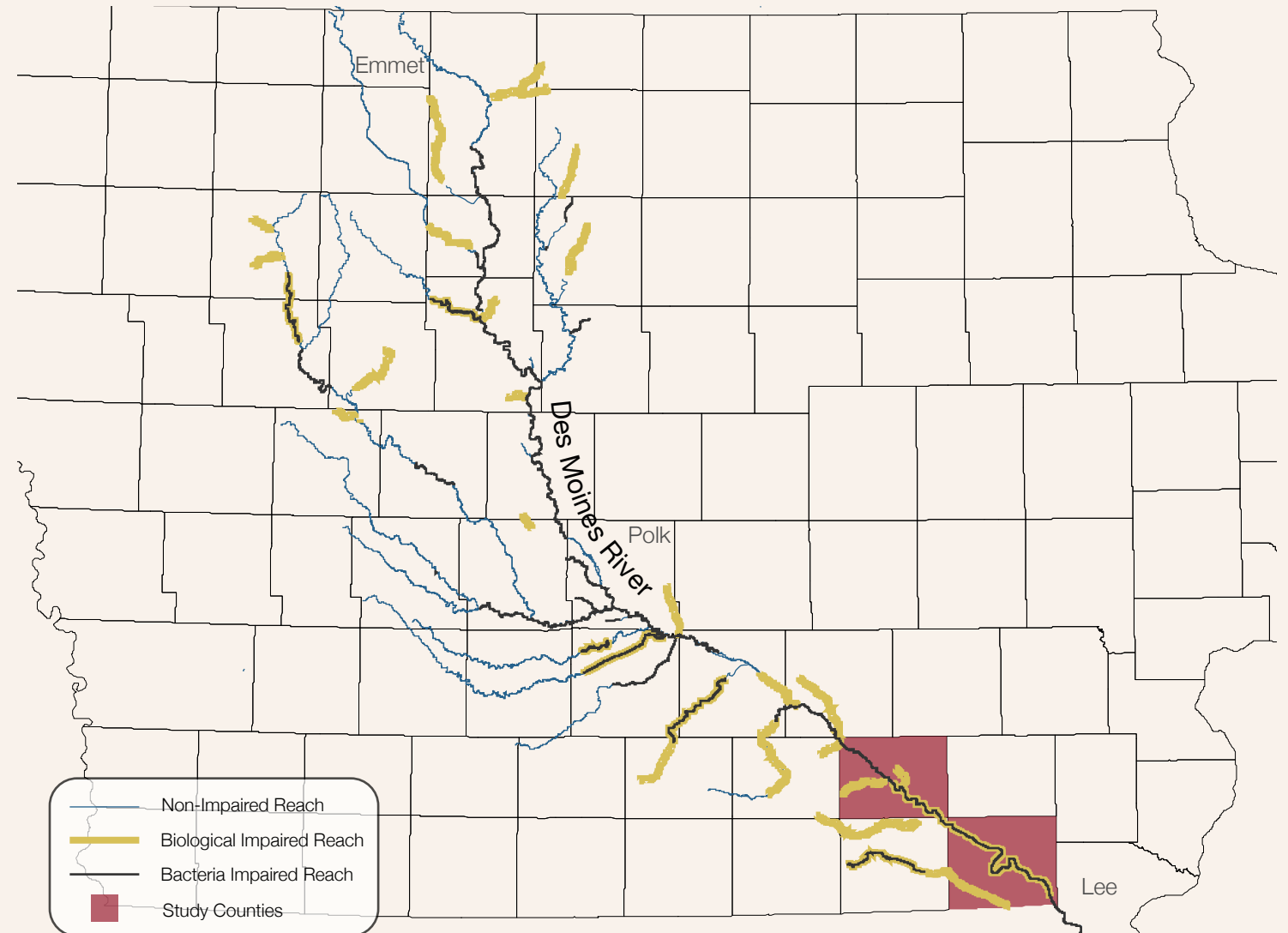


# WATER QUALITY CONDITIONS

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 stream bank instability, and fragmentation by culvert crossings or dams can limit biological diversity.

Measuring the level of 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.

**Figure 6**  
Nearly the entire reach of the Des Moines River included in this study area is listed as impaired for both indicator bacteria and biological conditions.



**Figure 7**  
The study area reach of the river included in this water trail is located in 2 of the 3 most-southern counties in Iowa the river flows through. In addition to these counties, water quality conditions in many upstream segments of the Des Moines River and portions of its tributaries are also impaired.

## 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 the 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.

The entire length of Lower Des Moines River water trail is included on Iowa’s 2012 List of Impaired Waters (also known as the 303(d) List). Three tributaries entering the main channel near the water trail (Bear, Sugar and Soap creeks) are also listed as impaired (Figure 6). Portions of the river in eleven upstream counties and the one Iowa county downstream are also impaired (Figure 7).

Nearly all the listed segments of the main channel are impaired for primary contact recreation due to levels of indicator bacteria (*E. coli*) that exceed state criteria. This type of impairment is, by far, the most common impairment of Iowa’s rivers and streams. Some segments of the Lower Des Moines are listed for biological impairments, including recent fish kills.





## CONTAMINANT SOURCES

Iowa DNR lists a total of 38 contaminant sources within 0.3 miles of the Des Moines River in study area (Table 8). Contaminant sources include potentials for contamination of water resources based on the type of operation.

Contaminant Source Type	Total Within 0.3 miles of River*
Hazardous Materials Spill	1
Leaking Underground Storage Tanks	12
Open Feedlot	1
Tier II Chemical Storage	3
Underground Storage Tank	8
Unsewered Community	5
Wastewater Outfall	5
Wastewater Treatment Facility	3

**Table 8**  
Contaminant sources includes locations from which contaminants are known to exist. The list does not imply contamination of surface water has occurred.  
\*Source: Iowa Department of Natural Resources, 2011

## WATER QUALITY INITIATIVES

Local, coordinated efforts to initiate water quality enhancement are an important indicator of local and / or regional commitment to water resources. Multiple types of organizations often participate in these efforts in Iowa including federal and state agencies, county government, soil and water conservation districts (SWCD's), conservation non-profit organizations and commodity groups.

Several types of funding mechanisms exist to direct resources toward initiatives on agricultural land in critical watersheds. Examples of these include the USDA-NRCS Mississippi River Basin Healthy Watersheds Initiative (MRBI), the Iowa Water Quality Initiative (WQI) and the Iowa DNR Lake Restoration Program. Prioritized Nutrient Management Strategy Watersheds are an example of critical geographic areas identified for water quality enhancement in the state. Assessments and planning efforts are used to develop strategies for enhancing water quality conditions. Total Maximum Daily Load (TMDL's) and their linked 9-element watershed management plans are examples of these strategies. These strategies are then implemented as funding becomes available. Watershed Management Authorities (WMA) is a mechanism for cities, counties, SWCD's and stakeholders to cooperatively engage in watershed planning and management including water quality enhancement.

Funding sources include state, federal and local entities as well as private sources. Federal examples include USDA programs such as the Environmental Quality Incentives Program (EQIP) and Conservation Reserve Program (CRP) and EPA Section 319 administered through Iowa DNR. At a state level In Iowa, important sources include Watershed Protection Funds and Watershed Improvement Review Board (WIRB), both administered through the Iowa Department of Agriculture and Land Stewardship.

Two statewide community-based participation efforts focus on water quality. Project AWARE (A Watershed Awareness River Expedition) engages volunteers in water quality and aquatic habitat enhancement through an annual 7-day trash removal expedition. IOWATER is a volunteer water quality monitoring program that collects and publishes preliminary monitoring data.

Water quality projects in study counties were successful in obtaining a total of \$2.9 million in federal and state grant funding and an additional \$0.5 million in loans between 2007 and 2014 to reduce erosion and sedimentation. The largest funding source for grants was WIRB. Watershed projects in Kettle, Chequest, Little Lick and Miller creeks and Lake Miami received a total of slightly more than \$1 million from WIRB. Section 319h funds provided an additional \$1.14 million to projects in the Muchakinock Creek, Lake Wapello and Williamson Pond watersheds to reduce sediment input to the streams. Muchakinock and Kettle Creek projects received an additional combined total of \$834,874 from other funding sources as well. Finally, Ottumwa and Blakesburg qualified for a total of \$567,311 in loans from the Iowa State Revolving Loan program for non-point source pollution reduction in 2013-14. These included streambank and grade stabilization practices and other BMPs in the agricultural and urban watersheds.



# Context of the River

## WATERSHED CHARACTERISTICS AND CONDITIONS

This water trail is located within the Loess Flats and Till Plains ecoregion in Iowa (Figure 8). Additional designated segments are situated in the Des Moines Lobe and Rolling Loess Prairies ecoregions. The Loess Flats and Till Plains ecoregion contains only one state designated water trail.

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 ecoregion.

The Loess Flats and Till Plains ecoregion has moderate loess deposits over glacial till and dark shallow soils. Loess deposits generally increase to the south, especially near the Missouri River in the state of Missouri. The topography varies from flat to moderately hilly. Valley sides are not steep, with slopes generally less than 10%. Natural wetlands historically occurred along several rivers in the region. Soils are inherently fertile, but use can be limited due to severe erosion. Land use includes area of cropland, pasture in the valleys and upland slopes, and bands of woodland (Chapman et al. 2002).

The drainage basin or watershed area draining into the Lower Des Moines River water trail includes 9,092,130 acres (Figure 9). A majority of the watershed acres (64%) were cultivated cropland in 2013 (Table 9). Developed areas, including roads, neighborhoods and buildings, totaled 9% of the watershed. Only four percent (405,965 acres) of the watershed is located in Wapello and Van Buren counties.

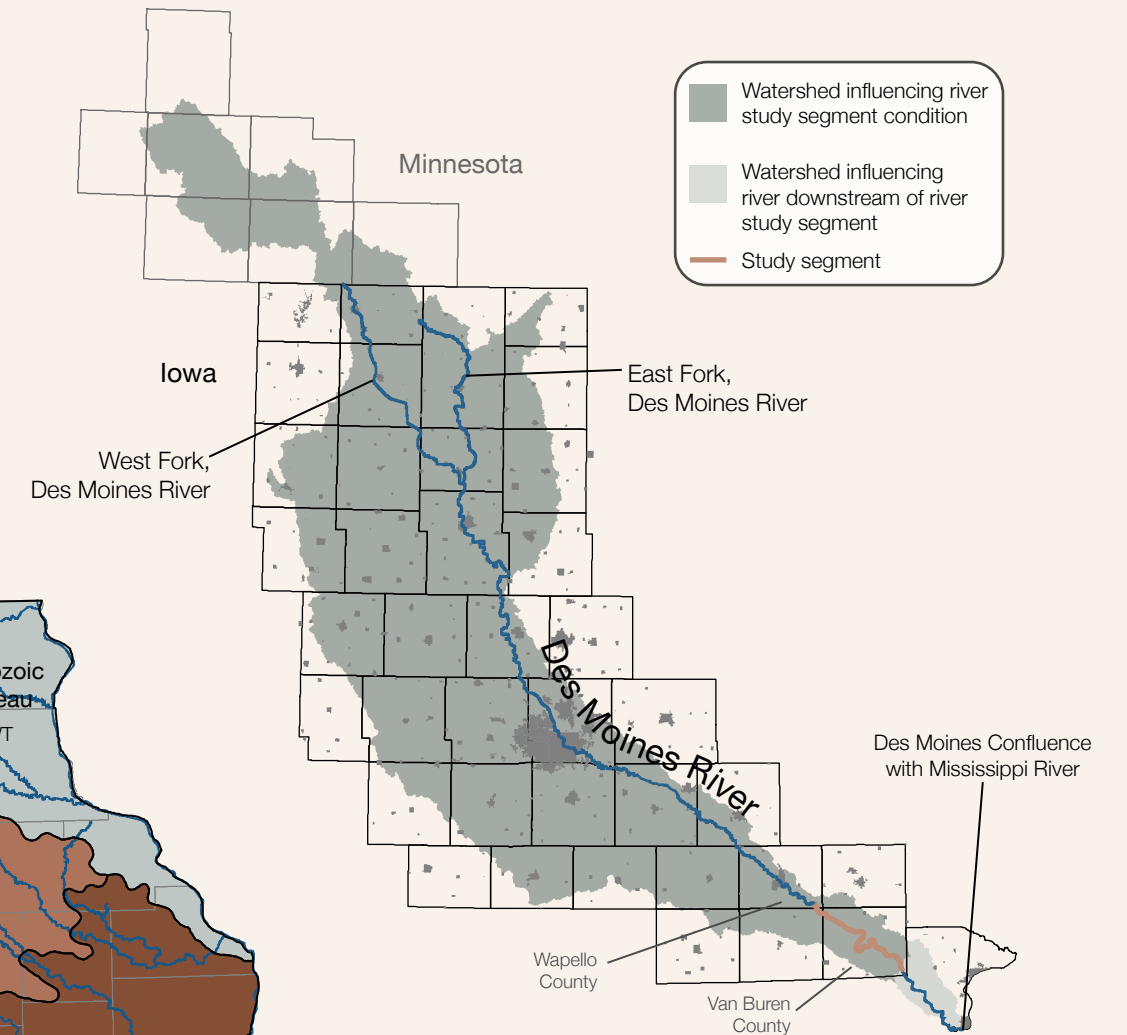
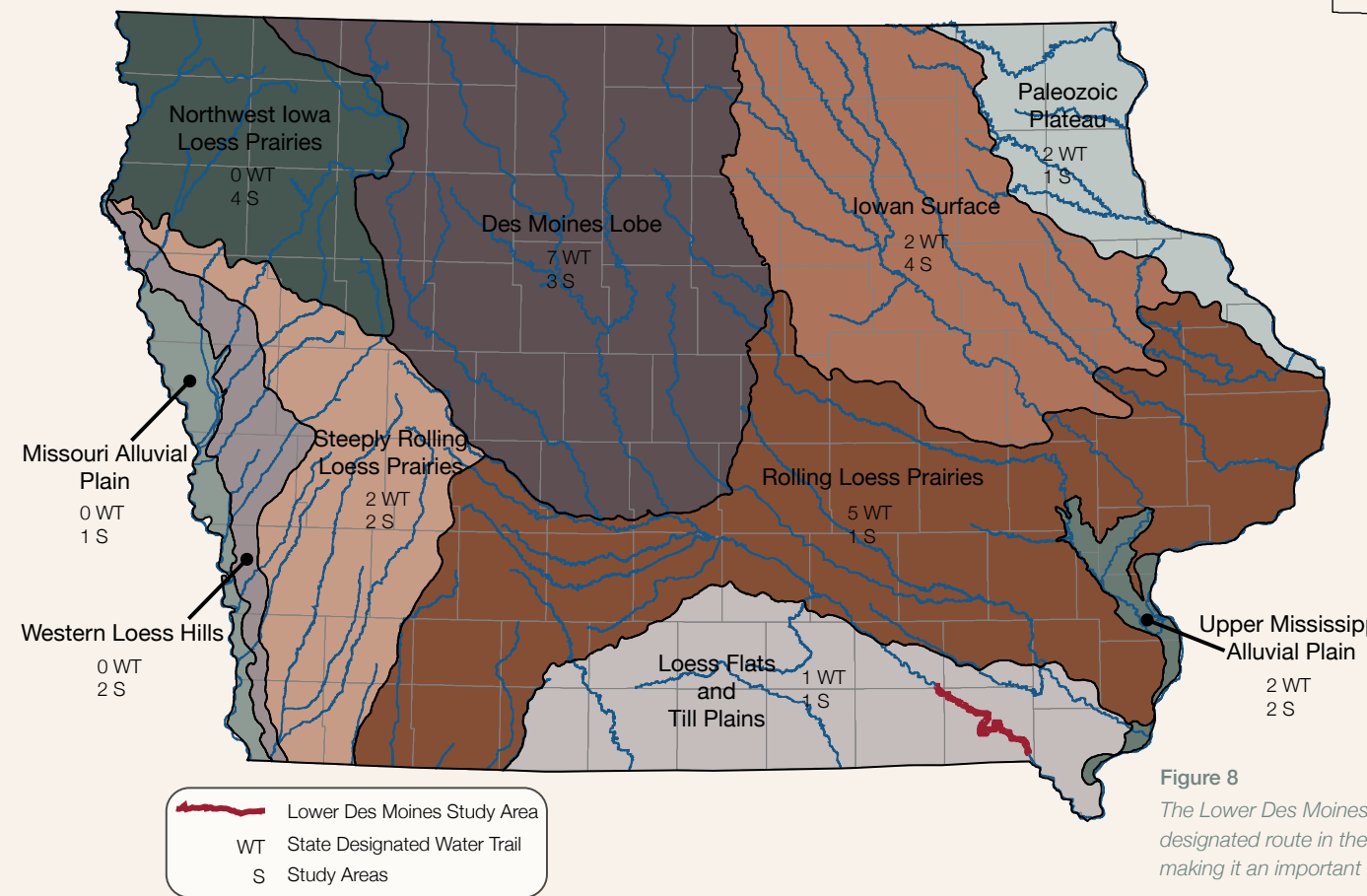


Figure 9

As its name implies, the Lower Des Moines River Water Trail is situated near the bottom of the Des Moines River watershed. While other segments of the Des Moines River are state-designated, these are located farther upstream in the watershed and within a different ecoregion.

Figure 8

The Lower Des Moines River Water Trail is the only designated route in the Loess Flats and Till Plains ecoregion, making it an important resource for ecological interpretation.

Table 9

Land cover from the 2013 crop year was used to characterize the watershed that supplies the Lower Des Moines River in Wapello and Van Buren counties. Twenty-seven percent of the watershed is some form of natural landcover including grasslands, forests and wetlands.

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

Land Cover Type	2013 Acres*
Annually Cultivated Crops	5,777,506
Grassland, Pasture, Alfalfa	1,448,974
Forest, Woodland, Shrubland	852,440
Wetlands	175,454
Developed Land	837,756
<b>TOTAL ACRES IN WATERSHED</b>	<b>9,092,130</b>

## Population and Development

This water trail is located in one of the least densely populated regions among those studied in 2014. The U.S. Census 2010 indicated approximately 190,473 people lived within 25 miles of the Lower Des Moines River water trail. And while only three road crossings exist in the study segment, there are more miles of roads within 100' of the top of bank of any river included in the 2014 study. Road crossings and adjacent roadways act as a public interface for river users and an access point for rescue teams.



# RESOURCE EXPERIENCES NEAR THE LOWER DES MOINES RIVER

## Recreation & Tourism in the Region

All but 3.5 miles of the 44 total river miles in this project are within Van Buren County, which is the least populated of the 25 counties where the state has active water trail planning efforts underway. According to the 2010 US Census the county has the tenth smallest population in the state. Van Buren County prides itself on having no stoplights or fast-food restaurants. It lacks an industry-driven local economy. Instead, the county relies heavily upon tourism for economic development. Its appeal is that not much has changed since the late nineteenth century. Sparsely populated villages are strung like beads on a necklace along the river running from Eldon in the northwest to Farmington in the southeast.

The Des Moines River hosts a variety of outdoor recreational activities that include paddling, motor-boating, motor-boat fishing, fishing from shore, camping and relaxing along the river. While no user intercept surveys have targeted this specific area, anecdotal evidence indicates fishing from boat, namely flat-bottomed skiffs or jon boats, is perhaps the most popular activity on this section of the Des Moines River. The local desire to install bridge signs on the downstream bridge piers and the County's request to include the hard surface ramp symbol as part of the water trail wayfinding signage attests to the popularity of recreational boating in the area.

Villages of Van Buren noted that their target market area is usually a 150 mile radius, which would include major population centers, such as, Des Moines, Cedar Rapids, Cedar Falls, Waterloo, Quad Cities, and St. Louis.

According to the 2009 Iowa Rivers and River Corridors Recreation Survey (Iowa State University 2009) the Lower Des Moines River is the most heavily used river in the immediate area. The segment of the river included in this study, however, had 59% fewer trips reported in 2009 compared to the immediately upstream segment. The segment of river that includes the water trail study area starts in Ottumwa and ends at the confluence with the Mississippi River. The section immediately upstream starts at Red Rock and ends at Ottumwa. The economic impact for the segment that includes the water trail study area was \$7,968, 924 of the overall \$829 million of total economic impact in 2009. The most popular activities were fishing, relaxing/picnicking, wildlife watching, and surface trail recreation. Kayak or canoe use reported on southeast Iowa rivers were generally quite low relative to other parts of the state. Reported use of boats with motors were

proportionately higher in this part of the state, likely due to the greater relative volume of water in rivers in this region of the state.

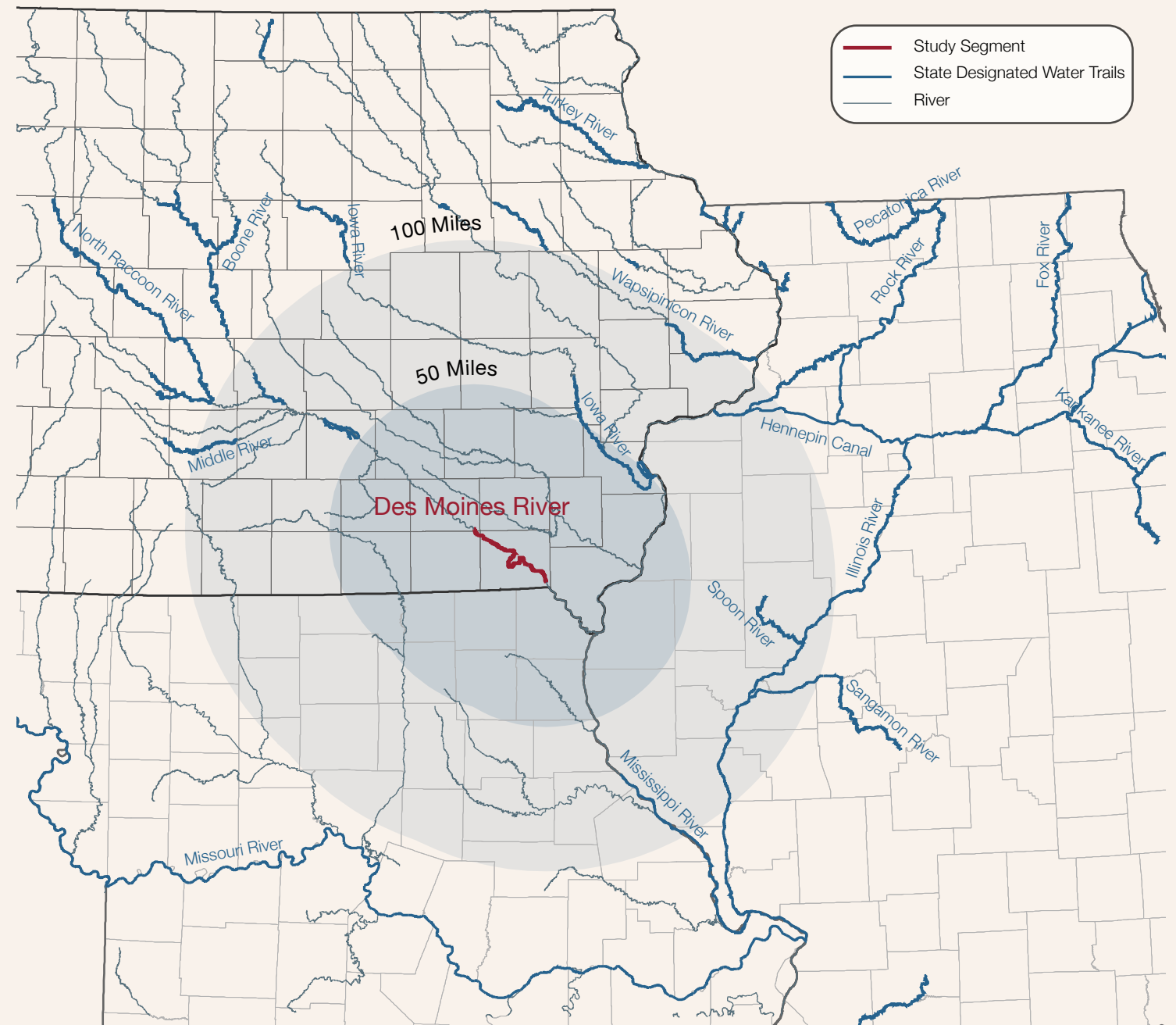
From a paddling perspective, the Lower Des Moines River Water Trail is fairly isolated from other state-designated water trails. The closest water trails are in Iowa and include Lake Red Rock, Iowa River, and Odessa—all at or just under the 50-mile range (Figure 10). In addition to state-designated water trails, a number of other paddling opportunities are available. Within a 10-mile radius Big Cedar Creek in southern Jefferson County offers some challenging moving-water experiences at the right water levels, while Lake Sugema and Lake Wapello State Park offer more beginner-friendly flat-water experiences.

Wapello County Trails Council is interested in extending the Des Moines River Water Trail upstream from Eldon and connecting it to Ottumwa's multi-use trail system. Downtown Ottumwa lies about 18 river miles from Eldon. The DNR owns and manages Cliffland Access located ten miles upstream of Eldon. They report challenges to managing it related to groups of partiers who take it over on weekends. The state water trail planning process could offer an opportunity to work through the local issues there to arrive at potential solutions.

A variety of other types of trails are contained within the 10-mile radius. The Mormon Pioneer National Historic Trail runs parallel to and along the north side of the Des Moines River from Farmington to Bonaparte. It crosses the river at Bonaparte and runs west and south of Keosauqua out of the study area. Many Mormons chose to stay and make Iowa their home in Van Buren County while others continued to other locations west--this adds to the local flavor in architecture and history.

Historic Hills Scenic Byway, one of nine state designated byways that promote tourism and natural beauty, snakes through the study area, crossing the river four times while it travels 47 miles within a 10-mile radius of the Lower Des Moines River Water Trail.

Several surface trails are in the vicinity. The Lindsey Wilderness Trail north of Bonaparte, includes two 1-mile pedestrian loop trails and two ponds that are stocked with fish. At Shimek State Forest there are 25 miles of well-maintained hiking trails and 27 miles of multipurpose non-paved trails for bicyclists



**Figure 10**  
Only two other state-designated water trails are located near the Lower Des Moines River. Several other state-designated routes in Illinois and Iowa are within 100 miles.



and equestrian users. Lacey Keosauqua State Park (one of Iowa's largest state parks) has 13 miles of hiking trails. There is also a 46-mile road-based bike route that connects Lacey Keosauqua State Park with Geode State Park, known as the "Southeast Iowa Bike Route" and is promoted on Web sites by the Iowa DNR, Villages of Van Buren, and Henry County.

Pioneer Ridge Natural Area, about four miles from the river and close to Ottumwa, offers both equestrian and hiking trails, and is the only hiking trail found in the area that offers a half-mile paved section of trail for those with limited mobility.

While a variety of trails are located close to the river, it is the abundance of public land adjacent to the river that makes this particular water trail standout, offering a multitude of outdoor recreational opportunities. More than 30,000 acres of public natural areas are within a 10-mile radius of the Lower Des Moines River Water Trail (Table 10). Ninety percent of those natural areas are state owned and make up two of the largest public land complexes in the state.

Shimek State Forest is one of only six state forests in Iowa, and ranks second largest at 13.3 thousand acres. Lacey Keosauqua is a complex of four large contiguous parcels of public land consisting of Lake Sugema Wildlife Area (3.8 thousand acres); Lacey Keosauqua State Park (1.5 thousand acres); a small section of Shimek State Forest (about one thousand acres); and Daughtry Timber County Park (about one hundred acres) owned and managed by Van Buren County Conservation. At 1,516 acres, Lacey Keosauqua State Park is Iowa's eighth largest state park. However, when you factor in the contiguous parcels, it is part of one of the largest complexes of public land in the state.

Shimek State Forest is less than a quarter-mile from the river and Lacey Keosauqua State Park is right on the river; both offer many opportunities for outdoor recreational activities (Table 11). It is unfortunate, however, that an access doesn't connect the state park to Iowa's longest interior stream.

Most of the outdoor recreational activities offered within the 10-mile radius are found at either Shimek State Forest or Lacey Keosauqua Complex. Lodges are available for event rental at Lacey Keosauqua State Park and River Valley Lodge and Campground; cabins are available at Lacey Keosauqua and by private businesses in Keosauqua and near Lake Sugema. Equestrian and mountain bike trails are located at Shimek State Forest and Pioneer Ridge Natural Area near Ottumwa.

There are a number of locations that offer both primitive and modern camping options and a few natural areas that have historic significance.

In addition to Shimek State Forest and Lake Sugema Wildlife Area (located within Lacey Keosauqua Complex), there are a

number of state and county wildlife management areas that offer hunting and wildlife viewing. More than 7,000 acres (27%) of the natural areas within a 10-mile radius of the river are dedicated to these activities, but some also offer other opportunities, as well, such as hiking, primitive camping, modern camping, etc (Tables 12, 13).

The remaining public areas are points for accessing the river for boating or fishing, and small, local parks or roadside pull-offs. For example, the towns of Floris and Troy each have a park, and LaCrew Roadside Rest Area is just a place to pull off the road, but does have historical significance in that it was a booming railroad town from 1881 to 1932, but now just a 2.5 acre parcel owned and managed by Lee County Conservation Board.

In addition to abundant outdoor recreation opportunities, the area has many attractions for visitors, in particular an abundance of museums and historic sites for those interested in history (Table 14). Four historic districts (Bentonsport, Bonaparte, Bonaparte Pottery and Lacey Keosauqua State Park), along with many other historic buildings, are located on the riverfront or within a few blocks.

	Within 10 miles	Adjoining Lower Des Moines River or Incredibly Close (Missouri)	Adjoining Lower Des Moines River or Incredibly Close (Iowa)
<b>Public Areas for River Access</b>	<b>72</b>		<b>38</b>
City Parks	3		
County Parks	117		28
Historical Site (Croton Civil War Memorial Park, Battle of Athens State Historical Site in Revere, MO)	7	409	
State Park	1,516		1,515
State Forest	9,109		921
WMA (Eldon, Fox Hills, Lake Sugema, De Voss-Foster, Fox River, Selma, Van Buren, Johnson-Noel Buckeye, Cardinal, Turkey Run, Pioneer Ridge, Schulz, Chequest, Bentonsport Timber, Lindsey Wilderness, White Timber, Reno Timber, Bluewing Marsh, Garrison Rock, Sugar Creek Bottoms)	10,277		3,737
WRP Easement	3,159		
Land in Permanent Protection (Acres) by State	24,260	409	6,239
<b>Total Recreational Land (Acres) within 10 miles of Lower Des Moines Water Trail</b>			<b>30,908</b>

Table 10  
Land in Permanent Protection and Recreation

	Miles From River	Hunting	Fishing	Paddling	Wildlife Viewing	Modern Camping	Primitive Camping	Hiking Trails	Historic Interest	Other	Accessibility
<b>Shimek State Forest</b>											
Shimek State Forest	1	x	x	x	x	x	x	x	x	Modern amenities, motor boating, equestrian trails	Accessible picnic area, fishing dock, and restrooms
<b>Lacey-Keosauqua / Lake Sugema Complex (23%) (6295 Total Acres)</b>											
Lacey Keosauqua State Park	On River		x	x	x	x	x	x	x	Modern amenities, electric motors only, lodge and cabin rentals	
Shimek State Forest	0.24	x			x			x			
Daughtry Timber County Park	1.1	x			x			x			
Lake Sugema Component	1.2	x	x	x	x	x	x	x		Modern amenities, motor boating	Accessible fishing dock, and restrooms

Table 11  
Public Land Amenities

Other State & County Wildlife Management Areas	Miles From River	Hunting	Fishing	Paddling	Wildlife Viewing	Modern Camping	Primitive Camping	Hiking Trails	Historic Interest	Other	Accessibility
Schulz Conservation Area	0	X	X		X		X				
Garrison Rock Resource Management Unit	0.2	X			X			X	X		
Lindsey Wilderness Area & Reno Timber	0.4	X	X		X			X			
Pioneer Ridge Natural Area	3.9	X	X		X	X	X	X		Cabin rentals, equestrian trails	1/2 mile paved accessible hiking trail

Table 12  
The following wildlife areas offer hunting and wildlife viewing only and are located from 0 to 8 miles of the river: Fox Hills, Bentonsport Timber, White Timber, Van Buren, Selma, Eldon, Chequest, Sugar Creek Bottoms, De Voss-Foster, Bluewing Marsh, Fox River, Turkey Run, Johnson-Noel Buckeye.



Other	Miles From River	Hunting	Fishing	Paddling	Wildlife Viewing	Modern Camping	Primitive Camping	Hiking Trails	Historic Interest	Other	Accessibility
Selma Access (not a launch)	0	X			X						
Bentonsport Riverside Park	0		X	X	X	X	X		X	Modern amenities, motor boating	
Croton Civil War Memorial Park	0		X		X				X	Modern amenities,	
Floris City Park	6.4				X					Modern amenities,	
Troy City Park	8.3				X				X		
LaCrew Roadside Rest Area	9				X				X		

Table 13

The following are public accesses offering immediate access to the river, fishing, paddling, motor-boating, and wildlife viewing: Cliffland, Des Moines River, Shidepoke, Turkey Run, Douds, and Austin Park.

Attraction	Type	Information	Nearest Town			
			Eldon	Keosauqua	Bonaparte	Farmington
American Gothic House & Visitor Center	Historic Site	house used as model in Grant Wood's iconic painting; a National Historic Landmark	X			
Chief Black Hawk Gravesite Memorial	Historic Site	Memorial marker in lowaville Cemetery	X			
Eldon Carnegie Public Library	Library	built 1913; significant architecturally and as one of the many libraries funded by Andrew Carnegie	X			
lowaville Archaeological Site	Historic Site	c. 1765-1820 site of significant loway village; c. 1830-1878 site of Euro-American village	X			
lowaville Cemetery	Historic Site	one of oldest cemeteries west of the Mississippi , stones of people born in the 1700s; prehistoric mounds also present	X			
Lockkeeper's House	Historic Site	considered to have been built as part of the Des Moines River Improvement project but no definite proof has been established	X			
Mars Hill	Historic Site	Historic log church (1820-1857) and cemetery	X			
McHaffey Opera House	Historic Site	significant because of its cultural and entertainment contributions to the community; built 1891 and operated as opera house until 1945; in process of being restored; used for community events	X			
Mount Moriah Methodist Church	Historic Site	only surviving country church in the county in near original condition located on the original site of a church/cemetery combination	X			
Oak Grove Historic School & Church	Historic Site	one of the only remaining church/school combinations in Iowa	X			
Rock Island Train Depot Museum	Museum	restored depot and museum	X			
Selma Log Cabin Park	Historic Site	built in 1846; moved to city park from original site east of Selma and restored in 1969	X			
Des Moines River Historic Locks & Dams	Historic Site	Part of Des Moines River Improvement Project; remnants of Lock & Dam #5 & #7		X	X	
Ely Ford Mormon Crossing	Historic Site	has memorial to Mormon migration and interpretive sign		X		
GAR Park Monument & Cannons	Historic Site	civil war monuments & cannons - located at Van Buren County Courthouse		X		
Hotel Manning	Historic Site	c.1854; operated as general store until 1893 when third floor was added and remodeled into a hotel; still operating as hotel (2015)		X		
Lacey Keosauqua CCC buildings & interpretive display	Historic Site	ca 1933-38; structures built by Civilian Conservation Corps; display about the CCC		X		
Lacey Keosauqua Indian Mounds	Historic Site	prehistoric mounds located in various locations in the park		X		
Milton Creamery	Mennonite	Mennonite business; locally produced cheese		X		
Milton Heritage House 1898	Historic Site	museum in historic church		X		
Milton School Park and Trail	Park	small park with old school and short trail		X		

Table 14

Historic sites and structures that are businesses or otherwise open to the public within 10-mile radius of the Lower Des Moines River Water Trail





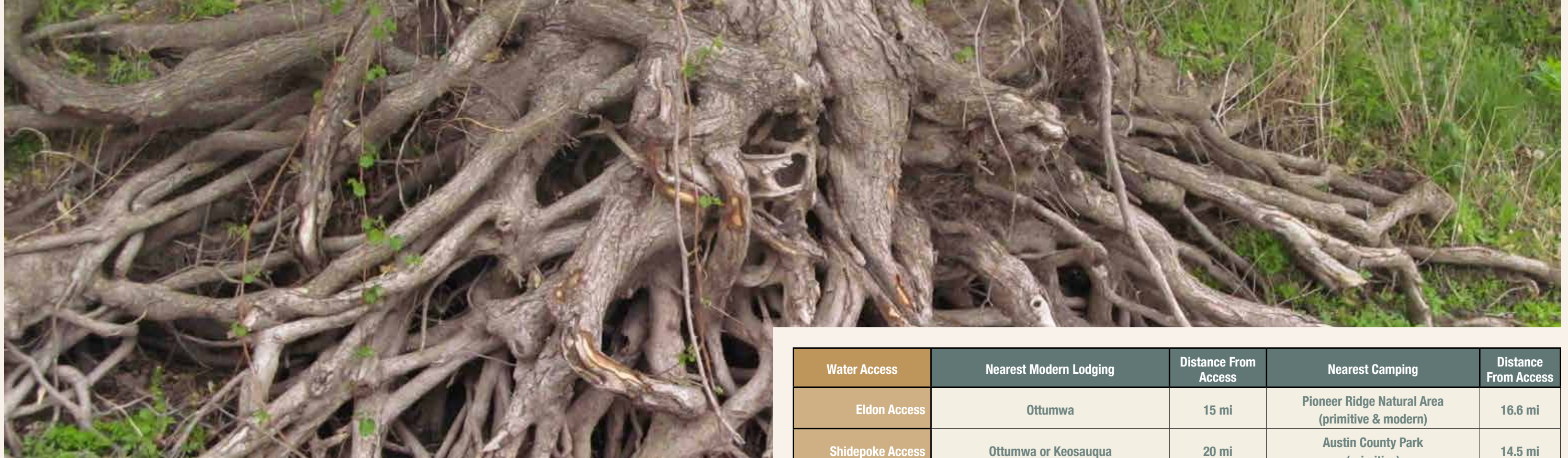


Attraction	Type	Information	Nearest Town			
			Eldon	Keosauqua	Bonaparte	Farmington
Milton Train Depot, 1871	Historic Site	restored railroad depot		X		
Morris Park	Historic Site	historic buildings with local artifacts located in a park with campground		X		
Pearson House Museum	Historic Site	c.1845; significant in terms of age, architecture & construction; now houses a museum		X		
Peavine Line Railroad Depot & Museum	Historic Site	restored depot and museum		X		
Township Hall	Historic Site	historic school house moved to site; now a community center		X		
Van Buren County Courthouse	Historic Site	built 1943; oldest courthouse in Iowa still in use (as of 2014);		X		
Villages of Van Buren Office	Visitor Center	visitor center, small museum & Village Folk School Office		X		
Voltaire Twombly Building/Museum	Historic Site	limestone block building (c.1875); housed various businesses, including the post office at one time; present use is as a museum		X		
Waubonsie Trail Park	Park			X		
Aunty Green Hotel Museum and Bonaparte Library	Historic Site	First brick building in Bonaparte; built 1844; now the town library & museum			X	
Bentonsport Bridge	Historic Site	built 1882; Operated as a vehicle bridge until 1985; now a pedestrian bridge over the Des Moines River located in Bentonsport Historic District			X	
Bentonsport Historic District	Historic District	restored historic structures, shops, artisans, museum, B&Bs, food			X	
Bonaparte Historic Riverfront District	Historic District	restored and unrestored buildings along the river			X	
Bonaparte Mormon Trail River Crossing	Historic Site	major crossing for Mormon migration			X	
Bonaparte Pottery & Archaeological District	Historic Site	Former Parkker Hanback Pottery; operating as a pottery currently; archaeological site			X	
Bonaparte Retreat	Historic Site	c. 1878; aka "Meek's Flour Mill" - well-preserved example of a water-powered flour/grist mill; now a restaurant			X	
Mason House Inn	Historic Site	Oldest steamboat hotel on the river; b. 1846 by Mormon craftsman; currently a B&B			X	
Stone House	Historic Site	aka "Mormon House; built by Mormon artisans in 1846; many uses over the years; renovated as a community center			X	
Vernon School	Historic Site	significant example of 19th century public school building and Italianate style; built 1868 & operated as school until 1952; now a private residence			X	
Whitely Opera House	Historic Site	historic opera house; now city hall and community center			X	
Appleberry Orchard	Historic Site	Iowa's oldest working orchard				X
Battle of Athens State Historic Site	Historic Site	northern most battle west of the Mississippi fought here, August 5, 1861,				X
Burg Wagon Works	Historic Site	aka "Buggy Factory"; c.1867 limestone building - now a private residence				X
Croton Civil War Memorial Park	Historic Site	northern most battle west of the Mississippi fought here, August 5, 1861, and Mormon Trail intersection				X
Herschler Winery and Historic District	Historic Site	c. 1865; Historic Limestone Buildings - now Herschler Winery and inn rooms				X
Pioneer Museum	Historic Site	Museum in historic (1848) church				X
Railroad Park & Museum	Historic Site	Restored depot and museum				X
River Valley Lodge and Campground	Recreation Facility	Equestrian Center, campground and lodge to rent for events				X
Sharon Cemetery Historic District	Historic Site	historic designed landscape of the cemetery, ground, buildings and roads				X

Table 14 (cont.)

Historic sites and structures that are businesses or otherwise open to the public within 10-mile radius of the Lower Des Moines River Water Trail





Paddlers, anglers, and those with motor boats wishing to recreate along the Lower Des Moines River will find a variety of lodging options to choose from. Keosauqua, Bentonsport, and Bonaparte offer the greatest number of options compared to the other access locations. Bed and breakfasts, hotels, cabins, and primitive or modern camping facilities are all available within a short distance of the accesses (Table 15).

Visitors wishing to stay in Keosauqua will find lodging on the river, including the historic Hotel Manning that was originally built in 1854, operating first as a general store and bank, but converted to a hotel in 1899 (Haury-Artz, 2014). Also operating under that same name are two modern hotels and two cabins within a few blocks of the hotel. In total, there are 35 rooms (16 antique-filled rooms in the actual hotel and 19 rooms split between two separate motel buildings outside) besides the two full service cabins. There are also three restaurants within walking distance of the ramp, as well as a convenience store. Primitive and modern camping facilities (76 sites total) are less than two miles away at Lacey Keosauqua State Park (Lacey Keosauqua State Park, n.d). The amenities in Keosauqua, with a combination of modern lodging and a large number of campsites close by, offer opportunities for conferences. For example, the Iowa Ornithologist Union has held annual meetings here in the fall and spring with organized bird watching trips to both Shimek State Forest and Lacey Keosauqua State Park. However, there is greater need for more modern lodging opportunities in the Keosauqua area. As this report is being written Hotel Manning is currently for sale and investors are interested in acquiring, updating and adding more rooms to the existing facility.

Bentonsport features three bed and breakfasts and two cottages, as well as several artisan shops, food and museums within walking distance of the access. The Mason House Bed and Breakfast, built by emigrant Mormon craftsmen who lived and stayed in the area, has been hosting guests since the nineteenth century. It briefly operated as a temporary hospital for wounded soldiers during the Civil War (Haury-Artz, 2014). The bed and breakfast offers eight rooms and a railroad caboose that serves as a cabin. Bentonsport Village Bed and Breakfast offers three rooms in a recently restored 1847 Victorian home known as the Hancock House. A former church offers yet another interesting lodging option a few blocks off the river. Bentonsport Campground offers 23 modern campsites along the river with electricity and an open area for primitive tent camping for 6-8 large-sized tents. Other camping options are located 8 miles away at Lacey Keosauqua State Park or 11.6 miles away at Lake Sugema.

Bonaparte has lost a few of its attractions but retains a regionally popular restaurant named Bonaparte's Retreat located on the river in the old historic Meek's Flour Mill built in 1878. The Bonaparte Pottery, built in 1875, stands about three blocks east of the access. The owner offers tours by appointment. The Bonaparte Inn Bed and Breakfast—offering ten rooms beginning at \$99-- recently closed its doors after operating just a few years. It operated out of the restored historic glove factory. It's unknown whether the building will continue as a bed and breakfast.

Table 15  
Lodging options.

Water Access	Nearest Modern Lodging	Distance From Access	Nearest Camping	Distance From Access
Eldon Access	Ottumwa	15 mi	Pioneer Ridge Natural Area (primitive & modern)	16.6 mi
Shidepoke Access	Ottumwa or Keosauqua	20 mi	Austin County Park (primitive)	14.5 mi
Douds Boat Ramp	Keosauqua	17.3 mi	Austin County Park (primitive)	9 mi
Austin Park	Hotel Manning Bed & Breakfast (Keosauqua)	5.2 mi	Austin County Park (primitive)	20 ft
	Lacey Keosauqua Cabins	6.7 mi	Lacey Keosauqua Campgrounds (primitive & modern)	6.7 mi
	Pine Ridge Retreat & Lodging	7.8 mi	Lake Sugema Campground (primitive & modern)	12.4 mi
Keosauqua Boat Ramp	Hotel Manning Bed & Breakfast	500 ft	Lacey Keosauqua Campgrounds (primitive & modern)	1.9 mi
	Lacey Keosauqua Cabins	1.9 mi	Austin County Park (primitive)	5.2 mi
	Pine Ridge Retreat & Lodging	3.7 mi	Lake Sugema Campground (primitive & modern)	7.2 mi
	Lacy Trail Cabins	4 mi		
Red Fox Lodging	7.2 mi			
Bentonsport Boat Ramp	Mason House Bed & Breakfast	980 ft	Bentonsport Riverside Park (primitive & modern)	500 ft
	Alexander's Cottage	1500 ft	Lacey Keosauqua Campgrounds (primitive & modern)	8 mi
	The Cottage	620 ft	Lake Sugema Campground (primitive & modern)	11.6 mi
Bentonsport Village Bed & Breakfast	950 ft			
Bonaparte Boat Ramp	Looker Retreat	1.6 miles	Bentonsport Riverside Park (primitive & modern)	4.2 mi
			Shimek State Forest (primitive, modern, equestrian)	8.5 mi
Farmington Boat Ramp	Porch Time Bed & Breakfast	0.2 miles	Shimek State Forest (primitive, modern, equestrian)	2.2 mi





## Cultural & Historic Resources

Humans have been drawn to the abundant natural resources of the Des Moines River Valley for thousands of years and still are today. There are four towns and four unincorporated communities on this 44-mile stretch of river.

Archaeological investigations have documented human occupation during both prehistoric and historic times.

The Office of the State Archaeologist (OSA) completed a Phase IA archaeological reconnaissance survey along the route of the water trail in 2014 (Horgen & Peterson, 2014). Their report 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 this 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 OSA study corridor included the total river valley from blufftop to blufftop, an area ranging from 3.4 to 5.5 miles wide. At least 156 separate archaeological investigations have occurred in the study area. Known cultural resources include 598 recorded archaeological sites and 1,600 architectural resources with associated Iowa Site Inventory numbers.

## Geologic Resources

The Des Moines River is located in the Southern Iowa Drift Plain. The topography of the region is one of steeply rolling hills, level upland divides, stepped erosion surfaces, and dendritic drainage networks. It is the result of glacial drift 500,000 years ago that has been reshaped over time. The Des Moines River valley had glaciers in its headwaters during the time of the more recent ice of the Des Moines Lobe. It was during that time that the valley obtained much of its present width, depth and alluvial fill during meltwater flooding. (Prior 1991).

Iowa lay near the equator some 300 million years ago and the current Des Moines River Valley was covered with shallow tropical seas on and off for millions of years. The sandstone and limestone beds exposed along the river today were deposited in the seas, near-shore environments, rivers and estuaries during that period. These exposed beds can be

seen in the bluffs near Keosauqua, most prominently in Lacey Keosauqua State Park.

More recent geological deposits visible in the valley are from the period commonly known as the Ice Age which was characterized by advances of continental glaciers. The glaciers deposited thick layers of gravelly till, sand and, occasionally, large boulders. A number of these “erratics,” some several feet in diameter, can be seen in Lacey-Keosauqua State Park. The metamorphic or igneous composition of the erratics show the great distances they were transported within or beneath the ice.

In the 500,000 years since the last glacier departed, erosion and deposition erased or buried many of the surface features carved by the ice. The region today is characterized by steeply rolling landscape and well-established drainage divides (Haury-Artz, 2014).

## The report suggests eight strong possibilities for interpretation in the water trail corridor. A summary of these is listed below:

### 1. Prehistoric occupancy

There are 21 recorded prehistoric sites that represent occupation of the area from Paleoindian through the Woodland periods. Possible themes connected to the river are the general importance of natural resources of the river valley, specifically the chert found in limestone bedrock outcrops and river mussels (as shown by a four-foot-thick shell Midden).

### 2. Thunderbird Petroglyph

This Native American rock carving is located in Lacey-Keosauqua State Park and is one of about 30 recorded petroglyphs in Iowa.

### 3. Des Moines Rapids and the Oneota tradition

The 1835 DeWard map shows a substantial riffle at Keosauqua, suggesting this was a natural ford location. An Oneota site near Keosauqua appears to lie near the location of that riffle and along a possible overland Late Prehistoric trail that connected the Mississippi and Missouri rivers. This location provides the opportunity to inform paddlers about the changing nature of the river and of the importance of paddling features to prehistoric peoples.

### 4. Báxoje (Ioway) tribal history/lowaville Village Site

One of the most significant Báxoje site in the nation known as lowaville borders the riverbank about one-half mile upstream from the Shidepoke Access. Archaeological work has demonstrated an outstanding level of preservation on the privately owned and farmed field. It is estimated that 500 to 1,600 Báxoje lived in this small 40 acre area from 1765 until the 1820s.

### 5. Sauk tribal history

A Sauk village, the home and burial place of the warrior Black Hawk, and the Jordan Trading Post were all located about halfway between the Eldon and Shidepoke accesses. The nearby lowaville Cemetery contains a marker memorializing the Sauk leader.

### 6. National Register-listed Historic Districts

The study corridor contains four NRHP-listed districts, each adjacent to the river. Two districts serve to educate the public about early settlement history, another on the stoneware industry, and the fourth, on Civilian Conservation Corps (CCC) projects.

- Bentonsport Historic District
- Bonaparte Historic Riverfront District
- Bonaparte Pottery Archaeological District
- Lacey Keosauqua State Park District

### 7. Steamboating

The Des Moines was initially considered steamboat navigable up to Fort Des Moines (now, the City of Des Moines) and extensive lock-and-dam improvements were begun but never completed. Remnants of the locks and dams at Bonaparte and Keosauqua are still present and beg the story from this particular era.

### 8. The American Gothic House

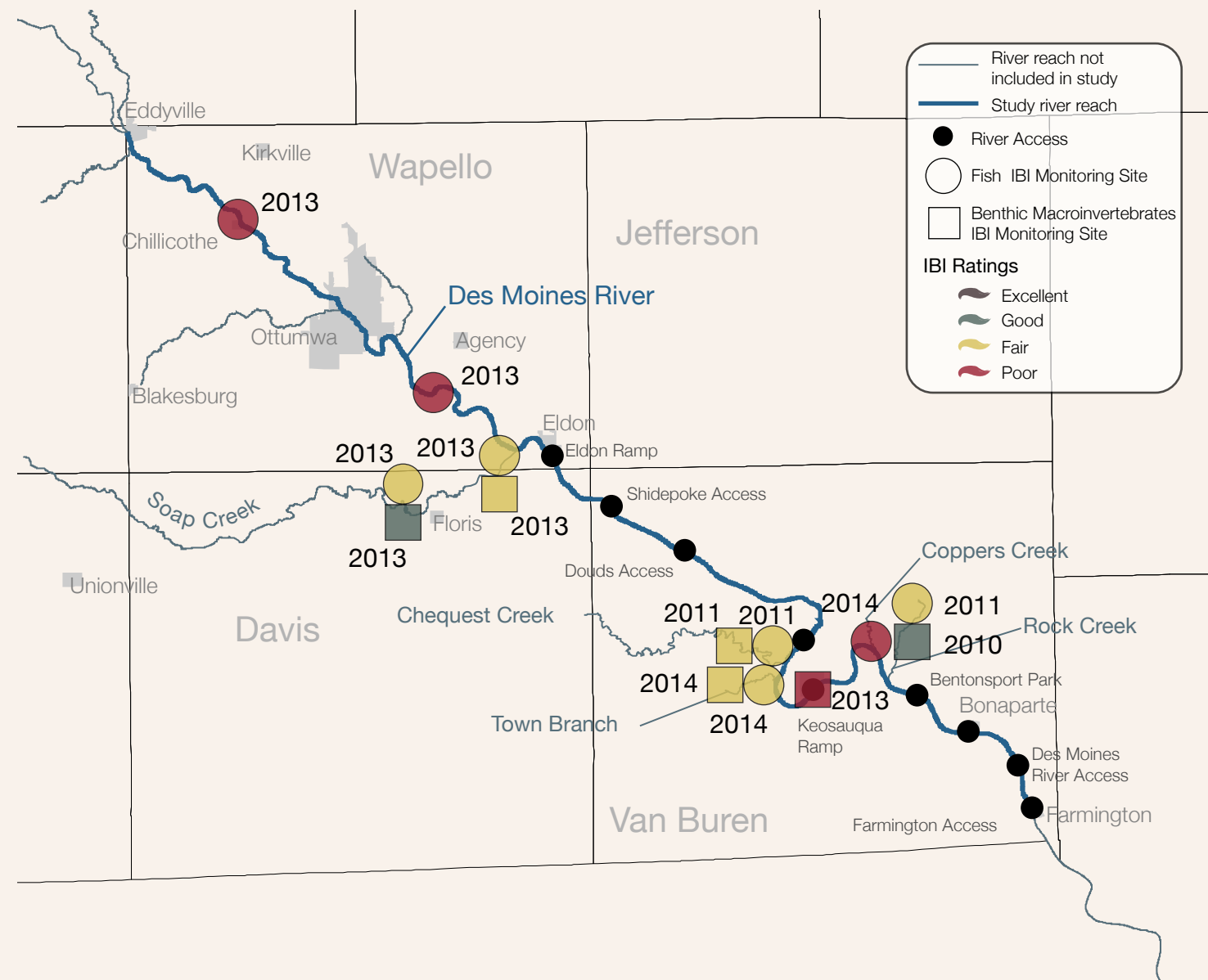
This building forms the backdrop of Grant Wood’s famous 1930 painting “American Gothic,” making the house one of the best known twentieth-century historical sites in Iowa. The house and its associated archaeological site are in the City of Eldon about 0.75 miles from the Eldon Access.



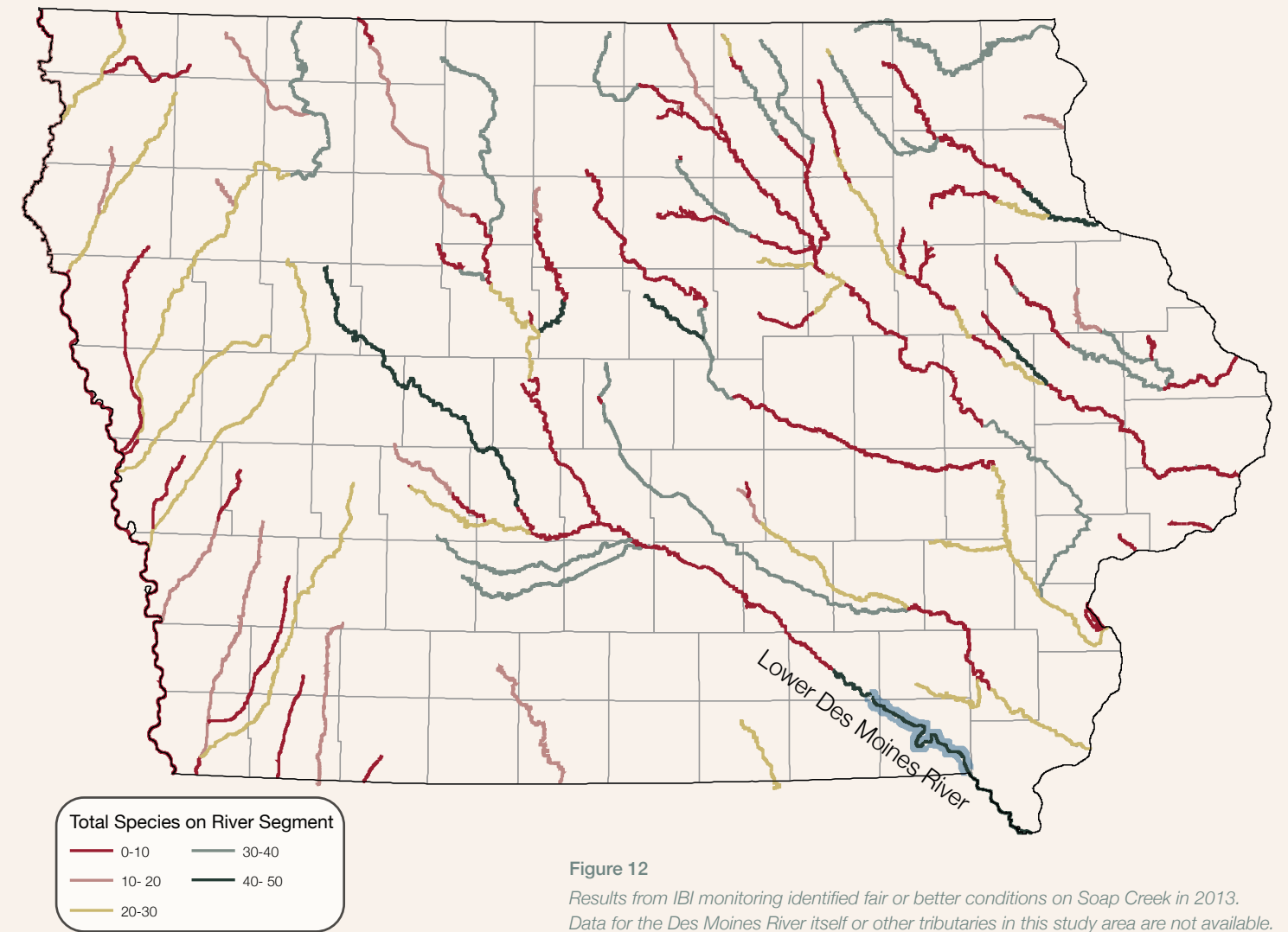
## Aquatic Species

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 macroinvertebrates. Benthic macroinvertebrates 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.

Sampling densities on large rivers such as the Des Moines River tend to be low, due in part to a lack of “non-wadeable” sampling protocols. Samples from connected tributaries, such as Chequest Creek, Soap Creek, Fox River, Honey Creek, and Copper Creek, can be used as rough surrogates to discuss assemblages expected in the main river, but also do not provide some habitats that are likely key for big river species. 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 macroinvertebrate species on average were found in the lowland Surface ecoregion. The Des Moines River is located in the Central Irregular Plains ecoregion which had some of the lowest scores in comparison to other ecoregions in the state.



**Figure 11**  
2010 DNR fish species inventory from this segment of Des Moines River identified a range of 40-50 species on the water trail segment which is higher than average for all streams in its ecoregion.



**Figure 12**  
Results from IBI monitoring identified fair or better conditions on Soap Creek in 2013. Data for the Des Moines River itself or other tributaries in this study area are not available.

General fish species maps generated by Iowa DNR in 2010 as a part of the Iowa Dams Plan suggested Des Moines River in Wapello and Van Buren counties is part of a segment where 40-50 fish species have been observed in biologist sampling efforts (Figure 11). Because of connectivity with the Mississippi River, big river species are present.

The most recent detailed inventory assessments of benthic macroinvertebrate and fish on the Des Moines River in Wapello and Van Buren counties was not available for the main channel. The tributary known as Soap Creek, which

converges at Eldon, had a score of “fair” for both benthic macroinvertebrate and fish near the confluence with the Des Moines River (Figure 12). Macroinvertebrate monitoring near Keosauqua on the Des Moines River in falls of 2012 and 2013 yielded poor counts under poor conditions in which substrates were covered in algae mats. It should be noted that those surveys were conducted at the ends of severe drought seasons. The Iowa DNR mussel survey from 2013 had no data for mussels in the Des Moines River.





## Birds Species

Breeding birds are of great interest to many Iowans. The Breeding Bird Atlas 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 (BBA) has been compiled twice in Iowa with the most recent compilation from 2008 to 2012.

Birds may also be listed on the “Endangered and Threatened Plant and Animal Species.” A species may be listed as an ‘endangered species’ if it is in danger of extinction throughout all or a significant part of its range; ‘special concern species’ if problems of status or distribution are suspected, but not documented, and for which no special protection is afforded under this rule; and ‘threatened species’ if a species is likely to become an endangered species within the foreseeable future. Iowa’s Species of Greatest Conservation Need (SGCN) list includes all Threatened, Endangered and Special Concern species as well as those with low or declining populations and are in need of conservation actions.

Four study blocks were located on the Lower Des Moines River in both the 1985-1990 Breeding Bird Atlas I and the 2008-2012 Breeding Bird Atlas II. A total of 22 BBA II study blocks were located in the watershed study area. The BBA II identified a total of 113 species in the riparian corridor blocks and 129 in the watershed study blocks. Of these, 26% (29) of riparian block species and 32% (41) are included on Iowa’s SGCN. *Table 16* details all species identified in the study area as well as those included on the Endangered and Threatened Plant and Animal Species List.

Species	Endangered Species	Threatened Species	Special Concern Species
Acadian Flycatcher			
American Woodcock			
Bald Eagle			Y
Barn Owl	Y		
Bell’s Vireo			
Black-Billed Cuckoo			
Blue-winged Warbler			
Bobolink			
Broad-winged Hawk			
Brown Creeper			
Cerulean Warbler			
Chimney Swift			
Common Nighthawk			
Dickcissel			
Eastern Meadowlark			
Field Sparrow			
Grasshopper Sparrow			
Henslow’s Sparrow		Y	
Kentucky Warbler			
Least Flycatcher			
Louisiana Waterthrush			
Northern Bobwhite			
Osprey			
Red-headed Woodpecker			
Sedge Wren			
White-eyed Vireo			
Willow Flycatcher			
Wood Thrush			
Yellow-billed Cuckoo			

**Table 16**

*Of the 85 birds on Iowa’s Species of Greatest Conservation List, 33 have been identified as breeding on or near the Lower Des Moines River by the Breeding Bird Atlas Project.*

*Pathfinders RC&D Event: Paddling Back in Time—First Encounters on the Lower Des Moines River. The historic Lockkeeper’s House is seen in the distance.*

## Visual Resources

On the Des Moines Water Trail, paddlers are treated to a variety of mostly pleasant scenery. While the average bank height is 8-10 feet at a moderate water level, the range is from floodplain to 100-foot wooded bluffs. Up and down river of Keosauqua, mainly where Lacey Keosauqua State Park borders the river, rock outcroppings are common and scenic.

There are also crop fields and pastures within the viewshed but those are uncommon and much of the trail is tree-lined.

The river itself is fairly wide with expansive vistas in the straight portions. Other parts of the river have large sweeping bends.

Wapello County Conservation Board has a comprehensive environmental education program, offering a variety of programming to schools and the general public that cover both natural resource topics and recreational skills training. Wapello CCB hosts paddling events each year on the Des Moines River upstream of the water trail. They publish a newsletter and have a website. Van Buren and Davis County conservation departments do not have environmental education programs. Extending the water trail upstream to connect with Ottumwa’s trails network may offer opportunities for greater collaboration between multiple agencies to fill gaps and solve problems as stated earlier in this report.

Wapello County’s Pioneer Ridge Nature Center (3.9 miles from the river) features indoor exhibits about natural resources. There may be an opportunity to promote and interpret elements of the water trail there.

Kiosks are located at each water trail access (except for Eldon) but currently have just water trail and area maps. There are interpretive signs at Ely Ford Crossing in Lacey Keosauqua State Park and in the river front park at Keosauqua.

The Villages of Van Buren, a tourism organization, maintains a website with information about attractions and some background on historic sites. They also host events, like the Scenic Drive, Bike Van Buren, and others. They should be consulted before any major water trail events are planned for the area.

The Villages Folk School sponsors classes which include some nature and history oriented themes, such as bird watching. The classes are usually held at Bentonsport which is one of the water trail access areas.

In 2012-2013 the University of Iowa Office of the State Archaeologist developed an interpretive booklet about the history of the Lower Des Moines, *A River of Unrivaled Advantages: Life Along the Lower Des Moines River* (Haury-Artz, 2014).





# Water Trail Potential

## WATER TRAIL THEME

The Lower Des Moines River Water Trail has several elements setting it apart from all others presently under study in Iowa. Destination-level attractions already center primarily around living history, rural culture, and abundant public lands rich with scenery and varied recreational opportunities. The water trail can help the river become better connective tissue among the riverside villages and public areas. Two types of activity hubs emerged as data was gathered and analyzed: human history hubs and outdoor recreation hubs. Local stakeholders are encouraged to consider the following potential themes as they develop a common vision for the water trail to enhance local livelihoods and quality of life.

### Theme 1:

Encourage human history elements revolving around the river, including the steamboat, milling, pottery and pre-settlement eras.

### Theme 2:

Encourage historic “community texture” through a spirit of preservation of the many important historic and cultural sites, while ensuring any new development enhances each community’s unique “feel.”

### Theme 3:

Encourage multi-day paddle trips, using Keosauqua as an overnight stop. This riverfront town has everything visitors need within blocks of the access: lodging, restaurants, convenience store, etc.

### Theme 4:

Help visitors understand the significant variety and quality of recreation via “packaged” experiences such as guided and/or self-guided river tours, driving routes, multi-sport adventure weekends, and overnight accommodations.

### Theme 5:

Focus major and minor infrastructure improvements on four “hubs” that enhance land-water connections among accesses, towns, and public areas.

### Theme 6:

Develop workarounds for challenges created by water-level fluctuations

### Theme 7:

Engage the local communities in volunteer opportunities that bring greater awareness and appreciation of cultural and natural resources within the river corridor and at the same time further the understanding of these resources among professional organizations and agencies.

**Pathfinders RC&D has been hosting water trail events with an educational component. They also maintain a website for the water trail: <http://www.desmoinesriverWT.com>. A summary of the programs from 2012 to 2014 is listed below:**

*Interpreting History Along the Des Moines River Water Trail*  
Indoor presentation by Lynn Alex and Cindy Peterson, University of Iowa Office of the State Archaeologist. Topics covered included the history of the Lower Des Moines River and findings from various archaeological investigations in the area (74 attendees).

*Des Moines River Improvement Project*  
Indoor presentation by historian Dr. Rick Woten about the History of the Des Moines River navigation project which was planned from the mouth of the Mississippi River to the fork of the Raccoon Rivers in the mid-1800’s (43 attendees).

*History on the River: Pioneer Potteries on the Des Moines River*  
Tour of the Bonaparte Pottery with owner Marilyn Thompson followed by a presentation by Cherie Haury-Artz, University of the State Archaeologist on the history and importance of potteries in Iowa (40 attendees).

*Paddle Round the Big Bend: Archaeology and Geology on the Des Moines River*  
Paddling trip with presentations along the way by Cherie Haury-Artz, University of Iowa Office of the State Archaeologist and Joe Artz, Earthview Environmental, Inc (21 attendees).

*Paddling Back in Time: First Encounters on the Lower Des Moines*  
Paddling trip with presentations along the way by Lynn Alex, University of Iowa Office of the State Archaeologist. Topics covered included the history of lowaville, loway occupation and the Des Moines River locks & dams (14 attendees).

*Wet and Wild: Critters on Iowa Rivers*  
Indoor presentation by wildlife biologist Dr. Jim Pease about wildlife along Iowa’s waterways (29 attendees).

*Wildlife Paddle*  
Paddling trip with presentations along the way by wildlife biologist Dr. Jim Pease about wildlife along Iowa’s waterways (14 attendees).

*Native American Village Life*  
Outdoor presentation held on the banks of the river at Bentonsport. Presenter Therese Cummisky, Jefferson County Conservation naturalist, led the group of children and adults through a series of hands-on activities based on Native American life. Activities included corn grinding, preparing hides, weapon building and atlatl throwing (17 attendees).





## Existing and Proposed Water Trail Experience Classifications

Determining experience classification for any given water trail segment (access point to access point) can be tricky. Criteria for decision making usually includes the following: Distance between accesses, hazards and a beginner's ability to avoid them, emergency access options along the segment, amenities available at access points, nearby lodging options, volume of existing use, scenic quality of the segment, interpretive opportunities, and off-river recreational options. However, probably one of the most important determinants is whether or not a land manager has the capacity and commitment to manage and maintain accesses to the required standards for each given classification. A gateway segment would likely require more maintenance than a recreational or challenge segment, for instance. See Appendix A for more detailed criteria.

We reviewed all water trail segments within the study area and considered the limiting and enhancing factors of each; we determined all but one to be recreational as they currently exist right now (Table 17). The segment between Douds and Austin Park was determined as challenge, mostly due to its length of ten miles, but also because it is a wide, open stretch of river that offers little protection from the sun or wind. Average current speed on a hot and humid day could make for a long, uncomfortable trip for a beginner. Among the seven recreational segments, four have the potential to be upgraded to gateway—an unusually high number for a 47-mile stretch of river (Table 17 and Figure 13). The potential Gateway segments offer unique activity cluster and theme possibilities that would be unique for a state designated water trail (Table 18).

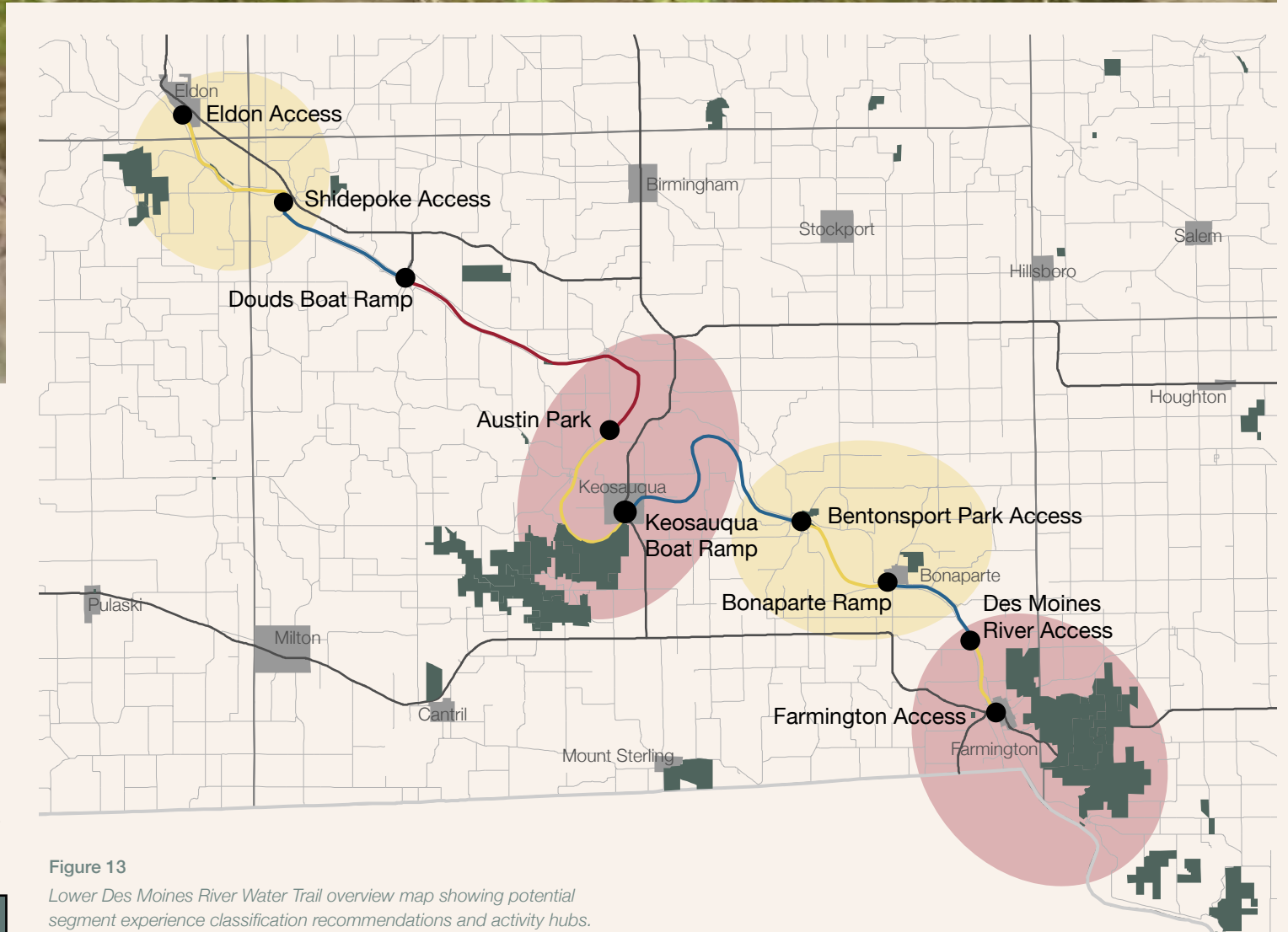


Figure 13  
Lower Des Moines River Water Trail overview map showing potential segment experience classification recommendations and activity hubs.

Segment Number	Launch to Landing	Existing Experience Classification	Potential Experience Classification	Special Focus
1	Eldon to Shidepoke	Recreational	Gateway	Historic & Cultural
2	Shidepoke to Douds	Recreational	Recreational	
3	Douds to Austin Park	Challenge	Challenge	Paddlecraft Campsite Opportunity
4	Austin Park to Keosauqua	Recreational	Gateway	Pedal Paddle Opportunity & Multi-use Trail Areas
5	Keosauqua to Bentonsport	Recreational	Recreational	Pedal Paddle Opportunity & Multi-use Trail Areas Historic & Cultural
6	Bentonsport to Bonaparte	Recreational	Gateway	Historic & Cultural
7	Bonaparte to Des Moines River Access	Recreational	Recreational	
8	Des Moines River Access to Farmington	Recreational	Gateway	Multi-use Trail Area

Table 17  
Existing and potential water trail classification for Lower Des Moines Water Trail.

	Pattern
#1 (Eldon Access to Shidepoke Access)	Human History Hubs: Human history is prevalent along the entire route, but these two segments snake through areas rich in historic architecture and significant archaeological sites. Museums and cultural attractions are within walking distance of accesses. All of the study area's three historic districts and more than 80% of all the properties listed on the National Historic Register are located within one mile of these three short river segments that total 17 river miles combined.
#5 (Keosauqua Boat Ramp to Bentonsport Boat Ramp)	
#6 (Bentonsport Boat Ramp to Bonaparte Boat Ramp)	
#4 (Austin Park to Keosauqua Boat Ramp)	Multi-use Trails and Outdoor Recreation Hubs: Large tracts of public land serve as trail hubs offering multiple opportunities for nearby outdoor recreational activities that include hiking, bicycling, horseback riding, modern and primitive camping, wildlife viewing, lake fishing, and flat-water paddling. Restaurants and shopping are close to accesses and facilities for the mobility impaired are available. In addition, there are several types of lodging facilities: bed and breakfasts, historic hotels, cabins, and a lodge.
#8 (Des Moines River Access to Farmington Access)	

Table 18  
Details on Activity Hubs for Potential Gateway Segments.





## Water Trail Segment Considerations

Issues and considerations for each water trail segment are organized by type. Types include recreation development, conservation/restoration/protection and interpretive. With one exception, issues and considerations are unique to each segment.

Streambank erosion and existing concrete debris and rubble are common issues on the entire study reach. Ongoing bioengineered stabilization throughout the segment is needed. Existing concrete rubble placed on streambanks causes four problems that warrant correction on a state designated water trail. First, broken concrete and rip rap is a short term fix only to the land on which it is placed; downstream streambank erosion is exacerbated as a result of the rubble or rip rap due to energy transferred to river water. Second, rubble and riprap placed on entire streambanks create dead zones that preclude use by any wildlife. Third, concrete rubble is perceived as dumped debris and serves to reinforce the notion that rivers are appropriate places to dump trash. Fourth, river users respond negatively to the visual appearance of rubble and rip rap covering streambanks. For the purposes of this assessment, only a placeholder referencing the need for attention to erosion or existing rubble on streambanks is placed in each segment where it exists as an issue.

## Segment #1 (Eldon Access to Shidepoke Access)

The short 4.7-mile route from Eldon to Shidepoke traverses portions of three counties (Wapello, Davis, and Van Buren) (Figure 14). The 1857 stone building known as the Lockkeeper's House prominently sits on the left side of, and is viewable from, the river about midway between the two access points. The riverside view reveals little topographic relief, but bluffs are visible in the distance on the north side while they abut the river on the south side at about the midway point.

This segment currently receives light use and there are no amenities at the hard-surface boat ramps, but the stretch is well-suited for beginning paddlers because it is short, the gradient is low and hazards are easily avoided. Emergency access is available via gravel roads that flank the river on both sides. No options for camping or lodging are nearby and interpretive opportunities are modest compared to other stretches.

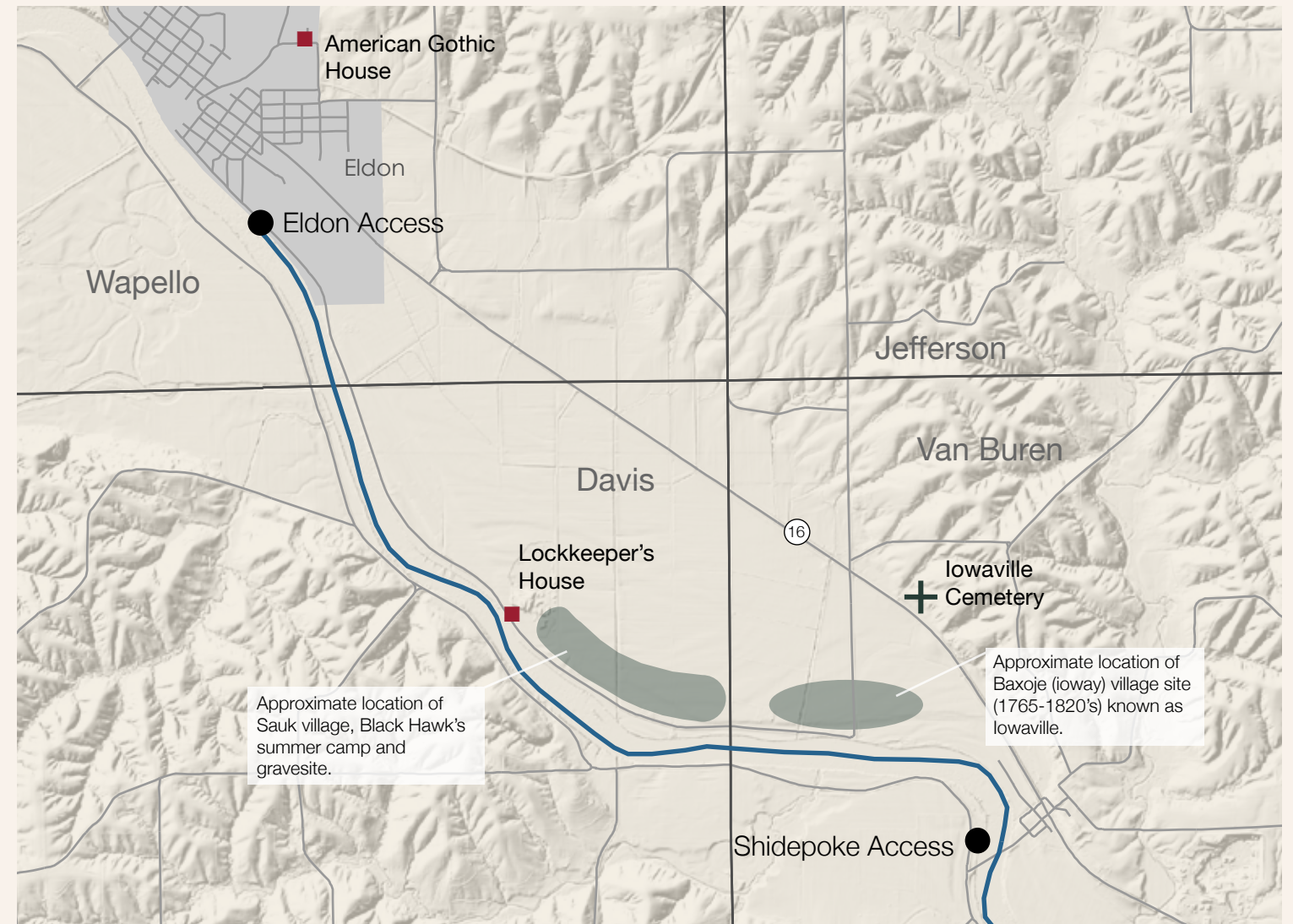


Figure 14  
Map of Segment 1: Eldon to Shidepoke



## Recreation Development Considerations

### Issue 1:

One of the biggest gaps for this segment compared with others is the lack of nearby lodging and camping facilities. Currently the nearest modern lodging is 15 miles away, and the nearest camping is more than 16 miles away. Considerations:

- Identify opportunities to add camping and lodging facilities within the segment corridor. The city of Eldon may offer options for modern lodging, and perhaps there is an option to add primitive camping at Eldon Wildlife Management Area. Another option is to acquire new land in the river corridor specifically to develop a campground.
- Consider “pedal-paddle” opportunities in which paddler and cyclists can use bicycles to run shuttles, or otherwise combine cycling with river trips from campsites or lodging locations as part of an interactive multi-sport weekend. Gravel roads parallel the river on both sides offering excellent opportunities to develop bike routes.

### Issue 2:

While the accesses for this segment have some of the lowest slopes and greatest number of parking stalls compared to other accesses within the study corridor, the slopes are still somewhat steep and there are no amenities (drinking water, restrooms, etc.) located nearby. Considerations:

- If the local desire is to develop this into a gateway segment, consider adding amenities, such as restrooms and drinking water, improving the accesses at each location, and reducing the slope of the Shidepoke access to 12% or less. If this idea is viable from management and maintenance standpoints, proceed with conceptual design in water trail master plan.
- Consider paired universally designed accesses that would allow for mobility impaired, elderly, and families with children convenient access to the river.

## Conservation/Restoration/Protection Considerations

### Issue 1:

Streambank erosion and placement of broken concrete. Considerations:

- See earlier discussion.

### Issue 2:

A large farm field adjacent to the river where the nationally significant archaeological site known as lowaville—a 40-acre area where the Baxoje (loway) village site is located—is in private ownership and continues to be in agricultural production. This site has ancestral ties to living members of the Baxoje (loway), Iowa’s namesake native nation. While agricultural production is currently the biggest threat, the site is well known to artifact collectors who continue to harvest artifacts from the surface and sub-surface area of the site. Considerations:

- Continue to pursue acquisition of the lowaville site through multiple avenues. Van Buren County Conservation Board voted unanimously to submit a 2015 REAP grant to acquire the property. DNR wildlife has agreed to manage the area if it is secured, provided the area is planted in native grasses and hunting is allowed. This has the mutual benefit of deterring artifact collectors.
- If the site is secured, follow OSA’s recommendation for preserving lowaville on page 13 of the Phase IA Cultural Resources Reconnaissance of the Des Moines River Water Trail Corridor through Portions of Davis, Jefferson, Van Buren, and Wapello counties, Iowa, 2014.

### Issue 3:

Sauk Warrior Black Hawk’s gravesite and a Sauk summer village site sit in the plow zone unprotected in a farm field adjacent to the river and just west of the lowaville site. A quarry operates next to the field and artifact collectors continue to harvest artifacts. There is need to properly identify the specific location of the burial site and summer village site in order to relocate or protect what remains. Considerations:

- Consider conducting a geophysical survey of Black Hawk’s gravesite and relocating artifacts or protecting the site in other ways.
- Consider conducting systematic pedestrian surveys in order to identify and relocate artifacts from the Sauk summer village site. A “pedestrian survey,” according to OSA, “involves public outreach, calling for artifact collectors to share information, generating volunteer participation in the survey itself, and eliciting landowner support for allowing walkovers of their cultivated fields”(Horgen, Peterson, 15)

### Issue 4:

There are four Euro-American cabin sites identified on the General Land Office survey maps located between Eldon and Shidepoke that have never been investigated. Considerations:

- Consider identifying and relocating these four GLO sites by conducting systematic pedestrian surveys.

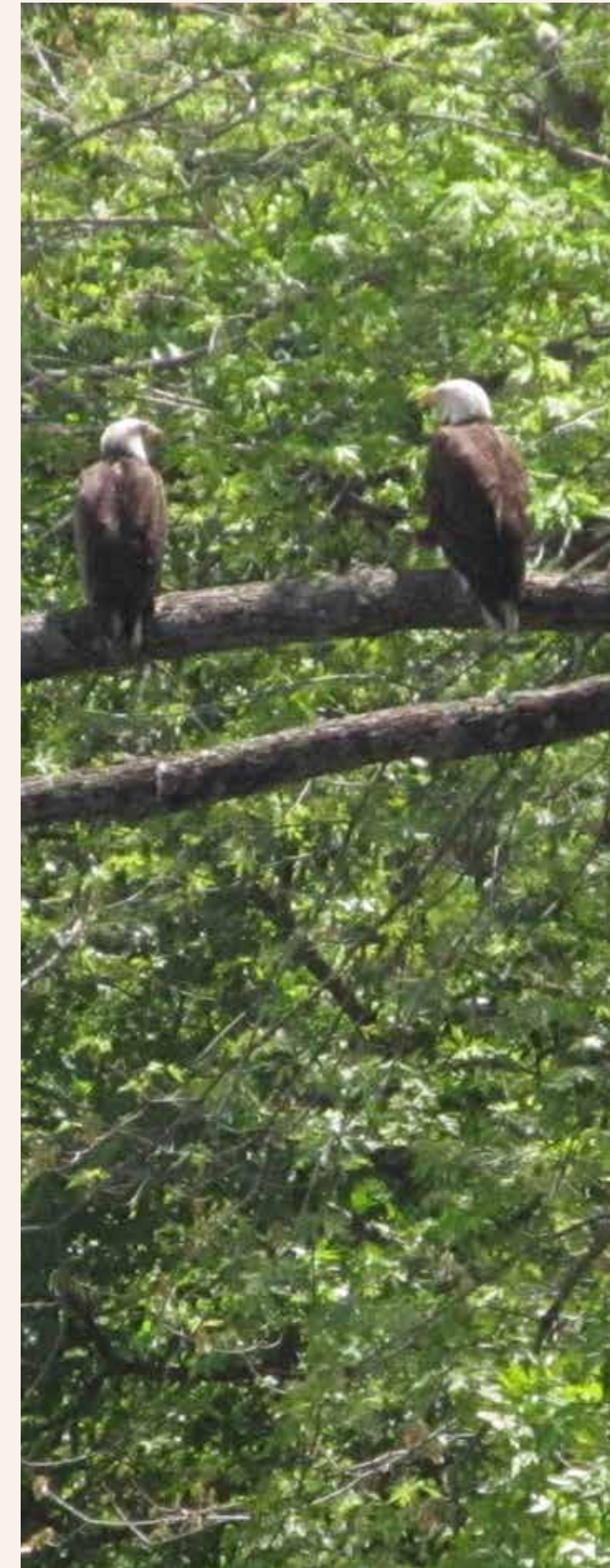
## Interpretive Considerations

The American Gothic House in Eldon is already an international destination attraction. There is also the potential to add cultural interpretive sites, such as the Lockkeeper’s House, lowaville Village site, and the lowaville Cemetery, creating multiple layers of connection among these areas for visitors.

1. A promising opportunity exists to tell the story of a period of great transition in American history along this segment by interpreting three separate but related sites. These sites are related by proximity and the westward advance of Euro-Americans from the east. A story rich in cultural history is waiting to be told.

- The lowaville Village site, one of the most significant Baxoje sites in the nation, was occupied from 1765 until the 1820s. As many as 1,600 Baxoje lived at the lowaville village. It’s an excellent opportunity to engage the public about our state’s namesake tribe.
- The Sauk village site and the Sauk warrior Black Hawk’s grave are located near the lowaville site.
- The pioneer town known as lowaville was also located in this vicinity. The lowaville cemetery is prominently located on a small bluff north of highway 16, less than a mile from the original lowaville Village site.

2. Opportunity exists to create a driving tour of interesting/significant pioneer cemeteries in the area. There are 20 cemeteries identified by OSA in the study area that could be surveyed and researched for significance that could lead to a driving tour of a select few.
3. While they are different types of historic properties, both the Lockkeeper’s House and American Gothic House in Eldon are significant sites in their own right. The American Gothic House has its own center and is already a destination attraction that has scheduled hours of operation. Any opportunity to cross-promote between this site and sites along the water trail shouldn’t be missed.
4. Consider exploring cooperative arrangements among Wapello, Davis, and Van Buren County Conservation staff for adequate capacity for interpretive programs in the area.







## Segment #2 (Shidepoke Access to Douds Ramp)

This is another short 4.6-mile segment of river from Shidepoke to Douds (Figure 15). This mostly straight segment currently receives moderate use. The scenery along this segment is less dramatic than others, with some rolling hills in the distance on the south side of the river, while a large area of flood plain lies along the north side. There are no amenities at the hard-surface boat ramps. That said, this stretch is well-suited for beginning paddlers because it is short and hazards are easily avoided. Emergency access is available via gravel roads that flank the river on both sides. No options for camping or lodging are nearby and there are no stand-out opportunities for interpretation.

### Recreation Development Considerations

No recreation development improvements are recommended.

### Conservation/Restoration/Protection Considerations

Issue 1: Streambank erosion and placement of broken concrete. Considerations:

- See earlier discussion

Issue 2: There are nine Euro-American cabin sites identified on the General Land Office survey maps located between Shidepoke and Douds that have never been investigated. Considerations:

- Consider identifying and relocating these nine GLO sites by conducting systematic pedestrian surveys.

### Interpretive Considerations

No specific stand-out interpretive themes are prominent along this segment, but general natural history/geology elements could be cited.

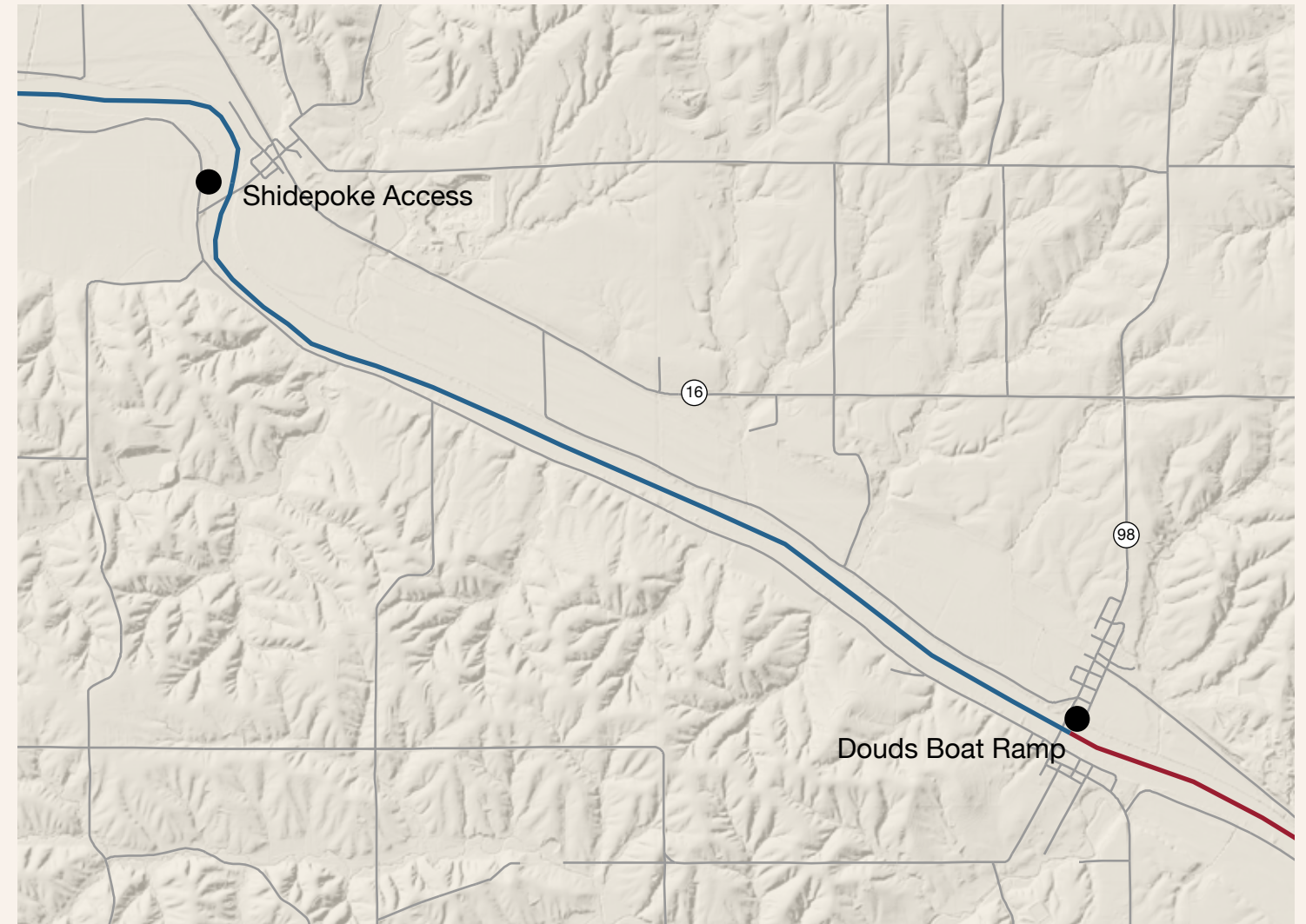


Figure 15

Map of Segment 2: Shidepoke to Douds





## Segment #3 (Douds Ramp to Austin Park)

This 10-mile segment is the longest of the eight segments under review (Figure 16). Although the segment currently receives moderate use, a challenge experience classification is recommended because of its length and width combined with certain weather conditions. Users report the view from the river becomes more scenic with each mile one travels downstream. Bluffs are mostly visible along the latter half of the segment, especially where the river bends southwest toward Austin County Park. This segment offers a unique opportunity to develop a paddlecraft campsite at Schulz Conservation Area. This 10-acre parcel of land, inaccessible by road and managed by Van Buren County Conservation Board, abuts the south side of the river at the midway point between the two accesses.

### Recreation Development Considerations

Issue 1: Good locations to add paddlecraft campsites on water trails across the state are not common. Where they exist, these campsites are well received and popular with the paddling community. A small strip of public land adjacent to the river but inaccessible by road is spaced approximately equidistant between accesses on the longest segment of this water trail, making an ideal location for a paddlecraft campsite. Considerations:

- Investigate the opportunity to develop a paddlecraft campsite at the Schulz Conservation Area. If this idea is viable from a development and management standpoint, proceed with concept design in water trail master plan.

Issue 2: See Issue 1 below for Segment #4 related to improving Austin Park.

### Conservation/Restoration Considerations

Issue 1: Streambank erosion and placement of broken concrete. Considerations:

- See earlier discussion

Issue 2: An agriculture field adjacent to the river located near the corner of Jewel Avenue and Hawk Drive—located on river left—is farmed to the banks, allowing for no buffer before the river. Additionally there is another section of land above Austin Park Access where there is no buffer. Considerations:

- Plant a perennial riparian buffer with plant species based on local habitat goals, soils at each location and present depth to water table.

Issue 3: There are 17 Euro-American cabin sites and one historic pottery kiln site identified on the General Land Office survey maps located between Douds and Austin Park that have never been investigated. Considerations:

- Consider identifying and relocating these 17 GLO sites by conducting systematic pedestrian surveys.
- Consider identifying and relocating the historic pottery kiln site 13B147 just south of Douds in coordination with OSA or other archaeological professionals. This survey will further the understanding of the historic pottery industry; Van Buren County had more potteries than any other county in the state.

### Interpretive Considerations

No specific stand-out interpretive themes are prominent along this segment, but general wildlife, natural history/geology elements could be noted.

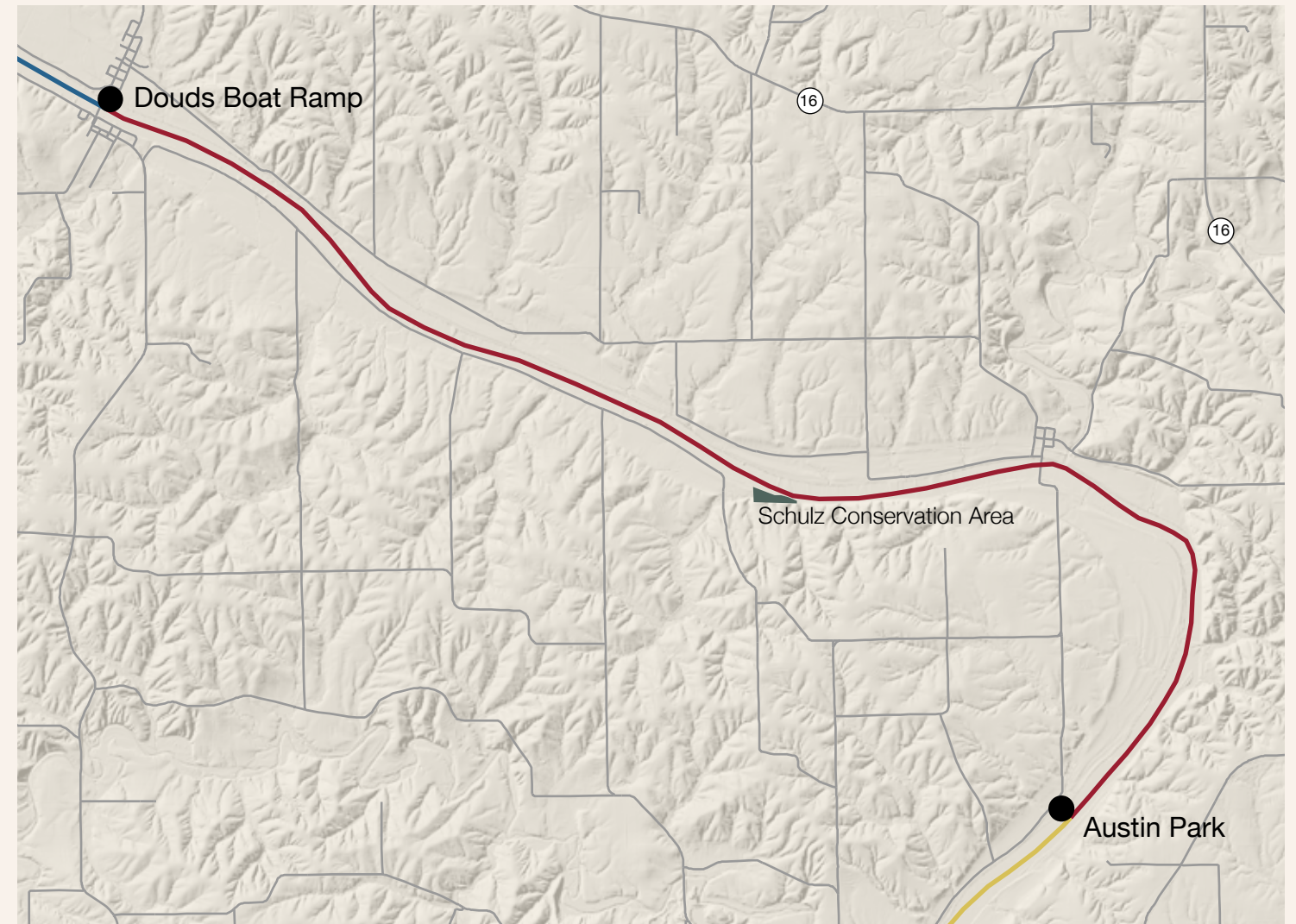


Figure 16  
Map of Segment 3: Douds to Austin Park





### Segment #4 (Austin Park to Keosauqua Boat Ramp)

This segment appears to have major potential as a destination recreational hub (Figure 17). This short, easy 5.8-mile segment already receives high use. There are primitive and modern lodging opportunities nearby and multiple opportunities for interpretation. The segment is also one of the most visually appealing within the study area with high bluffs on the south side of the river that appear immediately after launching. The bluffs become taller and denser with large sandstone outcroppings facing the river as the user approaches Lacey Keosauqua State Park. The bluffs continue on the right side of the river to the landing at Keosauqua. There are past and present trails in the area. Evidence supports the existence of a prehistoric overland trail connecting the Mississippi and Missouri rivers that crossed the Des Moines River at Keosauqua. Moreover, the Mormon Trail crossed the Des Moines River to the south at Bonaparte and continued west through present day Lacey Keosauqua State Park and Lake Sugema Wildlife Management Area. Today multiple trail types exist and others are under development making the area attractive to the outdoor adventurer. A combination of increased accessibility, amenities, interpretation, and services can leaven and simplify the quality of experience for the user. If gateway-level water trail development is considered, this segment is likely the best candidate.

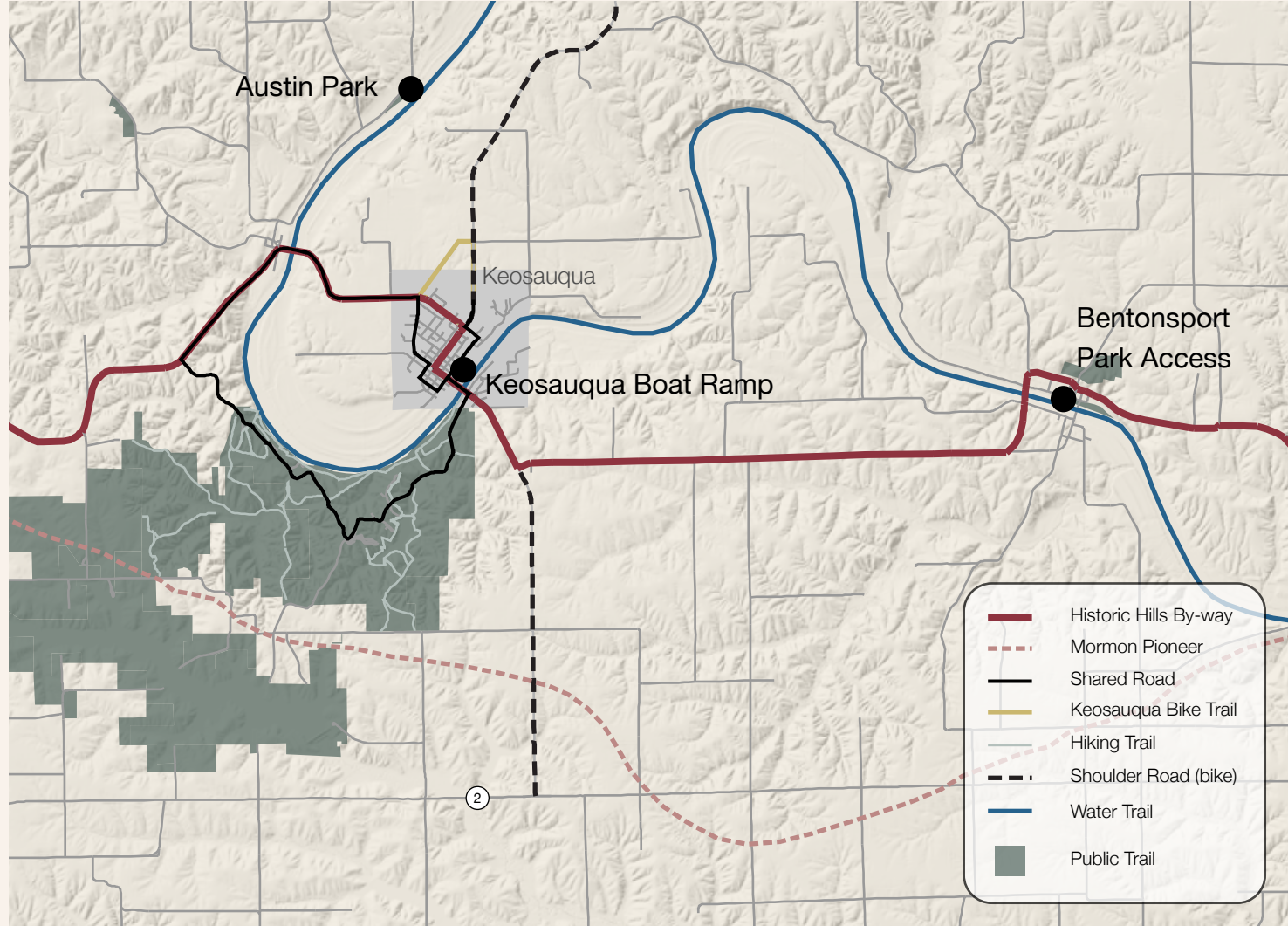


Figure 17  
Map of Segment 4: Austin Park to Keosauqua Boat Ramp

### Recreation Development Considerations

Issue 1: Austin Park previously provided modern amenities for campers and river users, but damage from ice-outs and high water events have left it without restrooms and only primitive camping. Considerations:

- Investigate potential to re-develop campground and restrooms possibly with the intent of improved revenue-generation for the county conservation board. Reduce ramp slopes at access to meet Gateway criteria and/or universal launch if paired with Keosauqua.
- Explore flood-resistant techniques used at other flood-damaged campgrounds in the past decade (i.e. Walnut Woods State Park). If this idea is viable from management and maintenance standpoints, proceed with conceptual design in water trail master plan.

Issue 2: Multiple layers of connection among Austin Park, Keosauqua, and Lacey-Keosauqua State Park remain to be drawn for visitors. Considerations:

- Attract livery business or incorporate livery operation as part of the daily operations of the county conservation board or state park.
- Consider “pedal-paddle” opportunities in which paddlers and cyclists can use bicycles to run shuttles, or otherwise combine cycling with river trips from campsites or lodging locations as part of an active multi-sport weekend. Minor expansions of “Share the Road” designated DOT routes could be the basis for routes in and among Keosauqua, the state park, and Austin Park.
- Develop interpretive river tours for history, prehistory, wildlife, and geology for future guided (public naturalists, private outfitters) and self-guided trips (brochure, phone app, etc.). Develop other back-up plans such as hiking state park trails and paddling Lake Sugema when river conditions prove too low or high.

- Market Keosauqua as unique place to overnight on a multi-day paddling trip. Keosauqua is ideally positioned in the center of two overlapping activity hubs, and multiple lodging opportunities are a short walk from the river.

Issue 3: At low flows, the stretch from Austin Park to Keosauqua can be a significant challenge, given the rocky nature of the stream. The bluffs of Lacey Keosauqua State Park arguably offer the most scenic vistas along the water trail, but the park and its camping amenities are disconnected from the water. Considerations:

- Investigate potential sites for a paddlecraft access location at the state park. Goals to discuss could include offering shorter river trips to Keosauqua; connect paddlers with camping amenities at the park, and to provide more options for viability of public or private rental services (inner tube, paddlecraft). If this idea is viable from management standpoints, proceed with conceptual design in water trail master plan.
- Investigate potential sites for walk-up access(es) from river where users can leave their craft and hike short loops for scenic overlooks or see major sites of interest (petroglyph, Ely Ford, etc.). If this idea is viable, proceed with conceptual design in water trail master plan.

Issue 4: Keosauqua Access is confusing, parking and traffic flow are not well defined, and the area is limited to only five spaces. There is one access for paddlecraft and another for motorboats, but both are in poor condition. If meeting Gateway criteria is a goal, the 20% launch slope is too steep to qualify. Considerations:

- Investigate the revamping of parking and access at Keosauqua. Consider Gateway and / or universal launch criteria if paired with Austin Park. If viable concept emerges, proceed with conceptual design in water trail master plan.





- Consider additional elements to the existing riverfront linear park, possibly in a way that echoes or enhances aesthetics, Keosauqua's steamboat history, and improves angling and event space. If this idea is viable, proceed with conceptual design in water trail master plan.

Issue 5: Ample lodging opportunities and public lands in the Keosauqua area lend themselves to outdoors and natural resources conferences and gatherings. Meeting space for such facilities may be limited or not communicated. Suggestions:

- Investigate potential to identify existing meeting space, convert meeting space from underperforming downtown Keosauqua facilities, and consider targeted marketing to these groups.

### Conservation/Restoration/Protection Considerations

Issue 1: Streambank erosion and placement of broken concrete. Considerations:

- See earlier discussion

Issue 2: There are 10 Euro-American cabin sites and two mill sites identified on the General Land Office survey maps located between Austin Park and Keosauqua that have never been investigated. Considerations:

- Consider identifying and relocating these 12 GLO sites by conducting systematic pedestrian surveys.

Issue 3: The only Oneota site in the study area is located on the north bank of the river, just slightly upstream of Keosauqua. Oneota village sites are typically large in area and not common along the Des Moines in SE Iowa. This one is likely related to a prehistoric overland trail that crossed the river at Keosauqua connecting the Mississippi and Missouri rivers. This site and six others occur along the river near a 60-acre farm field. The sites are threatened by eroding banks. Considerations:

- Consider further study of this rare Oneota Village site along with conducting a systematic pedestrian survey sooner than later in order to salvage what evidence exists before it is lost to the river.

### Interpretive Considerations

The area of Keosauqua has been host to different types of transportation routes from the prehistoric period to the present. Whether routes encouraged the establishment of villages, or were blazed to flee persecution, or developed out of a need to provide respite from our busy work life, these routes have connected people with place, leaving Keosauqua the wealthy benefactor of notable natural and cultural amenities.

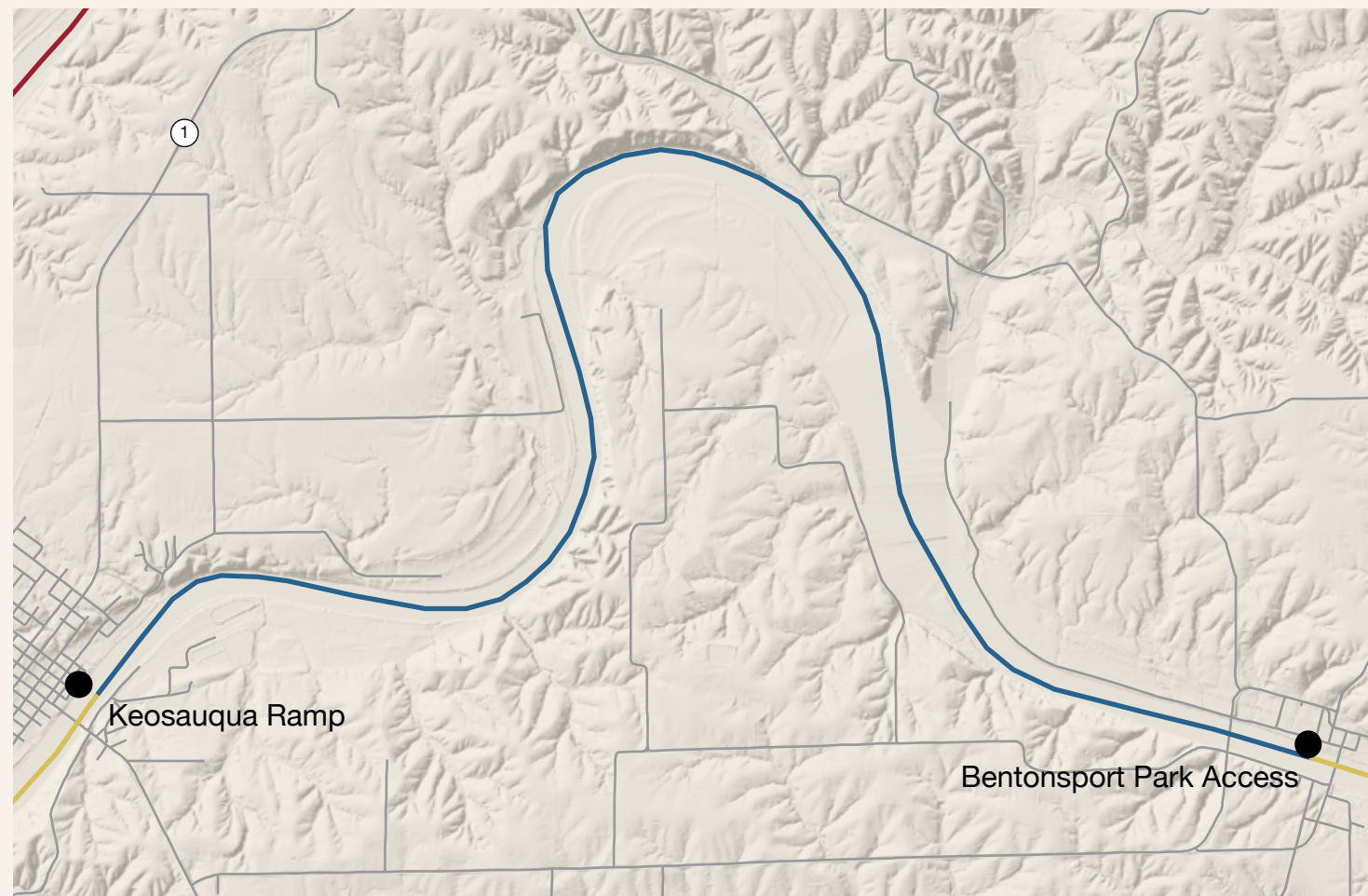
1. Worthy history and cultural elements that surfaced include:
  - The Oneota village site and its connection to the prehistoric overland trail that is believed to have once connected the Mississippi and Missouri rivers.
  - Remnants of the lock and dam structure still exist at Keosauqua and offer an opportunity to interpret river transportation in general, but in particular the 1858 Des Moines River Improvement to construct a series of locks and dams from the mouth of the Des Moines River to present day Des Moines.
  - The Thunderbird Petroglyph located in Lacey Keosauqua State Park would certainly be a draw if it were publicly known. There is an opportunity to interpret and discuss this site compared to other sites across Iowa and the nation. Currently, it is not listed in any public documents although many locals know about it.
  - There are 37 Civilian Conservation Corps structures within Lacey Keosauqua park that are worthy of being interpreted as part of a water trail project and cross-promoted through other water trail publications.
2. A walking tour of Keosauqua in pamphlet or brochure that discusses the significance of the buildings or structures on the NRHP would be useful. The courthouse is the oldest active courthouse west of the Mississippi.
3. Lacey Keosauqua contains a significant diversity of flora and fauna species compared to the rest of the area, and any effort to assist with interpretive materials for this park would certainly benefit water trail users.
4. Explore ideas to increase interpretive and/or outfitter capacities through position sharing among agencies, public-private partnership, and concessionaire agreements.



## Segment #5 (Keosauqua Boat Ramp to Bentonsport Boat Ramp)

This is the second longest segment of the water trail (Figure 18). While many of the elements desirable for a gateway segment exist here, such as scenic bluffs, abundant interpretive opportunities, nearby amenities, multiple lodging options, and many off-river recreation alternatives, this segment's length of 8.7 miles is a couple miles shy of being within the gateway range. However, because the segment already receives high-moderate use, a recommendation to improve parking, accesses, and add amenities is certainly reasonable. An additional access between Keosauqua and Bentonsport is not recommended unless a manager is identified.

Figure 18  
Map of Segment 5: Keosauqua Boat Ramp to Bentonsport Boat Ramp



### Recreation Development Considerations

Issue 1: While the distance may disqualify this segment from gateway classification, local users report the segment receives high-moderate use. However, the two access ramp slopes are the steepest on the water trail, and parking at each access can only accommodate five vehicles. Moreover, there are few amenities given the reported high use of this segment. Considerations:

- Consider implementing gateway style access treatment with ramp slopes 12% or less, adding additional parking, drinking water, and a restroom at Keosauqua. If gateway treatment isn't desired, provide signage/information to nearest water and restrooms in town.
- If gateway treatment is locally desired, consider a pair of universally designed accesses to accommodate the mobility impaired, elderly, and families with children.
- Market Keosauqua as unique place to overnight on a multi-day paddling trip. Keosauqua is ideally positioned in the center of two overlapping activity hubs, and multiple lodging opportunities are a short walk from the river.

### Conservation/Restoration/Protection Considerations

Issue 1: Streambank erosion and placement of broken concrete. Considerations:

- See earlier discussion

Issue 2: Agriculture fields adjacent to the river—on both sides—located at various points along this reach of the river that do not allow for a buffer. Considerations:

- Plant a perennial riparian buffer with plant species based on local habitat goals, soils at each location and present depth to water table.

Issue 3: There are eight Euro-American cabin sites identified on the General Land Office survey maps located between Keosauqua and Bentonsport that have never been investigated. Considerations:

- Consider identifying and relocating these eight GLO sites by conducting systematic pedestrian surveys.

Issue 4: The Des Moines River had the greatest concentration of potteries in the state with Van Buren County peaking at 40 kilns—more than any other county—through much of the nineteenth century. While a lot has been learned from the study of the Bonaparte Pottery, much is unknown about this industry and its relationship to lowans, the land, and other industries.

- Consider a systematic historical and archaeological investigation along the Des Moines River to aid in the documentation of various trends in the development of the pioneer pottery industry in southeastern Iowa.
- Consider conducting systematic pedestrian surveys in order to identify and relocate four historic pottery kilns located within a mile of Bentonsport in coordination with OSA or other archaeological professionals.

### Interpretive Considerations

1. A walking tour of Bentonsport in a pamphlet or brochure that discusses the significance of the buildings or structures on the NRHP would be useful.
2. The historic Mason House Bed and Breakfast displays marks on the southwest corner of their building showing the height of each of the historic floods from 1851 to 2008. This offers an opportunity to interpret the impacts of flooding in the area throughout multiple time periods.
3. Across the river from Bentonsport near the Bentonsport-Vernon Bridge on the south bluff top exists a section of bedrock-chert outcropping that was available for human exploitation throughout the Holocene period, and is the reason Archaic and Woodland peoples were consistently attracted to the site. The chert was likely used for stone tool manufacturing.





## Segment #6 (Bentonsport Boat Ramp to Bonaparte Boat Ramp)

This is another short, easy segment--only 3.6 miles in length (Figure 19). While emergency access is limited along the route, most other factors fall into the “gateway” realm. It currently receives high-moderate use; has many lodging options, both modern and primitive; the launch and landing have restrooms; lots of interpretive opportunities; and many alternative outdoor recreation opportunities are nearby. What is unique about this segment, in particular, is the abundance of buildings and structures on the National Register of Historic Places (NRHP). Forty two percent of all NRHP structures within this 47-mile study area are located in Bentonsport and Bonaparte, both of which have NRHP historic districts.

### Recreation Development Considerations

Issue 1: While this segment mostly fits the gateway classification, the two access ramp slopes are steep at 15% and 16% respectively, and the parking areas at each access can accommodate five vehicles or less. Considerations:

- Consider implementing gateway style access treatment with ramp slopes 12% or less as well as adding additional parking and drinking water at each location.
- Consider a pair of universally designed accesses to accommodate the mobility impaired, elderly, and families with children.

### Conservation/Restoration Considerations

Issue 1: Streambank erosion and placement of broken concrete. Considerations:

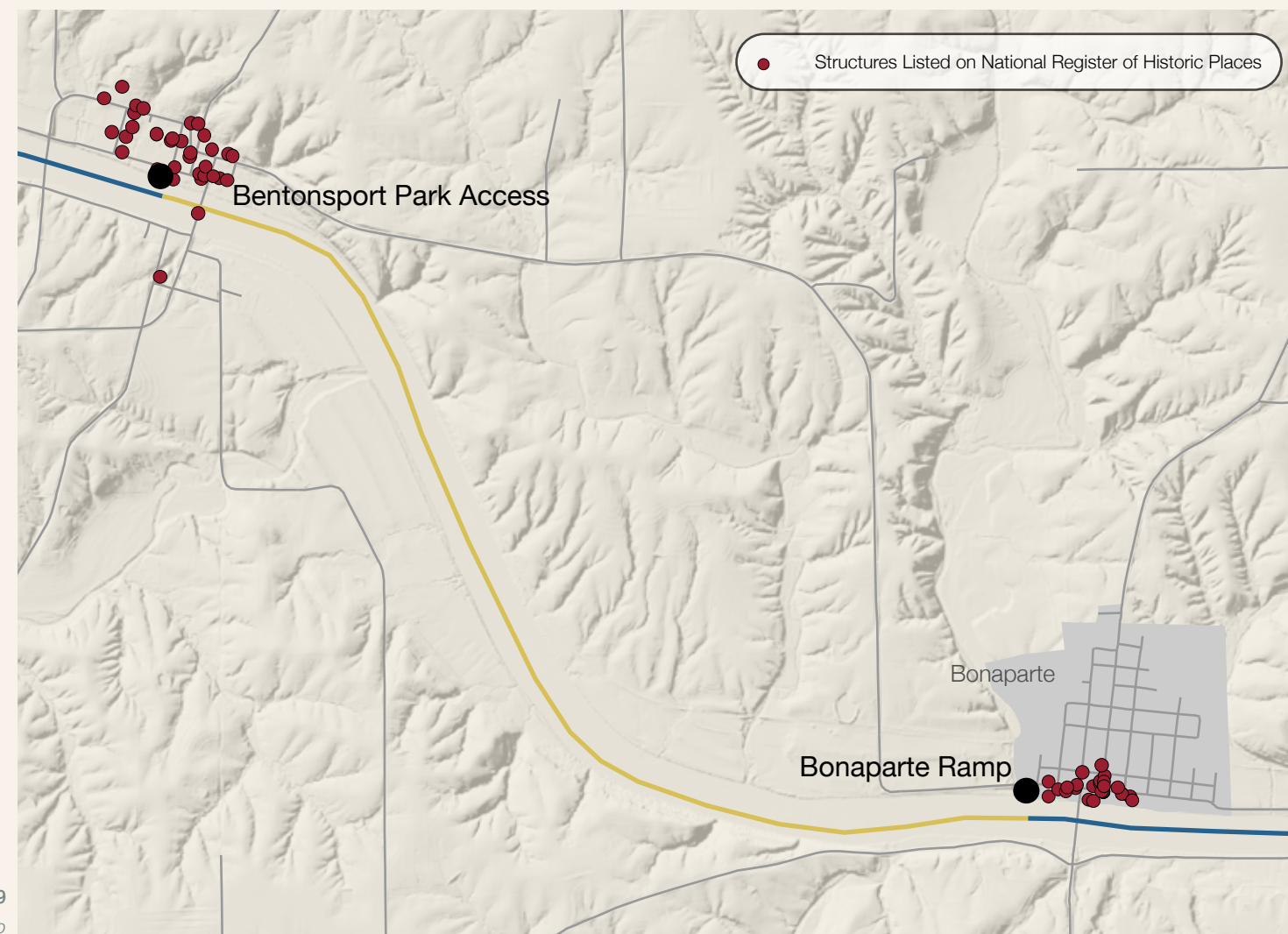
- See earlier discussion

### Interpretive Considerations

1. Consider developing a walking tour of Bonaparte in pamphlet or brochure form, complementing the virtual tour that is hosted on the Web at: <http://www.bonaparte-iowa.com/enjoy-your-virtual-tour-of-bonaparte.html>.
2. The historic Bonaparte Pottery offers an opportunity to interpret the pottery industry from its inception in Iowa to its decline. Van Buren County had the most potteries of any county in the state during the height of the pottery industry, and there are a couple known archaeological sites in addition to the Bonaparte Pottery within the study area.
3. The Meeks Mill building in Bonaparte offers an opportunity to interpret the milling industry. An old mill run structure still exists to the west of the building without any interpretation.
4. Lock and dam #6 could be included in interpreting river navigation.

Figure 19

Map of Segment 6: Bentonsport Boat Ramp to Bonaparte Boat Ramp







## Segment #7 (Bonaparte Boat Ramp to Des Moines River Access)

This 3.5 mile segment is somewhat challenging due to the remnants of the old dam just downstream of the Bonaparte Boat Ramp (Figure 20). However, it is a short distance and otherwise quite easy. It receives light use overall. Most of the attractions, lodging, and amenities are located in Bonaparte. None is near the takeout at the Des Moines River Access. An opportunity exists to add an access downstream of the dam remnants in order to allow beginners to put in at Bonaparte without having to navigate the rapids. This would also benefit whitewater enthusiasts who use this area for honing their skills; It is easier to exit the river downstream than having to paddle upstream to the current access. A new access would offer an option to upgrade the entire segment to gateway.

### Recreation Development Considerations

Issue 1: The remnants of the Bonaparte Dam can be intimidating for beginner paddlers, yet attractive to the more advanced. Considerations:

- Consider adding an additional access downstream of the remnants of the Bonaparte Dam that would allow for beginners to launch from Bonaparte and also offer an easier exit for whitewater playboaters or flatwater paddlers who would like to run the rapids. Consider universal design to accommodate the mobility impaired, elderly, and families with children.
- Consider adding warning signage at the Bonaparte Boat Ramp regarding the rapids.

### Conservation/Restoration Considerations

Issue 1: Streambank erosion and placement of broken concrete. Considerations:

- See earlier discussion

Issue 2: There are three Euro-American cabin sites identified on the General Land Office survey maps located between Bonaparte and the Des Moines River Access that have never been investigated. Considerations:

- Consider identifying and relocating these three GLO sites by conducting systematic pedestrian surveys.

### Interpretive Considerations

No specific stand-out interpretive themes are prominent along this segment, other than the Bonaparte area mentioned above, but general natural history / geology elements could be cited.

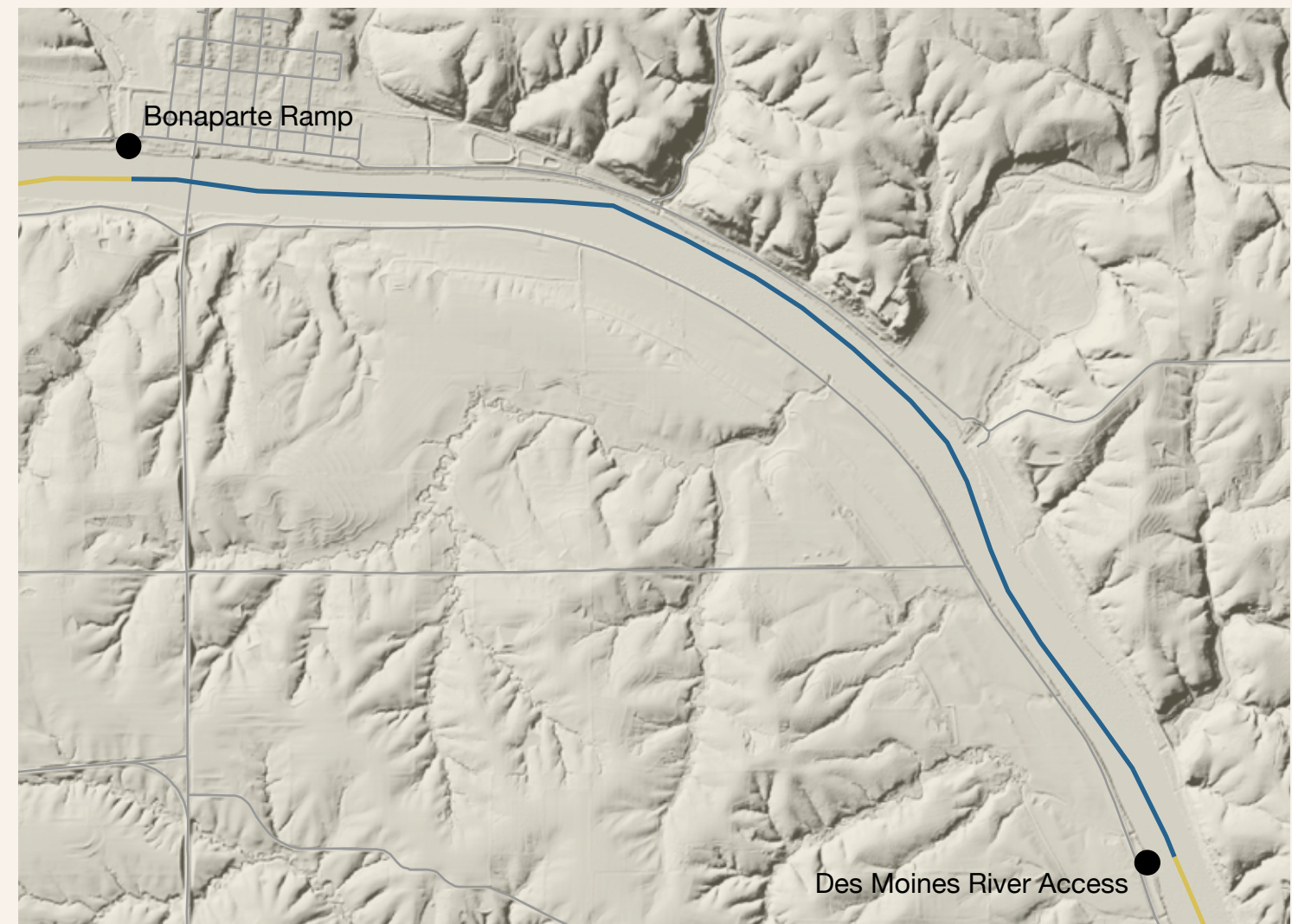


Figure 20  
Map of Segment 7: Bonaparte Boat Ramp to Des Moines River Access



## Segment #8 (Des Moines River Access to Farmington Boat Ramp)

The last segment of the water trail receives moderate use and is only 2.3 miles in distance (Figure 21). It is easy to navigate, there is excellent emergency access, modern and primitive lodging nearby, and there are many options for alternative outdoor recreation in the area. Shimek Forest is the stand-out attraction, offering more than 25 miles of multi-use trails, as well as hiking-only trails north of Highway 2 in Shimek State Forest, and add these routes to marketing materials.

### Recreation Development Considerations

Issue 1: While this segment mostly lines up with gateway classification, the two access ramp slopes are steep at 18% and 15% respectively, and the parking areas at each access can only accommodate seven or fewer vehicles. Considerations:

1. Consider implementing gateway style access treatment with ramp slopes 12% or less, adding additional parking, and putting in drinking water at each access.
2. If the desire exists to build a new access downstream of the remnants of the Bonaparte Dam, consider a pair of universally designed accesses to accommodate the mobility impaired, elderly, and families with children.
3. If consideration 2 is viable, consider not including the Des Moines River Access as part of the water trail and making the entire stretch from Bonaparte to Farmington a gateway segment.

Issue 2: Multiple layers of connection among Bonaparte, Farmington, and Shimek State Forest remain to be drawn for visitors, especially with regard to trails. Considerations:

- Consider “pedal-paddle” opportunities in which paddlers and cyclists can use bicycles to run shuttles, or otherwise combine cycling with river trips from campsites or lodging locations as part of an active multi-sport weekend. Working locally to add “Share the Road” designated DOT routes could be the basis for routes in and among Bonaparte, Farmington, and the state forest, that may increase numbers of both user groups.

- Develop interpretive river tour(s) for history, prehistory, wildlife, and geology for future guided (public naturalists, private outfitters) and self-guided trips (brochure, phone app, etc.). Develop back-up plans such as hiking state forest trails and paddling local lakes when river conditions prove too low or high.
- Consider inventorying/digitizing the many hiking-only trails located north of Highway 2 in Shimek State Forest, and add these routes to marketing materials.

### Conservation/Restoration Considerations

Issue 1: Streambank erosion and placement of broken concrete. Considerations:

- See earlier discussion

Issue 2: There are 13 Euro-American cabin sites and one Indian burial site identified on the General Land Office survey maps located between the Des Moines River Access and Farmington that have never been investigated. Considerations:

- Consider identifying and relocating these 13 GLO cabin sites by conducting systematic pedestrian surveys.
- Investigate and positively identify the one Indian burial mound noted on the GLO as part of a pedestrian survey with an archaeological professional.

### Interpretive Considerations

- Excellent opportunities exist to cross-promote the water trail with Shimek State Forest. Any interpretive needs at Shimek related to flora and fauna could be seen as needs for the water trail. In addition, highlighting alternative outdoor recreation opportunities in water trail marketing materials would be useful.
- Consider promoting and interpreting both the Honey War and Civil War sites at Croton and Battlefield at Athens historic site in Missouri.

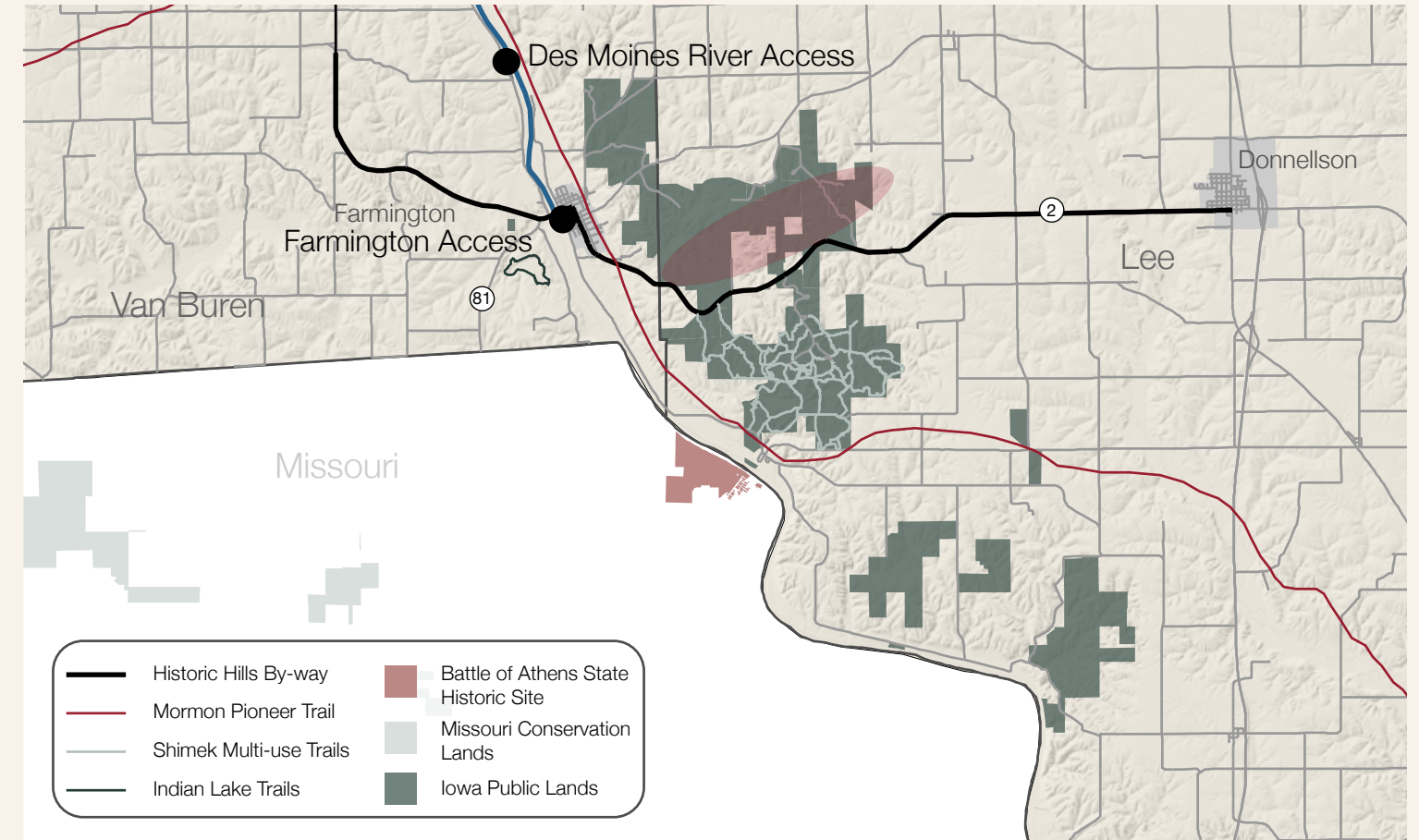


Figure 21  
Map of Segment 8: Des Moines River Access to Farmington Boat Ramp



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# 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.

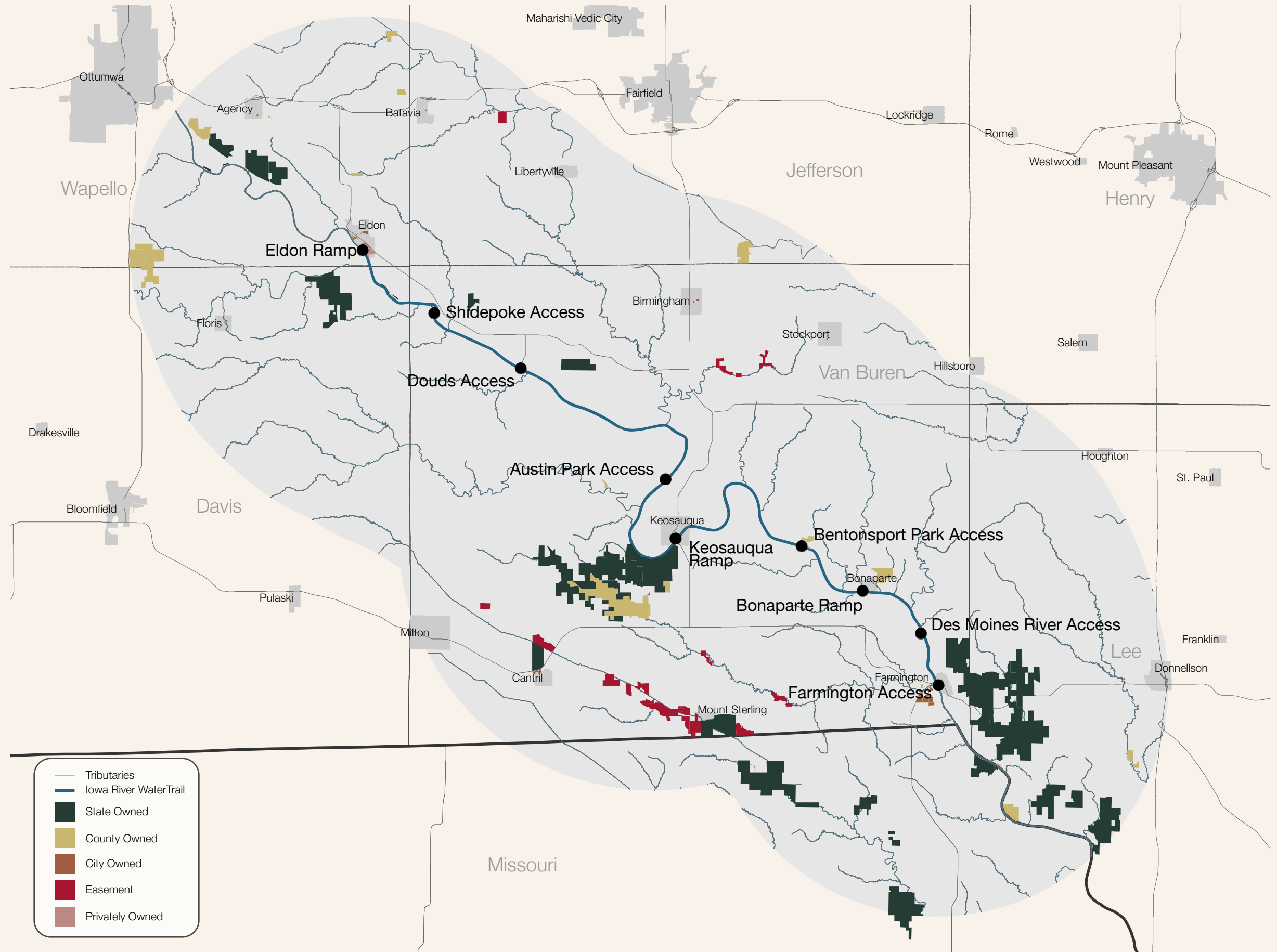


## Appendix C. Water Trail Experience Classification Summary

	Gateway	Recreational	Challenge	Wilderness
User Expectations	<ul style="list-style-type: none"> <li>• Most predictable, particularly for those with less experience</li> <li>• A paired launch and landing with ramped, hard-surface or well-maintained compacted aggregate</li> <li>• Slopes generally 12% and accommodating widths of 4' or greater</li> <li>• A readily enjoyable setting that will be attractive to new users</li> <li>• Exposure to few hazards relative to other segment types</li> </ul>	<ul style="list-style-type: none"> <li>• Requires some boat control</li> <li>• Intended for users with some experience</li> <li>• Low-head dam hazard signage present, as needed</li> <li>• Varied settings</li> <li>• Basic level of navigational aid available (maps, signage)</li> </ul>	<ul style="list-style-type: none"> <li>• User expects to manage risk in hands-on ways</li> <li>• Good boat control necessary</li> <li>• Launch and/or parking may be slightly to very difficult to use</li> <li>• Low-head dam hazard signage present, as needed</li> </ul>	<ul style="list-style-type: none"> <li>• Some degree of solitude and wildlife viewing</li> <li>• Paddling endurance and skill required</li> <li>• Launch and parking areas can be very undeveloped in context with the setting</li> <li>• Wayfinding signage not always present at accesses and on-river</li> <li>• Low-head dam hazard signage present, as needed</li> </ul>
Typical Development Goals	<ul style="list-style-type: none"> <li>• Exposing the greatest number of new users to water trails</li> <li>• Appropriate for extended families and groups of friends</li> <li>• Part-day to full-day trip opportunity</li> <li>• Strong emphasis on building user confidence through signage and ultra-easy launch and parking</li> <li>• Launches, parking, trails designed with Universal Design standards</li> <li>• High degree of environmental educational / interpretive opportunity</li> </ul>	<ul style="list-style-type: none"> <li>• Offers a typical Iowa water trail experience</li> <li>• Day-trip opportunity</li> <li>• Family and group experiences</li> <li>• Access points may be less developed compared with Gateway experience</li> <li>• Access surfaces may not be stable</li> </ul>	<ul style="list-style-type: none"> <li>• Day- and multi-day-trip opportunity</li> <li>• 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</li> </ul>	<ul style="list-style-type: none"> <li>• Day and multi-day-trip opportunity</li> <li>• Less development, more restoration and protection of habitats</li> <li>• May include parking in already impacted areas, rustic launches, and rustic remote campsites</li> <li>• Low-impact practices required in all water trails-related construction</li> </ul>
Accesses	≤ 6 miles apart	≤ 9 miles on average	Varies	> 9 miles
Amenities such as restrooms, running water, picnic areas, camping	<ul style="list-style-type: none"> <li>• Often available at accesses</li> <li>• Liveries, shuttle often operating</li> <li>• Wayfinding signage on roadways is more extensive to clearly identify driving route, turns, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• May be available but usually not as developed</li> <li>• Liveries, shuttle desirable</li> </ul>	<ul style="list-style-type: none"> <li>• May be available but usually not</li> <li>• Guided experiences may be encouraged</li> </ul>	<ul style="list-style-type: none"> <li>• Any facilities present, such as remote campsites, are minimal, primitive, and without signage</li> <li>• Guided experiences may be encouraged over rental</li> </ul>



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







CHAPTER 2  
WATER TRAIL  
VISION

LOWER DES MOINES WATER TRAIL



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## CHAPTER 2 WATER TRAIL VISION

**The reach of the Des Moines River between Eldon and Farmington has a long history of use by recreationists including paddlers, hikers and bird watchers. It also has unique history as the first interior river in the state inhabited by Euro-American settlers.**

The segment between Shidepoke Access in Selma and Farmington Access is currently designated as a State Water Trail by the Iowa Department of Natural Resources (DNR) River Programs. The proposed upstream extension to Eldon will be an important enhancement because of its linkage to nationally significant cultural sites and the community of Eldon generally. Van Buren County Conservation Board (VCCB) has agreed to be the water trail sponsor as a result of planning in 2013 – 2015.

Water Trail Theme. This water trail is a destination itself, rather than a stop on the way to somewhere else. The water trail theme celebrates the role of this portion of the Des Moines River corridor in the transportation of nationally significant cultural movements across the US. A likely prehistoric overland trade route as well as the well-documented historic Mormon Trail crossed the Des Moines River near Keosauqua. Steamboats on the Des Moines River were the sole method of transportation for immigrants and their household goods as well as commodities between the Mississippi River and Des Moines prior to 1860 when railroads were constructed. More recently, in 1919, the entire Des Moines River corridor from the Mississippi River up to Eldon was studied for public ownership by the State Park Commission. A park comprised of a narrow strip of land on both sides of the river for the entire length was proposed as well as larger parcels including today's Lacey-Keosauqua State





Park. Public ownership of the river bank and some adjacent parcels was believed warranted to provide public access to and recreation along the river, protect and restore streambank vegetation and for the unique cultural, geologic and biologic resources present. Today, two large tracts of public land bookend the heart of this water trail between Austin Park and Bonaparte.

Shimek State Forest and Lacey-Keosauqua State Park are significant because of their scale. Lacey-Keosauqua is one of the largest and the second-oldest state park while Shimek is the largest state forest. They both provide diverse additional off-water recreational opportunities for visitors including horseback riding, hiking, visiting prehistoric and historic sites, and flat water paddling. Also, Iowa's newest Bird Conservation Area was recently dedicated in this area indicating its importance for nesting and migratory grassland, savanna, and forest birds. Communities on the river, particularly Eldon, Keosauqua, Bentonsport, and Bonaparte have a strong historic connection to the river and are very engaged in this expansion of the State Water Trail. All parties are interested in enhancing use, tourism, conservation and protection of the river corridor.

Vision. The water trail sponsor shares the values of resource protection coupled with recreation held by the state program. They 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. 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. While the linear state park idea did not become reality in the 1920's, the sponsor sees the place today for a linear trail adjacent to the river. This would support future pedal-paddle use. A need exists locally for environmental education and interpretation and Iowa DNR River Programs is willing to partially support this enhancement. The permanent protection of key cultural and historic sites, including lowaville, is critical to enhancing local interpretation. An additional element for future interpretation is the Rose Garden within the foundation walls of Brown's five-story grist mill in Bentonsport. While the roses are old and historic, the mill itself was a significant historic site and remains un-interpreted. The sponsor is also hoping to build a relationship with the operations manager at Lake Red Rock to better understand water flow restrictions and what opportunities exist for flow adjustment during significant on-water recreational events held once or twice per year. The Villages of Van Buren functions as a public advocate for tourism and marketing of the region and the water trail. They have the skill needed to develop half and full day itineraries for visitors and other marketing materials which is a critical need.

Five of eight accesses are located in communities with developed facilities nearby while the remaining four are stand-alone rural access sites. The vision for these accesses includes reconstruction of some launches and the addition of near-launch amenities to accommodate use by people with a broader range of physical abilities. The majority of development and upgrades will occur between Austin Park and Bonaparte as this reach will have the greatest impact on the highest number of users. Other goals include minimizing maintenance by reducing erosion and deposition from high flows. Currently the river represents a classic Iowa version of a Recreational Experience Classification with the exception of one Challenge classification segment. These classifications will be maintained for the near future. During this time, organization will occur to enhance river management and safety, coordinate on-the-ground access management and complete access upgrades for the proposed near-future Gateway segment.

The water trail sponsor and the community of Keosauqua are interested in development of a Gateway Experience Classification in the near future. The 5.8 mile segment between Austin Park and Keosauqua matches the distance and difficulty standards for a Gateway segment. The established, rich resource and tourism base in this area further supports this classification. Enhancements would include access upgrades and river channel improvements to provide a more stable river edge. An additional Gateway segment between Bentonsport and Bonaparte is proposed as a future goal. Expansion of the water trail upstream through Wapello County is also a possibility for long term consideration.



# CHAPTER 3

# RECREATIONAL DEVELOPMENT PLAN

LOWER DES MOINES WATER TRAIL



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# CHAPTER 3 RECREATIONAL DEVELOPMENT PLAN

**The Lower Des Moines River Water Trail has abundant recreational opportunities. There are more than 27,000 acres of public natural areas within a 10-mile radius of the Lower Des Moines River Water Trail.**

Outstanding natural, cultural and recreational resources exist on these lands. Several large state owned areas -- Shimek State Forest, Lacey-Keosauqua State Park and Lake Seguma Wildlife Area -- offer trail opportunities to hikers, on-road cyclists and equestrians. Combined with outstanding visitor experiences in culture and history, the Lower Des Moines River Water Trail offers inclusive experiences for families and groups interested in broad recreational opportunities.

This project area was one of the first areas Euro-American settlers entered in what was to become known as Iowa because of navigation on the Des Moines River. As such, the river corridor includes many historic and cultural sites of importance. This water trail also includes four communities with city centers directly connected to the river. This offers unique opportunities to incorporate recreation into local culture and business. Strong evidence supports the existence prehistoric cultures that lived along this major tributary of the Mississippi River, as well.

From a geographic standpoint, this study area is located in the southeastern portion of the state. It is one of the more sparsely populated regions of the state. The U.S. Census 2010 indicated approximately 190,473 people lived within 25 miles of the Lower Des

Moines River water trail. The largest population center nearby, Ottumwa (population 24,682 in 2014), is located sixteen miles from the start of the water trail. Keosauqua is the largest city on the water trail with a population of 995 (2014). The city of Eldon, which has been added as a beginning point of the water trail, has a population of 915. The area is steeped in history, and the architecture and character of the cities along the river reflect early settlement with many brick buildings and historic structures.

Tourism is an important part of the local economy in this region. Many visitors come to the area to enjoy the historic sites, natural resources, or one of the many annual events such as Bike Van Buren. The region is fortunate to have an organization, the Villages of Van Buren County, established to coordinate and promote activities directed toward improving the economic conditions in Van Buren County. They coordinate events through-out the year highlighting the area and are an integral part of economic development in the area.

Along with Van Buren County Conservation and the Villages of Van Buren, the four communities managing the river accesses played an active role in the preparation of this plan. Their commitment to their river-edge park facilities demonstrate a continuing level of support for providing recreation amenities at these locations.





## Water Trail Planning Area

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 trail 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 Des Moines River beginning in Eldon on the upstream end to Farmington (Figure 1). The municipal boundaries of the five communities and several large state-owned public recreation land areas are important nodes on this water trail. This recreational plan serves three purposes:

- To provide a contemporary summary of all recreational plans near the Lower Des Moines River and integrate them with existing and proposed water trail infrastructure
- To develop design development level 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 Lower Des Moines River in ways that support successful, broad-based public access to the river for recreational purposes. Infrastructure designs that work with the river system hydrologically are critical to the nature of state water trails. 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 and economic development
- 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.

# 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.

## 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 Des Moines 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).

Figure 2

Iowa regulations providing the framework for use and behavior of public waters are constantly evolving. These interpretations were developed in late 2016 with assistance from the Iowa Attorney General's Office and Iowa DNR staff.

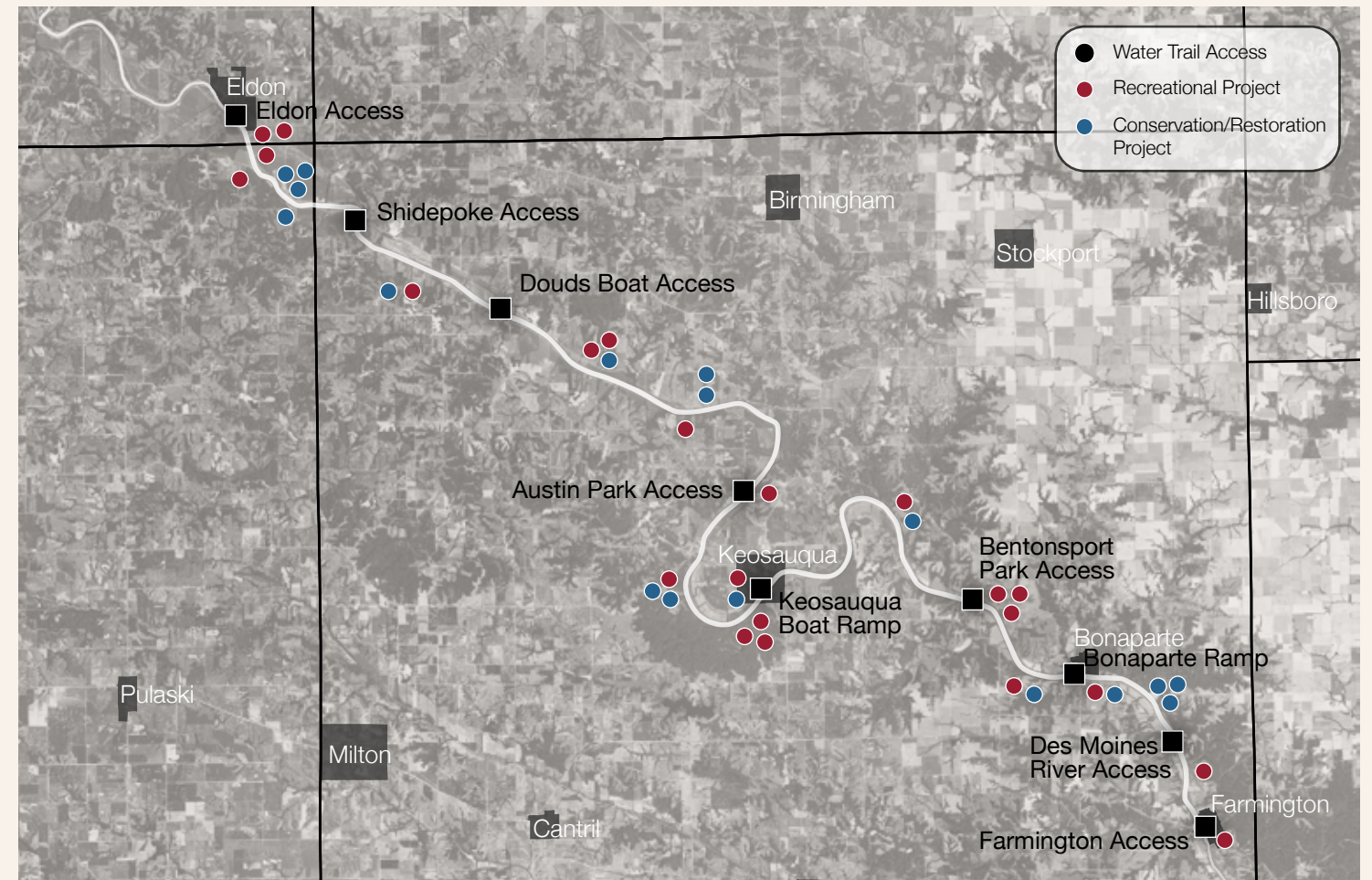


Figure 1  
This plan included both recommended recreational and conservation projects.

## 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 321.14.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 developed in late 2016 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.

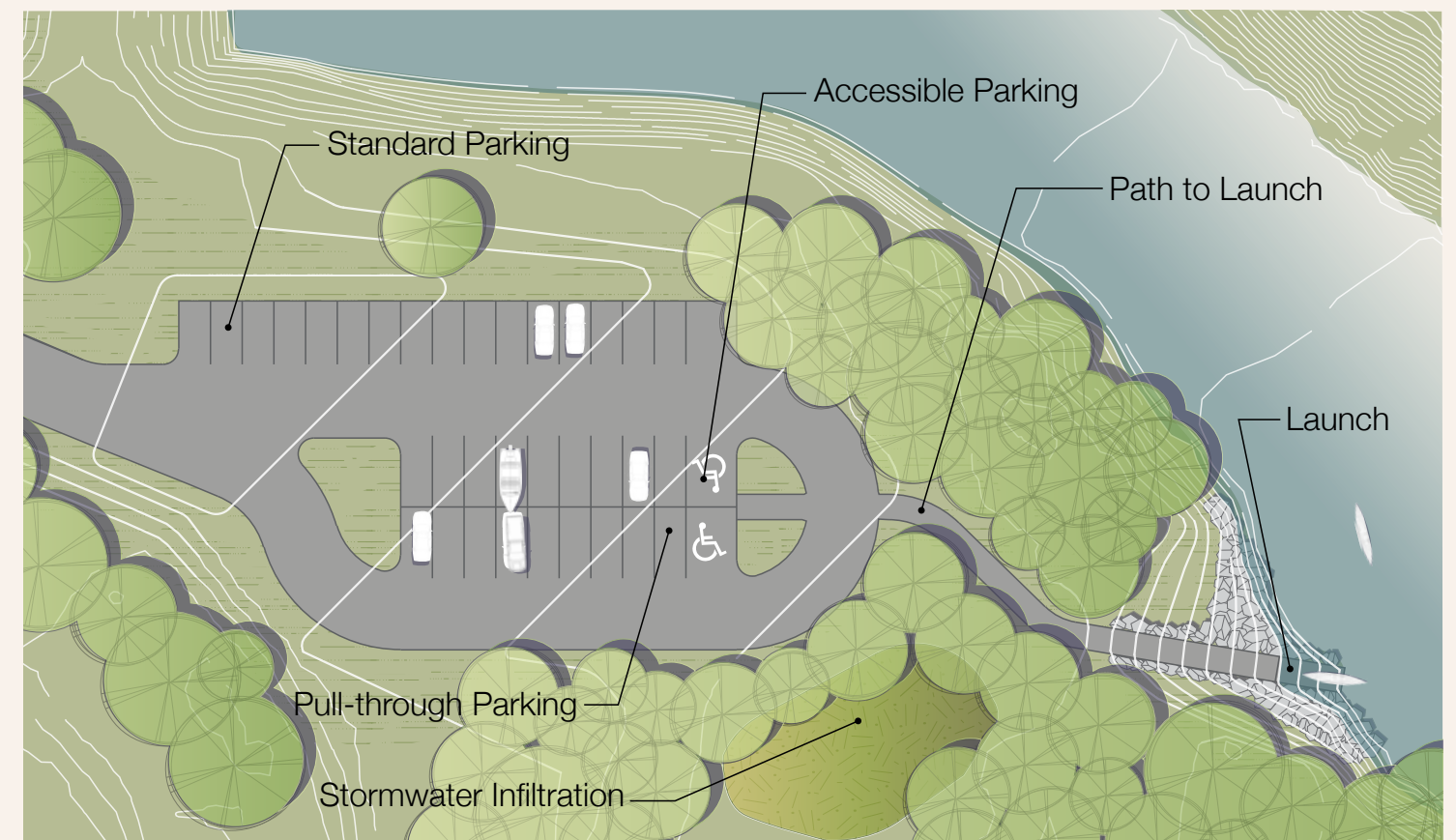


Figure 3

*Components of a typical river access area*



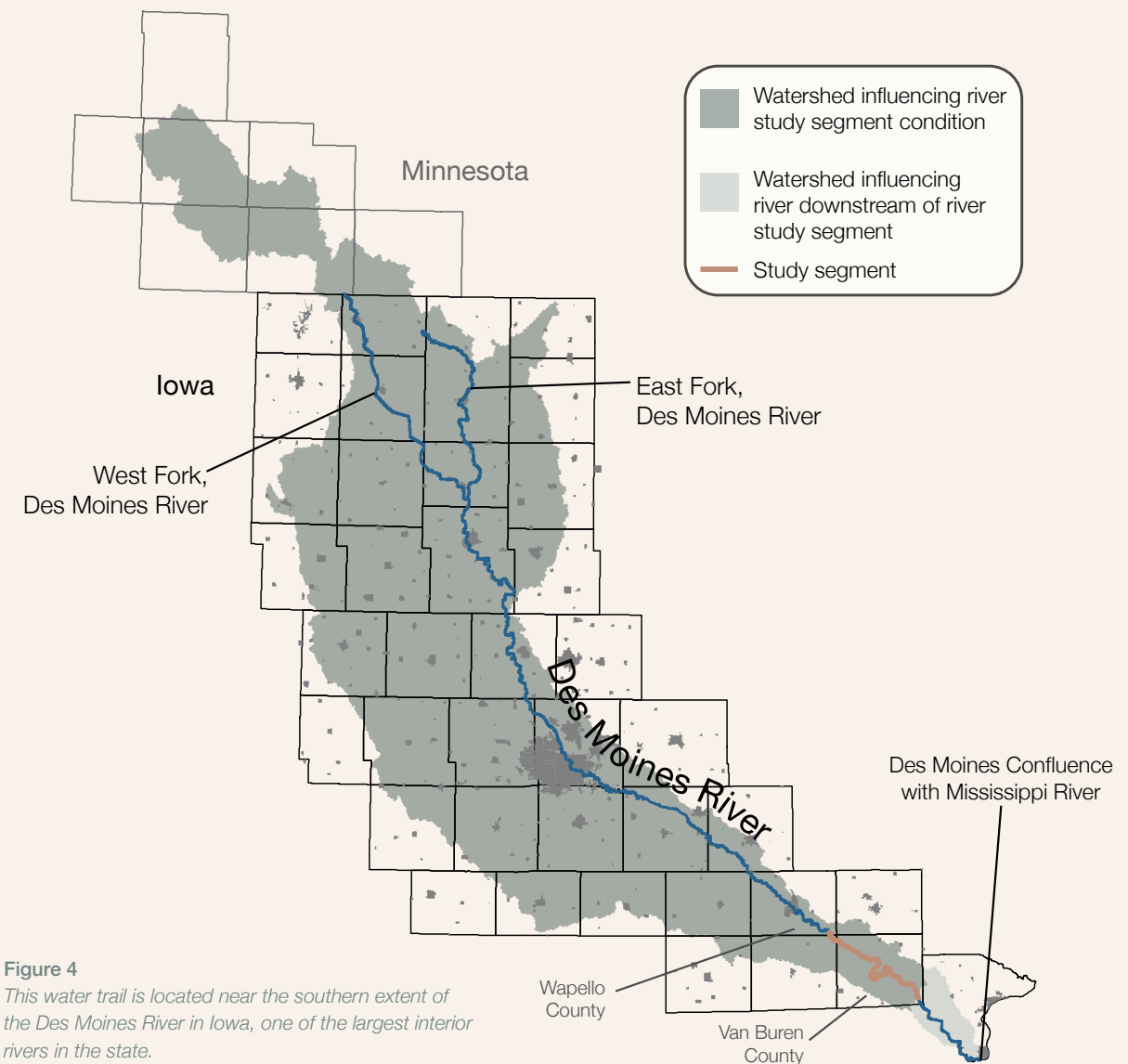


# The Lower Des Moines River Between Eldon and Farmington

This segment of the Des Moines River is situated in the lower portion of the watershed. The drainage basin or watershed area draining into the water trail portion of the Des Moines River is 9,092,130 acres in size (Figure 4), representing almost all of the total watershed. Only a small portion (4%) of the watershed is located in Wapello and Van Buren Counties. Many tributaries enter into the Des Moines River within the study area. Some of the largest are Soap Creek, Chequest Creek, Lick Creek, Reeds Creek and Big Indian Creek.

The Des Moines River in Wapello and Van Buren counties is classified a “meandered” stream. The entire Des Moines River was classified as such in original public land surveys completed before Iowa received statehood. Meandered status generally allows river users access on-foot to channel bottoms and stream banks up to the ordinary high water mark. The Lower Des Moines in the study area is a wide and open river with typical channel width of 650 feet. Upstream of Austin Park, the Des Moines River’s gradient averages less than 2 feet per mile in the study reach, resulting in a relatively slow river at average flows. The river bottom tends to be sandy. The river changes about five miles upstream of Austin Park and moves into a bedrock-controlled valley. The gradient increases to 2.5 feet per mile. The channel bottom materials are more diverse in this area, ranging from sandy to rocky riffles, and includes one set of rapids at Bonaparte caused by dam debris. The scenery changes as well. The undulating pattern of hills and valleys offer views of deeply forested banks and 50 to 100-foot high limestone and sandstone bluffs. Smaller bluffs offer bedrock benches that jut out over the river. The segment from Austin Park to Bentonsport is particularly picturesque and passes by Lacey-Keosauqua State Park.

Water levels fluctuate greatly not just because of precipitation, but also because flows are controlled by the U.S. Army Corps



**Figure 4**  
This water trail is located near the southern extent of the Des Moines River in Iowa, one of the largest interior rivers in the state.

of Engineers at the Red Rock Dam whose primary purpose is flood control, not downstream recreation. This has proved to be problematic for planning public river events.

This portion of the river is used for canoeing, kayaking, motorized boating, swimming, fishing, hunting and tubing. No dams occur in the water trail although two locations show signs of rubble from previous dams. The rubble below the

Bonaparte Access can cause some rough water which may be difficult for beginner paddlers to navigate. There are seven sets of bridge piers that can cause debris build-up and erratic water currents and for those reasons should be avoided by paddlers. No large logjams exist that cover greater than 30% of the river. Silver carp (Asian Carp, big-head carp) can leap out of the water next to a boat and startle or strike people and are considered a hazard.



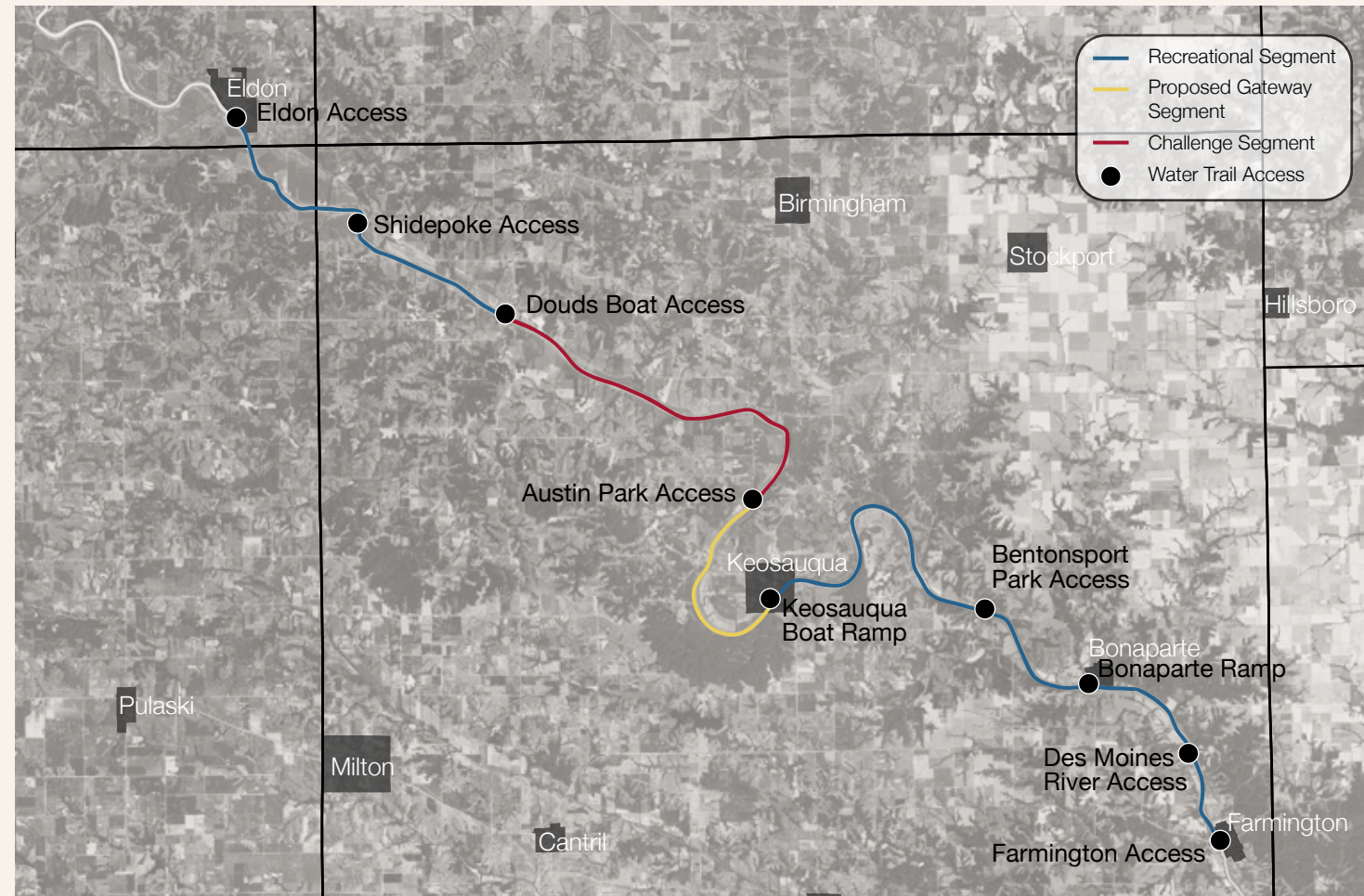
# IMPLEMENTATION OF THE LOWER DES MOINES WATER TRAIL VISION

The Lower Des Moines River between Douds and Farmington in Van Buren County was designated as a state water trail in 2007. An important part of the vision for this water trail includes the extension of the water trail upstream to Eldon in Wapello County. Another major part of the vision is protecting and enhancing the conditions that make this river a high quality recreational experience. These include preserving the feeling of remoteness and protecting and enhancing conditions that support the high diversity of birds and other wildlife within the corridor.

Other parts of the vision address resource concerns described earlier in the Existing Conditions chapter. A continuous perennial riparian buffer with diverse vegetation is envisioned. Diverse resource enhancement of the river corridors also includes permanent protection of critical cultural and historic resources and privately-owned river edge riparian forests.

Recreational development included in the vision focuses on enhancing the connection between the river and its adjacent communities. This connection will allow river users to enjoy the historic charm of the towns and explore the wide variety of businesses and attractions that provide such a unique user experience. Lastly, and most critical for river users, the vision includes reconstruction of launches and near-launch amenities to accommodate use by people with a broad range of physical abilities.

The majority of the Lower Des Moines River Water Trail will be designated as a Recreational Use classification. The segment from Douds to Austin Park is classified as Challenge due to its length and lack of cover from the sun and weather. Also, the segment from Austin Park to Keosauqua (Figure 5). will become Gateway once the access upgrades are complete.



**Figure 5**  
*The majority of the river will have a Recreational Use Classification. However, a Gateway classification segment is possible with improvements to the Austin Park and Keosauqua accesses. The Keosauqua to Bentonsport segment may also be classified as a Gateway segment in the long term future.*

## PLANNING PROCESS

This vision was developed through a two year planning process integrating stakeholders, agencies, non-profit organizations and landowners. A steering group composed of 14 local individuals representing special interests such as angling, paddling, land trails, conservation, history, business owners and landowners guided development of both the vision and this plan. The recreational development priorities included in this plan were developed by the Steering Group and the Water Trail Sponsors, Van Buren County Conservation Board and the Villages of Van Buren. The Iowa DNR has been co-sponsoring public events that help to generate interest and attention to the water trail. Five public events were held in 2017. These included a history paddle and a very popular Geode Paddle as well as a stand-up paddle board clinic, a geology camp for 3rd through 6th graders, and an archaeological interpretive program called Tools of the Past.

The existing conditions surrounding this section of the Des Moines 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, Van Buren County Conservation 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 structural upgrades for four of nine launches, the development of two Universal Design launches, and development of a paddle-in campsite. Land-based recommendations in the riparian area include improved parking areas, the addition of new recreation facilities near the river and the construction of a land trail.

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.

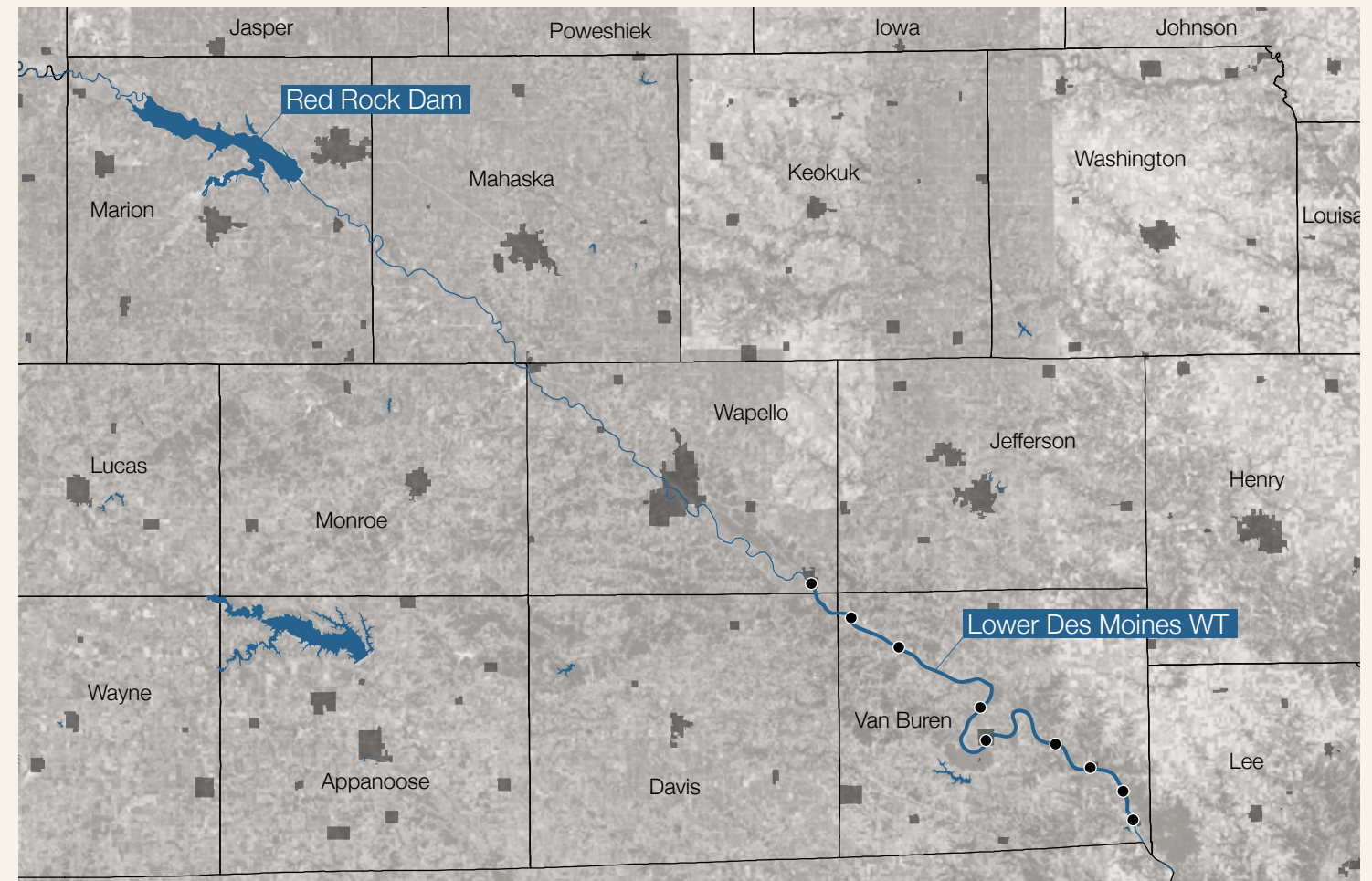
# Recreational Resources and Needs in the Corridor

## EXISTING CONDITIONS

The Lower Des Moines River is a meandered stream with a watershed extending into Minnesota. It is the largest interior river in Iowa and enters into the Mississippi River near Keokuk. The study segment in this plan is 44 river miles in length. The river is divided into three segments for the purposes of this plan.

Within the context of state water trails, the Lower Des Moines offers the experience of paddling a large, wide river in a rural section of the state. Water levels on this section of the river are impacted by the U.S. Army Corps of Engineers at Red Rock Dam (Figure 6). Flood control in the lower Mississippi River basin is the primary purpose of Red Rock Dam. As such, the viability of on-water recreation activities can be limited by low flow conditions. Several minor hazards are located on this water trail including the remnants of former dams, large woody debris in the channel and current irregularities near former and existing bridge piers. The river is used extensively by motor and fishing boats, as well as for canoeing and kayaking. The primary limiting factor for paddling use on the river is the steep slope and design of launches.

Steep launch slopes can limit use of an access by older people and young children. The angles that some launches are constructed at also require more maintenance than necessary to remove sediment after high flows. Motor boat and paddlecraft users pull their boats on the streambank and use downtown businesses and attend events in Keosauqua, Bentonsport and Bonaparte. These visitors are important to the communities; However, only minimal infrastructure has been developed to encourage this connection and use.



**Figure 6**  
Water flows in the Lower Des Moines Water Trail stretch of the river are highly impacted by the operation of the Red Rock Dam, despite its distance downstream.



The Des Moines River is recognized as a vital part of this region and local residents are interested in the condition of the river and its use for recreation. No one single organization or group is organized to advocate for the river. The state-level river clean up event, Project AWARE, was held on the Lower Des Moines River in 2016 and brought hundreds of volunteers to a week-long clean up event on the river.

The several large tracts of public land on the river and the amount and quality of hiking trails nearby set this project area apart from others in the state water trail system. More than 20,000 acres of public recreation land is located within 10 miles of the river (Figure 7). Bed and breakfasts, hotels, cabins, and primitive or modern camping facilities are all available within a short distance of the river accesses. Three communities: Keosauqua, Bentonsport and Bonaparte have developed recreational parkways adjacent to the river. Nearly twenty-five historic buildings are located in the project area and are open to the public. In addition, three historic districts adjacent to the river have been designated. Numerous cultural attractions, including museums, historical monuments, cemeteries and grave markers are interpreted for the public.

Eleven communities in the Van Buren County portion of the project area are linked together for social and promotional purposes (Figure 8). These communities are marketed by the Villages of Van Buren, a local non-profit organization in Keosauqua that helps with event organization and provides support for communities and entities working on tourism and visitorship.

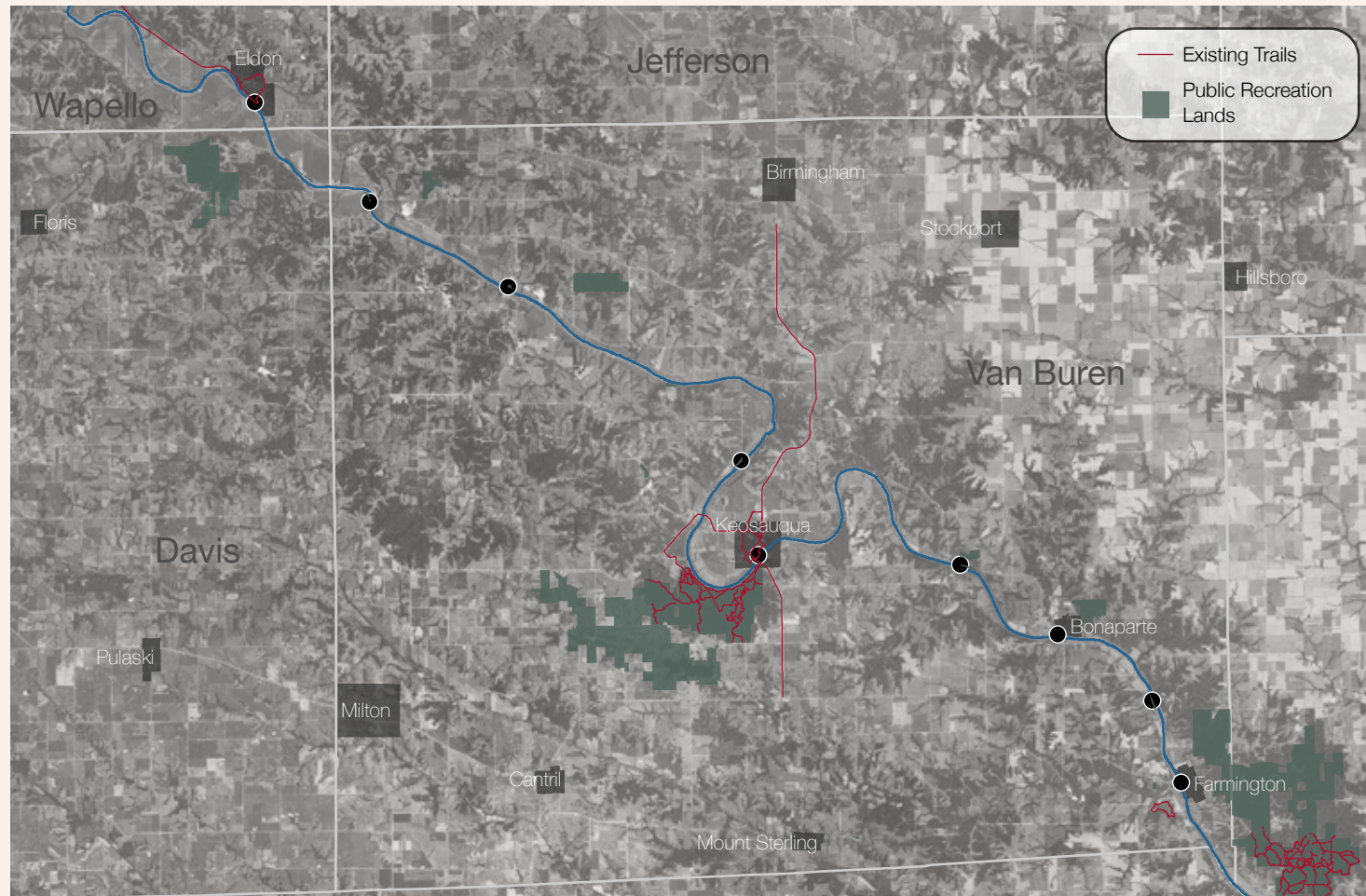


Figure 7  
Two large public recreation areas, Lacey Keosauqua State Park and Shimek State Forest.

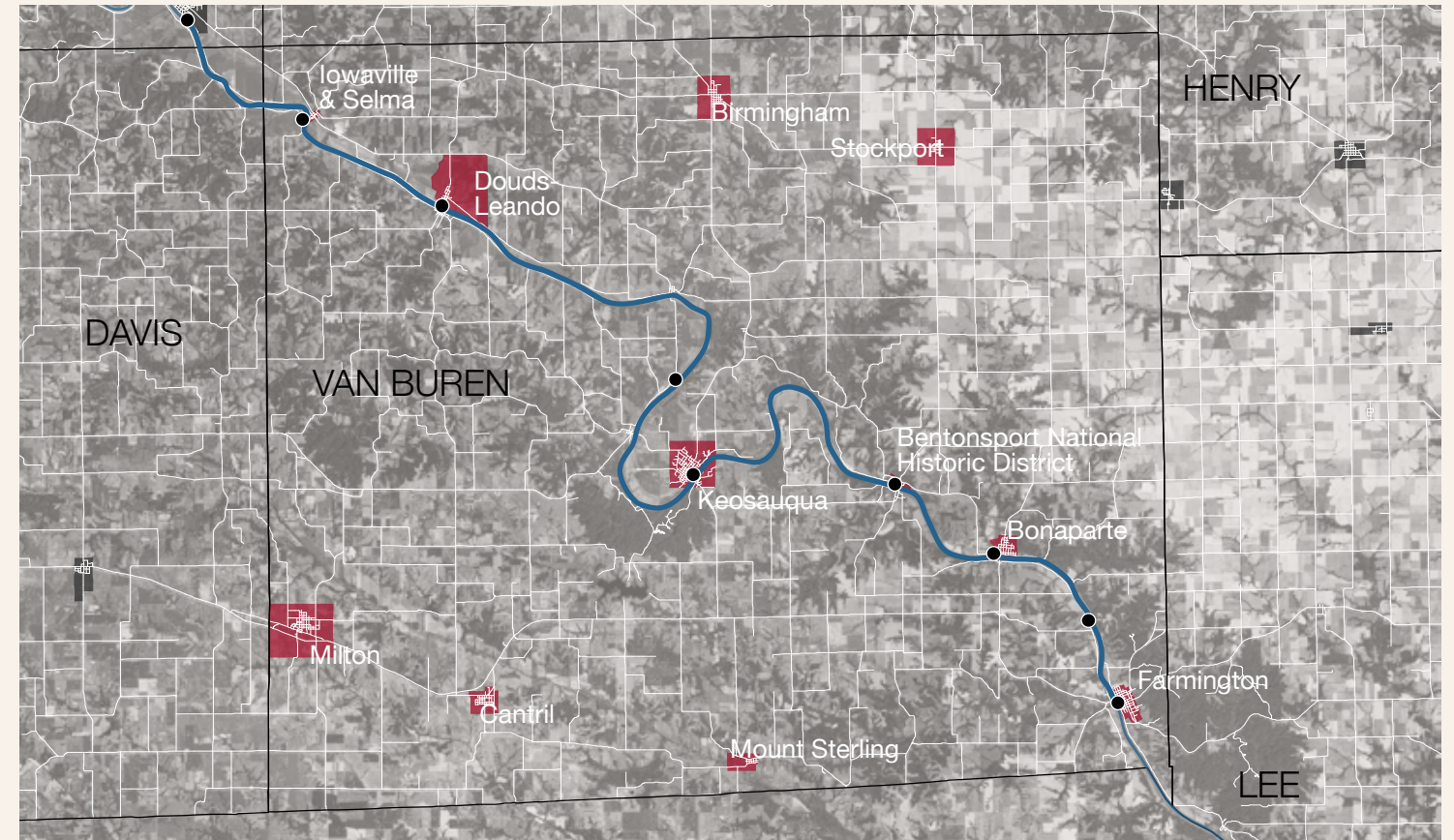


Figure 8  
The Villages of Van Buren are headquartered in Keosauqua but the associated villages are scattered throughout Van Buren County.



# 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 / managers prior to the time this plan was developed. 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 users 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 1**  
*These recommended capacity-building outcomes are expected to address the water trail management needs identified during this planning.*





# RIVER-EDGE INFRASTRUCTURE NEEDS

Recreational infrastructure upgrades are planned for four of the nine accesses on this water trail. These include a new carry-down launch at the Eldon Access, a gateway launch in a new location at Austin Park, a new motorized launch in Keosauqua as well as the addition of a separate carry-down launch near a city amphitheater, and the addition of a carry-down launch in Bentonsport.

The existing spacing and availability of river accesses in this corridor are adequate and functionally spaced although paddlers are usually required to use the same launches as motor boats. During busy periods of time, time delays can

occur at launches due to the high volume of use. Recreational developments recommended include replacement of four of nine accesses on this water trail. One additional launch at a new location is also recommended for construction. The majority of these include carry-down launches exclusively for paddlecraft use. Two of the four launches are Universal Design style, offering a coordinated carry-down and vehicle access transfer pad at the water's edge for people and equipment. Additionally an urban waterfront recreation enhancement is recommended at one location to formalize people's access between the community and the river and also to provide angler access and minimize streambank maintenance.

	Access Number	Inadequate Parking	Lacking Storm Water Management	Over-Steep Launch Slope	Launch Angle Pointing Upstream or Perpendicular	Stream Bank Restoration	Missing Riparian Buffer	Restroom Access Needed
Eldon	#77		X	X		X		
Shidepoke	#72				X			
Douds	#67				X	X		
Austin Park	#57				X		X	X
Keosauqua	#51		X	X		X		
Bentonsport	#42		X	X				
Bonaparte	#38	X	X		X	X		
Des Moines	#34			X			X	
Farmington	#32		X		X			

**Table 2**  
The existing spacing and availability of river accesses in this corridor are adequate for paddlers; however, conditions at some rural locations are primitive in terms of development. Access needs listed in this table were identified during the existing conditions assessment.

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

## On-Water Desired Outcomes

- Extend the length of this designated water trail to include the 4.7 miles between Eldon and Shidepoke Access
- Develop a Gateway-style Experience segment
- Upgrade some access facilities
  - Upgrade launch types to allow vehicles & people to reach water's edge experiences
  - Upgrade accesses with overly steep launch and path slopes as well as perpendicular alignment to the flow centerline
  - 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

- Enhance the existing pedestrian connection between the river and downtown areas in Eldon, Keosauqua, Bentonsport and Bonaparte
- Develop concept plans for a downtown waterfront recreation area in Keosauqua
- Enhance angler opportunities
- Increase bike route options adjacent to the Lower Des Moines 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
- Promote annual events involving river use

## 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 with the exception of the Farmington Access. 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 hazard signage
- On-water recreation infrastructure: Launch upgrades and replacements, parking improvements, urban riverfront development, a paddle-in campsite, angler access and coordination on river flow levels
- Land-based recreation enhancements: enhanced connections between the river edge and business opportunities in adjacent communities, bike/land trail expansion, passive riverfront recreation and paddler camping opportunities

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.





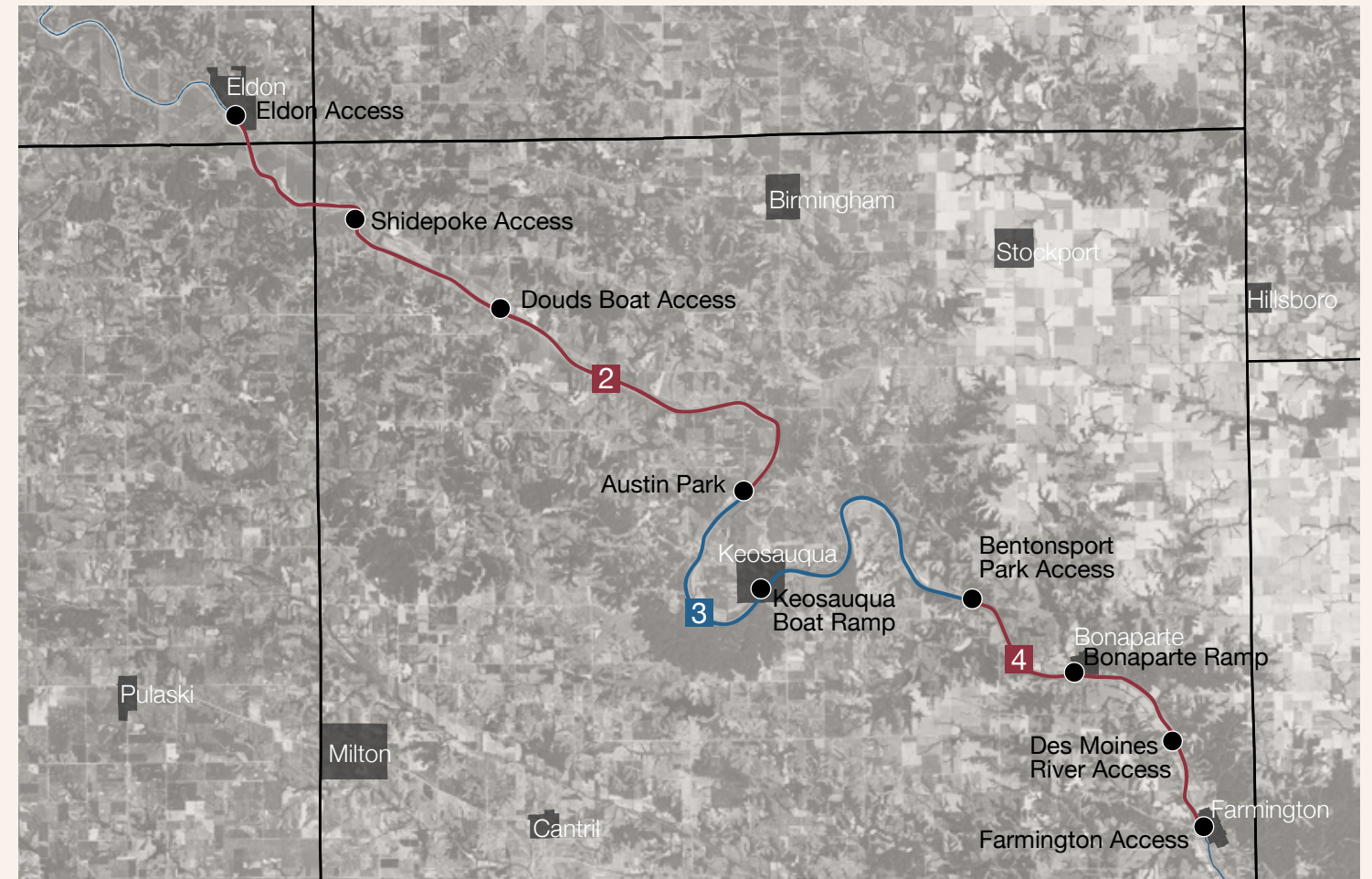
# Recommended Recreation Development Projects

The landscape of this water trail holds a strong connection with past cultures and overflows with history of Euro-American settlement. Physical remnants of these cultures and history still remain at many locations on the river. Each community on this water trail desires a stronger connection for river users between the river and the historic elements and businesses in their communities. Recommended infrastructure enhancements include traditional elements such as entry points for people entering the river channel and top of bank opportunities such as fishing. There is also a desire to add to the already diverse recreational opportunities with the creation of additional passive recreation infrastructure such as shuffleboard.

The river corridor in the study area is divided into three segments (Figure 9). Recommendations are organized by segment and include maps, drawings and text descriptions. Some recommendations span the entire 44-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 Eldon, Keosauqua, Bonaparte, and Farmington and Van Buren County Conservation. The design of infrastructure utilized technical experts from Iowa DNR and Iowa State University.



**Figure 9**  
The water trail study area is divided into three smaller segments for the purpose of this planning.





# 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 Wapello and Van Buren 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

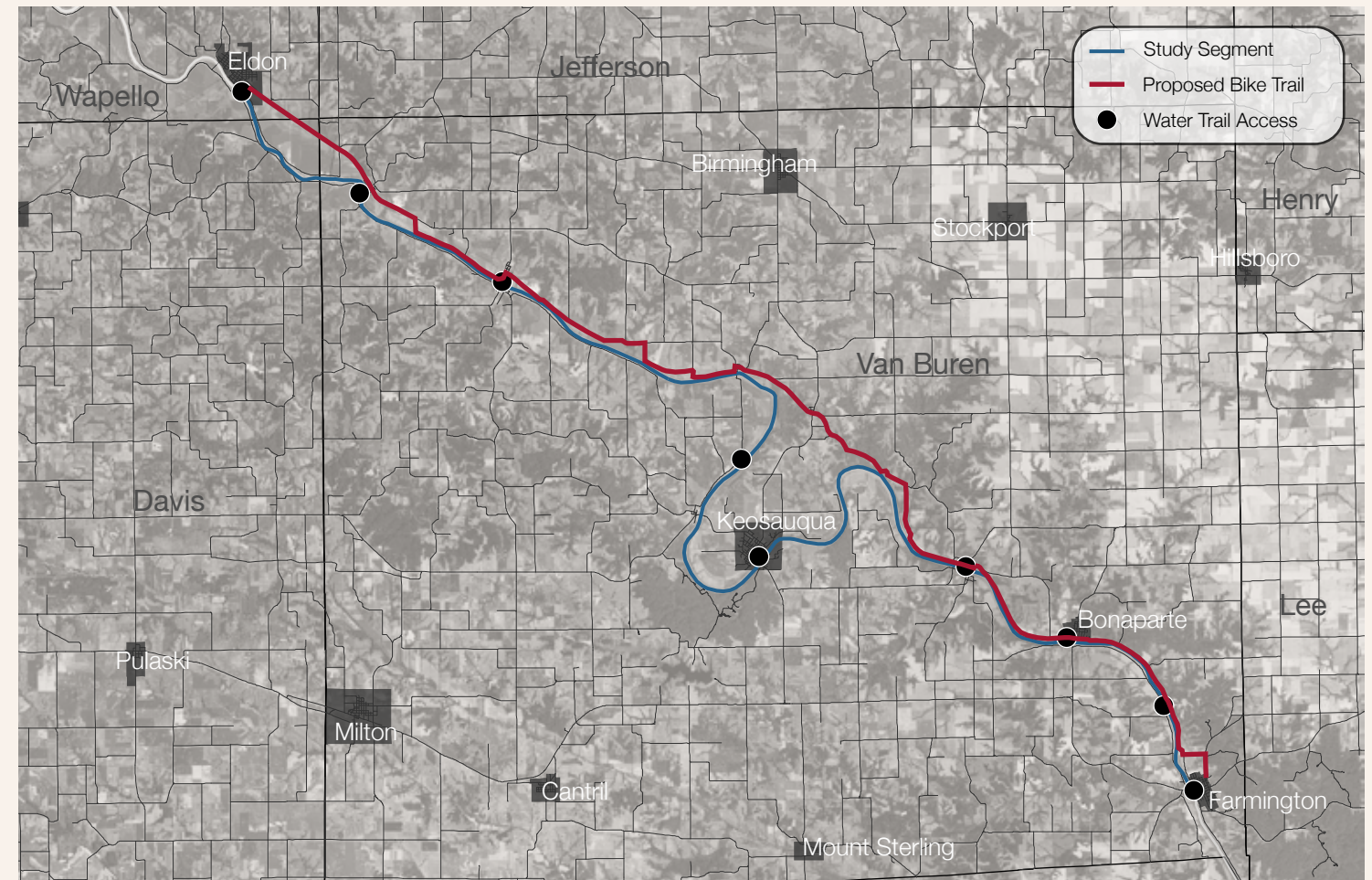
Enhanced communication with users before they get to the river is recommended. River users will feel better prepared for their experience with updated water trail maps; printed maps as well as downloadable pdf online versions are recommended.

## R1.C Long Term Bike Trail Route Between Eldon and Farmington

Development of a long term plan for a bike trail route between Eldon and Farmington is recommended. Van Buren County has had a long term interest in this element. A conceptual trail route is illustrated that includes sections of public roads, undeveloped river edge and the former rail bed adjacent to the Des Moines River. This route intersects with the designated IA paved shoulder bike route connecting to Keosauqua. Highway 16 would be an important link in this route, particularly when the road is resurfaced. Further planning and design is required to determine route feasibility and cost estimates.

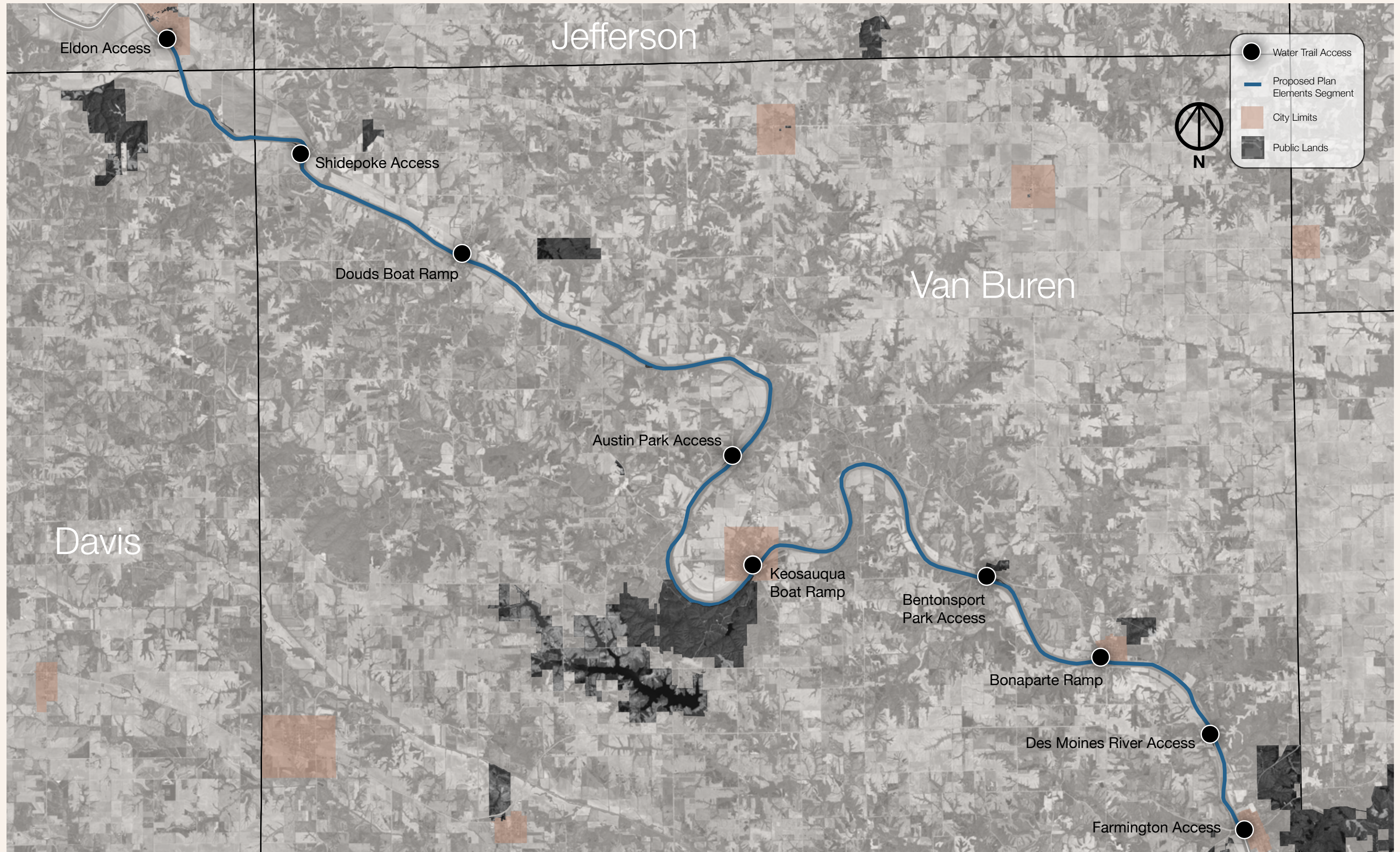
## R1.D Collaboration With U.S. Army Corp of Engineers

Collaboration with the U.S. Army Corp of Engineers is recommended to coordinate summer flow levels from the Red Rock Reservoir Dam. Paddling events planned for the water trail in past years have had to be canceled due to extremely low water levels. With advanced planning, flow levels could be increased prior to and during special planned events so the recreational events could be accommodated.



**R1.C**  
Additional bike trail miles are proposed for long term development.  
The majority of this conceptual route are near the river.









### **R1.E** Establish A Pedal–Paddle–Saddle Event

Local interest exists for the creation of a recurring single event that would include bicycling, paddling and equestrian elements. This would be the first event of its kind in Iowa.

### **R1.F** Create An Interpretative Plan

A formal interpretation plan including signage is recommended. The resources included in this water trail plan and future studies will be used to produce a compelling, varied interpretation of critical issues and resources based on the conditions on this river. Professional interpretation will add value and enjoyment for river users regardless of whether they are on the water.

### **R1.G** Enhanced Communication Among Water Trail Access Managers

A formalized system of communication is recommended between the Van Buren County Conservation 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.

### **R1.H** Establish Regular Naturalist Programming Related to the River

The addition of permanent naturalist educational programming is recommended. This could include hiring a naturalist at Van Buren County Conservation or the Villages of Van Buren or contracting for naturalist services. Increasing public understanding and awareness of the Lower Des Moines River through information and education will add quality to the user's experience.

# SEGMENT R2: ELDON ACCESS TO AUSTIN PARK

## EXISTING CONDITIONS

This river segment is 18.9 miles in length and has a light to moderate level of use by paddlers. There are two accesses within this segment: Shidepoke and Douds Boat Ramp. Paddling distances in the three reaches included in this segment vary between 4.5 and 9.75 miles. The first thirteen miles of the river channel is wide, relatively straight and runs through agricultural land with roads flanking both sides of the river. The character of the river changes about half-way between Douds and Austin Park. Owing to the geology of the area, the river meets a series of sandstone and limestone hills that are more resistant to erosion than the land up-river, causing the river to meander and forming several horseshoe bends in the river. The hills and valleys in this area hold diverse woodlands.

Several hazards exist on this segment. The presence of the invasive silver carp in the entire reach of the Des Moines River below the dam at Lake Red Rock present a hazard for paddlers. These carp leap several feet out of the water and can startle and strike river users. Bridge pilings can also present a hazard and should be avoided by paddlers as they collect debris and create disruptive currents. Three bridges are located within this segment: slightly below Shidepoke Access, slightly above Douds Access, and between Douds and Austin Park. This segment has been classified as a "Challenge" segment because it is nearly 10 miles in length and the wide channel has little or no tree cover. A gas pipeline crosses below the river between Shidepoke Access and Douds; warning signs are posted to alert river users not to dock at that point in the river.







## ISSUES AND OPPORTUNITIES

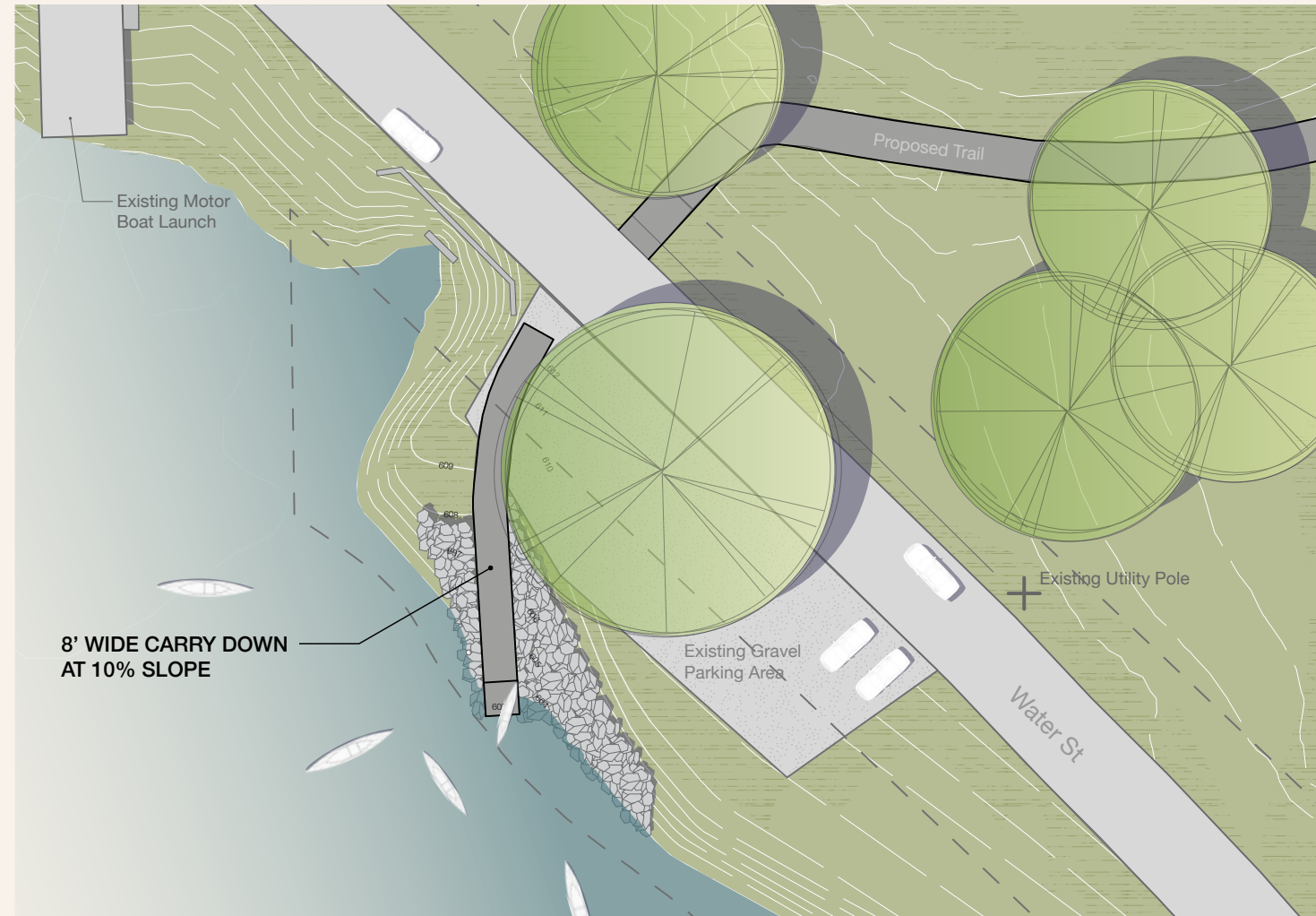
The addition of the reach between Eldon and Shidepoke Access is an enhancement to the existing water trail. Eldon provides a great anchor for the upstream limits of this water trail because it has a long history of welcoming visitors. Recommendations include additional or re-designed launch facilities, hazard warning signage at the dock, and enhanced connections between the river and community assets in Eldon.

### R2.A Hazard Signage Added to Existing Dock at Eldon

The Eldon Access currently includes a concrete boat ramp and a seasonal floating dock. The addition of a caution sign upstream of the existing floating dock is recommended. Unsigned docks can be hazardous to both paddlers and motorized boat users, especially in strong currents. Visual markers help to prevent river users from colliding with or getting hung up on the dock.

**DANGER DO NOT APPROACH THIS SIDE**

R2.A  
Warning signage, particularly geared by inexperienced paddlers is recommended for the upstream side of the dock.



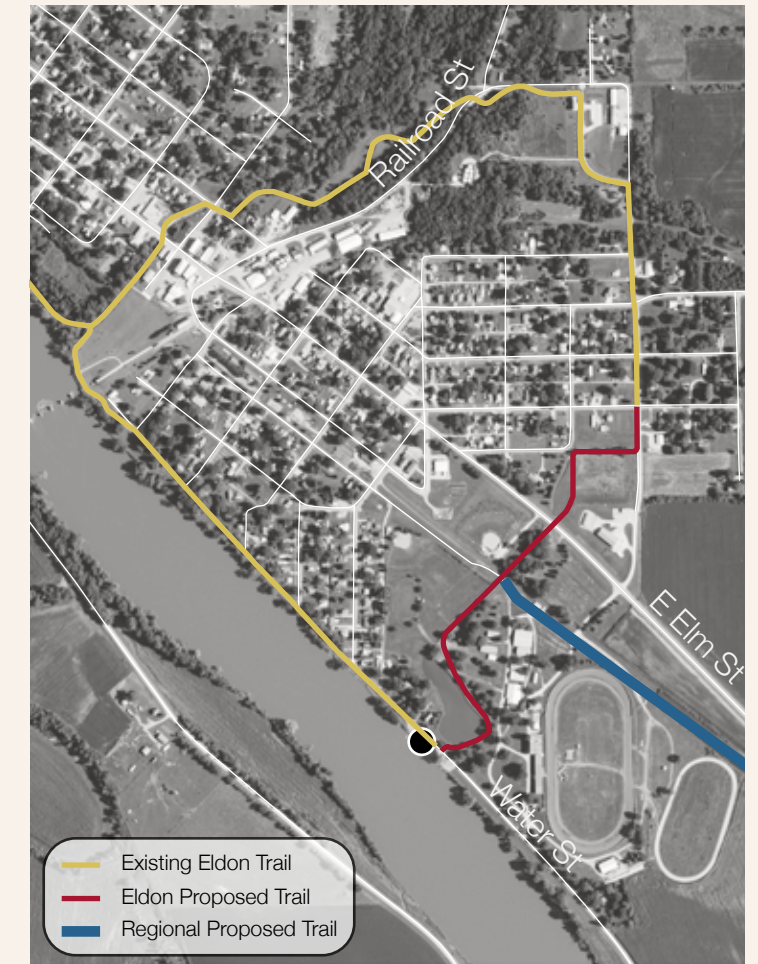
R2.B  
The recommended new carrydown launch downstream of the motor boat launch will relieve pressure and wait-times on the existing launch.

### R2.B New Carry-Down Launch at Eldon

Other than the existing motor boat launch, adjacent parking areas and a floating dock, no other amenities are present at the Eldon Access. The existing launch is steep and experiences a high volume of use by motorized boat users. The construction of a hard-surfaced carry down launch for paddlecraft is recommended slightly downstream of the motor boat launch. One of the parking areas for the access exists at this location so it is convenient to river users. This proposed carry down launch would allow for paddlers to get on and off the water without the interference of motorized boat users and help to alleviate the concentration of use on the existing launch. The new carry-down launch design is less steep allowing use by a greater range of user abilities and is more manageable when carrying paddlecraft to the river.

### R2.C Improved Pedestrian Connection Between the Eldon Access and the Community

The Wapello County Fairgrounds and access to Eldon's city trail system are located just across the street from the Eldon Access. However, no formal access exists between the river and these uses. The fairgrounds includes developed restroom and shower facilities and space for primitive camping. A simple pedestrian connection and signage between the new carry-down launch and fairgrounds is recommended. The addition of a gate to modify the existing fence is also recommended to control access. Signage is recommended to guide river users to fairgrounds and establishes rules for camping use. This trail connection will connect to Eldon's larger trail system.



R2.C  
A short extension of the existing land trail in Eldon is recommended to connect the river access to the fairgrounds and the rest of the community.

SEGMENT 2 COST ESTIMATES		
RECOMMENDATION	MAP CODE	COST ESTIMATE
Hazard Signage Added to Eldon Dock	R2.A	
New Carrydown Launch , Eldon	R2.B	\$38,570
Improved Pedestrian Connection, Eldon	R2.C	
Douds Access Improvement	R2.D	
New Paddlie In Campsite	R2.E	
New Universal Design Access, Austin Park	R2.F	\$133,198

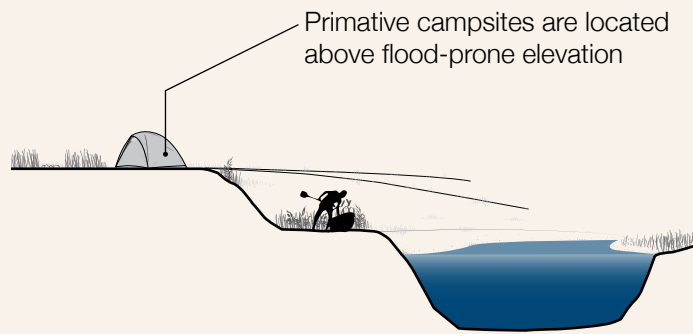


## R2.D Improvement to Douds Access Point

Van Buren County Conservation manages the Douds Access which includes the 1898 bridge abutments. They have received grant funds to start with the stabilization of the north bridge abutment. They also plan to build a shelter house and make other improvements to make the area more attractive to river users.

## R2.E New Paddle in Campsite

Construction of a paddle-in campsite is recommended at the Schultz Conservation Area. The Schultz Area is a small forested, land-locked parcel located 5 miles upstream of Austin Park. There is no vehicle access to this land and use would be limited to paddle-in camping. Iowa DNR water trail standard details for this amenity include only primitive development.



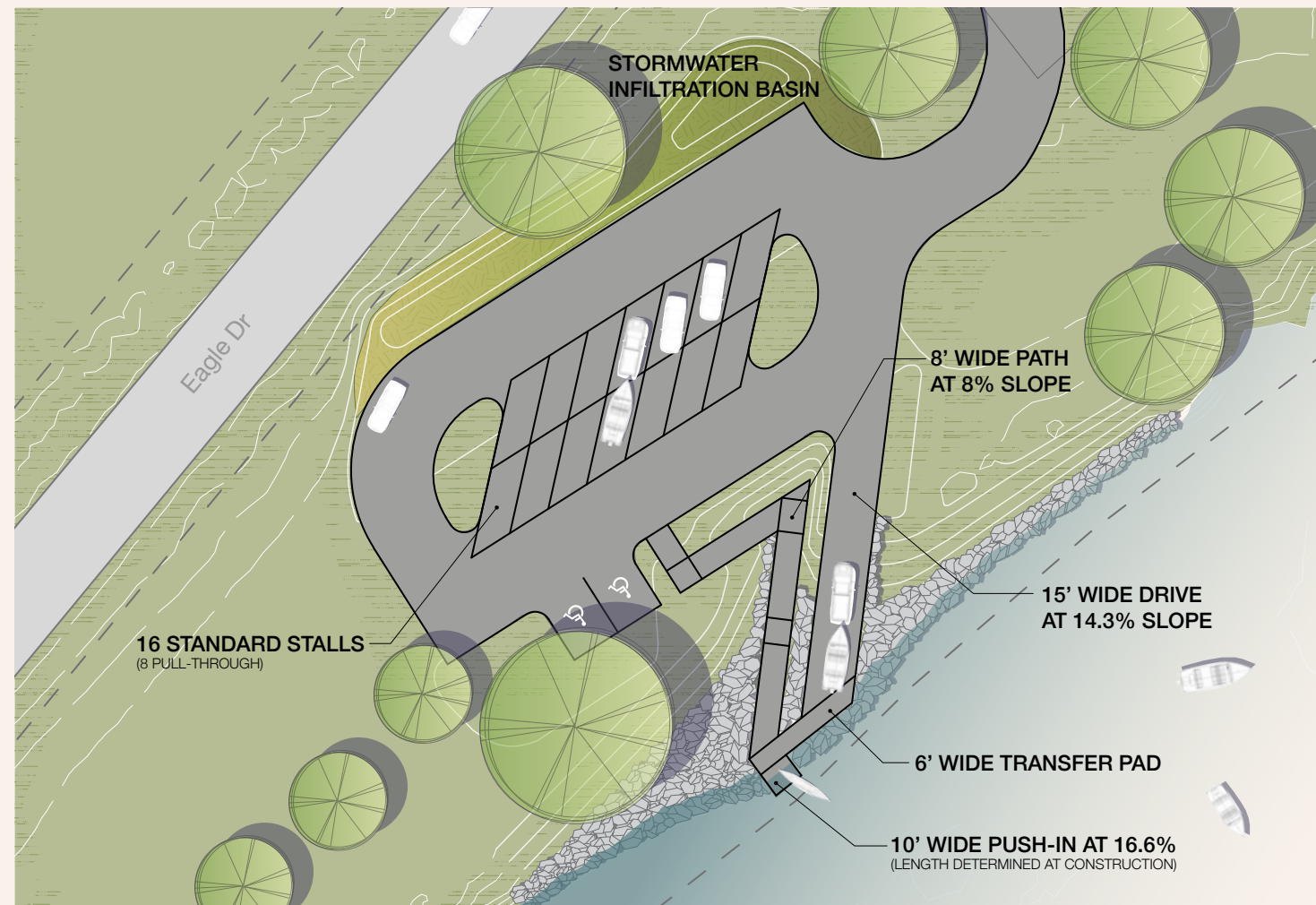
**R2.E**  
Paddle-in campsites are located on floodplain terraces with strong separation from the river channel. This separation promotes air flow and privacy for campers.

## Permitting

Disturbance for launch construction at Eldon will likely require a Phase I archaeological investigation unless previous disturbance of the construction area can be verified. Construction at Austin Park will likely not require a Phase I investigation.

## R2.F Austin Park Access Improvements

Construction of a new Universal Design launch is recommended at Austin Park. The location of the new launch is approximately 800 feet downstream of the existing launch. The existing launch is located on an extremely tall, steep and eroding streambank and adjacent to a large agricultural drain tile outflow. As such, the launch is susceptible to frequent damage. The location of the existing launch also requires users to drive through the entire campground to access the launch. The new Gateway style Universal Design launch will be located near the park entrance, avoiding the need to drive through the campground. This location also has a lower and less steep streambank. This improvement requires relocation of an existing picnic shelter to a different location in the park. Recommended upgrades in addition to the launch include parking for 8-pull through or 16 standard stalls plus two accessible parking stalls, stormwater infiltration for parking lot run off and a seasonal porta-potty.



**R2.F**  
The Universal-Design launch recommended for Austin Park is located downstream from the existing launch. The streambank is lower and more stable at this location.



# SEGMENT R3: BELOW AUSTIN PARK TO BENTONSPORT

## EXISTING CONDITIONS

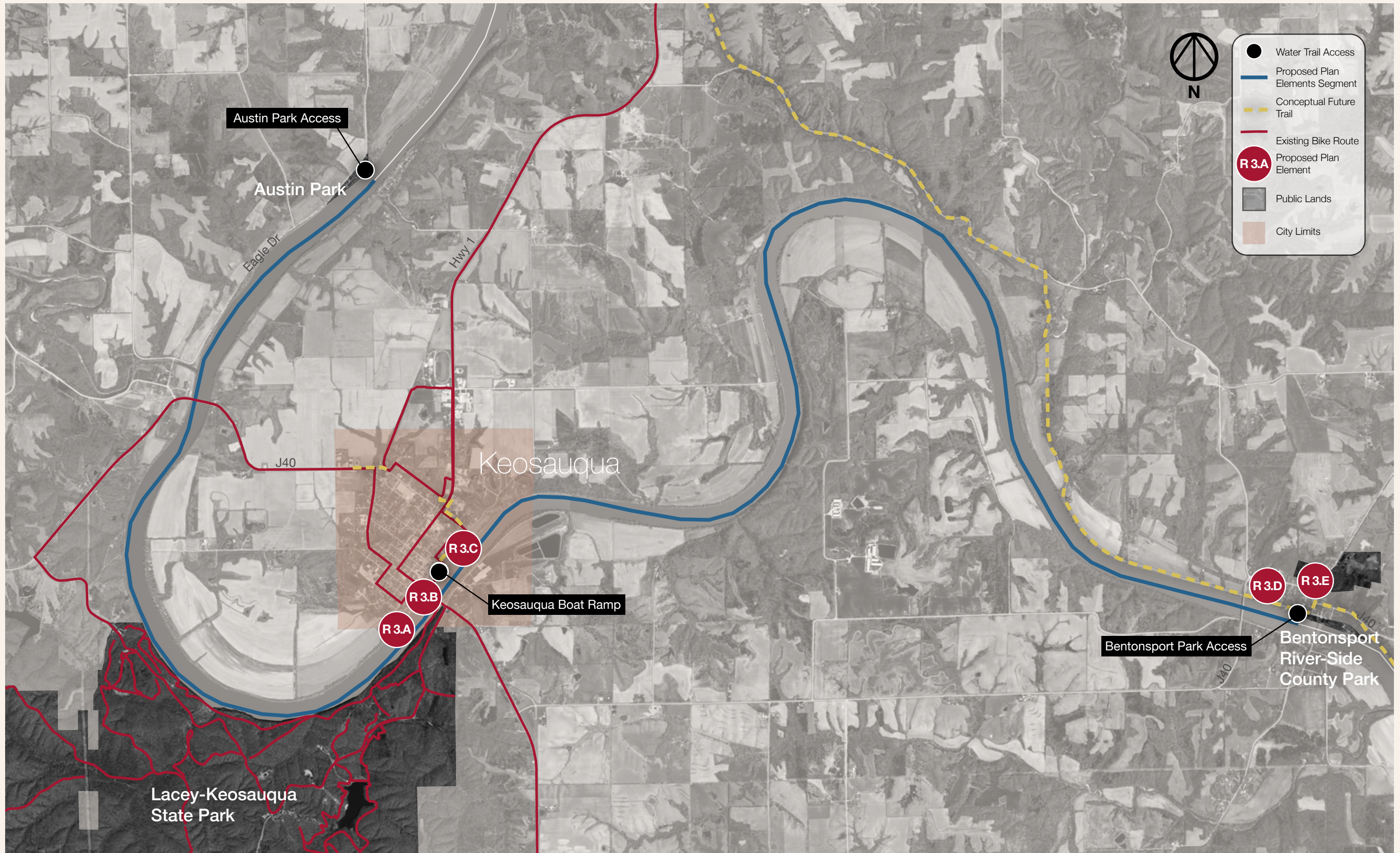
This river segment is 14.4 miles in length and has a high level of use by paddlers. There is one access within this segment at Keosauqua. Paddling distances in the two reaches in this segment are 5.8 miles and 8.6 miles. The four miles between the unincorporated community of Pittsburg and Keosauqua is a large curving meander. As paddlers approach Keosauqua, Lacey-Keosauqua State Park is located on river right.

Downstream of Keosauqua the river flows north through another large curving meander. Large deposits of resistant sandstone and limestone, underlain below waterline by dolomite, are responsible for this river pattern. Where the river bends sharply, sandstone cliffs are present and rise directly next to the river. In some places, a bench of land occurs above the river and the rock cliffs are set back 10-50 feet from the river's edge. These geological deposits, in turn, hold mature oak-hickory and maple-basswood forests in the uplands, some of the nicest of these are in Lacey-Keosauqua State Park. Houses and cabins can be seen in several stretches of this segment.

## ISSUES AND OPPORTUNITIES

This segment of the river offers a great deal to paddlers including impressive scenery, historical landmarks, and businesses welcoming to visitors. Keosauqua is the county seat and largest city in Van Buren County. It has a unique blend of historic architecture, quaint shops, local restaurants and bars, lodging options, and other businesses all within easy walking distance from the river. The city embraces the riverfront and has created a trail and many amenities along the riverfront. Planned improvements will greatly enhance access to the river for all users including paddlers, motorized boaters, anglers and those who just want to relax and enjoy the view.



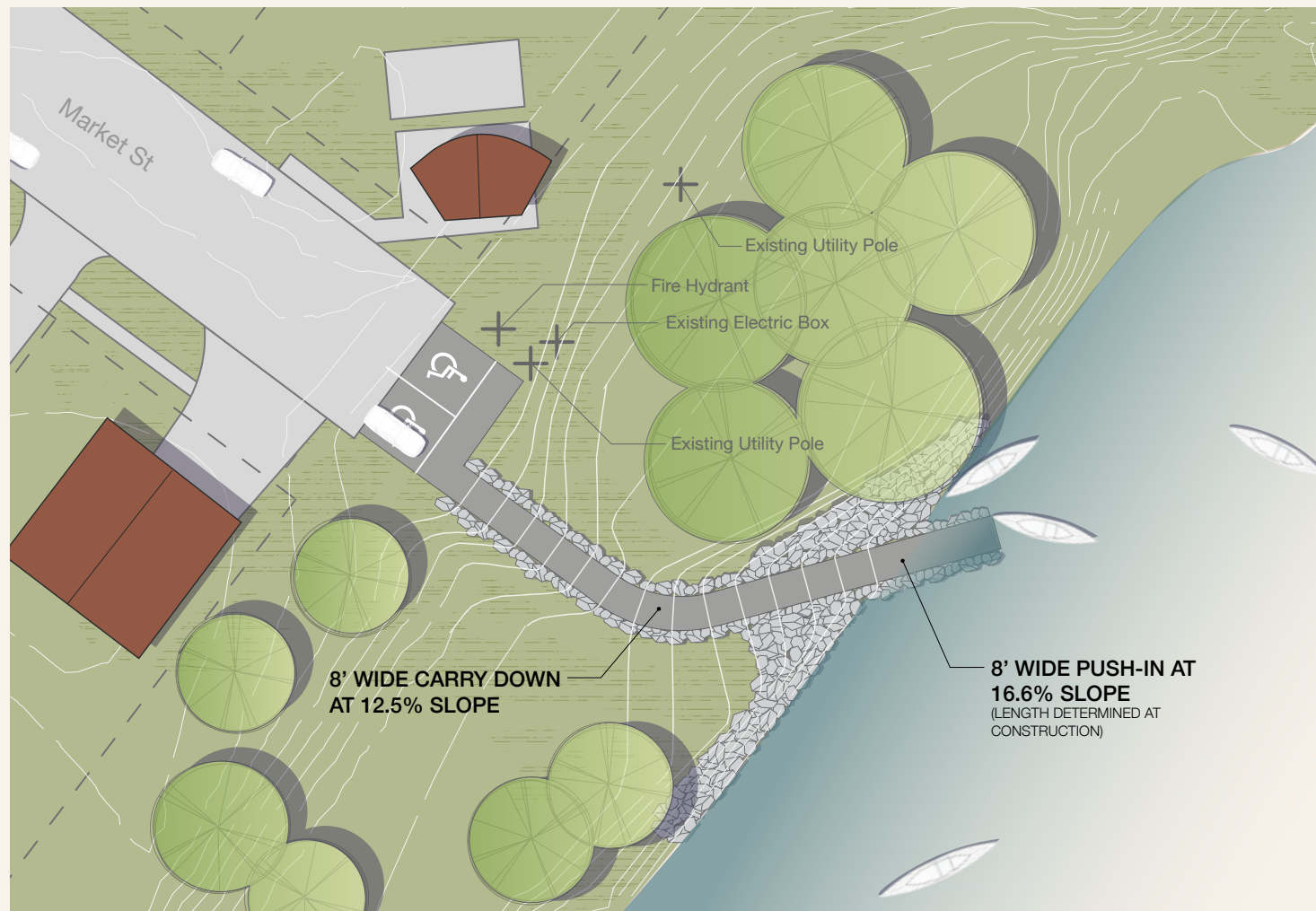




This segment ends at the Bentonsport National Historic District. The Bentonsport Access is located adjacent to the livery owned by Van Buren County Conservation. Recommendations include additional recreational amenities for river and riverfront users, including additional riverfront development in Keosauqua. The 5.8 mile reach between Austin Park and Keosauqua is planned to be developed as a Gateway Experience.

### R3.A New Carry-Down Launch and Accessible Parking

A carry-down access is recommended at the end of Market Street, upstream of the Main Street bridge in Keosauqua. Other recommended upgrades include two accessible parking stalls at the entrance walk to the access. This carry-down access will help to separate paddlers from the high volume of motorized boaters that utilize the existing Keosauqua access located downstream.



R3.A  
The new carrydown launch recommended for Keosauqua will separate paddlecraft from motor boat use.



Figure 10

Development of an urban river access edge in Keosauqua is recommended to complement the city's greenbelt and main street businesses. Anglers and others can interact on the hard surfaced, stair-stepped river edge at various water levels. Motor boats can pull up and moor while using businesses or attending events in Keosauqua.

### R3.B Urban Riverfront Recreation Area

The riverfront area in Keosauqua has been well developed as a parkway recently with walkways, restrooms, playground, landscaping, seating, and interpretive signage. This area is heavily used by residents and visitors. Motor boats frequently pull up on the edge of the river during summer months and patronize downtown businesses and events. One limiting factor in drawing additional people and river users are streambank treatment and conditions.

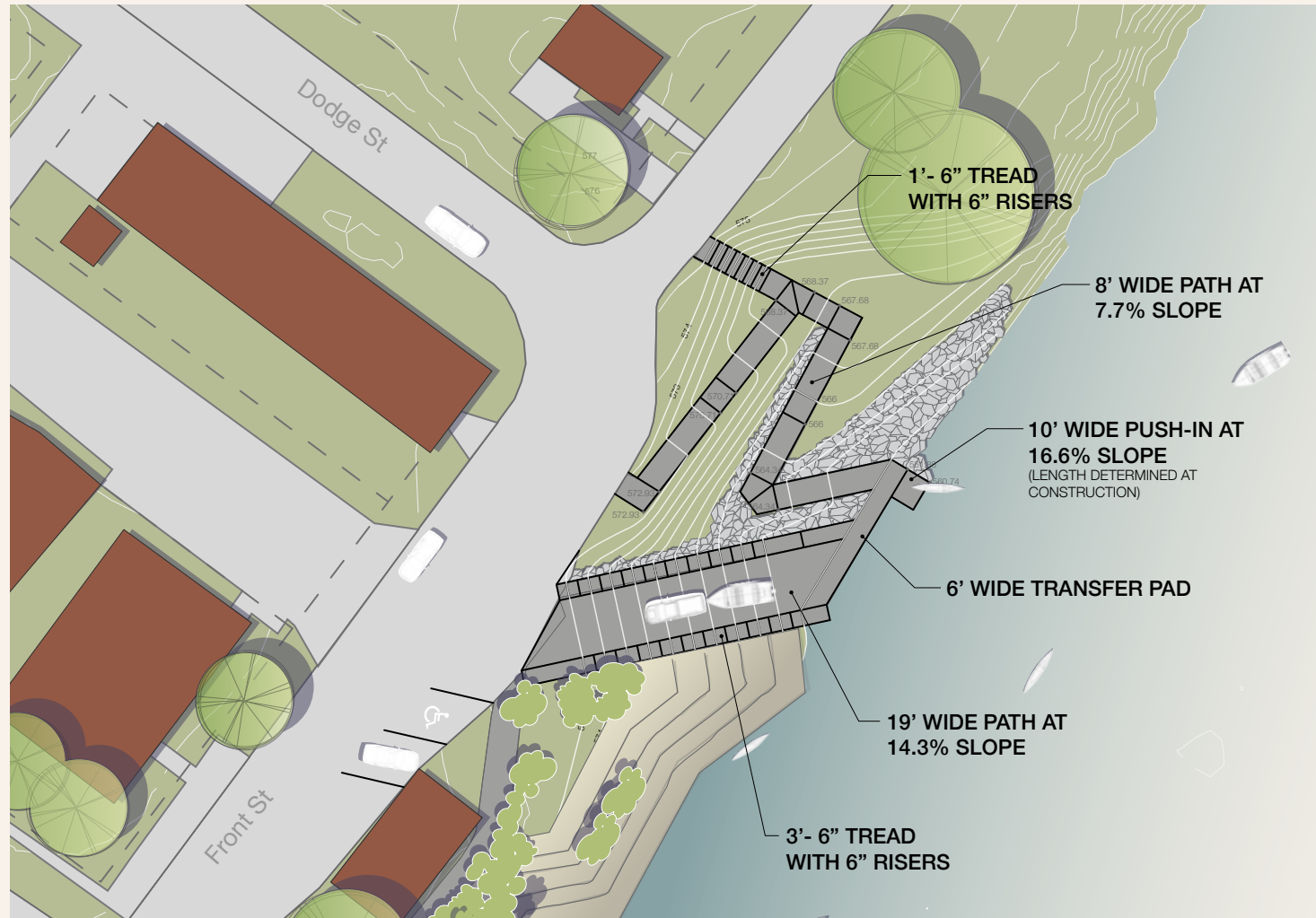
Rip-rap has been used extensively to prevent erosion on the high, steep banks. But while the river edge is perceived as "stable" with this treatment, the view is unattractive and the nature of the riprap does not allow people to access the

river edge to explore and fish. In design consultation with the City, a developed urban riverfront treatment is recommended for the space between the existing developed parkway and the water's edge (Figure 10). This treatment, similar to other riverfront designs in Manchester and Charles City, would allow people to fish, play and relax near the water's edge at varying water levels. Proposed materials are large, angular-cut stone in combination with low-growing shrub massing. This development in addition to the river access improvements included in this plan, while costly, would establish Keosauqua as a destination for a broader range of visitors and river users both by water and by vehicle.



### R3.C Keosauqua Access Upgrades

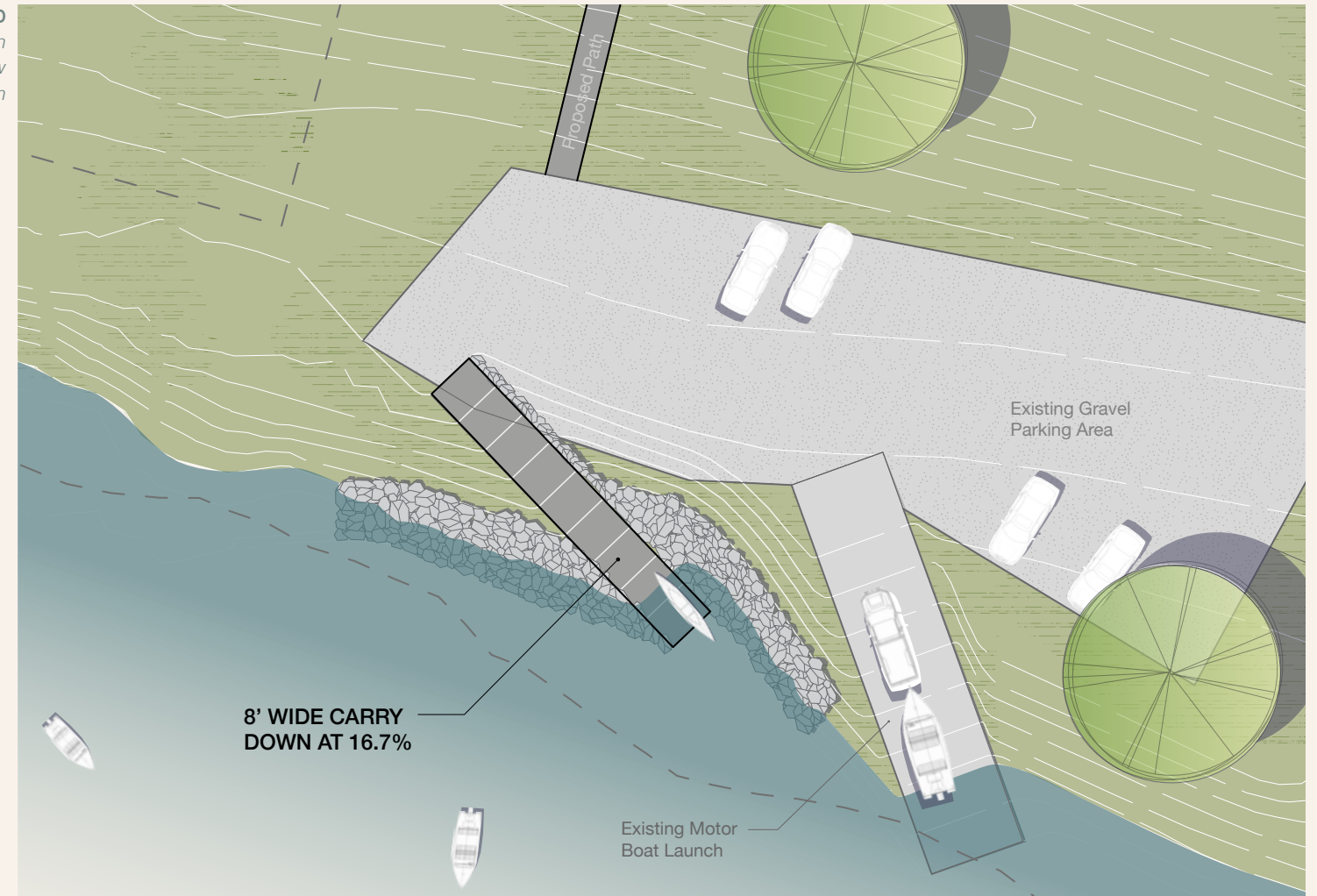
A new Universal Design access is recommended to replace the double motor boat launches that exist in Keosauqua. This access is the downstream end of the Gateway segment. The design of the launch surface is over widened to 19' to accommodate larger vehicles and boat trailers. A wide set of stairs and re-shaping of the streambanks are recommended on both sides of the launch. The Universal Design style of launch will accommodate users with a greater range of physical abilities while the stairs and riverbank enhancement will provide opportunities for river edge fishing and exploration.



**R3.C**  
A Universal-Design launch is recommended to replace the existing pair of motor boat launches in Keosauqua. The stair-stepped waterfront edge abutting the proposed launch will replace the existing, aged dock system which requires removal in the winter.

### R3.D

A new carry-down launch is recommended as an addition to the existing motor boat launch in Bentonsport. The new launch will relieve congestion at the launch



### R3.D Bentonsport Access Upgrades

A new carry-down launch is recommended slightly upstream and adjacent to existing motor boat launch. This launch will relieve congestion during peak motor boat use periods by providing a separate launch for paddlers.

SEGMENT 3 COST ESTIMATES		
RECOMMENDATION	MAP CODE	COST ESTIMATE
New Carrydown Launch, & Accessible Parkin, Keosauqua	R3.A	\$49,502
Urban Riverfront Recreation Upgrades	R3.B	
New Universal Design Access, Keosauqua	R3.C	\$226,245
New Carrydown Access, Bentonsport	R3.D	\$31,933
Bentonsport Riverfront Upgrades	R3.E	



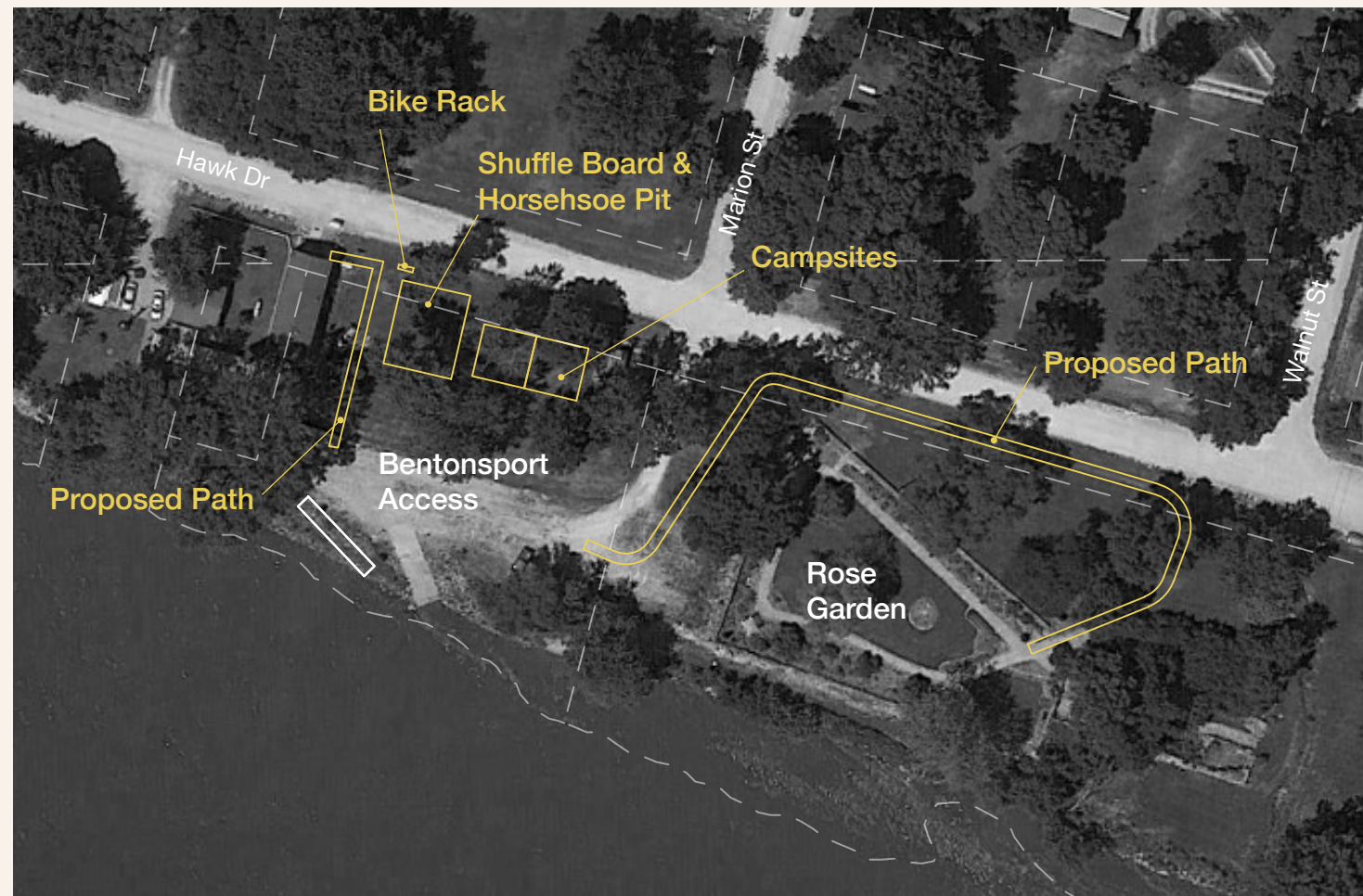
### R3.E Bentonsport Riverfront Upgrades

Several minor enhancements are recommended in the riverfront area to enhance pedestrian circulation and experience near the existing river access. A walkway connection between the launches, the Rose Garden and historic mill Interpretation panels, and the adjacent outfitter formalizes movement patterns between these separate but nearby elements. New shuffleboard, horseshoe pits are located near the rose garden and a bike rack encourages cyclists to stop and use river edge amenities. Lastly, several primitive campsites added near the launch on Van Buren County Conservation property and reserved for paddler use will accommodate tent-camping paddlers who do not wish to use the larger, modern campground .3 miles downstream.

Slightly downstream at the existing campground, an upgrade is planned to add showers to the restrooms located on the end of a large shelter house. A walking trail from the campground to the new shower house and new playground equipment is also planned.

### Permitting

Disturbance for launch and parking improvements for water trail accesses at Bentonsport and Keosauqua will likely not require a Phase I archaeological investigation because of previous evidence.



R3.F  
Additional recreational amenities are proposed near the existing launch at Bentonsport.

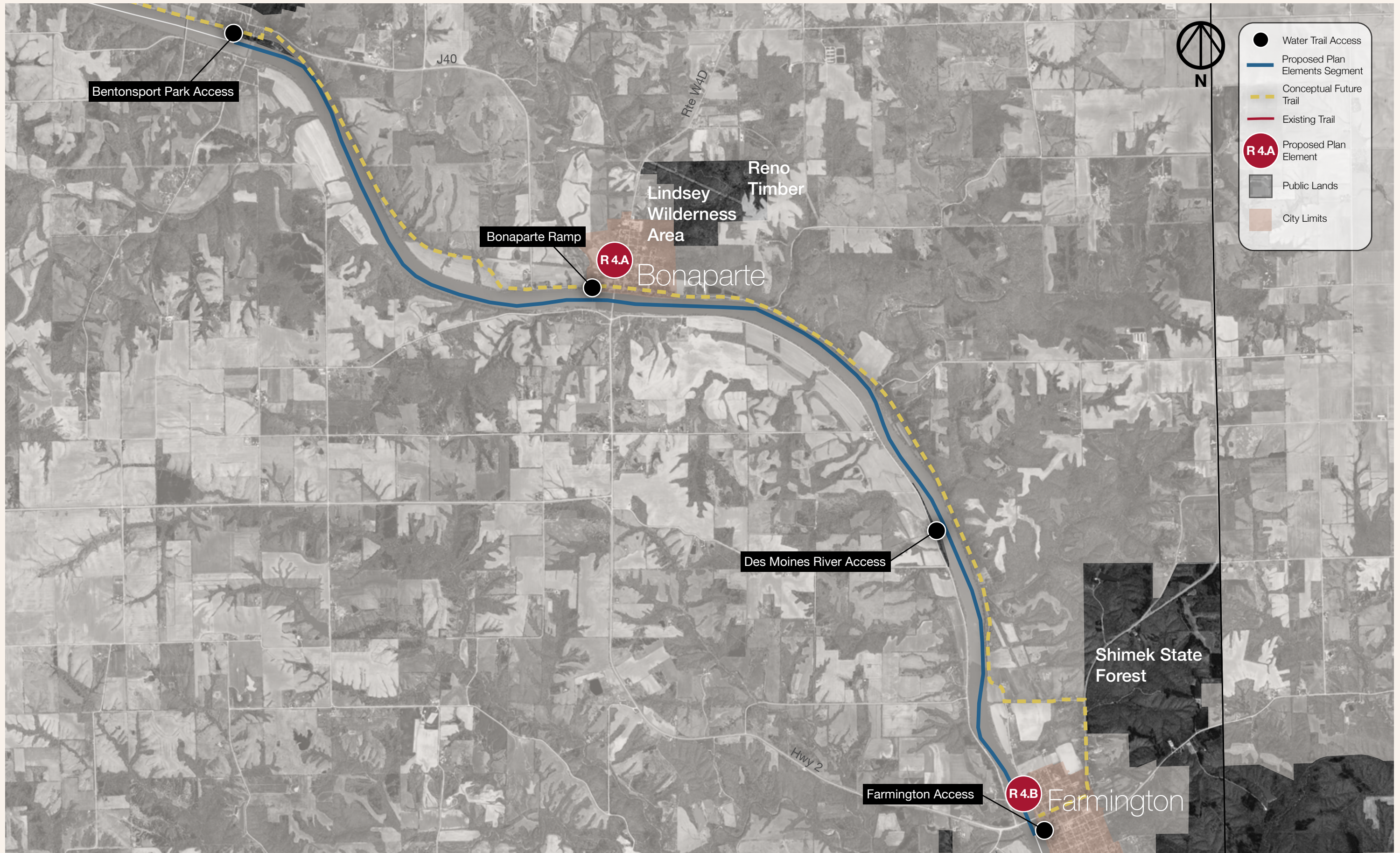
## SEGMENT R4: BELOW BENTONSPORT TO FARMINGTON

### EXISTING CONDITIONS

This river segment is 10 miles in length and has a variable level of use. The river between Bentonsport and Bonaparte has a high use volume by paddlers while the river below Bonaparte has low use. Two accesses, Bonaparte Access and Des Moines River Access, are located within this segment. Paddling distances for each of these reaches ranges between 2 and 3 miles. A historic steel span bridge, used now only for pedestrian traffic, is a landmark just below the Bentonsport access. The river edge between Bentonsport and Bonaparte is composed of floodplain forests and farmland. The upland ridges are heavily wooded and cabins can be seen from the shoreline. The river curves gently between Bonaparte and the Des Moines Access. Downstream of the Des Moines River Access, the river is straight and easy to paddle; this segment is mostly residential and agricultural land with roads close to the top of the riverbank on both sides.

Woody debris accumulations near the pilings on all bridges can present some hazard to paddlers. Two sets of bridge abutments are present just above Farmington are particularly hazardous and should be avoided. Rubble from an old dam is present for the first quarter mile beginning below the Bonaparte access. Depending on water levels, this rubble creates rough water and can be experienced as a hazard for inexperienced paddlers.







## ISSUES AND OPPORTUNITIES

Bonaparte and Farmington are both historic and interesting river towns with much to offer visitors. The river accesses in both communities are located near the downtown areas. Bonaparte's downtown area is listed on the National Register of Historic Places and is home to specialty and antique shops, the historic Bonaparte Pottery, and a well-known restaurant located in a restored 1878 grist mill. Farmington is the last access on the Lower Des Moines Water Trail. The City of Farmington is located at the end of the designated portion of the water trail. Traditional picnic, seating and interpretive signage exists at the access.

### R4.A Bonaparte Riverfront Upgrades

A pedestrian walkway is recommended between the river access and the Bonaparte Main Street.



**R3.A**  
A sidewalk for pedestrian use is recommended to connect the river access with Main Street in Bonaparte.

SEGMENT 4 COST ESTIMATES		
RECOMMENDATION	MAP CODE	COST ESTIMATE
Bonaparte Riverfront Upgrades	R4.A	
New Motorboat Access, Farmington	R4.B	

### R4.B Farmington Access Upgrade

The Farmington boat launch is extremely steep and difficult to maneuver. The drive loop facilitating circulation for vehicles using the launch is prone to erosion. A re-designed motor boat launch is possible on the existing site and is recommended. Parking improvements are also recommended in order to meet Iowa DOT minimums for boat launch signage. The scope of this planning did not include developing design plans for the launch but this is recommended. Aerial photo of existing site plan.



**R4.B**  
The existing boat launch in Farmington is very steep and is not configured to launch motor boats efficiently. The existing site is suitable for a new launch designed to current Iowa DNR motor boat standards.

## Permitting

Disturbance for launch and parking improvements for water trail accesses at the Farmington Access will likely require a Phase I archaeological investigation unless previous disturbance of this construction area can be verified.





# Recreational Development Conclusions

All recommended elements are summarized and organized in the Appendix A (Recreation and Conservation Prioritization). The prioritization includes 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 Cities and Counties may have 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

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 with oversight from the water trail manager. 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 Organizations such as Iowa Natural Heritage Foundation, Iowa Prairie Network, Iowa Ornithologists' Union and Iowa Archaeological Society
- Local and State Agencies including County Soil and Water Conservation Districts, Iowa Department of Transportation, Iowa Office of State Archaeologist, State Historical Society of Iowa, Iowa Department of Natural Resources, Iowa Economic Development Authority

Sections of this recreational development 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	Location	Lead Jurisdiction	Recommendation	Local Prioritization	Budget Estimate for River-Related Recommendations	Other Collaborators
R1.A	Corridorwide	Van Buren County Conservation Board	On-Water Rescue Capacity	1		Van Buren & Wapello County Sheriffs Offices
R1.B	Corridorwide	Van Buren County Conservation Board	Communication to Users	1		Iowa DNR
R1.C	Corridorwide	Van Buren County Conservation Board	Develop a long term plan for a bike/land trail adjacent to the Des Moines River.	3		
R1.D	Corridorwide	Van Buren County Conservation Board	Coordinate with the U.S. Army Corp of Engineers to coordinate flow levels during the summer months.	1		Iowa DNR River Programs
R1.E	Corridorwide	Villages of Van Buren	Establish a pedal/paddle/saddle event	1		Van Buren County Conservation Board
R1.F	Corridorwide	Iowa DNR River Programs	Create an Interpretative Plan	1		Villages of Van Buren
R1.G	Corridorwide	Iowa DNR River Programs	Enhanced Communication Among Water Trail Access Managers	1		Villages of Van Buren
R1.H	Corridorwide	Villages of Van Buren	Establish regular naturalist programming related to the river	1		Van Buren County Conservation Board
C1.A	Corridorwide	Van Buren County Conservation Board	Develop designs for low impact streambank restoration.	1		Iowa DNR River Programs
C1.B	Corridorwide	Van Buren County Conservation Board	Coordinate with Van Buren SWCD to establish a continuous perennial vegetation buffers on the Des Moines River and its tributaries	1		Van Buren SWCD
C1.C	Corridorwide	Van Buren County Conservation Board	Encourage additional volunteer water quality monitoring on the Lower Des Moines and tributaries.	1		
C1.D	Corridorwide	Van Buren County Conservation Board	Coordinate with Van Buren SWCD to work with farmers to reduce bacteria loading on the Lower Des Moines and its tributaries	1		Van Buren SWCD
C1.E	Corridorwide	Van Buren County Conservation Board	Explore Voluntary Land Protection Strategies for privately owned Riparian Forests	1		
C1.F	Corridorwide	Van Buren County Conservation Board	Pursue habitat enhancement for mussel species, turtles and amphibians	2		Iowa DNR
C1.G	Corridorwide	Van Buren County Conservation Board	Promote additional in-stream fish habitat structures	1		Iowa DNR
C1.H	Corridorwide	Van Buren County Conservation Board	Encourage bird habitat enhancement in river corridor	1		
C1.I	Corridorwide	USFWS	Continue monitoring Asian carp presence	1		Iowa DNR, state universities
C1.J	Corridorwide		Systematic pedestrian survey of cultural resource sites	2		
C1.K	Corridorwide	Iowa DNR	Develop Interpretive Plan	1		Van Buren County Conservation Board, Villages of Van Buren
R2.A	Eldon	City of Eldon	Add caution sign to existing dock	3		Iowa DNR
R2.B	Eldon	City of Eldon	New carry-down launch	1	\$38,570	
R2.C	Eldon	City of Eldon	Improved pedestrian connection and facilities between the boat launch and fairgrounds	2		



R2.D	Douds	Van Buren County Conservation Board	Douds Access Improvements	1		
R2.E	Schultz Conservation area	Van Buren County Conservation Board	New paddle-in campsite	2		
R2.F	Austin Park	Van Buren County Conservation Board	New universal design access, parking and seasonal portapotty	2	\$133,198	
C2.A	Corridorwide	Van Buren County Conservation Board	Survey and Protection of Cultural & Historic Resources including permanent protection of loway Village site	3		OSA, Villages of Van Buren
C2.B	Selma	Van Buren County Historical Society	War Memorial installation in City Park	3		
R3.A	Keosauqua, near Amphitheater	City of Keosauqua	New carry-down launch and accessible parking	2	\$49,502	
R3.B	Keosauqua	City of Keosauqua	Develop urban riverfront recreation area with improved access between the river and the community	3		
R3.C	Keosauqua	City of Keosauqua	Replace existing motor boat launch with universal design launch	1	\$226,245	
R3.D	Bentonsport	Van Buren County Conservation Board	New carry-down launch	2	\$31,933	
R3.E	Bentonsport	Van Buren County Conservation Board	Riverfront upgrades including walkway connections between key elements, bikerack and primitive camping spaces dedicated to paddlers	1		
C3.B	Keosauqua	Van Buren County Historical Society	Twombly Building Improvements	3		
C3.C	Keosauqua	Van Buren County Historical Society	Enhancement of Van Buren County Welcome Center & McCoy Historical Museum	2		
C3.D	Keosauqua	Van Buren County Historical Society	Pearson House Enhancement	1		
R4.A	Bonaparte	City of Bonaparte	New walkway connection between the boat launch and Main Street	1		
R4.B	Farmington	City of Farmington	Replace existing motorized boat ramp	1		
C4.B	Bonaparte	Willing landowner	Further Development and Protection of Bonaparte Pottery Archaeological District	1		OSA, Villages of Van Buren
C4.C	Bonaparte	City of Bonaparte	Restoration of Bonaparte Main Street	3		Villages of Van Buren
C4.D	Farmington	Pioneer Historical Society, Inc.	Enhancement of the Farmington Pioneer Museum	1		Villages of Van Buren



A scenic view of a riverbank with lush green trees and a fallen log in the foreground. The text is overlaid on the left side of the image.

CHAPTER 4  
RESOURCE  
CONSERVATION  
& PROTECTION  
PLAN

LOWER DES MOINES WATER TRAIL



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## CHAPTER 4 RESOURCE CONSERVATION & PROTECTION PLAN

**While every state water trail in Iowa is considered a special place, the Lower Des Moines River corridor is unique because it enters Iowa in the northwest corner, traverses the entire state and drains into the Mississippi River in the far southeast corner of the state.**

People have been hunting, collecting and processing resources, cooking food and interring their dead along this river corridor for 8,000-10,500 years (Haury-Artz 2013). The river was also the entry corridor for the first Euro-American settlers reaching the territory that would become Iowa. This river, more than most, has shaped the story and landscape of the state.

The banks and floodplains of this river have seen a large range of human endeavors including farming, villages, stone quarries, potteries, coal mining, flour mills, prehistoric and historic migration routes and river “improvement” projects. Federal “Indian policy”, conflicts and epidemics also evolved and impacted who lived here and called it home. Although much has changed, the corridor retains many preserved cultural and historic elements that are open to the public. And although the region today is dominated by agriculture, several large publicly owned, forested land tracts at the edge of the river offer enormous habitat value. The relative remoteness of this corridor is celebrated both locally and by visitors. To be here truly feels “a long way

from anywhere.” Small communities with amenities and businesses are scattered along the water trail route and offer river users a chance to explore and rest.

Today’s residents value the same resources that drew people here thousands of years ago: the ability to cultivate land, hunt animals and quietly live their lives. A strong community has come together 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 chert nodules, 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 Des Moines River beginning in Eldon on the upstream end to Farmington near the southern Van Buren county line (Figure 1). The communities of Eldon, Keosauqua, Bentonsport, Bonaparte and Farmington 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 extent and value of 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 Lower Des Moines 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 support this end

outcome 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 Des Moines 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.

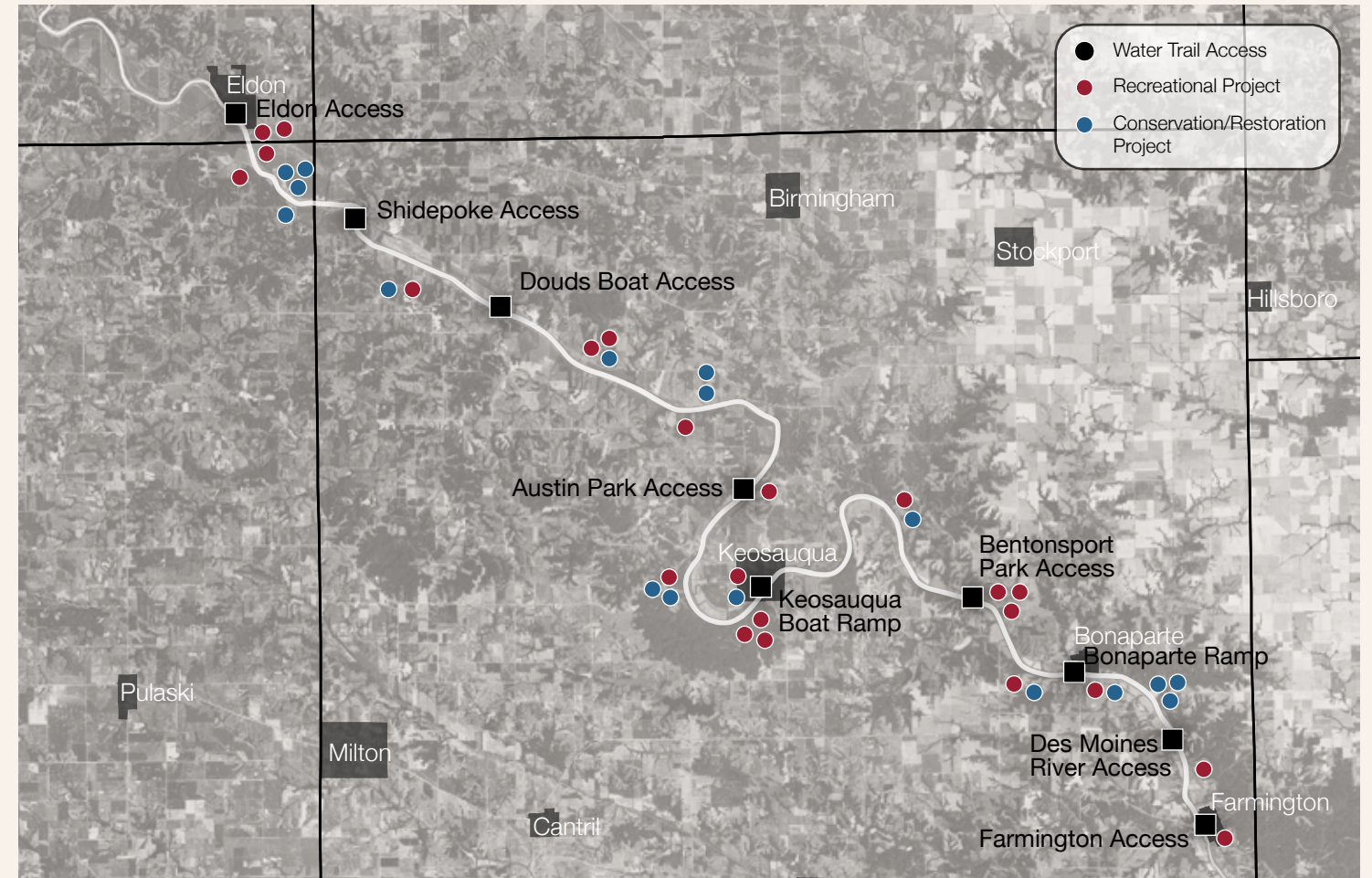


Figure 1  
Project recommendations for both resource conservation and protection as well as recreational development are distributed throughout the river corridor.

## 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 Lower Des Moines 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 Des Moines River Water Trail Corridor through Portions of Davis, Jefferson, Van Buren, and Wapello Counties, Iowa; 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 planning 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 in the water trail plan and implemented 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 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 Lower Des Moines in Wapello & Van Buren Counties

The Lower Des Moines River in this study area is an open river with a 750'+/- wide channel. The banks are mostly steep, ranging from 12 to 25 feet in height throughout with some exceptionally steep bluffs that peak above 100 feet on occasion. Flow in this river is artificially controlled at Red Rock Reservoir to minimize flood damage. The nature of the river has changed a great deal in the past three hundred years. Cultivation and urbanization processes resulted in massive amounts of soil loss into the river and altered water runoff processes. These changes produced the steep, vertical eroding streambanks visible today. Two large state public land holdings, Lacey-Keosauqua State Park and Shimek State Forest, have preserved the forested nature of this land from earlier periods of time. Together, these two areas total more than 10,000 acres adjacent to or very near the Des Moines River.

Land on either side of the channel is typically in cultivation although some forested areas also exist. Public roadways are located near the edge of the river on both sides for a majority of the study reach. There are few oxbow lakes or other similar low-lying areas adjacent to the channel. The river has not been channelized but its alignment has not shifted laterally to a large extent since measured maps began to be made.

Cultural and historic resources in this river valley are particularly rich (Figure 3). Many outstanding resource sites are

already in permanent protection and available to the public. Other sites, including at least one with national significance, remain in private ownership and are not protected from damage. Existing recreation and conservation areas are diverse although not plentiful outside of the large tracts of public ownership. Of the 85 bird species identified as breeding near the river in this project area, 33 are included on Iowa's Species of Greatest Conservation Need List by the Breeding Bird Atlas Project.



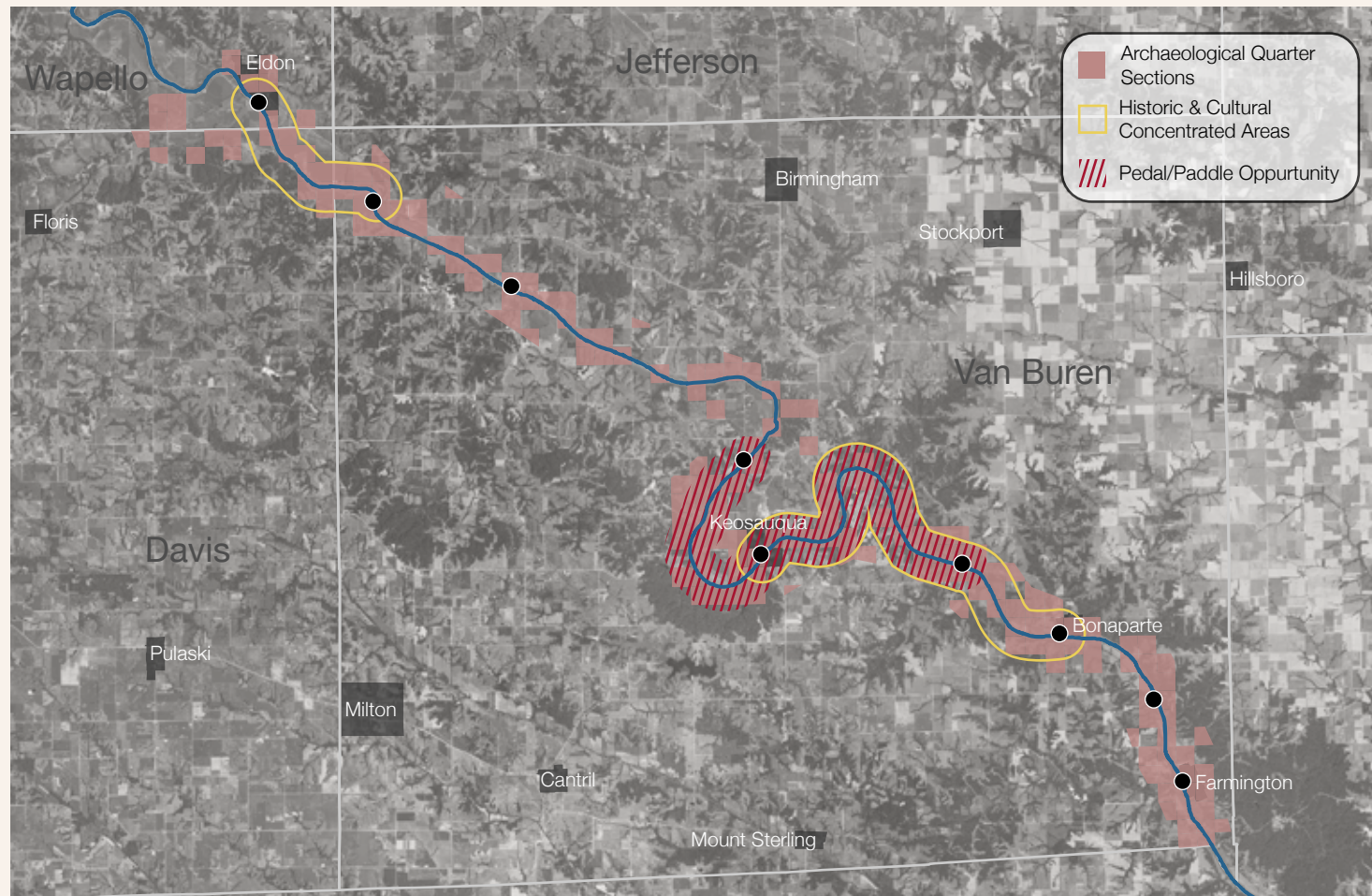


Figure 3  
Resource assessment conducted for the existing conditions of this water trail identified strong opportunities for both resource protection and recreation.

## IMPLEMENTATION OF THE LOWER DES MOINES VISION

The Lower Des Moines River between Douds and Farmington was designated as a state water trail in 2007. An important part of the vision for this water trail includes the extension of the water trail upstream to Eldon. Another major part of the vision is protecting and enhancing the conditions that make this river a high quality recreational experience. These include preserving the feeling of remoteness and protecting and enhancing conditions that support the high diversity of birds and other wildlife along 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 and parking areas to facilitate more efficient use and access by a greater proportion of the population. Additional bike trail miles and community recreation expansion in river edge parks are also included. Vision elements related to conservation and protection are largely focused on a concern for 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. Cultural and historic resource conservation and restoration are one of the most exciting and engaging features of this river region. Many opportunities present themselves to enhance what is known, interpreted and made publicly available for visitor experience.

## PLANNING PROCESS

This vision was developed through a two year planning process integrating stakeholders, agencies, non-profit organizations and landowners. A steering group composed of 14 local individuals representing special interests such as angling, paddling, land trails, conservation, history, business owners and landowners guided development of both the vision and this plan. The recreational development priorities included in this plan were developed by the Steering Group and the Water Trail Sponsors, Van Buren County Conservation Board and the Villages of Van Buren.

Existing conditions surrounding this section of the Des Moines River were assessed prior to beginning 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, Van Buren County Conservation staff and Board members, and the Iowa DNR prior to finalization of the plan.

## SCOPE OF THE PLAN

Conservation and protection elements are recommended for both the river channel 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 Van Buren County 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
Develop Partnerships With Other Watershed Efforts and Organizations	X	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 streambank erosion threatening infrastructure such as roads and bridges in Van Buren County as well as missing riparian buffer plantings (Figure 4). The Lower Des Moines Water Trail has an enormous watershed compared to other Iowa interior rivers. The drainage basin or watershed area draining into the water trail includes 9,092,130 acres (Figure 5). A majority of the watershed acres (64% 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 began to be produced. However, the river channel has widened since Euro-American settlement and this widening appears to be continuing.

Some portions of the river channel bottom and banks are relatively stable due to bedrock containment of the channel and its valley downstream of Douds. This prevents both lateral migration, and down cutting into the bed. Flows in the Des Moines River are regulated by the Red Rock Reservoir upstream to reduce flood damage. This management causes artificial flow conditions that can negatively impact streambank stability. 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 Red Rock Dam, and altered seasonal flow regimes due to flood management effects of the dam.

Concerns about the surface water quality exist locally. The entire reach of the Des Moines River included in this study, as well as upstream and downstream, are impaired for both indicator bacteria and biological conditions. Three tributaries entering the main channel near the water trail (Bear, Sugar and Soap creeks) are also listed as impaired. Water quality projects in Wapello and Van Buren counties were successful in obtaining federal and state grant funding to address water quality concerns particularly to reduce erosion and sedimentation. Funded water quality projects were included in the Chequest, Little Lick and Miller creek watersheds.

One of the most important conservation needs identified in the study area is also one of the easiest to address. The landcover within the first 100' of the top of the streambank for this water trail was compared to eleven other water trail study routes in Iowa. 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 leading 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 Des Moines River was among those with the highest percentages of both annually cultivated cropland and roadways in this first 100' wide area. Of all the water trail segments, the Douds Access to Austin Park segment includes the highest percentage of annually cultivated crops within the buffer area, with 19%. Excluding

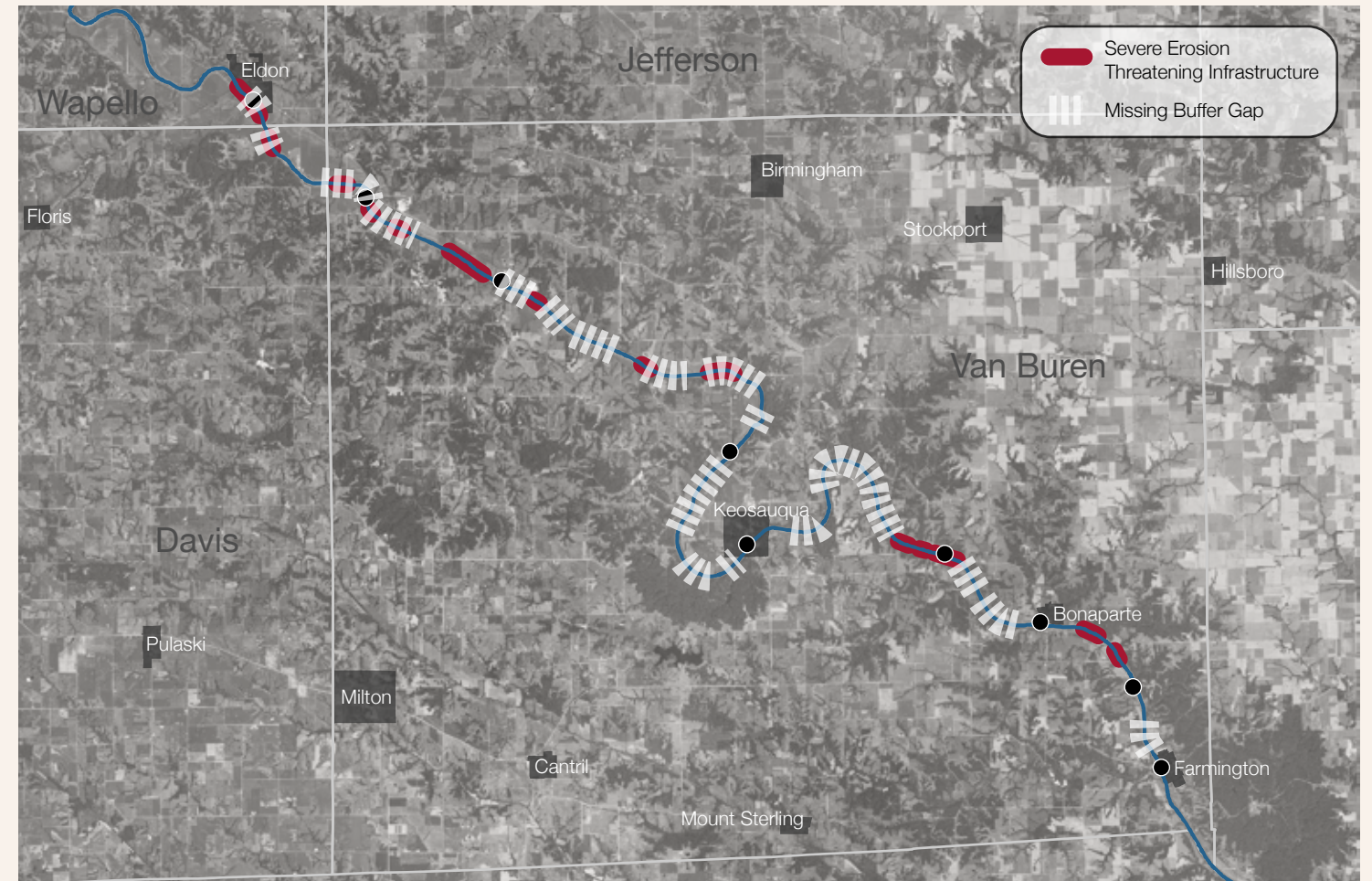


Figure 4  
Missing riparian buffer plantings are located in areas where annual row crops are planted up to the top of the streambank.

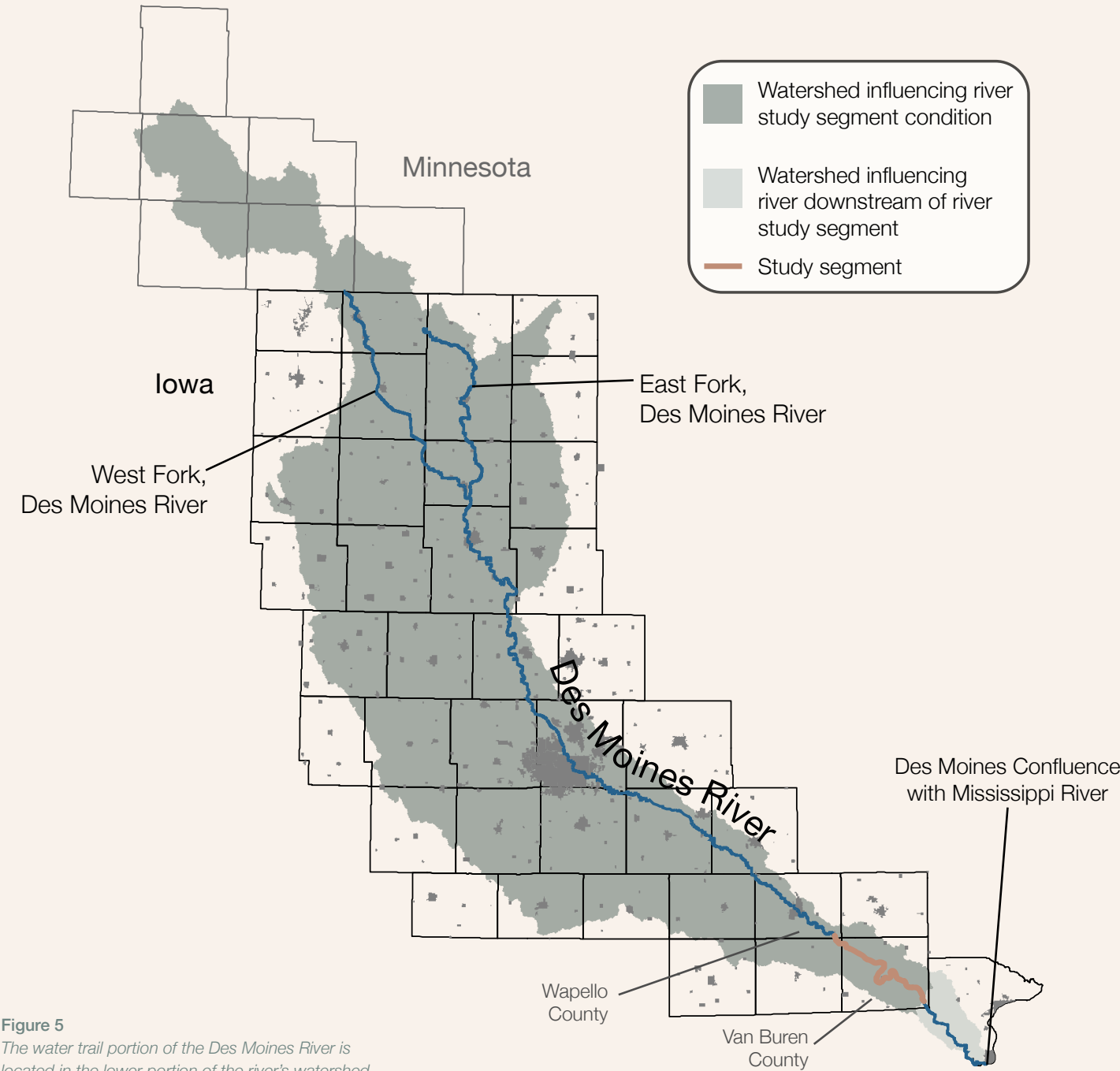


the “Other” category, 87% of the total acres in the 100’ buffer are perennial landcover while 13% are annually-cultivated crops. One of the goals and recommendations of this plan is to replace those annually cultivated acres with perennial vegetation.

More than 30,000 acres of public natural areas are within a 10-mile radius of the Lower Des Moines River Water Trail. This is one of the highest percentages of public land within 10-miles compared to all state water trails. Ninety percent of those natural areas are state owned and make up two of the largest public land complexes in the state. These lands provide an enormous benefit for wildlife and soil conservation as well as recreation.

The river corridor provides habitat to valuable wildlife species. General fish species maps generated by Iowa DNR in 2010 as a part of the Iowa Dams Plan suggested Des Moines River in Wapello and Van Buren counties is part of a segment where 40-50 fish species have been observed in biological sampling efforts. Breeding bird studies, the Breeding Bird Inventory II (BBA II) identified a total of 113 species in the riparian corridor blocks studied and 129 in the watershed study blocks studied. Of these, 26% (29) of riparian block species and 32% (41) of species identified in the watershed study area are included on Iowa’s Species of Greatest Conservation Need (SGCN). 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, 598 recorded archaeological sites and 1,600 architectural resources with associated Iowa Site File (I-Sites) Inventory numbers exist in the corridor adjacent to the Des Moines River. These resources include one of the most significant Báxoje (Ioway)village sites in the nation as well as historic districts, buildings and sites relating to Euro-American settlement.



**Figure 5**  
The water trail portion of the Des Moines 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 channel were identified during planning:

- Enhance water quality conditions in the Des Moines 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 Wapello and Van Buren 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 Des Moines River and its tributaries

Explore permanent protection of existing mature forested riparian land tracts in private ownership

Support U.S. Army Corps of Engineers plans to manage flows on the Des Moines River that mimic natural seasonal flow cycles rather than traditional flood control flow management

Increase the focus on the presence of invasive species, such as Silver Carp, which negatively impact native fish populations



# CULTURAL RESOURCE PROTECTION NEEDS

This corridor contains significant cultural and historic sites of national significance. The majority 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

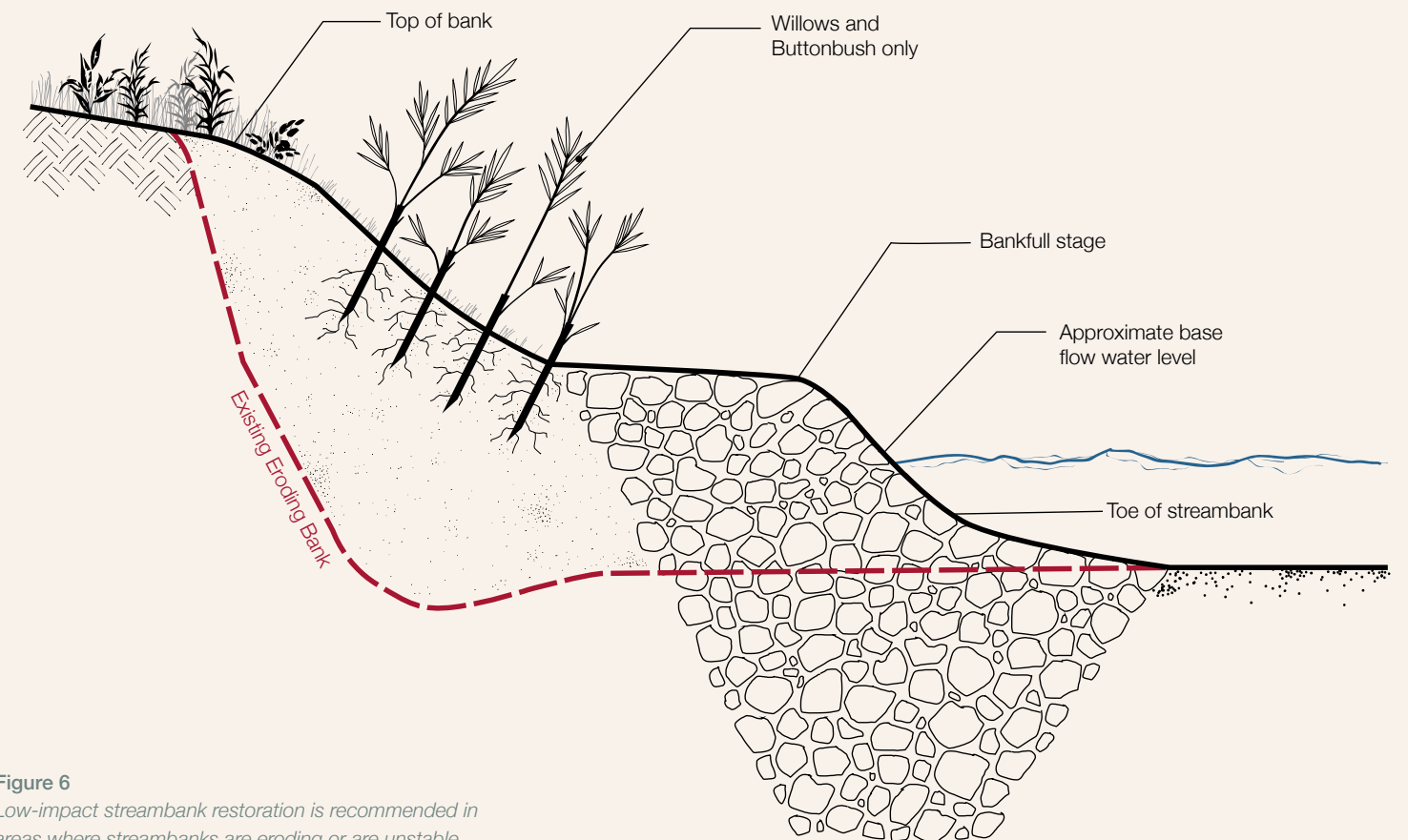
## RESOURCE CONSERVATION AND PROTECTION OVERVIEW

### Streambank

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 largely determine how resilient the river is to 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 the bank 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 6). 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 6**  
Low-impact streambank restoration is recommended in areas where streambanks are eroding or are unstable.



## 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 7). 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 7**  
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 Des Moines River was the transportation corridor that first provided access. This land saw intense activities between the American Indian residents and new settlers. Fortunately, many of the sites known to be important to both types of cultures are already in public or non-profit ownership and are protected from destruction. 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.

In many instances, historic structures and districts have been identified and registered with the National Register of Historic Places. These resources offer an enormous opportunity to explore the architecture and the way of life of townsfolk in the area for the past couple hundred years. However, local financial resources are extremely limited to maintain these historic buildings when they are in public or non-profit ownership. Further development and upgrades, including accessibility, archiving and interpretation, are likewise extremely difficult to accomplish due to funding limitations. When these enhancements occur, they are often completed by volunteer labor. Lastly, the amount of volunteer social capital available locally is limited because of the small population size and high proportion of those age 65 and older in these counties.





## 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 and fish migration enhancement
- 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
- 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 circulation between community downtowns and the riverfront, establishing a remote paddle-in campsite, development of additional bike route options, and river access upgrades.

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 Lower Des Moines River. The strategies include in-channel, streambank, and inland / upland areas. The study area river corridor is divided into three segments (*Figure 8*) and one additional segment that includes the entire corridor. Recommendations are organized by segment and include maps, drawings and text descriptions. Some recommendations span multiple segments or the entire 44-mile study area. Preliminary cost estimates for water trail-related enhancements based on recent restoration material and construction costs in Iowa.

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 Van Buren County Conservation Board and staff. Finally, these recommendations address local, regional, state and national conservation priorities.

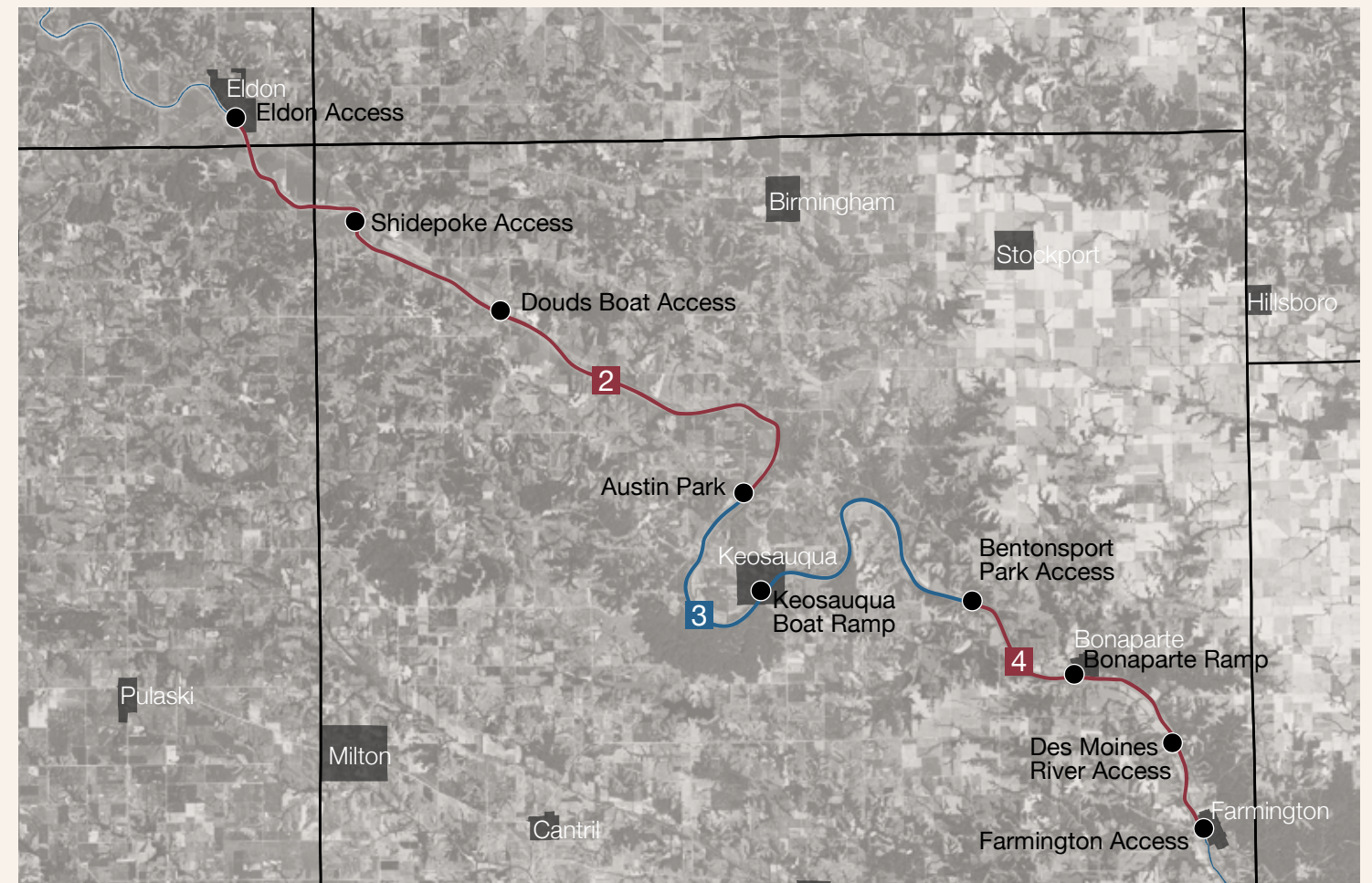


Figure 8  
The study area for this Conservation and Protection Plan is divided into three segments.





# SEGMENT C1: CORRIDOR-WIDE AND MULTIPLE SEGMENT PROJECTS

## C1.A Develop Designs for Low Impact Streambank Restoration

Reducing streambank erosion is one of the most important priorities for this water trail project. The development of professional standard designs and details using low impact and ecologically friendly methods appropriate specifically for this portion of the Lower Des Moines River are recommended. The construction design would take into account the effects of Red Rock Reservoir 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.

## C1.B Establish a Continuous Riparian Buffer

Development of a 100-foot wide perennial stream edge buffer is recommended for the entire 44 miles of the Lower Des Moines River. The buffer width is measured beginning at the top of the streambank. A total of 130 acres are missing from this buffer (2016) although much of this is due to the presence of public roads on one or both sides of the river. Establishment of a Woody Tree and Shrub Mix, comprised of native trees and shrubs along with a temporary seed mix is recommended.

## C1.C Encourage Additional Volunteer Water Quality Monitoring on the Lower Des Moines and Tributaries

Bacteria concentrations in the river are a concern to local residents. Additional volunteer monitoring on the Lower Des Moines 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.

## C1.D Coordinate with Van Buren SWCD to Work with Farmers to Reduce Bacteria Loading and Establish Perennial Vegetation Buffers on Tributaries of the Lower Des Moines River

Livestock sources of bacteria in rural parts of Van Buren County are likely contributing to impaired water conditions in the Lower Des Moines River and its tributaries. Coordination with Van Buren Soil and Water Conservation District (SWCD) is recommended. Together, efforts can be formalized to engage landowners and identify funding to make improvements that lower bacteria loading (Figure 9).

Development of a 100-foot wide perennial stream edge buffer on either side of the river is also recommended and ranked as a high priority by this Water Trail Sponsor. The replacement of annually-cultivated cropland and mown grass with a woody tree and shrub mix is recommended. The community would be comprised of native trees and shrubs with a temporary seed mix.

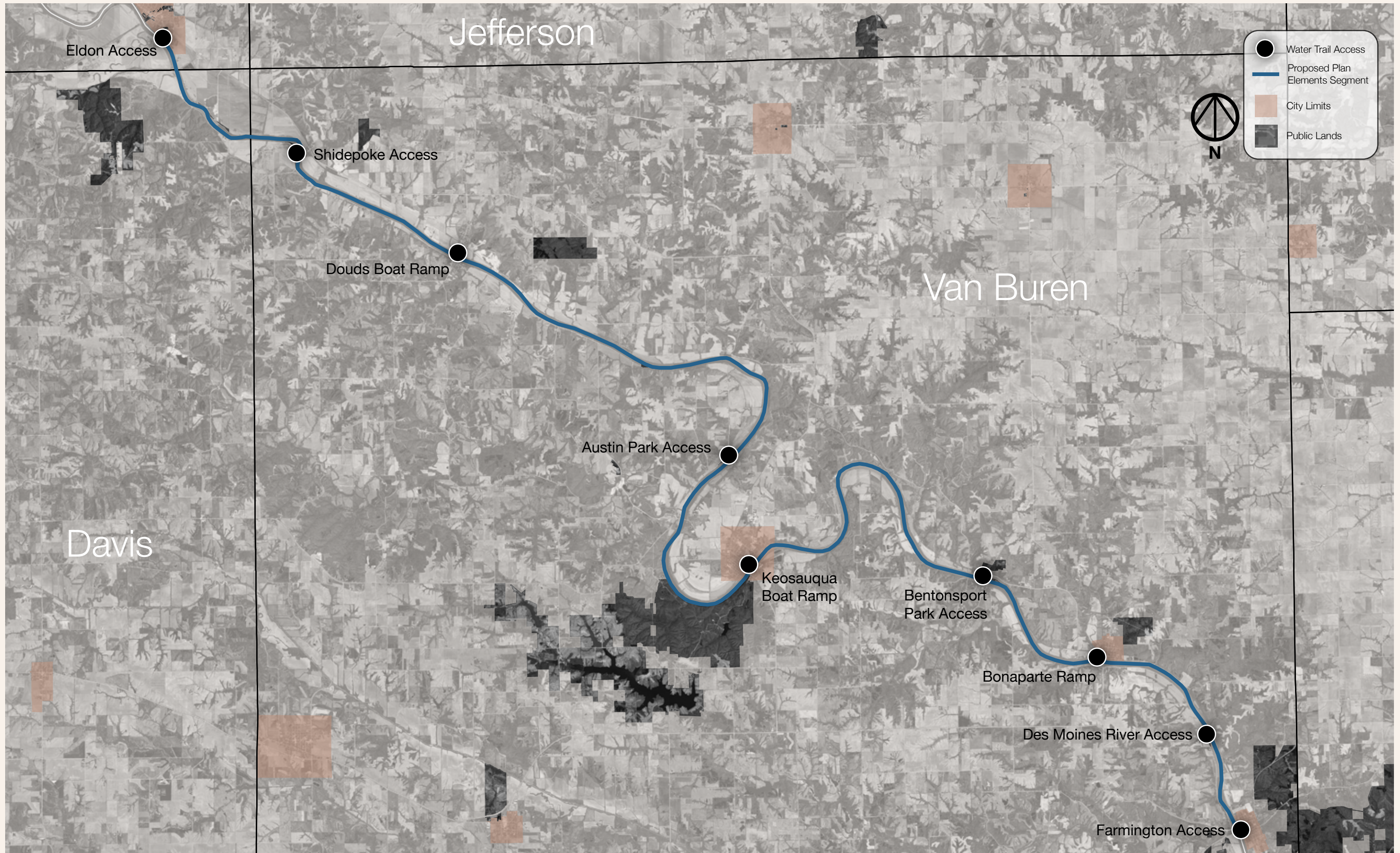
## C1.E Explore Voluntary Land Protection Strategies for Privately Owned Riparian Forests

The exploration of various strategies is recommended to protect privately-owned existing mature riparian forest tracts adjacent to the Lower Des Moines River. 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.



**Figure 9**  
The entire reach of this water trail is listed as Impaired on Iowa's most recent 303d list suggesting that watershed-wide approaches are necessary.







## C1.F Pursue Habitat Enhancement for Mussel Species, Turtles and Amphibians

Little technical documentation exists for mussel populations on this portion of the Des Moines River due to the size of the channel. In-stream and riparian corridor enhancements to further support populations of each species are recommended in conjunction with Van Buren County Conservation and Iowa DNR. Further investigation is recommended to understand what mussel species are present. Riparian corridor enhancements include restoration of savanna-type landscapes at the river's edge and protection of backwater slough areas.

## C1.G Promote Additional In-Stream Fish Habitat Structures

In-stream and riparian corridor enhancements to further support populations are recommended in conjunction with local anglers, Van Buren County Conservation Board and Iowa DNR. This includes tributaries which are important for seasonal migration and spawning.

## C1.H Encourage Bird Habitat Enhancement in River Corridor

Riparian corridor enhancements that further support populations are recommended in conjunction with Van Buren County Conservation Board and Iowa DNR. Spectacular habitat areas already exist on large public land parcels adjacent to the river. Additional habitat management and development off river and in the riparian corridor will enhance these conditions. Bird watching benefits local economies by the food, lodging and other shopping dollars visitors spend when they visit an area.

## C1.I Continue Monitoring Invasive Carp Presence

Three species of invasive carp (Silver, Bighead and Grass) are abundant in the study reach of the Des Moines River. Silver carp pose a significant hazard for water trail users, jumping near or into boats and startling paddlers or motor boaters. 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.

Bighead, Silver, and Grass Carp are widely distributed from the mouth of the Des Moines River near Keokuk upstream to the Red Rock Lake dam. Silver Carp appear to be more abundant than Bighead Carp throughout this stretch (K. Bogenschutz, personal communication, March 14, 2018). Boaters have also reported Silver Carp presence in Van Buren County. Densities are very high in some locations such as below Red Rock Lake dam. Populations of Silver Carp were the highest in April-May and decreasing in subsequent months based on monitoring reports (Sullivan et al. 2017). The US Fish and Wildlife Service, Iowa State University and Missouri Department of Conservation are monitoring the movement of these species on the Lower Des Moines River. Continued monitoring is recommended.

## C1.J Systematic Pedestrian Survey

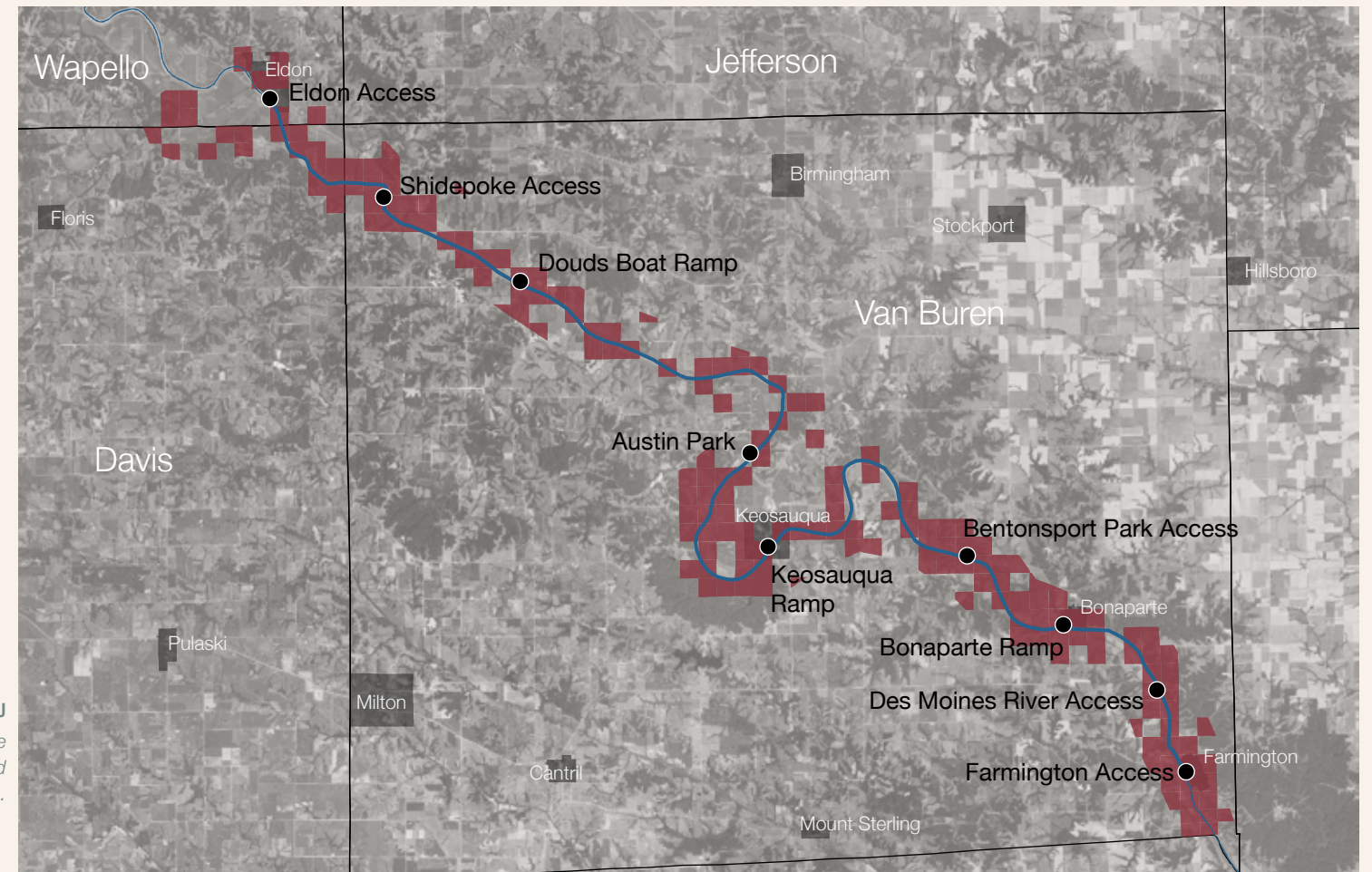
A systematic pedestrian survey of cultural resource sites is recommended in the river corridor (Horgen and Peterson 2014). Pedestrian surveys are single-day events where local volunteers (as many as 15 in number) are led by professional archaeologists to canvas an area that has potential for turning up artifacts. Survey elements include locating early General Land Office (GLO) survey sites, Oneota tradition site surveys and relocation, and identifying Early Settlement-era potteries. Pedestrian surveys can yield important new information about prehistoric habitation in this study area while simultaneously engaging local residents in the study of archaeology.

C1.J

*Shaded quarter-sections of land illustrated on this map have at least one documented archaeological or historic site located within them. These areas are ideal for pedestrian surveys.*

## C1.K Interpretive Plan

A formal interpretive plan would complement the publication, *A River of Unrivaled Advantages: Life along the Des Moines River* (Haury-Artz 2013). A large range of topics are appropriate to include in an expanded, coordinated format for interpretation, including steamboat transportation, Mormon Trail, stoneware pottery production, prehistoric occupancy and petroglyphs, four National Register of Historic Places districts adjacent to the river, and numerous Euro-American settlement era buildings such as the Gothic House. Interpretation across a variety of media types is recommended to engage visitors and residents of all ages and abilities.





# SEGMENT C2: ELDON TO AUSTIN PARK

## EXISTING CONDITIONS

This river segment is 18.9 miles in length. The first 13 miles the river is relatively straight with one bend above the Shidepoke Access. It mostly runs through privately owned farm land with a very narrow riparian corridor. Public roads run near the top of the streambanks on both sides of the river for a majority of this segment. The landscape begins to change just before a big bend in the river to the south. About five miles above Austin Park, near where a paddle-in campsite is recommended, a forested riparian buffer begins on river left. The area has hills and valleys, too steep and rugged for farming which hold diverse woodlands, including some old white and red oaks (150-200+ years old) and large shagbark hickory trees.

## ISSUES AND OPPORTUNITIES

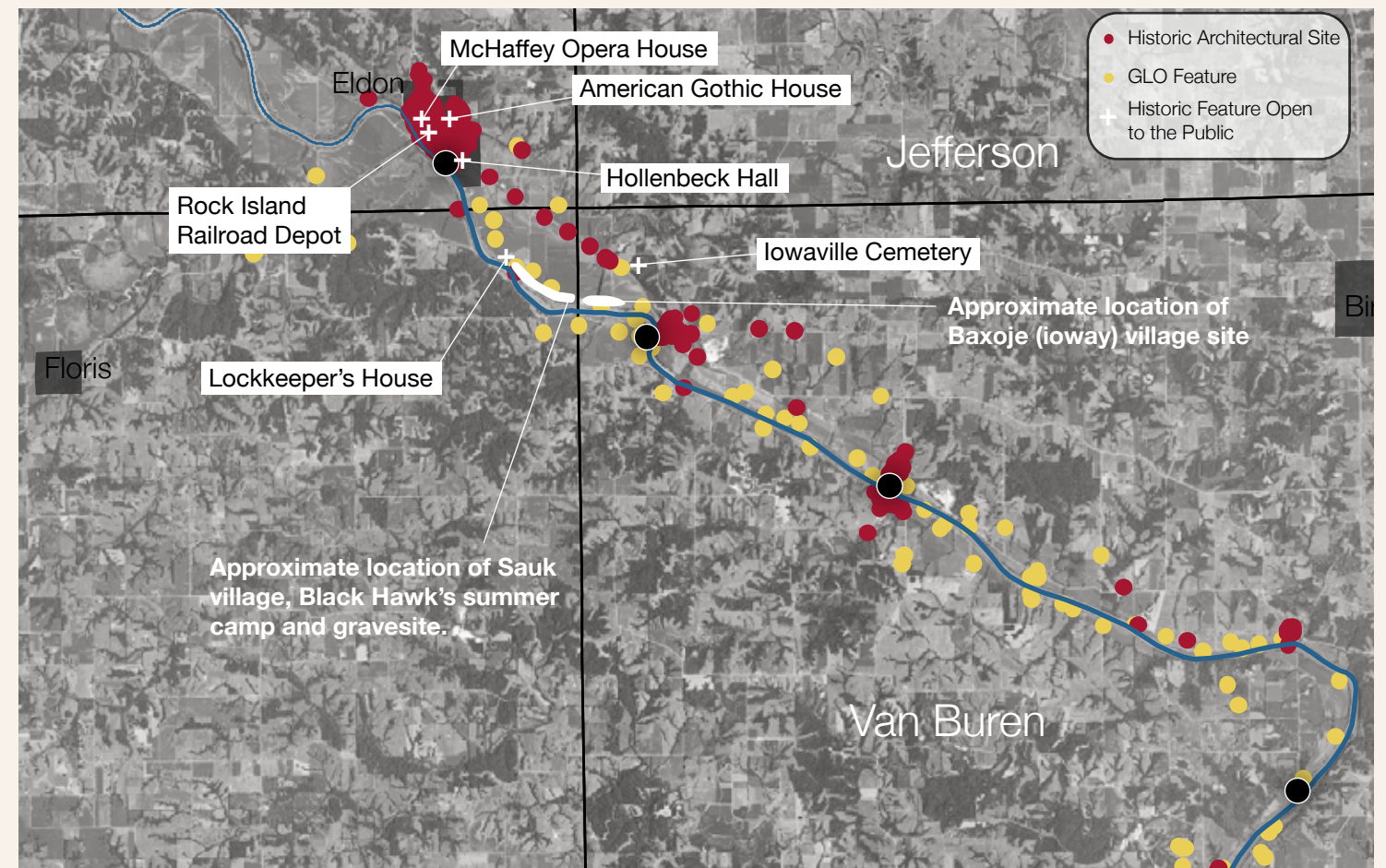
The primary conservation and protection concern on this segment is the lack of a riparian buffer. Forested riparian buffers protect streambanks from erosion, offer visual interest and provide habitat. An important cultural resource protection opportunity also exists on this segment.

### C2.A Survey and Protection of Cultural Resources

A number of established cultural resources exist near this segment of the river and in the town of Eldon, including the American Gothic House Center, McHaffey Opera House, Rock Island Railroad Depot, and Hollenbeck Hall on the Wapello County Fairgrounds. Another designated and publicly owned historic site, the Lockkeeper's House, is located two miles downstream of Eldon. A little known but nationally significant cultural resource, the loway Village Site, is located approximately 1/2 mile downstream of the Lockkeeper's House.

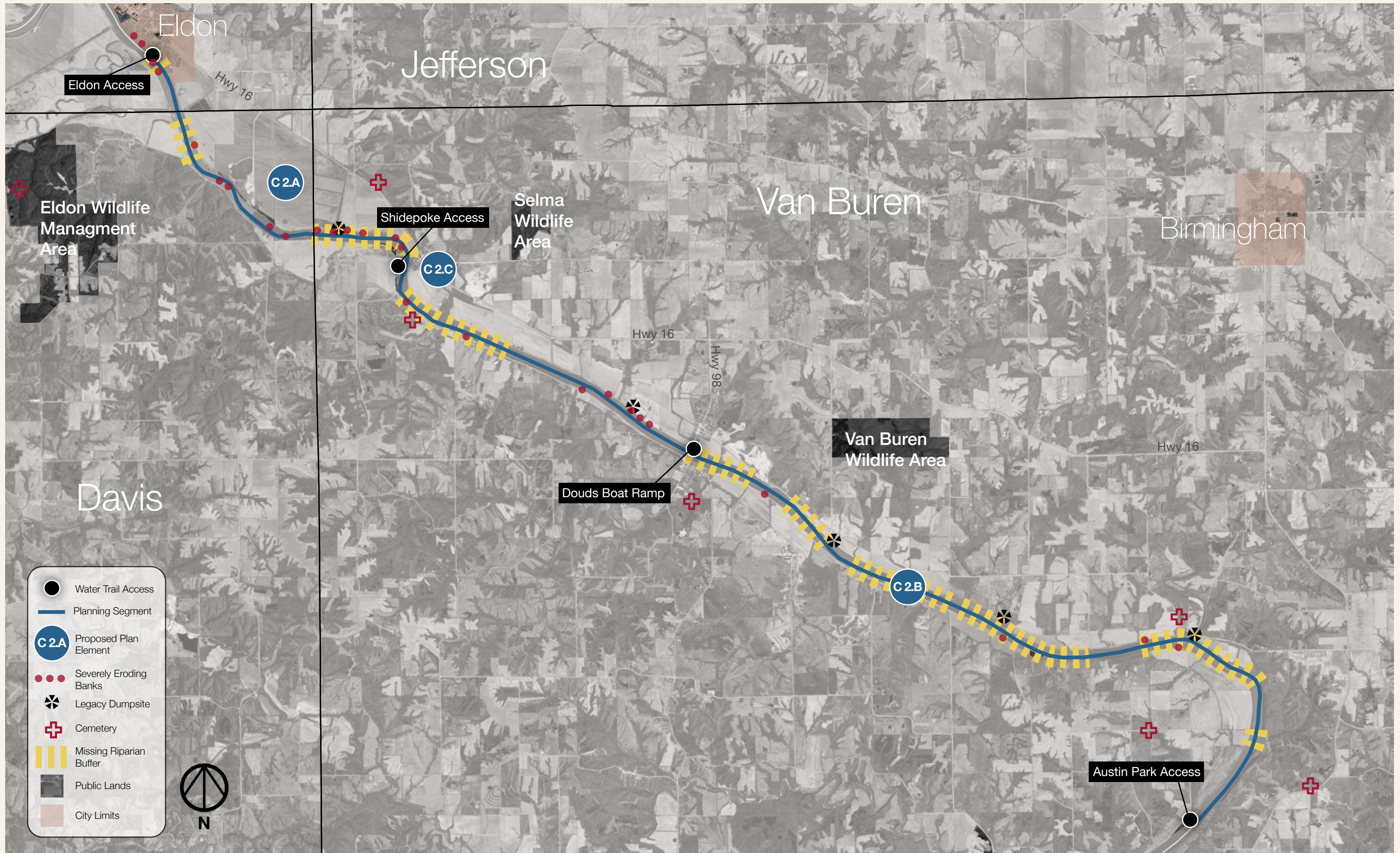
- A Sauk village site, the summer home and burial place of the warrior Black Hawk, and the Jordan Trading Post were also located in close proximity to the loway Village site. The lowaville Cemetery, which contains a marker memorializing Black Hawk, lies about 3/4 of a mile away on the hillside above the floodplain.
- The loway Village site is recommended for permanent protection and development of an Interpretation Center. This site is one of the most significant Báxoje sites in the nation. Báxoje is the antonym for the loway. Archaeologists estimate that 500 to 1,600 Báxoje occupied this 40 acre village area from 1765 until 1820s. They hunted, trapped, farmed, and traded using this village as their base of activity. The site is well known to artifact collectors and was first officially recorded as an archaeological site in the state database in 1971. Archaeological work in 2010 assessed the site condition in order to understand what, if anything remained preserved below ground in this cultivated farm field. The National Park Service greatly assisted by conducting a non-invasive magnetometry survey, covering over 19 acres. The magnetometry results, coupled with archaeological testing and help from local volunteers and artifact collectors, revealed astonishing news about the superior level of site preservation.

The village site is located on a 103 acre parcel of land that continues to be used for agricultural production. If the land becomes available, Van Buren County Conservation Board has agreed to be the public landholder, and the Iowa DNR has indicated interest in managing the site if it is planted in perennial cover and hunting is allowed. This would protect both the site and artifacts found on the property from exploitation. The location would be a rich opportunity to interpret the history of the region both prior to and after Euro-American settlement. The Office of the State Archaeologist and Iowa DNR have strong interest in permanent protection of this site. They have prepared extensive recommendations for site management if purchased.



C2.A  
While resource sites are located throughout the river corridor, this segment is particularly well developed for public interpretation.









## SEGMENT C3: AUSTIN PARK TO BENTONSPORT

### EXISTING CONDITIONS

This river segment is 14.4 miles in length and includes the border of Lacey-Keosauqua State Park and the communities of Keosauqua and Bentonsport. Large sandstone/limestone hills confine the river and direct it around the horseshoe bend. The hills and the river edges and benches below them, are heavily forested and contain abundant wildlife species.

### ISSUES AND OPPORTUNITIES

This segment of the river is notable for its unique landscape features, abundant public land, and its rich cultural history. The town of Keosauqua offers visitors a chance to view numerous buildings with interesting historic architecture. The entire unincorporated town of Bentonsport is registered as a National Historic District and is home to several resident artisans and specialty shops. A popular walking tour, with a printed brochure/map, features all of the historic homes and sites within the historic district.

### C2.B Vegetative Buffer Establishment

A total of 71 acres of riparian buffer is missing on this segment of the water trail. Establishment of a forested buffer comprised of native trees, shrubs and a temporary seeding 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.

### C2.C Selma

The erection of a war memorial monument is planned in the City Park. The park includes an 1846 authentic log cabin. Preservation of the cabin continues, which is owned by the Van Buren County Historical society.

### Permitting

Construction for streambank restoration or other activity near the edge of the Des Moines River could require a Phase I archaeological investigation unless past disturbance can be verified, particularly near the Eldon Boat Ramp.

### C3.A Vegetative Buffer Establishment

A total of 50 acres of riparian buffer is missing on this segment of the water trail. The land is predominantly privately owned and is in annually-cultivated crops. Establishment of a forested buffer is recommended comprised of native trees, shrubs and a temporary seeding mix. 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.

### C3.B Improvement of the Twombly Building

The Twombly building is owned by the Van Buren County Historical Society and is located in downtown Keosauqua. The intention of this group is to continue to use this building as a museum. Future plans include improving and upgrading the artifact displays for interpretation and continued restoration and preservation of the building.









**C3.C**  
Enhancement of Van Buren County Welcome Center & McCoy Historical Museum

Located on the same block as the Twombly Museum, this building functions as Van Buren County's Welcome Center with offices for Villages of Van Buren tourism & Village Folk School, as well as a meeting room and classroom area for the Folk School. The building will continue to be used for these purposes. In addition, a cultural / community center addition is planned in the rear of the building.

**C3.D**  
Enhancement of the Pearson House

The Pearson House is operated by Van Buren County Historical Society in Keosauqua. The home operated as a prominent stop on the Underground Railroad, helping to hide escaping slaves from the southern states to reach freedom in the North in the years prior to the Civil War. Accessibility upgrades are recommended on the main level. A new structure with accessible restrooms is recommended. These enhancements would improve the cultural and historic interpretation by offering access to a broader range of visitors.

**Permitting**

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



# SEGMENT C4: BENTONSPORT TO FARMINGTON

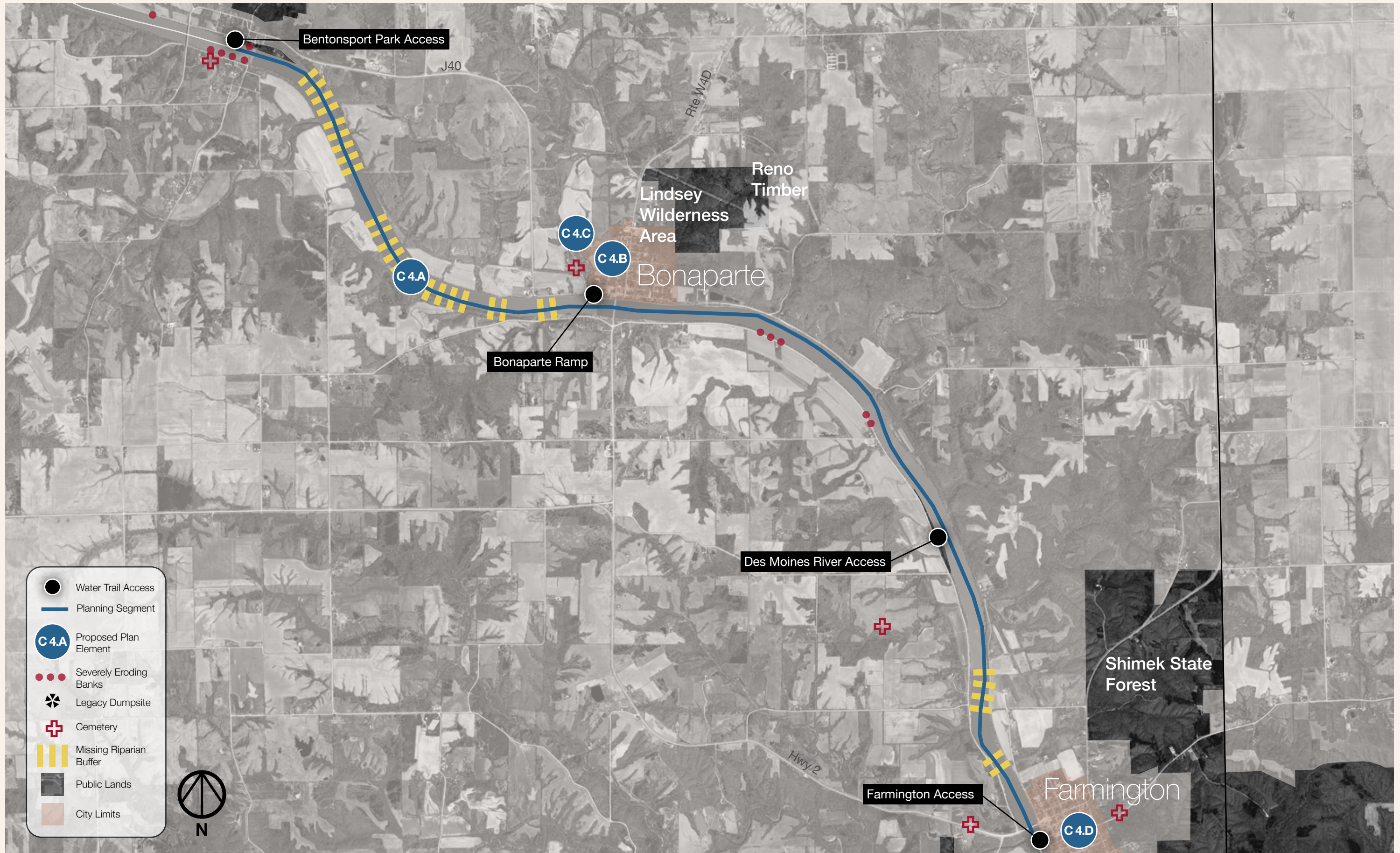
## EXISTING CONDITIONS

This 10-mile segment includes the Bonaparte, Des Moines River, and Farmington Accesses. The corridor in this segment includes both ridges and hills and some farmed floodplain. Roads flank both sides of the river the majority of the way below Bonaparte. There is a densely wooded ridge on the north side of the river about 2.5 miles above Farmington. In the farmed segments a complete 100-foot riparian corridor is often missing.

## ISSUES AND OPPORTUNITIES

Multiple opportunities exist to protect cultural, natural and historic resources in this segment, as well as enhance water quality conditions. This segment of the river has the most intact perennial vegetation buffer compared to all other segments in the water trail. The segment also includes significant historic resources. Two communities, Bentonsport and Bonaparte, have districts included on the National Register of Historic Places. An additional historic district has also been designated in Bonaparte.









### C4.A Vegetative Buffer Establishment

A total of 9 acres of riparian buffer is missing on this segment of the water trail. The land is predominantly privately owned and is in annually-cultivated crops. Establishment of a forested buffer is recommended comprised of native trees, shrubs and a temporary seeding mix. 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.

### C4.B Further Development of Bonaparte Pottery Archaeological District

This District is on the National Register of Historic Places, including the standing Bonaparte Pottery factory and the surrounding factory site. Other pottery sites in the river corridor include the Green Pottery near Leando and Dickinson Pottery at Vernon. Bonaparte Pottery is privately owned and operated in the spirit of historic education and interpretation. Eventual permanent protection of this site is recommended. A systematic historical and archaeological investigation along the Des Moines River would aid in the documentation of the pioneer pottery industry in southeastern Iowa.

### C4.C Bonaparte Main Street

Main Street in Bonaparte is a National Historic District with several historic buildings that are in need of restoration and development including an 1863 woolen mill which is a very iconic structure along the river. Other such structures along the river include the 1878 Grist Mill and the 1892 Pants Factory.

### C4.C Enhancement of the Farmington Pioneer Museum

Originally the First Congregational Church of Farmington, the building was modeled after the typical rural New England Church. The building now houses a museum with many artifacts and historic items. Accessibility, signage and archival upgrades are recommended. These enhancements will expand the range of visitors able to use the facility and upgrade their ability to store, study and preserve artifacts.

## Permitting

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

# Recreational Conservation and Protection Overview

All recommended elements are summarized and organized in the Appendix A (Recreation and Conservation Prioritization). The prioritization includes 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 (Eldon, Keosauqua and Farmington) and Van Buren County may have 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 (Appendix A) with oversight from the water trail manager. 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 Villages of Van Buren, Iowa Natural Heritage Foundation, Iowa Prairie Network, Preservation Iowa, Iowa Ornithologists' Union and Iowa Archaeological Society
- Local and State Agencies including Wapello and Van Buren 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.



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# APPENDIX A. Recreation and Conservation Prioritization

Map Code	Location	Lead Jurisdiction	Recommendation	Local Prioritization	Budget Estimate for River-Related Recommendations	Other Collaborators
C1.A	Corridorwide	Van Buren County Conservation Board	Develop designs for low impact streambank restoration.	1		Iowa DNR River Programs
C1.B	Corridorwide	Van Buren County Conservation Board	Coordinate with Van Buren SWCD to establish a continuous perennial vegetation buffers on the <b>Des Moines River and its tributaries</b>	1		Van Buren SWCD
C1.C	Corridorwide	Van Buren County Conservation Board	Encourage additional volunteer water quality monitoring on the <b>Lower Des Moines and tributaries.</b>	1		
C1.D	Corridorwide	Van Buren County Conservation Board	Coordinate with Van Buren SWCD to work with farmers to reduce <b>bacteria loading on the Lower Des Moines and its tributaries</b>	1		Van Buren SWCD
C1.E	Corridorwide	Van Buren County Conservation Board	Explore Voluntary Land Protection Strategies for <b>privately owned Riparian Forests</b>	1		
C1.F	Corridorwide	Van Buren County Conservation Board	Pursue habitat enhancement for mussel species, <b>turtles and amphibians</b>	2		Iowa DNR
C1.G	Corridorwide	Van Buren County Conservation Board	Promote additional in-stream fish habitat structures	1		Iowa DNR
C1.H	Corridorwide	Van Buren County Conservation Board	Encourage bird habitat enhancement in river corridor	1		
C1.I	Corridorwide	USFWS	Continue monitoring Asian carp presence	1		Iowa DNR, state universities
C1.J	Corridorwide		Systematic pedestrian survey of cultural resource sites	2		
C1.K	Corridorwide	Iowa DNR	Develop Interpretive Plan	1		Van Buren County Conservation Board, Villages of Van Buren
R1.A	Corridorwide	Van Buren County Conservation Board	On-Water Rescue Capacity	1		Van Buren & Wapello County Sheriffs Offices
R1.B	Corridorwide	Van Buren County Conservation Board	Communication to Users	1		Iowa DNR
R1.C	Corridorwide	Van Buren County Conservation Board	Develop a long term plan for a bike/land trail adjacent to the Des Moines River.	3		
R1.D	Corridorwide	Van Buren County Conservation Board	Coordinate with the U.S. Army Corp of Engineers to coordinate flow levels during the summer months.	1		Iowa DNR River Programs
R1.E	Corridorwide	Villages of Van Buren	Establish a pedal/paddle/saddle event	1		Van Buren County Conservation Board
R1.F	Corridorwide	Iowa DNR River Programs	Create an Interpretative Plan	1		Villages of Van Buren
R1.G	Corridorwide	Iowa DNR River Programs	Enhanced Communication Among Water Trail Access Managers	1		Villages of Van Buren
R1.H	Corridorwide	Villages of Van Buren	Establish regular naturalist programming related to the river	1		Van Buren County Conservation Board
C2.A	Corridorwide	Van Buren County Conservation Board	Survey and Protection of Cultural & Historic Resources including permanent protection of <b>loway Village site</b>	3		OSA, Villages of Van Buren
C2.B	Selma	Van Buren County Historical Society	War Memorial installation in City Park	3		
R2.A	Eldon	City of Eldon	Add caution sign to existing dock	3		Iowa DNR



R2.B	Eldon	City of Eldon	New carry-down launch	1	\$38,570	
R2.C	Eldon	City of Eldon	Improved pedestrian connection and facilities between the boat launch and fairgrounds	2		
R2.D	Douds	Van Buren County Conservation Board	Douds Access Improvements	1		
R2.E	Schultz Conservation area	Van Buren County Conservation Board	New paddle-in campsite	2		
R2.F	Austin Park	Van Buren County Conservation Board	New universal design access, parking and seasonal portapotty	2	\$133,198	
C3.B	Keosauqua	Van Buren County Historical Society	Twombly Building Improvements	3		
C3.C	Keosauqua	Van Buren County Historical Society	Enhancement of Van Buren County Welcome Center & McCoy Historical Museum	2		
C3.D	Keosauqua	Van Buren County Historical Society	Pearson House Enhancement	1		
R3.A	Keosauqua, near Amphitheater	City of Keosauqua	New carry-down launch and accessible parking	2	\$49,502	
R3.B	Keosauqua	City of Keosauqua	Develop urban riverfront recreation area with improved access between the river and the community	3		
R3.C	Keosauqua	City of Keosauqua	Replace existing motor boat launch with universal design launch	1	\$226,245	
R3.D	Bentonsport	Van Buren County Conservation Board	New carry-down launch	2	\$31,933	
R3.E	Bentonsport	Van Buren County Conservation Board	Riverfront upgrades including walkway connections between key elements, bikerack and primitive camping spaces dedicated to paddlers	1		
C4.B	Bonaparte	Willing landowner	Further Development and Protection of Bonaparte Pottery Archaeological District	1		OSA, Villages of Van Buren
C4.C	Bonaparte	City of Bonaparte	Restoration of Bonaparte Main Street	3		Villages of Van Buren
C4.D	Farmington	Pioneer Historical Society, Inc.	Enhancement of the Farmington Pioneer Museum	1		Villages of Van Buren
R4.A	Bonaparte	City of Bonaparte	New walkway connection between the boat launch and Main Street	1		
R4.B	Farmington	City of Farmington	Replace existing motorized boat ramp	1		