Maquoketa River downstream from Pioneer Road River Access
Photo Credit: Dan Cohen, Iowa Department of Natural Resources

LOWER DELAWARE COUNTY WATER TRAIL PLAN

Lower Maquoketa River: Bailey's Ford Park to County Line

Draft 11-24-25

Contents

1. Introduction

Delaware County is located in picturesque Northeast Iowa and is home to approximately 17,500 people. Residents are spread throughout the county on farms and in small cities and unincorporated communities. While Delaware County is known for its livestock and crop production, it is also known for its many parks and recreational opportunities.

Delaware County is home to the Maquoketa River, its tributaries, and its watershed. The Lake Delhi Dam on the Maquoketa River forms the recreationally popular and scenic Lake Delhi. Manchester has developed Iowa's largest Whitewater Park on the upper section of the Maquoketa River as it passes through the city. The river's spring fed cold-water tributaries provide fishing opportunities in county and state parks and provide the water for the State Fish Hatchery in Manchester.

Water trails are recreational routes on rivers and lakes that provide a unique experience for all types of river users including canoers, kayakers, anglers, and motorized boat users. Water trail routes provide designated access points that can be used for planning trips at various lengths and levels of difficulty. The Iowa Department of Natural Resources (DNR) partnered with the Delaware County Conservation Board (DCCB) and East Central Intergovernmental Association (ECIA) to develop this water trail master plan for the lower portion of the Maquoketa River in Delaware County. The plan will focus on the 23.2-mile lower section of river that begins at Bailey's Ford Park, flows through Lake Delhi, and ends at the county's southern boundary. When completed, this new water trail will connect with the state-designated 23.4-mile water trail that begins on the upper section of the Maquoketa River four miles upstream from Backbone Lake Dam and continues downstream to Bailey's Ford Park.

Purpose

The Lower Delaware County Water Trail Plan provides the community with a guide for future decision making. The plan establishes a vision for the future of the lower section of the Maquoketa River and identifies a set of actions that the community can take to realize that vision. To achieve the vision established in this plan, the community must actively work to incorporate its recommendations into its policies and budgets.

The master plan presents a vision for the future of river recreation in Delaware County and recommends actions that can be taken to make that vision a reality. The plan identifies improvement projects like boat launches, information signs, parking areas, and safety improvements.

2. Community Engagement

The Lower Delaware County Water Trail Plan presents a vision for the future of the Maquoketa River water trail that has been agreed upon by the community. To ensure that the vision represents the views of the community, project team worked to engage the community throughout the planning process. The community engagement process used a variety of methods to involve land managers, stakeholders, river users, land owners, and the general public in the formation of the plan's vision, goals, and objectives and to identify the recommended policies and projects that will help the community realize its vision for the water trail. Community engagement strategies utilized in the planning process included formation of a project steering committee, focus group meetings, creation of a project webpage, use of social media, distribution of a community survey, media releases, promotion by stakeholder organizations and partners, and a community open house. Using these strategies, the project team was able the achieve the goal of giving members of the Delaware County community multiple opportunities to learn about the project and to help shape the plan as it was being developed.

Steering Committee

Development of the plan was guided by a project steering committee whose members were selected by the DCCB based on their experience with river related issues and familiarity with the area. The committee met throughout the planning process and reviewed plan progress, worked on goals and objectives, identified issues, and provided feedback on draft documents. The committee served as representatives of the broader community. Early in the process, the committee participated in brainstorming sessions to identify areas needing improvement and develop projects to address these needs. As the planning process moved forward the committee's role shifted to reviewing and providing feedback on draft chapters and water trail development plans and signage, and finalizing public input opportunities.

Project Website and Social Media

As part of the public engagement process, ECIA created and hosted a project webpage at https://www.eciatrans.org/delaware_county_water_trail_plan/index.php. ECIA used the webpage to distribute information about the planning process and collect community input. Notices for meetings, reports, and other information were posted on the project webpage and ECIA's Facebook page. The Delaware County Conservation (DCC) Facebook page and media releases were used to distribute project information. At the time the plan was being developed, the DCC Facebook page had just over 900 followers. The Maquoketa River Watershed Management Authority (MRWMA), the Lake Delhi Recreation Association (LDRA), and other organizations also helped publicize the plan by sharing plan-related posts with their members and followers.

Steering Committee and Stakeholder Meetings

Throughout the process ECIA and the steering committee members met with project stakeholders including the DCCB and staff, paddling enthusiasts, and law enforcement officials. Some key meetings are listed below in Table 2.1. Meeting notes are provided in the Appendix.

Table 2.1 Key Project Meetings

Date	Attendees	Major Topics Discussed
10/05/2023	Steering Committee, ECIA	Overview of water trails, water trail planning process, plan study area, and role of steering committee; existing conditions, possible projects, area history, and next steps
10/17/2023	Manchester City Manager and Police Chief, County Sheriff and Emergency Management Agency (EMA)	Overview of water trails, water trail planning process, and plan study area; existing conditions and possible projects; issues of concern for law enforcement officers and emergency responders
12/11/2023	Steering Committee, County EMA, Iowa DNR, ECIA	Review of preliminary design concepts for top 4 sites
8/28/24	Steering Committee, Iowa DNR and ECIA	Review of water trail planning; community engagement; draft community survey; draft vision, goals, and objectives; plan corridor overview of existing accesses, portages, and segments; improvement projects and design concepts
10/15/24	DCC, ECIA, and Iowa DNR	Discussion of design plans for top priority and opportunity projects; role of Iowa DNR engineering consultant — LT Leon Associates
10/23/2024	Steering Committee, Iowa DNR, ECIA, and Park 360	Review of project schedule extension; review of draft survey with Iowa DNR consultant – Park 360; discussion of top priority, signage, and opportunity projects
1/15/25	DCC, County Engineer, ECIA, Iowa DNR, and LT Leon Associates	On-site visits for potential improvement projects along the water trail
4/29/25		Review of preliminary design concepts for top 4 sites
5/8/25		Review of revised design concepts for top 4 sites
5/29/25	Steering Committee, ECIA, and LT Leon Associates	Community survey results; design concepts for top 4 sites; draft water trail signage program and plan; review schedule
6/24/25	Steering Committee, Iowa DNR, ECIA	Review of draft water trail brochure, draft map, draft signage program, and draft master plan; discussion of community open house, LDRA meeting, and schedule
7/16/25	LDRA, ECIA and Iowa DNR	Overview of water trail plan and proposed projects for the Board of Trustees, Combined Lake Delhi Recreational Facility and Water Quality District
7/24/25	Steering Committee, DCC, ECIA, general public	Community Open House for the draft water trail plan and proposed projects
10/30/25	Steering Committee, Iowa DNR, ECIA	Review input from open house and comment forms, finalize draft water trail plan
TBD	DCC, ECIA, and Iowa DNR	Meet with DCCB to review/approve final draft of plan
TBD		Meet with Board of Supervisors to review/adopt final plan

Community Survey

ECIA conducted a community survey to collect public input for the plan. ECIA worked with the steering committee, Iowa DNR staff, and the IDNR survey consultant Park 360 to develop the thirty survey questions and design the print version of the survey and the online questionnaire using Survey Monkey .

ECIA and the committee used various communications channels to publicize the survey including word of mouth, online resources, a media release, and posting on the ECIA project webpage and DCC Facebook page. The committee, MRWMA, LDRA, other area conservation and recreation groups, and the Iowa DNR's paddle craft registration list were notified of the survey, invited to complete the survey, and asked to share the survey notice with their members, partners, and contacts.

The ECIA project webpage included a link to the online form and instructions on how to fill it out. Paper forms were available at the DCCB Nature Center at Bailey's Ford Park. The Community Survey was opened on November 15, 2024 and closed on January 31, 2025. The online questionnaire collected a total of 95 responses. A summary of the community survey results is provided in the Appendix.

Community Open House

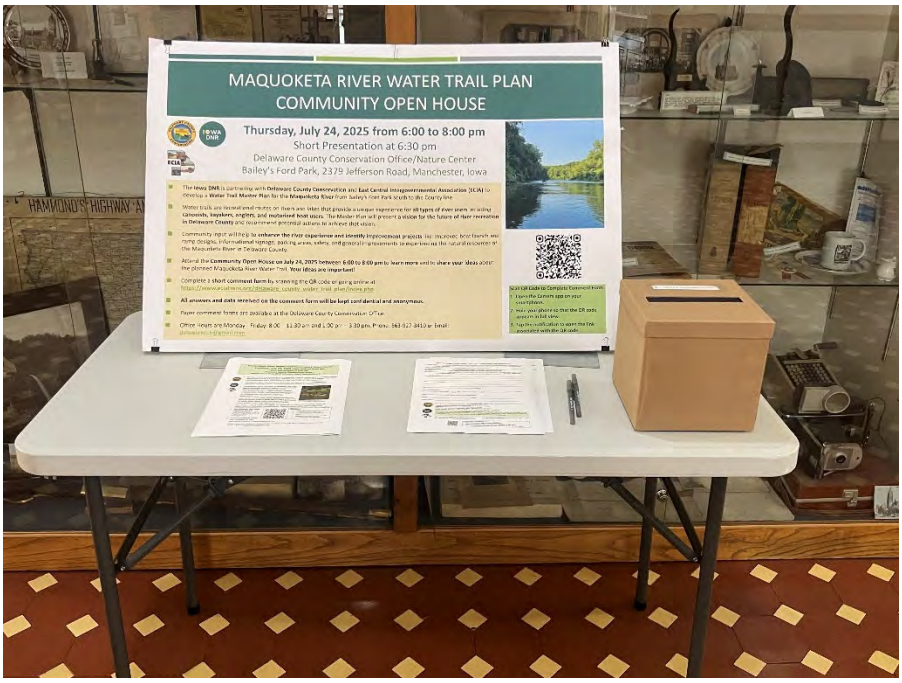
A Community Open House was held on July 24, 2025 in the DCC Nature Center at Bailey's Ford Park from 6:00 to 8:00 pm. There were seven poster boards on easels arranged in a line around the outside of the room to let people walk through and look at each one. There were printed copies of the handouts, maps, comment forms, and a sign in sheet on a table at the doorway. The comment forms had a QR code to submit comments online at the ECIA project webpage. County and ECIA staff were available to answer questions and respond to comments. Meeting notes and a list of attendees are in the Appendix.

Community Open House presentation at Delaware County Conservation Office/Nature Center
Photo Credit: ECIA

At 6:30 pm, ECIA staff gave a brief presentation on the Delaware County Water Trail Plan and proposed water trail improvements for the Maquoketa River area. DCC and ECIA staff then responded to public questions and comments about water trails in general, currently designated trails in the County, the proposed water trail, and the construction improvement projects. Many of the visitors were familiar with the area's historical sites and environmental conditions. Many of the visitors shared their

recreational experiences along and on the Maquoketa River. Overall, public comments were very supportive of the water trail plan and the proposed improvement projects.

ECIA and DCC staff used various communication channels to publicize the Community Open House including: word of mouth, online resources, media release, and posts on the ECIA project webpage and DCC Facebook page. A display with the open house flyer, comment forms, and a box for completed comment forms were set up at the Delaware County Courthouse from July 15 to July 25, 2025. The steering committee, MRWMA, LDRA, Iowa DNR, other area conservation and recreation groups were notified of the community open house, and asked to share the open house flyer with their members, partners, and contacts.



Display at County Courthouse
Photo Credit: Kyle Soderblom, DCC

3. Vision, Goals, and Objectives

After considering all the input collected from the community through the planning process, the Delaware County community developed the following vision for the future of the Maquoketa River.

Vision

The Delaware County community will embrace new opportunities to improve the recreational experience for river users while striving to preserve the ecological integrity of the river while supporting water quality.

To help the community achieve its mission, the plan includes the following goals and objectives. The goals and objectives represent the most important topics that emerged through public input sessions and work with the Steering Committee.

Goal One: Provide positive water trail experiences meeting user expectations

- Balance water trail experience options between urban and rural, landform region, historic and cultural resource context, and waterbody types.
- Provide information allowing water trail users to select routes meeting desired skill levels, time available and accessibility needs.
- Minimize limitations to water trail experiences based on users age and physical abilities.
- Enhance safety education for water trail users including skill-building and hazard avoidance.

Goal Two: Use water trail development to strengthen natural resources conservation

- Avoid impact from intensive use to known highly-sensitive aquatic and land-based species and habitats.
- Implement low- or no-impact design standards for water trail amenities including parking areas, trails, and launches.
- Foster a greater sense of public awareness of and inspire citizen participation in watershed and restoration efforts on Delaware County's waterways.
- Coordinate with other related existing programs to enhance conservation efforts including the Maquoketa River Watershed Management Authority.

Goal Three: Adapt water trail development techniques to the waterway's individual character

- Minimize avoidable damage to new launches by locating them with consideration of flooding patterns, stream channel evolution, borrowing techniques from the field of stream restoration, using Chapter 3 of *Developing Water Trails in Iowa* as a guide.
- Choose construction methods and materials relative to ability to maintain launches using the River Restoration Toolbox as a guide.

- Encourage broad stakeholder participation in trail planning, development, and maintenance including landowners, volunteer groups, and liveries to consider unique, existing local features and develop within that context.

Goal Four: Support public access to water for recreational purposes

- Promote close-to-home recreational opportunities for Delaware County residents.
- Encourage healthy lifestyles related to exercise and relaxation.
- Provide recreational activities that encourage area tourism and support local businesses.
- Evaluate additional water trail access points to enhance the user experience.

Goal Five: Create a robust, resilient system for developing and experiencing water trails

- Implement Iowa DNR's systematic signage system for water trail users.
- Implement Iowa DNR's comprehensive dam hazard warning signage system.

Goal Six: Encourage education in outdoor settings

- Integrate historical and cultural resources awareness with recreational opportunities.
- Promote learning about landscape impacts resulting from land management choices, including water quality.

Goal Seven: Support positive water trail experiences by initiating strategies to manage intensively used areas

- Actively manage intensively-used areas at a high level
- Coordinate with emergency responders, law enforcement, and liveries for hazard mitigation, user conflicts and litter control.
- Maintain water trail accesses and signage to Iowa DNR's minimum requirements, and finalize water trail sponsor agreement.

4. Existing County Conditions

The following section provides an overview of the county, its rivers, and the surrounding area.

A. Overview

Delaware County, located in northeastern Iowa, is crossed by US Highway 20 east to west and by State Highways 13 and 38 north to south. According to the 2020 decennial census, just over 52 percent of the county's 17,488 residents live in one of its eleven cities, while the remaining 48 percent are dispersed across its unincorporated areas.

Figure 4-1 is a map of the Study Area for Delaware County Water Trail Plan. That shows the plan corridor and river access locations. The study area encompasses the environs along the Maquoketa River from Bailey's Ford Park south of Manchester, through Lake Delhi and the city of Hopkinton to the southern Delaware County line. The following information is derived from the *2018 Delaware Crossing Scenic Byway Corridor Management Plan*.

City of Manchester

As the largest community (population: 5,065) and the county seat for Delaware County, Manchester is located at the intersection of U.S. Highway 20 and State Highway 13. Bailey's Ford Park is located three miles southeast of Manchester at the north end of the study area. Manchester was founded in the 1850s and retains its historic charm. The county courthouse was constructed in 1894 and is listed in the National Register of Historic Places (NRHP). The Maquoketa River is a major feature in this community, which is home to Manchester Whitewater Park and the State Fish Hatchery.

Downtown Manchester
Source: ECIA

City of Delhi

Located three miles south of U.S. Highway 20, on State Highway 38, the small city of Delhi (population 420) is approximately the midpoint of the study area. Two miles from the community is access to Lake Delhi and to the Maquoketa River downstream of the Lake Delhi Dam.

City of Hopkinton

Hopkinton is located at the southeast end of the study area along Highway 38. This small city (population: 622) is best-known as the home of Lenox College, which operated from 1859 to 1944. The Lenox College campus became the Delaware County Historical Museum Complex and is listed in the NRHP. Hopkinton has access to the Maquoketa River. Hardscrabble Wildlife Area is about a mile and a half south of Hopkinton.

Lake Delhi Area

The unincorporated Lake Delhi Area includes the residential and commercial areas, as well as the important natural and recreational amenities that surround the lake. Lake Delhi is created by a dam on the Maquoketa River that backs up water to create nine miles of meandering lake surrounded by wooded bluffs and wildlife areas.

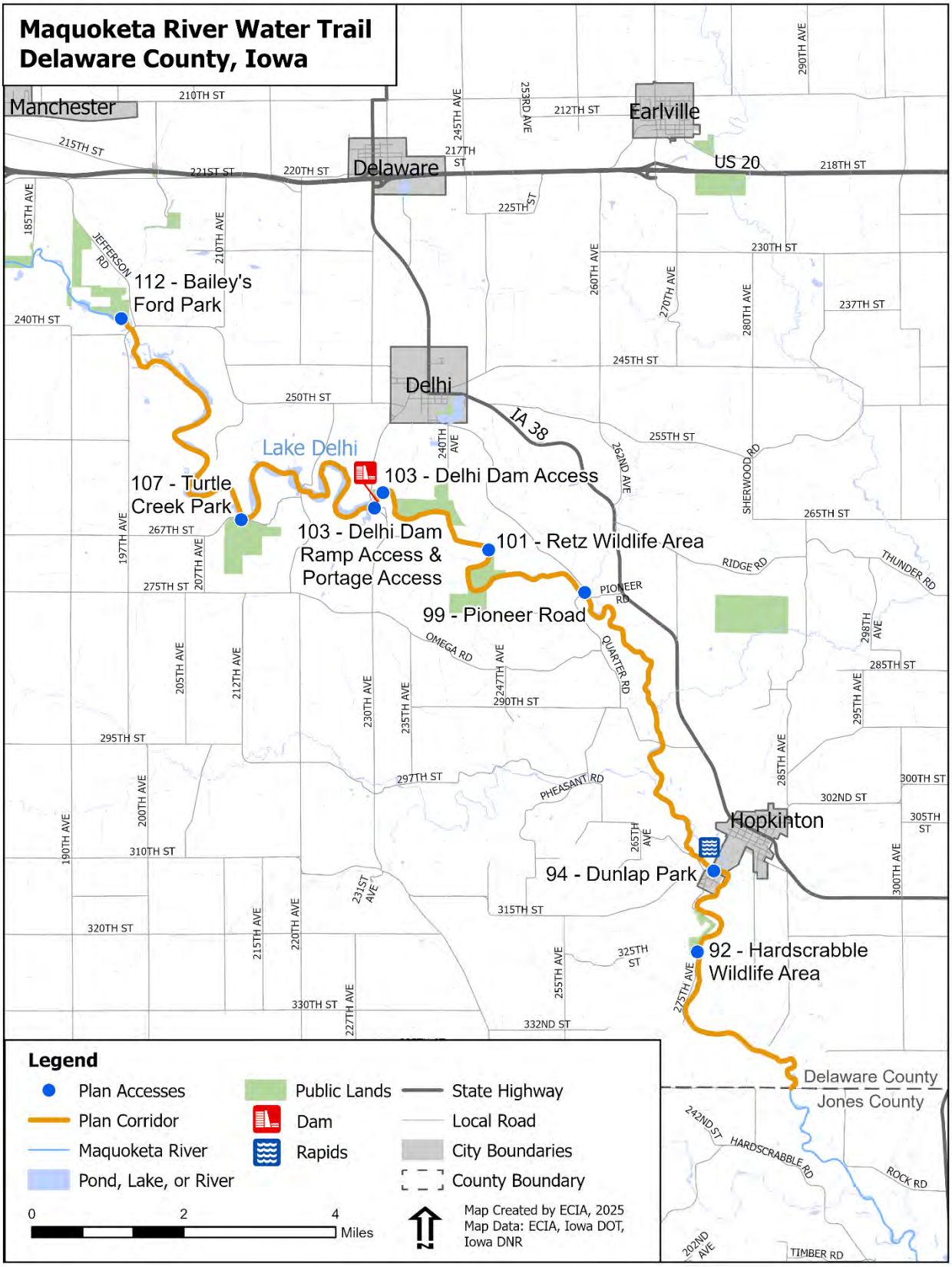


Figure 4-1. Map of Study Area for Delaware County Water Trail Plan
Source: ECIA

COUNTY HISTORY

"Native Americans lived in Iowa for at least 13,000 years. During this time, they gradually changed from highly mobile hunters and gatherers living in small camps to farmers living in large villages."[1] "Early Native American contact and activity in the Maquoketa and North Fork Maquoketa river valleys has also been well documented. Native American groups, primarily Mesquaki, Sauk, and Ho-Chunk, were pressured out of their native territories to the north in the early nineteenth century."[2]

Delaware County was some of the earliest land made available for settlement in Iowa. Before the Black Hawk War and Treaty of 1832, the land belonged to the Native Americans. The land opened to settlement in 1833. "The earliest European settlers began arriving in Iowa in 1834. Their numbers grew rapidly after the area was surveyed for settlement in 1838 - 1839. The U.S. Congress established the Territory of Iowa in 1838. In 1846, Iowa became a state and its population expanded quickly."[3] Anecdotal settler records from the mid-1800's and current records with the Office of the State Archaeologist indicate there are many pre-contact Native American mounds throughout around the region. "Mounds were built by the Woodland people sometimes as burial places but also as territorial markers, ritual meeting places, and symbols of ancestral and ongoing human connections with the land."[4]

"Water figured in to the early history of the county in a number of ways. The frequent streams and springs were important water sources for families and villages while timber that was found along rivers was both useful for construction and fuel. The permanence of many of Delaware County's streams—even during times of drought—is due to these numerous springs and the volume of water they supply."[5] The spring water creates high-quality cold-water fish habitat.

Prior to the establishment of the railroad in the county in 1859, Bailey's Ford was the main crossing on the Maquoketa River in this area for stage coaches, freight wagons and travelers on foot. "The ford was named after the first settler, Joel Bailey, who lived nearby in 1837. The ford is a large riffle, a shallow area of the river where the riverbed consists of gravel, rock and cobble, near the location of today's Bailey's Ford Park. In early history, a post office, stone school house and homes were located near the ford."[6]

"Settler accounts of vegetation at the time included largely prairie with high grasses and numerous wildflowers. Trees occurred near the streams and other areas that had been protected from fires. Much of the land near the streams was covered with a thick growth of "hazel brush" which impeded travel and cultivation. Plum, cherry and crabapple thickets were common and prized for their sweet fruit. Raspberries, blackberries, strawberries, gooseberries and grapes were also plentiful. At the time of white settlement: deer, rabbits, raccoon, bear, panther, wolves, mink and muskrat; bird species included

[1] 2017 OSA Technical Report 556, p. 4

[2] Ibid, p. 11

[3] 2016 Maquoketa Water Trail Plan for Delaware County, p. 38

[4] Ibid

[5] Ibid , p. 39

[6] Ibid

Passenger Pigeon, prairie chickens, ducks, geese, sand hill cranes, blue heron, and the Carolina parakeet."[7]

Delaware County was established in 1837 when Dubuque County was divided into multiple smaller counties. The railroad arrived in Earlville in 1857 and in Manchester in 1859. Lenox College began organizing in Hopkinton in 1855; the first campus building was constructed in 1857 and the first classes were held in 1859. The county seat was located in Delhi until 1880, when Manchester became the permanent county seat. The current courthouse was built in 1894.

"Early settlers began harnessing local resources to improve their quality of life by the late 1800's. Six dams had been constructed on the Maquoketa River by 1897 to generate power and to mill grain in Delaware County. Of these, only the Lake Delhi location continues to have a full-height functional dam. Also, by 1897, early settlers were also using Loess and drift clays for brick making as these deposits are widely distributed throughout the county. Primary brickyards were located in Manchester and near Hopkinton while a stone quarry was operating in Delhi township."[8]

The Old Mill and Dam in Hopkinton
Source: Delaware County Tourism

Prior to the mid-1800s, Delaware County (like the rest of Iowa) was covered with three major natural ecosystems: tallgrass prairie, savanna, and deciduous forest. Since then, the prairies, savannas, and forests that once covered Delaware County have yielded to the spread of agriculture and the development of communities. At present, agriculture is the primary land use and a key part of the local economy in Delaware County.

COUNTY LAND USE

The land area of Delaware County is 577.7 square miles. According to the 2022 Census of Agriculture for Delaware County, land in farms was 345,856 acres or 540.4 square miles. Eighty percent of the county's farmland was cultivated for crops, primarily corn and soybeans. Delaware County also ranked ninth out of Iowa's 99 counties in the market value of livestock and dairy farming products sold.

Land Cover

"Water resource character and quality are partially determined by land use and land cover. Land use focuses on the use or purpose of land, while land cover describes the physical land type. Land use can be characterized by uses such as agricultural, non-agricultural, residential, commercial, or industrial. The land cover can be described by coverings such as forest, open water, or wetland. Land use and land cover can be the result of human influence such as zoning, or naturally occurring. Both have a significant impact on water quality in the watershed. Analysis of the water quality parameters shows that forest cover plays a critical role in keeping water clean. Conversely, agriculture and urban areas can lead to

[7] Ibid, p. 40
[8] Ibid

deterioration of water quality."[9] Figure 4-2 is an approximate land use/land cover comparison by percent for Maquoketa River Watershed, Delaware County, and the study area. Agriculture is the predominant land use in the watershed (80.1%), county (84.3%), and study area (54.3%). The agricultural land cover consists primarily of row crops and secondarily of pasture and hayland. There is significantly more natural land cover (woodland, water, and wetland) in the study area.

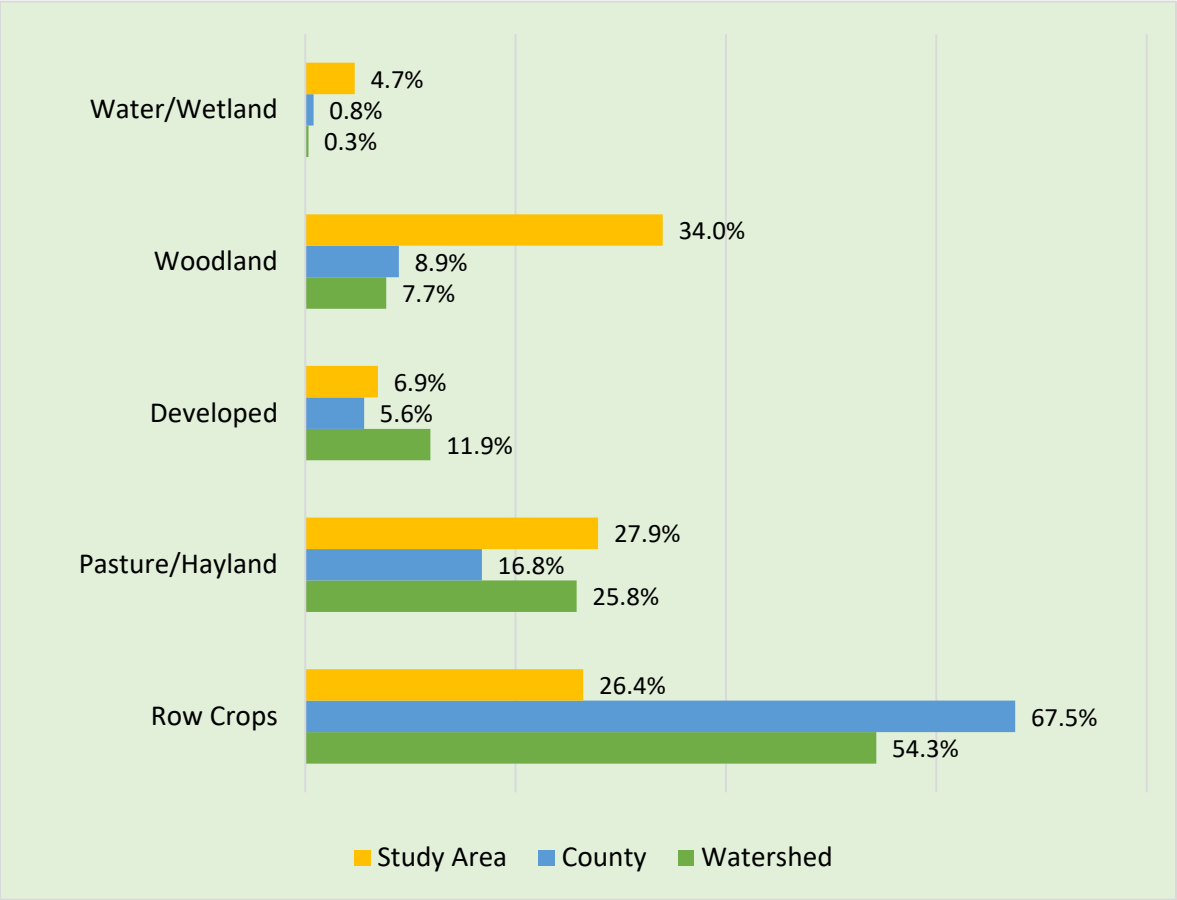


Figure 4.2. Comparison of Land Use and Land Cover for Watershed, County, and Study Area
Source: Maquoketa River Watershed Management Plan, p. 84; and USDA, https://nassgeodata.gmu.edu/CropScape/ accessed 6/24

"The infiltration abilities of soil determine how much water stays in the soil, trickles into groundwater supplies, and runs off into streams and rivers. With greater amounts of water run-off, soil erosion increases. Overall, ***erosion due to runoff from cropland*** accounts for ***90% of soil erosion*** in the area."[10] "Across the Midwest, ***intense precipitation*** has increased substantially in recent decades. Although these factors increase the risk of flooding, studies have shown that the risk can be minimized by monitoring land cover changes and effective policy on natural drainage features retention."[11]

[9] Maquoketa River Watershed Management Plan, p. 84
[10] Ibid, p. 5
[11] Ibid.

The higher concentration of woodland, water, and wetland in the study area along the Maquoketa River is evident in Figure 4-3, a land cover map of Delaware County with the study area circled in red.

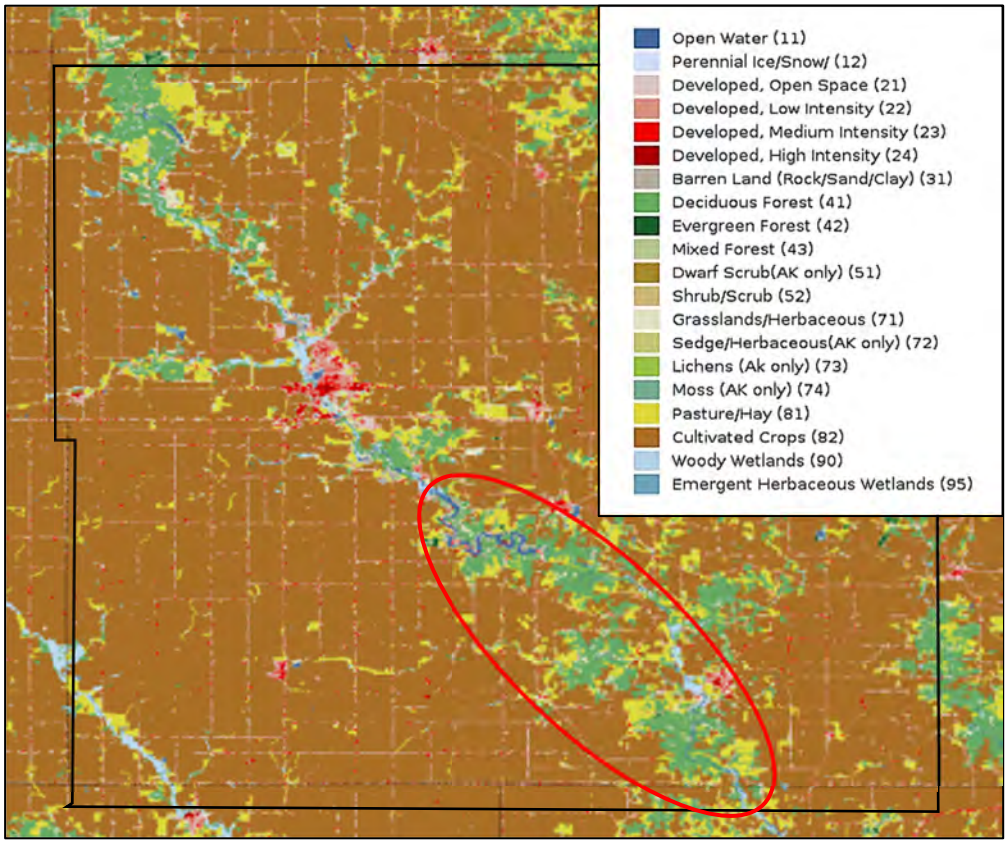


Figure 4-3. 2021 Land Cover Map of Delaware County, Study Area circled in red
Source: Multi-Resolution Land Characteristics Consortium, accessed April 2024 at https://www.mrlc.gov/viewer//

LAND USE PLANS AND REGULATIONS

This section discusses land use plans and regulations impacting Delaware County and the study area.

Comprehensive Plan

The 2012 Delaware County Multi-Jurisdictional Comprehensive Plan is for Delaware County and the Cities of Earlville, Edgewood and Hopkinton. The plan's Future Land Use Map includes a mix of agricultural, residential, industrial, and park/recreation/conservation uses in the study area.

Zoning Regulations

A zoning ordinance divides a community into districts, or zones, and regulates land use activity in each district, specifying the permitted uses of land and buildings, the intensity or density of such uses, and the bulk (size) and placement (setbacks) of buildings on the land. Delaware County's 2023 zoning ordinance applies to the unincorporated areas. It also applies to properties located in an incorporated city if the city has not adopted its own zoning regulations. Iowa Code exempts farmland, farm houses, farm barns, farm outbuildings, or other buildings or structures which are primarily adapted for use for agricultural purposes from county zoning unless located in or on the floodplains of any river or stream.

The county zoning in the study area is primarily A-1 Agricultural District and R-1 Single-Family Residential District, while the Lake Delhi District is zoned R-4 Lake Delhi Residential/Recreational District. The R-4 District allows temporary, seasonal, and permanent residential dwellings as well as public open space and commercial recreational uses. Uses and structures in the R-4 District also are subject to the deed restrictions, covenants, and Iowa Department of Natural Resources (DNR) regulations applicable to development within the Lake Delhi District.

The City of Hopkinton adopted a restricted residence district that applies to all land within the city limits. This district requires that no building or other structure, except residences, school houses, churches and other similar structures, shall be erected, reconstructed, altered, repaired or occupied within the restricted residence district without first receiving a special building permit from the City Council.

Subdivision Regulations

Subdivision regulations provide rules for the division and development of vacant land into parcels for agricultural, commercial, residential, industrial, or other land uses. Delaware County has not adopted subdivision regulations. Hopkinton's 2022 subdivision regulations apply to all land in the city limits and within two miles of the city limits.

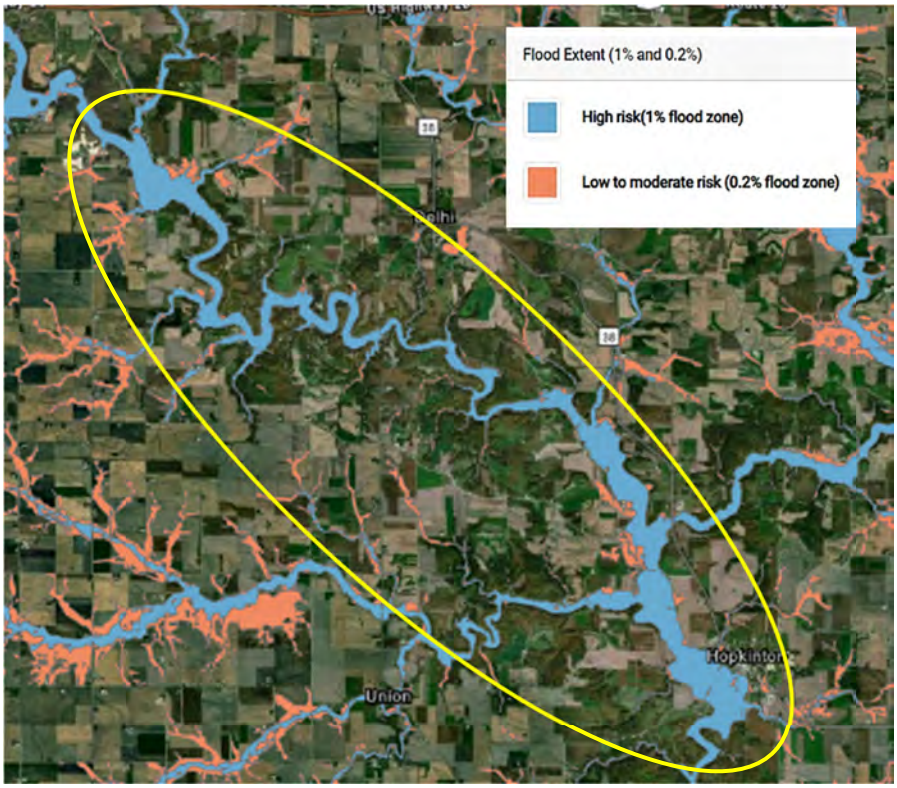


Figure 4-4. Map of Flood Hazard Zones in Study Area circled in yellow
Source: Iowa DNR Floodplain Mapping database

Floodplain Management Regulations

The area adjacent to a river channel is its floodplain. In its common usage, "floodplain" most often refers to that area that is inundated by the 100-year flood, the flood that has a 1 percent chance in any given year of being equaled or exceeded. The 1 percent annual flood is the national standard by which communities regulate their floodplains through the National Flood Insurance Program (NFIP).

Figure 4-4 is a map of the flood hazard zones in the study area circled in yellow. The High-Risk Zone shown in blue is the 1% annual chance flood zone. The Low to Moderate Risk Zone shown in orange is the 0.2% annual chance flood zone, which has a 0.2% chance of its height being equaled or exceeded in a given year. All lands and uses in the flood hazard areas are subject to Delaware County's 2023 zoning

ordinance and 2022 floodplain management regulations. Hopkinton's 2022 floodplain regulations apply to all lands and uses in the city limits which have significant flood hazards.

B. Natural Resources

The natural resources found in Delaware County and the study area are described below.

GEOLOGY

According to the Iowa Geological Survey, "A landscape is a collection of terrain features, or landforms. Iowa's landforms are composed of earth materials derived from glacial ice, strong winds, flowing rivers, and marine environments during the geologic past." Delaware County is at the junction of the Iowan Surface, Paleozoic Plateau (Driftless Area), and East Central Iowa Drift Plain.

In the study area, the Maquoketa River is in the Iowa Surface landform. According to the Iowa Geological Survey, this landform is a region of sweeping, outstretched landscapes. The land surface usually appears slightly inclined to gently rolling with long slopes, low relief, and open views to the horizon. The hillslopes of the Iowan Surface have multi-leveled or stepped surfaces that occur in a gradual progression from the major stream valleys outward toward the low crests that mark their drainage divides. Erosion on a large scale is the key to the geological origins of the Iowan Surface. Figure 4-5 illustrates the stratigraphy of the Iowan Surface landform. Stratigraphy is a branch of geology concerned with the study of rock layers (strata) and layering (stratification).

In the study area, the Maquoketa River runs on and cuts through almost exclusively Silurian strata, where the bedrock geology is primarily Silurian Hopkinton Formation dolomites flanked by Hopkinton bluffs, and the Maquoketa River valley landscape consists extensively of terraces and bedrock outcrops. "The Hopkinton Formation rocks that comprise most of the exposures along the river average about 130 feet thick in east-central Iowa. Early residents used them extensively as building stone."[12]

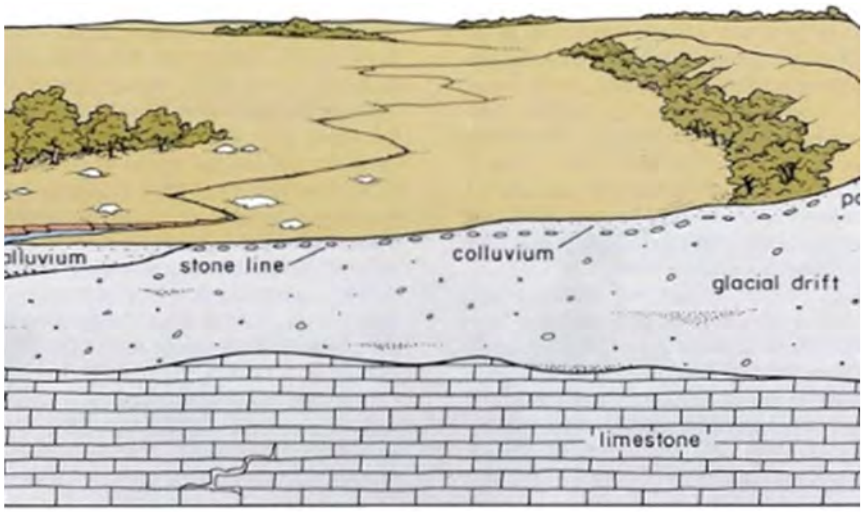


Figure 4-5. Stratigraphy of the Iowa Surface Landform
Source: Iowa Geological Survey

[12] EarthView Project IDNR-009A, p. 2

The Hopkinton Formation dolomites, the most frequently encountered bedrock along the Maquoketa River, were originally deposited as lime in shallow seas. Some rocks in this unit are among the most fossil-rich in Iowa. However, the fossils are usually preserved only as molds or internal casts, seriously degraded over time. Fossils may include brachiopods, crinoids (sea lilies), corals, sponges (stromatoporoids), bryozoans, snails (gastropods), clams, nautiloids, and trilobites (see Figure 4-6).[13]

Figure 4-6. Examples of Fossils in Iowa
Source: Iowa Geological Survey

An unusual geologic formation in Delaware County is the *paha*, which is found along the Maquoketa River Valley ridges. *Paha* means hill or ridge in the Siouan language dialects spoken by the Lakota, Nakota, and Dakota peoples or Oceti Sakowin Oyate (The Seven Council Fires). Geologically, a paha "is a constructional landform, a southeast-trending ridge that was created during periods of low flow and high wind when sand and silt were blown from floodplains to adjacent uplands."[14]

The karst topography of Delaware County is distinctive. Karst topography is a landscape that has been formed over many years by the dissolution of soluble rocks. It is characterized by karst features, which include sinkholes, caves, springs, cold water trout streams, and underground drainage systems that mix surface and ground water. In the study area, cold water streams and springs are found in Bailey's Ford County Park and caves are found in the County's Retz Wildlife Area and Hardscrabble Wildlife Area.

NATIVE HABITATS AND WILDLIFE

"In the Iowan Surface landform, prairie was the dominant historic vegetative land-cover, with savannas and woodland in areas where fire had less access, like the top of *paha* ridges and bordering river valleys. Today row crops dominate this region, with some grassland and a bit of native prairie remaining, especially in areas with rock outcroppings or an abundance of exposed glacial boulders."[15] With the historical spread of agriculture across the county, native habitats now are found in the parks and natural resource areas maintained by the Delaware County Conservation Board (DCCB) as shown in Table 4-1.

[13] Ibid. p. 3

[14] 2018 Delaware Crossing CMP, p. 59

[15] Iowa Breeding Bird Atlas https://iowabba2.org/Landforms/Iowan.aspx

Table 4-1. Natural Resource Areas that provide Wildlife Habitat and River Access in the Study Area

Natural Resource Area	River Access	Type of Habitats	Common Species		
			Trees	Wildlife	Fish
Bailey's Ford Wildlife Area and Kuhlman Wildlife Area	motorized boat users, canoers, kayakers and tubers	95 acres Upland Woodland	mixed oak, ash, elm, basswood, cherry, box elder, hickory, walnut, cottonwood, silver maple, hackberry, red cedar, willow, river birch, sycamore, ironwood	deer, turkey, small game, furbearers	trout, smallmouth bass, walleye, catfish, crappie, bluegill
Turtle Creek Wildlife Area	motorized boat users, canoers, kayakers	182 acres Upland Woodland, 6 acres Native Grasses	mixed oak, elm, walnut, hickory, maple, ironwood, red cedar	deer, turkey, small game, furbearers	
Delhi Dam Access	canoers, kayakers	10.9 acres Woodland		deer, turkey, small game, furbearers	smallmouth bass, walleye, catfish, bluegill, crappie
Shearer Wildlife Area	access via Retz Wildlife Area	104 acres Upland Woodland, 46 acres Grassland	red cedar, hickory, mixed oak, elm, walnut	songbirds, deer, turkey, small game, furbearers	smallmouth bass
Retz Wildlife Area	canoers, kayakers and tubers	105.8 acres Grassland, 309.2 acres Woodland	oak, walnut, hickory, maple, elm	deer, turkey, pheasants, small game, furbearers	smallmouth bass
Hardscrabble Wildlife Area	canoers, kayakers	44.3 acres Upland Forest	oak, hickory, walnut, butternut, honey locust, elm	deer, turkey, squirrel, raccoon, furbearers	

Source: Delaware County Conservation Board, https://delawarecounty.iowa.gov/conservation/

Fish and Wildlife

The remote nature of the study area combined with the abundance of public lands located along the river corridor provides abundant habitat for fish and wildlife and the perfect setting for wildlife enthusiasts. Mammals, including white tailed deer, coyotes, bobcats, foxes, raccoons, weasels, minks, badgers, skunks, bats, and otters, move throughout the county. Smaller animals like opossums, rabbits, mice, voles, squirrels, chipmunks, gophers, woodchucks, muskrats, and beaver are also common throughout the county. Reptiles and amphibians include frogs, toads, snakes, turtles, lizards, and salamanders. Insects include beetles, ants, termites, aphids, hopping insects, flies, bees, wasps, butterflies, moths, and dragonflies.[16] Aquatic life also includes crustaceans, leeches, and snails. Figure 4-7 shows examples of natural resources found in the study area.

[16] 2028 Delaware Crossing CMP, p. 70

Figure 4-7. Examples of Natural Resources in the Study Area
Left to right: ferns, rock formation in upland forest, squirrel, raccoon, deer, smallmouth bass, rabbit, turkeys
Source: DCCB park maps, https://delawarecounty.iowa.gov/conservation/

Many state and county areas in Delaware County, especially the designated Wildlife Management Areas and trout streams, are specifically managed for hunting and fishing. Most commonly hunted are ducks, geese, turkey, and deer as well as rough grouse, woodcock, mourning doves, rabbit, squirrel, and coyote. Trappers seek out raccoons, beaver, mink, and muskrats. Cold water streams that support native or introduced trout are an important natural resource in Delaware County. River anglers can fish for walleye, pike, and bass. Lake fishing for similar species is well-known locally and regionally.[17]

According to the Iowa DNR, the cold-water stream within Bailey's Ford Park is stocked annually with catchable-sized rainbow trout. Also, this stream maintains a self-reproducing population of wild brown trout that originate from upstream segments of Spring Branch Creek. The most recent Iowa DNR fish survey data for Lake Delhi was collected in May 2025 with 340 total fish measured. This survey showed the most abundant game fish species in Lake Delhi are Bluegill, White Crappie, Smallmouth Bass, and Largemouth Bass. Black Crappie, Channel Catfish, and Walleye were also present in the 2025 fishery survey of Lake Delhi and provide additional fishing opportunities.

According to the August 2024 *Report to IDNR River Programs on the Maquoketa River Water Trail*: Animals seen or heard include white-tailed deer, softshell turtle, frogs jumping from the bank (no ID), and fish splashing and surfacing. Anglers were fishing for bass, bluegill, crappie, and walleye. Invertebrates included cabbage and sulfur butterflies, dragonflies, gnats, and mosquitos.

Forests and Woodlands

"Upland forests are found above the floodplains on slopes and ridge tops. Bottomland forests can be found in the moist bottom of ravines and along streams and rivers, areas that are often susceptible to temporary flooding."[18] Many common tree species of upland and bottomland forests are found in the DCCB's natural resources areas in the study area (see Figure 4-8).

[17] 2018 Delaware Crossing CMP, p. 140

[18] *Forests*, Iowa State University: May 2021.

"Forest tree species in the upland sites and on the steep sides of valleys consist mostly of various oak species, shagbark hickory, and some walnut except in woodlands that have been harvested, in which case sugar maple and basswood are more prevalent. Spring ephemerals and other woodland flowers, ferns, and grasses are still common in many forest ecosystems. Flood plains of the Maquoketa River are dominated by silver maple, elm, and ash, with cottonwood, river birch and willow."[19]

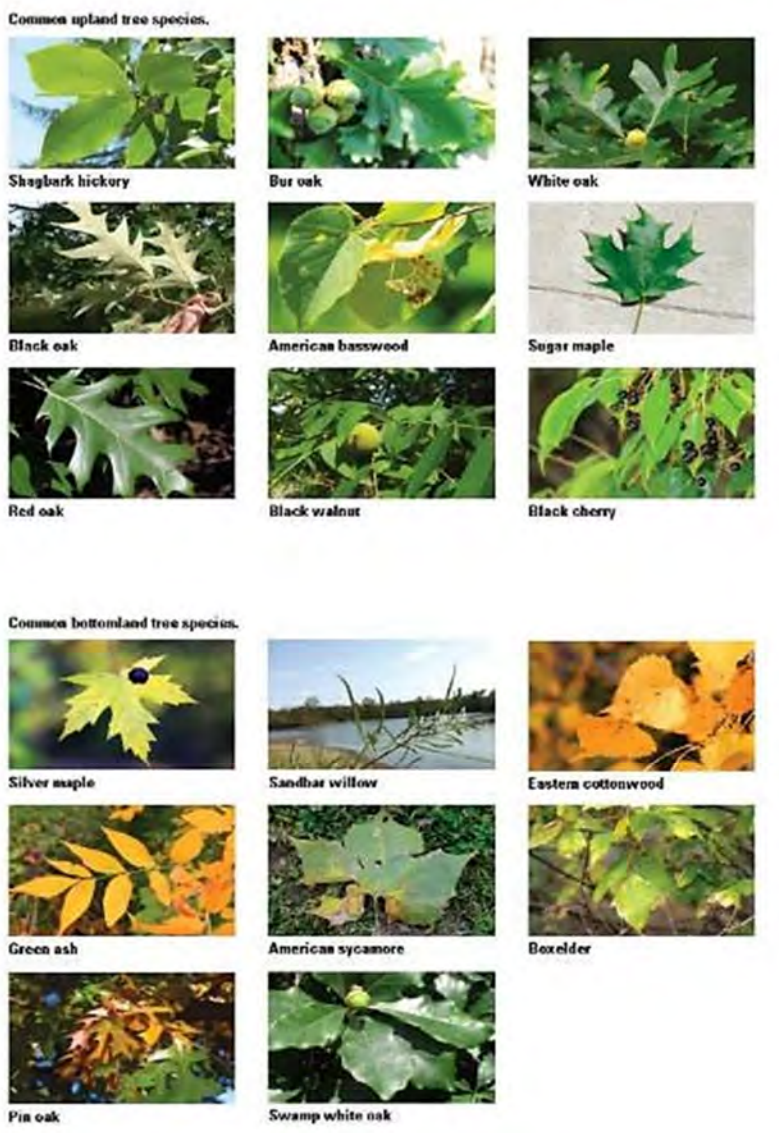


Figure 4-8. Common tree species in upland and bottomland forests
Source: Forests, Iowa State University: May 2021.

Grasslands, Prairies, and Wetlands

The vast majority of the native grasslands, prairie and wetlands in Delaware County is actually restored vegetation with introduced and/or native plants. Some of the more common species of prairie plants are big bluestem and Indian grass, as well as clovers, phlox, sunflower, goldenrod, bergamot and other forbs located on the rolling hills where there are well-drained soils. Little bluestem, porcupine grass, and sand lovegrass are more dominant in rocky and sandy soils. Prairie bush clover, spiderwort, and flowering spurge are more likely to be found on drier soils; switchgrass, prairie cordgrass, prairie dropseed, sedges, and rushes are common on wetter soils. Also tolerant of wet soils are loosestrife, bedstraw, milkweed, and tickleovers. Swampier areas are typically dominated by cattails and sedges.[20]

[19] 2018 Delaware Crossing CMP, p. 70

[20] 2018 Delaware Crossing CMP, p. 70

The August 2024 *Report to IDNR River Programs on the Maquoketa River Water Trail* identified these vegetation groups along the river.

- **Bailey's Ford Park to Delhi Dam:** Where the land has not been cleared for buildings, woodlands are quite diverse. They often are associated with hillside bluffs and rock faces. Black walnuts, hard maples, silver maple, basswood, and ironwood are the most common trees. Other tree species include honey locust, mulberry, catalpa, elm, willow, and white, red, and burr oak. Shrubs and vines include dogwood, elderberry, honeysuckle, grape, wild cucumber, Virginia creeper, and poison ivy. Other ground vegetation includes soapwort (phlox), cup plant, field mustard, stinging nettles, field thistle, cattails, canary grass, jewelweed, daisies, and bellflower.

- **Delhi Dam Access to Hardscrabble Wildlife Area:** The upper stretch down to Pioneer Road has the most diverse forest, with hard maple, silver maple, black walnut, oaks, basswood, elm, cottonwood, and ironwood. Silver maple is increasingly common as the river continues downstream, along with beach and black willows, boxelder, black walnut, cottonwood, elm, and mulberry, and other lowland forest trees. Other shoreline tree species include ash, elm, hard maple, burr oak, black willows, and cottonwood. Undergrowth along forested banks include grape, Virginia creeper, and wild cucumber vines. Open areas have more mullein, giant ragweed, soapwort, cup plant, daisies, jewelweed, and grasses. Ninebark, grey dogwood, and elderberry are among the shrub species.

Common soapwort
Source: Dan Cohen, Iowa DNR

Cup plant
Source: Dan Cohen, Iowa DNR

Monarda
Source: Dan Cohen, Iowa DNR

Birds

"The most recent Breeding Bird Atlas survey of Turtle Creek Park lists 80 species of birds, including 23 Species of Greatest Conservation need. In addition to geese, ducks, herons and wild turkey, visitors can see dozens of different species of neotropical migratory and other birds, including vireos, larks, bobolinks, dickcissel, meadowlark, wood thrush, brown thrasher, many different types of woodpeckers and swallows, yellow-billed cuckoos, flickers and others."[21]

According to the August 2024 *Report to IDNR River Programs on the Maquoketa River Water Trail*:

- Songbirds are numerous and varied, with the species makeup changing as the river flows from forest to agricultural landscapes.
- Great blue herons, bald eagles, and turkey vultures are seen in all portions of the trip.

[21] Ibid, p. 65

- Open areas have more song sparrows, red-winged blackbirds, dickcissels, bank swallows, red-headed woodpeckers, goldfinches, and killdeer.
- Belted kingfishers, eastern wood peewees, red-bellied woodpeckers, spotted sandpipers, American redstarts and other warblers are more common in wooded portions.
- Other bird species seen or heard include white-breasted nuthatch, black-capped chickadee, great-crested flycatcher, Acadian flycatcher, rough-winged swallow, barn swallow, cliff swallow, purple martin, American robin, grey catbird, northern towhee, northern cardinal, mourning dove, house wren, common yellowthroat, eastern kingbird, tufted titmouse, house sparrow, cedar waxwing, yellow-throated warbler, yellow warbler, blue-gray gnatcatcher, warbling vireo, red-eyed vireo, yellow-throated vireo, common yellowthroat, goldfinch, house finch, indigo bunting, brown-headed cowbird, American crow, and wood duck.

Bald eagle on cottonwood tree
Source: Dan Cohen, Iowa DNR

Great blue heron
Source: Dan Cohen, Iowa DNR

Spotted sandpiper
Source: Dan Cohen, Iowa DNR

The Iowa DNR maintains the Iowa Natural Areas Inventory (INAI) interactive website at https://www.iowadnr.gov/Conservation/Iowas-Wildlife/Threatened-and-Endangered. It provides information on threatened, endangered, special concern, and selected rare species data and maps. As of June 2024, Delaware County has 82 unique listed species including four birds, four fish, five freshwater mussels, two mammals, sixty-one plants, four reptiles, and three snails. Of these, 12 are endangered and 32 are threatened.

WATER QUALITY

The Maquoketa River is a significant component of the natural resources in the study area. Although the land under and adjacent to the river in Delaware County is privately owned, the river itself is publicly owned and a portion has been designated by the Iowa DNR as a state water trail. The river and Lake Delhi are important aquatic ecosystems that support an abundance of wildlife and provide opportunities for river exploration and recreation.[22] The Maquoketa River and its tributaries, as well as the forest and herbaceous ecosystems that flank them, dominate the landscape. Unfortunately, the Maquoketa River and several of its tributaries, and lakes are or have been listed on Iowa's list of Impaired Water Bodies.[23]

[22] Ibid, p. 56

[23] Ibid, p. 66

The Iowa DNR enforces the State's water quality standards, which help ensure that Iowa's surface waters are fishable and swimmable to the fullest extent practicable and that water resources that are put to their best uses. The Ambient Water Monitoring Programs provide information about the condition of Iowa's surface and groundwater resources so that decisions regarding the development, management, and protection of these resources may be improved.

Segments of streams and rivers in Iowa each have specific designations, based on what they are used for – like recreation, such as swimming or fishing; drinking water; or maintaining a healthy population of fish and other aquatic life. The sampling data are used to make water quality "assessments" of Iowa's waterbodies using the following classification system:

- Waterbody segments designated for recreational use involving human contact with the water are classified as Class A1, A2, or A3.
- Warm water waterbodies also can be designated to protect aquatic life, such as fish, plants and insects. The classifications are: Class BWW1, BWW2, BWW3, and BLW.
- Support Level: Each of the designated uses can be assessed as Fully Supported, Not Supported, Not Assessed, or as a Water in Need of Further Investigation (WINOFI).

Impaired Water Resources

Every two years, the Iowa DNR compiles an impaired waters list composed of those lakes, wetlands, streams, rivers, and portions of rivers that do not meet all state water quality standards. The Iowa DNR is required to calculate total maximum daily loads (TMDLs) for pollutants causing the impairments. *A Total Maximum Daily Load (TMDL) is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards.*

These "impaired waters" are placed in one of five categories. Assessment Category 5 indicates a waterbody is impaired. The Maquoketa River is a Category 5 impaired water in Delaware County, as shown in Figure 4-94. The study area is circled in blue on the map.

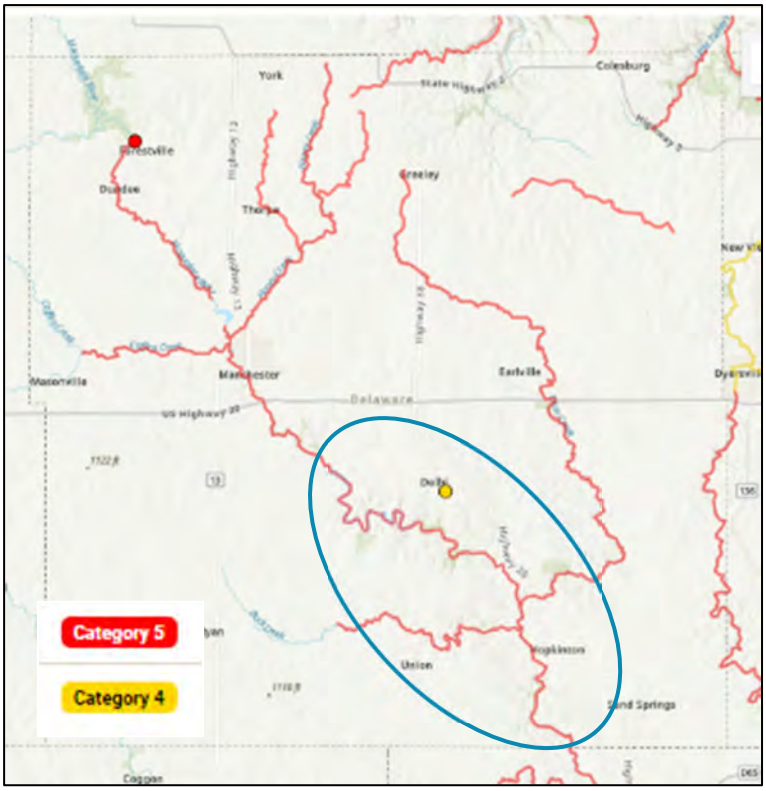


Figure 4-9. 2022 Map of Impaired Waters in Delaware County, Study Area circled in blue

Source: Iowa DNR – ADBNet Database, accessed 4/24

The failure to meet water quality standards might be due to an individual pollutant, multiple pollutants, "pollution," or an unknown cause of impairment. The list includes waters impaired by point sources and

non-point sources of pollutants. The state also establishes a priority ranking for the listed waters, considering the severity of pollution and uses.

Each type of impairment carries a level of complexity and cost in time and money for the Iowa DNR to develop a TMDL. The Iowa DNR prioritizes TMDLs that are able to address impairments on waterbodies with a high potential for social impact and a low complexity / cost for development. TMDL priorities range from a high priority of Tier 1 to a low priority of Tier 4.

While the Maquoketa River is listed as impaired, it is still safe for recreational use. According to the Iowa DNR's State Water Trail Plan: For water trail users, "impaired" water quality can range from having no bearing whatsoever on our experience to conditions that make people ill through contact with or ingestion of the water. Table 4-2 shows the 2022 impaired water quality assessments for the two segments of the Maquoketa River in that are in the study area.

Table 4-2. Impaired Water Quality Assessments for Maquoketa River in Study Area, 2022

Segment	Location	Length	Impaired Use (1)	Impaired Use (2)	Cause of Impairment (3)	Support Level	DNR Listed	TMDL Priority
01-MAQ-16	Reiger Creek to Plum Creek	22.56 miles	Class A1	Class BWW1	Bacteria: Indicator Bacteria - E. coli	NS (4)	2008	Tier 4
					Biological: loss of native mussel species	NS (4)	2004	Tier 4
01-MAQ-15	Plum Creek to Farm Creek (Jones County)	38.05 miles	Class A1	Class BWW1	Bacteria: Indicator Bacteria - E. coli	NS (5)	2008	Tier 4
					Biological: loss of native mussel species	NS (5)	2004	Tier 4
					Biological: low aquatic macroinvertebrate IBI	NS (5)	2006	Tier 4

Notes:
(1) *Primary contact recreational use (Class A1)*: Recreational uses involve full body immersion with prolonged and direct contact with the water, involving considerable risk of ingesting enough water to pose a health hazard. Examples: swimming, water skiing.
(2) *Warm Water Aquatic Life (Class BWW1):* These water bodies are typically large interior and border rivers and the lower segments of medium-size tributary streams capable of supporting and maintaining a warm water game fish population, along with a variety of aquatic life.
(3) *Index of Biotic Integrity (IBI):* twelve metrics that reflect a broad range of aquatic community attributes.
(4) *Not Supported (NS):* The Class A1 use remains assessed as "not supported" due to levels of indicator bacteria (E. coli) that exceeded state water quality criteria. The Class BWW1 use remains assessed as "not supported" based on biological sampling data.
(5) *Not Supported (NS):* The Class A1 use remains assessed as "not supported" due to levels of indicator bacteria (E. coli) that exceeded state water quality criteria. The Class BWW1 use remains assessed as "not supported" based on results of a 1998-99 statewide assessment of freshwater mussels in Iowa streams. Results of biological sampling also suggest the aquatic life use was "not supported."

Source: Iowa DNR – ADBNet Database, accessed April 2024

High Quality Water Resources

The Iowa DNR regulates two types of animal feeding operations (AFOs): confinements, where animals are kept in fully roofed facilities, and open feedlots, where animals are kept in unroofed or partially roofed enclosures. "Unlike livestock on pasture, animals in AFOs are kept in small areas where feed and manure become more concentrated. Animal manure and urine contain nitrogen (nitrate and ammonia), phosphorus, organic matter, sediments, pathogens, and heavy metals—all of which are potential pollutants if they are concentrated in a small area. Some of these substances can pose threats to human health or impair drinking water. When excess nutrients reach our waters, they can cause low levels of dissolved oxygen, algal blooms and, in extreme cases, fish kills."[24]

According to the Iowa DNR's *High Quality Water* Resources list, one of the requirements for the location and expansion of confinement feeding operations and for the land application of manure is separation distances from high quality water resources. High quality water resources have above average characteristics and have not been channelized or significantly altered. There are two types found in Delaware County:

> *High quality water (HQ):* Waters with exceptionally better quality than the levels specified in the Water Quality Standards and with exceptional recreational and ecological importance. Special protection is warranted to maintain the unusual, unique or outstanding physical, chemical, or biological characteristics which these waters possess.
>
> *High quality resource water (HQR):* Waters of substantial recreational or ecological significance which possess unusual, outstanding or unique physical, chemical, or biological characteristics which enhance the beneficial uses and warrant special protection.

Delaware County has six high quality water (HQ) and six high quality resource water (HQR) designations. Designations in the study area in relationship to AFOs are described below and shown in Figure 4-10.

Spring Branch HQ - Mouth to spring source just north of U.S. Highway 20. In Bailey's Ford Park, the Spring Branch is a trout stream winding its way through the park. There are no AFOs in the vicinity.

Maquoketa River HQR - Delaware-Jones County line to confluence with Plum Creek. As shown in Figure 4-15, there are four active AFOs in the vicinity: an open feedlot (yellow dot), a dairy with confinement and open feedlot, (yellow/pink dot), and two confinements (pink dots).

The AFO Siting Atlas is an interactive map that can be used to determine if a potential building or expansion location is in karst terrain or alluvial soils, or near a major water source. Learn more at https://www.iowadnr.gov/Environmental-Protection/Animal-Feeding-Operations/AFO-Online-Services.

[24] Iowa DNR's *AFO - General Overview: Jan. 2021*

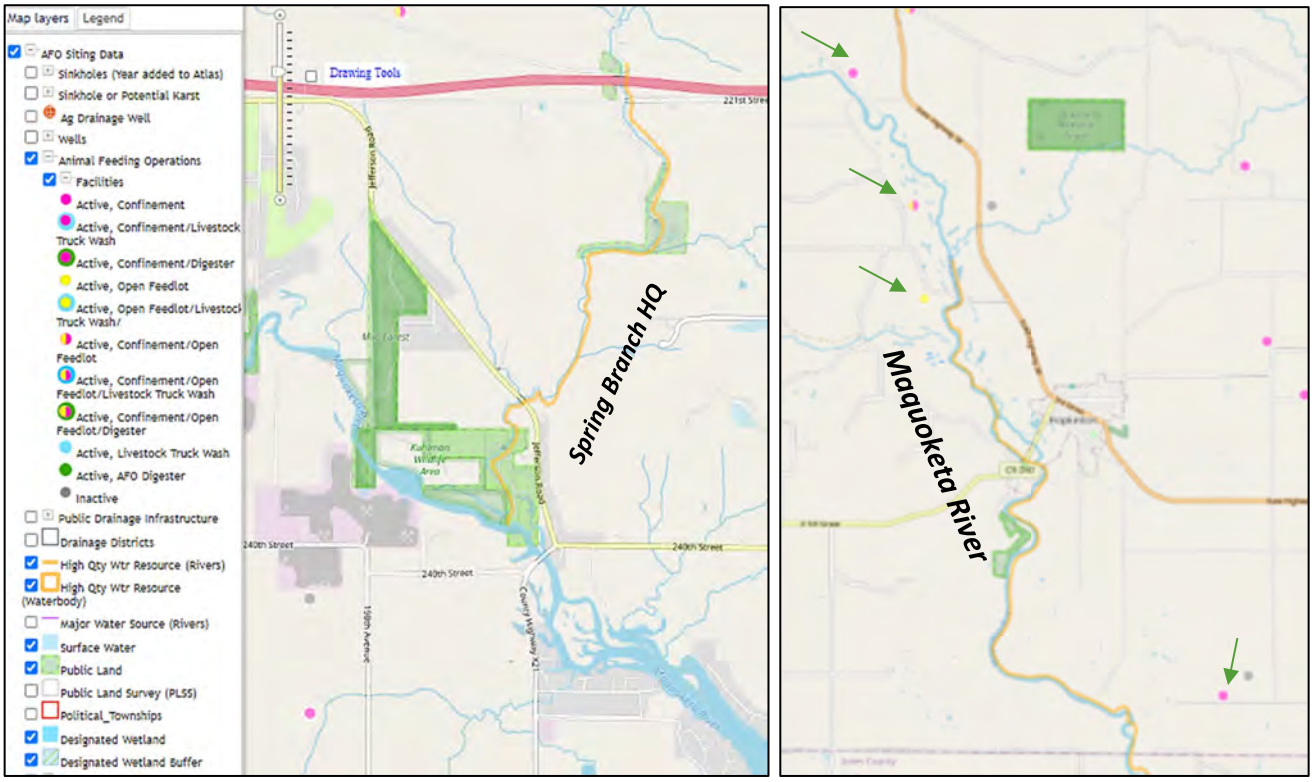


Figure 4-10. High Quality Water Resources (orange lines) in Relationship to AFOs in Study Area
Source: Iowa DNR's AFO Siting Atlas accessed May 2024

Aquatic Life

A diverse collection of fish and other aquatic animals not only makes a river a good fishing spot, it is also an important indicator of stream health. Streams with clean, healthy water provide good habitats for aquatic life, while streams impaired by pollution do not. Researchers with the Iowa DNR collect samples of fish and other small animals such as insects, crustaceans, leeches, and snails from the state's streams and rivers. The Iowa DNR then uses an online application called *BioNet* to collect and analyze this biological information and make it available for public use.

To collect samples, researchers use devices that generate an electric current to temporarily stun the fish and other aquatic animals so they can be netted, examined, counted, and released back into the water. The researchers then combine many individual measurements to create an index of general stream health. Iowa DNR reports two indexes: the Fish Index of Biotic Integrity (FIBI) and the Benthic Macroinvertebrate Index of Biotic Integrity (BMIBI). Benthic Macroinvertebrates refer to non-fish aquatic animals such as insects, crustaceans, leeches, and snails. Figure 4-11 maps the most recent FIBI scores for four monitoring sites in the project corridor. Scores ranged from 55 to 68. Sites that score between 51 - 70 are considered Good. There were no BMIBI scores available for these four sites.

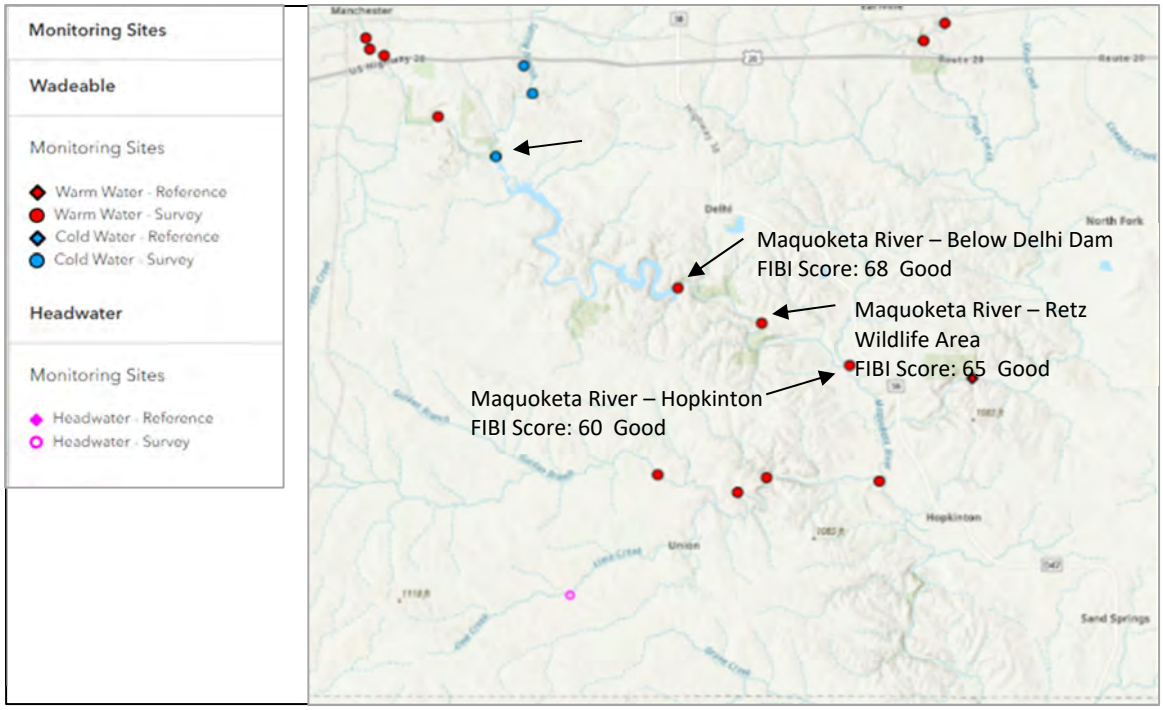


Figure 4-11. BioNet Monitoring Sites in Project Corridor
Source: Iowa DNR BioNet Reports accessed July 2024

C. Public Lands Near the Water Trail

The primary public lands in Delaware County include Backbone State Park and County Parks and Natural Areas. They are shown on the map in Figure 4-12. The green circle is the study area.

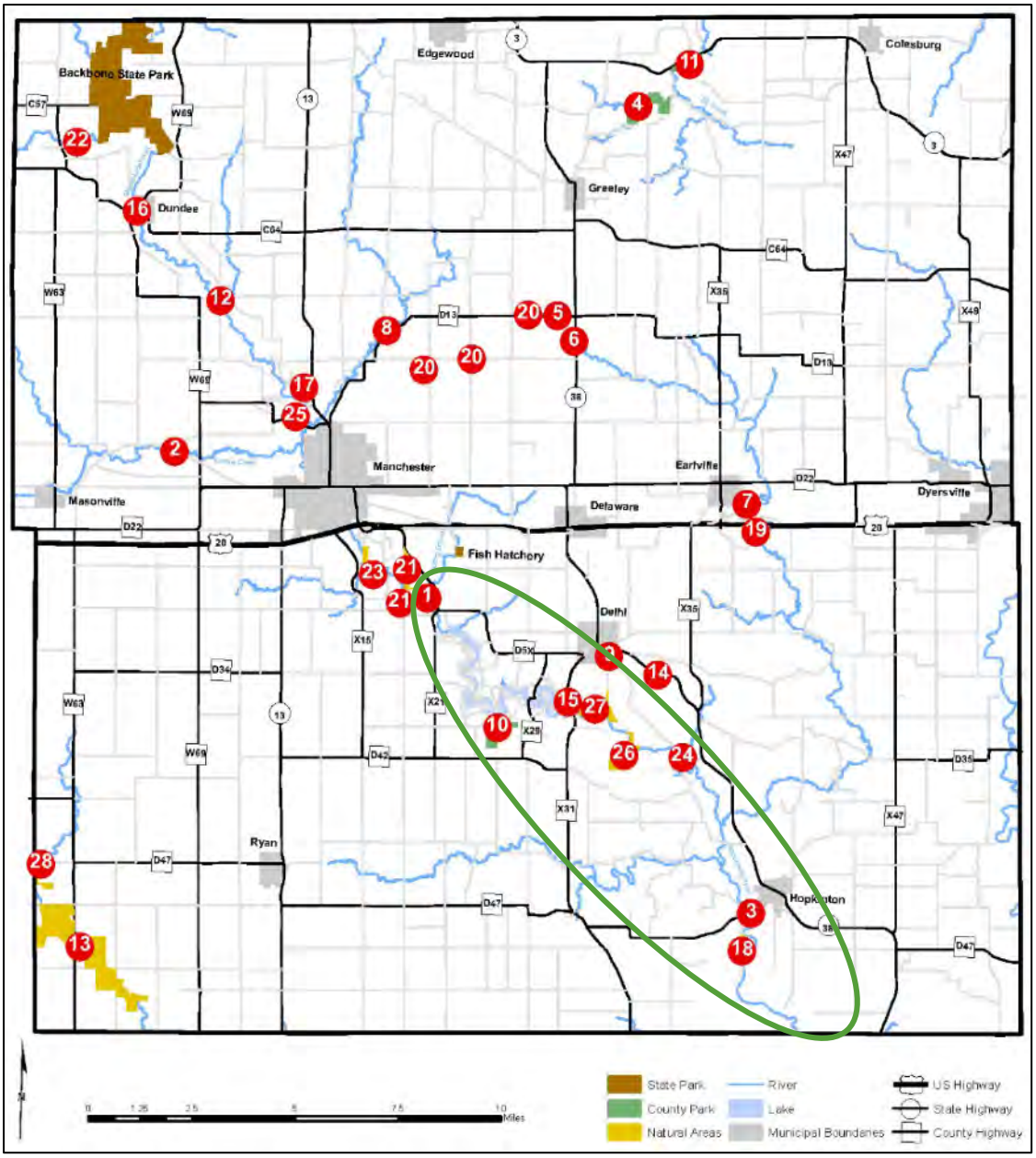


Figure 4-12. Map of Delaware County Parks and Natural Areas, Study Area in green circle
Source: Delaware County Conservation website

COUNTY-OWNED PARKS

The Delaware County Conservation Board (DCCB) manages 28 individual parks, wildlife areas, historic sites and river accesses encompassing 2,265 acres. Utilizing the rugged beauty that nature has provided,

the county parks feature high limestone bluffs, sloping forest lands, winding trout streams and scenic views of the Maquoketa River Valley. County parks offer a tremendous variety of outdoor recreational opportunities available which makes the enjoyment of the outdoors possible for people of all ages and interests as shown in Figure 4-13. County owned and managed sites with access to the Maquoketa River in the study area are: 1. Bailey's Ford Park, 3. Dunlap Park, 10. Turtle Creek Park, 15. Delhi Dam River Access, 18. Hardscrabble Wildlife Area, 24. Pioneer Road River Access, 26. Retz Wildlife Area, and 27. Shearer Wildlife Area. The DCCB also manages historical sites at Bailey's Ford Park and Dunlap Park.

DELAWARE COUNTY PARKS and NATURAL AREAS

2379 Jefferson Road
Manchester, IA 52057
563-927-3410
delawareccb@gmail.com
www.delawarecounty.iowa.gov
Managed by Delaware Co. Conservation Board

		Acres	Information	RV Camping with Electric/Water	RV Camping with Electric	Primitive Camping	Water D=Drinking S=Showers	Dump Station	Toilets P=Pit F=Flush	Picnicking	Picnic Shelters with Electric Rentals Available	Picnic Shelter without Electric	Play Equipment	N=Nature Center w/Exhibits H=Historic Site	Trails H=Hiking	River or Lake Access C=Canoe K=Kayak B=Boat	Fishing T=Trout S=Stream L=Lake R=River	Hunting - with restrictions W=Wetland F=Forest U=Upland	Undeveloped Natural Areas	Youth Group Camp Area
	PARKS																			
1	Baileys Ford Park Office, Shop, Nature Center	170	●	●	●	●	D/S	●	P/F	●	●		●	N/W/H	●	C/K/B	T/R	H/F	●	●
2	Coffins Grove Park	22	●	●	●	●	D	●	P	●	●		●				S			
3	Dunlap Park	1								●	●		●	H		C/K	R			
4	Fountain Springs Park	180				●			P	●					●		T/S	H/F	●	
5	Oneida City Park	1							P	●		●	●							
6	Oneida Township Park	2							P	●		●	●	H						
7	Plum Creek Park	29							P	●		●	●		●		S	H/F	●	
8	Red Schoolhouse Museum	1							P	●			●	H						
9	Silver Lake Park	60							P	●	●		●		●	C/K/B	L			
10	Turtle Creek Park	200	●	●		●	D	●	P	●			●		●	C/K/B	L/R	H/F	●	
11	Twin Bridges Park	144	●	●	●		D	●	P	●	●		●		●		T/S	H/F	●	
	NATURAL RESOURCE AREAS																			
12	165th Street River Access	0.5														C/K	R			
13	Buffalo Creek Wildlife Area	84													●		R	H/U/W	●	
14	Burton Preserve	1																	●	
15	Delhi Dam River Access	10														C/K/B	R		●	
16	Dundee Preserve	20														C/K	R	H/F	●	
17	Gaffney Wildlife Area	22																H/F	●	
18	Hardscrabble Wildlife Area	44													●	C/K	R	H/F	●	
19	Indian Hills Wildlife Area	108													●			H/F/U	●	
20	M & O Railroad Preserves	7																	●	
21	Milo Forest	100													●			H/F	●	
22	Morris Wildlife Area	80													●			H/F/U	●	
23	Pin Oak Wildlife Area	103													●	C/K	R	H/F	●	
24	Pioneer Road River Access	0.5														C/K	R			
25	Quaker Mill Dam River Access	2												H		C/K	R			
26	Retz Wildlife Area	433													●	C/K	R	H/F	●	
27	Shearer Wildlife Area	150													●		R	H/F/U	●	
28	Silver Creek Wildlife Area	75													●		R	H/F/U/W	●	

Figure 4-13. Recreational Opportunities in Delaware County Parks and Natural Areas
Source: Delaware County Conservation website

D. Nearby Attractions

In addition to the Maquoketa River Water Trail, Delaware County has a variety of attractions and activities that give visitors additional opportunities to enjoy the communities near the water trail. The area's parks and public lands, restaurants, shops, and historical points of interest can attract a broader audience to the area, encourage longer stays, and allow larger groups and families to engage in a variety of activities that suit everyone's individual interests. These attractions make Delaware County a destination that appeals to water enthusiasts and those seeking diverse recreational experiences. This section of the plan highlights some of the area's key attractions. For additional travel and tourism information, visit the Delaware County Tourism Committee's website at https://www.delawarecountyiowatourism.com/.

Backbone State Park
Source: Iowa DNR

BACKBONE STATE PARK

Dedicated in 1920 as Iowa's first state park, Backbone State Park is one of the most geographically unique locations in Iowa. The steep and narrow ridge of bedrock from the Maquoketa River forms the highest point in northeast Iowa - The Devil's Backbone - giving the park its legendary name. Amenities include the Civilian Conservation Corps (CCC) museum, 21-mile multi-use trail system, and some of Iowa's best trout streams.

LAKE DELHI

Lake Delhi is a unique destination for water trail users as it provides a wide range of amenities and activities right on the water's edge. The lake is open to the public, with public boat ramps, public beaches, marinas, restaurants, campgrounds, resorts, and vacation rentals. The area surrounding the lake is primarily residential with some commercial properties mixed in. Several lake area businesses cater to the needs of lake users providing food, lodging, and services.

Lake Delhi Area
Source: Delaware County Tourism

LENOX COLLEGE MUSEUM

The Delaware County Historical Society operates the Lenox College Museum located in Hopkinton on the campus of the former Lenox College, a small, private institution that operated between 1859 to

1944. The campus is listed on the National Register of Historic Places and is considered historically significant because of the college's early establishment in Iowa and its diverse architectural resources.[25] The college also has a significant relationship to the Civil War. In 1864, the college was temporarily closed because its president and all but two of its students enlisted in the Union Army and served in what became known as the "School Boy Company." 92 students enlisted and 27 gave their lives.[26] In 1865 community members erected a Civil War Monument that still stands as the centerpiece of the museum campus.

Old Main at Lenox College Museum
Source: Delaware County Historical Society

MANCHESTER FISH HATCHERY

The Manchester Fish Hatchery is operated by the Iowa DNR, and functions as the state's trout brood stock station where trout are spawned, incubated, and hatched. The station produces over 600,000 fish each year. The hatchery grounds are open for self-guided tours daily from sunrise to sunset and guided tours are available by appointment.

Manchester Fish Hatchery
Source: Friends of Manchester Fish Hatchery

MANCHESTER WHITEWATER PARK

For water trail users looking for a challenge on the Maquoketa River, the Manchester Whitewater Park provides a fun and adventurous experience for canoers, kayakers, and tubers. Located in downtown Manchester, the 800-foot white water course features six whitewater structures, each with an 18-inch drop. After completing the course, park users can use the paved trail to walk back to the beginning. The park is open year-round, 24 hours a day, seven days a week and. The City of Manchester maintains the park which is free for everyone to use.

Manchester Whitewater Park
Source: City of Manchester

[25] See "Old Lenox College National Register of Historic Places Inventory – Nomination Form"

[26] See Delaware County Historical Society Website

E. Scenic Byway Resources

A "scenic byway" is a road identified by the federal or a state Department of Transportation (DOT) as having one or more of the following six qualities: archaeological, cultural, historic, natural, recreational, and scenic attributes. The Delaware Crossing Scenic Byway is one of Iowa's eleven state-designated byways. The state also has three nationally designated byways. The Iowa DOT promotes the state's byways as a great way to experience Iowa's natural beauty, history, and culture. For more information, visit the Travel Iowa website at https://www.traveliowa.com/trails/delaware-crossing-scenic-byway/2/.

The Delaware Crossing Scenic Byway (DCSB) is a 44-mile route that loops though in the heart of Delaware County, running along the Maquoketa River and encircling Lake Delhi. The DCSB is a destination that encourages exploration of the entire county. The *2018 DCSB Corridor Management Plan (CMP)* provides a comprehensive evaluation of the county's scenic, recreational, natural, historic, cultural, and archaeological resources. It includes an action plan with strategies and projects. It offers and recommendations for byway management. It is online at https://iowadot.gov/iowasbyways.

SCENIC RESOURCES

Although it is one of the smallest and most rural Scenic Byways in Iowa, the DCSB has been recognized by the State of Iowa as one of Iowa's most scenic roadways. Overall, views along the DCSB are dominated by four visual resource themes that define the byway corridor: 1) Diverse Agriculture, 2) Forests and Woodlands, 3) Rivers, Streams, and Lakes, and 4) Cultural and Historic Resources.

RECREATIONAL RESOURCES

Recreational venues include adventure and other natural resource-based tourism recreation, family friendly activities, and recreational activities associated with hobby tourism.[27] Recreational activities in the DCSB Corridor include a variety of established and emerging public and private opportunities.

- County Parks: Turtle Creek Park, Bailey's Ford Park and Nature Center, and Dunlap Park;
- City Parks: Silver Lake Park in Delhi;
- Campgrounds: Lake's End Cabin Rental, Lost Beach Campground & Marina, Lazy T Campground, and Bailey's Ford Park;
- Delaware County Fairgrounds;
- Maquoketa River Water Trail.

NATURAL RESOURCES

The DCCB Natural Resource Areas are wildlife areas, river access areas, and forests designated for hiking, river or lake access, fishing, and/or hunting. They are intended to be enjoyed for their natural qualities including woods, meadows, trout streams, wetlands, prairies, lakes, rivers, birds and other wildlife.[28]

- Caves at Retz Wildlife Area and Hardscrabble Wildlife Area,
- Cold-Water Trout Stream and Natural Springs at Bailey's Ford Park,
- Maquoketa River and Lake Delhi.

[27] Ibid, p. 137

[28] Ibid, p. 64

HISTORICAL, CULTURAL, AND ARCHEOLOGICAL RESOURCES

Historic, cultural, and archaeological resources in the DCSB corridor are inherently connected with and influenced by each other. Historic Resources in the study area include:

- Historic Church: Bay Settlement Church in Delhi;
- Historic Sites: Hobb's Chimney and McCreey Monument;
- Historic Districts: Delaware County Historical Museum Complex/Lenox College;
- Museums: Delaware City Historical Museum and Delaware City Genealogy Society;
- Pioneer Cemeteries: Danton, Grove Creek, Lillibridge, Livingston, and Plum Creek.

Cultural Resources in the study area include:

- Festivals & Events: Yesteryear Celebration, Hot Rods and Harleys Car, Bike, and Rat Rod Show, and Lenox College Radio Theatre in Hopkinton; and Delhi Days;
- Local Amish Stores: Barntreger Bakery C&M Greenhouse, Hartwick General Store, Countryside Greenhouse, Double E Discount, E&A Bulk Foods, Yader's Bag N Feed Supply, and Miller's Produce;
- Civil War Monuments: Hopkinton and Delhi: Evergreen Cemetery and Bay Settlement Church.

Archaeological Resources in the study area include:

- Interpretation/Display: Bailey's Ford Nature Center and Delaware County Historical Museum;
- Archaeological Mounds: Near Delhi Dam;
- Archeological Sites: Delhi Dam Area, Lake Delhi and Delhi Dam Building foundation 1, Lake Delhi and Delhi Dam Building foundation 2, and Lake Delhi and Delhi Dam Building foundation scatters;
- Archaeological Rock Shelters: Willard Cave and Hardscrabble Cave.

5. Existing River Conditions

The Maquoketa River conditions found in Delaware County and the study area are described below.

A. River Overview

From its headwaters in Fayette County, the Maquoketa River winds a 501-mile course to the Mississippi River touching five eastern Iowa counties along the way. The river begins near the town of Arlington and flows southeasterly crossing briefly into the southwest corner of Clayton county before entering Delaware County and passing through the cities of Dundee and Manchester. At Manchester the river flows through the middle of town passing over the community's acclaimed whitewater course.

South of Manchester, the Maquoketa River flows into Lake Delhi, an artificial lake created by the Lake Delhi Dam. After passing over the dam, the river passes the city of Hopkinton before crossing Delaware County's southern boundary into Jones County. The river flows along the north side of the city of Monticello and crosses into Jackson County flowing east towards its confluence with the North Fork of the Maquoketa River north of the city of Maquoketa. From there, the river continues east and northeast for another 30 miles before emptying into the Mississippi River on Jackson County's eastern boundary.

MAQUOKETA RIVER WATERSHED

A watershed is an area of land that is drained by the same body of water. Within the watershed all rain water eventually ends up in the same river, lake, or ocean. Rivers and streams are hierarchical systems that begin where surface runoff flows into a small stream. The small stream then flows into a river that eventually empties into a larger river. This continues until the water reaches its final destination such as an ocean or lake.

Like rivers, watersheds are also hierarchical systems with smaller watersheds nested inside larger watersheds. The watersheds of small streams that flow into the same river combine to make up the river watershed. Then, the river watershed combines with watersheds from other rivers to makeup a larger watershed.

Figure 5-1. Map of Maquoketa River Watershed, Study Area circled in yellow
Source: ECIA

The Maquoketa River Watershed covers 1,196,960 acres and touches parts of nine eastern Iowa counties. Figure 5-1 is a map of the Maquoketa River Watershed with the study area circled in yellow.

In 2020, around 59,000 people lived within the watershed boundary. The Maquoketa River and the North Fork of the Maquoketa River form the HUC 8 Maquoketa Watershed. The watershed is part of the larger Mississippi River Basin.

Watershed Management Authority

Delaware County is a partner in the Maquoketa River Watershed Management Authority (MR WMA), formed in 2017 by intergovernmental agreement. The MR WMA represent 19 cities, seven counties, six Soil and Water Conservation Districts (SWCDs), and the Lake Delhi District. In 2021, the MR WMA developed a Watershed Management Plan: Phase 1 that serves as a guidebook and vision to achieve these broad goals to improve watershed planning and management: protect local drinking water, support positive soil health practices, reduce flooding, promoting recreation, and improving overall water quality. In 2022, the Watershed Management Plan Phase 2: Sub-watershed Implementation was developed. Find Phases 1 and 2 of the Maquoketa River Watershed Management Plan and the Watershed Interactive GIS Map at https://iisc.uiowa.edu/partners/maquoketa-river-watershed-management-authority.

MEANDERED AND NON-MEANDERED STREAMS

In Iowa, people are allowed to paddle or navigate on any stream with enough flow to support a small watercraft (navigable stream). On some rivers people are allowed access to the stream beds and banks (meandered stream), while on others access is more restricted and people are only allowed to float on the water (non-meandered streams).

Under Iowa law, river usage rights are determined based on whether the river is designated as a meandered or non-meandered stream. It is important to understand that this legal terminology (navigable, meandered, and non-meandered) has nothing to with the character of the river itself. Original public land surveys, conducted before Iowa became a state, designated a number of the state's rivers as meandered. All other streams are designated as non-meandered. On meandered rivers, the stream bed and banks up to the ordinary high-water mark (usually where vegetation begins) are held in public trust for all. River users are allowed unrestricted access to stream beds and can camp on sandbars without concern of trespass. However, on non-meandered rivers, which are the majority of rivers in the state, users are only allowed to float on the water's surface.

Questions lingered. What if you came upon a river-wide obstruction, such as a downed tree or an electric fence? What if we wanted to take a break on a sandbar, or fish? To answer these questions, the Attorney General's office offered Opinion No. 96-2-3 in 1996 stating "activities incident to navigation, including fishing, swimming, and wading" are allowed on non-meandered streams. The Iowa DNR has used this as guidance ever since.

Figure 5-2. Maquoketa River - Meandered Section, Study Area circled in red
Source: Iowa DNR

The Maquoketa River in Delaware County is designated as non-meandered (see Figure 5-2). A meandered portion of the Maquoketa can be found downstream,

beginning at the Mississippi River and continuing upstream 26 miles to the city of Maquoketa.

RIVER FLOODING

Floods are among the most frequent and costly natural disasters in terms of human hardship and economic loss in Delaware County. Eastern Iowa has experienced numerous flood events and the loss of millions of dollars in property and crop damage over the past 25 years. There are two types of flooding.

Flash flooding is an event that occurs when water levels rise at an extremely fast rate as a result of intense rainfall over a brief period, sometimes combined with rapid snowmelt, ice jam release, frozen ground, saturated soil or impermeable surfaces.

River flooding is defined as the overflow of rivers, streams, drains, and lakes due to excessive rainfall, rapid snowmelt or ice melt. The areas adjacent to rivers and stream banks that carry excess floodwater during rapid runoff are called floodplains. A floodplain is defined as the lowland and relatively flat area adjoining a river or stream.

High water can be dangerous for paddlers. Rivers are constantly changing, and during a flood, big changes can occur quickly. High water makes the river move faster and with much greater force. A flooded river can also be filled with tree branches and other debris that can be hazardous for paddlers. It is important for paddlers to know the river and know the river level means for paddling conditions before going out on the water. Flooding also creates maintenance issues for river accesses. Following a flood, land managers must clear the mud and debris deposited by the flood waters in boat ramps and parking areas. They must also replace signs, picnic tables, and other items that are carried away by flood waters. According to the August 2024 *Report to IDNR River Programs on the Maquoketa River Water Trail*: **"**Action stage is 12 feet, flood stage is 14 feet, historic high crest was 24.48 feet on 07/24/2010 (when the old dam failed)."

Hazard Mitigation Plan

Hazard mitigation planning is the process through which hazards that threaten communities are identified, likely impacts of those hazards are determined, mitigation goals are set, and appropriate strategies to lessen impacts are determined, prioritized, and implemented. The *2021 Delaware County Multi-Jurisdiction Multi-Hazard Mitigation Plan* documents the county-wide hazard mitigation planning process and identifies relevant hazards, vulnerabilities and strategies that the participating jurisdictions will use to decrease vulnerability and increase resiliency and sustainability. Participating jurisdictions include: Delaware County; the Cities of Colesburg, Delaware, Delhi, Dundee, Earlville, Greeley, Hopkinton, Manchester, Masonville, and Ryan; the Ed-Co, Maquoketa Valley, and West Delaware Community School Districts; and St. Mary's School. This plan is available online at https://delawarecounty.iowa.gov/emergency-management/.

According to the *2021 Delaware County Multi-Jurisdictional Hazard Mitigation Plan*, "Delaware County has repeatedly endured extensive damage by river flooding from the Maquoketa River as well as its many creeks, streams and tributaries." The plan reports a total of "11 river flooding events in Delaware County between 1996 and 2021 with a total of $29.3 million in property damages and $1 million in crop damages." Given the history of flooding in Delaware County, the plan estimates that "a major flooding event requiring federal assistance will occur in the next five (5) years." Flooding in 2010 caused extensive damage in Delaware County including the breach of the Lake Delhi Dam.

Lake Delhi looking west from the dam
Source: Lake Delhi District website

LAKE DELHI

Lake Delhi, fed by the Maquoketa River, twists and turns for nine miles through wooded bluffs and wildlife areas. The 448-acre lake offers a wide variety of recreational and leisure activities for children and adults. There are multiple local and regional marinas servicing Lake Delhi.

Lake Delhi is a public lake regulated by the Iowa DNR. The lake is accessible to the public via several points. There are three public beaches: Lost Beach, North Beach, and Turtle Creek Cove Beach. Bailey's Ford Park at the north end features camping, pavilions, and access to Lake Delhi for small water craft. Turtle Creek Park offers camping, multiple boat ramps with trailer parking, beach, restrooms, and temporary docking. At the south end the Dam and Labyrinth Spillway offer spectacular lake views. There is a portage at the dam for kayakers and canoers to continue the journey downstream along the Maquoketa River.

Lake Delhi District

The Lake Delhi Combined Recreational Facility and Water Quality District (Lake Delhi District) is the public entity that owns and manages the dam and spillway and other public facilities within the district. The Lake Delhi Iowa Taxing District was created under Iowa Code Chapter 357E – Recreational Lake and Water Quality Districts.

The Lake Delhi District is governed by a seven-member Board of Trustees that represents the 854 property owners within the district. Delaware County voters elect the trustees in elections administered by the Delaware County Auditor. Trustee meetings are open to the public and recorded meeting minutes are posted on the district's website. The Trustees also publish a newsletter, called the Lake Delhi VOICE, that is sent out as well as posted and archived on the district's website http://lakedelhi.org/.

Lake Delhi Recreation Association

The Lake Delhi Recreation Association (LDRA), formed in 1973, has played an active role in supporting recreation areas, water quality efforts, dredging, fish stocking, and representing the lake residents' interests whenever needed. Since 1989, Lake Delhi property owners have paid a property assessment in the Benefited Lake Taxing District to provide funds for the annual maintenance of the Lake Delhi Dam and Dredging. These funds have been supplemented with donations and grants.

Figure 5-3 is a detailed map of Lake Delhi amenities available on the LDRA's website at https://lakedelhi.com/lake-links.

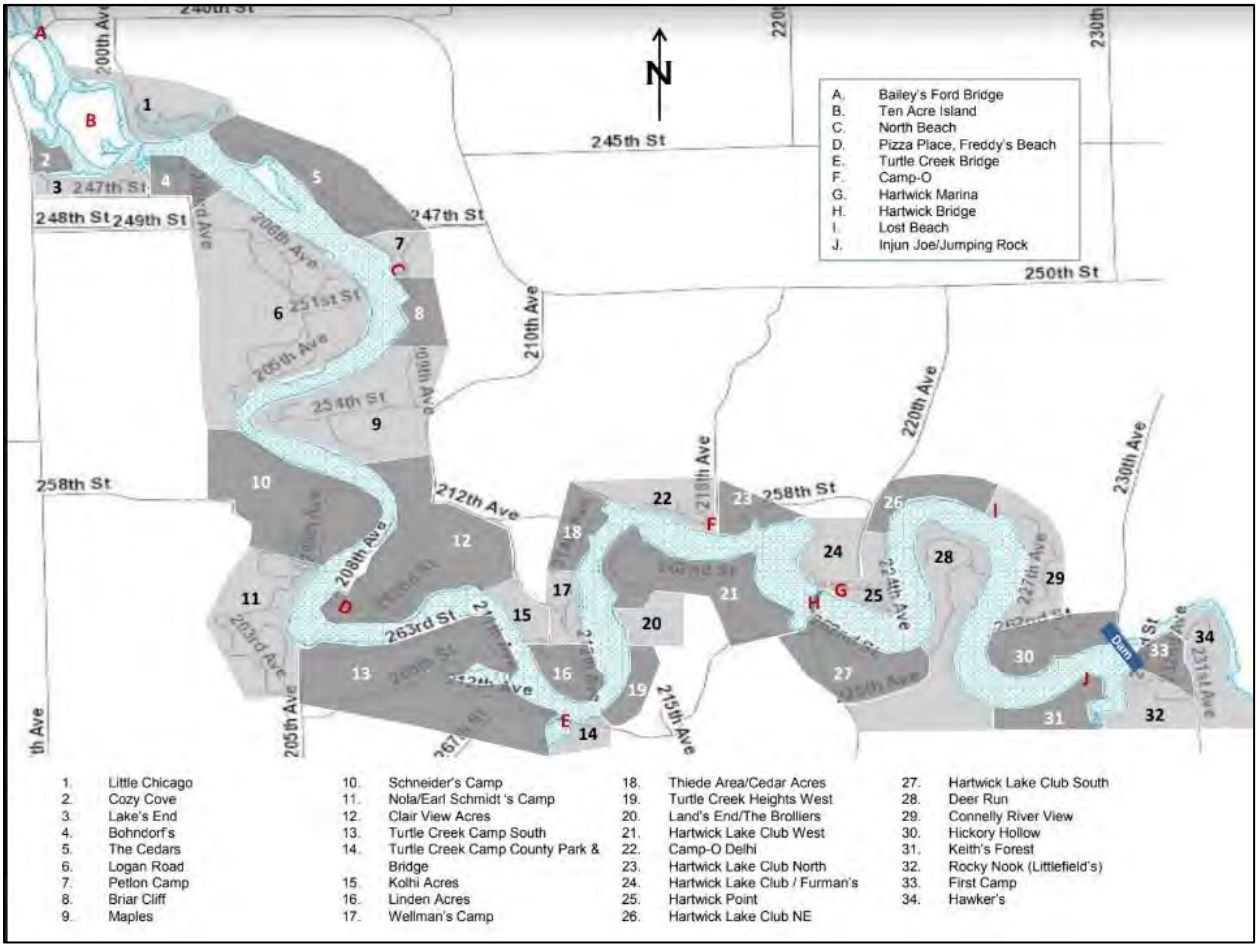


Figure 5-3. Map of Lake Delhi
Source: Lake Delhi Recreation Association website

Lake Delhi Dam

The Lake Delhi Dam was originally constructed between 1922 and 1929 by the Interstate Power Company for hydroelectric power generation. The dam's powerplant generated electricity until it was decommissioned in 1973 and the Lake Delhi Recreation Association assumed ownership. The Iowa DNR's Low Head Dam Project Map indicates that Lake Delhi Dam serves many purposes: river crossing, utility/pipeline protection, stream channel stabilization, water supply, flood control, enhanced water quality, aeration, wildlife habitat, fish and aquatic habitat, historic value, visual interest, fishing, hunting, agricultural, and upstream large impoundment.

Dam Breach and Reconstruction

In a 48-hour period between July 22nd and 24th 2010, a large storm system dropped eight to twelve inches of rain on Delaware County and the surrounding area. The large amount of rain over a short period of time caused the river level in the Maquoketa River and Lake Delhi to quickly rise to record

levels. This unprecedented level of flooding was too much for the dam to hold, and the earthen berm on the south side of the dam gave way around 1:00 p.m. on July 24. Water rushing out of the dam caused extensive damage, washing away most of the dam and several homes and other structures downstream.

Following the breach, area residents began the long process of rebuilding. After several years of fundraising and negotiations, construction on a new dam began in 2014. Dam and spillway reconstruction was completed in 2015 and the lake was refilled by September 2016. For more information, see https://www.radioiowa.com/2015/01/30/lake-delhi-getting-closer-to-a-refill/

Lake Delhi Links

Below is a list of links for more information about Lake Delhi.

- Lake Delhi District Website – http://lakedelhi.org/
- Lake Delhi Recreation Association Events -- https://lakedelhi.com/
- Delaware County Tourism - https://www.delawarecountyiowatourism.com/lake-delhi/
- Delaware County Board - https://delawarecounty.iowa.gov/lake-delhi-board/
- Dam Case Study - https://damfailures.org/case-study/lake-delhi-dam-iowa-2010/
- KWWL 10-year anniversary- https://www.kwwl.com/weather/blog/lake-delhi-dam-failure-10-years-ago/article_4ca50163-b3c0-56d9-b481-eb96fd9c8df2.html
- Des Moines Register, After 6 dry years, Lake Delhi dreams of its best summer ever. https://www.desmoinesregister.com/story/news/local/kyle-munson/2016/05/25/iowa-dry-lake-delhi-refilled/84493606/
- Telegraph Herald, Owners look to reactivate dam. https://web.archive.org/web/20081016055304/http://www.thonline.com/article.cfm?id=219149

RIVER MANAGEMENT

Rivers, streams, and lakes in Delaware County are managed by a collection of conservation and public safety agencies that are charged with law enforcement and emergency response on the county's rivers. The DCCB owns and manages most of the public lands and river accesses in the plan corridor. Delaware County also regulates floodplain development and land use. The list of agencies includes:

- Iowa DNR Conservation Officers
- Delaware County Conservation Officers
- Delaware County Engineer (Secondary Roads and Floodplain Development)
- Delaware County Water and Sanitation Administrator (Wells and Septic Systems)
- Delaware County Zoning Administrator (Land Use)
- Delaware County Sheriff
- Delaware County Emergency Management Coordinator
- Delhi Fire Department
- Hopkinton Fire Department
- Manchester Fire Department
- Manchester Police Department

B. Existing Water Trails

When complete, the stretch from Bailey's Ford to the Delaware County/Jones County line in the study area would be the fourth section of the Maquoketa River designated as a state water trail. Figure 5-4 shows state water trails in the region that are designated or under development. The study area is circled in red. Future water trail connections are circled in green. Maps and brochures for the Maquoketa River Water Trails in Delaware, Jones and Jackson Counties are online at https://www.iowadnr.gov/Things-to-Do/Canoeing-Kayaking/Water-Trail-Maps-Brochures. The maps show access points and provide descriptions of amenities available along the river.

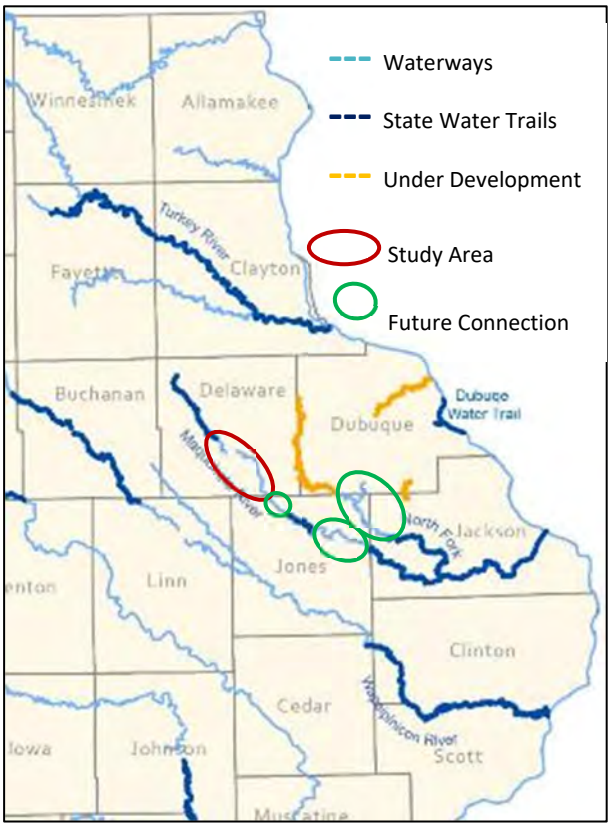


Figure 5-4. 2025 State Water Trails Map for region, Study Area circled in red and future connections circled in green
Source: Iowa DNR

MAQUOKETA RIVER WATER TRAIL: DELAWARE COUNTY NORTH

The Iowa DNR designated a 23.4-mile stretch of the Maquoketa River in Delaware County as a water trail in June 2018. The water trail begins four miles upstream from Backbone Lake Dam and continues downstream to Bailey's Ford Park, where it ends at the upstream limits of Lake Delhi. The anchoring river access locations of this water trail are Backbone State Park, located at the northern edge of Delaware County, and Bailey's Ford Park, located three miles southeast of Manchester.

Along this water trail, the Maquoketa River showcases limestone cliffs, mature oak forests, shallow impoundments, lowland forests, and diverse wildlife. Some stretches provide a quiet, prehistoric feel among ancient rocks and forests. Iowa's largest constructed whitewater paddling course is located in downtown Manchester. It features six 18-inch drops over a span of 800 feet. Paddlers can use a paved trail to walk back to the beginning and repeat the course, or continue downstream on the water trail.

From the Backbone State Park Access to the Dundee Access, this section is most appropriate for paddlers with at least an intermediate skill level. From the Dundee Access to the Manchester Whitewater Park, this stretch of river is appropriate for paddlers with intermediate to advanced skill levels. From Manchester Whitewater Park to Pin Oak Access, and onto Bailey's Ford Park Access, this stretch of river is recommended for paddlers with at least an intermediate skill level.

Existing Plan

The *Maquoketa Water Trail Plan for Delaware County* was completed in December 2016. It includes a description of existing conditions, the water trail vision, and a recreational development plan. The recreational development plan identifies recreational resources and needs in the water trail corridor

and recommended recreation development projects. Available on the Iowa DNR's website at https://www.iowadnr.gov/Things-to-Do/Canoeing-Kayaking/Water-Trail-Development. Figure 5-5 is a map of the Maquoketa River Water Trail in Delaware County, with the study area circled in red.

Figure 5-5. Maquoketa River Water Trail in Delaware County, Study Area circled in red
Source: Iowa DNR

MAQUOKETA RIVER WATER TRAIL: JONES COUNTY

The Iowa DNR designated a 7.7-mile stretch of the Maquoketa River near Monticello in Jones County as a water trail in October 2010. The water trail follows the river from the Mon-Maq Dam to Pictured Rocks Park. This stretch of river flows through areas of dense upland and lowland woodlands. As the river approaches Pictured Rocks Park, paddlers are treated to a valley of limestone bluffs and a wondrous woodland landscape teaming with wildlife. Bluffs rise up 30 to 100 feet or more above the water. Some rise up right out of the water while others are somewhat hidden behind shoreline trees.

The sandbar access below the Mon-Maq dam makes for easy launching, and the takeout at Pictured Rocks Park features a large, wide boat ramp constructed of native stone. It is one of the most beautiful and well-constructed ramps in the state. Bathrooms, water, and ample parking are available at both accesses. Although an eight-mile trip may be a bit long for beginners, this stretch of river is appropriate for paddlers of all skill levels.

Figure 5-6 is a map of the Maquoketa River Water Trail in Jones County, with the stretch in the study area above Hopkinton to the county line circled in red and future connections circled in yellow. Jones County Conservation has improved the Eby's Mill Access with a concrete boat ramp and a parking lot. Learn more at https://www.jonescountyiowa.gov/conservation/current_projects/.

Figure 5-6. Maquoketa River Water Trail in Jones County, Study Area circled in red and future connections circled in yellow *Source: Iowa DNR*

MAQUOKETA RIVER WATER TRAIL: JACKSON COUNTY

The Iowa DNR designated Jackson County segments of the Maquoketa River and the North Fork of the Maquoketa River as water trails in 2023. In Jackson County, Maquoketa River passes through high bluffs of the Mississippi Valley on its way eastward to meet the Mississippi River. The bedrock exposed along the water trail is over 400 million years old. Natural caves and springs dot the landscape, known as "Karst topography," formed from the slow process of seeping groundwater dissolving lime-rich rock. Many of these features can be explored at Maquoketa Caves State Park, six miles west of the City of Maquoketa. A six-mile stretch between the Joinerville Park and Maquoketa City accesses are not part of the official water trail because there is no portage around the Lakehurst Power Dam.

Figure 5-7. North Fork and Maquoketa River Water Trail in Jackson County, future connections circled in yellow

Source: Iowa DNR

C. Plan Corridor Overview

The Maquoketa River and Lake Delhi have been used for water sports and as informal water trails for many years. This section provides an overview of river access points, segments, and usage along the water trail plan corridor in the study area.

EXISTING RIVER ACCESSES

River accesses are an important part of a successful water trail. The primary purpose of a water trail access point is to provide a location to launch and land boats. A basic river access will typically have a gravel boat ramp and a small parking area, while a more heavily-used access may have a concrete boat ramp and other amenities such as paved parking areas, restrooms, information kiosks, and picnic areas. The Iowa DNR requires a formal parking area with enough space for a minimum of five vehicles in order to qualify as an official water trail access.

There are nine (9) existing river accesses along the Maquoketa River in the plan corridor. The DCCB owns the land at six of the access points. The DCCB manages and maintains the Delhi Dam Access, which is owned by the Iowa DNR. The Lake Delhi District owns the Delhi Dam Ramp Access and the Delhi Dam Portage Access. Table 5-1 lists the name, property owner, location in river miles, miles to next access, and approach roads for the existing river accesses in the plan corridor.

Note: At this time, there is no access downstream from the Hardscrabble Wildlife Area Access within the plan corridor, which ends at the County line. The next access downstream from the Hardscrabble Wildlife Area Access lies beyond the plan corridor to the Mon-Maq Dam Access 82 in Jones County. This access is ten miles from the Hardscrabble Wildlife Area Access.

Table 5-1. Existing River Accesses in the Plan Corridor

Access Name	Property Owner	Location (River Mile)	Miles to Next Access	Approach Road to Access
Bailey's Ford Park Access	DCCB	112.3	4.7	Jefferson Rd. / K21
Turtle Creek Park Access	DCCB	107.6	3.8	267th St.
Delhi Dam Ramp Access	Lake Delhi District	103.8	0.2	230th Ave. / X31 south side
Delhi Dam Portage Access	Lake Delhi District	103.7	2.1	230th Ave. / X31 south side
Delhi Dam Access	Iowa DNR	103.6	2.0	230th Ave. / X31 north side
Retz Wildlife Area Access	DCCB	101.6	2.4	Pioneer Rd.
Pioneer Road River Access	DCCB	99.2	5.2	Intersection of Quarter Rd. & Pioneer Rd.
Dunlap Park Access	DCCB	94.0	1.8	Washington St. / D47
Hardscrabble Wildlife Area Access	DCCB	92.2	3*	275th Ave.

*Note: This mileage is to the County line; there is no access at this location.

Figure 5-8 maps the locations of the existing river accesses in the plan corridor, from Bailey's Ford County Park past Hardscrabble Wildlife Area to the County line.

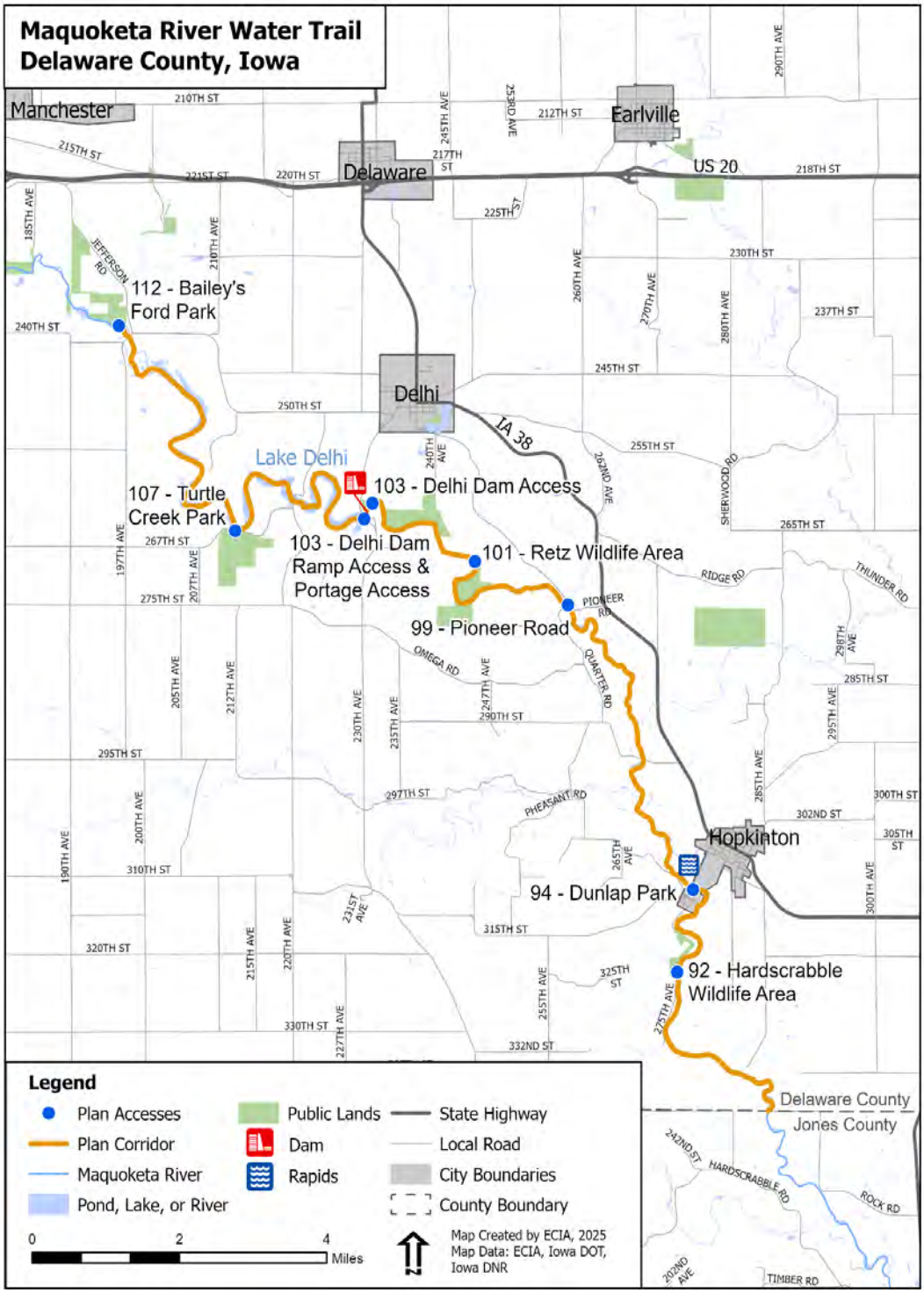


Figure 5-8. Map of Existing River Accesses in the Plan Corridor
Source: ECIA

According to the August 2024 *Report to IDNR River Programs on the Maquoketa River Water Trail*: "The river takes on lake characteristics in the reservoir above the Delhi Dam, beginning less than a mile downstream of Bailey's Ford Park. The width varies between 200 and 750 feet, and depth exceeded the length of a paddle at the water levels that existed. Below the Delhi Dam, the river quickly narrows and takes on characteristics of a more natural waterway, varying in width from 100 to 170 feet. There are some wonderful limestone rock bluffs, especially between the dam and Pioneer Road Access. Water clarity is more than a foot, being dirtier after rains and then slowly gaining clarity. Bank erosion is rare, except in some areas between Pioneer Road Access and Dunlap Park. The river channel bottom is rocky below the dam, becoming more a mix of sand and gravel as one proceeds downstream."

Access Ratings

According to the August 2024 *Report to IDNR River Programs on the Maquoketa River Water Trail*, **e**ach access in this plan corridor has been assigned a numerical value from 1 -- lowest rating to 5 – highest rating (see Table 5-2). It is assumed that accesses rated 3 and above will be fully signed for way-finding.

Table 5.2 Iowa DNR Access Ratings for Water Trail Accesses and Wayfinding Signage

Rating	Access Description	Should be Signed for Public Use?
1	Access is not advised and should not be advertised to the public.	**No**
2	Access has a difficult carry-down or landing and, absent substantial management improvements, should not be advertised for public use. No parking or other amenities are available.	**No**
3	Access has a carry-down with good footing and distance, and a landing that is usable but may be muddy or steep. Access may be advertised for public use, with appropriate description in brochures and websites. There are no restrooms, trash receptacles, camping, or other amenities. Parking may be difficult for more than three vehicles.	**Yes**
4	Access has a ramp and/or carry-down of short distant and gentle slope. The landing is very usable, even if it does gather some mud or is a little steep or rocky. There may or may not be any restrooms, trash receptacles, camping, or other amenities. Parking is adequate for several vehicles.	**Yes**
5	Access has a ramp and/or easy carry-down of short distant and gentle slope. The landing is very usable with little mud, steepness, or obstacles. Restrooms, trash receptacles, campgrounds, and/or other amenities are present. There is ample parking and turn-around area for vehicles.	**Yes**

Below are descriptions of the existing river accesses in the plan corridor, including their access ratings, attributes, and amenities. They are divided into two stream reaches within the plan corridor: one upstream of the Delhi Dam, and the other downstream from the dam.

Stream Reach: Bailey's Ford County Park to Delhi Dam. There are four possible accesses along this segment. Numbers in parenthesis refer to rating of access as defined in Table 5-2.

- **Bailey's Ford Park access (5)** has both a paddler access ramp and motorized boat ramp. Both are concrete ramps with good landings. It is advised to use the paddler ramp since it is

designated for this purpose and provides good landing areas on, and adjacent to, the concrete. There is ample parking, a port-a-potty, water hydrant, bench, and garbage can close to the parking and the access. Upon entering the park, there is a sign pointing to the boat ramps. The paddler access is signed at the parking lot with DNR water trail signs, and there is a water trail access number sign facing the river just upstream of the landing.

Bailey's Ford Park paddler access
Source: Dan Cohen, IDNR

- **Turtle Creek Park (5)** has two separate accesses with concrete ramps and boat docks, well signed off 267th Street. The west access lane winds through the 12-acre park, which is mostly a campground. Ample parking is available above the boat ramp area, and paddlers can drive down to the ramp to unload and then drop off vehicle(s) back at the parking area. It is a short but steep walk down the road from the parking area to the boat ramp. The east access is located on the east side of the 267th Street bridge and provides a larger parking area adjacent to two boat ramps. Both the east and west accesses provide very good river access, with the west access providing a better earthen launch adjacent to the ramp. Vault restrooms are located near the parking areas for both accesses. The accesses provide a launch into a small bay, mostly protected from the high-speed motorized traffic on the lake.

Turtle Creek Park – west access ramp (left) and east access ramp (right)
Source: Dan Cohen, IDNR

- **Delhi Dam Ramp (3)** above the dam has a concrete ramp. It is grooved and in good condition leading to a good landing. It is rather steep (10-degree slope). There is only room for a few vehicles to park, and paddlers will compete with motorboaters for parking spaces. There are no other amenities. Private property signs are on either side of the ramp and along a dock that extends toward the dam. There are no signs indicating public access facing land or water. There also are no signs along roads leading to the dam indicating public access.

- The **Delhi Dam Portage Access (3)** is a concrete paved trail that begins just south of the dam. The first third of the 450-foot trail is very steep, dropping some 50 feet at a slope of about 18

degrees. The concrete is not grooved, and likely is slippery when wet. At this water level, the landing is at an abrupt end to the trail in some fast water. Regardless of water level, paddlers will need to navigate through some swift water and obstacles to get out to the normal river flow. There are no amenities or signs indicating the trail is meant to be a portage. The portage trail likely will not get much paddler use as there is a much easier access and landing downstream along the north side of the dam (Delhi Dam Access).

Delhi Dam Ramp (upper) and Portage Access (lower)
Source: Dan Cohen, IDNR

Stream Reach: Delhi Dam Access to Hardscrabble Wildlife Area. There are four possible accesses along this segment. Numbers in parenthesis refer to rating of access as defined in Table 5-2.

- **Delhi Dam Access (4)** provides a grooved, concrete ramp on the left bank below the Delhi Dam. The ramp slope is gentle and the landing is good. There are no restrooms, water, or other amenities at the access. There is ample parking. There is a sign indicating that the stretch below the dam is managed by Iowa DNR for catch-and-release fishing for bass. The access includes a foot path that extends downstream along the shoreline for angler use. There is ample parking and area to turn around. The access lane is signed on 230th St. north of the Delhi Dam. There are no official water trail signs.

Maquoketa River Access
Source: Dan Cohen, IDNR

- **Retz Wildlife Area Access (3)** provides a good, short, concrete slab ramp, that is a bit steep. Boulders and concrete slabs are at the landing and either side of the ramp, and some flat rocks provide good footing for getting in and out of the water. Fishing at and below the access is managed as catch-and-release on all bass. The lane to Retz Wildlife Area is off of Pioneer Road is marked with a small road sign and appears to be a private drive. The access is a half-mile down the lane which ends at a turnaround around a big cottonwood tree. There is a somewhat steep downhill portion of the lane which likely gets rutted during large rain events. Paddlers can drop boats and gear at the ramp and then park vehicles about a

hundred feet back up the lane at a very spacious parking lot. There are four well maintained parking lots along the lane, with the last being signed for the river access. The sign off Pioneer Road, and signs at each of the other three parking lots, make no mention that a river access exists down the lane.

Retz Wildlife Area Access
Source: Dan Cohen, IDNR

- **Pioneer Road River Access (3)** has a stairway access that ends abruptly at the shoreline, with no flat area for takeout. The stairway has a couple landings as it traverses down the bank, and is usable for most able-bodied adults to put in. It would be more difficult to do the takeout carry up the steps. The landing at the bottom steps was overgrown with trees, making the access not visible from upstream. There is a good circle drive and parking for a few vehicles. The parking area is fenced with a stairway access to carry over the fence to the start of the stairway. The area is signed as managed by Delaware County Conservation Board, but it is not listed on the Delaware County parks page of MyCountyParks.com. There are no restroom or other amenities. The access is located on Quarter Road, just off of Pioneer Road. There are park signs directing traffic from Highway 38, but no official water trail signs.

Pioneer Road Access
Source: Dan Cohen, IDNR

- **Dunlap Park Access (5)** provides a good, concrete boat ramp and landing. The rapids just upstream of the ramp were constructed during dam removal that was part of the project that replaced the SW Marion Street bridge in 2003. A concrete portage path provides the option to exit the river on the right shoreline before the bridge to bypass the rapids. The landing for the portage is earthen, not signed, and difficult to see. The portage path also connects to a sidewalk that goes to a picnic shelter and then to a paved trail that extends over the bridge. In addition to the picnic shelter and trail, the park offers a vault restroom, ample parking, and playground equipment. The park is signed from SW Marion St. There are no official water trail signs.

Dunlap Park – Upstream takeout, portage path, and downstream ramp
Source: Dan Cohen, IDNR

- **Hardscrabble Wildlife Area Access (3)** provides a concrete boat ramp that ends short of the water at a mud landing of a small inlet, river-right. It is adjacent to two large culverts that divert water under 275th Avenue, a gravel road that comes right to the boat ramp. The access is not signed and difficult to see from the water upstream. There is parking on either side of the road near the boat ramp for a few vehicles. There also is a bench near the ramp. The Hardscrabble Wildlife Area is not signed until at the ramp, and when taking 275th Avenue to the access, paddlers will pass private land along the river that is park-like (mowed with benches and picnic table). The access is near the dead-end of 275th Avenue, which has lots of potholes. There are no restrooms or other amenities, and no official water trail signs.

Hardscrabble Wildlife Area Access
Source: Dan Cohen, IDNR

Table 5.3 summarizes the access ratings and available amenities for the existing river accesses. It is assumed that accesses rated 3 and above will be fully signed for way-finding as a state water trail.

Table 5.3 Ratings and Amenities at Existing River Accesses

Access Name	Access Rating	Signed for Public Use	Toilets	Camping	Picnic Shelter	Drinking Water	Boat Ramp	Canoe/Kayak Ramp	Play Equipment	Parking Area
Bailey's Ford Park Access	5	Yes	x	x	x	x	x	x	x	x
Turtle Creek Park Access	5	Yes	x	x	x	x	x		x	x
Delhi Dam Ramp Access	3	Yes					x			x
Delhi Dam Portage Access	3	Yes					x			x
Delhi Dam Access	4	Yes					x	x		x
Retz Wildlife Area Access	3	Yes						x		x
Pioneer Road River Access	3	Yes					x	x		x
Dunlap Park Access	5	Yes	x		x			x	x	x
Hardscrabble Wildlife Area Access	3	Yes	x					x		x

EXISTING DAM ON LAKE DELHI

The Iowa DNR Dam Safety Program maintains a database of dams that meet the thresholds for the National Inventory of Dams (NID). Dams are classified by the Iowa DNR Dam Safety Program into three categories based on the potential risk to people and property in the event of failure.

- Failure of a **low hazard dam** would result in no probable loss of human life, low economic losses, and low public damages.

- Failure of a **significant hazard dam** would result in no probable loss of human life but may damage residential structures or industrial, commercial, or public buildings; may negatively impact important public utilities or moderately traveled roads or railroads; or may result in significant economic losses or significant public damages.
- Failure of a **high hazard dam** would result in probable loss of human life.

Lake Delhi Dam, located at 2628 230th Ave. in Delhi, is classified as a significant hazard dam. The dam is owned by the Lake Delhi District. The Iowa DNR's latest inspection on 07/20/2020 rated its condition as satisfactory, which means: "No existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all loading conditions (static, hydrologic, seismic) in accordance with the minimum applicable state or federal regulatory criteria or tolerable risk guidelines." This concrete dam is considered a major structure with a height of 55 feet and a length of 750 feet. Its surface area is 440 acres, and its drainage area is 347 square miles. Normal storage is 3,790 acres-ft, and maximum storage is 9,920 acres-ft.

Lake Delhi Dam is considered a low head dam, which are extremely dangerous and have led to fatalities of anglers, boaters, paddlers, tubers, swimmers, and would-be rescuers. Powerful recirculating hydraulics at these small dams can trap and drown unsuspecting river users (see Figure 6-6). The Iowa DNR educates all river users about these hazards, provides support for dam-owners to install warning signs in vicinities of dams, and works with dam owners to mitigate safety hazards at dams. The last reported drowning at Lake Delhi occurred on July 3, 2020: "A 17-year-old died after drowning at Lake Delhi Friday," published July 4, 2020 and copyright by KCRG.

Lake Delhi Dam spillway
Source: Dan Cohen, Iowa DNR

EXISTING PORTAGE ROUTE AT DELHI DAM

For paddlers coming down the river, Lake Delhi Dam presents a potentially dangerous situation and should be approached with extreme caution. In general, the Iowa DNR recommends exiting the river at least 300 feet upstream from a dam. The Portage Only Access points and portage route for the dam are shown in Figure 5-9.

According to the August 2024 *Report to IDNR River Programs on the Maquoketa River Water Trail*, **"**Prior to the takeout, there is a large limestone face on a hillside river-right. There is a bay to the right, but the

takeout ramp is straight ahead, right of the dam, somewhat hidden by a cluster of docks and boats. To the left of the ramp, orange buoys mark the dangerous area just before the dam. The ramp is grooved concrete, with private property signs on either side. It is located a good, safe distance from the dam.

The Delhi Dam ramp serves as both a takeout and portage. Paddlers may choose to leave the water trail or traverse the portage and continue downstream. Those wishing to portage down to the river below the dam should be prepared for a long, steep carry-down." See descriptions of the takeout and portage accesses in the Existing Accesses section.

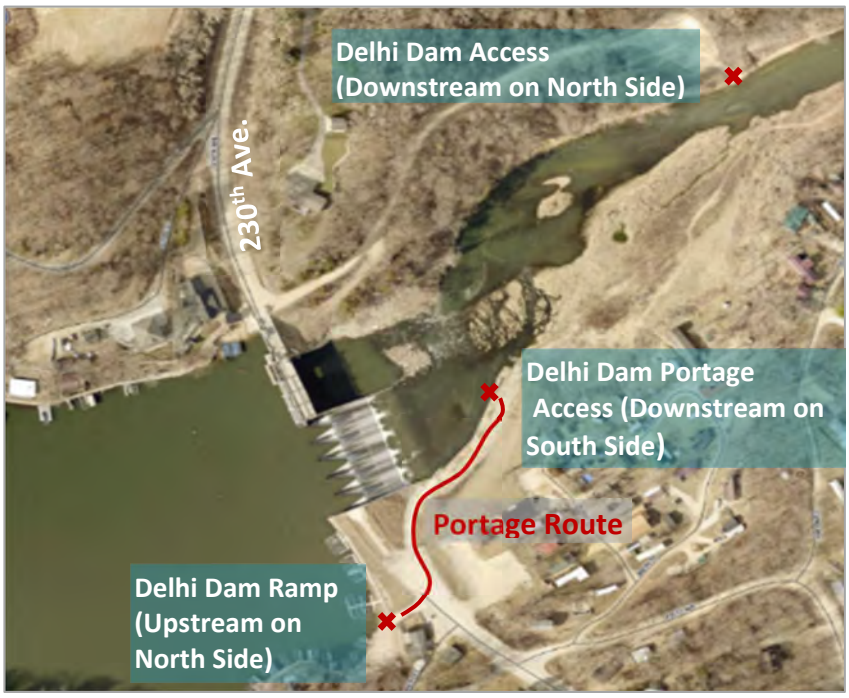


Figure 5-9. Portage Only Route at Lake Delhi Dam
Source: ECIA using Delaware County Beacon GIS

Delhi Dam Ramp (upper) and Portage Access (lower)
Source: Dan Cohen, Iowa DNR

EXISTING RAPIDS AND PORTAGE AT DUNLAP PARK

In Delaware County, the historic Hopkinton Milldam at Dunlap Park was replaced with a rock riffle in 2003 to create the Hopkinton Rapids. The rapids are considered a hazard. The portage route has a grass and dirt takeout upstream of the rapids and a concrete hog slat carry-down ramp downstream that are connected by a three-foot wide gravel path that goes under the bridge. See descriptions in the Existing Accesses section.

Hopkinton Rapids at Dunlap Park
Source: ECIA

EXISTING RIVER SEGMENTS

For water trail planning, existing river segments are described as the stretches between existing river accesses. Based on discussions with land managers and river users, the steering committee and stakeholders developed a usage estimate of the current river segments in the plan corridor. Special features of the river segments also were identified. Table-5-4 classifies each river segment as low, medium, or high use based on its estimated level of paddling use.

Table 5-4. Usage Levels for Existing River Segments in the Plan Corridor

River Segment	Special Features	Length	Usage
Bailey's Ford Park Access to Turtle Creek Park Access	Lake Delhi, North Beach	4.7 miles	High
Turtle Creek Park Access to Delhi Dam Ramp Access	Lake Delhi; North Beach and Lost Beach both offer beaches and portable restrooms	4.1 miles	High
Portage Route: Delhi Dam Ramp to Delhi Dam Portage Access	Portage Only Accesses, high risk	745 feet	Low
Delhi Dam Portage Access or Delhi Dam Access to Retz Wildlife Area Access	Scenic quality; catch and release area for smallmouth bass	2.0 miles	High
Retz Wildlife Area Access to Pioneer Road River Access	Scenic quality; catch and release area for smallmouth bass	2.4 miles	Low
Pioneer Road River Access to Dunlap Park Access	Hopkinton Rapids, high risk	5.2 miles	Low
Dunlap Park Access to Hardscrabble Wildlife Area Access	Shallow and sandy, with pretty easy floating	1.8 miles	Low
Hardscrabble Wildlife Area Access to County Line (no access)	Consider designating new access, working with Jones County	3.0 miles	Low

CLASSIFICATION OF EXISTING RIVER SEGMENTS

The design considerations in *Developing Water Trails in Iowa*, the state's water trail development guide, are organized around the idea of providing water trail experiences that appeal to the full range of the paddling community. Some paddlers are just starting out and looking for a comfortable and predictable experience, while other, more experienced, paddlers may be looking for opportunities to challenge

themselves and improve their skills. This section classifies Delaware County's water trail segments based on existing conditions in the plan corridor.

Management Levels

State-designated water trails in Iowa are classified by one of four management categories: Gateway, Recreational, Challenge, and Wilderness. The management categories describe how land managers are currently maintaining the water trail. These categories let paddlers know what to expect before they start out on the water trail. *Developing Water Trails in Iowa* provides the following descriptions of each management category.

Gateway segment - Manchester Whitewater Park on Maquoketa River
Source: ECIA

Gateway segments: At normal flow conditions, these segments provide the most predictable experiences for paddlers. They tend to either be in urban areas or the more scenic and attractive segments in rural areas. Portaging around major hazards is usually not required, but whitewater parks are considered Gateway. These segments are intended for high use levels. Launch construction includes stable surfaces, such as concrete, often with gentle slopes. Amenities are often available near launches, and parking surfaces are generally paved. Water accesses are highly developed and designed with Universal Design standards. Gateway segments are the flagship segments of the water trail.

Recreational segments: Recreational segments generally require more skill and experience compared with Gateway segments. At normal flow conditions, some boat maneuvering around hazards may be needed. Short portages are also possible. Launch locations may be more difficult to access from parking areas or may have been constructed with less stable materials such as gravel. Amenities are sometimes present near launch parking areas.

Challenge segments: These segments are not for beginners. At normal flow conditions, paddlers will experience a moderate to high number of hazards including logjams, rapids, or other elements such as larger lakes with long open-water crossings and the potential for high waves or limited egress. Multiple short or long portages may be required. Access spacing varies considerably, and amenities are usually not available. Launch areas are usually more difficult to access from parking areas. Maintenance is minimal in these areas.

Wilderness experience segments: While some contend that Iowa includes no wilderness, the goal of this classification is to provide users with what is possible in the state in terms of a paddling experience with minimal human-made distractions and amenities. Launch design and spacing between access points assumes above-average physical condition. Overnight primitive camping facilities may be present, as paddlers on these routes are often looking for multiple-day experiences. Any facilities present are minimal, primitive, and without signage.

Skill Levels

The Iowa DNR also has identified paddler skill level as an important consideration when planning for water trails. Water trails in Iowa are classified in three Skill Level categories: Beginner, Intermediate, and Advanced. Table 5-5 provides a description of each level.

Table 5-5. Water Trail Skill Levels

Beginner	Intermediate	Advanced
Segments are generally less than six miles.	Segments are generally less than nine miles.	Segments may exceed nine miles.
Hazards are few and easy to avoid in normally slow-moving currents.	Users should have the ability to recognize and avoid hazards in moderate river flow.	Hazards are likely and often occur in fast-moving water.
Users can easily access these segments from parking areas.	The need to portage is rare, but users should be able and willing to carry boats and gear a short distance.	The need to portage may be frequent or may involve carrying boats and gear a long distance.
Users will not need to portage, except to walk a boat around some shallow riffles or make the going easier around an obstacle.	Access to the river may involve a short portage, and the launch or take-out may be a bit difficult.	Access to the river may involve a long portage, and the launch or take-out may be from steeper banks or faster moving water.

Classifications

Based on an assessment of existing conditions collected through the planning process, including input from Iowa DNR staff, land managers, river users, and other stakeholders, the project team assigned existing Skill Level and Management Level classifications to the existing river segments. Table 5-6 lists the segment classifications for management level and skill level. Issues and opportunities discussed by the steering committee and stakeholders are summarized for each segment.

Table 5-6. Classification of Existing River Segments in Plan Corridor

River Segment	Issues and Opportunities	Management Level	Skill Level
Bailey's Ford Park Access to Turtle Creek Park Access	Narrower river, high motor boat traffic on Lake Delhi	Challenge	Advanced
Turtle Creek Park Access to Delhi Dam Ramp Access	Lake Delhi: most users are landowners, high motor boat traffic on weekends, possibility of high waves, low current, Delhi Dam hazard presents high risk	Challenge	Advanced
Delhi Dam Ramp Access to Delhi Dam Portage Access	Signs for dam safety and portage access; improved walking path and ramp for downstream access	Challenge	Intermediate to Advanced

Table 5-6. Classification of Existing River Segments in Plan Corridor

River Segment	Issues and Opportunities	Management Level	Skill Level
Delhi Dam Portage Access or Delhi Dam Access to Retz Wildlife Area Access	Scenic, good fishing, minor riffles, not dangerous at normal flows, mostly shallow and pretty easy, Retz Wildlife Area Access is steep	Recreational	Beginner to Intermediate
Retz Wildlife Access to Pioneer Road Access	A little easier, flatter, some sand, softer landing, Pioneer Road Access is problematic	Challenge	Intermediate to Advanced
Pioneer Road Access to Dunlap Park Access	Hopkinton Rapids at Dunlap Park are hazardous: not passable except at high water, need to use portage route; need sign at fork	Challenge	Advanced
Dunlap Park Access to Hardscrabble Wildlife Area Access	Shallow, sandy, remote, easy floating	Recreational	Beginner to Intermediate
Hardscrabble Wildlife Area Access to County Line (no access)	10-mile segment to Mon-Maq Dam; consider working with Jones County	Recreational	Beginner to Intermediate

6. Water Trail Development

This section provides a concept for future development of the county's water trails that will help the county take the next step and maximize the potential of these important water resources. The concept includes a general vision for the future of the trails along with a prioritized list of future projects that, when implemented, will help the county achieve its water trail development goals.

A. Design Considerations

To develop a useful water trail development concept, the Project Steering Committee worked with the Iowa DNR and closely followed the design considerations contained in the state's water trail development guide provides guidance for local land managers to use when developing water trails. The following section highlights some of the key design criteria from *Developing Water Trails in Iowa*. The full version of *Developing Water Trails in Iowa* with additional detail and illustration can be downloaded from the Iowa DNR website at https://www.iowadnr.gov/Things-to-Do/Canoeing-Kayaking/Water-Trail-Development

B. Water Trail Development Goals

The Management Level and Skill Level classifications from *Developing Water Trails in Iowa* that were introduced in the previous section will be a key component of the water trail development concept. The water trail concept will map out a strategy that will guide the development of the trail from its existing conditions to the desired future development goals. Table 6-1 summarizes the existing classifications and the future development goals for Management Level and Skill Level for each river segment.

Table 6-1. Existing Classifications and Future Development Goals for Each River Segment

River Segment	Existing Management Level	Existing Skill Level	Management Level Goal	Skill Level Goal
Bailey's Ford Park Access to Turtle Creek Park Access	Challenge	Advanced	No Change	No Change
Turtle Creek Park Access to Delhi Dam Ramp	Challenge	Advanced	No Change	No Change
Delhi Dam Ramp to Delhi Dam Portage Access	Challenge	Intermediate to Advanced	No Change	No Change
Delhi Dam Portage Access or Delhi Dam Access to Retz Wildlife Area Access	Recreational	Beginner to Intermediate	No Change	No Change
Retz Wildlife Area Access to Pioneer Road Access	Challenge	Intermediate to Advanced	No Change	No Change
Pioneer Road Access to Dunlap Park Access	Challenge	Advanced	No Change	No Change
Dunlap Park Access to Hardscrabble Wildlife Area Access	Recreational	Beginner to Intermediate	No Change	No Change
Hardscrabble Wildlife Area Access to County Line	Recreational	Beginner to Intermediate	No Change	No Change

C. Design and Maintenance

Long term maintenance of water trail infrastructure is another key consideration identified in *Developing Water Trails in Iowa*. Boat ramps and other types of water trail infrastructure help transition people from land to water. To serve this purpose, these structures must be placed in or very near the water. Rivers are dynamic and flood events are common. Powerful currents can easily wash away structures that are not properly designed and fortified to withstand such forces.

Developing Water Trails in Iowa provides guidance for designing common water trail structures including boat ramps, parking areas, walking paths, and other amenities such as restrooms. A few key design considerations, guidelines, and typical launch design concepts are described below.

Water Trail Launch Design

Three things are important when designing and constructing a launch: where on the stream the launch is located, the angle of the launch relative to the stream, and the launch construction and materials. Each is important to minimize impact to a given stream and its biologic community. Launches are also the first experiences paddlers will have on Iowa water trails. Well-designed launches minimize stress for users shifting gear from vehicles to the water.

Where to Locate Launches: Consider three key features of streams when evaluating where to locate launches. The first aspect is the route of the stream across the land--whether it is curvy or straight. The second aspect is the shape of the streambanks and bottom. The third consideration in location is how accessible it will be for users and maintenance (see Figure 6-1).

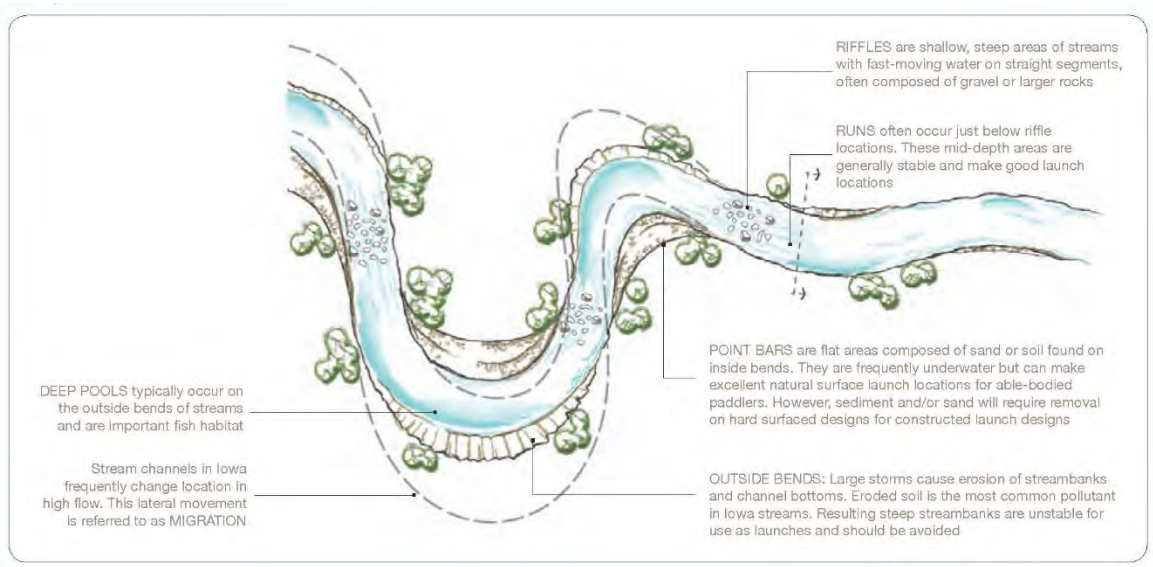


Figure 6-1. Stream Dynamics related to Successful Launch Locations
Source: Iowa DNR, Developing Water Trails in Iowa, page 3-6

Launch Design Selection Criteria: The materials and design of a launch correspond with its location. Minimize disturbance to the stream, banks, and surrounding landscape. The most successful launches serve a wide variety of paddlers and physical abilities. Budget expectations for construction and

maintenance are also important criteria. Launch materials in Iowa include cast-in-place concrete, pre-cast concrete, stair steps, and natural surfacing. All launches require attention to five elements, regardless of launch type or location. These elements include armoring, the slope or steepness of the launch ramp, a push-in section, the horizontal alignment of the launch, and the height of the water at the launch location (see Figure 6-2).

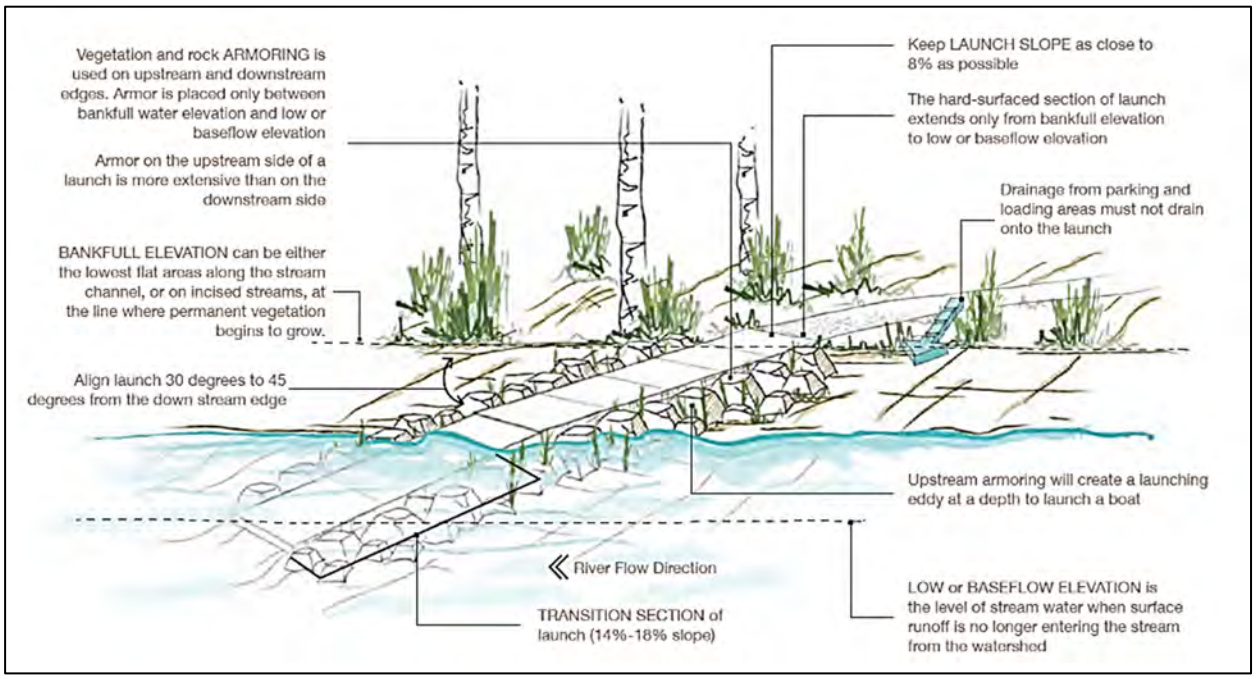


Figure 6-2. Typical Launch Design Components
Source: Iowa DNR, Developing Water Trails in Iowa, page 3-8

Parking Area Design

All launch sites for state-designated water trails require designated off-road parking for a minimum of five vehicles. General guidelines for paddler friendly parking include:

- Consider including loading lanes.
- Allow generous-sized parking stalls to ease movement between vehicles and water.
- Place staging areas either adjacent to parking or near the water's edge. These areas are used to assemble gear and put on personal flotation devices.
- Route walking trails between parking areas and launches that make it easy to carry gear and boats.
- Storm water management practices should be considered to protect water quality. Storm water from the parking area should not drain into the stream through the launch ramp.

Walking Trail Design

Walking trails are used for circulation between parking and launch areas and as portages, which are land-based alternative routes for water trail segments used to avoid in-stream hazards such as dams. Trail construction includes decisions about trail route, slope, drainage, dimensions or size, and trail surface.

D. Signage

A successful paddling experience requires consistent wayfinding and communication. *Developing Water Trails in Iowa* establishes signage standards that ensure that signs used on state-designated water trails in Iowa are intentionally consistent in color, size, and graphics. Sign standards help to create a seamless recreational experience for users across jurisdictions. Installation of Iowa DNR water trail signage is required for state designation of the future water trail, making signage a top priority.

Developing Water Trails in Iowa notes: Water trails signage includes all signs associated with wayfinding, navigation, and use information viewed from both on-land and on-water. Users should be able to drive to the water trail launches they seek, as well as understand their locations while on-water. Locations on state-designated trails are identified with river mile numbers. Each launch location references both an access number, representing the river mile where the launch is located, and the launch's formal name, such as Bailey's Ford Park Access. River miles are calculated beginning with 0 (zero) at the mouth of a stream and progressing upstream. Consecutive numbering stops at Iowa state boundary limits. The three categories of water trail signs are: 1) On-Land Navigational Signage, 2) On-Water Navigational Signage, and 3) Low-Head Dam Warning Signage.

On-Land Navigational Signage

Wayfinding to launch locations should be a straightforward and minimal signage sequence to communicate driving directions. Wayfinding signs are consistently used for state-designated trails, regardless of the type of road or road jurisdiction. The Iowa Department of Transportation (DOT) approved these standards to provide identity for the water trails program and to use the fewest signs needed to communicate with drivers looking for launch locations (see Figure 6-3).

Figure 6-3. On-Land Navigational Signage Examples *Source: ECIA*

1. County Arrowhead Sign
2. Water Trail Symbol
3. Access Point Identifier

1. Water Trail Symbol
2. Access Point Identifier
3. Arrow Sign with Miles

1. Water Trail Symbol
2. Arrow Sign

Launch locations are often included inside existing recreation sites. Figure 6-4 illustrates how the standard water trail signs are used in conjunction with existing recreational signage.

Figure 6-4. On-Land Signage: Existing Compliant Access Signs in Bailey's Ford Park
Source: ECIA

1. County Park Sign
2. Access Point Identifier

1. Water Trail Name and Logo
2. Access & End of Trail Identifier
3. Water Trail Rules

On-Water Navigational Signage

Land ownership rights in Iowa allow agricultural producers to graze livestock with free access to water on streams classified as non-meandered. While many producers have excluded livestock from streams and provided off-stream watering devices, water trail users can still encounter both grazing animals and also barbed-wire fencing running across the stream to contain them. Disruption of fencing and the safety of water trail users passing under it are both valid concerns. Positive relationships between the water trail sponsor and landowners and renters on the water trail route are critical to ensuring that fencing remains functional for livestock and safe for paddlers.

Paddlers unsure of a water trail route and those paddling longer distances indicated they would benefit from location information visible from on-water (see Figure 6-5). Additional signage visible from on-water includes: identification of and distance to the next upcoming launch, bridge identification, portage trail wayfinding, boat navigation arrow, and water trail rules.

Figure 6-5. On-Water Navigational Signage *Source: IDNR*

1. Water Trail Name and Logo
2. Next Downstream Launch
3. Water Trail Rules

Low-Head Dam Warning Signage

Low-head dams, like Delhi Dam for example, include unsafe currents upstream, downstream, and at the site of the dam for boaters and those wading, These high-

current areas are known as “drowning zones” (see Figure 6-6). Signs identifying drowning zone limits surrounding a hazard must allow a boater to reach shore before being carried by currents over the dam.

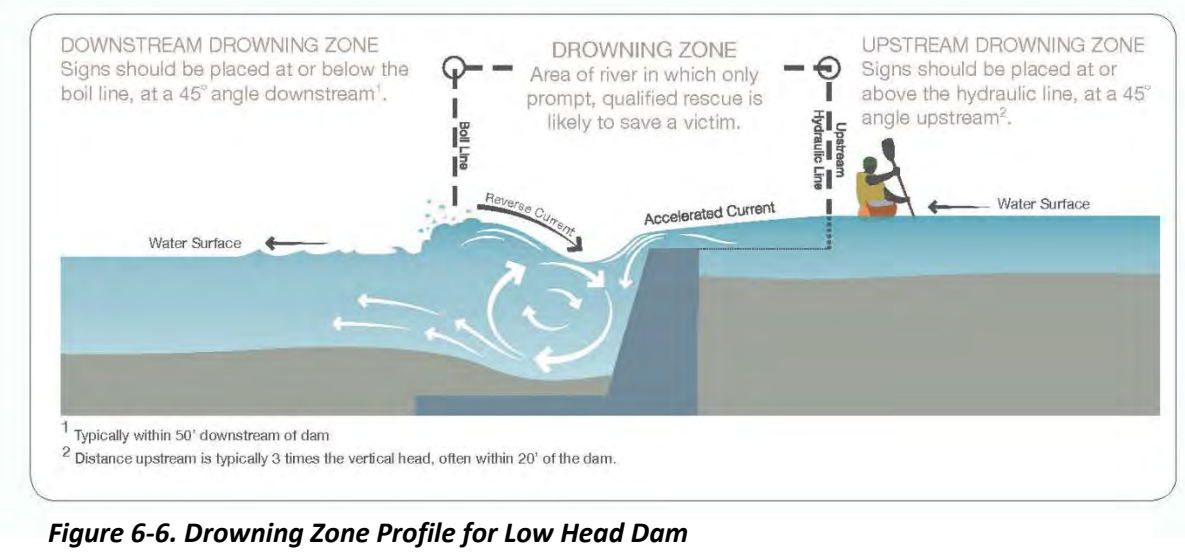


Figure 6-6. Drowning Zone Profile for Low Head Dam
Source: Iowa DNR, Developing Water Trails in Iowa, page 15

River users are minimally provided with two upstream warnings to prepare to leave the stream before reaching a drowning zone and dam. Because rivers often damage signs during flood times and because sign vandalism can be a regular occurrence, some redundancy is programmed into this system to allow time for maintenance responses. River users are directed to a specific side of a stream to reach portage routes or launch locations to avoid the drowning zone (see Figure 6-7). Options include portage trails around the hazards or launches before the drowning zones (which may or may not be the end of the water trail).

Any sign placed on the banks should be as far above the bankfull water elevation as possible. Depending on local conditions, alternative mounting systems such as buoys, overhanging cables, or bridges may be used, in which case the signs may face directly upstream or downstream.

Guideline-compliant signage has been installed on the existing Maquoketa River water trail in Delaware County, and some non-compliant signage has been placed at accesses on the un-designated portion of the river. Wayfinding signage has also been placed along state and county highways.

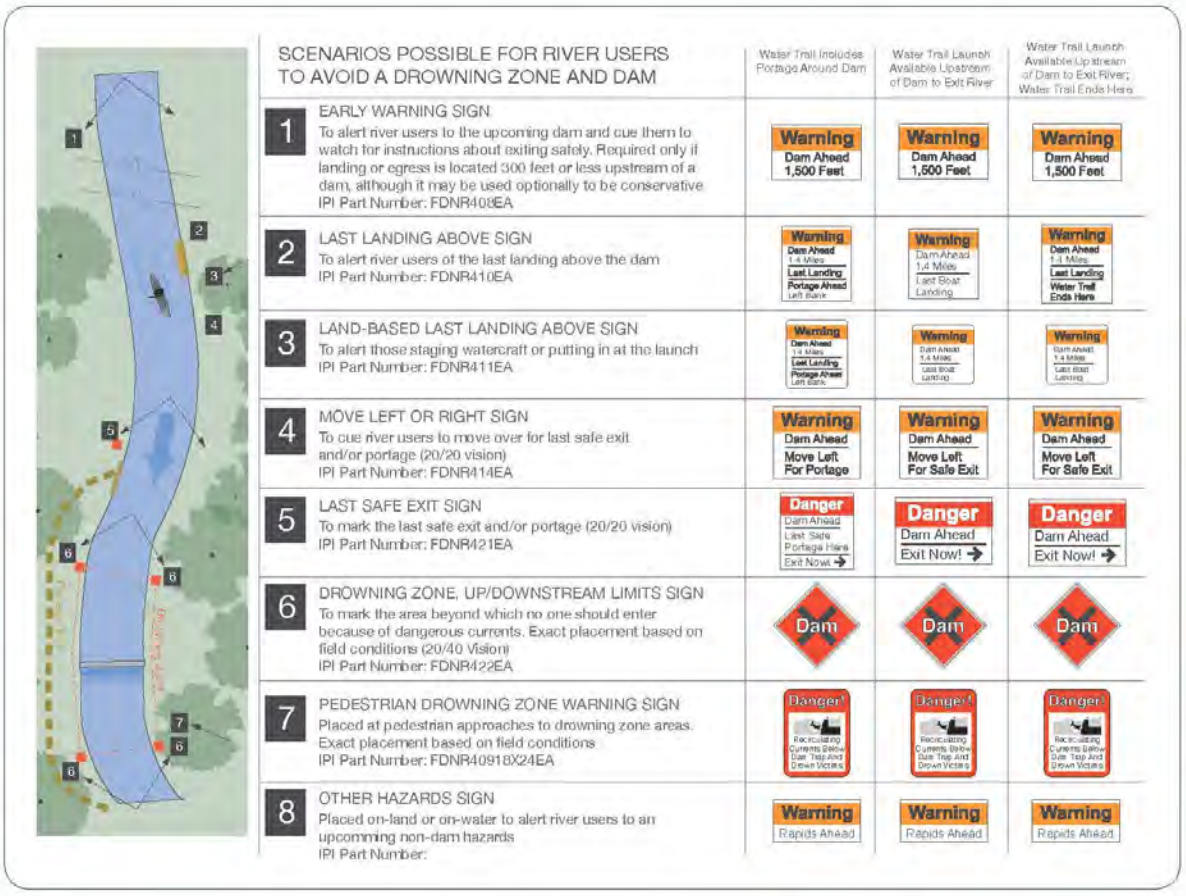


Figure 6-7. General Sign Locations for Use with Dams and Other Hazards
Source: Iowa DNR, Developing Water Trails in Iowa, page 16

Water Trail Signage Plan

A signage plan will be developed for the project study area by a consultant under contract with the Iowa DNR. As part of development of the sign plan, land managers along the water trail will work with the Iowa DNR to conduct an inventory of the county's existing water trail signage and to develop an updated water trail signage plan for the county that complies with state guidelines. Installation of IDNR signage is required for designation of a state water trail. Iowa DNR pays for production of the required signs, and the DCCB as project sponsor installs and maintains the signs. Complete water trail signage for wayfinding and hazards will be installed at the following locations in the Plan Corridor:

- Turtle Creek Park Access – East Boat Ramp
- Delhi Dam Ramp, including dam hazard signs
- Delhi Dam Portage Access, including portage signs
- Delhi Dam Access
- Pioneer Road Access
- Dunlap Park, including rapids hazard and portage signs
- Retz Wildlife Area Access
- Hardscrabble Wildlife Area Access

E. Archeological Considerations

Historically, humans have used the resources provided by rivers and have many times chosen to live and build their settlements close to rivers. The historical relationship between humans and rivers means that river environments are often rich in significant archeological resources. Because of the increased probability of encountering archeological resources in river environments, it is important to consider their conservation when planning for future water trail improvements.

2017 Technical Report 556

In 2017, the University of Iowa's Office of the State Archeologist (OSA) conducted a Phase 1A archaeological reconnaissance survey along the Maquoketa River and North Fork of the Maquoketa River through Delaware, Dubuque, and Jackson Counties. The resulting Technical Report (TR) 556 identified 121 previously recorded archaeological prehistoric and historic sites in the study area, including 27 prehistoric rock shelters and 9 historical cemeteries.

2024 Technical Report 2888

Technical Report 2888, a Phase I archaeological survey, was conducted by the OSA at four access locations of the Maquoketa River Water Trail in Delaware County, Iowa on November 26–27, 2024. No artifacts or archaeological features were identified in three access areas: Turtle Creek, Retz Wildlife Area, and Pioneer Road. No further archaeological investigation of these areas prior to the proposed project activities is recommended. At the Dunlap Park project location historic deposits related to site 13DW93, a historic mill and dam complex, were encountered. Avoidance or Phase II testing of site 13DW93 is recommended.

F. Water Trail Development Concept

Historically, the Maquoketa River has been the most developed water trail in Delaware County and has been the most popular with paddlers. The general concept for the future is to make improvements that improve the water trail experience for all river users. The development concept is for a future water trail that provides a range of experiences for paddlers ranging from beginner to expert. The county's future water trail plan will encourage economic development and tourism by making Delaware County a regional paddling destination.

GENERAL DEVELOPMENT CONCEPT

The Maquoketa River Water Trail will have the following classifications for the Plan Corridor:

- Three river segments that will be maintained at the Recreational Management Level and that will cater to Beginner to Intermediate paddlers.
- Two river segments that will be maintained at the Challenge Management Level and that will cater to Intermediate to Advanced paddlers.
- Three river segments that will be maintained at the Challenge Management Level and that will cater only to Advanced paddlers.

Table 6-2 summarizes the General Development Concept's planned classifications for Management Level and Skill Level for each river segment in the Plan Corridor.

Table 6-2. Planned Classifications for Management and Skill Levels by River Segment

River Segment	Management Level	Skill Level
Bailey's Ford Park Access to Turtle Creek Park Access	Challenge	Advanced
Turtle Creek Park Access to Delhi Dam Ramp Access	Challenge	Advanced
Delhi Dam Ramp to Delhi Dam Portage Access	Challenge	Intermediate to Advanced
Delhi Dam Portage Access or Delhi Dam Access to Retz Wildlife Area Access	Recreational	Beginner to Intermediate
Retz Wildlife Area Access to Pioneer Road River Access	Challenge	Intermediate to Advanced
Pioneer Road River Access to Dunlap Park Access	Challenge	Advanced
Dunlap Park Access to Hardscrabble Wildlife Area Access	Recreational	Beginner to Intermediate
Hardscrabble Wildlife Area Access to County Line	Recreational	Beginner to Intermediate

Figure 6-8 is a water trail access chart of the future water trail development concept in the 23.2-mile Plan Corridor.

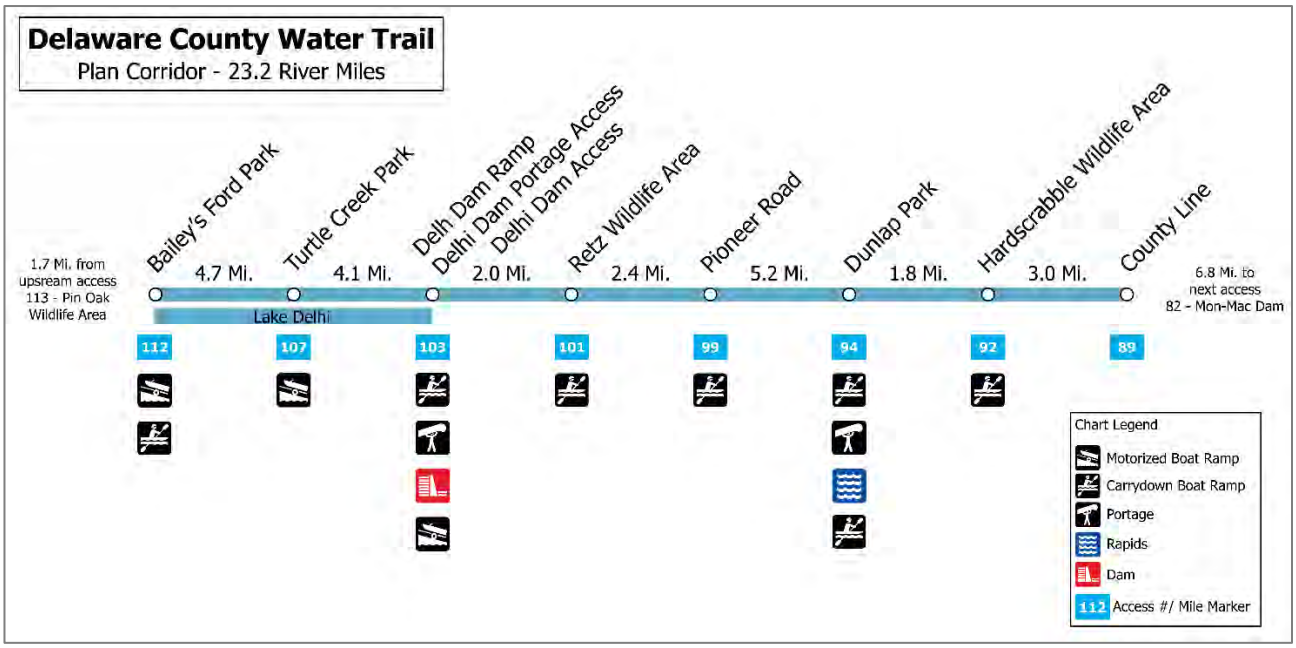


Figure 6-8. Water Trail Access Chart for Future Water Trail Development Concept in Plan Corridor
Source: ECIA

RIVER SEGMENT CONCEPTS

A description of the water trail development concept for each river segment follows.

Bailey's Ford Park Access to Turtle Creek Park Access (4.7 miles)

This segment's current designations and development goals are Management Level: Challenge and Skill Level: Advanced. Bailey's Ford Park is located at 2379 Jefferson Rd/K21, three miles southeast of Manchester. The Bailey's Ford Park Access has a concrete hog slat carry-down ramp and a concrete motorized boat ramp on the east bank of the Maquoketa River that share a parking area. It is Access 112 at the end of the existing Maquoketa River Water Trail and has the Iowa DNR-required water trail signage in place. Small boats may go up river to fish at Sand Pit Pond. The stretch from Bailey's Ford Park to North Beach on Lake Delhi is a different experience, with a narrower river and lots of boat traffic.

Bailey's Ford Park Access ramp and sign
Source: ECIA

Turtle Creek Park Access to Delhi Dam Ramp Access (4.1 miles)

This segment's current designations and development goals are Management Level: Challenge and Skill Level: Advanced. Turtle Creek Park is located on 267th Street, 3.5 miles southwest of Delhi.

The Turtle Creek Park East Access is located on Turtle Creek Bay, an inlet on the south side of Lake Delhi at the Maquoketa River's confluence with Turtle Creek. The East Access has two concrete motorized boat ramps, large parking areas, restrooms, and fishing docks. Boats using the access travel under the 267th St bridge to get to the main part of the lake.

Turtle Creek Park Access
Source: ECIA

The West Access, located on the west side of the inlet next to the Turtle Creek Campground, has a smaller concrete motorized boat ramp, parking area, and restroom. The area on the north side of the 267th St bridge is a popular spot for fishing. Turtle Creek is the busiest boat ramp on the lake/river.

Combined Segment Concepts: Lake Delhi

As shown in Figure 6-10, the segments from Bailey's Ford Park Access to Turtle Creek Park Access to the Delhi Dam Access encompass the length and breadth of Lake Delhi.

The current designations and development goals for Lake Delhi are at Management Level: Challenge and Skill Level: Advanced due to motor boat traffic and the possibility of high waves. Power boats can be a challenge, especially on weekends, such that paddlers have to travel along the shorelines. This lake water trail lets users paddle up to a bar and restaurant. which is not available on many water trails in the state. Skill level is advanced, however, as paddlers will need to have boat control, be aware that with the low current -- "it's a good pull to the end," and be able to reach the Delhi Dam Ramp Access.

Delhi Dam Ramp Access to Delhi Dam Portage Access (745 feet)

This segment's current designations and development goals are Management Level: Challenge and Skill Level: Intermediate to Advanced.

For paddlers coming down the river, Lake Delhi Dam presents a potentially dangerous situation and should be approached with extreme caution. The Delhi Dam Ramp Access is located off 230th Ave/X31 upstream of the dam at a concrete motorized boat ramp about 250 feet from the dam on the south side of the lake. There is limited parking at this site.

Paddlers can portage from here across 230th Ave/X31 along a paved path about 745 feet to the Delhi Dam Portage Access downstream of the dam. The Lake Delhi District recently paved the portage path that leads to the ramp, which is about 100 yards downstream from the dam.

Delhi Dam Ramp Access (upper) and Delhi Dam Portage Access (lower)
Source: ECIA

Delhi Dam Portage Access or Delhi Dam Access to Retz Wildlife Area Access (2.0 miles)

This segment's current designations and development goals are Management Level: Recreational and Skill Level: Beginner to Intermediate.

The Delhi Dam Access has a concrete motorized boat ramp with a gravel parking area on the north bank of the Maquoketa River off 230th Ave/X31. It is located about 1,000 feet downstream from Lake Delhi Dam. This scenic segment offers good fishing, minor riffles, mostly shallow water, pretty easy paddling at normal flows, some tricky spots at higher flows, some obstacles, high usage for tubing and fishing, occasional motor boats, and a shorter distance.

Delhi Dam Access
Source: ECIA

Retz Wildlife Area Access
Source: ECIA

Retz Wildlife Area Access to Pioneer Road Access (2.4 miles)

This segment's current designations and development goals are Management Level: Challenge and Skill Level: Intermediate to Advanced.

The Retz Wildlife Area Access is a concrete hog slat carry-down ramp, one-half mile south of Pioneer Road. A large gravel parking area is located about 100 yards from the ramp. A gravel road with a turnaround connects the parking area and the ramp. This scenic segment is unique,

with towering rock bluffs along the Maquoketa River and diverse woodland habitat. It is a very popular area for paddling, tubing, and fishing for smallmouth bass.

Pioneer Road River Access
Source: ECIA

Pioneer Road River Access to Dunlap Park Access (5.2 miles)
This segment's current designations and development goals are as Management Level: Challenge and Skill Level: Advanced.

Pioneer Road River Access is a carry-down ramp on the northeast bank of the Maquoketa River located near the intersection of Pioneer Road and Quarter Road, one-half mile east of Iowa Highway 38. There is a small gravel parking area. The access is located on a steep riverbank. Wood and stone steps lead down the bank to the river. This segment is a little easier, flatter, more remote, and offers a quiet, wider, slower float.

Dunlap Park Access to Hardscrabble Wildlife Access (1.8 miles)
This segment's current designations and development goals are as Management Level: Recreational and Skill Level: Beginner to Intermediate.

Dunlap Park Access and Riffle
Source: ECIA

The access is located on the south bank of the Maquoketa River next to the Marion Street / D47 Bridge in Hopkinton. A grass and dirt take-out upstream of the rock riffle and a concrete hog slat carry-down ramp downstream are connected by a three-foot wide path. The riffle is not too hazardous at normal flow, and paddlers have to know how to navigate through the middle. This shallow and sandy segment is easy floating.

Hardscrabble Wildlife Access to County Line (3.0 miles)
This segment's current designations and development goals are as Management Level: Recreational and Skill Level: Beginner to Intermediate. The concrete hog slat ramp has a dirt path down to the water access A gravel parking area is shared with a hiking trail. There is a small overlook next to the ramp.

G. Improvement Projects

Throughout the planning process, the Project Steering Committee collected input form stakeholders, river users, and the general public. The committee evaluated the existing conditions of the water trails and other nearby recreational amenities. They also reviewed trail development guidance and considered advice from experts in water trail development.

Hardscrabble Wildlife Area Access
Source: ECIA

Using all the information collected, the Project Steering Committee developed a list of improvement projects for Delaware County's water trails. After compiling the project list, the committee then took to the task of assigning cost estimates

and prioritizing projects. The Committee organized its projects into two groups: Top Priority Projects and Opportunity Projects. The following section lists all the projects identified along with preliminary cost estimates. The section also describes how projects were ranked and organized into groups. Improvement projects along the Maquoketa River Water Trail will focus on improving existing access points.

Top Priority Projects

The projects in the Top Priority group are the most important projects for the future development of the water trail and the projects that should be implemented first. Top Priority projects should be considered short to medium term objectives that should be targeted for implementation over the next fifteen years. Project cost estimates are preliminary. Table 6-3 lists Delaware County's top priority improvement projects, which fall into two fiscal years. The Steering Committee ranked its Top Priority Construction projects from 1 -- most important to 4 -- least important.

Table 6-3. Top Priority Improvement Projects

Rank	River Access Location	Project Description	Fiscal Year	Estimated Cost
1	**Turtle Creek Park – East Boat Ramp**	Improve existing parking lot area, possibly with asphalt paving to reduce erosion and maintenance cost and help channel runoff water	2025-2026	$1.5 million
2	**Retz Wildlife Area Access**	Replace existing access ramp	2025-2026	$250,000
3	**Dunlap Park Access**	Improve the take-out site above the rapids	2026-2027	$170,000
4	**Pioneer Road River Access**	Improve existing access or secure a location for new access	2026-2027	TBD

Opportunity Projects

The projects in the Opportunity group are projects that will help move Delaware County closer its long-term water trail goals, but are not considered an immediate need. Opportunity projects are to be considered long-term objectives, that would be implemented between fifteen and twenty-five years down the road. However, the implementation timeline can be moved up if an opportunity presents itself. For example, a bridge reconstruction project could provide the opportunity to add a new access. Opportunity projects are not ranked and the cost estimates provided are preliminary. Table 6-4 lists Delaware County's opportunity projects.

Table 6-4. Opportunity Projects

River Access Location	Project Description	Estimated Cost
Bailey's Ford Park Access	Construct a permanent restroom	TBD
	Expand the parking area	TBD
	Construct a dock	TBD
Delhi Dam Portage Access	Future county bridge project	TBD
	Improve portage path and downstream ramp	TBD
Delhi Dam Access	Improve parking area to reduce erosion	TBD

Table 6-4. Opportunity Projects

River Access Location	Project Description	Estimated Cost
	Add a trail along the river for fishing access	TBD
	Acquire land downstream to connect to Shearer Wildlife Area	TBD
Pioneer Road Access	Replace bottom step	TBD
	Possible replacement for Pioneer Road Access at bridge crossing at 295th Street	TBD
Dunlap Park Access	Improve portage path – the existing path is a little uneven in some spots.	TBD
	Consider a dam mitigation project to reduce or eliminate the rapids hazard	TBD
Access Downstream from Hardscrabble Wildlife Area Access	Coordinate with Jones County Conservation to designate a state water trail access	TBD

Bailey's Ford Park Access

High water is a problem for all projects at this location, since most of the area around the access is in the 100-year floodplain. The DCCB currently rents a portable restroom, but would like to add a permanent restroom. An expanded parking area is needed. A dock is desirable, but there may be problems with it getting washed away during high water.

There are no Top Priority projects identified for this access.

Opportunity projects are: construct a permanent restroom, expand the parking area, and construct a dock.

Gravel Parking at Bailey's Ford Park Access
Source: ECIA

Turtle Creek Park Access

Turtle Creek is the busiest boat ramp on the lake and river. The Iowa DNR permits 10 to 15 fishing tournaments a year on the lake, but limits tournaments between Memorial Day and Labor Day because the lake gets too busy.

More parking is needed at this location. The access has two gravel parking areas, one for each ramp. The east side parking area is the largest and busiest. On busy weekends the parking area fills up quickly with

trucks with trailers and people park along a narrow gravel road causing safety hazards. The DCCB has added signage to direct people to the west side parking lot and ramp, but more could be added.

Top Priority projects at the Turtle Creek Park Access -- East Boat Ramp are: complete water trail signage and improve the existing parking area, possibly with asphalt paving to reduce erosion and maintenance cost and help channel runoff.

There are no Opportunity projects identified for this access.

Gravel Parking at Turtle Creek Park Access
Source: ECIA

Delhi Dam Ramp Access and Delhi Dam Portage Access

The Top Priority project for the Delhi Dam Ramp and Portage Accesses is to complete water trail, dam warning, and portage signage.

An Opportunity Project is a future bridge. The Delaware County Board of Supervisors has discussed building a new bridge to replace the old road connection that was on top of the old dam. This project is in preliminary stages and does not have funding assigned to it, but it could impact the upstream and downstream portage only accesses at the dam. The bridge would likely be downstream from the dam.

Top of Delhi Dam
Source: ECIA

Erosion at Delhi Dam Access
Source: ECIA

Delhi Dam Access

The road comes down a steep hill to a large gravel parking area, where erosion is an issue. The access ramp is a concrete motorized boat ramp that is in good condition. Motorized boat traffic is very rare at this location and the water is very shallow.

A Top Priority project is to complete water trail signage.

Opportunity projects are: improve the parking area to reduce erosion, add a trail along the river for fishing access on Iowa DNR land, and acquire land downstream from access to connect to the Shearer Wildlife Area.

Pioneer Road River Access

The access is located on a very steep river bank. The bottom of the steep steps appears to be washed out with about a three-foot drop down to the water.

Top Priority projects are: complete water trail signage and secure a location for a new access by acquiring land at a suitable location.

An Opportunity project is a new access at the bridge crossing at 295th Street. This access could potentially replace the Pioneer Road River Access if the county is unable to acquire additional land. Another opportunity project is to replace bottom step of ramp.

Steep Steps at Pioneer Road River Access *Source: ECIA*

Dunlap Park Access

At Dunlap Park, there is a grass and dirt take-out upstream of the rapids and a concrete hog slat carry-down ramp downstream that are connected by a three-foot wide gravel path as the portage route around the rapids hazard.

Top Priority projects are: complete water trail signage, including portage and rapids signage; and improve the upstream take-out ramp.

Opportunity projects are: improve the portage path and consider a dam mitigation project to reduce or eliminate the rapids hazard.

Grass and dirt take-out and gravel connecting path for portage route at Dunlap Park Access
Source: ECIA

Retz Wildlife Area Access

Ramp improvements have been identified here, as the end of the ramp has washed out. There may not be a need to widen the ramp, however. Keeping the ramp narrow would limit motorized boat traffic.

Top Priority improvements are: complete water trail signage and replace the existing access ramp.

There are no Opportunity projects identified for this access.

Ramp washout at Retz Wildlife Area Access
Source: ECIA

New access downstream from Hardscrabble Wildlife Area Access

It is ten river miles from the Hardscrabble Wildlife Area Access to the Mon-Maq Access in Monticello in Jones County. An Opportunity project is designation of an access in this stretch. DCCB communication with Jones County Conservation may identify a mutually-beneficial location for both counties that also provides access for emergency responders.

H. Design Concepts

The project budget for the Delaware County Water Trail Plan included funding to develop design concept plans and cost estimates for the Top 3 Priority development projects in Fiscal Year 2024-2025. These projects require construction plans based on the existing conditions and needs identified above.

Turtle Creek Park Access Design Concept

Recommended improvements at the Turtle Creek Park – East Boat Ramp are to improve the existing parking lot area with asphalt paving to reduce erosion and maintenance cost, help channel runoff water, and maximize use of the space with pavement markings. Figure 6-9 is the design concept prepared by the Iowa DNR's engineering consultant, L T Leon Associates, in consultation with the Delaware County Conservation staff and the steering committee.

The design concept proposes to regrade the site, and push into the hill by adding a retaining wall. Parking will include 2 accessible stalls with concrete steps to the river, 20 trailer stalls, and 6 vehicle stalls. Stormwater best management practices (BMPs) include 1 underground detention cell and possibly a bio cell. Cost estimate of $1.5 million to be refined.

Retz Wildlife Area Access Design Concept

Recommended improvements at the Retz Wildlife Access are to complete water trail signage and replace the existing ramp. Figure 6-10 is the design concept prepared by the Iowa DNR's engineering consultant, L T Leon Associates, in consultation with the Delaware County Conservation staff and the steering committee.

The design concept proposes clearing and grading, increasing the turning radius around the cottonwood tree, and reshaping the bank for a carry-down access and a rustic/primitive grass boat ramp for occasional research boats. The theme is to keep it simple, work with the site. The design includes accessible paved parking and access with an interpretive sign. The current parking area is grass. There may possibly be fencing with gated access for pedestrian and equestrian access. Culvert improvements are planned. The existing culvert is undersized and may need to be replaced to ensure access during and after flooding. Cost estimate of $250,000 to be refined.

Dunlap Park Access Design Concept

Recommended improvements at the Dunlap Park Access are to improve the upstream take-out ramp and to complete water trail signage, including portage signage. Figure 6-11 is the design concept prepared by the Iowa DNR's engineering consultant, L T Leon Associates, in consultation with the Delaware County Conservation staff and the steering committee.

The design concept proposes adding an accessible parking stall and an interpretive sign near the existing shelter, and concrete sidewalk to existing restrooms. A 6-foot concrete trail between upstream take-out and downstream would replace the existing 3-foot path. The design proposes to retain the existing boat ramp, and adding a hybrid concrete boat ramp for motorized boats and emergency access. The project will avoid the archeological site of the former mill. Cost estimate of $170,000 to be refined.

Figure 6-9. Design Concept for Turtle Creek Park Access – East Boat Ramp
Source: L T Leon Associates

Figure 6-10. Design Concept for Retz Wildlife Area Access
Source: L T Leon Associates

Figure 6-11. Design Concept for Dunlap Park Access
Source: L T Leon Associates

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