

Green River Blueways Water Trail Master Plan



Prepared by Barren River Area Development District with the assistance of the National Park Service
Rivers, Trails & Conservation Assistance Program.



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Introduction

The planning process for the Green River Blueways Water Trail plan began in June 2013 when representatives from various agencies and local governments gathered to discuss the possibility of developing a Blueways Water Trail. The initial conversation was championed by Butler County Judge/Executive David Fields, who envisioned the development of this natural resource for the counties in the Barren River Area Development District (BRADD).

Attending the first session were representatives from the BRADD, Mammoth Cave National Park, Western Kentucky University, Kentucky Division of Water, Kentucky Fish & Wildlife, NCRS/USDA, the Nature Conservancy, and local government officials. Once the meeting was convened, a discussion was initiated to extend the project to include the full length of the river and not just for the BRADD region. Agreement was reached to seek to develop a Blueways Water Trail for the full 383 miles of the Green River and to obtain official designation as a National Water Trails System for portions of the Green River that achieve the National Water Trail System criteria.

The BRADD, along with the collaborating agencies, requested assistance from the Rivers, Trails and Conservation Assistance Program through the National Park Service to begin the development of the Green River Blueway Water Trail Plan. Through this assistance, the development of a Master Plan was initiated to establish goals, objectives and strategies in order to coordinate and guide river oriented development and tourism efforts along the 383-mile Green River.

Later in the planning process in 2017, the planning team determined that it would be best to both consider the entire Green River in this plan, but to also divide the Green River into three sections: the Upper Green, the Middle Green, and the Lower Green. Green River Dam and the Rochester Dam would be the demarcation points between sections. The Green River upstream from the Green River Dam would comprise the Upper Green Section. The Green River downstream from Green River Dam to the Rochester Dam would form the Middle Green Section. And the Green River section from Rochester Dam to the confluence with the Ohio River would be the Lower Green Section. Having three sections of the Green River would be more practical for communities to work together to make progress in implementing the master plan objectives.

Consequently, it is recommended that working committees be established with key community and stakeholder groups in the three river sections. While there was support and interest amongst stakeholder groups in all three river sections, the Middle Green Section attracted the most interest and established a Middle Green Committee to further plan implementation. It is recommended that the other two river sections consider establishing an organizational structure or working committee to likewise champion plan implementation.

Although the three implementation committees may work autonomously in large part, it would be advantageous to coordinate some efforts for the entire river. In particular, there may be plan implementation action efforts that encompass the entire length of the river and would therefore be appropriate to coordinate with all three working committees once they are in place (i.e. such as developing a branding logo).

National Water Trails System Designation

An identified outcome of the Green River Blueways Water Trail Master Plan is to seek official designation as a National Water Trails System. The program is administered by the National Park Service (NPS) through the Rivers, Trails, and Conservation Assistance Program and the National Trails System. There are three primary goals of the National Water Trails System:

- Establish a national system of exemplary water trails.
- Become a catalyst for protecting and restoring the health of local waterways and surrounding lands.
- Build a community that mentors and promotes the development of water trails and shares best management practice.

Local management groups can obtain official designation as a Blueways Water Trail by submitting an application to NPS. A Water Trail must meet four identified criteria:

- The trail (and its access points) must be open to public use and be designed, constructed, and maintained according to best management practices, in keeping with the anticipated use.
- The trail is in compliance with applicable land use plans and environmental laws.
- The trail will be open for public use for at least 10 consecutive years after designation.
- The trail designation must be supported by the landowner(s), public or private, on which access points exist.

A water trail must also incorporate the following best management practices:

- Recreation Opportunities: Public access points have been secured and are labelled in a way that allows for use to participate in a variety of outdoor activities.
- Education: The trail is used to disseminate knowledge about the value of water resources, cultural heritage, boating skills, and outdoor ethics.
- Conservation: A water trail system will be used to improve conservation efforts and protect the natural environment.
- Community Support: Stakeholders from both the public and private sector have worked together to support the development and maintenance of the water trail.
- Public Information: Information related to the water trail has been made available to the public.
- Trail Maintenance: There is an identified plan to maintain investment in the water trail.
- Planning: A process has occurred by which stakeholders have met to determine a vision for the future of water trail, and has identified actionable strategies to fulfill that vision.

As development of the Green River Blueways Water Trail continues, it is imperative the goals, criteria, and best management practices outlined in the National Water Trails System application package are pursued. Official designation has major advantages for the Green River, the counties along the Green, and Kentucky as a whole. The Department of the Interior's acceptance of the Green River Blueways Water Trail application would provide nationwide visibility, new marketing opportunities, and technical assistance and support for future endeavors from the NPS and local management groups for Blueways Water Trails across the country. Most importantly, fulfillment of these goals indicate that the Blueways project has successfully brought together a variety of individuals to ensure protection of Kentucky's natural environment and development of its economy.

The formal designation of the Green River as a National Water Trail will require preparation and submission of an application once the criteria have been achieved. It is recommended that the three planning regions champion efforts in the years ahead to obtain National Water Trail designation for one or more sections of the Green River. Much of the information in this plan can be used to support a National Water Trail application, though additional requirements will be needed. A recommended approach is to identify sections of the Green River that have the most potential to attain a National Water Trail designation by one or more of the three three working committees., It may also be advantageous to include key tributaries that would contribute to the goals of a National Water Trail.

About the Area

The Green River is a tributary of the Ohio River and is the most biologically diverse branch of the Ohio River system. The Green River Basin is illustrated in Figure 1. The largest river basin within Kentucky, the Green drains an area over 9,200 square miles in size as it meanders from east to west for over 300 miles through south central Kentucky.

The river begins in Lincoln County, the eastern-most part of the basin, and then winds across the Knobs of Kentucky to the Green River Lake, an 8,200-acre man-made lake bordered on the western shore by the Green River Lake State Park. Beyond the lake, the river passes through the cities of Greensburg and Munfordville before entering Mammoth Cave National Park and on to the Rochester Dam. This area of the river offers several boat ramps and facilities that cater to both non-motorized and motorized watercraft.

While the upper half of the river has a more wild and natural character suitable for non-motorized watercraft such as canoes and kayaks, the portion downstream from the Rochester Dam to the Ohio River, has limited commercial vessel and powerboat usage.

This project covers the entire 300 plus mile span of the Green River, which travels across 16 counties in Kentucky through the length of Mammoth Cave National Park in Edmonson and Hart Counties. The project crosses through five Area Development Districts (Bluegrass, Lake Cumberland, Barren River, Pennyriple and Green River).

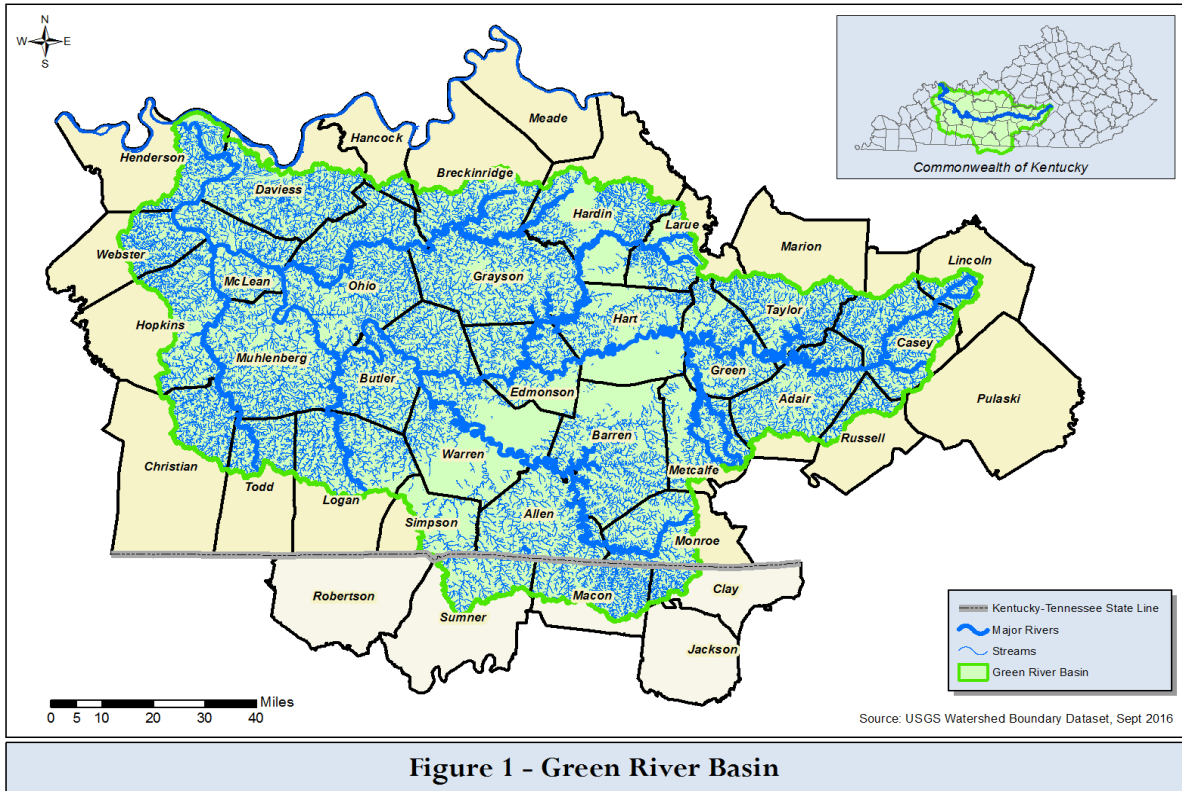


Figure 1 - Green River Basin

The project looks at the river as a whole and creates a plan for development along the river. The Plan takes inventory of existing facilities and helps to begin planning and seeking resources for additional facilities and recreational areas along the Green River.

For purposes of the study and implementation of proposed recommendations, the Blueways Planning Committee divided the planning area into three sections: East (Lincoln County headwater to the Green River Dam), Central (Green River Dam to the Rochester Dam) and West (Rochester Dam to the Ohio River). Within the Plan, information is presented in a format that follows the flow of the river from east to west.

Lock & Dams

There were six old lock and dam structures located on the Green River that were authorized for navigation and one earthen dam (Green River Lake Dam) constructed for flood control. Some of the structures date back to the mid 1800's. All facilities are owned and administered by the U.S. Army Corps of Engineers (USACE). Of the locks and dams (L&D), only two are in operation (1 and 2) and the remaining locks and dams (3, 4, 5, and 6) were deactivated. L&D 6 breached and has been removed. Even though the remaining sites are no longer in use, the USACE still has administrative accountability for the properties and must periodically inspect and report on the facilities, which requires federal

funding. The location of these structures are shown in Figure 2 and a brief description of each structure is listed below.



Figure 2 Green River Locks & Dams

- Green River Lock and Dam 1, located near Henderson in Henderson County, was constructed beginning in 1954 and placed in operation in 1956. The facility is still used for navigation.
- Green River Lock and Dam 2, located near Calhoun in McLean County, was constructed beginning in 1954 and placed in operation in 1956. The facility is still used for navigation.
- Green River Lock and Dam 3, located near Rochester in Butler County, was built between 1833 and 1838 and was acquired by the federal government in 1895. The lock was closed to navigation in 1981 and placed in caretaker status.
- Green River Lock and Dam 4, located at Woodbury in Butler County, failed in May 1965 and was closed to navigation. The property and buildings were deeded to the City of Woodbury, which operates the Green River Museum in the lockmaster’s house. The majority of the dam is gone due to the breach, and the lock remains in various states of deterioration and poses a significant safety hazard to park visitors. Remnants of the dam remain, but do not have a significant effect on the pool and are not considered a safety hazard.
- Green River Locks and Dam 5, located in Butler and Warren Counties. The original lock was constructed in 1900 but was removed in 1934, when a new lock and dam was built and put into

operation. The locks were deactivated in August 1951. The lock and dams are stable and in good condition.

- Green River Lock and Dam 6, located at Brownsville in Edmonson County, breached in November 2016, resulting in the pool of water behind it dropping nearly 7 feet. The breach caused nearly 8 miles of the Green River to flow naturally for the first time in over a century. A decision was made to remove the structure due to safety concerns, since it presented a danger to canoeists and kayakers. The removal was completed in August 2017, allowing the water to resort to its natural characteristics as a free flowing river and provide conditions for the return of aquatic habitats and species, especially endangered mussels. A new gravel parking area and boat ramp has been constructed at the site by the Kentucky Department of Fish and Wildlife.
- Green River Lake Dam, located in Taylor County, is an earthen dam constructed for flood control. Construction began in 1964 and was completed in 1969. The Green River Lake State Park, consisting



Lock and Dam 5

of 1,331 acres, is located on the western shore of the lake. There are several Wildlife Management Areas administered by the Kentucky Department of Fish and Wildlife Resources at the lake. Overall management of the lake project is administered by the Corps of Engineers.

The Army Corps of Engineers completed the Green River Locks and Dams 3 through 6 and Barren River Lock and Dam 1 Disposition study in 2014 which recommended to Congress deauthorization of commercial navigation at these facilities. Section 1315 of the Water Infrastructure Improvements for the Nation Act (WIIN), also referred to as Section 1315 of the Water Resources Development Act (WRDA) of 2016 deauthorized commercial navigation at the facilities and directed transfer of each site to non-federal entities.

Section 1315 specifically directed that Green River Lock and Dam 3 be transferred to the Rochester Dam Regional Water Commission and remaining USACE land holdings at Green River Lock and Dam 4 be transferred to Butler County, KY.

Green River Lock and Dam 5 was directed to be transferred to the Commonwealth of Kentucky, a political subdivision of the State of Kentucky, or a nonprofit, nongovernmental organization for purposes of removing the lock and dam and making the associated land available for conservation and public recreation, including river access.

Green River Lock and Dam 6 was directed to be transferred to the Commonwealth of Kentucky, for use by the Kentucky Department of Fish and Wildlife Resources, for purposes of removing the lock and dam and making the associated land available for conservation and public recreation, including river access. A small parcel on the left descending bank at was directed for transfer to Mammoth Cave National Park

Located on the Barren River, not far from the confluence with the Green River, Barren River Lock and Dam 1 (BRLD1) was directed to be transferred to the State (Commonwealth) of Kentucky, for the use of the Department of Fish and Wildlife Resources of the State of Kentucky, for purposes of removing the lock and dam and making the associated land available for conservation and public recreation, including river access.

The Army Corps of Engineers is currently in the process of transferring these facilities as directed in WRDA 2016.

There is great interest in removing dams and repurposing lands associated with each site in order to provide beneficial public greenspace. Removal of some of these structures would provide considerable ecosystem restoration. Removal would also improve safety and increase access to the river for canoers and kayakers due to the elimination of the hazards presented by an obsolete dam.

If implemented, dam removal will positively impact a widely-embraced effort to boost eco-tourism and recreational canoeing and kayaking opportunities on the Green and Barren Rivers. This will provide direct economic benefits in a region needing quality economic development. Several interested parties are actively pursuing federal, state, and private sources of funding for removal.

Natural Environment

The flowing water of the Green River is the most dominant force shaping the regional landscape, characterized by deep valleys and well-incised meanders cutting through the terrain. The Green River is an ancient channel, predating the earliest cave development. Ultimately, caves drain to the Green River creating important springs. The cave streams in the park are designated Outstanding National Resource Waters, and the park's underground drainage basins, which extend beyond the park's boundaries, are designated as Outstanding State Resource Waters. The Green River is designated as an Outstanding State Resource Water and a state Wild River, providing significant scenic and recreational opportunities.

Historically, more than 70 mussel species inhabited Green River. Today that number has been reduced by approximately 20 species, and many of those remaining are imperiled. Even so, Green River still holds one of the most diverse populations of mussels in the eastern United States. Approximately 150 species of freshwater fish are known to live in the Green River.

The Green River is the master stream controlling the geologic development of Mammoth Cave and its karst ecosystem. Springs along the Green River provide opportunities to experience the intersection between the surface and subsurface environments. Within the park, the Green River bisects two

physiographic regions and supports one of the most biodiverse aquatic communities in North America. The scenic Green River provides significant opportunities for scientific study and recreation within the forested karst landscape.

Mammoth Cave National Park

Mammoth Cave National Park is composed of approximately 52,830 acres in Edmonson, Hart, and Barren counties. Named for the enormity of its “mammoth” subterranean vaults and the unparalleled extent of its passages, Mammoth Cave is the longest known cave system in the world with over 400 miles surveyed to date. The purpose of Mammoth Cave National Park is to preserve, protect, interpret, and study the internationally recognized biological and geologic features and processes associated with the longest known cave system in the world.

Explorers continue to discover the secrets of Mammoth Cave, and visitors continue to be attracted to its diversity, beauty, and mystery, as they have been since prehistory. Its caves, scenic river valleys, bluffs, forests, and abundant wildlife draw visitors to the park. The park offers ranger-led cave tours and surface walks, camping, hiking, horseback riding, bicycling, scenic drives, canoeing and kayaking, fishing, accessible trails, and picnicking. This breadth of activities is available because Mammoth Cave National Park is a park on two levels—reclaimed hardwood forest and winding riverways above and complex cave systems below.

Mammoth Cave’s cavernous limestone or “karst” features draw the most interest. In karst terrain, everything that happens on the surface affects the caves below—surface and subsurface are intricately bound together, and water is the binding thread through all aspects of the park. Rainwater enters the underground river system through cracks, crevices and thousands of sinkholes, some up to 10 miles outside the park boundary, and eventually emerges through springs into the Green River. Over millions of years, water has slowly cut and dissolved its way deeper into the landscape, leaving upper levels of dry cave behind. Underground rivers at the water table are still carving new passages today. A myriad of related geologic processes contribute to the formation of not only the extensive Mammoth Cave / Flint Ridge/Roppel Cave system, but also to hundreds of smaller caves in the park as well as numerous other karst features. Within the subterranean spaces, the interplay of water and mineral has produced remarkable formations in stone, some of them breathtaking in their beauty and fragility.

As with the Green River in general, Mammoth Cave National Park has one of the most biologically diverse river systems in the nation, which supports one of the most diverse fish and invertebrate faunas in North America. The park protects the world’s longest known cave and more than 400 other caves that contain features that are superlative examples of their types. The park has one of the highest diversities of cave-adapted organisms in the world. The park’s interrelated cave and surface karst features are superb, with textbook examples of the karst process including drainage systems, vast recharge areas, sinkholes, and complex networks of conduits and springs. For more than 200 years, the cave system has been a laboratory for multiple disciplines and has served to explain fundamental principles of speleology, hydrology, cave biology and cave archeology.

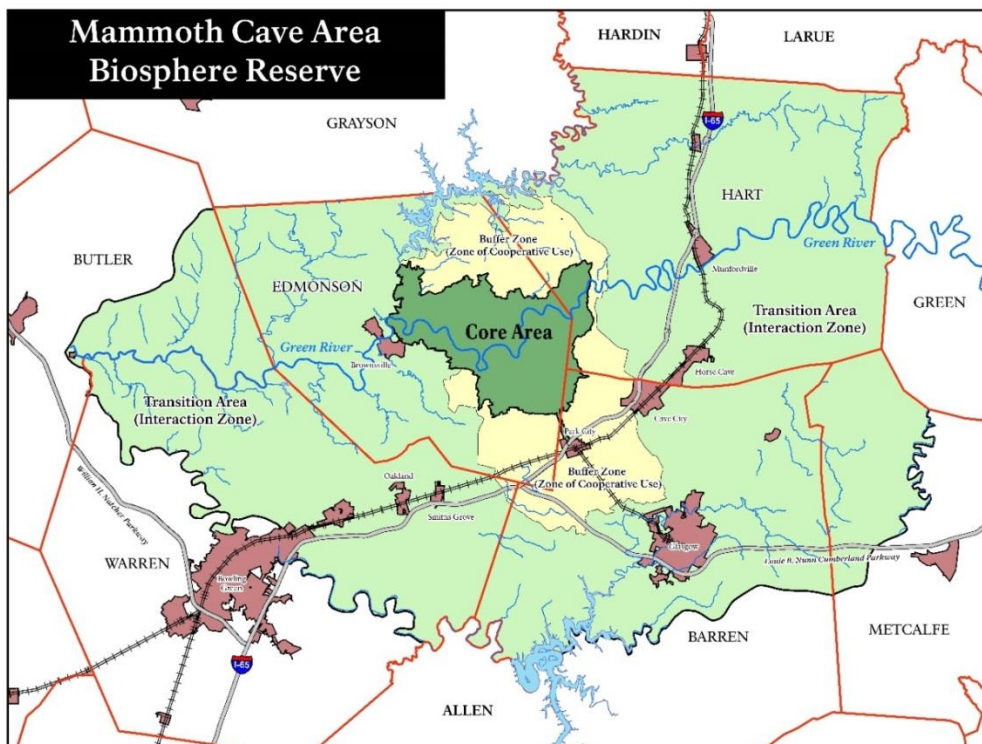
Even without the world’s longest cave system, the land within Mammoth Cave National Park would merit national park status simply for its extraordinary density and diversity of plant and animal life. Mammoth Cave is recognized as having one of the most diverse karst biota in the world, including more

than 40 species that spend their entire life in the cave and almost 100 others that can readily be found in the caves.

The mosaic of habitats and diversity of forests types, grasslands, and caves supports more than 70 threatened, endangered, or state-listed species. Of the more than 130 species of fauna within the park's caves, some are known to exist only within the Mammoth Cave area, such as the federally endangered Kentucky cave shrimp. There are 13 species of bats, including 3 federally endangered species. The Green and Nolin rivers possess some of the most diverse fish (82 species) and invertebrate fauna (51 species of mussels, including 7 federally endangered species) populations in North America. The combination of the topographic variety associated with the karst landscape and the temperate climate of the region provides a number of ecological niches that support an exceptionally diverse assemblage of more than 1,300 vascular flora species, including unusual communities.

International Significance of the Mammoth Cave National Park Area

The cultural and natural resources protected within Mammoth Cave National Park are national treasures. In recognition of these world-class resources, the park has received two international designations— Mammoth Cave National Park is both a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site and the core of an International Biosphere Reserve, primarily due to its globally significant karst resources. In 1981, UNESCO designated Mammoth Cave as a World Heritage Site. In 1990, the Mammoth Cave Area International Biosphere Reserve was designated to include all park acreage along with portions of six counties that total 909,328 acres. The outer transition zone of the Mammoth Cave Area Biosphere Reserve includes the Green River in Hart, Edmonson, Butler, and Warren Counties.



Attractions and Recreational Opportunities

The Green River is located in an area that is blessed with many natural and man-made attractions. In addition to Mammoth Cave, within the Green River Basin are located four US Corps of Engineers lakes, which are popular with recreational boaters and also provide amenities for hiking, camping, fishing and other recreational opportunities. State Parks are located at all four lakes, two of which are resort parks, which provide lodging, campgrounds and restaurants, in addition to a greater variety of recreational amenities. However, the lakes are owned and administered by the USACE and are not state parks. The area also has numerous bicycle routes that are near the proposed blueways water trail. Figure 3 identifies recreational and tourism opportunities along the Green River.

Population

Appendix 1 details the population and projections for Kentucky, all counties along the Green River, and the Area Development Districts. These sixteen counties have a 2010 Census population of 520,284. Warren and Daviess Counties, with a combined 210,448 population, account for 40% of the total. Located in these counties are the cities of Bowling Green and Owensboro, which respectively are the third and fourth largest cities in Kentucky.

Between 2010 and 2040 the Commonwealth is anticipated to experience a population growth of 12.6%. Similarly, the population of the sixteen county area is expected to increase by 12.2%. Of the sixteen counties, eleven are projected to decline in population, which is consistent with the 66% projected decline in the combined 120 Commonwealth counties. These population declines can be attributed to the lack of job opportunities and the general decline in the quality of life in those communities.

These projections highlight the importance of investing in community projects, such as outdoor recreational facilities, that will improve the quality of life that will appeal to families and individuals looking to relocate or improve the living conditions of current residents. Quality of life is an important and effective selling point to build tourism, and retain and attract business and industries.

Economy

In the sixteen counties that the Green River passes through or borders, the poverty rate ranges from 14.4 – 28.8%, as noted in Appendix 2. In most of those counties, the river passes through the poorest areas, offering low-income areas direct access to a recreation source and creates the potential for development and growth of local business. The Green River flows through six Appalachian Regional Commission (ARC) counties. Of those six ARC counties, three are considered economically distressed, and three are at risk of becoming distressed. The project area is located in five Area Development Districts (ADDs),

According to Kentucky Labor Market Information, the three most prominent industries in the counties along the Green River are manufacturing, retail trade, and accommodation and food services. Formalization of the Green River Blueways Water Trail presents the opportunity to expand upon industries well-established in the area and to provide diversification. Increased traffic on the Green

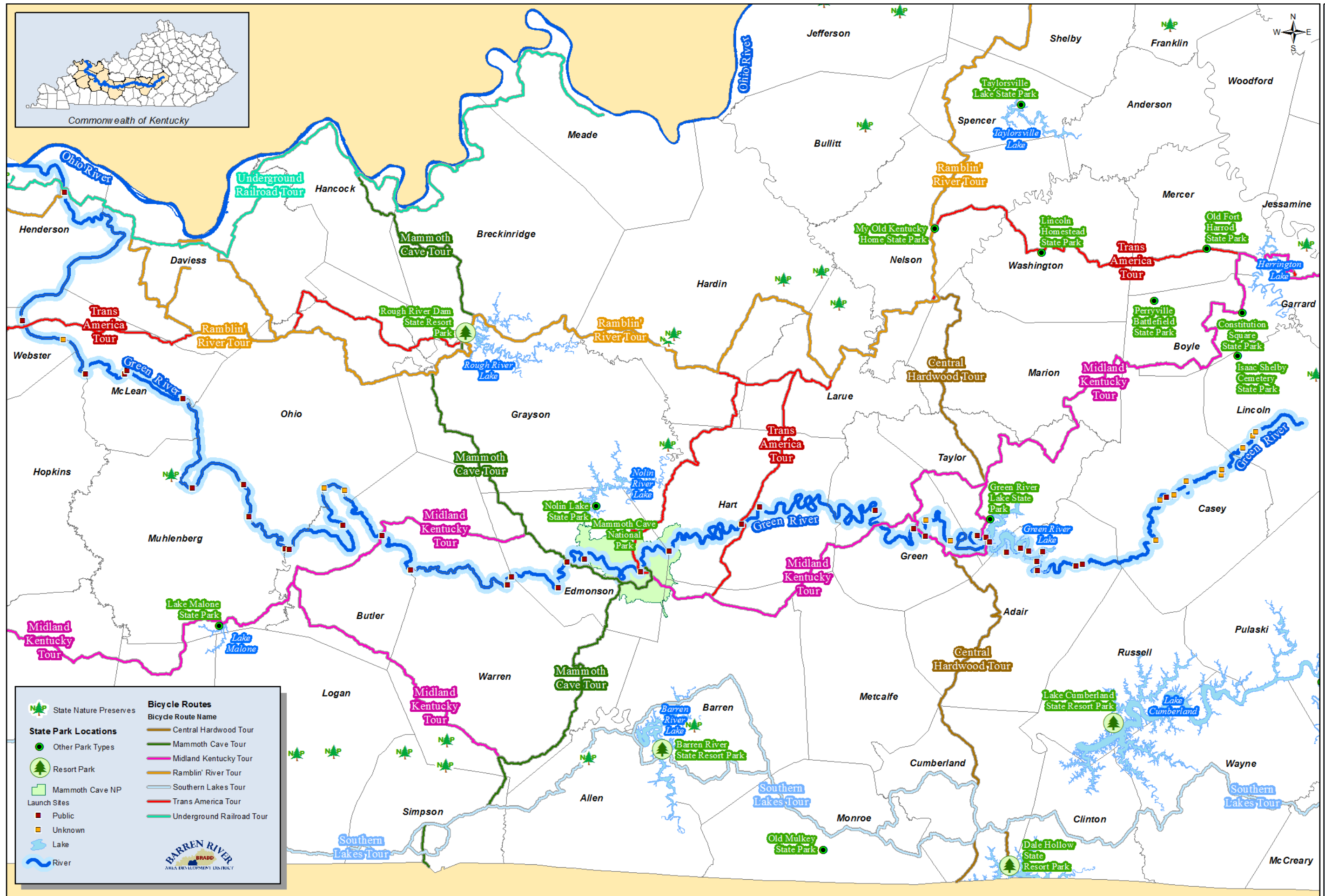


Figure 3 - Green River Blueway Water Trail - Proximity to Kentucky Recreational Facilities

River can lead to more customers for the retail trade and food services industry as kayakers and canoers make stops in river towns. The manufacturing industry may benefit as the water trail can be marketed as a quality of life asset in order to recruit skilled workers to relocate to the area. A water trail may open more opportunities for new businesses to be created, due to an increased demand for outdoor outfitters and tourist attractions along the river.

Health Conditions

Marketing of the Blueways Trail, increasing access points along the river, and pairing with established outdoor recreation initiatives can help improve the health of area residents by providing individuals in communities that lack exercise facilities a way to engage in physical activity. Kentucky has historically underperformed the United States in public health outcomes and, unfortunately, many counties along the Green River underperform State averages.

Appendix 3 details a variety of public health outcomes for the 16 counties through which the Green River flows. Figures highlighted in red indicate that the county underperformed the state average for that measure. Adult obesity, number of preventable hospital stays, diabetes prevalence, cardiovascular deaths and stroke deaths is higher than national and state averages for the majority of those counties.

Of particular relevance to the Blueways Water Trail Plan is the percent of each county's population that indicated that they had access to exercise opportunities, with 15 of the 16 counties along the Green River underperforming the State average. In two counties surveyed, 3% or less of the population revealed that they had access.

Active Initiatives in the Area

Trail Towns

There has been active solicitation of the Trail Town designation by many of the communities along the Green River. The Kentucky Trail Town Program is an official tourism development designation obtained by application through the Office for Adventure Tourism.

As identified in Figure 4, there are two Kentucky Certified Trail Towns currently located along the proposed Green River Blueway - Munfordville (Hart County) and Columbia (Adair County). Nine additional communities are in the process of seeking designation. Recent applications have included Campbellsville (Taylor), Greensburg (Green), Horse Cave/Cave City (Hart/Barren), Park City (Barren), Brownsville (Edmonson), Morgantown (Butler), Rochester (Butler) and Hartford (Ohio).

According to the Kentucky Trail Town Guide for Communities “A Trail Town is a destination along a long-distance trail or adjacent to an extensive trail system. Whether the trail is a hiking trail, water trail, or rail trail, users can venture from the path to explore the unique scenery, commerce and heritage that each trail town has to offer. It is a safe place where both residents of the town and trail users can walk or drive to find the goods and services they need.”

The summary criteria to receive designation from the state are:

- Close proximity to a national or state park, forest or recreation area and near trail systems, including water trails;
- Integration of cultural, historical and agricultural elements into the overall experience; and
- Intent to be part of the Cross Kentucky Trail system

Cave Country Trails (CCT)

The Cave Country Trails (CCT) initiative was formed to enhance and develop a regional network of bicycling, hiking, and general non-motorized multi-use trails within Warren, Barren, Hart, and Edmonson Counties. This network will provide connections within our communities and the region that will improve the physical and mental health of our citizens, facilitate growth in regional tourism and economic activity, and provide a multi-faceted transportation network.

Early in 2016, CCT received a planning assistance grant through the National Park Service Rivers, Trails, & Conservation Assistance Program to assist the planning effort for a regional trail network. A workshop was held in each of the four counties within the study area and, from that input, a draft network of existing and proposed trails, trailheads, and points of interests were identified.



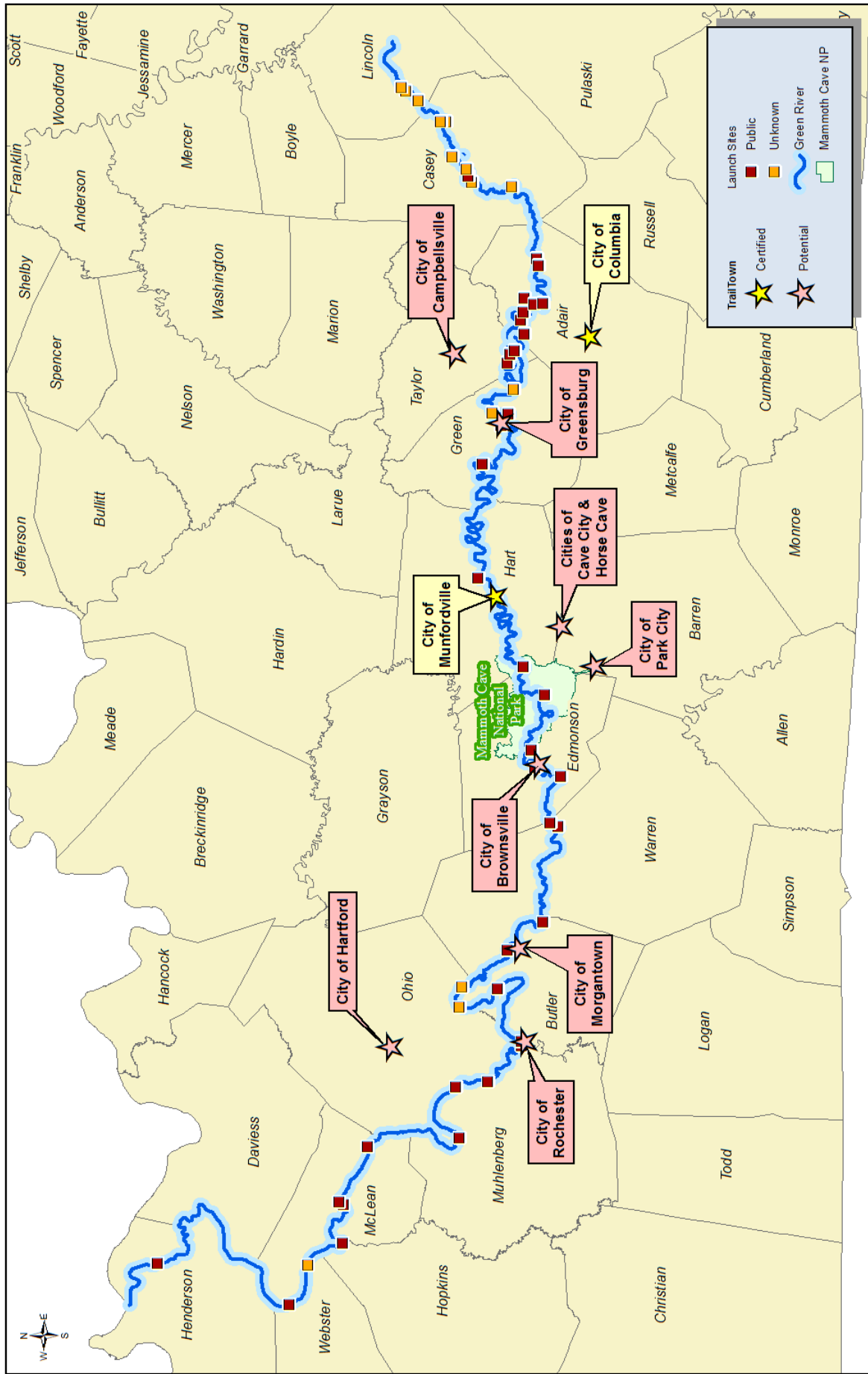


Figure 4 - Green River Blueway Water Trail - Proximity to Potential Trail Towns

The committee developed and worked to implement the following goals for 2016-2017:

- Identify priority projects
- Field-verify projects
- Finalize Cave Country Trails Master Plan
- Seek funding

During the first year of the Cave Country Trails Master Plan, the CCT accomplished the following activities:

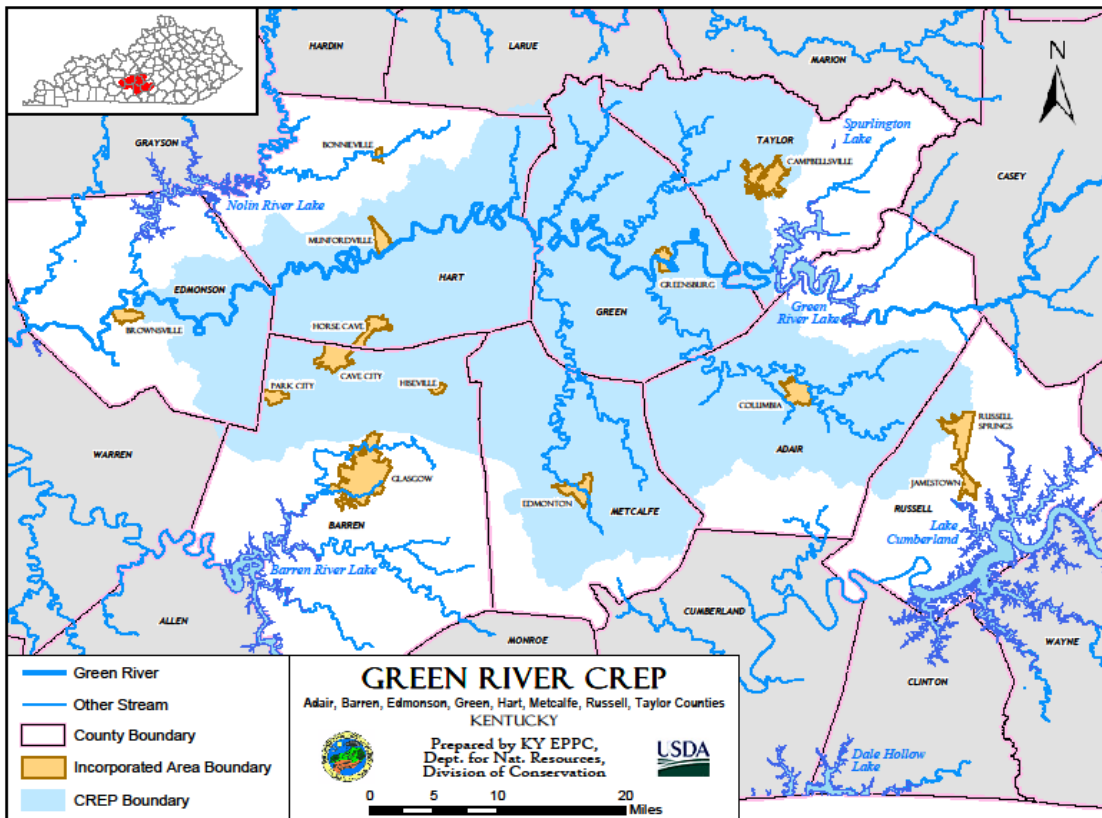
- Formed non-profit 501(c)3 organization with Board of Directors
- Secured \$10,500 from six funding partners; successful search for part-time Project Director
- Submitted Rails-to-Trails Conservancy grant application for \$10,000 (not awarded this time)
- Developed social media strategy; to-date 462 on Facebook, 117 on Instagram, and 117 on Twitter
- Hosted community workshops in four partner counties during February & March (150 total attendees)
- Completed SWOT analysis with workshop participants of existing and potential trails for hiking, mountain biking, road cycling, horseback riding, and river paddling
- Developed a composite trail map and summary of community assets
- Hosted Public Review Meeting on the composite trail map in June (45 attendees)

In 2018, Cave Country Trails continues to work on trail related initiatives such as supporting communities seeking Kentucky Trail Town status and formally submitting a new connecting route for United States Bike Route 23 between Simpson and Larue Counties.

Most significantly, CCT voted to support and submit a National Water Trail application for 37 river miles in Edmonson and Hart Counties. This segment would extend from Dennison's Ferry (River Mile 204.8) inside Mammoth Cave National Park to Alexander Creek Ramp in Edmonson County (River Mile 175.6). This application would also include nine miles of the Nolin River. Furthermore, it is possible that this segment could be further extended either upstream or downstream if additional safe river access could be secured.

Green River Conservation Reserve Enhancement Program (CREP)

A large portion of the Green River has benefitted from the implementation of Kentucky's Green River Conservation Reserve Enhancement Program (CREP), which has led to a major shift toward ecosystem enhancement and implementation of water quality best management practices. Revitalization of the area has helped protect Mammoth Cave National Park and the ecologically rich Green River. First implemented in 2001, the Green River CREP provided landowners located in the eight counties along the 100-mile stretch, with an opportunity to voluntarily enroll agricultural acreage in the program. As a result, some 100,000 acres of hardwood trees, native grasses, and wildflowers now serve to protect water quality and provide outstanding wildlife habitats, while diversifying many farm operations throughout the CREP program area. The following map shows the project area for the Green River Conservation Reserve Enhancement Program:



In 2006, the project area for the Green River Conservation Reserve Enhancement Program was expanded to include 30 river miles of significant watersheds downstream of the original project area and to use the community-based approach to more effectively protect locally unique resources and provide better service to landowners. The proposed addition included all or parts of Allen, Barren, Butler, Edmonson, Grayson, Logan, Simpson and Warren counties.

The Kentucky Green River CREP will ensure the long-term protection of water quality and habitat for a wide array of wildlife, including threatened and endangered species. Specific objectives of this program include:

- Reducing by 10 percent the amount of sediment, pesticides, and nutrients entering the Green River and Mammoth Cave system by growing strips of grass and trees around streams and sinkholes
- Protecting wildlife habitat and populations, including threatened and endangered species
- Restoring riparian habitat along the Green River.
- Restoring the subterranean ecosystem by targeting 1,000 high priority sinkholes.

Initiated in 2001, implementation of the Kentucky Green River CREP began in 2002. The program occurred as a result of the cooperation and collaboration among a number of key government agencies and other organizations. Participation included the U.S. Department of Agriculture, the Kentucky Department of Fish and Wildlife Resources, the Natural Resources Conservation Service, the Kentucky Division of Conservation, Western Kentucky University, Mammoth Cave National Park and the Kentucky Chapter of the Nature Conservancy.

Planning Process

This project has received support from county and city officials along the river. Butler County Judge/Executive David Fields has acted as the champion for the project, promoting the conversation about a Blueway plan among local governments and area agencies

The planning process for the Green River Blueways Water Trail plan began in June 2013 when representatives from the BRADD, Mammoth Cave National Park, Western Kentucky University, Kentucky Division of Water, Kentucky Fish & Wildlife, U.S. Army Corps of Engineers, NCRS/USDA, the Nature Conservancy, and local government officials convened to discuss the viability of developing a Blueways Water Trail on the Green River. After completing a preliminary SWOT (Strengthens, Weaknesses, Opportunities, & Threats) analysis of current river assets, the group determined that they should apply for funds through the National Park Service's Rivers, Trails, and Conservation Assistance Program for assistance to develop a master plan. The application, which was submitted by BRADD, was awarded on October 23, 2013.

The objectives of the project were to:

- Undertake a strategic planning process that would result in designation as a National Water Trails System,
- During the planning process, engage the communities, agencies, individuals and other interested organizations in the area in order to develop partnerships and create lasting support to undertake and maintain the identified goals and objectives,
- Create an information base and prepare maps that can be used to guide the development of the river,
- Identify future funding opportunities
- Plan marketing events
- Establish public websites and branding

To this end, planning participants have participated in nine public meetings at locations across the project area. The purpose of these meetings was to seek input and engage in an assessment of the Green River. An outcome of these meetings was a second, more in-depth SWOT analysis that drew on the knowledge of dozens of stakeholders. This analysis was created through by data collected and packaged by a variety of different stakeholders. A significant outcome of the planning process was data collection of access points along the Green River. This tremendous effort was undertaken by Joanna Ashford, Curtis McDaniel, and Dale Reynolds from Kentucky Division of Water; Eric Cummins and Rob Rold from Kentucky Fish & Wildlife; and Russell Clark from the National Park Service.

The following section details the assessment of the Green River produced by planning members during their meetings. This analysis is the foundation upon which the plan's goals and objectives were determined.

Economic Opportunity

Kentucky has recently enjoyed a significant boost to its economy through growth in the tourism and travel industry. As summarized in Table 1, a report produced by the Kentucky Tourism, Arts, and Heritage Cabinet found that, in 2016, tourism contributed over \$14.5 billion to the state's economy,

with \$9.2 billion of that figure (an increase of 5% from the previous year) being the result of direct investment by tourists. Growth in tourism benefited both private businesses and government as the industry generated more than \$1.51 billion in tax revenue across the state. Local governments received nearly \$196,000 in taxes.

The “Caves, Lakes, & Corvettes” tourism region, again showed strong gains in comparison with the other travel regions for the third consecutive year. From 2015 to 2016, total expenditures in the tourism industry in the BRADD region grew from \$665 million to \$709 million, a 6% rate of growth.

Table 1: Travel Industry Expenditures and Tax Revenues & Wages, 2015 & 2016		
	2015	2016
Travel Industry Expenditures		
Total Expenditures in Kentucky	\$13,800,000	\$14,500,000
Direct Expenditures	\$8,800,000	\$9,200,000
Indirect Expenditures	\$5,000,000	\$5,300,000
Annual Change 2015 – 2016 (direct expenditures only)		5%
Tax Revenues & Wages		
Total State & Local Taxes	\$1,400,000,000	\$1,500,000,000
State Taxes	\$1,300,000,000	\$1,300,000,000
Local Taxes	\$186,000,000	\$195,000,000
Wages	\$3,092,000,000	\$3,248,000,000

Source: Kentucky Tourism Arts, and Heritage Cabinet. (2016). *Economic Impact of Kentucky's Travel and Tourism Industry - 2015 and 2016* (Rep.).

In an interview with the Lane Report, Hank Phillips, president and CEO of the Kentucky Travel Industry Association, described the tourism industry as an economic driver for Kentucky. Phillips pointed to other keystone industries for the State, including coal, agriculture, and automotive, and noted that tourism has one of the largest impacts on the economy. Tourism is a larger industry than both coal and agriculture and is competitive with the automotive industry in terms of total revenue it brings into the State—in 2015 the auto industry had a gross state product of \$14.3 billion. Tourism should continue to drive the State’s economy by bringing in out-of-state and in-state revenue, generating tax revenue for local governments, and creating jobs.

In 2013, the Outdoor Industry Association (OIA) completed an assessment of Kentucky’s outdoor recreation economy. The report found that, in Kentucky, outdoor recreation generates \$8.4 billion in consumer spending, \$105,000 in direct Kentucky jobs, \$2.5 billion in wages and salaries, and \$552 million in state and local tax revenue. The assessment revealed that, nationally, outdoor recreation is an “overlooked economic giant” as it was the third largest industry in annual consumer spending behind pharmaceuticals and motor vehicles and parts. The OIA concluded that “preserving access to outdoor recreation protects the economy, the businesses, the communities and the people who depend on the ability to play outside.”

The Green River Blueways Water Trail has the potential to benefit from Kentucky’s and the United States’ strong and growing tourism industry. Adventure tourism is a cornerstone of Kentucky tourism. People come from around the country to visit outdoor attractions, such as Mammoth Cave National Park, Lake Cumberland, Barren River Reservoir, Nolin Reservoir, and other natural and man-made

attractions and to participate in activities such as cave tours, boating, biking, hiking, zip-lining, canoeing, and kayaking. Programs such as Trail Towns that are created and led by the State, and local initiatives such as Cave Country Trails, have been developed to facilitate the growth of adventure and outdoor tourism. Established infrastructure, programs, and interest are in place and create a foundation for the Blueways Water Trail to develop and thrive.

Development of the Green River Blueways Water Trail would also add to the state's tourism industry. Improving knowledge of recreational activities on the Green River and access to them will bring more tourists to the communities along the Green River. Kayakers and canoers who utilize the Green River can stop in local communities to eat, purchase supplies, and stay overnight. In addition to an increase in the amount of dollars flowing into a community and an increase in tax revenue, benefits to private industry can increase the number and quality of jobs available. The previously cited report from the Kentucky Tourism, Arts, and Heritage Cabinet found that, in 2016, the tourism industry resulted in 192,697 jobs in Kentucky, an increase of 5,925 jobs from 2015. These jobs created \$3.2 billion in wages.

Increased awareness of the river will spur development and attract more users. More traffic on the river will promote return business and keep local people in the area for recreational purposes, improving the overall health of the community and providing the opportunity to create extraordinary memories. The possibility of linking river recreation areas with hiking and biking trails increases this potential.

This project would provide new marketing opportunities for the trails already in existence, and allow new economic development and business endeavors, such as new camping areas, partnerships with outfitters, and paddling groups. It would produce another outlet for local people to share their town with those that have never traveled to it before, increasing cultural opportunities for both tourists and locals. New services would result from more traffic, but already established local businesses would benefit as well.

The Water Trail is mutually beneficial to the Kentucky economy as it will both benefit from the strength of and grow the existing tourism industry. Through marketing campaigns, efforts to increase the number of access points, and community support, the Blueways Water Trail can become an important asset to the state and local economy.

Health Benefits

Increased access to outdoor recreation can significantly improve health outcomes. A 2013 meta-analysis of studies that examined the impact of outdoor recreation on health concluded the following:

Outdoor natural environments may provide some of the best all-round health benefits by increasing physical activity levels with lower levels of perceived exertion, altering physiological functioning including stress reduction, restoring mental fatigue, and improving mood and self-esteem and perceived health...The great outdoors, therefore, should not be just considered a playground for those who seek the thrills of extreme sports, but emphasis should be placed on access for all.

With anticipated increases in insurance premium rates on the horizon, it is important that the Commonwealth of Kentucky take stock of the myriad of ways it can improve public health outcomes. Outdoor recreation is a cheap, sustainable, and effective form of exercise. Investments in infrastructure and initiatives to increase access to outdoor recreation should be made to create healthier communities.

Healthy Communities, Healthy Workforce

There is an economic incentive for communities to actively invest in the health of their residents. A 2016 report prepared by the Robert Wood Johnson Foundation that studied the linkage between investments in community health and local economies found the following:

- *Healthier communities help to cultivate a healthy, more productive workforce fueling future economic growth.*
- *Healthier communities are associated with higher rates of education, which can benefit both workers and employers.*
- *Healthier communities attract more talented employees and a healthier customer base, which can strengthen their economies.*

As a way to curb expenditures on insurance, many businesses have begun to incentivize healthy workplace habits. However, a 2014 study completed by the Vitality Institute concluded that workplace incentives for healthy living are negated if the employee returns home to an unhealthy community. The findings of both of these studies indicate that investing in community health initiatives, such as the Blueways Water Trail, can improve health outcomes, develop a stronger workforce, and decrease company expenditures. As such, it would be of benefit to actively pursue both local government and local business buy-in and support of the Water Trail.

Environmental Stewardship

The Green River is one of the greatest rivers in North America with regard to the amazing diversity of life found both in the river itself and in adjacent lands that are closely associated with the ebb and flow of the river's waters. Over 70 species of freshwater mussels are known to live in the river, along with 150 species of fish.

Not only is the Green River a globally-important biodiversity hotspot, but the river and its tributaries provide clean drinking water, recreation, ecotourism, sustainable agriculture, and power reliability for 630,000 people who live within the river basin. Fishing, hunting, and wildlife watching activities within the entire basin provide tremendous economic benefits.

For many years, the lands and waters within the Green River Basin have been the focal point for a great deal of collaborative conservation efforts from a host of concerned partners and stakeholders. While many of these endeavors were and are undertaken with a primary interest in maintaining and improving water quality, many other positive conservation outcomes result. For example, improved quail habitat in the area has resulted in this area of Kentucky becoming one of the few "bright spots" for quail restoration in the southeastern United States. Future investment in conservation partnerships along the

Green River corridor should result in the region continuing to flourish as a kayaking, canoeing, hunting, fishing, hiking, and wildlife watching paradise.

Some have raised concerns that more traffic on the river would be hazardous to protected species. For example, the collection of mussel shells by the Blueways' users may have a harmful impact on the ecosystem. The concern stems partially from an increase in people invading the natural space, but is largely due to the amount of trash and waste users could leave behind. However, the group came up with a number of ideas to combat this:

- Partner with local groups for river “cleanups”
- Create an “Adopt-a-Mile” much like the road system, but converted to work on the river
- Increase education and awareness for outdoor ethics
- Make additional access points to allow for better spill monitoring

Safety

Outdoor recreation creates hazards and safety concerns that should be of highest importance for paddlers as the river is different from the head to tail waters. Some areas of the river are prone to flooding, while others experience significant commercial traffic from barges transporting coal. Additionally, Green River dams 1, 2, 3, and 5 are still in place. These low head dams present an extreme hazard to boaters at each of these locations.

Another safety concern relates to the primarily rural access of the Green River and the challenge this type of access creates for emergency response. The lack of reliable cell service or internet in rural parts of the area makes it difficult for rescue operations to provide quick response. The limited existence, currently, of consistently marked and numbered mile markers designating locations on the river has hampered first responders in their rescue efforts.

In recent years, there have been fatalities, injuries, and near misses related to people going over old dam structures, or paddling when water is too high. As these types of threats are frequently preventable, these incidents show a lack of river safety awareness and education on necessary precautions.

When the proper safety precautions are not taken, outdoor recreation and water-based recreation in particular, can be very dangerous. However, the formalization of the Green River Blueways Water Trail presents a unique opportunity to address these issues. First, there will be more emphasis on increasing the number of access points and making them more visible. This will facilitate faster and more efficient emergency response. Similarly, efforts need to be increased to install consistent river mile markers along the river.

Second, education initiatives must be undertaken to increase knowledge of water safety. Safety information can be distributed through social media, marketing materials (pamphlets, brochures, etc.), or training events and classes held on the River. Because of the creation of a Blueways committees and solicitation of community support, there are new avenues to pursue to improve safety on the Green River.

River safety needs to be continually emphasized with increased levels of river usage, particularly novice users. The Green River is dynamic, and with the removal of Lock and Dam #6 and other possible future changes, the river runs faster and can be more hazardous with downed trees, rapidly changing water levels, adverse weather, and other factors. Accordingly, emergency response preparedness needs to be enhanced along with a greater emphasis on user education.

Educational Opportunities

The Green River Blueways Water Trail will provide communities unique opportunities to educate their residents about water safety, conservation, and cultural heritage. The success of the creation of the water trail has relied upon bringing together stakeholders from a variety of backgrounds, including local government, private industry, the national park service, and schools. Representatives from the organizations can come together to create curriculum to impart these lessons. A formalized push to make the Green River a water trail has created the framework under which it is possible to identify issues associated with the river, and then to develop curriculum to address them. Social media and websites that have been identified as part of the marketing schema for the water trail can be used to reach a wider audience, both to share invitation to workshops and classes and to directly share information about water recreation, such as safety tips.

Access

Since safety was recognized as a major concern, this project will identify ideal locations for new access points. More visible access points could prevent situations where someone inadvertently floats beyond their planned take-out location.

The inventory of existing access points that was collected during the planning process is presented in Figure 5. Also, included are more detailed maps of the access points by the planning areas. Also denoted on the map are the general areas where access points are needed. Table 3 supports the mapping of the access points by detailing characteristics of each point. Table 2 presents a summary by county of the number of existing access points and the number of needed access points.

Table 2: Existing and Access Points Per County			
	County	Access Points	Needed Access Points
UPPER GREEN	Lincoln	3	0
	Casey	7	0
	Casey/Adair	N/A	1
	Adair	8	0
	Taylor	3	0
	Taylor/Green	N/A	1
MIDDLE GREEN	Green	7	2
	Green/Hart	N/A	1
	Hart	3	4
	Edmonson	5	0
	Warren	2	0
	Warren/Butler	N/A	2
	Butler	6	1
LOWER GREEN	Muhlenberg	3	0
	Muhlenberg/Ohio/ McLean	N/A	1
	Ohio	3	0
	McLean	4	0
	McLean/Daviess/ Henderson	N/A	1
	Hopkins	0	0
	Webster	2	0
	Henderson	1	0
	Henderson/Daviess	N/A	1
	Daviess	0	1

An additional launch point at the Nolin River Lake Tailwater area should be considered, although it is not located on the Green River. This is a very scenic stretch of river and provides access to the Green River and Mammoth Cave National Park. Through the process of inventorying existing access points, the committee now has a better idea of where new access points could be located. An estimated 16 more sites are needed to achieve the goal of having an access point every eight to ten miles.

However, this goal may be difficult to reach due to the rural nature of the land alongside the river, which is mostly privately owned farmland. Permission from landowners will be needed, which is not ideal since a private landowner can revoke the contract at any moment, or the contract could change if the land is sold.

Landowners do not have access, especially since ruined access at a few sites. A landowner present at his site. With such disrespect to his land, it is easy to see why he no longer volunteers his land for these types of projects. Another landowner expressed apprehension for the possibility of people camping on his land without permission and feels this is a safety issue for his family.



an incentive to allow people have already due to inappropriate use. during one of the public concern over the amount waste that was always

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However, this negativity also proves there is hope in our project. Understanding why landowners could be hesitant gives us the opportunity to create solutions. In some areas, local outfitters are proving their reliability to land owners.

River Mile Markers

During their discussions, the commission determined that the posting of mile markers along the river is a high priority, especially at access points. This would allow users of the river to know exactly where they are and would aid first responders if rescue missions were needed. The committee agreed to use the United States Coast Guard system for signage when posting along the river.

Maps

Figure 5 on the following page shows the three sections of the Green River. Access locations and the locations of the locks and dams are also indicated. The colored river sections indicate where there is good access between river access points (8 miles or less), borderline river access between river access points (8-10 miles), and poor river access between river access points (10+ river miles).

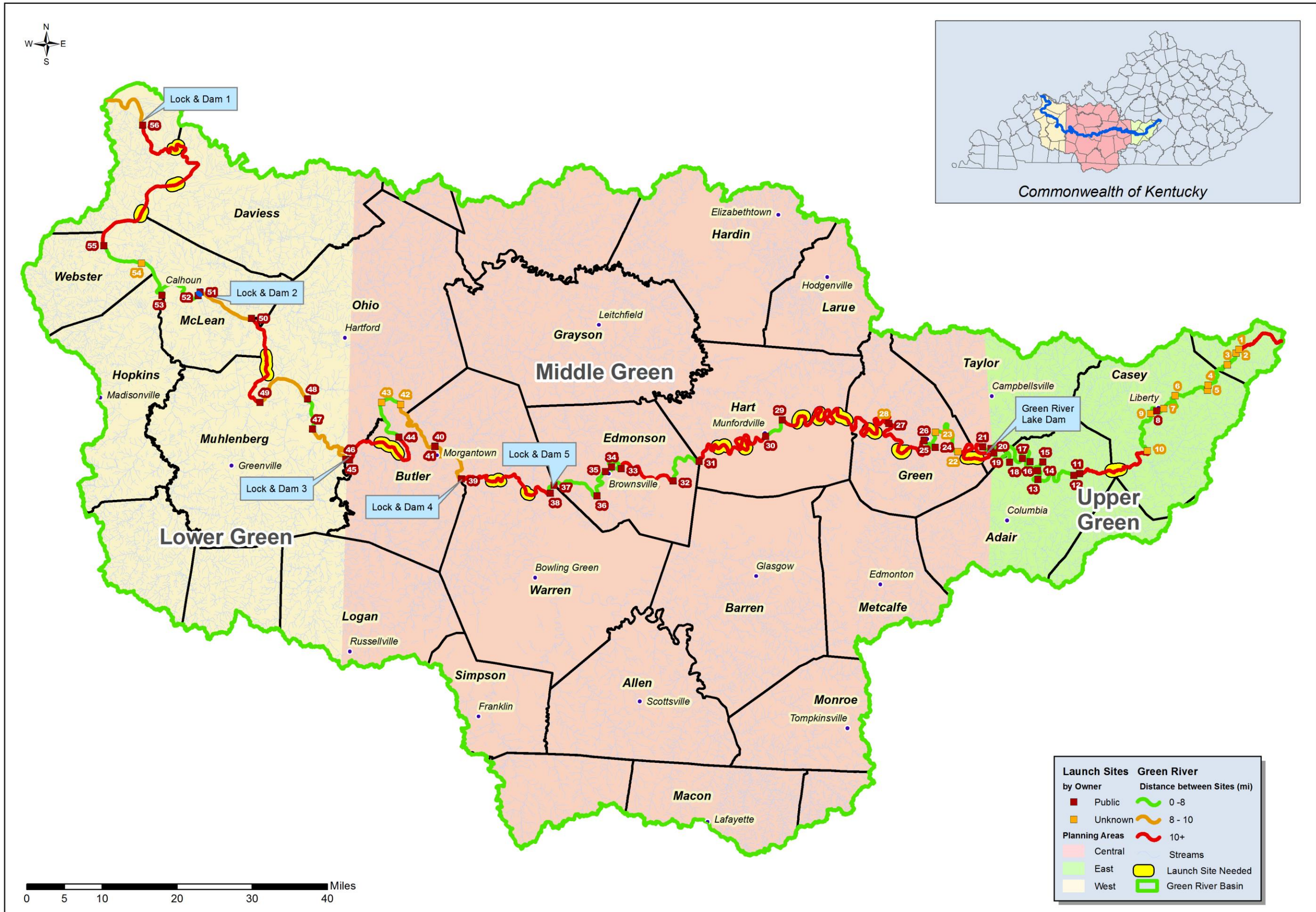


Figure 5 - Green River Launch Sites

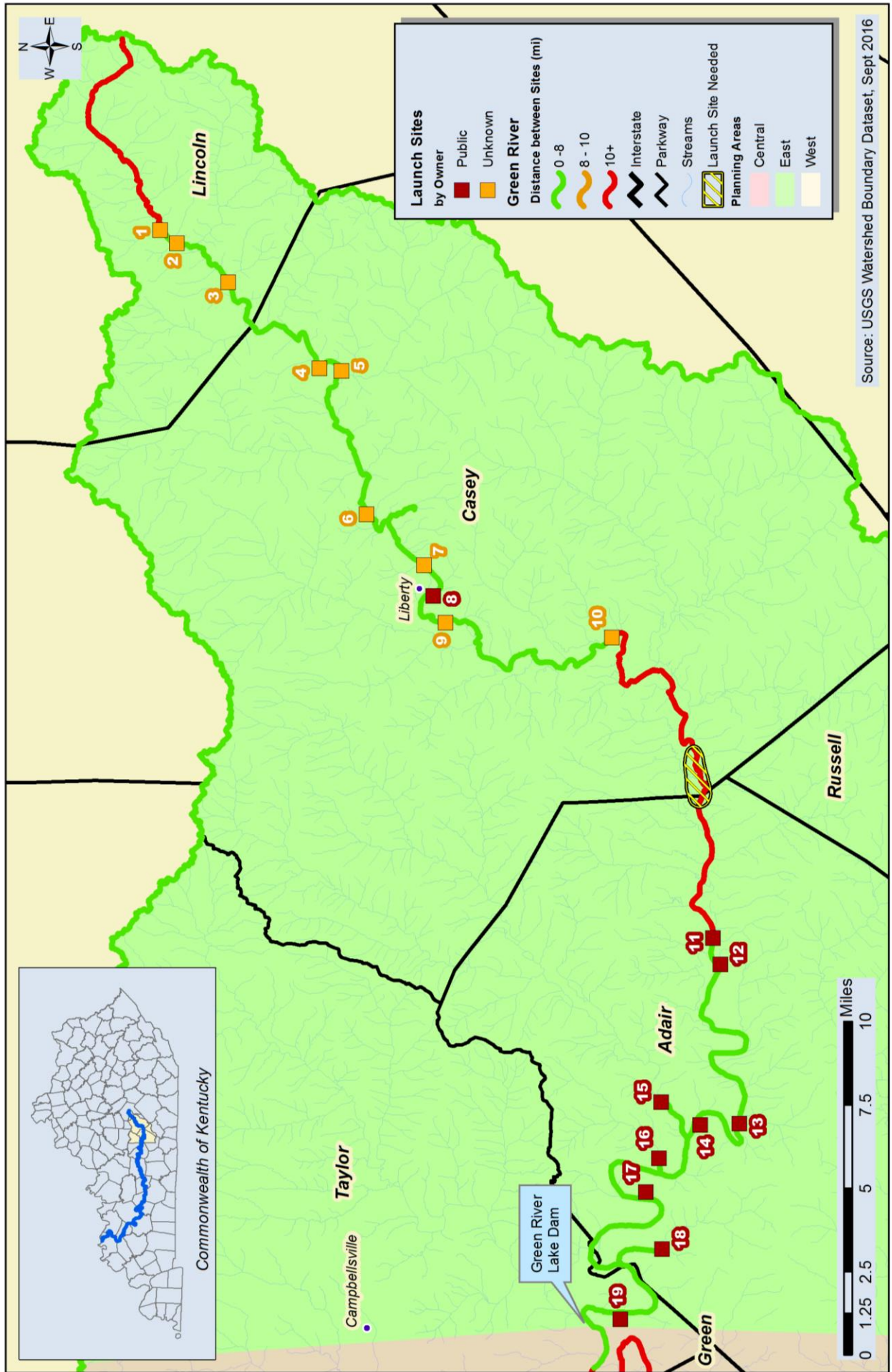


Figure 5A - Green River Basin: Upper Green

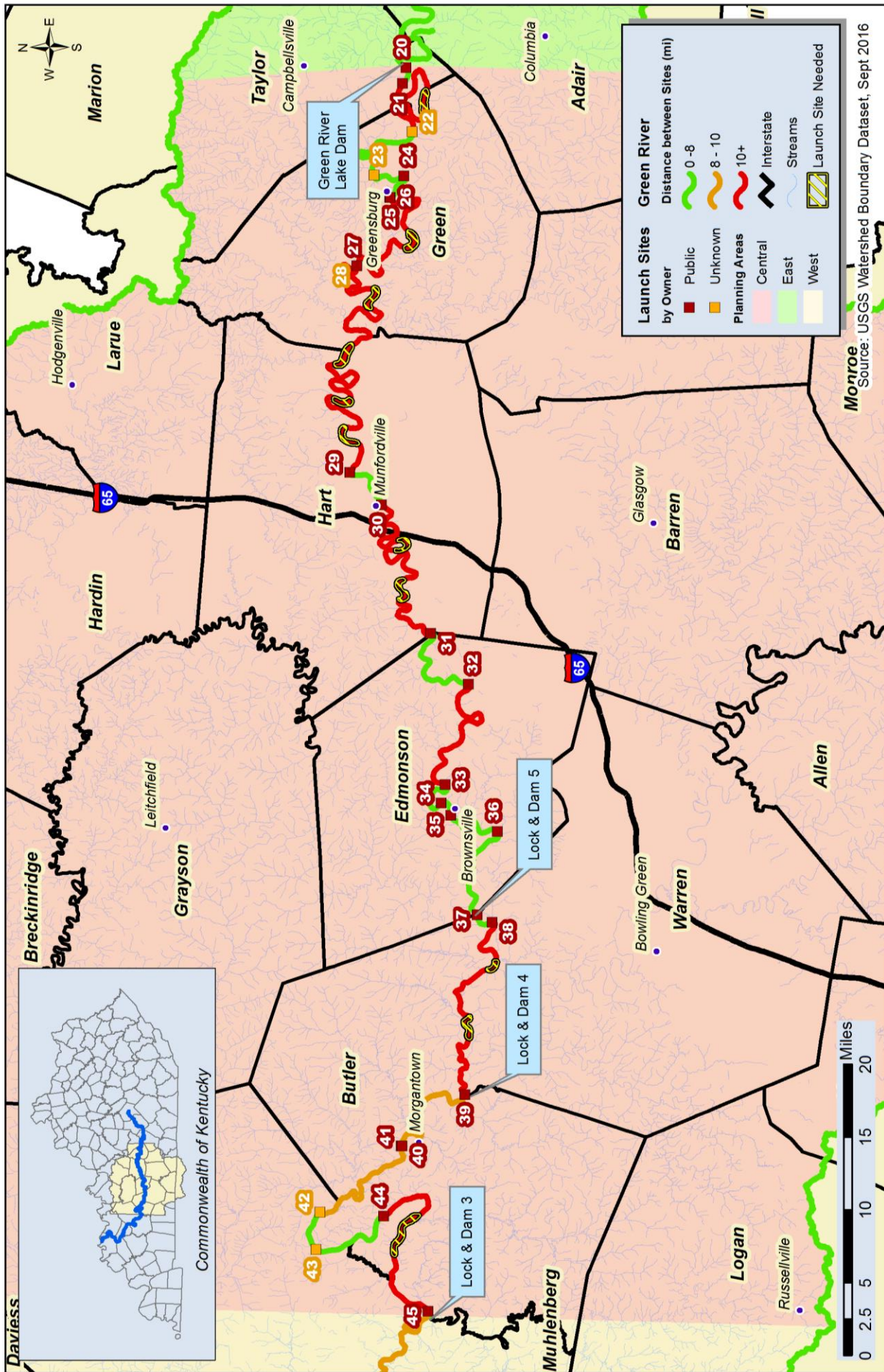


Figure 5B - Green River Basin: Middle Green

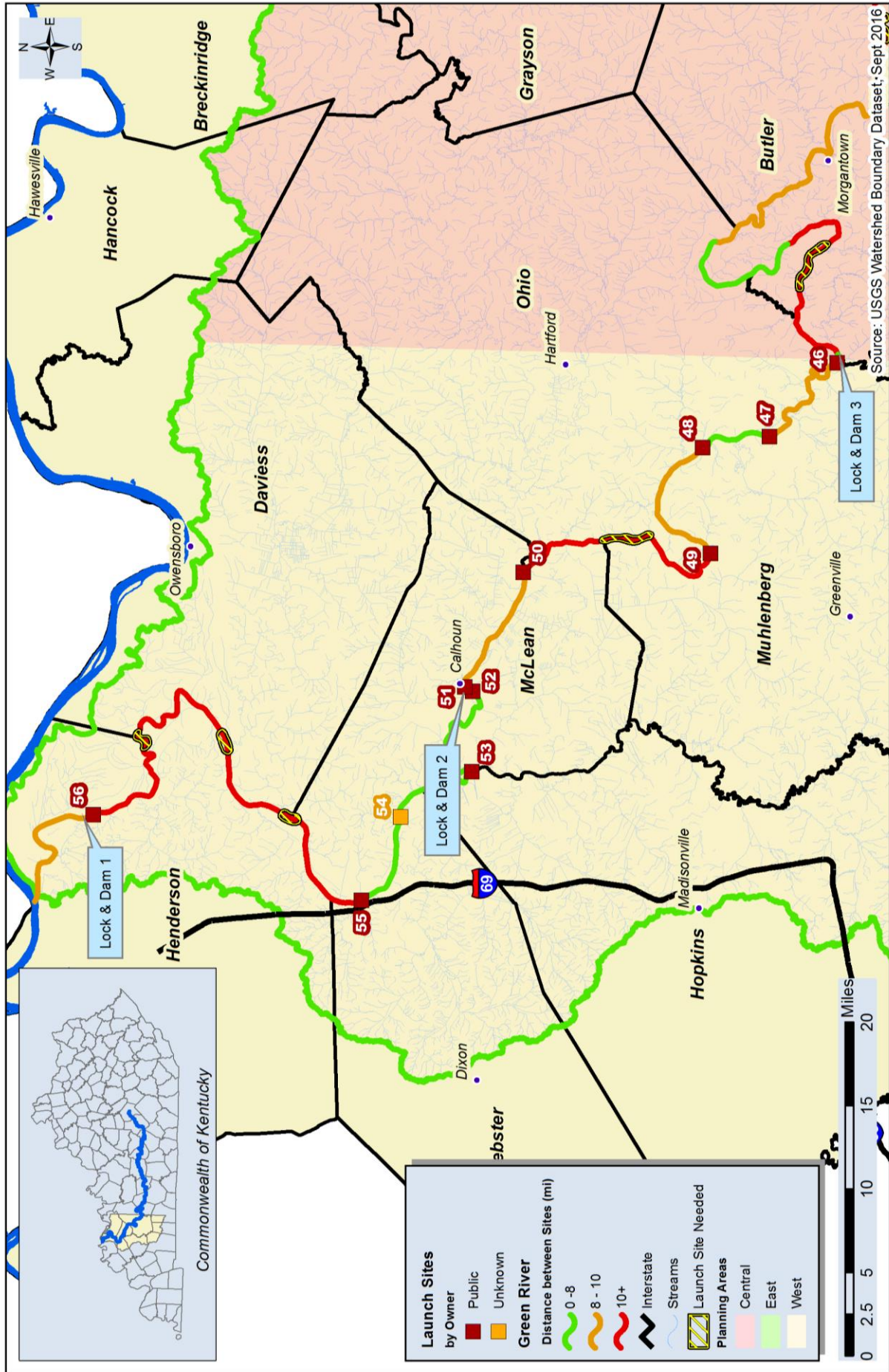


Figure 5C - Green River Basin: Lower Green

Table 3: Acces Points on the Green River

	Map #	Site Name	River Mile	Distance to Next Site	Latitude	Longitude	Down River Access Side	Canoe Launch	Motor Boat	Launch Paved	Land Ownership	ADA Accessible	Restroom	Trashcans	Drinking Water	Signage	Parking	Overnight parking	Trailer Turnaround		
UPPER	1	MP 376	376	1	37.4297027	-84.7424916	River Right	YES	NO	NO	Unkown	NO	NO	NO	NO	NO	NO	NO	NO	NO	
	2	MP 375	375	2	37.4224	-84.74986	River Left	NO	NO	NO	Unknown	NO	NO	NO	NO	NO	NO	NO	NO	NO	
	3	MP 373	373	6	37.400236	-84.771469	River Left	NO	NO	NO	Unknown	NO	NO	NO	NO	NO	NO	NO	NO	NO	
	4	MP 367	367	1	37.361	-84.8189	River Right	NO	NO	NO	Unknown	NO	NO	NO	NO	NO	NO	NO	NO	NO	
	5	MP 366	366	5	37.351583	-84.82036	River Left	MAYBE	NO	NO	Unknown	NO	NO	NO	NO	NO	NO	NO	NO	NO	
	6	MP 361	361	3	37.34126	-84.8985	River Right	YES	NO	NO	Unknown	NO	NO	NO	NO	NO	NO	NO	NO	NO	
	7	MP 358	358	1	37.316516	-84.9266	River Right	NO	NO	NO	Unknown	NO	NO	NO	NO	NO	NO	NO	NO	YES	
	8	MP 357	357	2	37.3126	-84.9434	River Left	YES	NO	NO	Public	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
	9	MP 355	355	7	37.307383	-84.95785	River Right	NO	NO	NO	Unknown	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
	10	MP 348	348	14	37.23513	-84.9668	River Left	YES	NO	NO	Unknown	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
	11	Neatville Bridge Below	334	1	37.192137	-85.130647	River Right	NO	NO	NO	Public	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES
	12	Evans Cemetary Rd. (Evans Camp Rd.)	333	7	37.189126	-85.144997	River Left	YES	NO	NO	Public	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES
	13	Snake Creek	326	3	37.2181286	-85.231625	River Left	YES	YES	YES	Public	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
	14	Plum PT	323	0	37.198263	-85.232021	Lake	YES	YES	NO	Public	NO	NO	NO	NO	NO	NO	YES	YES	YES	NO
	15	Arnolds Landing	323	2	37.21514	-85.219566	River Right	YES	YES	Unknown	Public	NO	NO	YES	NO	NO	NO	YES	YES	YES	YES
	16	White Oak Ramp	321	5	37.216176	-85.250174	Lake	YES	YES	NO	Public	NO	NO	NO	NO	NO	NO	YES	YES	YES	NO
	17	Holmes Bend Ramp/ Fishing Pier II	316	6	37.222072	-85.268546	Lake	YES	YES	YES	Public	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	18	Butler Creek Ramp	310	3	37.215088	-85.299411	Lake	YES	YES	YES	Public	NO	NO	YES	NO	YES	YES	YES	YES	YES	YES
	19	Green River Lake Fishing Pier and Ramp	307	2	37.233292	-85.337422	Lake	YES	YES	YES	Public	YES	YES	YES	YES	Unknown	YES	YES	YES	YES	YES
	20	Green River Tailwaters	305	2	37.24163	-85.344433	River Right	YES	YES	YES	Public	YES	NO	YES	NO	YES	YES	YES	YES	YES	YES
MIDDLE	21	Tebbs Bend Road- *Under Construction*	303	12	37.245077	-85.3642	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	22	Roachville Road	291	7	37.23552	-85.424116	River Right	YES	YES	YES	Unknown	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
	23	Rakph Vaughn Road	284	3	37.273516	-85.47833	River Left	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
	24	American Legion Ramp	281	2	37.244128	-85.479457	River Left	YES	NO	NO	Public	NO	NO	NO	YES	YES	YES	YES	YES	YES	YES
	25	Green River Paddle Trail	279	0	37.257566	-85.506217	River Right	YES	YES	YES	Public	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	26	Greensburg Ramp	279	13	37.258083	-85.506099	River Right	YES	YES	YES	Public	NO	YES	YES	NO	YES	YES	YES	YES	YES	YES
	27	Glenview Road/Ford	266	0	37.291	-85.5913	N/A	YES	NO	NO	Public	NO	NO	NO	NO	NO	NO	YES	YES	YES	NO
	28	MP 269	266	36	37.290783	85.5913	River Left	YES	NO	NO	Unknown	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
	29	HW Wilson Park	230	4	37.2978	-85.8489	N/A	YES	YES	YES	Public	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES
	30	Munfordville - Stovall Park	226	21	37.2663	-85.8892	River Left	YES	YES	YES	Public	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
	31	Dennison Ferry	205	8	37.217367	-86.049608	River Left	YES	NO	NO	Public	NO	YES	NO	NO	NO	YES	YES	NO	NO	YES
	32	199 Green River Ferry	197	12	37.17948	-86.11234	Both	YES	NO	YES	Public	NO	YES	NO	NO	NO	YES	YES	NO	NO	YES
	33	187 Houchens Ferry	185	3	37.20239	-86.23756	River Left	YES	NO	NO	Public	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
	34	Lock 6 Site	182	2	37.206284	-86.260844	River Right	YES	YES	NO	Public	NO	NO	NO	NO	NO	NO	YES	NO	NO	YES
	35	Green River at Brownsville	180	4	37.196493	-86.275885	River Left	YES	YES	YES	Public	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
	36	Alexander Creek Ramp	176	7	37.149871	-86.295566	River Left	YES	YES	YES	Public	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
	37	GR Lock and Dam Ramp	169	2	37.169337	-86.399532	River Left	YES	YES	YES	Public	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
	38	Arrie Young Boar Ramp/ Honakers Ferry	167	17	37.154519	-86.408565	River Left	YES	YES	YES	Public	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
	39	Woodbury	150	9	37.180496	-86.623534	River Left	YES	YES	YES	Public	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
	40	Old River Road	141	0	37.2424	-86.623534	River Left	YES	YES	YES	Public	YES	NO	NO	NO	NO	YES	YES	NO	NO	YES
	41	GR/Morgantown - Old River Rd	141	9	37.243315	-86.688041	River Left	YES	YES	YES	Public	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES
	42	Cromwell	132	3	37.32328	-86.77197	River Right	YES	YES	YES	Unknown	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
	43	Highview Hill Ramp	129	6	37.32671	-86.81826	River Right	YES	YES	YES	Uknown	YES	NO	NO	NO	NO	YES	YES	YES	YES	YES
	44	Reeds Ferry	123	14	37.260047	-86.775657	River Left	YES	YES	YES	Public	NO	YES	NO	NO	NO	YES	YES	NO	NO	YES
	45	Rochester Ramp	109	1	37.21482	-86.89388	River Right	YES	YES	YES	Public	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
	46	Rochester Dam	108	9	37.215831	86.903013	River Left	YES	YES	NO	Public	NO	NO	NO	NO	NO	NO	YES	YES	YES	NO
LOWER	47	Paradise Ramp	99	4	37.27391	-86.98441	River Left	NO	YES	YES	Public	NO	NO	NO	NO	YES	YES	YES	YES	YES	
	48	Rockport	95	9	37.33144	-86.99726	River Left	YES	YES	YES	Public	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES
	49	Reservoir Ramp	86	15	37.32341	-87.11212	N/A	YES	YES	YES	Public	NO	NO	NO	NO	YES	YES	NO	NO	YES	YES
	50	Livermore Ramp	71	8	37.48573	-87.13564	River Left	YES	YES	YES	Public	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
	51	Calhoun Ramp	63	0	37.53482	-87.26142	River Left	YES	YES	YES	Public	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
	52	Rumsey Ramp	63	8	37.52809	-87.26614	River Left	YES	YES	YES	Public	NO	YES	YES	NO	YES	YES	YES	YES	YES	YES
	53	Jewel City Ramp	55	6	37.527561	-87.354129	Both	YES	YES	YES	Public	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
	54	Wrightsburg Landing	49	6	37.58879	87.40456	River Left	YES	YES	YES	Unknown	NO	NO	NO	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
	55	Old Eastwood Ferry	43	34	37.62138	-87.49652	River Left	YES	YES	YES	Public	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
	56	Spottsville Boat Ramp	9	9	37.85518	-87.40818	River Left	YES	YES	YES	Public	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES

Goals & Objectives

Sharing data across the 300 plus miles of river allows a better understanding of the river as a whole, and could aid in the information being available to a larger audience. Working from a regional approach empowers cooperation, but for this plan to flourish an alliance of local groups interested in promoting their natural resource is crucial. Local groups know their sections of river better than groups in other regions and have more to gain from the success. The following are goals and objectives the initial steering committee developed to further this project.

The mission of the Green River Blueways Plan is to create a 300 plus mile water trail that facilitates exploration, appreciation, and stewardship of the natural resource.

- 1 Develop a formalized committee structure to oversee projects which will give focus and direction to Green River Blueway Water Trail, i.e. Green River Partnership Alliance**
 - 1.1 Create steering committees on the local levels that will champion the Blueway objectives in their locality while coordinating with other groups along the Green River.
 - 1.2 Recruit members from a variety of backgrounds (paddle and environmental groups, tourism based businesses, search and rescue first responders, etc.)
 - 1.3 Define the system by sharing data with partners.
 - 1.4 Create goals to promote sustainability of the Committee.
 - 1.5 Create a marketing plan to “brand” and promote the Green River as an official Water Trail.
 - 1.6 Create a group stakeholder message advocating for issues related to the Green River.
- 2 Promote safe access to the Green River.**
 - 2.1 Maintain a database of known public access points.
 - 2.2 Advocate and seek additional sites to allow access points that are no more than eight to ten miles apart.
 - 2.3 Create a system, which would allow users to see real time river conditions and dam releases.
 - 2.4 Identify safe portage routes.
 - 2.5 Advocate for removal of locks and dams.
 - 2.6 Promote Leave No Trace ethics to waste disposal, and advocate for the purchase of trash bins.
 - 2.7 Enhance security efforts at access points.
 - 2.8 Seek legislative action to incentivize private provision of access points
- 3 Support the Economic Ecosystem of communities along the Green River.**
 - 3.1 Engage communities to establish new services.
 - 3.2 Promote partnerships with outfitters.
 - 3.3 Develop marketing plan for existing trails to increase use.
 - 3.4 Empower the local community to support local businesses.
 - 3.5 Encourage economic development opportunities.
 - 3.6 Promote return business.
- 4 Promote usage of the Green River and encourage environmental awareness.**
 - 4.1 Assist communities seeking Trail Town status.
 - 4.2 Create educational opportunities for conservation and local culture (including lock & dam sites).
 - 4.3 Place river mile markers for enhanced safety.
 - 4.4 Engage communities to monitor spills and other hazards.
 - 4.5 Improve health benefits by promoting existing trails.
 - 4.6 Create Green River Blueway Water Trail website.
- 5 Seek official Water Trail recognition from the National Park Service, National Water Trail System**

Potential Funding Sources

Land Water Conservation Fund (LWCF)

The LWCF provides federal grant funds to protect important natural areas, acquire land for outdoor recreation, and to develop or renovate public outdoor recreational facilities, such as campgrounds, picnic areas, sports and playfields, swimming facilities, boating facilities, fishing facilities, trails, natural areas, and passive parks.

Who Can Apply - Cities, counties, and state and federal agencies are eligible to apply. The minimum amount is \$5,000 and the maximum grant amount is \$75,000. It is a matching reimbursement program.

Recreational Trails Program (RTP)

The Recreational Trails Program (RTP) is funded by the Federal Highway Administration (FHWA). It can be used to provide assistance for acquisition of easements and development and/or maintenance of recreational trails and trailhead facilities for both motorized and non-motorized use. The Recreational Trails Program benefits communities and enhances quality of life. It does not fund equipment such as mowers, UTV's, or trucks. All trails that have received FHWA funding must remain open to the public and maintained in perpetuity.

Who Can Apply - Cities, counties, and state and federal agencies are eligible to apply. Non-profit organizations must partner with a governmental entity.

Appalachian Regional Commission (ARC)

The ARC is a federal-state economic development program designed to assist in the economic development of Appalachia through a diversity of projects in the areas of public infrastructure (water, sewer, solid waste, housing, and telecommunications), human resource development (education/workforce development, affordable/accessible healthcare, and leadership development) and business/entrepreneurial development. Historically, the far eastern region of Kentucky has lagged behind the rest of the nation in terms of economic development. The ARC grant program provides the region with financial assistance for the purpose of creating jobs, developing a workforce, and providing health care and education services.

Who Can Apply - Local governments, special districts, and non-profit entities that include Kentucky's 54 most eastern and south-central counties are eligible to apply for the grant dollars.

State Flood Control Matching Grant Program

The Flood Control Program uses state bond funds as grants to help meet cost-share match requirements associated with projects funded by the U.S. Corps of Engineers, the Federal Emergency Management Agency and the Natural Resources Conservation Service.

The type of projects previously funded include small dam reconstruction, acquisition and relocation of homes from flood prone areas, removal of debris created by tornadoes, and construction of floodwalls and elevation of structures in or near the floodplain. The fund has also been used to participate in flood studies

for future projects.

Who Can Apply - Cities, counties, special districts and area development districts are eligible for grants

Kentucky Oral History Commission Grant

The Kentucky Oral History Commission grant program offers monetary, equipment, and training grants to assist amateur or professional oral historians with oral history research projects on topics of particular significance to Kentucky. These grants encourage statewide participation in the collection and preservation of historically valuable interviews.

KOHC also offers accreditation for archives that want to be permanent repositories for oral history collections, which KOHC sponsors through grant awarded funds and resources.

KOHC provides three monetary grants (project, transcription and indexing, and preservation) and two non-cash grants (technical assistance and preservation assistance).

Who Can Apply - For project grants - any individual or organization that has oral history experience or is collaborating with an oral historian to undertake the project. Nonprofit organizations are welcome, but not required, to apply for grants. Partnerships can be an important part of any oral history project and we encourage applicants to consider building formal or informal partnerships within their project applications.

For transcription and indexing grants - Any Kentucky-based nonprofit institution or organization with an existing oral history collection. Individuals also may apply but must have a written agreement with an appropriate Kentucky repository for storage of and access to the interviews and transcripts. (The KOHC administrator can provide a list of accredited Kentucky oral history repositories.)

For preservation assistance grants - Any organization with oral history interviews in its archival collection. Applicants may include, but are not limited to, county historical societies, libraries and universities.

USACE Planning Assistance to States Program

Every year, each State, local government, or other non-Federal entity can provide the Corps of Engineers its request for studies under the program, and the Corps of Engineers then accommodates as many studies as possible within the funding allotment. Typical studies are only planning level of detail; they do not include detailed design for project construction. The studies generally involve analysis of existing data for planning purposes, using standard engineering techniques, although some data collection is often necessary. Most studies become the basis for State, and local planning decisions. Congress funds the Planning Assistance to States (PAS) Program annually. Federal allotments for each State or Tribe from the nationwide appropriation are limited to \$5 million annually, but typically are much less. Individual studies, of which there may be more than one per state each year, generally range in cost from \$35,000 to over \$100,000.

Typical Studies encompass many types of studies dealing with water and related land resources issues. Types of studies conducted in recent years under the program include the following:

- Water Supply and Demand
- Water Quality
- Environmental Conservation and/or Restoration
- Dam Safety
- Flood Risk and/or Floodplain Management

- Land Use
- Master Planning
- Brownfield Assessment
- Navigation
- Recreational Master Planning
- GIS Development
- Engineering Analysis
- Drainage analysis
- Erosion and Sedimentation

PAS Studies are cost shared on a 50% Federal, 50% non-Federal basis. The non-Federal cost share may be made up of cash, in-kind services, or a mixture of both.

A Planning Assistance to States project can be initiated upon receipt of a request from a sponsoring agency empowered under State law to provide local partnership.

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Appendices

Appendix 1: Projected Population Change: Kentucky; Counties along the Green River; and ADDs, 2010-2040						
		2010 Census	2015 Estimate	2020 Projection	2030 Projection	2040 Projection
	Kentucky	4,339,367	4,425,092	4,533,464	4,726,382	4,886,381
UPPER	Lincoln	24,742	24,463	24,324	23,576	22,319
	Casey	15,955	15,808	15,521	14,729	13,725
	Adair	18,656	20,640	21,377	22,473	23,091
	Taylor	<u>24,512</u>	<u>25,420</u>	<u>25,945</u>	<u>26,890</u>	<u>27,718</u>
		83,865	86,331	87,167	87,668	86,853
MIDDLE	Green	11,258	11,010	10,716	9,971	9,093
	Hart	18,199	18,454	18,683	18,935	18,889
	Edmonson	12,161	12,007	11,812	11,237	10,391
	Warren	113,792	122,851	133,207	157,013	183,705
	Butler	<u>12,690</u>	<u>12,938</u>	<u>12,720</u>	<u>12,068</u>	<u>11,269</u>
		168,100	177,260	187,138	209,224	233,347
LOWER	Muhlenberg	31,499	31,183	30,582	29,110	27,286
	Ohio	23,842	24,216	24,235	23,832	23,181
	McLean	9,531	9,512	9,274	8,642	7,942
	Hopkins	46,920	46,222	45,565	43,549	40,890
	Webster	13,621	13,170	12,600	10,600	9,910
	Henderson	46,250	46,407	46,358	45,516	43,987
	Daviess	<u>96,656</u>	<u>99,259</u>	<u>102,033</u>	<u>106,676</u>	<u>110,129</u>
		268,319	269,969	270,647	267,925	263,325
		TOTAL	520,284	533,560	544,952	564,817
ADDs	Barren River	284,195	295,952	308,284	334,069	359,989
	Bluegrass	770,404	806,167	842,987	919,654	995,859
	Green River	213,472	216,306	218,192	219,083	217,056
	Lake Cumberland	207,256	207,984	209,833	210,785	208,870
	Pennyrile	<u>219,305</u>	<u>216,964</u>	<u>216,553</u>	<u>212,277</u>	<u>206,588</u>
	TOTAL	1,694,632	1,743,373	1,795,849	1,895,868	1,988,362

Sources: Projections of Population and Households - State of Kentucky, Kentucky Counties, and Area Development Districts, 2015-2040; Vintage 2016, Kentucky State Data Center, University of Louisville

Appendix 2: Poverty Rate, Average Hourly Wage, Average Annual Wage, Unemployment Rate, and Per Capita Income for Counties along the Green River, 2015						
	County	Below Poverty	Average Hourly Wage	Average Annual Wage	Unemployment Rate	Per Capita Income
	U.S.	12.7%	\$24.57	\$55,775	5.3%	\$29,979
	Kentucky	18.5%	\$20.08	\$41,760	5.4%	\$24,063
UPPER	Lincoln	25.0%	\$14.73	\$30,628	7.1%	\$29,204
	Casey	28.8%	\$13.50	\$28,080	5.9%	\$28,153
	Adair	19.8%	\$13.48	\$28,028	8.0%	\$26,876
	Taylor	22.9%	\$14.98	\$31,148	5.9%	\$33,309
MIDDLE	Green	21.1%	\$12.38	\$25,740	5.5%	\$33,484
	Hart	25.9%	\$15.50	\$32,240	5.5%	\$32,465
	Edmonson	16.8%	\$14.58	\$30,316	7.4%	\$29,588
	Warren	19.1%	\$18.30	\$38,064	4.6%	\$35,966
	Butler	27.3%	\$14.83	\$29,900	6.9%	\$32,054
LOWER	Muhlenberg	21.2%	\$19.48	\$40,508	8.0%	\$31,472
	Ohio	22.2%	\$15.28	\$31,772	8.2%	\$31,613
	McLean	19.2%	\$15.18	\$31,564	6.0%	\$37,007
	Hopkins	17.3%	\$19.68	\$40,924	6.2%	\$36,518
	Webster	14.4%	\$22.98	\$47,788	6.0%	\$36,870
	Henderson	18.5%	\$17.75	\$36,920	5.7%	\$36,766
	Daviess	15.8%	\$17.55	\$26,504	5.3%	\$40,032

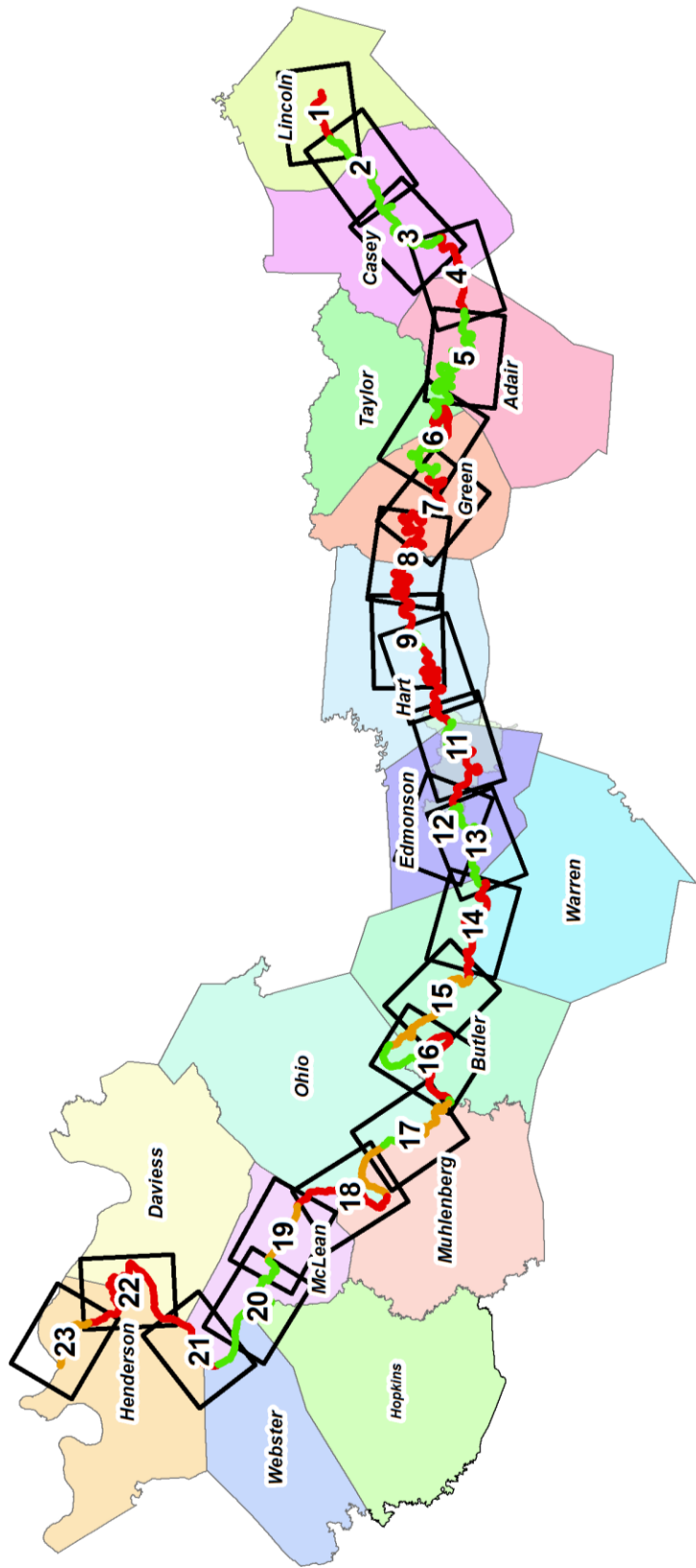
Source: 2015 ADD Wage & Employment, Kentucky Center for Education & Workforce Statistics.

<https://kcews.ky.gov/KYLMI/Index/>; Bureau of Labor Statistics.

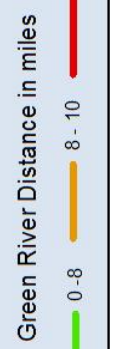
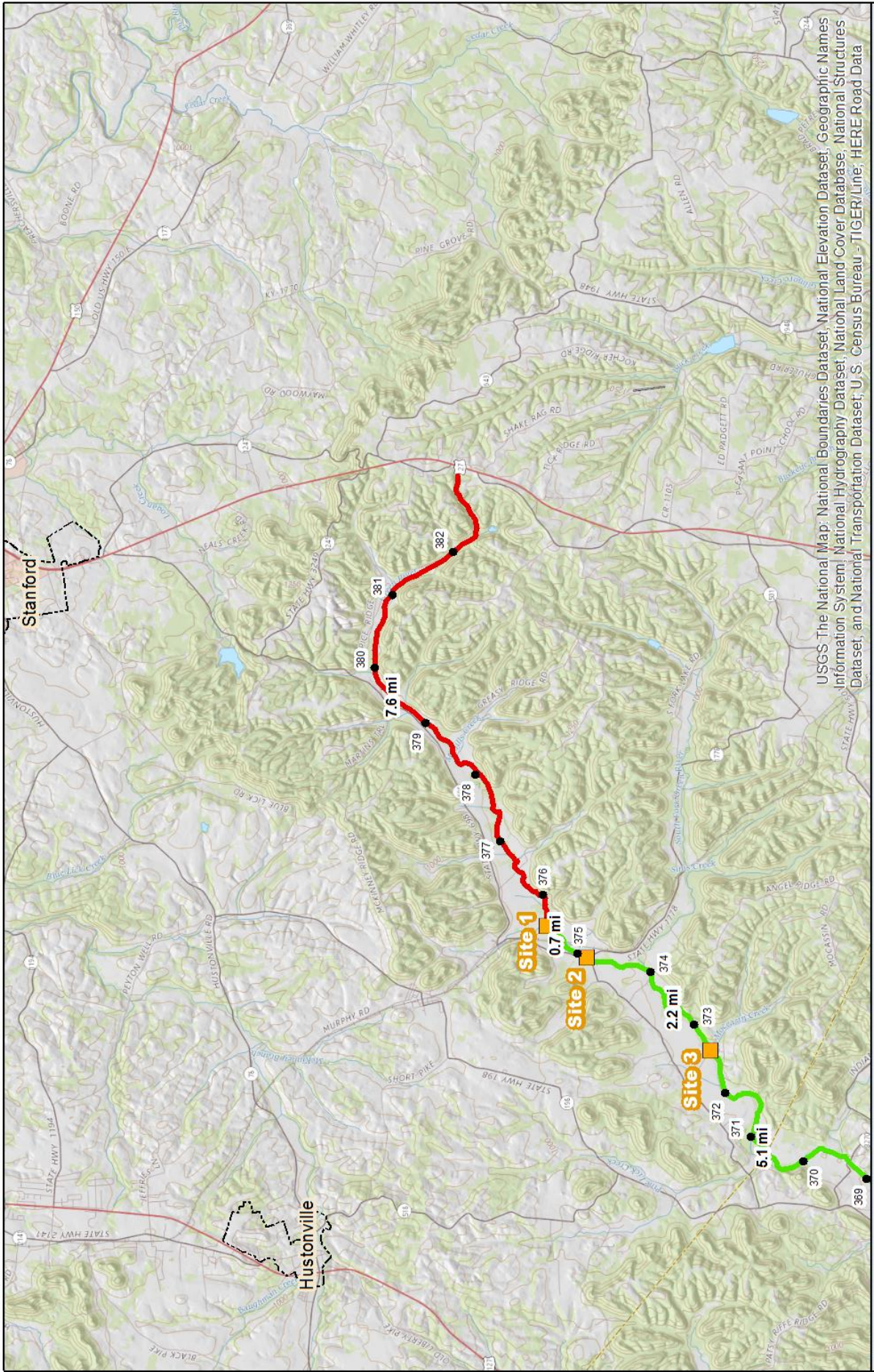
Appendix 3: Public Health Outcomes for US, Kentucky and Counties Along the Green River

		Adult Obesity (%)	Physical Inactivity (%)	Access to Exercise Opportunities (%)	Preventable Hospital Stays	Diabetes Prevalence	Cardiovascular Deaths (per 100,000 population)	Stroke Deaths (per 100,000 population)
	US	31%	28%	62%	60	9.3%	167	41.7
	Kentucky	32%	29%	70%	85	12%	204	42
UPPER	Lincoln	29%	33%	30%	67	13%	200	39
	Casey	36%	33%	33%	151	15%	203	41
	Adair	32%	32%	45%	100	13%	264	44
	Taylor	37%	35%	69%	90	13%	215	48
MIDDLE	Green	33%	31%	48%	108	14%	237	47
	Hart	35%	34%	56%	81	14%	227	42
	Edmonson	35%	33%	40%	85	13%	188	35
	Warren	29%	27%	60%	78	10%	195	43
	Butler	36%	37%	31%	127	14%	219	47
LOWER	Muhlenberg	37%	33%	31%	108	13%	214	42
	Ohio	40%	34%	3%	93	13%	222	39
	McLean	36%	32%	24%	50	13%	212	40
	Hopkins	35%	29%	58%	75	13%	248	50
	Webster	33%	30%	1%	94	12%	224	61
	Henderson	32%	29%	66%	102	13%	199	51
	Daviess	29%	25%	76%	58	12%	183	37

Sources: Adult Obesity, Physical Inactivity, Access to Exercise Opportunities, Preventable Hospital Stays, & Diabetes Prevalence: 2016 County Health Rankings Report for Kentucky; Cardiovascular & Stroke Deaths: 2014, Kentucky State Data Center.

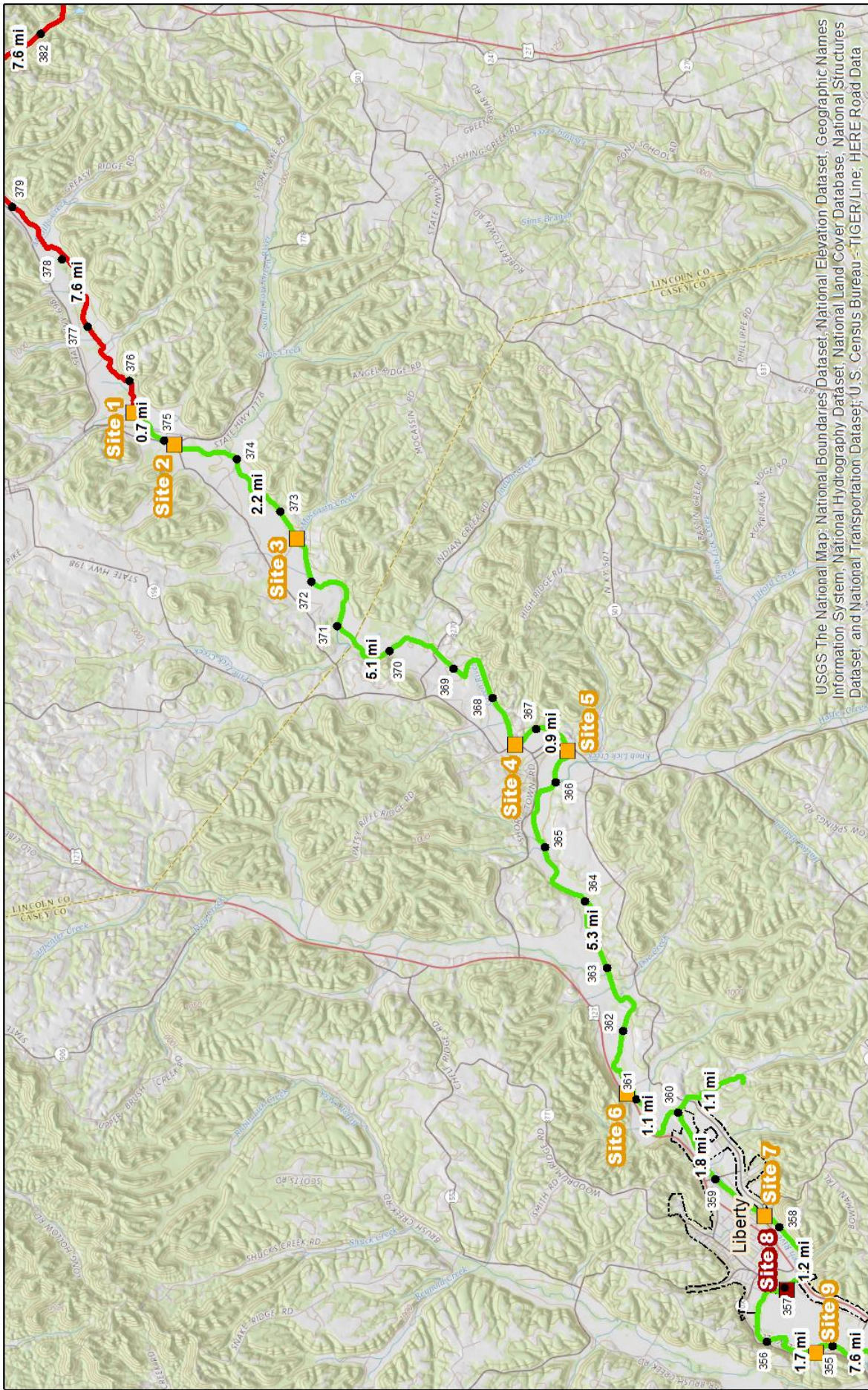


Appendix 4: Green River Launch Site Index



Green River Launch Site
Map 1 of 23

USGS: The National Map, National Boundaries Dataset, National Elevation Dataset, National Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data



USGS The National Map; National Boundaries Dataset; National Elevation Dataset; Geographic Names Information System; National Hydrography Dataset; National Land Cover Database; National Structures Dataset; and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data

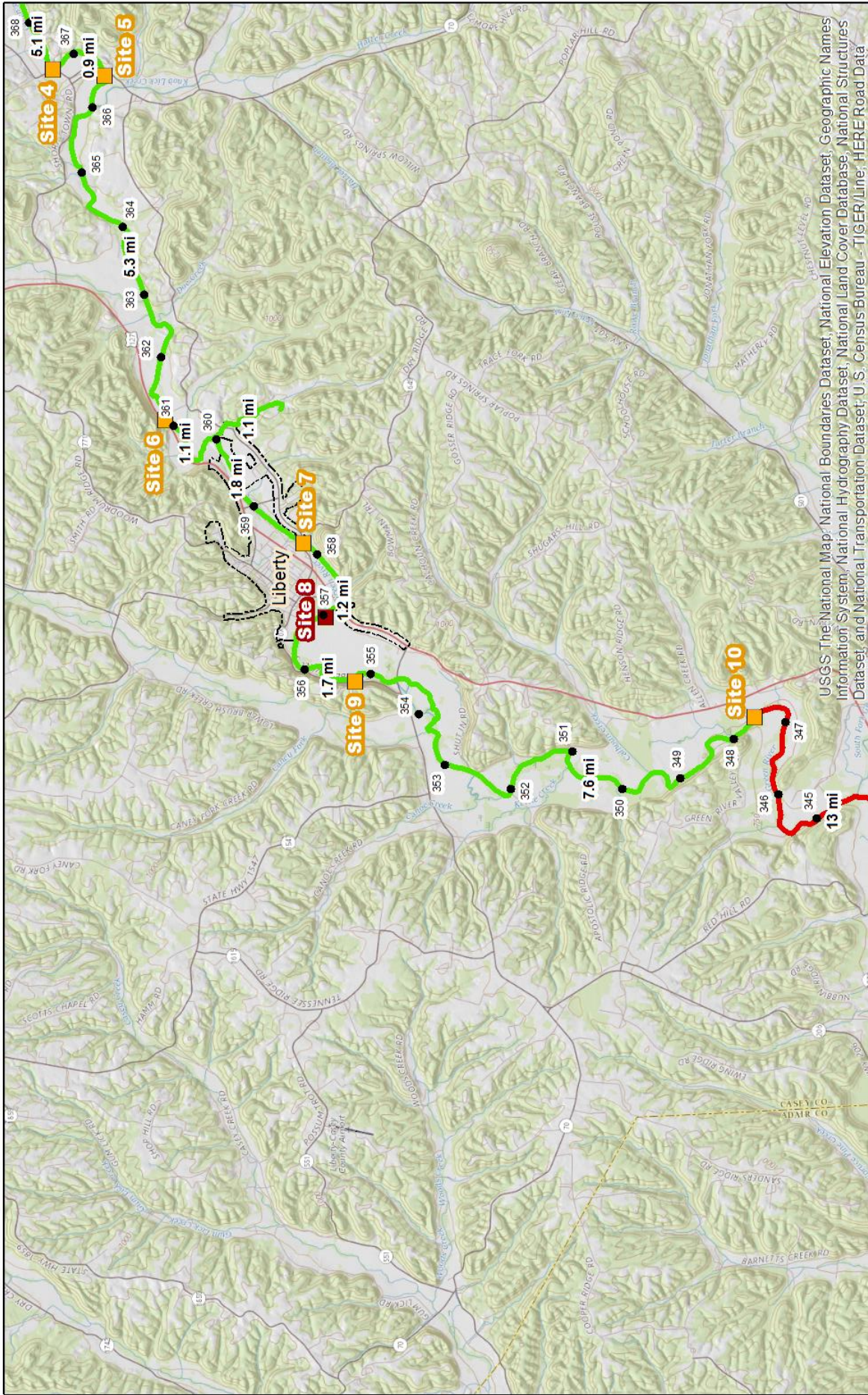


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- City Boundary

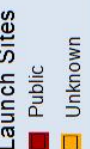
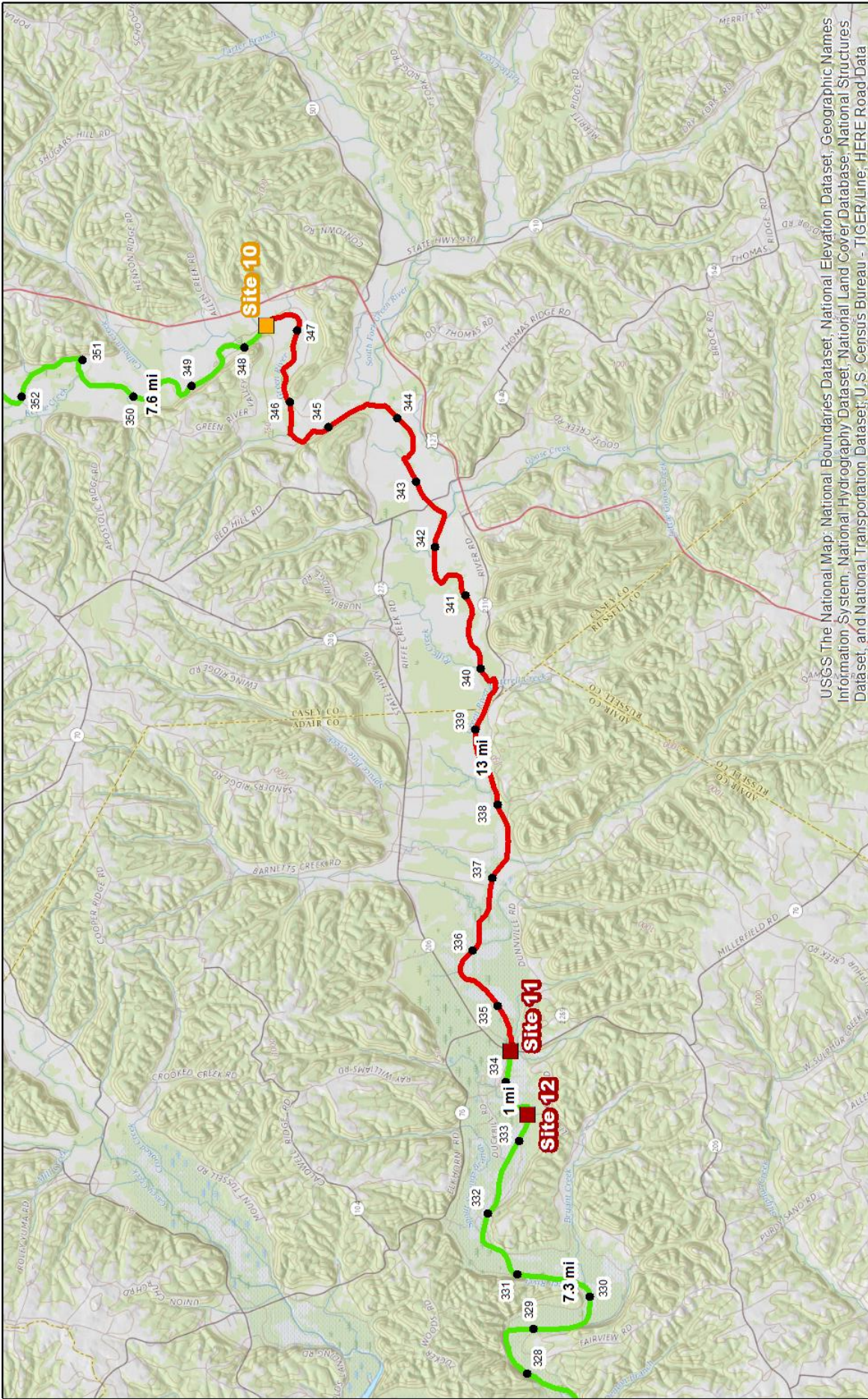
- Green River Distance in miles**
- 0 - 8
 - 8 - 10
 - 10 +

- Launch Sites**
- Public
 - Unknown

Green River Launch Site Map 2 of 23

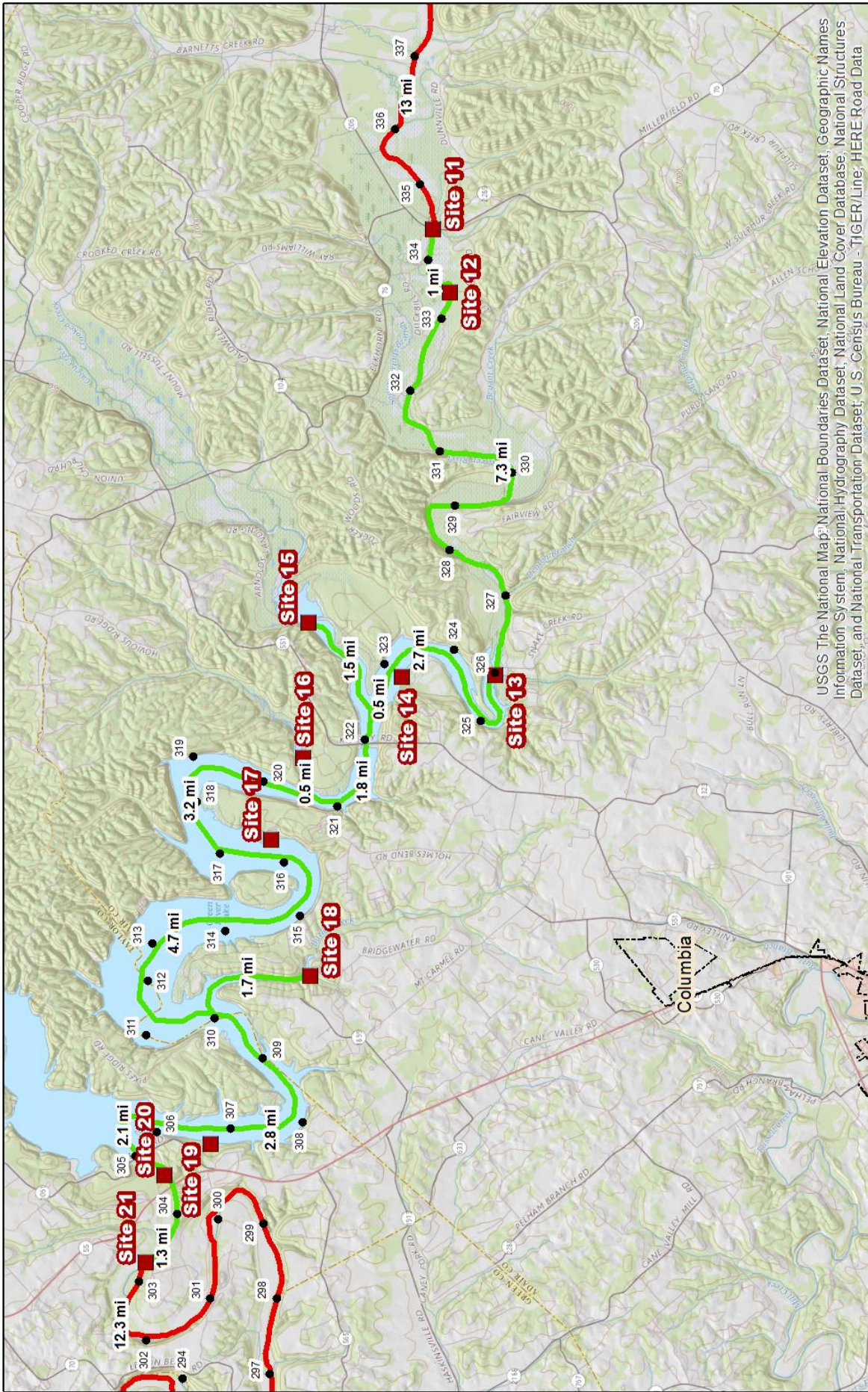


Green River Launch Site
Map 3 of 23



Green River Launch Site Map 4 of 23

USGS: The National Map; National Boundaries Dataset; National Elevation Dataset; National Geographic Names Information System; National Hydrography Dataset; National Land Cover Database; National Structures Dataset; and National Transportation Dataset; U.S. Census Bureau - TIGER/Line- HERE Road Data



USGS The National Map; National Boundaries Dataset, National Elevation Dataset, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data



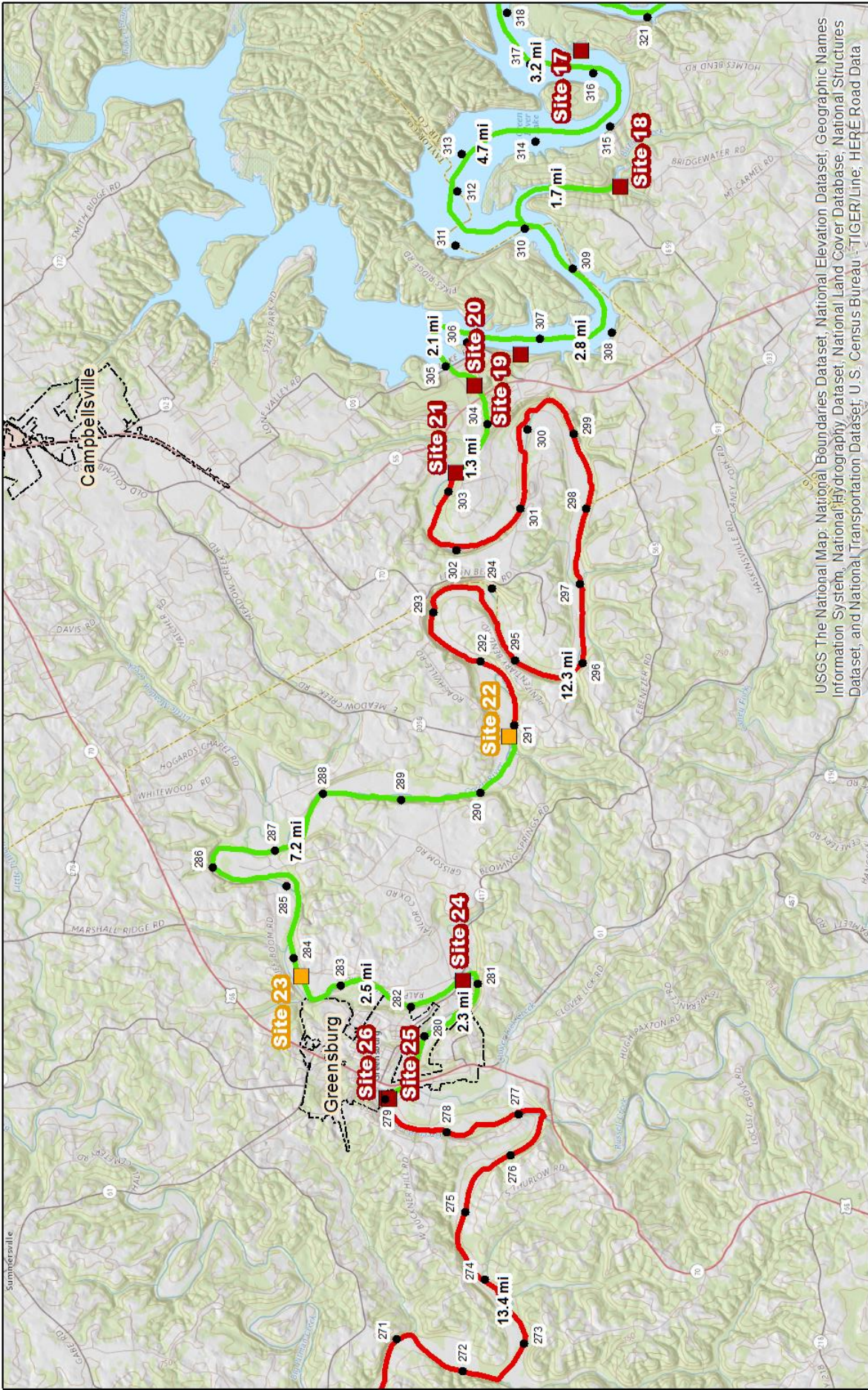
- Milepoints
- City Boundary

- Green River Distance in miles
- 0 - 8
 - 8 - 10
 - 10+

- Launch Sites
- Public
 - Unknown

Green River Launch Site

Map 5 of 23



USGS The National Map; National Boundaries Dataset; National Elevation Dataset; Geographic Names Information System; National Hydrography Dataset; National Land Cover Database; National Structures Dataset; and National Transportation Dataset; U.S. Census Bureau; TIGER/Line; HERE Road Data

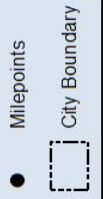
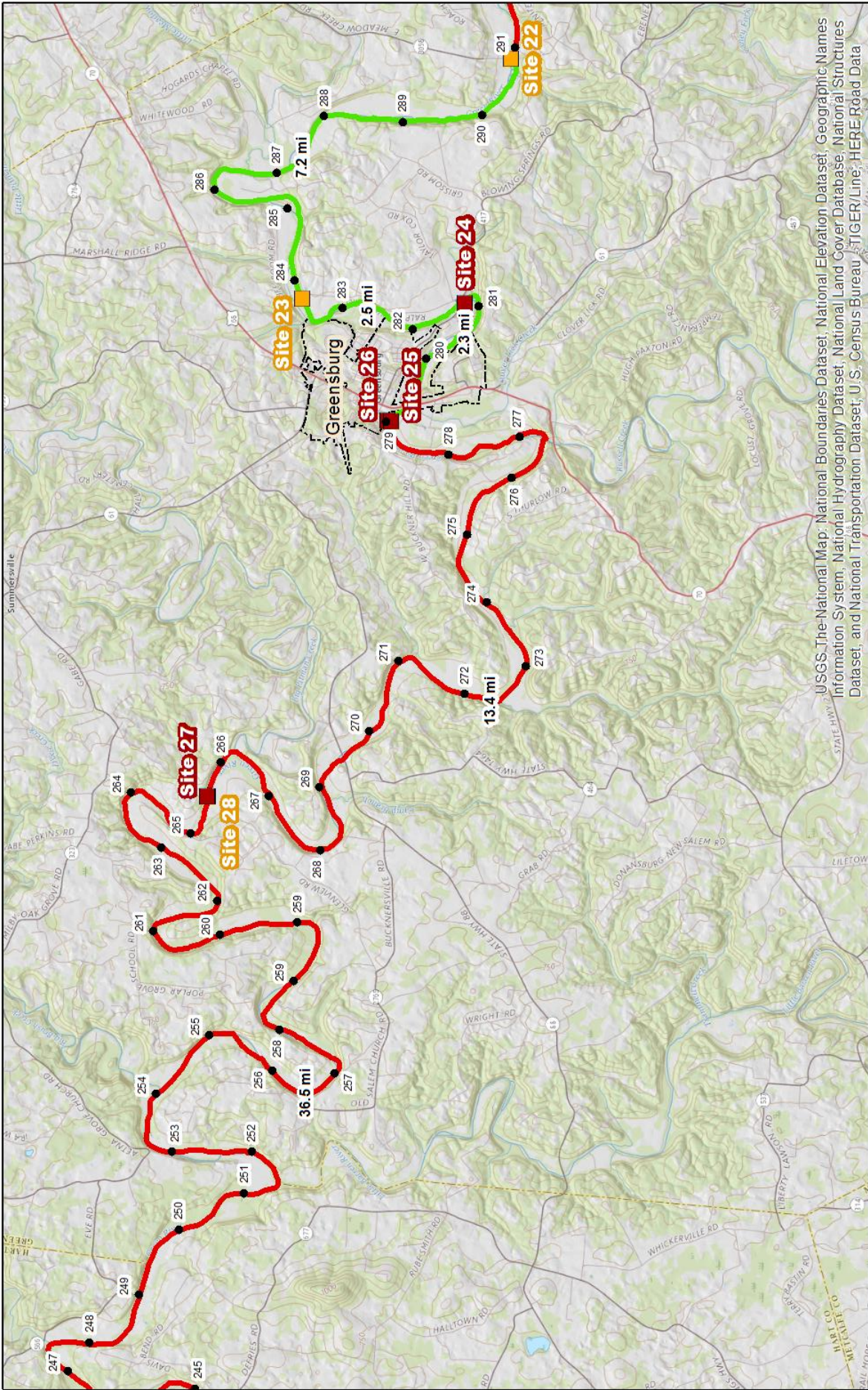


- Milepoints
- City Boundary

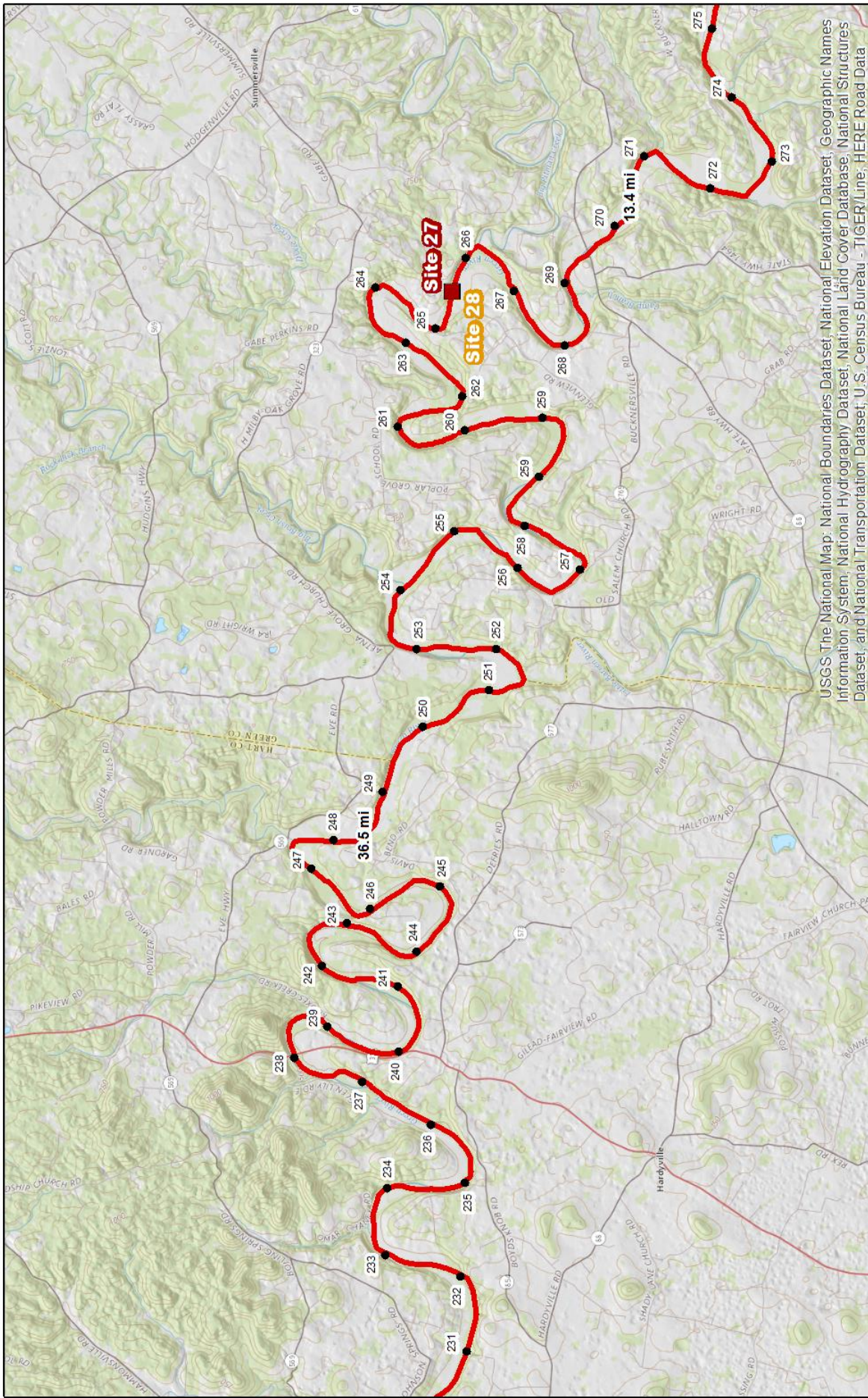
- Green River Distance in miles
- 0 - 8
- 8 - 10
- 10+

- Launch Sites
- Public
- Unknown

Green River Launch Site Map 6 of 23



Green River Launch Site Map 7 of 23



USGS The National Map; National Boundaries Dataset; National Elevation Dataset; Geographic Names Information System; National Hydrography Dataset; National Land Cover Database; National Structures Dataset; and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data

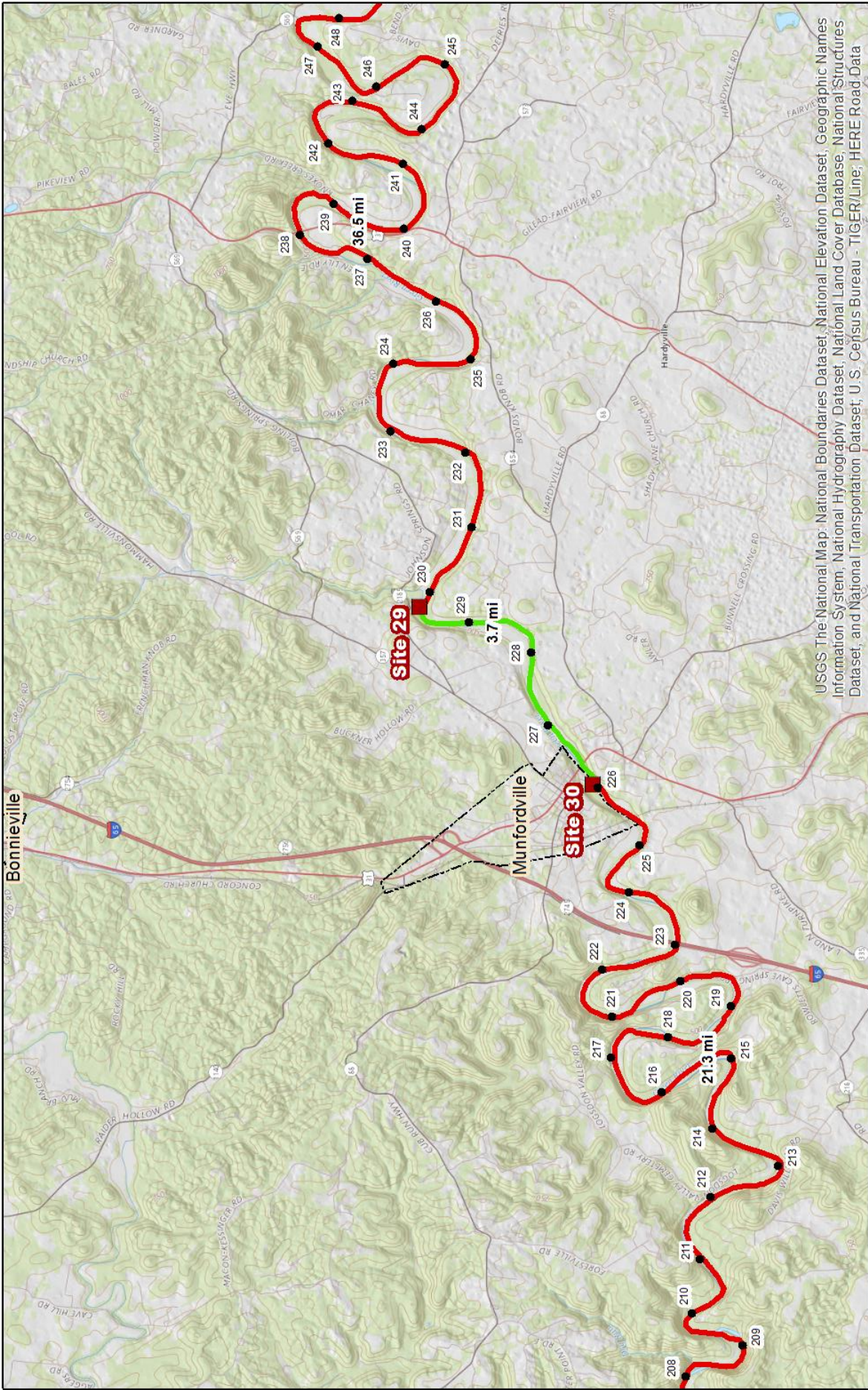
Green River Launch Site Map 8 of 23

Launch Sites
■ Public
■ Unknown

Green River Distance in miles
— 0-8
— 8-10
— 10+

Milepoints
 ● Milepoints
 □ City Boundary



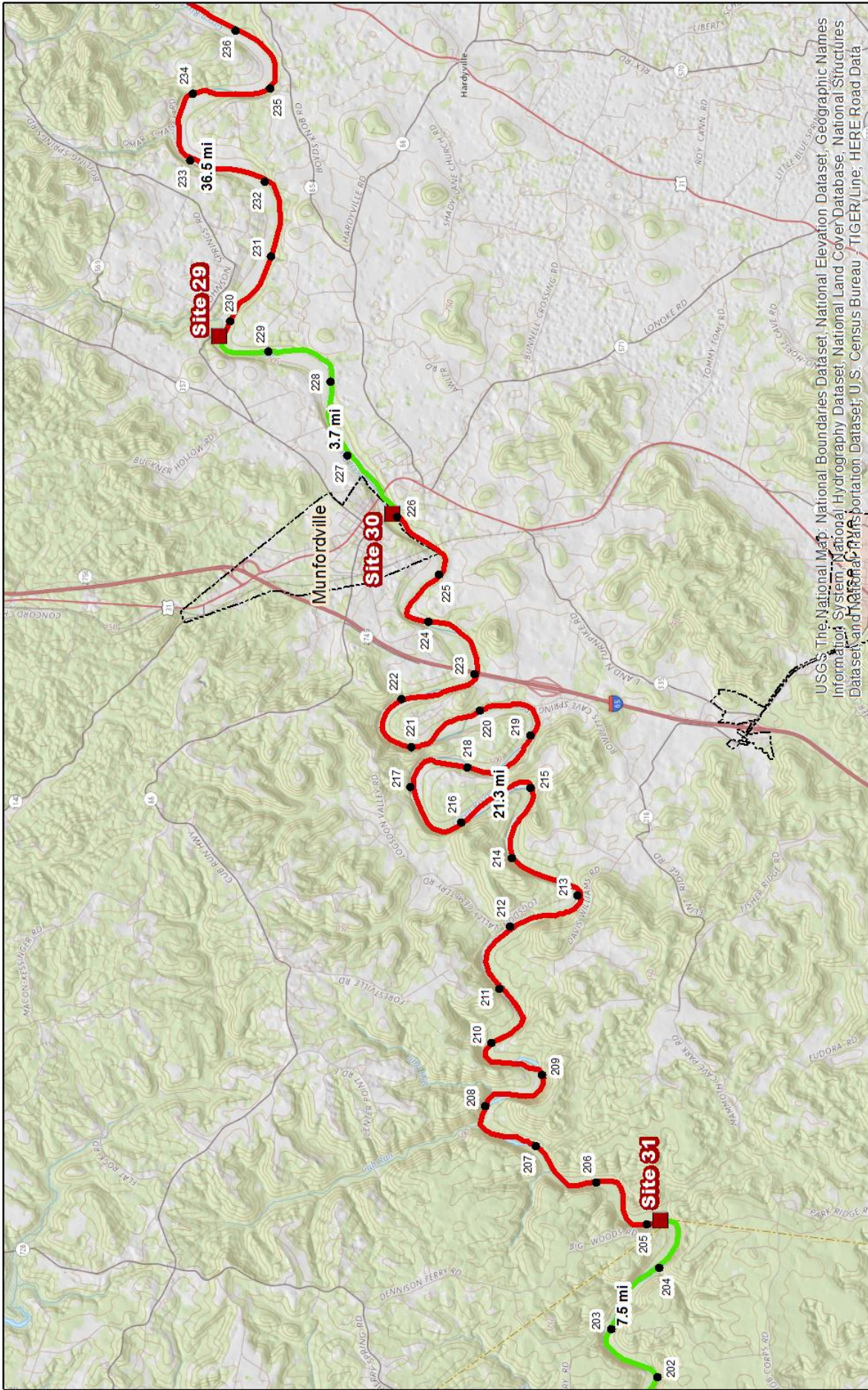


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- Launch Sites
- Public
- Unknown
- Green River Distance in miles
- 0 - 8
- 8 - 10
- 10+
- Milepoints
- City Boundary

Green River Launch Site Map 9 of 23



USGS: The National Map, National Boundaries Dataset, National Elevation Dataset, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data

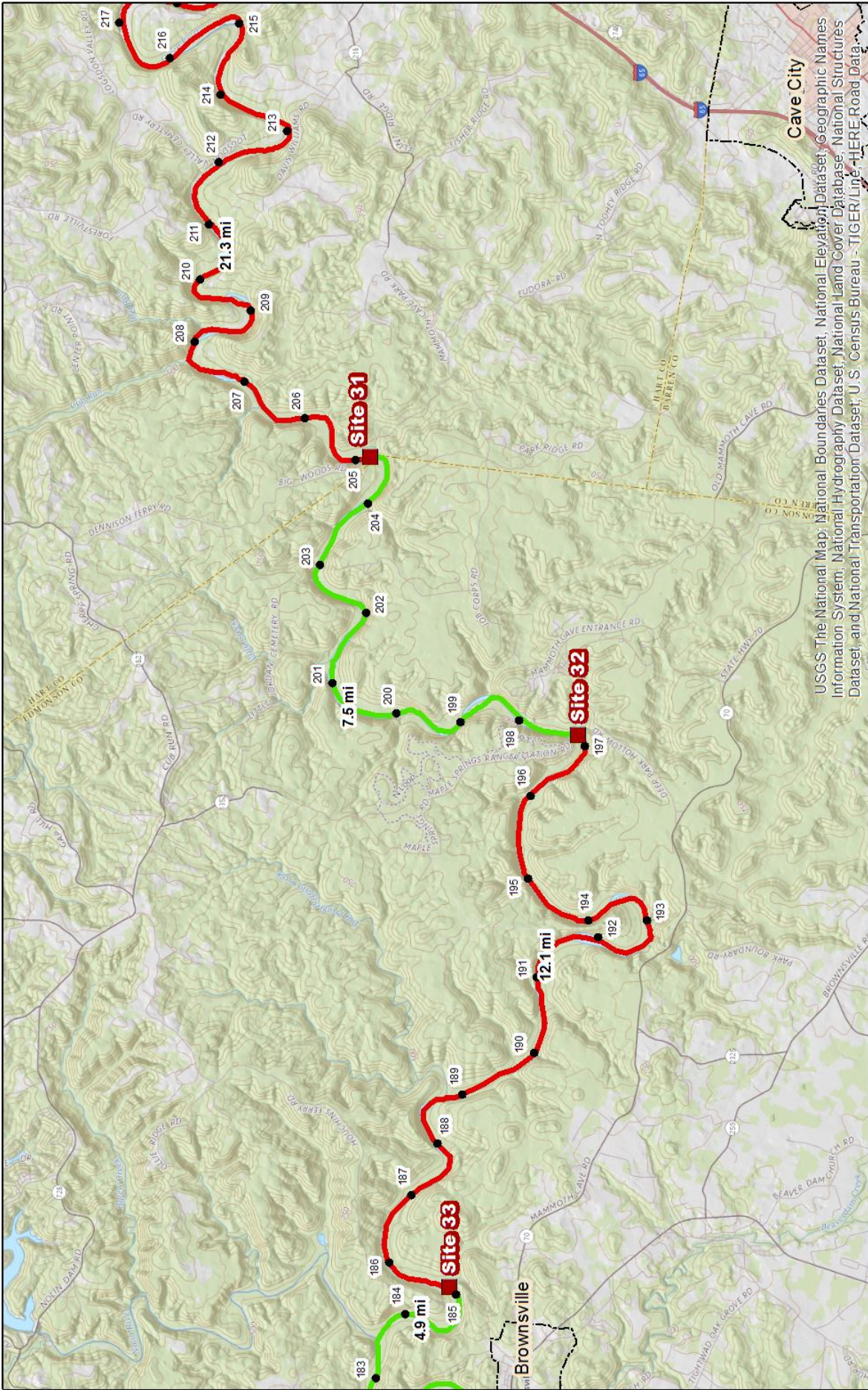


● Milepoints
 □ City Boundary

Green River Distance in miles
 0 - 8
 8 - 10
 10+

Launch Sites
 ■ Public
 □ Unknown

Green River Launch Site Map 10 of 23



USGS: The National Map; National Boundaries Dataset; National Elevation Dataset; Geographic Names Information System; National Hydrography Dataset; National Land Cover Database; National Structures Dataset; and National Transportation Dataset; U.S. Census Bureau - TIGER/Line-HERE Road Data

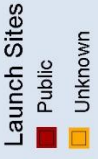
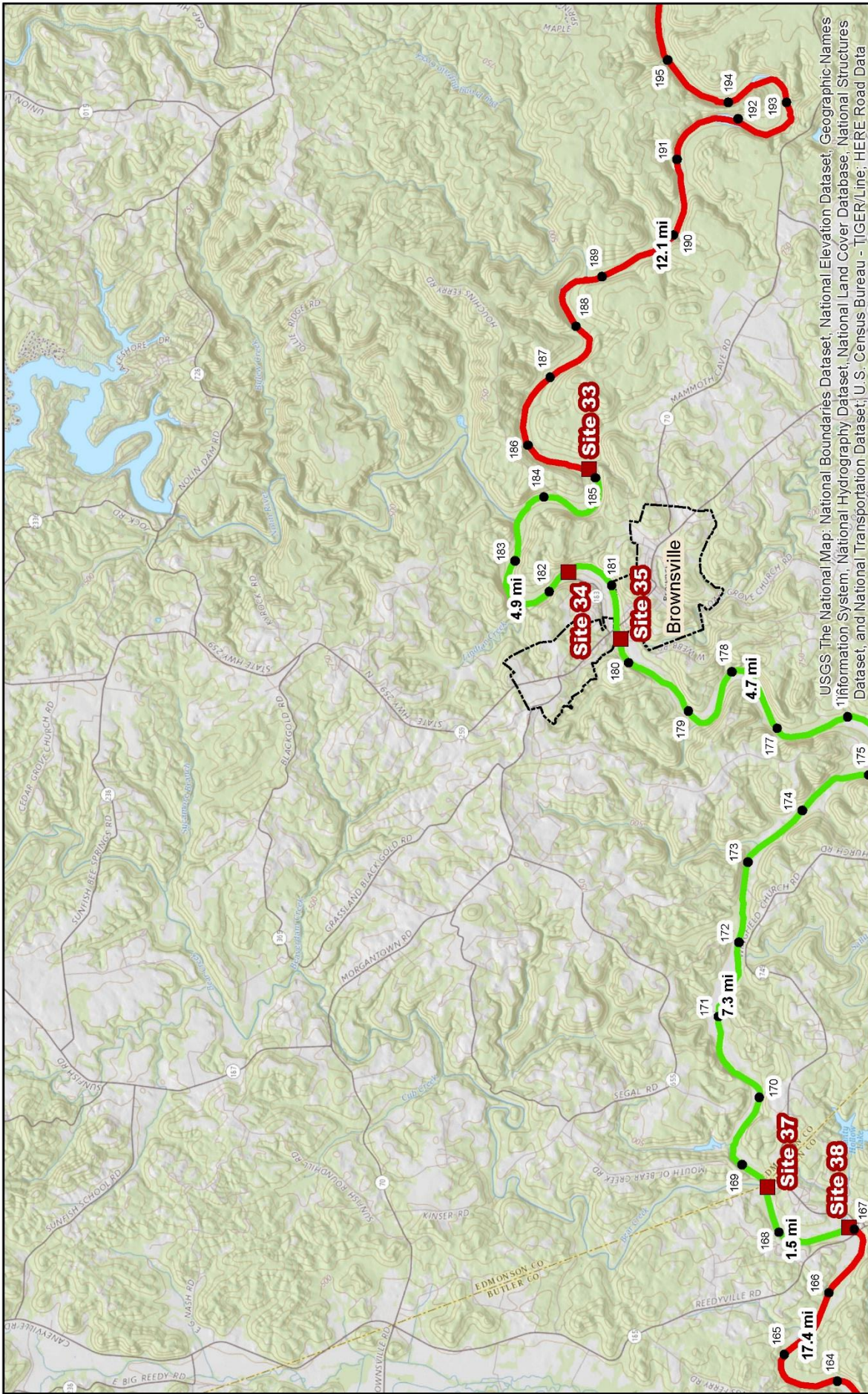


- Milepoints
- City Boundary

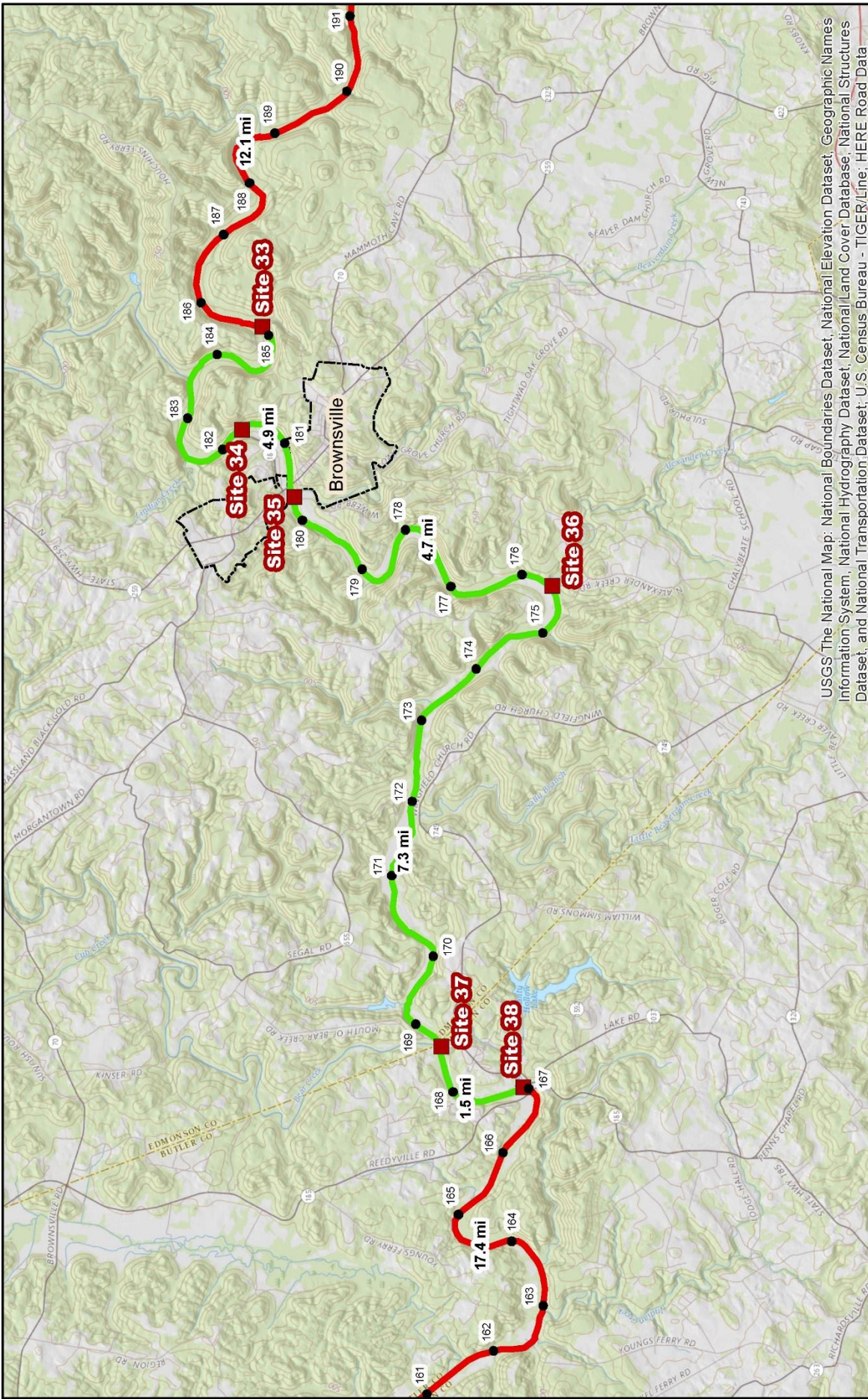
- Green River Distance in miles
- 0 - 8
 - 8 - 10
 - 10+

- Launch Sites
- Public
 - Unknown

Green River Launch Site Map 11 of 23



Green River Launch Site
Map 12 of 23



USGS The National Map: National Boundaries Dataset, National Elevation Dataset, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data

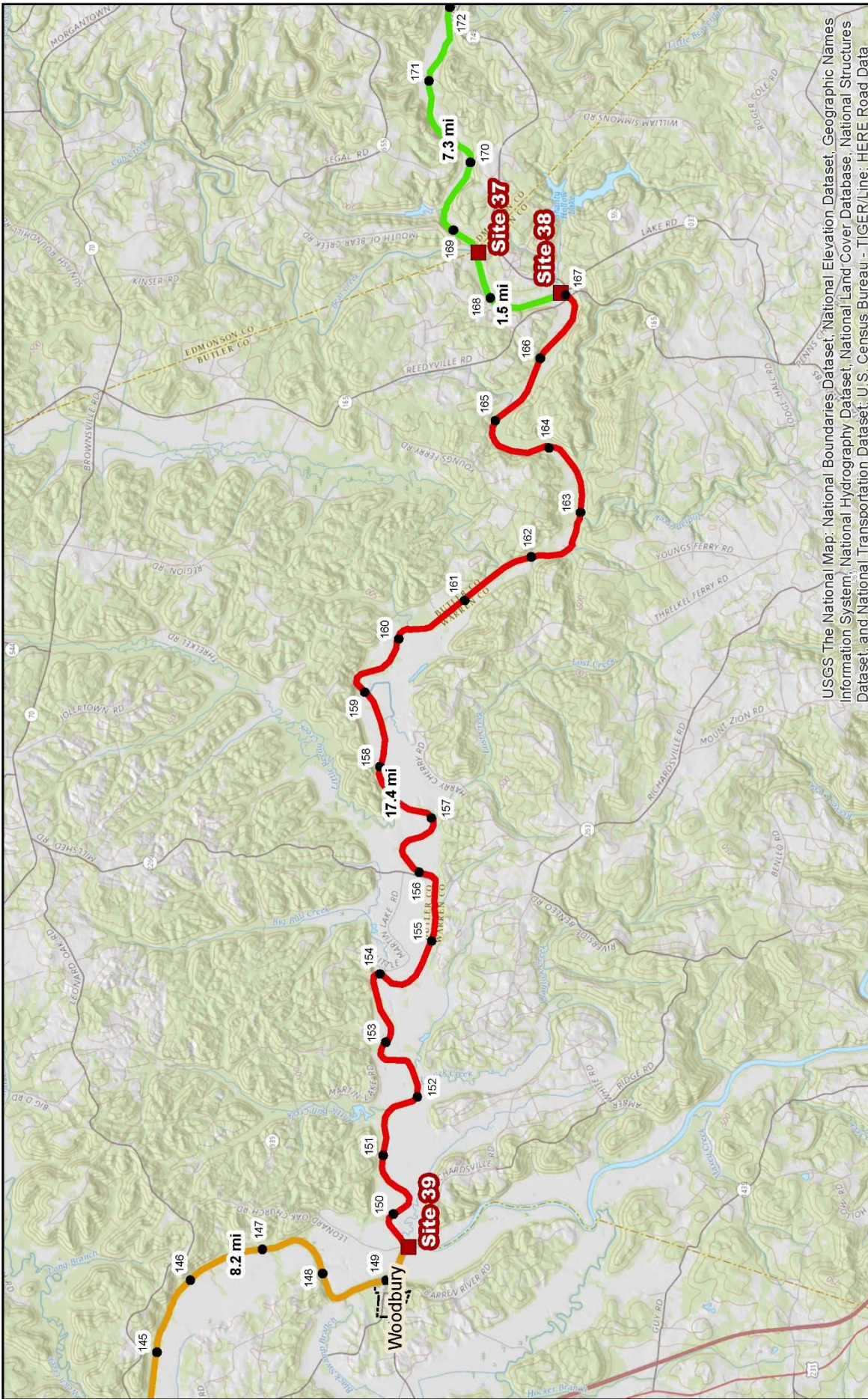


- Milepoints
- City Boundary

- Green River Distance in miles
- 0 - 8
 - 8 - 10
 - 10+

- Launch Sites
- Public
 - Unknown

Green River Launch Site Map 13 of 23



USGS The National Map; National Boundaries Dataset; National Elevation Dataset; Geographic Names Information System; National Hydrography Dataset; National Land Cover Database; National Structures Dataset; and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data



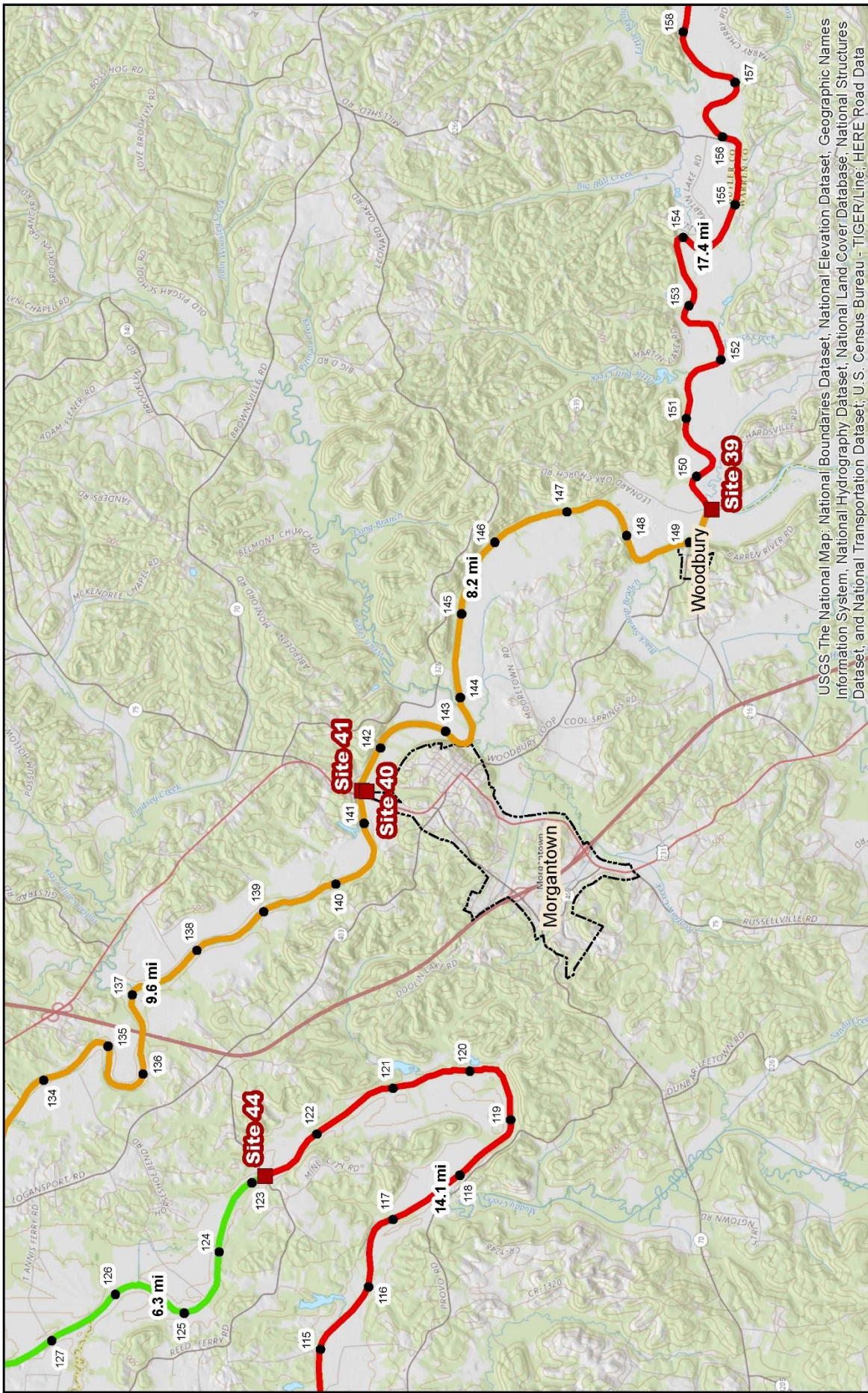
- Milepoints
- Launch Sites
- Public
- Unknown
- City Boundary

Green River Distance in miles

- 0 - 8
- 8 - 10
- 10+

Green River Launch Site

Map 14 of 23



USGS: The National Map; National Boundaries Dataset; National Elevation Dataset; Geographic Names Information System; National Hydrography Dataset; National Land Cover Database; National Structures Dataset; and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data

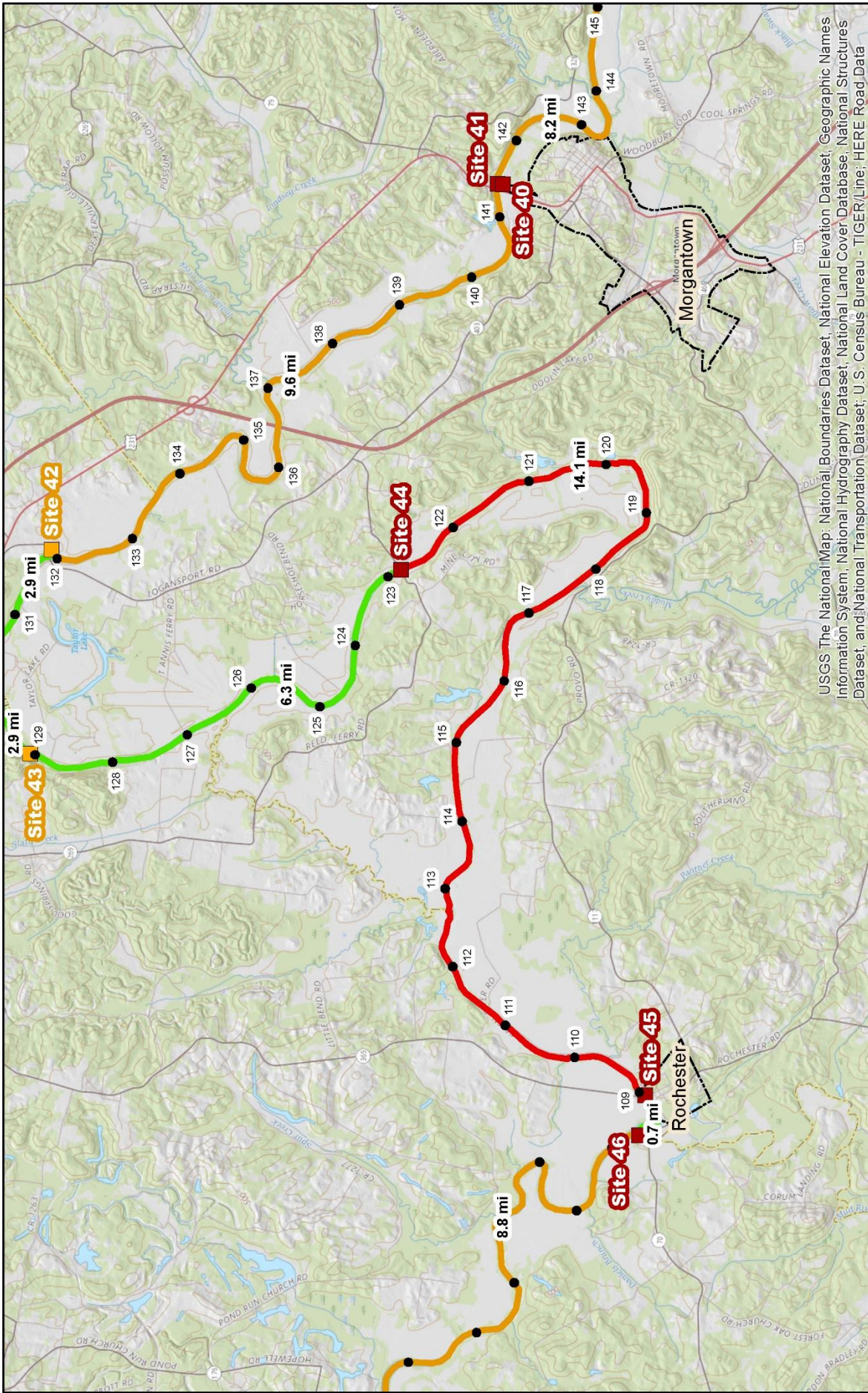
Green River Launch Site Map 15 of 23

Launch Sites
■ Public
■ Unknown

Green River Distance in miles
— 0 - 8
— 8 - 10
— 10+

● Milepoints
 □ City Boundary





USGS The National Map; National Boundaries Dataset; National Elevation Dataset; Geographic Names Information System; National Hydrography Dataset; National Land Cover Database; National Structures Dataset; and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data

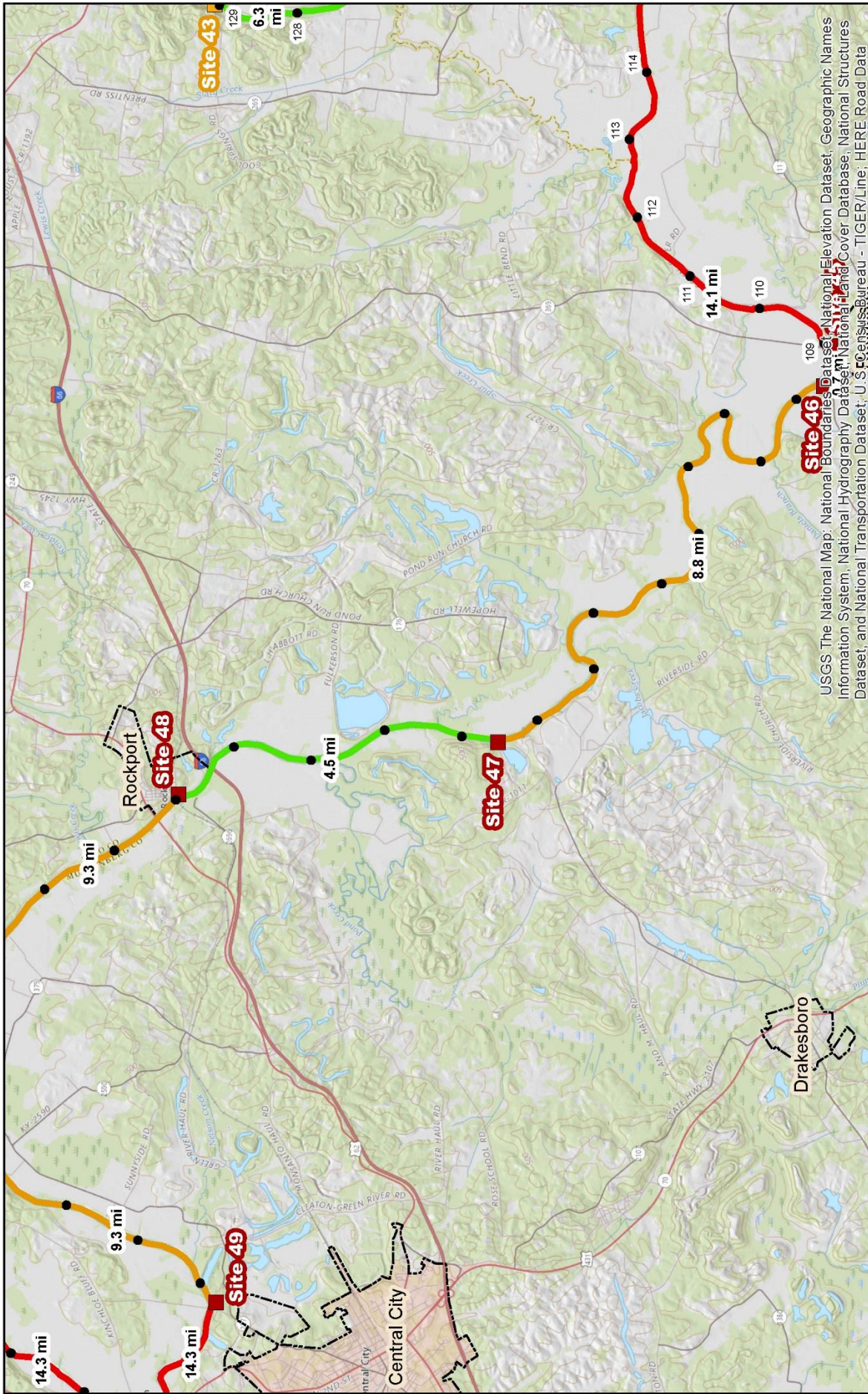


● Milepoints
 □ City Boundary

Green River Distance in miles
 0-8
 8-10
 10+

Launch Sites
 ■ Public
 ■ Unknown

Green River Launch Site Map 16 of 23



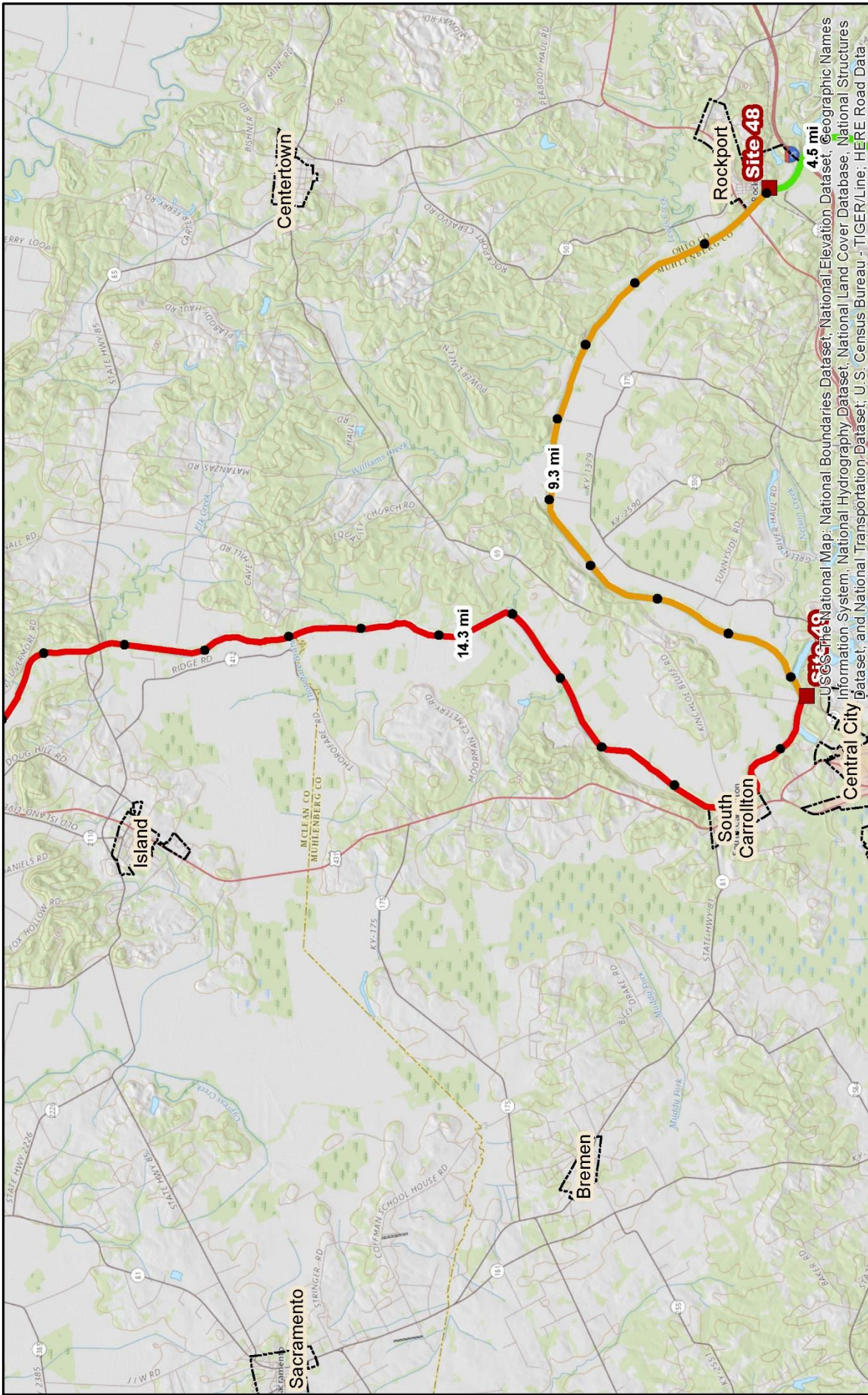
Green River Launch Site
Map 17 of 23

Launch Sites
 Public (Red square)
 Unknown (Orange square)

Green River Distance in miles
 0-8 (Green line)
 8-10 (Orange line)
 10+ (Red line)

Milepoints (Black dot)
City Boundary (Dashed line)

Barren River Area Development District logo
 North arrow (N, S, E, W)



Green River Launch Site
Map 18 of 23

■ Public
■ Unknown

— 0 - 8
— 8 - 10
— 10+

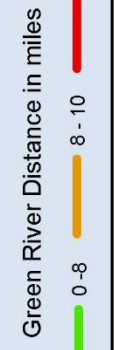
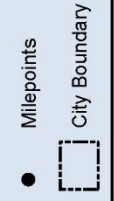
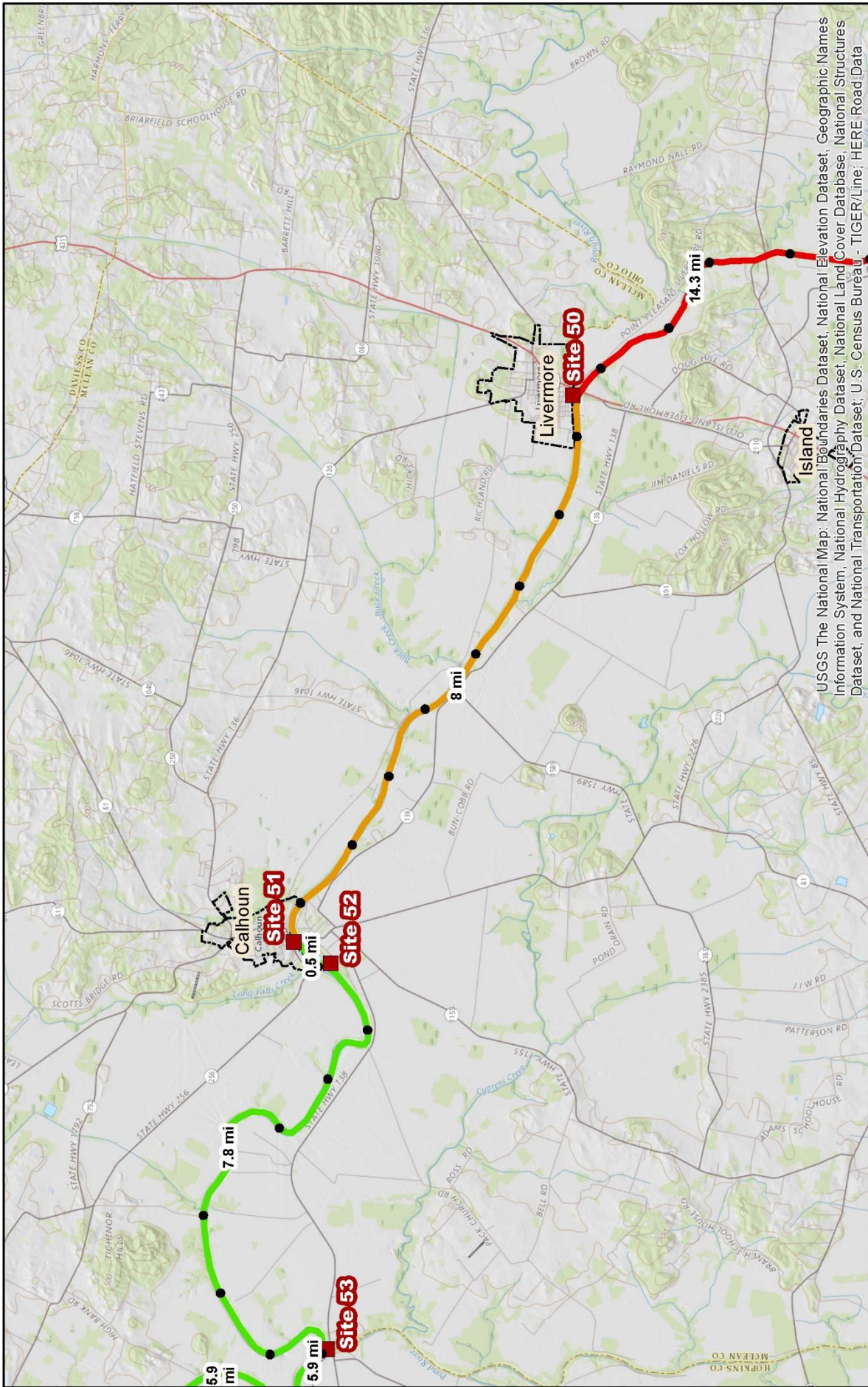
● Milepoints
 City Boundary

Launch Sites
 Green River Distance in miles

N
 W — E
 S

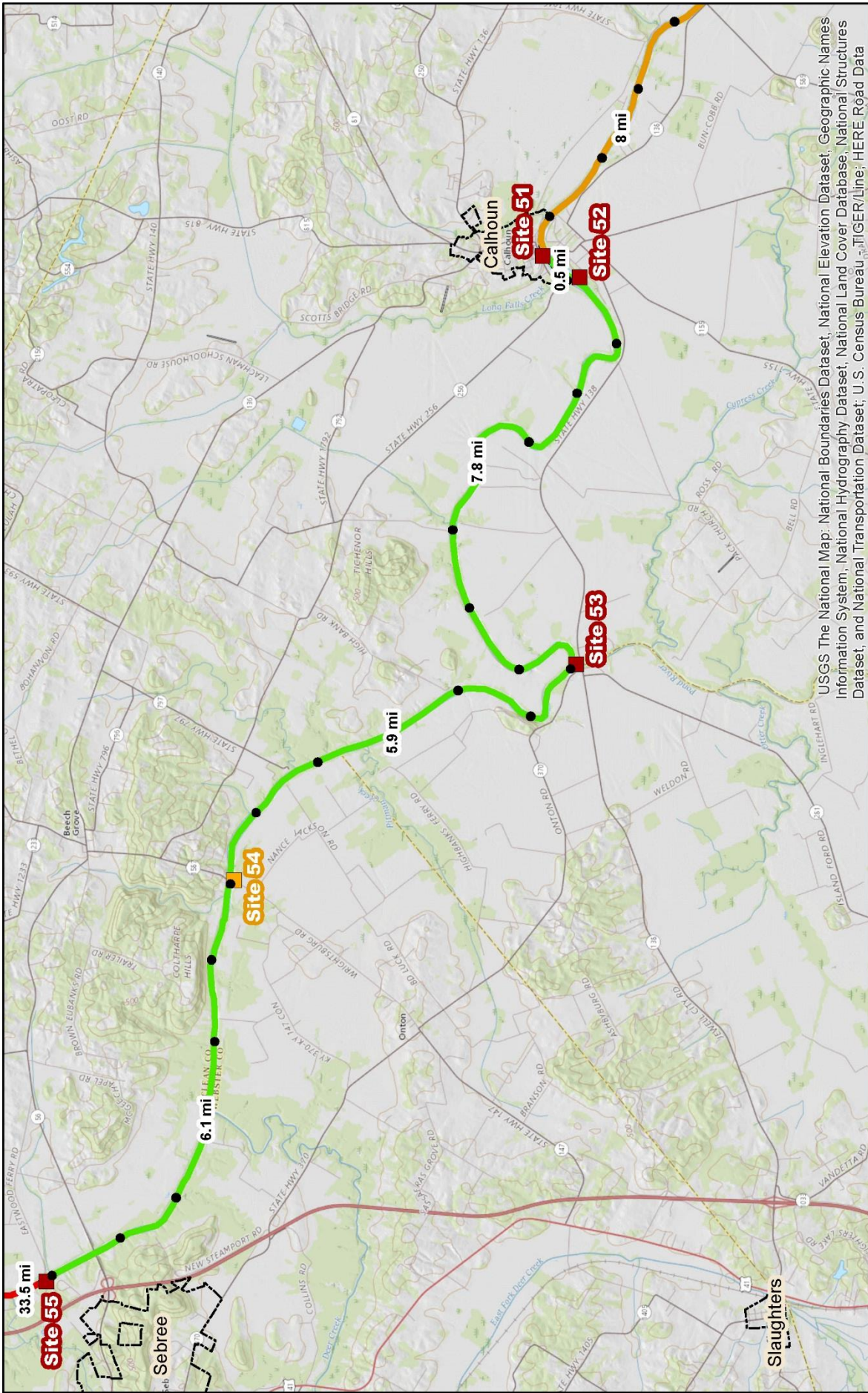
BAREN RIVER
 BRADDO
 AREA DEVELOPMENT DISTRICT

USGS Time National Map; National Boundaries Dataset; National Elevation Dataset; Geographic Names Information System; National Hydrography Dataset; National Land Cover Database; National Structures Dataset; and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data



Green River Launch Site
Map 19 of 23

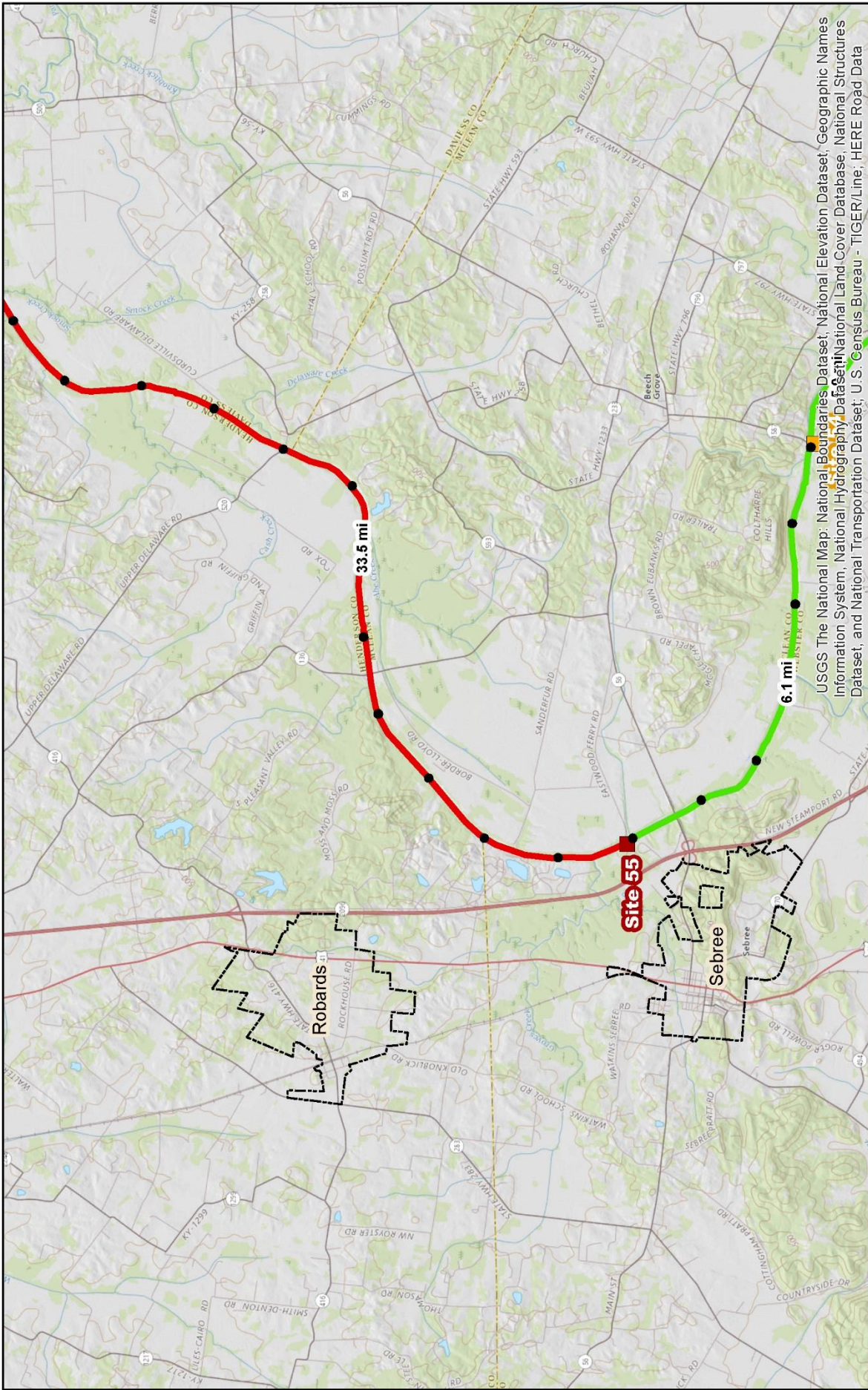
USGS The National Map: National Boundaries Dataset, National Elevation Dataset, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data



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Green River Launch Site Map 20 of 23



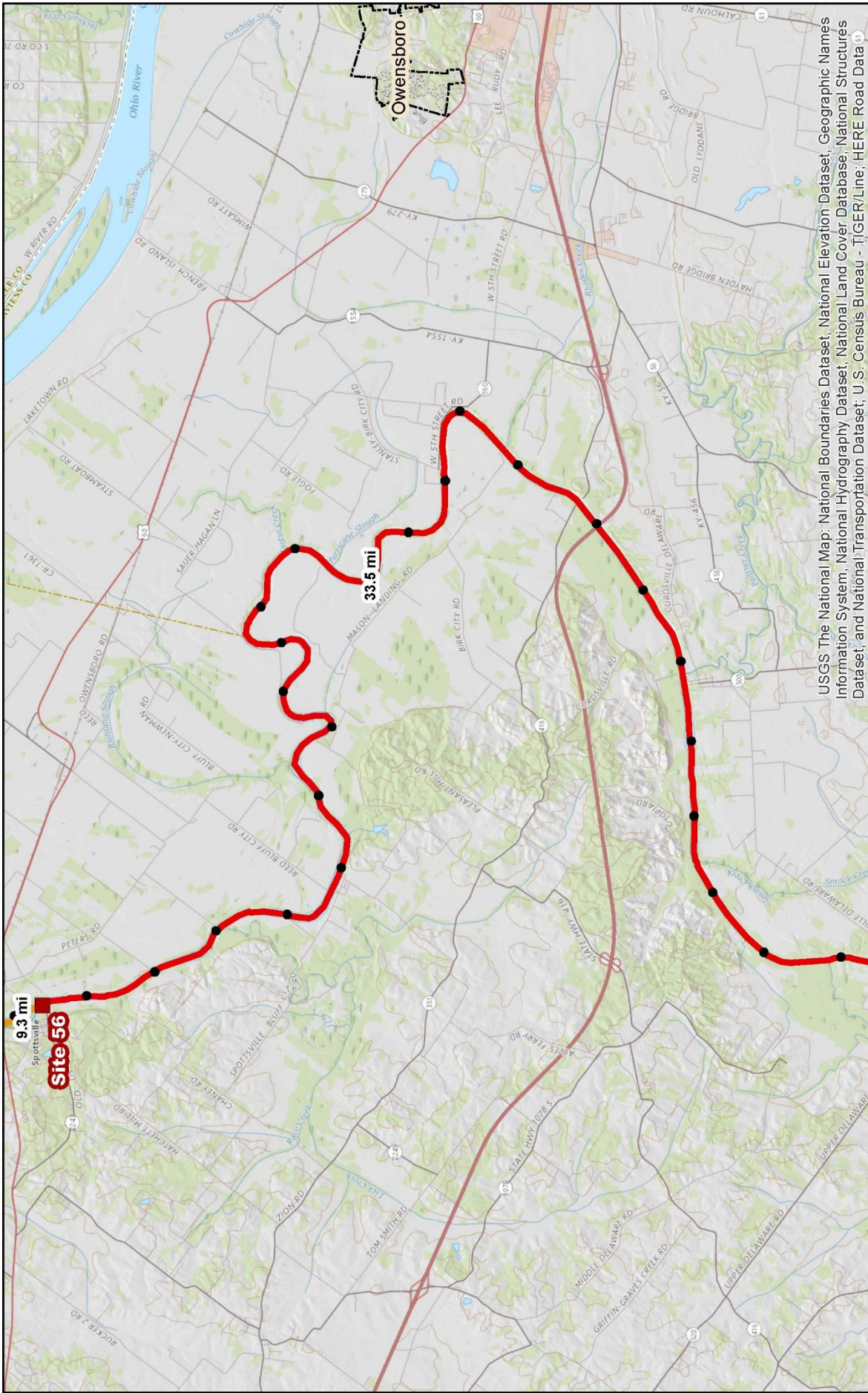
USGS The National Map: National Boundaries Dataset; National Elevation Dataset; National Hydrography Dataset; National Land Cover Database; National Structures Information System; National Hydrography Dataset; National Land Cover Database; National Structures Dataset, and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data



- Launch Sites
 - Public (Red square)
 - Unknown (Orange square)
- Green River Distance in miles
 - 0 - 8 (Green line)
 - 8 - 10 (Orange line)
 - 10+ (Red line)
- Milepoints (Black dot)
- City Boundary (Dashed line)

Green River Launch Site

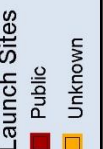
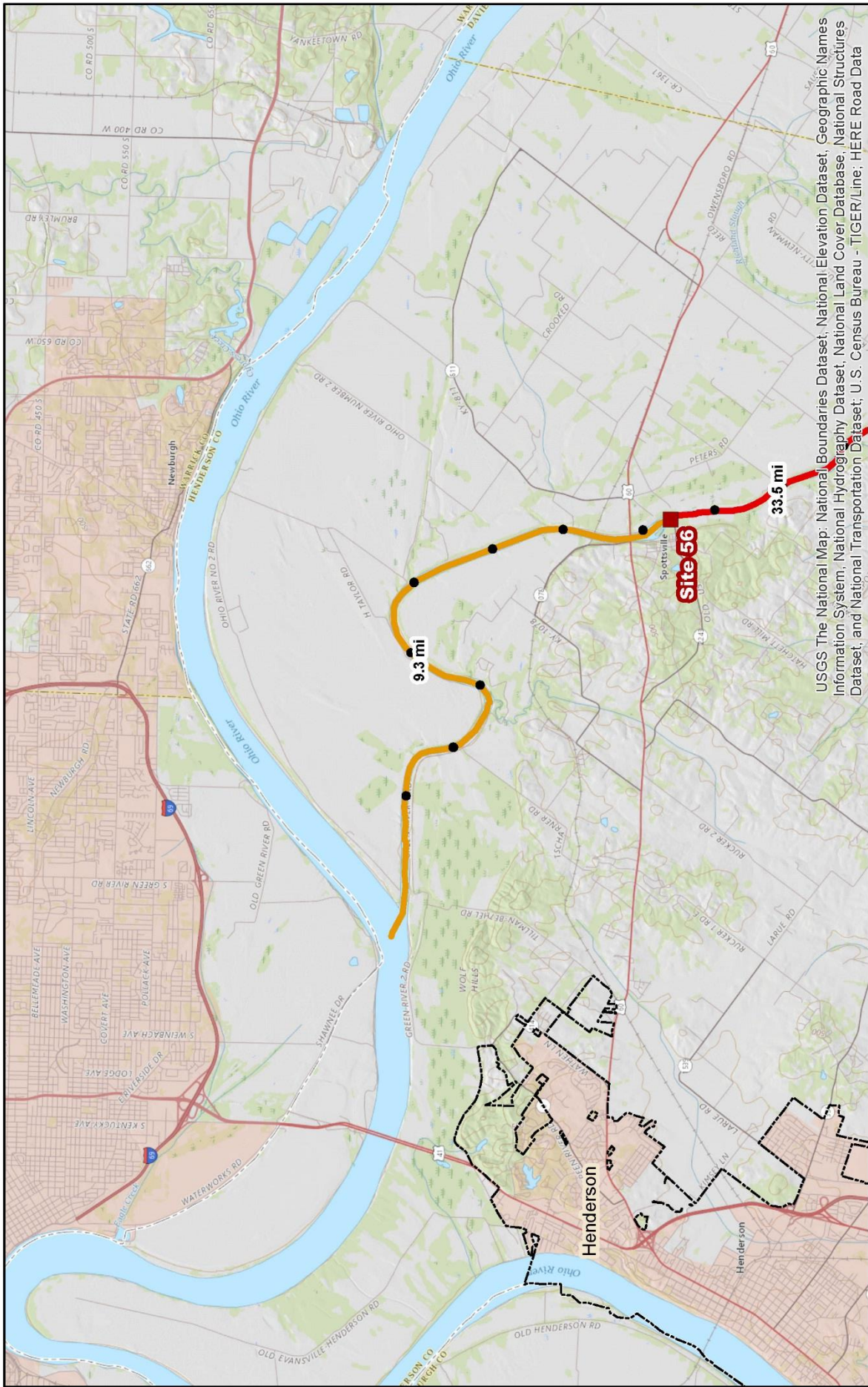
Map 21 of 23



USGS The National Map; National Boundaries Dataset; National Elevation Dataset; National Geographic Names Information System; National Hydrography Dataset; National Land Cover Database; National Structures Dataset; and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data



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Green River Launch Site Map 23 of 23

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