



CONTENTS

| | |
|--|----|
| EXECUTIVE SUMMARY | 4 |
| BACKGROUND CONTEXT | |
| Geographic Overview | 6 |
| Geology | 7 |
| Physiographic Region | 8 |
| Vegetation | 9 |
| Human History | 11 |
| SITE INVENTORY | 18 |
| General Description | 19 |
| Site History | 20 |
| Vegetation | 29 |
| Exotic Species | 36 |
| Cultural Landscape | 38 |
| Special Places | 39 |
| OTHER ASSESSMENTS | 47 |
| PLANNING AND MANAGEMENT | |
| Interpretive Themes | 50 |
| Vegetation | 51 |
| Experiences | 53 |
| Other Recommendations | 54 |
| REFERENCES | 55 |
| APPENDICES (HELD DIGITALLY) | |
| Special Places spreadsheet | |
| Historical Aerial Photos (by Historic Information Gathers) | |

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EXECUTIVE SUMMARY

Rarely does a patch of green in the center of a million-person metro region come up as an opportunity to create a dynamic public park on the shores of a major river. For this particular parcel, in Clarksville, Indiana, add to the verdant setting a rich historical legacy from key regional archeological sites, the home site of a revolutionary war general, the launch site for the country's most celebrated expedition of discovery, and you find one of the most exciting park opportunities in America. With context including world famous geological strata, property overlooking the Falls of the Ohio from the banks of one of America's great rivers, and the site and its story gets all the richer.

I had the pleasure of walking all 225 acres of the Ohio River Greenway project area in May 2018. I wandered the site in a systematic way to cover the place as finely as I was able. The transect took me through quiet forests of Buttonbush Woods, the modified banks of Mill Creek, the lush maple woods of Silver Creek, and floodplains and uplands of Old Clarksville. In there I found the Buttonbush Hills, Emerald Pond, and trees five feet in diameter.

Geographically, this site lies in a remarkable location. It's nestled along the most important stretch of the Ohio River (the Falls), with its world famous Devonian fossil beds. Historically, the location served as home for people for thousands of years, including recently as the northeastern-most reach of the vast Mississippian culture – one of the strongest and most wide reaching cultures found north of Mexico. Shortly thereafter, the site served as the location for the first planned community in America's Northwest Territory at Old Clarksville. George Roger's Clark settled here, briefly, at Clark's Point – oft-cited as the most scenic spot on the entire Ohio River.

The story of water is everywhere in this landscape. Rivers of all sizes, from the tiniest of springs in the woods, to the two branches of Mill Creek (at times impounded by beaver dams), to Silver Creek, to the Ohio itself, water defines this place in multiple dimensions. There is a human layer to the water with levees of contemporary times and levees hidden among trees from agricultural days. Layers are added from an effluent pond with engineered falls, and bridges gap spans of all sizes.

Recent history was dominated by agriculture; nearly the entire 225 acres was cleared land just 50 years ago. After the flood of 1937 the area turned industrial with the arrival of junkyards, stripping of land to build floodwalls, and dumping in small landfills.

A key tenet moving forward will be to recognize and celebrate the history and unique position of the site. From the world famous Devonian fossil beds of the Falls of the Ohio, to the layers of known and celebrated human history, to the uncelebrated

agricultural and industrial history of the past 100 years, the Ohio River Greenway is a palimpsest – a landscape etched with the actions of people and nature over thousands of years. While more recent eras have abundant and observable history, the deeper past is not to be ignored; it's this past that gives the place celebration and worth.

Ultimately, the narrative of this property, and the project more broadly could be as follows: Despite the celebrated history of Mississippian culture and George Rogers Clark, this property has been abused in every way possible; it's been ditched and drained, dumped on and filled in, cleared and farmed, polluted and neglected. And yet, when you spend a moment in the woods and waters, you find the place teeming with life; a Cooper's hawk chasing ducks through the forest, beavers building dams, and the pure white of a great egret standing juxtaposed against the mud pool of a derelict retention basin. In 50 years forest has turned green a site that in 1960 had hardly a tree standing. Combine that with the fact that the property already functions as a park; in 25 hours on site I saw women pushing strollers, countless joggers and bikers, birdwatchers, a woman cleaning up trash from a ditch, and a dad mucking about the creek with his young boys.

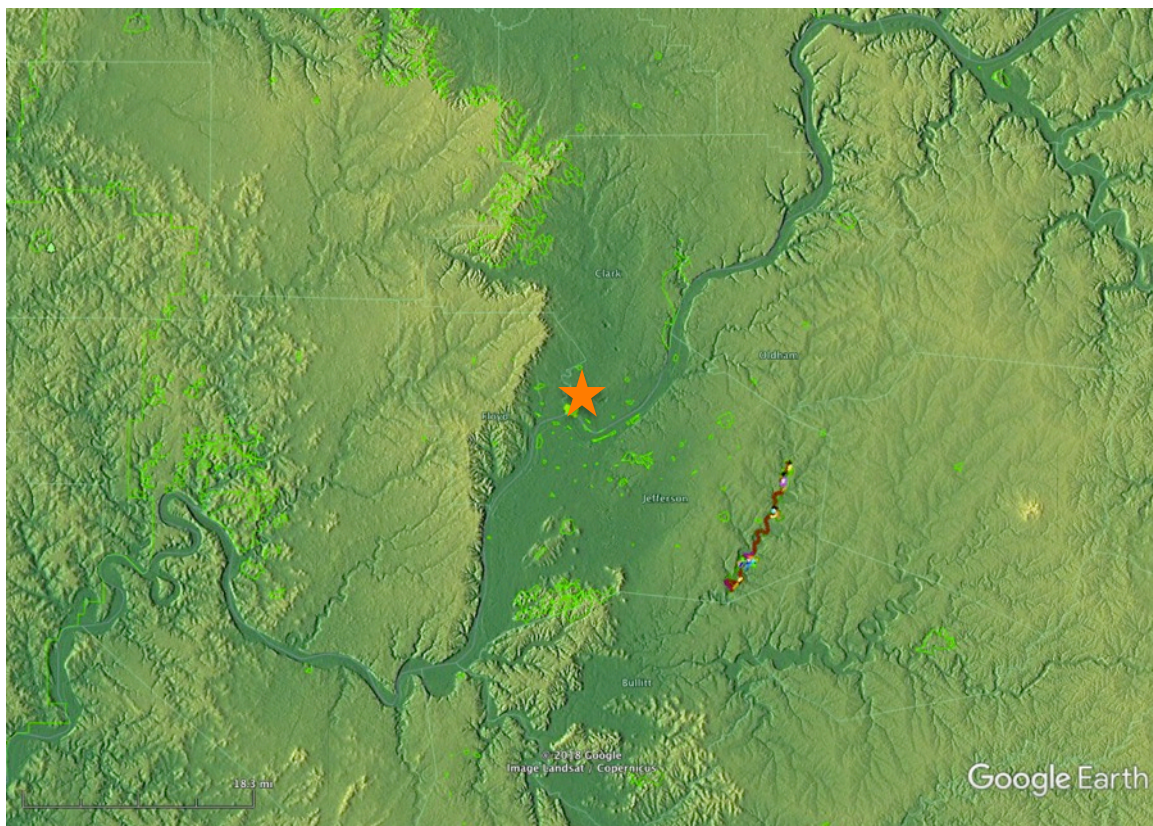
The most important element of this property is that it is green. Because of that, people want to be there. And despite the dump trucks and earthmovers, the trash deposited by of the Ohio River, the potential for flood, the lack of wayfinding or infrastructure, people are out there. With a great circulation plan and intentional themes to make the rich story of the site come alive, this patch of green in the middle of a million people can become the most desired park no one knew existed.



BACKGROUND CONTEXT

GEOGRAPHIC OVERVIEW

Clarksville lies at the midpoint of several natural transects. Geologically, it lies in the stable center of a vast swath of eastern North America known as the Interior Platform. Ecologically, Southern Indiana lies equidistant between the tropical Everglades of southern Florida and the boreal forests of northern Minnesota in what is called the Central Hardwood Forest region – one of the most diverse regions of the Eastern Deciduous Forest biome. Its location on the Ohio River is roughly at the midpoint of the river; beginning at Pittsburgh, Penn., the Ohio River runs 981 miles to Cairo, Illinois where it joins the Mississippi. Clarksville lies slightly downstream from the midway point at mile 606. Silver Creek, a small tributary to the Ohio that drains nearly 100,000 acres of southern Indiana, forms the geographical centerpiece of the broader project area. Mill Creek, a smaller tributary to the Ohio River, rises in Jeffersonville's north end near 10th Street, and runs under the I-65 interchanges to the project area. It drains much of east Clarksville and most the project area as currently envisioned.



SHADED RELIEF MAP OF SOUTHERN INDIANA AND ADJACENT KENTUCKY: Ohio River Greenway located with star; green outlines show public lands; multicolor area is The Parklands. Note how Ohio River enters the Scottsburg Lowland (dark green) as it enters the Louisville region. The Knobstone Escarpment forces the river south where it tightens up again. See text below.

GEOLOGY

Clarksville, and the Ohio River Greenway (ORG) project, lies on an internationally renowned geological feature: the highly fossiliferous 386-million year old Jeffersonville Limestone exposure at the Falls of the Ohio. This exposure is part of a system of sedimentary rock layers occurring between the Appalachian Mountains and the Mississippi River. A brief summary of the features and processes captured in Clarksville's landscape is outlined. (Detailed information on this feature is available from Falls of the Ohio State Park.)

Regional geology is composed of horizontally bedded sedimentary layers of Paleozoic age (540 million years to 250 million years before present). During this time, continents were composed of small fragments of today's landmasses; what is today the Ohio River basin was a shallow tropical sea south of the equator. Life was limited to marine organisms and their fossils are found in most of the regional limestone and dolomite rocks that formed originally as sediments in that tropical sea.

Over time, land uplifted, sediment poured in, and the deposition of new sediments switched from limestone and shale to sandstones and siltstone. We find these rock types nearby in the Knobstone Escarpment and in Kentucky's knobs region. Later still, with the evolution of new life forms, organic rich swamps composed of newly evolved plants took hold and these deposits form the coalfields upstream and downstream of Clarksville in the Ohio basin. Over time, these upper layers were stripped off of what is now the Bluegrass Region (including southeast Indiana) revealing the older, fossil-rich limestone layers below. (Bedrock outcrops do not occur in the ORG project properties, however, at low water they can be found along the shoals of the Ohio River.)

Skipping ahead, geologically speaking, to recent times, most of Indiana was covered in glacial ice, on and off, over the past two million years. Clarksville was literally at the melting edge of the glacial period ending 130,000 years ago. That event formed the Ohio River as tremendous volumes of meltwater poured out of the ice during the melt event. The water excavated the channel that is now the Ohio River. An entirely different – mostly north flowing – drainage network occurred prior to the reshaping of the land. Just 20,000 years ago, the maximum of the most recent glacial period, ice reached to within 50 miles of Clarksville (from the north). Considering this, Clarksville sits in a unique position at the terminus of one of Earth's largest-ever ice sheets.

The widest point of the Ohio River occurs in the area around Clarksville and Louisville. This flat lowland is formed as a result of the soft shale rock layers that underlie much of the region. The shale easily erodes (over geological time) leaving a wide low-relief landscape (Hill 2017).

PHYSIOGRAPHIC REGION

Geographers have divided Indiana into physiographic regions. These regions are organized based on a combination of climate, topography, and geology. Various authors divide Indiana differently. The Indiana Geological Survey (Hill 2018) divides the state into four broad regions and 23 subregions. By this system, Clarksville is located in the Charlestown Hills regions of the broader Southern Hills and Lowlands Region. Homoya (1997) places Clarksville in the Scottsburg Lowland section of the Bluegrass Natural Region. This section is only two miles wide at the Ohio River (basically includes only Silver Creek and the Greenway project area); to the west is Knobstone Escarpment and to the east are Muscatatuck Flats and Canyons region. Although both of these region types are driven by the complex topography that covers much of southern Indiana, the Ohio River Greenway is nonetheless composed of flat Ohio River floodplain and river terraces (and arguably should be a physiographic region unto itself). Simpson and Shoal (2014) have determined the shore area of the project site is composed of three vintages of Ohio River sandbars dating back to late glacial times; the sediments that form the project area were deposited as a result of melting glacial ice 20,000 to 10,000 years ago. The site has a unique set of natural drivers when considered in the context of the broader physiographic region(s).

VEGETATION

Eastern Deciduous Forest

Clarksville lies in the heart of North America's temperate deciduous forest. This vast biome spans from Maine to Iowa, to east Texas to Florida. It's connected in deep time to the similar temperate deciduous forests of eastern Asia (China, Japan, etc.) and Europe (Germany, Romania, Balkans, etc.). Until about 80 million years ago, these forests were all connected. They separated as the continents split apart, and cooling climate at the poles forced them southward. The flora has changed somewhat as each region has evolved its own suite of species. But at higher levels of taxonomy they are quite similar. A person living in the Ohio River region could be dropped into the forests of Romania or Japan and they would feel very much at home.

Presettlement Forest

When Europeans first entered North America they were immersed in a wilderness landscape with incredible cultural diversity. Indigenous Americans shaped the landscape through the use of fire, hunting, and agriculture and by doing so the American wilderness was a cultural landscape as much as it was a natural one. The oak and mixed hardwood forest that covered much of the interior Ohio River region was, and still is, a result of that cultural period. As American Indians burned the landscape as a management tool to promote mast and fruit trees, and create better game habitat, they facilitated the dominance of oak, hickory and other fire tolerant species (Abrams

and Nowacki 2008). Mixed into this mostly forested landscape were open glades, woodlands, and savanna type environments.

A landmark study by Potzger et al. (1956) examined original witness tree records for most of Indiana. They found that at the time shortly before European settlement, beech and maple dominated the central and eastern portions of the state, while oak and hickory dominated the western, and north and south portions of the state. The northwest contained “oak openings” as the landscape transitioned into the prairie landscape of Illinois. We still see much of this American Indian legacy today in the oak-dominated forests. However, we are finding that without fire, the forest of the central hardwood region transition to beech and sugar maple, among other shade tolerant species.

At Clarksville, because of the strong influence of the Ohio River, the landscape prior to Indiana settlement likely included the same suite of species we find today: Silver maple, eastern cottonwood, sycamore, American elm, sweetgum, hackberry, ash, and box elder. In their study of witness trees throughout the state of Indiana, Potzger et al. (1956) had no available data for the area of Clark County and surroundings. Because George Rogers Clark withdrew 150,000 acres (see history below) the land was not surveyed in the manner of the rest of the state. Thus the one major gap on the presettlement map of Indiana forests occurs with the Ohio River Greenway project. A review of the species found in the project area, and a list of underrepresented species that should focus future management will be discussed later.



VIEW FROM THE TRESTLE OVER SILVER CREEK. This is a prime place in the project area to experience the Eastern Deciduous Forest. The forest, and the streams are globally important areas for biodiversity.

Ohio River Bottomland

Though southern Indiana is for the most part an upland forest environment with dominance by oak, hickory and other hardwoods, the lowland strip of land that includes the Ohio River Greenway is bottomland and is strongly controlled by flooding of the

Ohio River. The extent, duration, and timing of flood events on the Ohio River drives the vegetation found in the bottomland forests. Subtle changes in topography can induce remarkably different ecological communities as floodwaters inundate some areas and fall short of river terraces. Tolerance to flooding is a specialized adaptation to which only a small proportion of native species have adaptations.

Nonetheless, the species dominants we see today are likely the same dominants we would expect to have seen 300 years ago. These species are the most tolerant of flooding to varying degrees. Silver maple, sycamore, cottonwood, and box elder are the most tolerant of flooding. These species will be found at the most flood-prone elevations and closest to the river's edge. Hackberry, American elm, pin oak, ash, sweetgum, and black walnut are moderately tolerant of flooding and can be found in slightly elevated situations, but still occasionally inundated. Other plants are similarly differentiated.

The broad floodplains of the Ohio River also provided rich soils for the continent's first agriculturalists. Ideal soils were on sites that were not too frequently flooded, but were flooded periodically enough to replenish nutrients. The Ohio River floodplains are among the most dynamic ecological and cultural landscapes in the Central Hardwood Forest region.

Although the presettlement landscape of Clarksville and Silver Creek likely included similar tree species to what we find in today's forest, stepping back to the days before Clarksville, wildlife was much more diverse, much more abundant, and included many large animals. Elk, wolves, bear, and cougars – the now extirpated charismatic fauna of the region, shaped the landscape and cultures. With them, the bison perhaps played the greatest role in shaping regional ecosystems and culture as they thundered down the Silver Creek valley and across the shallow-water ledges of the falls. Passenger pigeons, which John James Audubon observed by the billions, formed a natural phenomenon unmatched by contemporary nature. Carolina parakeets, sturgeons, hellbenders, and dense populations of freshwater mussels, among many more imperiled animals once thrived in this remarkably rich center of the continent.

The truly impressive nature of The Falls of the Ohio area prior to the arrival of Europeans must have been a sight to behold. The combination of geology, the beauty and sounds of the falls, combined with the rush of thousands migrating bison, billions of passenger pigeons, stands of colossal bottomland trees, overlain by a rich and diverse cultural presence would rank the site among the top of the continent's most impressive spectacles at that time.

HUMAN HISTORY

American Indian

All of Clarksville's human occupation, and the descendants of those occupants, ultimately relates back to the region's geology and the Falls of the Ohio. This includes the Native American presence as well as more recent European-influenced presence. A highly detailed study on the human history of the Falls of the Ohio and Ohio River Greenway project area is beyond the scope of this project, however, a key recommendation from this work is to synthesize the archeological efforts that have occurred over the past 200 years. What follows should be considered broad, generalized history for the area the importance of which is noted for understanding the land and the interaction of people and nature. The prehistory of the site ties together many elements of the landscape and should form a central theme in the park's development and interpretation.

Just as today seven bridges connect Kentucky and Indiana, several centuries ago was likely equally integrated, if at times adversarial as well. The American Indian history of the site must be understood in conjunction with that occurring across the river in what is now Louisville.

As discussed above, The Falls area was (and is) a dynamic place. The level of landscape diversity – from the Knobstone Escarpment, to the backwater creeks, the broad floodplain of the Ohio River to the herds of bison that crossed it – around the falls offered so many resources in a compact area that it should come as no surprise to find an abundance of cultural remains. The list goes on: abundant migratory birds were drawn to the breadth and complexity of the Ohio River; abundant freshwater mussels (a group more diverse in eastern North America than anywhere else on earth) on account of the shallow water; and a spawning ground for fish. The Knobstone Escarpment provided additional terrestrial upland resources. The fertile bottomland provided agricultural opportunity. Silver Creek provided a small tributary with a different suite of resources than the large Ohio River, while the much smaller Mill Creek offered yet more. Food and material resources were plentiful and seasonally abundant. The convergence of these various environments centered on what is now Clarksville meant a rich living was possible.

Archeological investigations in Clarksville have gone on since the days of George Rogers Clark. More formal investigations included work by Borden in 1874 and Cox in 1875. Guernsey continued the efforts in the 1930s and 1940s and he divided the area into three sites: Elrod, Newcomb, and Clark's Point. Together these sites extend roughly from Silver Creek in the west to the site of Clark's cabin in the east. Following Guernsey, Janzen continued efforts in 1969-70 and additional work was carried out by White (2004). Munson (2011) completed a survey for the Lewis and Clark Trail, and Simpson et al. (2013) evaluated the Newcomb site, however neither of these reports

was publically available. To my knowledge, there has been no synthesis of Clarksville's rich prehistoric record.

The locations of sites in the Ohio River Greenway project area has been difficult to track down, however, Simpson et al. (2014) provide some indication of what and where the site(s) are:

The 1969 excavations at the Old Clarksville/Elrod site lay approximately 75 m south-southwest of the Newcomb site (map). These excavations were focused on a broad shell midden that was exposed on the bank of the Ohio River at that time. The shell midden extended from nearly ground surface to a depth of approximately 1-1.5 m. [The site] dates to the Late Archaic Period, extending from approximately [5365–4289 years before present].

The West Riverfront Master Plan (Woolpert 2011) summarizes much of the archeological work and notes the Elrod site contains a "large multicomponent prehistoric and historic archeological site." This includes a Mississippian age village site (900-1450 CE), (and the original village site of Old Clarksville) along with ceramics, discarded objects, and human remains (Woolpert 2011).

The Newcomb site, which may be part of a single larger site with Elrod, produced "large amounts of prehistoric artifacts, including pottery, stone and bone tools, shell and stone beads, and a small amount of human skeletal material" (Woolpert 2011). Also found were house basins of Woodland (2500 years BP to 500 BP) and/or Mississippian age (900-1450 CE).

Simpson et al. (2014) further states: "A significant portion of the bank has eroded in the last 30-40 years, removing the majority of the Newcomb site and potentially the entirety of the Old Clarksville/Elrod site".

Slightly farther east at Clark's Point (the site of the replica Clark Cabin), White (2004) excavated a 6-foot by 8-foot area next to the cabin in prep for the installation of a stone fireplace. The small area yielded midden deposits including terrestrial and riverine faunal remains, bone and stone tools, over 2600 stone chips (waste from tool making), and 90 relatively intact tools. Specific tool types, cultural periods, and stone source locations are detailed by White (2004). Most stone sources are cherts regional to the Falls of the Ohio area. The site also yielded human remains. The site is Late Archaic age, 4400 to 3200 before present and the midden suggests residential use of the site. White (2004) noted the management priority of mapping the extent of the site, which might be possible through non-invasive ground penetrating radar.

The Falls region – the Scottsburg Lowland physiographic region more broadly – is the only wide expanse of bottomland flood terrace in between the Little Miami River at

Cincinnati, Ohio (occupied by Fort Ancient peoples) and the Anderson River near Evansville, Indiana (occupied by the Angel Phase of Mississippian culture). The local area was located on the overlapping influence area of the Fort Ancient people to the north and east, the Mississippian culture to the west and south. Considering that context, the Clarksville site(s) has an archeological record reaching back to at least Late Archaic times (4000 years BP) up to and including a Mississippian culture village site from recent times (~1300 CE).

This Mississippian cultural context is important to consider. The Falls area was the northeastern-most extent of that cultural group whose characteristics includes earthworks as mounds and platforms; corn-based agriculture; shell-tempered pottery; centralized control and class system; and extensive trade networks. Other Mississippian sites regionally include Devil's Backbone (at 14-Mile Creek), Eva Bandman (in Louisville), Wiley and Koons (near Battle Creek upstream of Utica), and the most surveyed and best known, Prather (6 miles NNE of Jeffersonville). Together, these sites are known as the Prather complex and they represent the northeastern-most Mississippian site in what was a sprawling, dominant, mid-continent cultural group from 900-1450 (CE). It's significant to have representative sites from this group within the project area. This should be an interpretive focus for the park.

Below the falls, the archeological record is scant for 85 km to the Angel complex near the confluence with the Wabash River. Similarly, to the north, is another empty quarter with a 95 km gap to the Fort Ancient sites. The Falls Mississippian complex was somewhat isolated which highlights the importance of the falls geological feature as an important biocultural driver for human settlement. The same could be said for Louisville and adjacent Indiana.

This prehistoric history is accessible from scattered and fragmentary sources. It is strongly suggested that the River Heritage Conservancy direct a cohesive, systematic review of the project area's archeological resources, with perhaps additional site investigations. This isn't purely an academic exercise; as the park project develops it will be the responsibility of the organization to respect, to highlight, and to interpret these features in a way that makes the broader relationships accessible to park visitors. The 5000+-year presence of people at this site, and the intimate ecological relationships demonstrated through previous studies (e.g. use of terrestrial and riverine resources, trade networks, etc.) that ultimately ties back to the geology of the Falls, is a complex, insightful, and revealing story. George Rogers Clark had a relatively ephemeral presence on the site and yet, as presented currently, his story receives comparatively more airtime. The story of indigenous people on the site should reflect their long duration, tangible remains, and deep ties to the land and water.

European History and George Rogers Clark

Though there had been European activity around the falls region for a few decades prior, the history of the Clarksville area really begins with the town's namesake, George Rogers Clark (1752-1818). He was a revolutionary war general, surveyor, speculator, among other claims.



CLIP FROM JOHN FILSON'S 1784 MAP of Kentucky and surrounding lands. The Ohio River goes top to bottom with Louisville and Clarksville at center. Note Clarksville occurring at the mouth of Silver Creek and "Gen. Clark's Grant 150,000 acres." The dotted line from Clarksville, southeast to Bullets Lick, is the Bison Trace that crossed at the Falls and was used as a road by settlers.

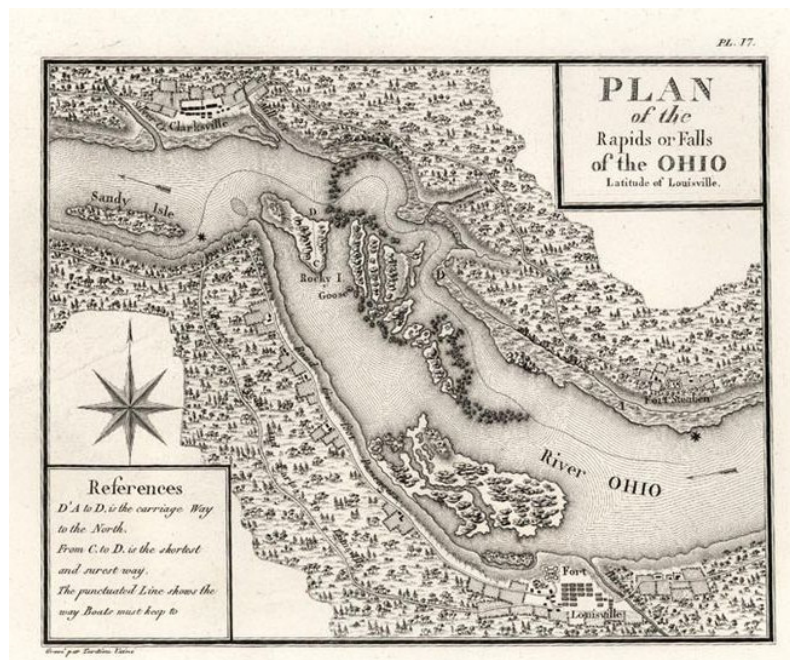
Following the revolutionary war, Clark was granted land from the United States for his services. Clark's grant from 1781 included 150,000 acres from slightly below Silver Creek up to 18-Mile Island, including the Ohio River Greenway project area. He established the community of Clarksville – the first town laid out in the Northwest Territory (1784). After financial difficulties, Clark signed over much of his land to family and friends. But Clark kept the section by the Ohio River, which includes the Ohio River

Greenway; here he built a cabin in 1803. He lasted just six years and soon moved back to his sister's place at Locust Grove with ailing health and financial problems.

He settled here likely for the same reasons the previous inhabitants did: diverse and abundant resource base; the barrier to navigation; and the beauty and intrigue of the falls. Clark had a keen interest in the earlier inhabitants of the Falls region and apparently explored the old village site and mounds of Mississippian culture found there (he didn't keep good records of his findings). Clark established a grist mill – identified by the mill stones that remained on site – on the namesake Mill Creek about 150 yards up from the confluence with the Ohio (near the bridge, today). The original Clarksville never really thrived. Overall, considering his brief tenure, Clark's impact on the land was likely minimal, however, his indirect impact was considerable as he paved the way for settlement of the greater region.

Navigation History

A thorough narration of Clarksville history, Louisville, etc., is beyond the scope of this inventory; volumes have been written about that elsewhere. However, the development of the Falls river transport corridor is worth noting as the third act in this story; it directly affects the project area and should be a theme of the Ohio River Greenway's interpretation.



MAP BY GEORGE HENRI VICTOR COLLOT (Fr.) in 1796. Collot made a trip and document titled "A Journey Through North America" and included many first time quality maps of the Ohio Valley. Note Clarksville in upper left occurring between Silver Creek and Mill Creek. The plan shows the location for foot passengers to portage and a second road for carts and wagons to portage.

Navigating the falls was challenging, made more difficult at low water. Professional pilots were hired to run the falls. Still, many boats were destroyed completely, and many more damaged.

The following passages are taken from an excellent catalog of first hand narratives of merchants encountering the falls for the first time compiled by Olliges (2015).

Josiah Epsy (1771-1847) in 1805:

At the lower end of the falls is the deserted village of Clarksburgh, in which General Clark himself resides. I had the pleasure of seeing this celebrated warrior, at his lonely cottage seated on Clark's point. This point is situated at the upper end of the village and opposite the lower rapid, commanding a full and delightful view of the falls, particularly the zigzag channel which is only navigated at low water. The General has not taken much pains to improve this commanding and beautiful spot, having only raised a small cabin, but it is capable of being made one of the handsomest seats in the world.



Clip from map titled: A map of the rapids of the Ohio River and of the countries on each side thereof: so far, as to include the routes contemplated for canal navigation, dated 1806 by Jared Brooks. Numerous plans were proposed for ways to get around the falls. Also note the extensive forest cover.

William Bullock in 1827:

The falls of the Ohio, which are at this place, excepting at high water, prevent large vessels from passing up [from Shippingport to Louisville, ie. around the Falls]; we therefore left the Washington [steamboat], and embarked in a smaller vessel, above the falls. On our road up from Shippingport, at the foot of the falls, we had an opportunity of examining the fine canal and locks, now constructing at great expense, to enable vessels of all dimensions to navigate the river at all season. It is a great work, and calculated to be of considerable advantage to this country.

The plan for a canal in the early 1800s pushed for a route through Indiana to thwart Louisville business interests. The Indiana Canal Company raised public and private money, and work started by 1819. The engineering failed mid way in, and there wasn't enough money to resurrect it. Meanwhile, the Louisville and Portland Canal received federal funding by 1825 and was complete by 1831. This defined Louisville as a shipping and business city, and left Clarksville undefined. As a result, Clarksville suffered, and population declined. In 1925 hydroelectric capacity was added to the system and it was renamed the McAlpine Lock and Dam in 1960.

The Falls played another critical transportation role in the development of the region. Because of the shallow water crossing on bedrock at the falls, the location served as a migration corridor for bison moving from the west and north in Indiana, to the salt licks in Kentucky. A substantial bison trace was beat down as a result of thousands of animals moving through for hundreds of years. The route crossing the Ohio is believed to have crossed right through the Ohio River Greenway. Upon European entrance to the region, the bison were exterminated quickly (by mid 1800s) in less than 100 years. However, the trace lived on as a shipping corridor for salt works, and later as a general transportation corridor throughout the Ohio River Valley (Jakle 1969).



THE MOUTH OF MILL CREEK, AND VICINITY OF OLD CLARKSVILLE. A number of historical features align here: Clark's Mill, the original road grid, the McAlpine Lock and Dam, and more. The photo is taken from the high ground at the old fish

SITE INVENTORY

APPROACH

To document the vegetation, cultural features, special places, and by extension the interpretive themes of the Ohio River Greenway, I walked the property to observe each of the roughly 225-acres under public or conservation ownership (see map below). I identified unique natural features, and cultural or historical features and marked them with GPS. (A separate spreadsheet showing all locations occurs as an appendix.) Most of the cultural and historical features lack the fame and importance of Mississippian village sites, or Clark’s cabin. Instead, the sites listed here illustrate how the land has been used and modified over the preceding decades and centuries.

Similarly, the natural features, documented primarily through the vegetation, tells a cultural story as much as a natural one. There are no old growth or pristine areas in this project area. People have disturbed every acre; nearly every acre has been cleared. Today most of the land is forested. This is a cultural legacy as much as a natural one.



OHIO RIVER GREENWAY PROJECT AREA in May 2018. The green line includes the approximate outer boundary of all parcels included in this inventory. The blue track shows the 13 miles walked for this inventory (a walk along the Emory Crossing Road and Clark’s cabin site is not shown); yellow dots are marked points and each is described in the spreadsheet appendix.

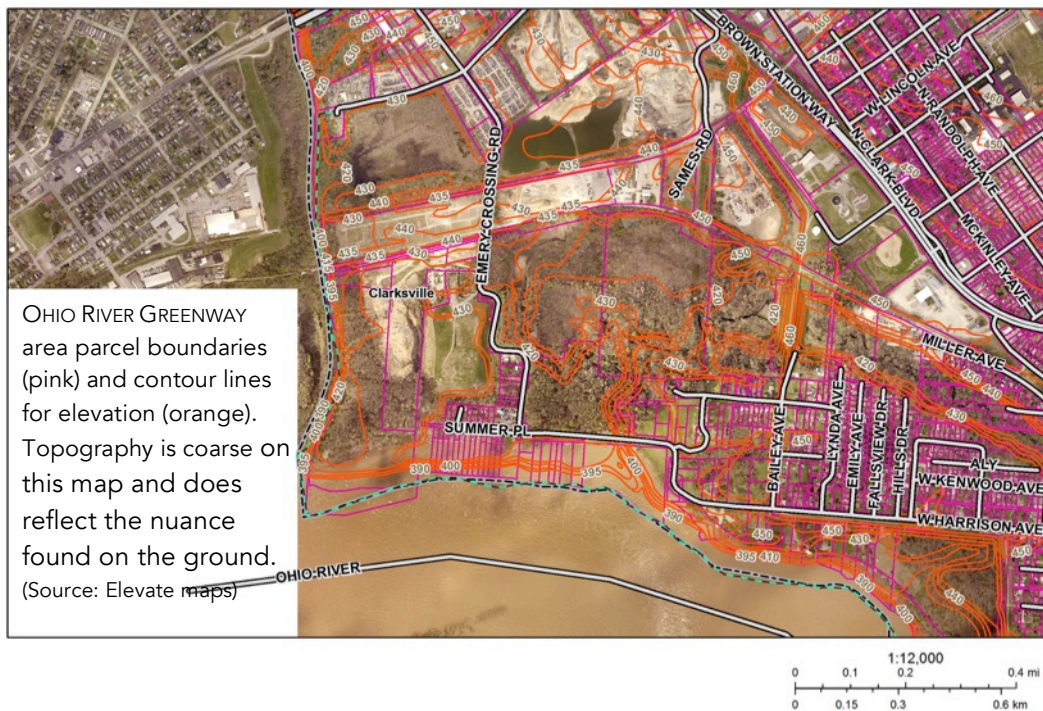
GENERAL SITE DESCRIPTION

The project area as surveyed includes 228 acres centered on the low bottomlands east of Silver Creek, including the mouth of Mill Creek, to Clark's Cabin site. The project area stretches back away from the Ohio River to approximately McCulloch Pike in the north and levees on the east side.

The project is bounded by a large river on the south (the Ohio River), a moderate stream on the west (Silver Creek), and contains the lower end of a small stream (Mill Creek) along with numerous springs and seeps. The highest points include: the old fish camp house (1235 Kenwood Ave) at 460 feet and surrounding areas; Clark's Cabin site at 450 feet; the flood wall on the east at 460 feet; and the capped landfill at 470 feet. These elevations are approximate. The site contains much subtle topographic variation that is not captured in coarse elevation models like topographic maps. Areas within the site indicate through their vegetation that they are only occasionally inundated.



OHIO RIVER GREENWAY PROJECT AREA. The green line includes the approximate outer boundary of all parcels included in this inventory. Text refers to area/parcel names used in this document. Blue lines show small tributary streams. Mill Creek enters the Ohio at Old Clarksville.



SITE HISTORY

Since the current conditions of any the site are simply an expression of the site's history, (and its substrate) it is worth noting that history prior to describing what occurs today. In the background section, I noted the broader historical context including prehistoric sites, and George Rogers Clark, and transportation. Here I'll give a brief description of the recent history as interpreted from field conditions and historical aerial photographs.



Old maps of the Falls of the Ohio indicate the banks of the river were forested up until at least the early to middle 1800s. It is likely that by the middle to late 1800s the "Old Clarksville" project area was mostly cleared of forest. Exception to this would be the especially low lying areas along Mill Creek, Silver Creek, and the Ohio River. As technology developed, we'd expect that the low-lying agricultural land was ditched and drained to increase production. It should be possible to trace deeds back to historical owners and, through those names, obtain the agricultural census schedules, which will detail the activities of the farms.

In the middle 1800s the rail network was built. The northern line in the project area was Boston and Ohio (B&O) and was constructed in 1857. It was part of a broader rail network connecting St. Louis, Ohio, and the east coast. The southern line was known as the Dinky line and connected New Albany to Louisville. It was built in 1867.

The earliest aerial imagery available is from 1940 and subsequent imagery was taken once or twice each decade. A complete set of historical aerial images for the project area is provided in an appendix. Below is a brief narration of events occurring on those images:

1940 (image below): This was on the heels of the largest ever-recorded Ohio River flood in 1937. Thus, the important activity in this image is what appears to be the construction of levees east of the project area. Otherwise, the site is remarkably similar to today in its layout with the same network of roads, the two rail lines, and other features. Forest area occurs only along Mill Creek and a few other isolated fragments while most of the properties are agricultural. Other features as noted, including the apple orchard at the Fish House. A single apple tree from this orchard (I think) remains.





| | | | | |
|---|--|--------------------------------------|--|---|
|  | Clarksville ESAs Clarksville, Indiana | 1940 | |  |
| | | HIG Project Number: MBA-1238 | | |
| | | Client Project Number: 88.12774.0003 | | |
| | | Approximate Scale 1:6000 (1"=500') | | |

1949: Levee is completed on the east side. Vegetation is largely the same. Bright areas could be borrow-pits from levee construction. Most of the landscape remains agricultural.

1955: A small island of trees in the center of the project was eliminated. Areas with trees expanded slightly indicating declining agriculture.

1958: The image (below) shows nicely the floodplain for Mill Creek and backing up of the Ohio River into Silver Creek. This is an instructive image for park planning. There appears to be little change in vegetation. However, the small apple orchard at the Fish House has been reduced in size. Neighborhoods in the southeast corner are under construction.





| | | | |
|---|--|--------------------------------------|---|
|  | Clarksville ESAs Clarksville, Indiana | 1958 |  |
| | | HIG Project Number: MBA-123B | |
| | | Client Project Number: 86.12774.0003 | |
| | | Approximate Scale: 1:6000 (1"=500') | |

1960: The apple orchard has further been reduced. Agriculture still dominates and there is little total change in vegetation since 1940 (and probably since late 1800s). The small cluster of houses and industrial shops along Emory Crossing Road is established.



1969: The years leading up this image had significant change. The bulk of what is now Buttonbush Woods, the CAB-X landfill, and others, were taken out of farming and appear as brush in the image. This establishes the point of succession for woods in these areas at dating from the late 1960s (50 years to 2018). However, a few scattered trees in the 1940 image and later indicate trees older than 50 years do occur on the site. Additional development occurs on the riverfront lots of the Ohio west of Mill Creek. A road network was created within Buttonbush Woods is still apparent today. Junk cars appear for the first time in the upper left Marshall Junkyard. The apple orchard is reduced to a handful of trees.



| | | | |
|---|--|--------------------------------------|---|
|  | Clarksville ESAs Clarksville, Indiana | 1969 |  |
| | | HIG Project Number: MBA-1238 | |
| | | Client Project Number: 86,12774.0003 | |
| | | Approximate Scale 1:6000 (1"=500') | |

1973: (Below) Though the bulk of the project area is brushy, some tree cover has been reduced along Mill Creek. The community of river front houses and camps is built out. The landscape is in a classic state of transition from agricultural to residential/urban edge (camps, junk yards, etc.).


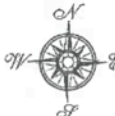


| | | | |
|---|--|--------------------------------------|---|
|  | Clarksville ESAs Clarksville, Indiana | 1973 |  |
| | | HIG Project Number: MBA-1238 | |
| | | Client Project Number: 88.12774.0003 | |
| | | Approximate Scale: 1:6000 (1"=600') | |

1981: What are today junkyards are fully established. Succession continues in the low woods of Buttonbush and the Marshall corner, among others. Two fields are maintained in Buttonbush. Activity starts in the landfill.

1983: Landfill area is busier. Areas of Buttonbush Woods on the west have been reclaimed (mowed), however the east continues natural reforestation.



| | | | |
|---|--|--------------------------------------|---|
|  | Clarksville ESAs Clarksville, Indiana | 1983 |  |
| | | HIG Project Number: MBA-1238 | |
| | | Client Project Number: 86.12774.0003 | |
| | | Approximate Scale 1:6000 [1"=500'] | |

1992: [Below from Google Earth; no map in appendix]

Surface activity in the north creates the Emerald Pond. Landfill activity in place. Property has essentially rewilded and is now covered in young woods. Curious circular plots are cut into the Marshall Woods. Rail cars appear active in the north rail line. High-tension line installed.



1998: The three quarry lakes are formed in the north. The landfill area is still a small operation. The dump truck area in the center top has established. The cleared areas of Buttonbush Woods and others are forested fully. Trees now reach up to 30 years. A large ponded area also occurs but it is unclear exactly what this is; could be a borrow pit. The high-tension power lines are installed and vegetation below them is maintained.

2003: The CAB-X landfill is in full activity and is spreading south. Buttonbush Woods and the Marshall Woods are fully forested (young), except for a patch at center. This could be an abandoned beaver pond (appears as water in previous image). The Clark Point site parking and boat ramp are installed.

2006: [Below, from Google Earth]

The CAB-X landfill is at full extent, and operations have moved west to Marrs. Junkyards are in full activity, and natural vegetation has taken over the landscape.



2010: [From Google Earth]

Complete reforestation in most areas. CAB-X landfill is capped, Marrs landfill is active.

2013: [From Google Earth]

Effluent pond and aeration falls on the east side are constructed. Landscape resembles present day with only subtle differences.

2016: [Below, From Google Earth]

The contemporary landscape.



OHIO RIVER GREENWAY in 2016 (winter). Dark areas are low-lying and wet.

VEGETATION

The vegetation of the Ohio River Greenway project area is a reflection of the site's land use history and its susceptibility to flooding from the Ohio River. Land use history drives the successional age and source stock for species composition and structure, while subtle topographic differences (i.e. vulnerability to flooding intensity and duration) sorts species into low, middle, and upper flood zone communities. The areas that are dominated by forest have been growing in most cases for 50 years or less. Open areas have been maintained as industrial sites, power line corridor, and lawns. Though heavily dominated by agriculture until the 1960s, and portions retained as such into the 1980s, none exists today; agriculture had a brief 100-year tenure in the project area.

Below is a map that contains 21 compartments differentiated by community composition. Each area is described briefly with history, substrate, vegetation, etc.



VEGETATION COMPARTMENTS FOR THE OHIO RIVER GREENWAY PROJECT AREA. Letters refer to descriptions below. Compartments are based on general species composition, age, and physical drivers of topography and flood exposure. Average compartment size is 9.5 acres.

A: MARSHALL WOODS LOWLANDS – 17 ACRES



The Marshall Lowlands is a depressed area inundated by waters held back by a dam on its western periphery. The dam has breached, however still holds a shallow pool. It has at times been rebuilt by beavers. The area was historically agricultural, however, it appears the site was excavated in ~1949 possibly as source material for floodwall construction (see 1949 image in appendix). In 1970 it was

modified further with a dam at the west end to create a retention basin. In the 1990s equipment forged two paths through the compartment, which is still visible in the vegetation today. Vegetation is composed of a flood tolerant suite of trees and shrubs: ash, sycamore, silver maple, pin oak, elm, cottonwood, sweetgum, red maple as well as a host of herbaceous plants and grasses and sedges. Willows occur in the wettest areas. The lowland was rich with birdlife in spring of 2018. The north and east periphery are slightly elevated and described later.

B: SILVER CREEK RIPARIAN – 5 ACRES



This low-lying area – RHC currently controls only a small segment of (a larger segment is on Marris' property) – is classic flood-prone riparian area. Several weak springs rise in the area. The ground was silty muck on my visit shortly after high floodwaters receded, but it is expected that the ground cover is sparse in the growing season. Dominant trees include silver maple, eastern cottonwood, and

sycamore. Exotic creeping vine winter creeper (*Euonymus fortunei*) climbs most mature trees.

C: MARSHALL WOODS MIDLANDS – 10 ACRES

This compartment includes the rail bed and associated slopes, and the lower terrace that runs parallel to the rail bed. This is a special place and one that is dry most of the time allowing natural surface trails. Vegetation is composed of black locust, black cherry, American elm, pin oak, box elder, cottonwood, silver maple, ash, hackberry, grape vine, poison ivy, as well as exotics Japanese honeysuckle, winter creeper, and



others. Trees are sorted by subtle topographic differences with less flood tolerant species on the rises, and more tolerant species in the low area. The stand is young, aged roughly 50 years. However, a handful of trees appear to predate that. Two pin oaks measure 49 inches and 58 inches in diameter respectively and may be 80 to 100 years. On the rail bed itself, exotic shrub honeysuckles

of impressive size dominate with impressive *Ailanthus* trees on the southern edge. This compartment also contains the dam that holds back water of the Marshall Woods Lowlands. The dam is breached, but vegetation on it reflects the less flood tolerant (upland) species listed above.

D: MARSHALL WOODS PERIPHERY – 5 ACRES

This compartment contains a slope reaching from adjacent elevated roads, down into the excavated lowland basin. The slopes are drier and less flood-prone than the bottom and while they harbor many of the same species as the lowland such as sycamore, pin oak, silver maple, elm, ash, sweetgum, they also include upland plants like eastern red cedar red bud, hackberry, black locust, and others indicating less intense and less frequent flooding. A patch of daffodils in the east section (point C24) indicates a former settlement area, which appears on early aerial photos as a grove of trees perhaps containing a small structure. (There was a farm on the site of existing junkyard slightly off property to the east). A trail could be looped through this compartment.

E: MARSHALL JUNKYARD – 11 ACRES

This site was most recently an automobile junkyard and was cleared out in during the 2010s. In 2018 the site was filled with a layer of sediment taken from pond dredging at the Clarksville Town Office complex. Thus in 2018 there was no vegetation of note, except for the largely exotic flora that grows on the north edge of the property.



F: CAB-X LANDFILL – 15 ACRES

This site was agricultural until the 1960s, then had unknown activity until landfill operations began around 2000. The landfill was capped in the 2010s.

Vegetation is dominated by grasses and other herbaceous plants. A grove of cottonwoods occurs at the entrance lowland and another is on the plateau.

G: CAB-X LOWLANDS – 5 ACRES



This Ohio River floodplain area lies between the river and the steep slope of the landfill. The Ohio River pumps tons of debris into the site with each flood; the piles are massive. Nonetheless, a large cottonwood stands close to the river with sweeping river views. A small backwater area is composed of silver maple and other hydric species. With access granted through the River

Camps neighborhood, this area will be an asset.

H: BEAVER POND AND EDGE – 10 ACRES

This area contains the slopes from the public road network down to the lowland of Mill Creek (west fork). It includes a beaver pond, which is one of the most tranquil sites in the project area. An earthen ramp accesses the site from the west and provides a ready bed for trail placement. Vegetation is young successional dominated by ash, sycamore,



elm, cottonwood, etc. The beaver pond was active in the past year, but I did not see sign to indicate they've been present since recent spring flooding.

I: SUCCESSIONAL ASH SWAMP – 10 ACRES

This site was part of the large agricultural area that was abandoned in the 1960s. After limited closure, the site was reclaimed from vegetation and kept open into the 1980s and 1990s. It's unclear if it was kept open by people (farm trails appear) or by flooding (it's the lowest area of Buttonbush Woods). Nonetheless, today the site is dominated almost entirely by small diameter ash (diameters average 4 inches) suggesting trees about 15 years old. There has been some recent beaver activity, but like other areas no fresh sign since recent flooding.

J: MIDLANDS TERRACE – 19 ACRES



This compartment is named for the middle elevation terrace that covers most of the site. As such it is protected somewhat from minor floods but is still inundated by the large floods. The vegetation therefore is more mixed with silver maple, elm, ash, box elder, sycamore, some cherry and black walnut etc. The presence of exotic shrub honeysuckle indicates limited flooding as it is intolerant.

Along the north end are high terraces with views down into Mill Creek. There is useful topography in this area that will help with sustainable trails, however, in the largest floods (like spring 2018) the highest points in this area are under more than 5 feet of water.

K: WET WOODS – 37 ACRES

This is the largest compartment in the project area. The site is composed of the flattest (but not lowest) portions of Buttonbush Woods. It is wet and prone to flooding. As such, vegetation is low diversity with silver maple, sycamore, cottonwood, and few others. The understory and ground cover are sparse. Tree cover is dense and the woods are dark. There are several small drainages and a causeway from an old farm road all running north to south.

L: BUTTONBUSH HILLS – 11 ACRES

This very interesting and diverse area of ridges and wet valleys has the most topographic variation in the project area. Several mounds and ridges rise up to 20 feet above the base elevation. Numerous small tributary springs and seeps run generally south to Mill Creek. Some contain pools and small ponds. Vegetation is successional and more diverse than other areas of the project. Trees include: cottonwood, silver maple, black walnut, ash, box elder, sycamore, hawthorn, elm, hackberry, Ohio buckeye, grape vines, spicebush among many herbaceous plants, grasses, and sedges. Included is an old growth hackberry 39 inches in diameter; it is probably the oldest tree in the project area (maybe 150 years). It's especially interesting in that it has beaver chew marks over 15 feet up the trunk as a result of flooding. Spicebush occurs in dense clusters as is typical for the species.

M: UPPER MILL CREEK – 8 ACRES

This mixed area could probably be broken into a number of smaller areas. It includes the scenic upper reach of Mill Creek to the floodwall. Numerous openings here make for a pleasant spot. Tree species are typical mix of silver maple, ash, sycamore, pin oaks, and box elder, among others. The openings allow for much more herbaceous and shrub cover than occurs elsewhere. The forested areas (north and west) are denser, darker, and with less ground cover.

N: EFFLUENT POND – 2 ACRES



This area in the northeast of Buttonbush Woods comprises the engineered pond and outflow that hold and releases effluent from the water treatment plant. The site was constructed in recent years and adds diversity to the project. Cattails, arrow arum, pickerelweed, among other emergent aquatic plants grow in the pond. The water cascades down a series of waterfalls to Mill Creek.

Though engineered, this is a scenic spot worthy of making a destination in itself and an interpretation of urban ecology and water management.

O: NORTHEAST LEVEE WOODS – 5 ACRES

A successional mix of black locust, black cherry, cottonwood, sweetgum, Osage orange, and exotic honeysuckle shrubs, Japanese honeysuckle, and *Ailanthus*. The stand is classic early successional suite and maybe 40 years old.

P: POWER LINE CORRIDOR – 3 ACRES



Area has mixed vegetation of raspberries, wing stem, goldenrod, and many, many other herbaceous plants. However, everything is periodically mowed and thus retains this successional stage. There is also a small engineered retention pond of recent construction.

Q: PAWPAW WOODS – 5 ACRES

This rare upland area occurs on the slope up to the dry house sites above. The trees are, on the whole, older than any other site in the project because the upland slopes were abandoned from agriculture earlier than the more productive lowlands. Trees likely date to the 1950s making them up to 60+ years. Black cherry, black locust, elm, silver maple, cottonwood, hackberry, ash, and understory coralberry and approximately 30 pawpaw trees. Exotics are abundant with shrub honeysuckle, Japanese honeysuckle, winter creeper, and garlic mustard.

R: FISH HOUSE GREEN – 11 ACRES



This area includes all of the mostly mowed grass and specimen trees around the house that was formerly a fish camp. This area has been settled for a long time. In 1940 the site had structures and a small apple orchard. The orchard has been reduced over the years until today only a single tree remains (by the house). The site is very “park-like” with upper and lower level grassy areas, shade trees,

excellent views of the Ohio River, and good access.

S: SHIRE AND SLOPE – 3 ACRES

These woods cover the slope that drops off of the terrace upon which all the houses avoid all but the highest Ohio River floods. The east compartment is pleasant, if small, and is dominated by black locust, box elder, and a few Norway maple, grape, winter

creeper, and others. It offers another small patch of upland, lush, quiet, and with bigger trees, in what is otherwise a lowland park. On the slope very close the road, a couple bur oaks occur (the only upland oaks in the project).

T: CLARK’S POINT – 9 ACRES

This compartment is mostly mowed grass with specimen trees around the Clark Cabin site and boat ramp. Planted trees include bald cypress (4) and sugar maples, while natural seeded silver maple and others cover the site.

U: OHIO SHORES – 4 ACRES

Along the edge of the bank is a narrow grove of trees dominated by black locust. The small western extent is also covered in flood debris as this area takes the brunt of water discharged from the dam (this is also the Newcomb archeological site). While the bank should retain tree cover, a new crop of trees could replace those. A small section of engineered slope west of Mill Creek contains little vegetation.

EXOTIC INVASIVE PLANTS

Exotic species are those found outside a local region. They’ve been brought in as ornamental or culinary plants, or hitched here inadvertently. Invasive plants are those that spread and take over a site rapidly. *Exotic invasive* plants suppress native vegetation, reduce diversity, and change soil chemistry. Like a cancer on the land, they spread unchecked by local ecological feedbacks. Exotic invasive plants are widely recognized as being the greatest threat to forests and biodiversity after habitat fragmentation and land use change.



Exotic winter creeper vines (dark green) climbing silver maples.

Exotic invasive plants tend to follow ecological disturbance such as land clearing, fires, etc. Considering that 50 years ago the Ohio River Greenway project area was almost entirely cleared for agriculture, and since that time houses junkyards and landfills have sprouted up, we’d expect the site to be completely infested and overrun with exotics. In some areas, this is true. But considering the scale of disturbance, there is much to enjoy out there.

Some of this is on account of flooding and tolerance; most of our troublesome exotic invasive plants are intolerant of flooding. Shrub honeysuckle, multiflora rose, Japanese

honeysuckle, and others are less tolerant of flooding just as most native species are. Exceptions are the herbaceous garlic mustard, winter creeper, Japanese knotweed, and a variety of obscure grasses and herbs.

The map below identifies a few key areas for exotic plant treatment. Of course, the project's goal of creating park is still far off and has certain priority level over treating weeds. However, treating the two Japanese knotweed infestations now will have real paybacks; the species is flood tolerant, spreads through flooding, tolerates shade, and is one of the most pernicious exotic species found in North America.



DISTRIBUTION OF EXOTIC INVASIVE WOODY PLANTS. Red areas are highly infested, orange areas are moderate, and yellow are light-moderate. Uncolored areas are generally clear, however, discrete localized populations likely occur. The pattern here reveals exotic plants are concentrated along edges in the less flooded environments. The two red circles are small infestations of Japanese knotweed. These will spread and it is highly recommended that they be eliminated and monitored. This information is based on cursory observation and should not form the basis of an exotic plant management plan; it is intended to provide high-level understanding of the site's ecology and future management.

CULTURAL LANDSCAPE

As described previously, every inch of the project area property has some level of human history; the site has been thoroughly exploited in some form. There are no old growth forests, and no original vegetation was found. However, areas closest to the creek have likely never been entirely cleared, but have been disturbed at smaller scales repeatedly throughout the past 200 years.

Thus it is not hard to find elements of the cultural landscape. Elevated terraces, disturbed soil, levees, infrastructure and more speckle the landscape. One might consider these a distraction from the nature of the site. I suggest these features are merely a reflection of Clarksville's history – often an unwritten history – and they weave additional layers of complexity and enable thought provoking interpretive opportunities into an urban site.

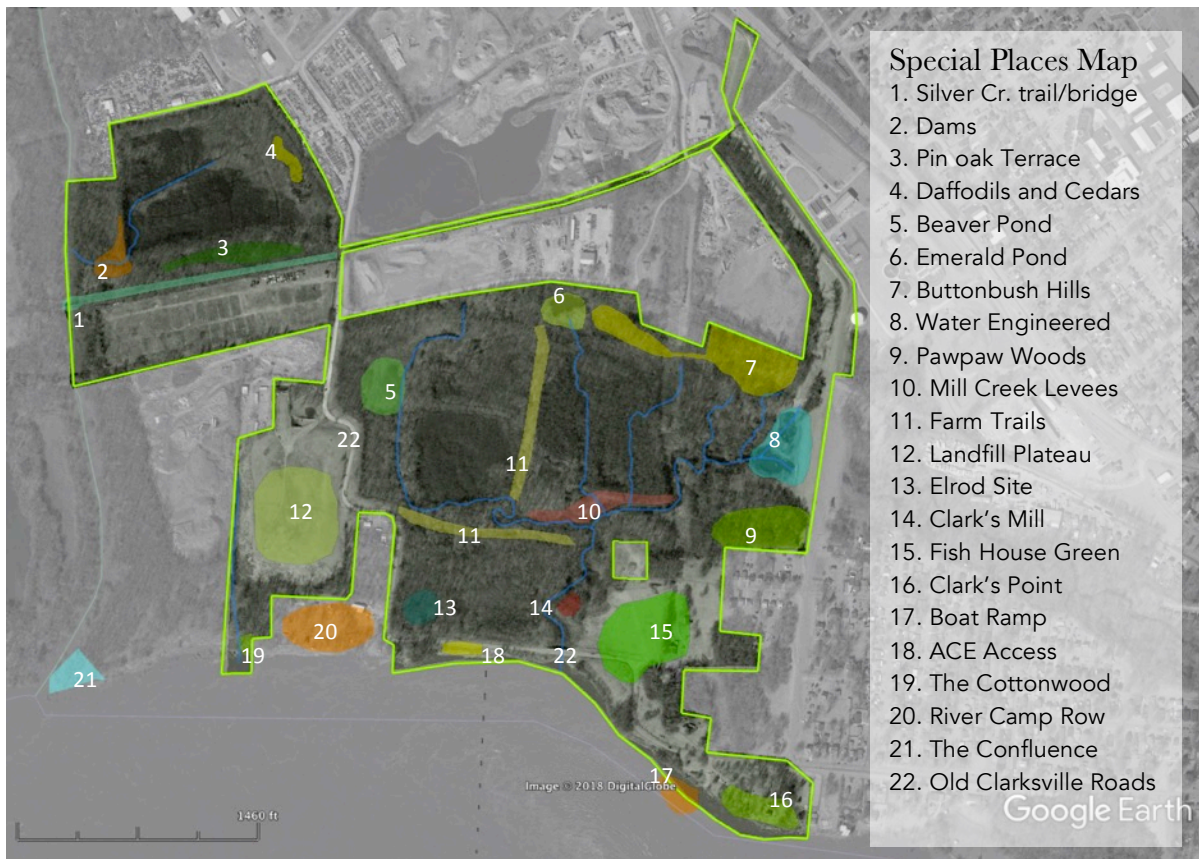
The map below details some of the features of the cultural landscape. The features listed are only a beginning. Most features are obscure on the landscape and deal with excavation, earth moving etc. (these features will assist in trail planning.) What is not shown here is the contemporary cultural landscape, i.e. those features found functioning in today's urban Clarksville green-space.



SPECIAL PLACES

The 228 acres of the Ohio River Greenway project area, when taken as a whole unit in time and space, is one special place. The overlapping and related layers of geology, glaciology, hydrology, American Indian history, Clark-era history, land use history, ecology, and more creates a dynamic, complex landscape greater than the sum of its parts. However, to understand the whole, one needs first to observe and understand the place, and context of the individual pieces.

The purpose of this project has been to document the broader context of the site, and then find the places on the ground that, when taken together, reveal a broader story. This list of special places, while not exhaustive, provides park planners with the places they will want to ensure are included in the circulation plan. While most have a deeper significance in the broader story of the future park, they also offer excellent views, quiet corners, outstanding bird observation, and delightful walks in the woods.



MAP OF SPECIAL PLACES IN THE OHIO RIVER GREENWAY PROJECT AREA: These are the top-20 sites in the project area. Additional sites can be found in the appendix spreadsheet. These sites are described in text below. The colors of polygons on the map are random.

1. Silver Creek Trail and Bridge



This site offers the nicest walk in the property on a historic rail bed. The main drawback currently is exotic plants (honeysuckle) shading and constricting the trail and limiting views. The bridge at Silver Creek will be a considerable draw. A link to Loop Island Wetlands trails would add considerable value and mileage to both projects.

2. Dams



A dam built in 1969 held water in the basin. Today it holds only a small amount of water as the dam has been breached. Beavers have historically rebuilt the dam. The basin is covered in trees; however, these are slow growing in a swamp environment. Planting new species would increase diversity and complexity in the site. The dam offers nice walking on a dry elevated surface.

3. Pin Oak Terrace



This terrace below the north side of the rail bed offers nice, elevated, dry walking and is perfect for a trail. Features include upland trees such as black cherry and black locust. The largest trees in the project area are here: pin oaks at 58 inches and 49 inches in diameter. A large cottonwood also stands nearby. This is one of the best and driest walking sites in the project area.

4. Daffodils and Cedars

Old aerial photos indicate a farm stood on what is now the existing junkyard to the east. At this site, the images show a group of trees and maybe a small structure. On the ground one finds daffodils and other remains of earlier inhabitation. The site is slightly elevated from the retention basin and has the project's only grove of eastern red cedar – a flood intolerant species. It is possible the cedars began growing when the dam failed and the site became somewhat drier.

5. Beaver Pond



This is one of the most peaceful and scenic spots in the project. The low lying, old meander of the west fork of Mill Creek has been plugged up by beavers. The ensuing pond is rich with life (shorebirds seen in May 2018). The site may currently be without beavers after the recent flood event, however, they'll return. Old farm roads nearby (see cultural landscape map) should facilitate trails to access the site.

6. Emerald Pond



This man-made depression (1970s?), which has been further enhanced by beavers, was emerald green in May 2018 and shows up that color on some aerial images. The site has a complex drainage network and forms the western extent of the Buttonbush Hills. The complex structure and sunny openings have created a rich wildlife locale: seven warbler species were seen on the site in May 2018.

7. Buttonbush Hills

This area contains the most topographic diversity in the project area. It is unclear if it is natural or to what degree the site has in the past been reworked by machinery. Nonetheless, the site is cool to walk through and climb the ridges and knolls. An interesting trail network could be created in here taking in the high points. Vegetation is

a mix of upland and lowland with some species not found elsewhere in the project area. Several small tributaries emerge from the northern bank and run south to Mill Creek.

8. Water: Engineered

This site celebrates water and the engineering of water in an urban environment. Four features form the site: the Ohio River Flood Wall built in the 1940s; Mill Creek in place since glacial times; the effluent pond built in the 2010s; and its spillway which cascades down a series of steps to join Mill Creek. The area is part open and part wooded and the effluent pond has a number of aquatic and emergent plants. Considering most of the site is engineered, it is surprising pleasant, quiet, and rich with animal life.



9. Pawpaw Woods

This is the oldest patch of woods in the project area (60+ years) and the only significant upland community. Black locust, black cherry, black walnut, elm, ash, silver maple, and others dominate. There is a small stand of pawpaw. Invasives are robust. Nonetheless, it adds diversity to the bottomland floodplain matrix and presents nice opportunity for trail experience in between the Fish House Green and Water Engineered sites.

10. Mill Creek Levees



Along the banks of Mill Creek is a remarkable system of levees built to hold the creek in the banks and prevent flashy floods from getting into crops. This was a common practice in the mid-1900s. The levees are impressively high (10 feet). They are breached at times and no longer functional. Nonetheless, they make for interesting and dry walking in what is a flat, lowland environment.

11. Farm Trails

In addition to the high levees along the creek, there are a number of lower causeway trails built up throughout Buttonbush Woods and Marshall Woods. The site listed here includes two trails: The first is the north – south farm road through the middle of Buttonbush Woods. This trail appears in 1940 imagery and all subsequent years until the 1980s when the site was naturally reforested. The causeway is wide (15 feet) and relatively dry. It should be repurposed into a trail. It had a bridge across the west fork of Mill Creek, but this has failed. With a bridge it can join the second site shown which runs east – west on the south side of the creek. This was a farm road on a creek terrace. Overall this is an interesting area with great potential.



12. Landfill Plateau

The top of the CAB-X landfill offers leaf-off views of the river and a high, dry recreational



space. The entrance wall of blocks may also be repurposed. The plateau at present is grass and is of little importance, other than views and as a dry site. But the potential for a high dry area of 10 acres is huge even if the soil cannot be disturbed. Combined with the Marris landfill to the west (shown) and the site becomes a 25-acre elevated complex comparable in size to The Parklands Egg Lawn.

13. Elrod Site

Somewhere around here is the Mississippian village archeological site. This is my best guess as to where it is; all the archeological sites in this area should be identified, respected, and interpreted at a high level. There is a great opportunity to inform people of the first residents of what became Clarksville, and the reasons for why they used this site.

14. Clark's Mill

This is my best guess for Clark's Mill. It was somewhere around the lower 100 meters of Mill Creek (thus the name). It's unclear to me what type of mill it was (saw or grist?). But the information could be available and the site properly identified. (There are other historic sites in the Old Clarksville area for which nothing remains. I have not identified all of these, however, a map below does.)



15. Fish House Green

The house that functioned as a fish-processing center has the best views in the project area after Clark's Point. Unlike Clark's Point, however, this site is park-like, sweeping, flat, etc., and lends itself nicely for intensive use. There are nearly 8 acres of open land here. The site holds a number of specimen trees including a single

apple tree, which I believe is the sole remaining tree from the orchard that predates 1940. (The ground may be contaminated from lead arsenate pesticide; it was commonly applied to orchards until DDT came around.)

16. Clark's Point

Much has been written and said about Clark's Point. It's the best view in the project, one of the best views regionally. It has remarkable history – much deeper and richer than simply Clark's short-lived tenure. Over 2500 prehistoric artifacts came out of a six square meter excavation area. The cabin is a replica and it is unclear if the location is exactly right. So much land has been lost to erosion on account of the volume pouring out of the dam aimed at the site, that it is possible the majority of the site has been lost.

17. Boat Ramp



The boat ramp provides access for paddlers and boaters as was its intent. However, it provides other people a way to access to river on foot. It's a place to throw rocks in the water, listen to the falls, watch light play on the current, and observe birds and other animals. The site is as important for non-boaters as it is for boaters.

18. USACE River Access



Slightly downstream from Mill Creek is a USACE erosion mitigation project. The slope is covered in coarse riprap; the erosion was exposing American Indian artifacts. At the base of the engineer work, however, is a platform that offers another way for people to access the Ohio shoreline (at appropriate water levels). The value of such experiences cannot be overstated. The site has paved access

down to the platform. I saw this site in high water so in low water it may be less significant. At flood level is will be underwater.

19. The Cottonwood



This site holds a large open-grown cottonwood tree on the bank of the Ohio. Nice views are had downstream. The river pumps debris into this site during floods so behind the tree is packed with urban river detritus. Nonetheless, the site is valuable as a scenic spot and river access area. The inclusion of the River Camps neighborhood will reduce the value of this site as additional

riverbank sites are incorporated into the park.

20. River Camp Row

This area is outside presently controlled property. However, the importance of this area to the park is huge. Take the structures away and you have a grassy, shaded, tree-lined riverbank pleasure ground – the perfect place for a riverfront park.

21. The Confluence

This site is off property but since I visited it I felt it needed to be included. The



confluence of Silver Creek with the Ohio forms a dynamic point of deposition where people can access both rivers for fishing and relaxing. I sat here for a while among peaceful shaded riverfront to watch the current, birds, and more. The value of this area cannot be overstated.

22. Old Clarksville Roads

Emory Crossing Road makes seven 90° bends as it parades through the project area. These turns are a legacy of history as Emory Crossing Road navigates through the old grid system of historic Old Clarksville. This palimpsest highlights layers of history onto a landscape with still another chapter due yet to be written.

OTHER SPECIAL PLACES ASSESSMENTS

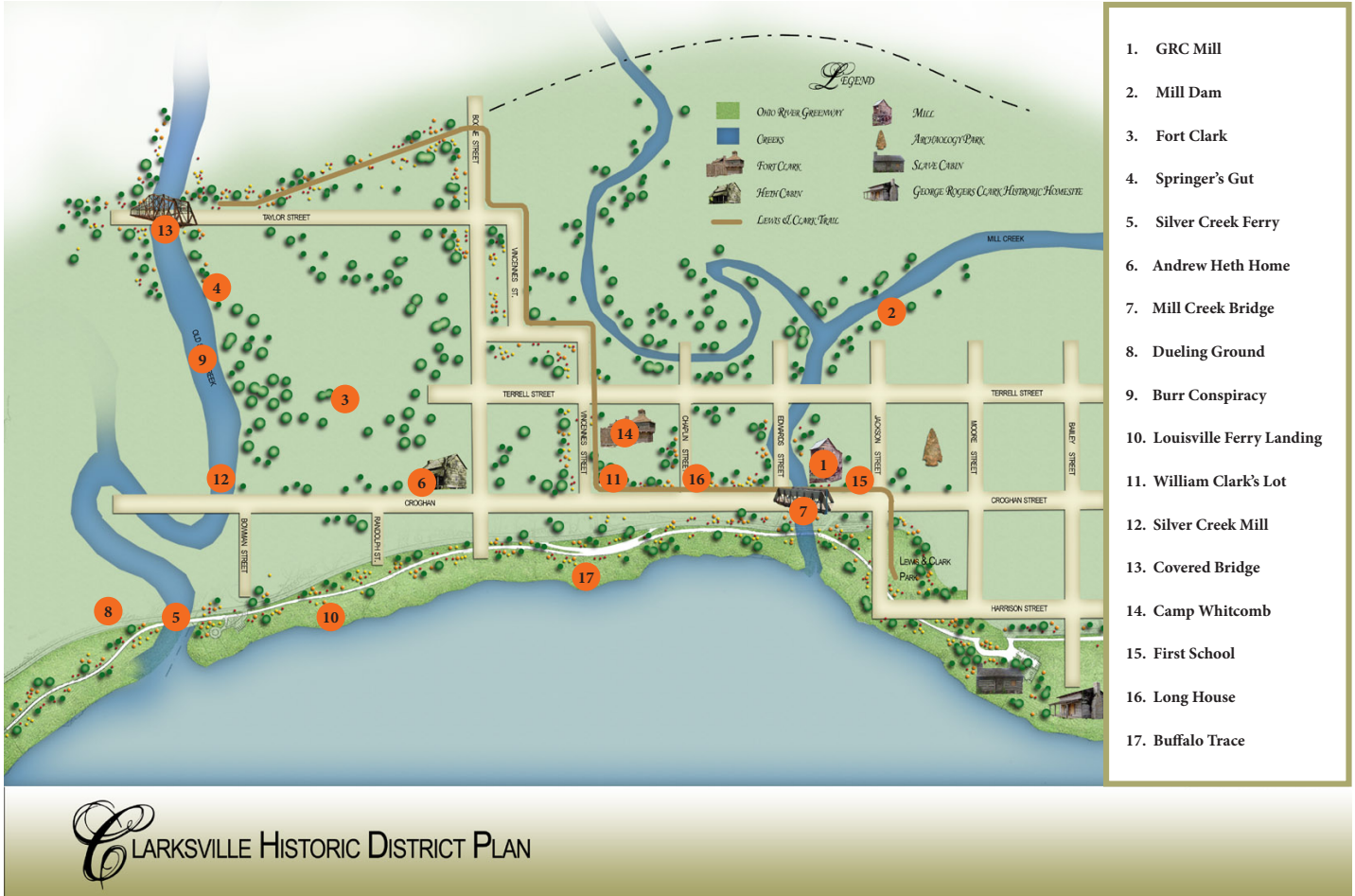
The following two maps provide additional points of interest in the project area. Most of the sites identified in these assessments are historical in nature, and for most no trace of the feature(s) exists on the ground today. These sites are, nonetheless, significant and historical confirmation and interpretation will be important.



HISTORIC RESOURCES identified by Woolpert (2011) for the West Riverfront Master Plan. Note the Bison Trace (brown) cutting through the original road network of Old Clarksville.



CULTURAL RESOURCES map from Woolpert (2011, p. appendix B-5). The map identifies the Elrod, Newcomb, and Clark’s Point sites, however, Woolpert acknowledges the imperfection of these locations, that they were documented in some cases 90 years ago prior to extensive erosion. A systemic review and field analysis of archeology in the project area is needed.



SPECIAL PLACES FOR THE PROPOSED CLARKSVILLE HISTORIC DISTRICT PLAN (originator and date unknown). It is unclear what the documented historical resources used to obtain this information, much of which does not appear in other documents.

PLANNING AND MANAGEMENT RECOMMENDATIONS

INTERPRETIVE THEMES

As this pre-planning inventory reveals the nuances of the site, it may be helpful to organize the concepts and themes that have emerged through this process as a launching point for future interpretive or planning themes. The 2011 West Riverfront Master Plan (Woolpert 2011) also outlines a number of themes for the property. The ideas below are how I see the landscape and its story emerging.

FALLS OF THE OHIO AS THE ULTIMATE LANDSCAPE DRIVER:

As has been alluded to in this document, without the Falls of the Ohio, there would be no park, no project, no Clarksville nor Louisville, no bison trace, and much United States history would have to be rewritten. The Falls are the unifying feature that drives everything else in this landscape. Fossils, fish, mussels, migratory birds, bison, the Scotsburg lowland, native people, George Rogers Clark, the Louisville shipping industry, Louisville itself, all occur here on account of this happenstance of geologic and glacial history.

WHY THEY CHOSE CLARKSVILLE:

For thousands of years people have chosen the site of Clarksville (original) to make home. Indigenous groups of several cultural periods chose this site for its diverse resource base and as a crossroads of the continent. Clark chose it for similar reasons and the serenity of the Falls. This theme can explore the landscape attributes for why people chose to settle in a particular place. Ultimately, this probably goes back the Falls of the Ohio (see above), but perhaps there are more subtle direct reasons.

CHANGES IN THE LAND:

Native Americans; George Rogers Clark; Old Clarksville; land use history including farming, dredging, and dumping; Clark's mill, and more reveal a story of constant change. From the days when mammoths and giant sloths crossed the Ohio at the Falls (as they likely did), to the construction of the McApline Lock and Dam system and the erosion it has caused at Old Clarksville, the landscape has seen incredible change in shape, composition, structure, characters, and more.

WATER:

This site is subtly and boldly defined by water. The Ohio River, Silver Creek, Mill Creek, the Falls, the floodwall and history thereof, the effluent ponds, springs, the flood tolerant vegetation, the flood intolerant vegetation, the undevelopable lowland, the birds, the abandonment of Old Clarksville, the location of Mississippian village on the bluff, glaciology, even the landfills and junkyards...*everything* here comes back to water.

RIVER TRANSPORTATION:

From early canoes, to riverboats, barges, bison traces, a theme of transportation could stitch a spectrum of components together. The site has two railways, once had a ferry, still contains the old road grid, and more. A park is about a great circulation plan, which is just a way of transporting people around a green space.

VEGETATION

The vegetation of the Ohio River Greenway project area is typical successional floodplain vegetation. As described above, the vegetation is dominated by a handful of flood-tolerant species, with less tolerant species in slightly higher elevations, and still less tolerant species in still higher elevations. Exotic species are common mainly in the higher, less flood-prone locations.

As the park planning process moves forward, it will be important to consider a planting plan, and reforestation plan for some areas. The list below outlines a number of woody species that should be found on the site or are found currently only in small numbers. These species are absent or underrepresented in the project area and should be included in the future planting plan. Each species has a different flood tolerance and each should be planted in the appropriate zone. Some species listed here are not native to Clark County but are included because their range is slightly west or south. Considering climate trends, the species will likely arrive in future decades so are included here.



SPECIES LIST FOR FUTURE PLANTING EFFORTS IN THE OHIO RIVER GREENWAY. The list includes trees and shrubs only and is not exhaustive. Some species are more flood-tolerant than others and care should be taken to plant appropriate species in the best locations.

| Scientific Name | Common Name | Notes |
|--------------------------------|-------------------|--|
| <i>Acer rubrum</i> | Red maple | A few individuals. Moderately flood tolerant. |
| <i>Alnus serrulata</i> | Smooth alder | Not found. Good wet site shrub. |
| <i>Arundinaria</i> sp. | River cane | Not found. Historically abundant. |
| <i>Asimina triloba</i> | Pawpaw | Small population present in uplands; |
| <i>Betula nigra</i> | River birch | Not found. |
| <i>Carpinus caroliniana</i> | Musclewood | Not found. Should be widely planted. |
| <i>Celtis</i> sp. | Hackberry | Common in some area, more can be planted. |
| <i>Carya laciniosa</i> | Shellbark hickory | Not found. Excellent bottomland tree. |
| <i>Carya illinoensis</i> | Pecan | Not found. |
| <i>Ceplanthus occidentalis</i> | Buttonbush | Not found (despite name of state forest). An excellent wet-site shrub. |
| <i>Ilex decidua</i> | Possumhaw | Not found. Excellent bottomland shrub found slightly west of site. |
| <i>Ilex verticillata</i> | Winterberry holly | Not found. Beautiful wetland shrub with bright red winter berries. |
| <i>Liquidambar styraciflua</i> | Sweetgum | Occasionally found. Should be more common. |
| <i>Lindera benzoin</i> | Spicebush | One population found. Should be more common on terraces; less flooded sites. |
| <i>Liriodendron tulipifera</i> | Tulip poplar | Not found. Fast growing tree suitable for terraces. |
| <i>Nyssa sylvatica</i> | Blackgum | Not found. Longest lived broadleaf tree on the continent. Grows in low density. |
| <i>Phsocarpus opulifolius</i> | Ninebark | Not found. An unusual shrub; found in wetland and stream banks. |
| <i>Quercus bicolor</i> | Swamp white oak | Not found. A classic bottomland oak, should be planted widely. |
| <i>Quercus shumardii</i> | Shumard oak | Not found. Large bottomland red oak. |
| <i>Quercus palustris</i> | Pin oak | Occasionally found. Fast growing oak of bottomlands. |
| <i>Taxodium distichum</i> | Bald cypress | Not found. Classic southern bottomland deciduous conifer. Slightly outside range, but warming climate will drive it north. |
| <i>Tilia americana</i> | Basswood | Not found. Plant in small numbers as Ohio Valley is southern end of range. |

EXPERIENCE

The Ohio River Greenway project area has a number of special places, historic sites, and rich native vegetation. Planners will need to design a great circulation plan to stitch these various pieces together. As part of that process a few suggestions are offered here:

- The Fish House Green is a central hub that combines excellent river views with flat accessible, elevated terrain.
- Utilization of the (subtly) elevated causeways and farm paths and old levees found in the forested sections cannot be overstated. They will still flood, but will escape some floods.
- An elevated canopy walk through the woods should also be considered. Launching from the dry Fish House Green and traversing to the rail bed to the north (dry) would allow a loop experience.
- Consider adding portions of Mill Creek outside the flood wall (to the east) into the project area. There is an opportunity to tie those neighborhoods into the park. The area already functions as a park as several people were seen playing/exploring the creek on that side of the floodwall.
- In the north extent of the park, the sounds, sights, and smells are incongruent with a park experience. The noise and dust streaming out of the dump are unbearable when one is close by and the winds are up.
- The soundscape is a critical piece of this park. The falls and the river more broadly can be heard in a number of places. Planners should attempt to bring people as close as possible to the river in various capacities. The sounds of the water lapping against the bank can only be heard at the bluff edge and this is the experience people should be offered.
- Consider concrete pots for large trees in the landfill area. As such, the site could have shade without compromising the surface of the landfill.
- Consider perhaps a floating pier much like one would find in a harbor of a place with large tidal fluctuation. The Ohio doesn't flood all that frequently, so perhaps this is an unnecessary expense. But it would simply float up and down with the high waters.

OTHER RECOMMENDATIONS

- Water quality should be tested for each of the many small springs and seeps (maybe a dozen throughout) mostly in Buttonbush Woods. These should be tested for pollutants.
- Consider a LiDAR study or other localized fine-scale aerial topographic survey. The nuances in topography profound repercussions in vegetation and trail potential. This topography is not captured in most data sets.
- A review of the archeological resources and additional field investigation is strongly recommended. Considering the importance of the site (Falls of the Ohio, documented Mississippian Culture, etc.) it is remarkable some sites have not been visited since 1930.
- Additional historical research on George Rogers Clark's original land patent could also reveal interesting information on the presettlement landscape of Clarksville. The land grant was omitted from the early surveys that covered the rest of the state.



- The river detritus pumped into the site by the Ohio River floods is a problem that is unfortunately outside the control of local management. Most of this debris is bottles and foam products. Any kind of river walk experience will need to manage these events.

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An old-growth hackberry in Buttonbush Woods shows the height of flooding through beaver chew marks 15 feet above the ground.