

RIVERBEND PARK MASTER PLAN REVISION



Fairfax County Park Authority

**APPROVED
April 24, 2013**

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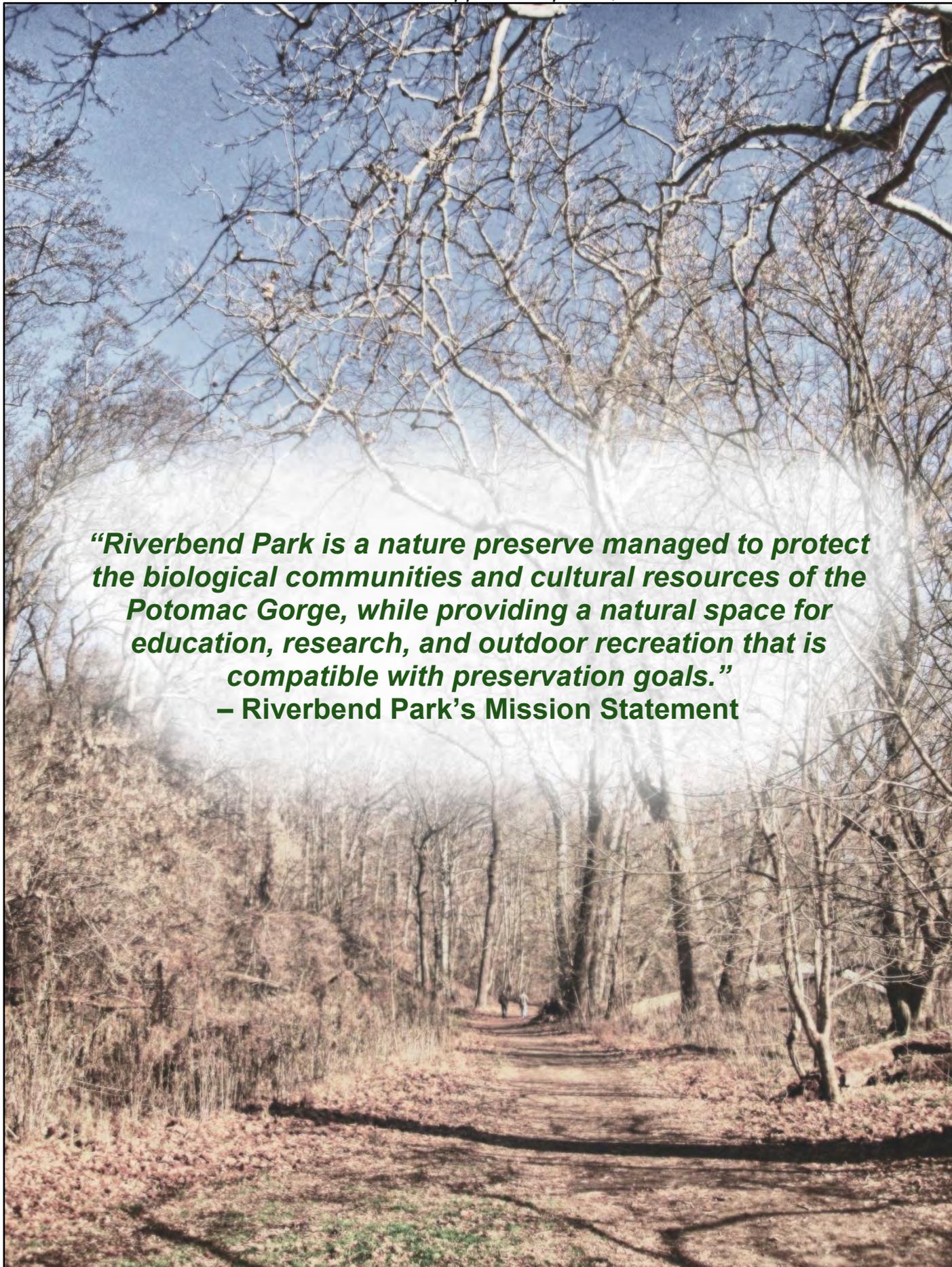


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“Riverbend Park is a nature preserve managed to protect the biological communities and cultural resources of the Potomac Gorge, while providing a natural space for education, research, and outdoor recreation that is compatible with preservation goals.”
– Riverbend Park’s Mission Statement

TABLE OF CONTENTS

I. INTRODUCTION..... 4

 A. PURPOSE & PLAN DESCRIPTION 4

 B. PLANNING PROCESS & PUBLIC INVOLVEMENT 4

II. PARK BACKGROUND 4

 A. LOCATION & GENERAL DESCRIPTION..... 4

 B. CONTEXT..... 7

 C. ADMINISTRATIVE HISTORY..... 7

 D. PARK CLASSIFICATION 11

 E. PARK & RECREATION NEEDS 12

III. EXISTING CONDITIONS 14

 A. NATURAL RESOURCES 14

 1. Geological..... 14

 2. Soils..... 15

 3. Topography..... 19

 4. Hydrology..... 19

 5. Natural Communities, Plants, & Animals of Riverbend Park..... 23

 B. CULTURAL RESOURCES 32

 1. Early Archaic Period (8,000-6,000 B.C.)..... 32

 2. Middle Archaic (6,000–2,500 B.C.) 33

 3. Woodland (1,200 B.C. – 1600 A.D.)..... 35

 4. Early Exploration & Settlement (1600-1700)..... 36

 5. Early Settlement- 1700-1790 37

 6. Early National to Civil War 1790-1861 39

 7. Civil War through Prohibition 1861-1920 40

 8. Prohibition through Park 1920-1970 41

 C. EXISTING INFRASTRUCTURE 45

 1. Utilities 45

 2. Vehicular Access 45

 3. Pedestrian Access & Trails 45

 D. EXISTING USES & OPERATIONS 48

IV. PARK ASPIRATIONS 49

 A. PARK PURPOSE..... 49

 B. VISITOR EXPERIENCE 49

 C. MANAGEMENT OBJECTIVES..... 50

V. GENERAL MANAGMENT PLAN 50

 A. RESOURCE PROTECTION ZONES..... 50

 1. Upland Forest & Slope Resource Protection Zone 52

 2. Floodplain Forest Resource Protection Zones..... 52

 3. Meadow Resource Protection Zone..... 53

 4. Historic Resource Sensitivity Zone 53

 B. ENTRANCE, EXIT, ACTIVITY ZONES & CIRCULATION 54

- 1. Vehicle Entrance Zones..... 54
- 2. Vehicle Exit Zone 54
- 3. Vehicular Circulation 54
- 4. Pedestrian Entrances..... 54
- 5. Pedestrian Circulation..... 55
- 6. Activity Zones 55

- VI. CONCEPTUAL DEVELOPMENT PLAN 56**
 - A. VEHICULAR ENTRANCES, Exit, CIRCULATION, & PARKING..... 56
 - B. TRAIL NETWORK & ACCESS 59
 - C. WATERFRONT ACTIVITY AREA & VISITOR CENTER 59
 - D. INTERPRETIVE FACILITY 60
 - E. MAINTENANCE FACILITY 60
 - F. PICNIC AREAS..... 61
 - G. PICNIC SHELTERS / OUTDOOR CLASSROOMS 61
 - H. OUTDOOR ENVIRONMENTAL EDUCATION AREA (SHOWN ON GMP) 62
 - I. EDUCATIONAL FACILITIES..... 62
 - J. MEADOW INTERPRETIVE AREA & NATURE WATCHING TOWER 63
 - K. PLAYGROUND..... 63
 - L. SITE FURNISHINGS..... 63
 - M. INTERPRETIVE & DIRECTIONAL FEATURES..... 63
 - N. STORMWATER MANAGEMENT 63

- VII. DESIGN CONCERNS..... 63**
 - A. ACCESSIBILITY 64
 - B. PEDESTRIAN IMPROVEMENTS 64
 - C. SOILS & SLOPES 64
 - D. CULTURAL & NATURAL RESOURCE PROTECTION..... 64
 - E. MITIGATE ENVIRONMENTAL IMPACTS 64
 - F. VEHICULAR ACCESS & CIRCULATION 65
 - G. UTILITIES..... 65
 - H. PHASING 65
 - I. ADDITIONAL SPACE PROGRAMMING & DESIGN..... 65
 - J. FISCAL SUSTAINABILITY 66

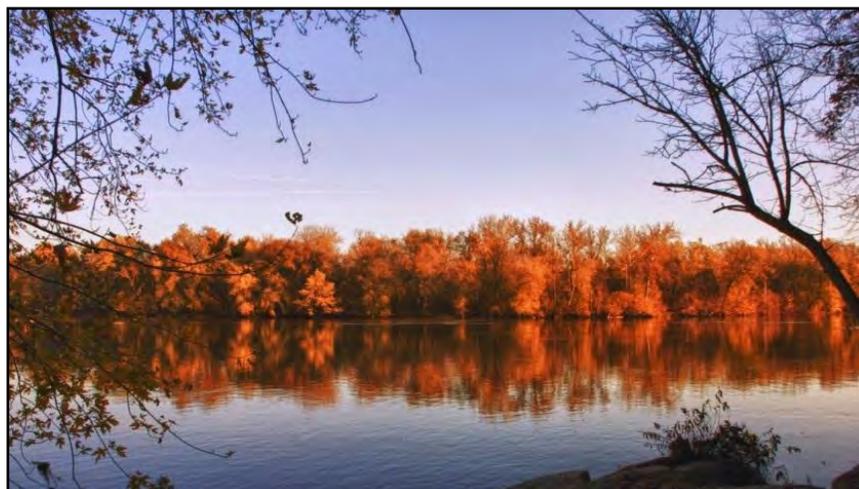


TABLE OF FIGURES

Figure 1: General Vicinity Map 5
 Figure 2: 2009 Aerial Photo of Park and Surrounding Area 6
 Figure 3: Park and School Facilities within Three Miles of Riverbend Park..... 8
 Figure 4: Parcel Map with Dates 9
 Figure 5: 1975 Master Plan 10
 Figure 6: Geology and Soils Map 16
 Figure 7: Topography, Hydrology, & Resource Protection Areas (RPA) Map 21
 Figure 8: Steep Slopes Map 22
 Figure 9: Riverbend Park Primary Vegetation Type 24
 Figure 10: Illustration of Archaic Period American Indian campsite. 33
 Figure 11: Illustration of Atlatl Use..... 34
 Figure 12: Unfinished Bannerstone Found at Riverbend Park 35
 Figure 13: “A Map of Virginia: With a Description of the Countrey, the Commodities, People, Government, and Religion” (SIC) by John Smith (1612)..... 36
 Figure 14: Old map showing Fairfax County and the Potomac River 37
 Figure 15: Northern Neck Grants, from Mitchell, 1977. 39
 Figure 16: Military map referring to the campaigns of the Army of the Potomac in Virginia, Bechler 1864..... 40
 Figure 17: Aqueduct Dam, Circa 1915. 41
 Figure 18: River Bend Camp Commissary, Late 1800s. 42
 Figure 19: 1937 Aerial Photo of Riverbend Park with Current Buildings Overlay. 43
 Figure 20: 1953 Aerial Photo of Riverbend Park. 44
 Figure 21: Major Utilities and Easements..... 46
 Figure 22: Riverbend Park Trail Map..... 47
 Figure 23: General Management Plan Map (GMP)..... 51
 Figure 24: Conceptual Development Plan Map (CDP)..... 58

TABLE OF TABLES

Table 1: Parks and Recreation Facilities within 3 Miles of Riverbend Park 12
 Table 2: Upper Potomac Planning District 2020 Facility Needs Analysis 13
 Table 3: Riverbend Park’s Rare Plants 30
 Table 4: Riverbend Park’s Rare Wildlife..... 30
 Table 5: Riverbend Park’s Rare Birds with Partners in Flight (PIF) Rankings 31



I. INTRODUCTION

A. PURPOSE & PLAN DESCRIPTION

The purpose of a Park Master Plan is to create a long-range vision for the park by determining the best uses, facilities, and resource management for a specific site. During the planning process, the park is considered in the context of the surrounding community and as one park of many within the Fairfax County park system. The approved master plan will serve as a long-term decision making guide to be used before the initiation of any planning, design/construction projects, resource management activities, or programming. Master Plans are general in nature and can adapt over time to accommodate changing park users' needs, and management practices. Park master plans are updated as necessary to reflect community and park changes over time.

For Riverbend Park, this master plan represents a revision to the Master Plan approved in 1975. This revision reflects knowledge gained through 40 years of park operations, research on significant resources in the park as well as changes in the community use patterns and preferences. This master plan revision seeks opportunities to best protect and manage the sites resources while capitalizing on efficient park services, program delivery that highlights the riverfront, the area history, ecology, as well as special features, such as the night skies and spring bluebells. Operational plans and growth projections are carefully considered in the master plan, however, the park master plan is not a guide to park operations. The park master plan is conceptual with facilities shown in general locations within the park. Many of these features will require additional, separate fiscal analysis, funding, space program analysis, design, and engineering.

B. PLANNING PROCESS & PUBLIC INVOLVEMENT

The Park Authority kicked off the public Riverbend Park Master Plan Revision process on February 21, 2012, with a public information meeting attended by over 70 community members. Public input centered on continuing to manage the environmental park features, safety, traffic concerns, trail usage, site access, financial sustainability, and the general community values provided by the park. This public input is considered along with existing site conditions, natural and cultural resources, site management needs, as well as design issues during development of the draft master plan. This draft was published for public review and presented at a public comment meeting on January 24, 2013. The plan was revised based upon the public input and was approved by the Park Authority Board on April 24, 2013.

II. PARK BACKGROUND

A. LOCATION & GENERAL DESCRIPTION

Located at the edge of the Potomac River, within 20 miles of Washington D.C., Riverbend Park has over 400 acres of forest, meadow, and shoreline. An extensive trail network includes a 2.5 mile segment of the Potomac Heritage National Scenic Trail linking national and regional parkland. Kayakers and canoeists enjoy exploring the Potomac River, its shoreline, further reaches, and many islands. Serious anglers, novices, and families fish from the shady riverbank or small boats. Nature observation and enjoyment is highlighted by spectacular river views, abundant beautiful wildflowers, and diverse bird species.

Riverbend Park is located in the Dranesville Supervisory District, at 8700 Potomac Hills Street in Great Falls and classified as a resource-based park. Park facilities include a visitor center, nature center, picnic pavilion, boat ramp, parking lots, and other structures surrounded by forested natural areas that contain cultural resources representing multiple periods of history (Figures 1 and 2).



Figure 1: General Vicinity Map



Figure 2: 2009 Aerial Photo of Park and Surrounding Area

B. CONTEXT

Riverbend Park is located along the southwest bank of the Potomac River. Along the river, the park is bordered on the north by Upper Potomac Park, managed by the Northern Virginia Regional Park Authority and on the south by Great Falls Park, managed by the National Park Service. Large lot residential communities make up the remainder of the park border. These neighborhoods consist of single-family homes, most of which have been built since the 1950s, several of which border the park along its west side (Figure 2).

Riverbend Park is located in the Riverfront Community Planning Sector (UP1) of the Upper Potomac Planning District as described in the Fairfax County Comprehensive Plan. Surrounding land uses are planned, zoned, and developed with residential uses ranging from one to twelve units per acre. Riverbend Park is in the R-E residential zoning district that allows residential use at one dwelling units per two acres and public facilities, such as parks. Jeffery Road runs along the park boundary for approximately three quarters of a mile, separating the residences from the park boundary.

Within three miles of Riverbend Park, there is one elementary school; five County Parks; segments of the Potomac Heritage National Scenic Trail (PHNST); the Cross County Trail; Great Falls Park; Upper Potomac Regional Park; and two private parks (Riverbend Golf Course, and The Nature Conservancy's Fraser Preserve) (Figure 3).

Additionally, Riverbend features an important segment of the Potomac Heritage National Scenic Trail (PHNST) as shown on the Countywide Trails Plan Map as a Major Regional Trail with existing trail connection to the adjacent communities. The PHNST network follows many of the paths explored by George Washington, linking the Potomac and Upper Ohio River basins. Various PHNST segments offer opportunities for travel on foot, bicycle, horse, as well as boat throughout the contrasting landscapes between the Chesapeake Bay and the Allegheny Highlands.

C. ADMINISTRATIVE HISTORY

Riverbend Park is made up of ten parcels identified as numbers 4-4 ((1)) 6; 8-2 ((1)) 1, 6, 7; 8-4 ((1)) 4, 5, 6, 7, 15, & 18). These parcels were acquired between 1961 and 1973 by the Fairfax County Park Authority for public park use (Figure 4).

In 1975, the Park Authority created the original master plan, which has guided Riverbend for the past 40 years. As with other master plans from the time, it consists only of a graphic conceptual map showing planned uses and facilities (Figure 5). This master plan includes a variety of uses, including:

- Trails,
- Managed conservation area,
- Interpretive Center,
- Intern Naturalist Residence,
- Five Picnic Areas,
- Two Picnic Shelters,
- Visitor Center,
- Parking,
- Boat House,

- Boat Ramp,
- Playground Apparatus Area,
- Park Manager’s House,
- Access Roads,
- Maintenance Yard with Building,
- Meadow,
- Equestrian Center,
- Youth Hostel,
- Restrooms with Showers,
- Large Camping Area,
- Environmental Education Center,
- Registration and Control facility (at entrance),
- Gate House.

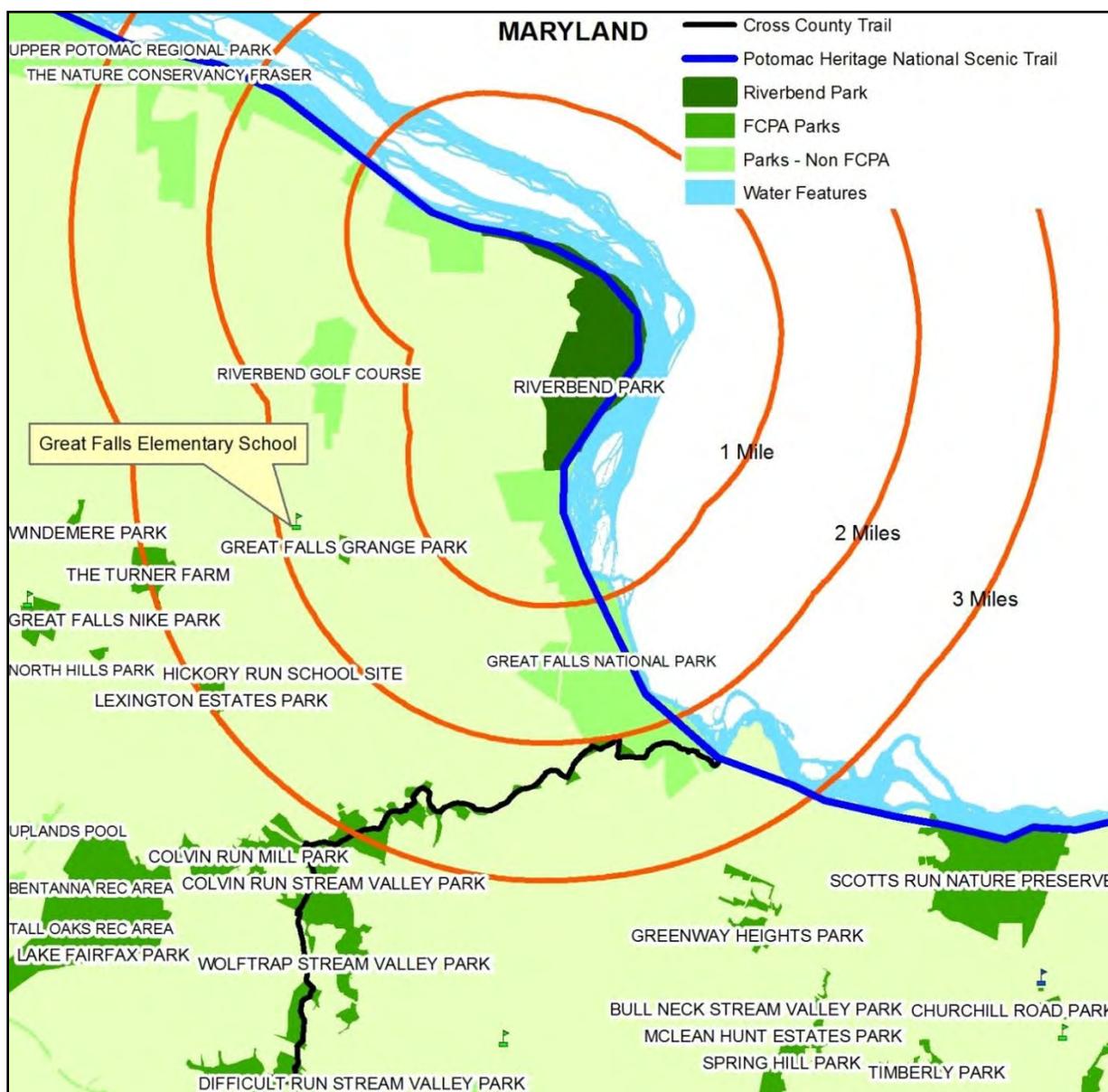


Figure 3: Park and School Facilities within Three Miles of Riverbend Park



Figure 4: Parcel Map with Dates



Figure 5: 1975 Master Plan

Planned facilities that have been implemented include trails, managed conservation areas, an interpretive center, two picnic areas, one picnic shelter, a visitor center, parking lots, a boat ramp, access roads, a meadow, and a gatehouse. Additionally, there are two former residences that served as rental program houses for several years, until the maintenance cost more than the revenue they produced. Even more funding would be required to bring them up to the current building codes necessary to repurpose them. Both houses were approved for demolition by the Park Authority Board on January 26, 2011. An Emergency Services communications tower and several outbuildings also exist within the park. Unimplemented facilities approved with the original 1975 Master Plan include a large Camping Area, Youth Hostel, and Equestrian Center.

Over the past 37 years, this County park has evolved as visitation to the park and the region has grown. A greater understanding of the natural and cultural resources within the Park has been gained, changing the park's focus to resource interpretation. Visitors of all ages now expect an interactive learning experience, which requires dynamic, changing exhibits that highlight new information and the park mission. A revised master plan will help Riverbend Park continue to evolve to meet the needs and interests of County residents for the foreseeable future, while ensuring protection of the park's important resources for future generations.

D. PARK CLASSIFICATION

Park classifications provide a categorical framework for parks within the County park system. Riverbend Park is classified as a resource based park. As described in the Fairfax County Comprehensive Plan, Policy Plan, Parks and Recreation section, resource based parks primarily function to preserve and interpret significant natural and/or cultural resources. Locations for resource based parks within the county are determined by the location of specific resources. Size and access can take many forms depending on the setting and type of resources. Management plans should consider the resources and allow public use only as it is compatible with resource protection.

Resource based parks are selected for inclusion in the park system because of their exemplary natural and/or cultural features. Such parks are acquired, identified, and preserved for stewardship of these resources, which provide a variety of public benefits. These parks provide interpretive opportunities relative to environmental and cultural resources. The lands may offer opportunities to restore degraded areas to protect, increase, and restore biodiversity of species that may inhabit these areas. In addition, recreation opportunities and facilities are also appropriate at these parks. Development which does not adversely affect resources and which enhances awareness of the resource values or serves community leisure needs is appropriate. This development should include opportunities to support education as well as outdoor enjoyment, and may include interpretive (educational) facilities, visitor centers, nature centers, orientation kiosks, nature watching stations, demonstration areas, preserved specialty or historic structures, or gardens. Trails and connections are a significant feature at these parks, especially along stream valleys, which should be designated for hiking, biking, and equestrian uses. To the extent that they do not adversely impact the resources themselves, support amenities may also be developed such as picnic areas, restrooms, signs, benches, waterfront access areas, and parking.

The user experience at resource based parks will be varied, due to the park specific nature, horticulture, and history programs. More casual interests such as gardening, nature watching, and appreciation of local, regional, state, or national history are also supported. Settings for quiet contemplation are appropriate in these parks, which visitors may frequent on a regular or occasional basis. Some resource parks may have areas designated for recreation purposes. The typical duration of visits to resource based parks will be two hours or less.

E. PARK & RECREATION NEEDS

Within three miles of Riverbend Park are five County parks, two of which provide recreational facilities, such as playgrounds, picnic areas, and athletic fields (Table 1). Some offer distinctive facilities including the Great Falls Grange, the Potomac Gorge at Riverbend, as well as the extensive trail network in Difficult Run and along the Potomac. In addition, there are four non-county parks, including a private golf course, Great Falls National Park, Upper Potomac Regional Park, and Nature Conservancy owned land (Figure 3).

PARK NAME	MULTI USE TRAILS	RESERVABLE PICNIC SHELTER	OPEN PLAY AREA	PICNIC TABLES	SCHOOL AGE PLAYGROUND	UNLIT RECTANGLE FIELDS	SKINNED UNLIT 60FT DIAMOND	EQUESTRIAN CENTERS	HISTORIC FEATURE	HISTORIC RENTAL FACILITY	NATURE CENTER	BOAT RENTALS	BOAT LAUNCH	FISHING PIER
GREAT FALLS GRANGE	Y	Y	Y	Y	Y	1	1		Y	Y				
THE TURNER FARM	Y	Y		Y	Y			Y	Y					
RIVERBEND	Y	Y	Y	Y					Y		Y	Y	Y	Y
HICKORY RUN SCHOOL SITE														
DIFFICULT RUN STREAM VALLEY	Y		Y						Y					
LEXINGTON ESTATES														

Table 1: Parks and Recreation Facilities within 3 Miles of Riverbend Park

The need for park and recreation facilities is determined through long range planning efforts. Recreation needs are generally met through the provision of park facilities. The 2003-2013 Needs Assessment provides guidance for parkland and facility needs. As part of the Needs Assessment process, the Park Authority tracks inventory of facilities, looks at industry trends, surveys County citizen recreation demand, and compares itself

with peer jurisdictions to determine park facility needs. In addition, the Park Authority Board adopted countywide population-based service level standards for parkland and park facilities. Table 2 reflects projected local serving park facility needs in the Upper Potomac Planning District in which Riverbend Park is located.

Evaluation of park recreation facility service levels use planning district geography established in the County Comprehensive Plan. As shown in Table 2, Upper Potomac Planning District, which covers part of the Dranesville Supervisory District including the Great Falls area, has a deficit of public playgrounds and athletic facilities (fields and courts). Most parks in the district have few opportunities available where these needs can be addressed. School facilities and private facilities in homeowner common areas supplement the public inventory for trails, playgrounds, fields, and courts.

185,092		2010 population – Upper Potomac Planning District		
200,805		2020 population projection		
Facility	Service Level Standard	2010 Existing Facilities	2020 Needed Facilities	2020 Projected (Deficit)/ Surplus
Rectangle Fields	1 per 2,700 people	67.7	74.4	(6.7)
Adult Baseball Fields	1 per 24,000 people	8.0	8.4	(0.4)
Adult Softball Fields	1 per 22,000 people	4.5	9.1	(4.6)
Youth Baseball Fields	1 per 7,200 people	27.5	27.9	(0.4)
Youth Softball Fields	1 per 8,800 people	13.0	22.8	(9.8)
Basketball Courts	1 per 2,100 people	18.0	95.6	(77.6)
Playgrounds	1 per 2,800 people	30.5	71.7	(41.2)
Neighborhood Dog Parks	1 per 86,000 people	2.0	2.3	(0.3)
Neighborhood Skate Parks	1 per 106,000 people	0.0	1.9	(1.9)

Table 2: Upper Potomac Planning District 2020 Facility Needs Analysis

In addition, the Great Parks, Great Communities Comprehensive Park System Plan adopted by the Park Authority Board on June 22, 2011, includes several specific recommendations for improvements in the Upper Potomac Planning District. This plan included a three year process with extensive public comment on the draft Plan, after which Park Authority staff considered all public comments received. For those comments requiring further action, staff updated Plan text or forwarded comments on to the Park Authority division best suited to take further action. Recommendations relating to Riverbend Park include the following:

- Riverbend Park was master planned in 1975. Since that time, original functions have changed and more information about the park's resources has led to the development of a site specific Natural Resource Management Plan. These changes should be reflected in a Revised Master Plan that includes current resource stewardship and facility needs.
- Renovate the visitor center and nature center at Riverbend Park, including restrooms, offices, storage space, and visitor services areas.

- Build new facilities at Riverbend Park including picnic shelter, boat rental building, playground, maintenance facility, and equipment storage facility.
- The Riverbend Park entrance and visitor center parking lot are in particularly poor condition and additional parking areas are needed. Growth in site usage at Riverbend Park justifies improved roads, trails, and parking areas. Overflow parking areas should be identified at Riverbend Park that may be converted to permanent parking as needed.
- New and improved interpretive exhibits should be developed at Riverbend Park, including waysides, signs, and kiosks.
- The historic corncrib at Riverbend Park should be restored.
- Continue, expand, and strengthen natural resource management efforts at Riverbend Park, including the Invasive Management Area (IMA) program.

III. EXISTING CONDITIONS

The existing site conditions determine the opportunities and challenges located within the park, such as soil types and steep slopes, which effect or limit suitability for construction of park facilities. Using the existing conditions data allows for more focused planning and development.

A. NATURAL RESOURCES

1. Geological

Riverbend Park is located within the Potomac Gorge, a unique 15 mile corridor of steep, rugged terrain. The Potomac Gorge is located in the Piedmont Physiographic Province and is classified by The Nature Conservancy as being in the Piedmont ecoregion. Parks located within the Gorge have unusually distinctive geological, biological, and hydrological features. Other parks sharing the unique, distinctive natural resource features of the Potomac Gorge include Scotts Run Nature Preserve, Great Falls Park, Upper Potomac Regional Park, Turkey Run Park, and George Washington Memorial Parkway. Consistent natural resource management within these parks is beneficial to protection of the resources throughout all sites within the Potomac Gorge.

The geology of the Potomac Gorge is highly unusual because the geographic fall zone drops continuously at a steep grade for an extended distance of 15 miles. The series of metamorphic rocks found in the upper reaches of the gorge in the Great Falls area, including Riverbend Park, were originally classified as Peter's Creek Schist, as they were thought to share many characteristics with this widespread rock unit. However, the United States Geological Survey (USGS) designated these metamorphic rocks as the Mather Gorge Formation because they are unique to the Potomac Gorge. Seen throughout the gorge, these rocks have weathered to create a series of cliffs, over which there are many cascading waterfalls. These rocky bluffs are impermeable water surfaces, creating upland areas above the cliffs where seeps are found, also a distinctive feature of the gorge.

Originally a series of sedimentary deposits on the ocean floor, then metamorphosed under intense heat and pressure, forming the schist and metagraywacke rocks found at Riverbend Park. As they were pushed higher these rocks broke and slid up over each other, creating a stack of thrust sheets as they were pushed upward which can be seen

along at Turkey Run Park. This shearing of the rock layers allowed for intrusions of quartz and Bear Island Granodiorite rock, which has been dated to be at least 469 million years old. Subsequently these rocks underwent multiple mountain building events as evident by the foliation and lineation, then later folded by the same three known orogenic events that resulted in the ultimate formation of the Appalachian Mountains. Presence of iron is readily apparent where rust has formed on the rocks, as is the black color of oxidizing manganese. Together, these traits characterize the Mather Gorge Formation, which are visible throughout Riverbend Park and surrounding area (Figure 6).

2. Soils

Soil characteristics can have major implications on site suitability for certain uses. As classified by the Natural Resources Conservation Service (NRCS) of the United States Department of Agriculture (USDA), Riverbend is comprised of a mix of seven soils and rock out crops found throughout the park. As with most of Fairfax County Glenelg silt loam soil is the most common within the park (Figure 6). These soils and their characteristics are as follows:

a. Codorus

Codorus soils are usually deep, moderately well drained to somewhat poorly drained, with low runoff. They occur on floodplains with smooth, nearly level slopes of 0 to 3 percent. Codorus soils are an acidic, low strength soil, with wetness, a shallow depth to saturated zone, regular flooding, unstable excavation walls with tendencies for cutbanks to cave, affected by frost action, with seepage, and slow water movement. Due to these attributes, they have very limited suitability for structures such as buildings, shallow excavations, local roads, streets, septic tank absorption fields, excavated ponds, playgrounds, and campsites. Given these conditions, they have somewhat limited suitability for trails, landscaping, picnic areas, or anything requiring excavation. They also have a slight to moderate potential for erosion from natural surface trails, roads, or staging areas, with a severe rutting hazard, making them only moderate suitable for these uses.

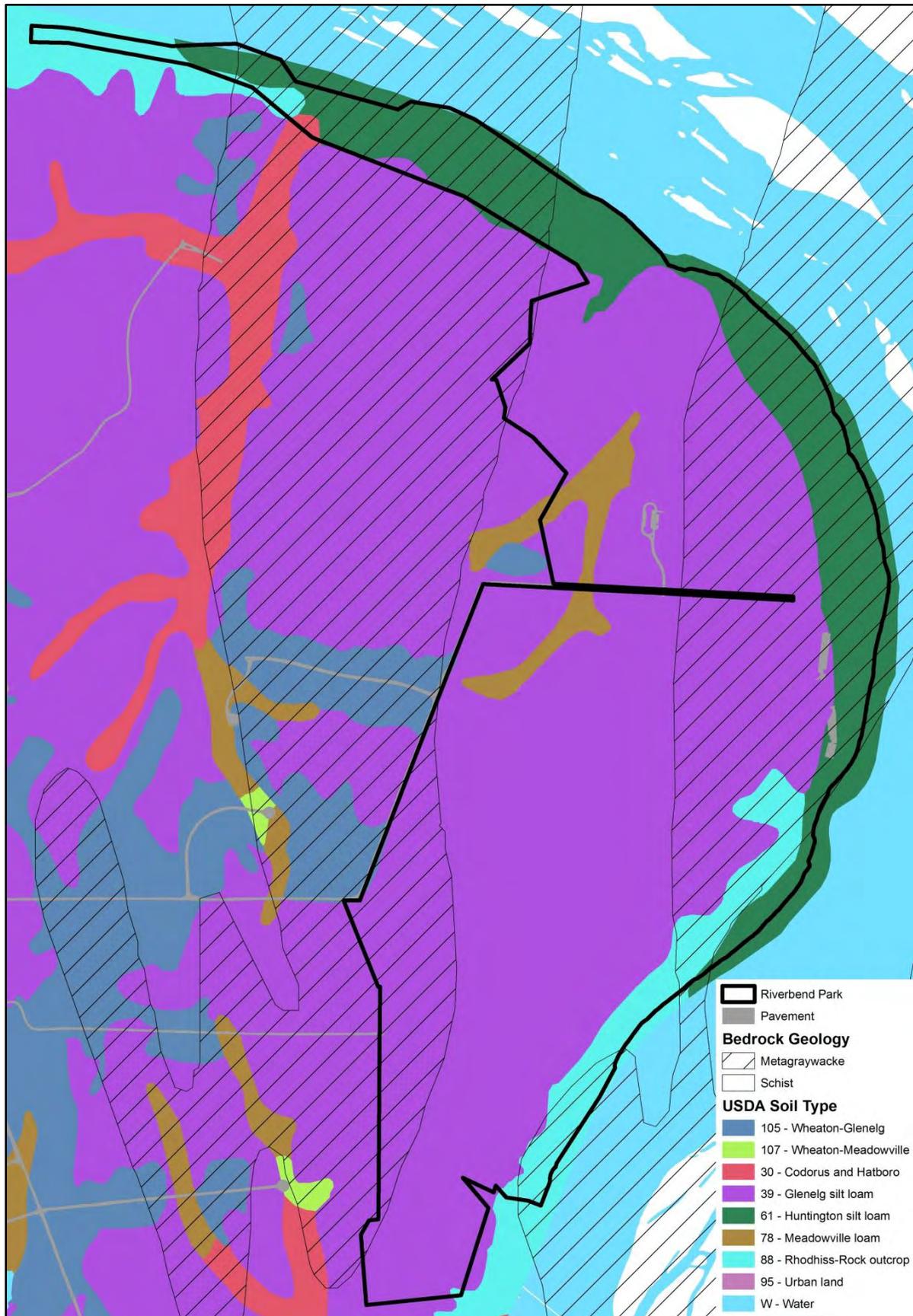


Figure 6: Geology and Soils Map

b. Glenelg

Glenelg soils are moderately deep, well-drained soils, often occurring on the upper slopes and hilltops. Glenelg soils are acidic with slow water movement, shallow depth to water or gravel, susceptible to frost action, with low soil strength, and a moderate to severe soil rutting hazard. Slope can limit use potential since they have unstable excavation walls with tendencies for cutbanks to cave, with potential for water erosion. Potential erosion hazard is moderate under, while severe over seven percent slopes. Due these attributes, suitability for different uses on Glenelg soils is very slope dependent.

At slopes less than seven percent, these soils have a moderate potential erosion hazard. They have very limited usability for excavated ponds, and are somewhat limited in suitability for local roads, streets, moderate excavations, landscaping, and playgrounds. At this slope, they are moderately suited for natural surface (low volume) roads. These slopes are well suited for structures such as buildings, shallow excavations, campsites, trails, and picnic areas. Between 7 and 15 percent slopes, Glenelg soils have a moderate erosion hazard, with very limited suitability for excavated ponds, trails, and playgrounds. Within this slope range, they are somewhat limited for building structures, local roads, streets, shallow excavations, landscaping, campsites, or picnic areas. They are moderately suited for natural surface (low volume) roads, and well suited for minor excavations. Above 15 percent, slopes Glenelg soils are a severe erosion hazard, with very limited suitability for buildings, local roads, streets, shallow excavations, landscaping, natural surface roads, campsites, trails, picnic areas, playgrounds, or excavated ponds. Over 25 percent slope, they are not suitable for anything.

c. Hatboro

The Hatboro series consists of very deep, poorly drained soils, occurring on nearly level flood plains with a slopes range from zero to 3 percent. Surface runoff is high with periodic stream overflow, usually occurring during the winter and spring months. Hatboro soils are acid, often wet, with a shallow depth to saturated zone, have slow water movement, frequent flooding, and are susceptible to frost action. They are low strength, cutbanks cave, and have a severe soil rutting hazard. These characteristics give Hatboro soils very limited usability for building structures, local roads, streets, shallow excavations, landscaping, natural surface roads, campsites, trails, picnic areas, playgrounds, and septic tank absorption fields. Suitability for very minor excavations and excavated ponds is somewhat limited.

d. Huntington

Huntington soils are very deep, and well drained, occurring at the base of slopes in river flood plains, with rare to occasional brief flooding. Huntington soils are low in strength, with frequent flooding, slow water movement, and frequent frost action. There is a slight potential erosion hazard, cutbanks to cave, and soil rutting is a severe hazard. Such characteristics give Huntington soils very limited usability for building structures, local roads, streets, natural surface roads, campsites, septic tank absorption fields, and excavated ponds. They have somewhat limited usability for shallow excavations, landscaping, and playgrounds. Suitability is not limited for trails, and picnic areas.

e. Meadowville

Soils of the Meadowville series are very deep and moderately well to well drained. Permeability is moderate to moderately rapid with slow to moderate runoff. Meadowville soils are on undulating to rolling uplands, occurring around the heads of drainage ways, in saddles, depressions, on concave or slightly convex slopes. Meadowville soils are an acidic, low strength soil, with a shallow depth to saturated zone, seepage with bottom layer, and shrink-swell potential. They are affected by frost action, with unstable excavation walls and caving cutbanks. Due these attributes Meadowville soils have very limited suitability, for excavations, septic tank absorption fields, or excavated ponds. They have somewhat limited suitability for building structures, local roads, or streets. These soils have a slight potential for erosion from natural surface trails, roads, or staging areas, with a severe rutting hazard, making them only moderate suitable for these uses. Uses are unlimited for landscaping, campsites, trails, picnic areas, and playgrounds.

f. Rhodhiss

Rhodhiss soils tend to be very deep, well drained, occurring on slopes, hills, and ridges. Surface runoff ranges from low to high, with moderate permeability. Rhodhiss soils have steep slopes, low strength soil, are erodible, with caving cutbanks. They also have a shallow depth to saturated zone, with seepage to bottom layer, and are affected by frost action. These attributes give them very limited suitability for building structures shallow excavations, local roads, streets, landscaping, septic tank absorption fields, excavated ponds, picnic areas, playgrounds, and camp sites. Such conditions combined with a severe potential for erosion from natural surface trails, roads, or staging areas, along with a moderate rutting hazard, make them poorly suited for such uses.

g. Wheaton

The Wheaton series consists of very deep well drained soils with moderate permeability, and medium to rapid runoff. They are low strength soils, with slow water movement/perc rate, shallow depth to water, are susceptible to frost action, and are a severe soil rutting hazard. Slope can limit use since they have unstable excavation walls, with tendencies for cutbanks to cave. Potential erosion hazard is moderate under, but severe over seven percent slope.

Due these attributes, suitability for uses on Wheaton soils is very slope dependent. With less than a seven percent slope, these soils have a moderate erosion potential. They have very limited usability for local roads, streets, landscaping, excavated ponds, septic tank absorption fields, but are somewhat limited in suitability for moderate excavations, campsites, picnic areas, and playgrounds. At this slope, these soils are moderately suited for natural surface (low volume) roads and trails. These slopes are well suited for structures such as dwellings and small commercial buildings, minor excavations, or trails. Between seven and 15 percent slopes, Wheaton soils have a severe erosion hazard. They have very limited suitability for local roads, streets, landscaping, excavated ponds, and playgrounds. Within this slope range, they are somewhat limited for building structures, shallow excavations, campsites, and picnic areas. Here they are moderately suited for natural surface (low volume) roads, and well suited for trails or very minor excavations. Above 15

percent, slopes Wheaton soils are a severe erosion hazard. They are very limited for use with building structures, local roads, streets, shallow excavations, landscaping, natural surface roads, campsites, trails, picnic areas, playgrounds, and excavated ponds. Over 25 percent slope, they are not suitable for anything.

3. Topography

Riverbend Park's topography contains several predominant ridges, divided by steep sided stream valleys draining to the Potomac River. The remainder of the park is characterized by the relatively flat Potomac River floodplain (Figure 7). Slopes above the floodplain and stream channels frequently exceed 15 percent, making them highly erodible and unsuitable for development (Figure 8).

4. Hydrology

Riverbend Park is entirely within the Pond Branch watershed, which drains solely to the Potomac River, and ultimately to the Chesapeake Bay. The Pond Branch watershed is a valuable resource in Fairfax County due to the high biological integrity and habitat quality. Riverbend Park's location is significant as it is within a larger area of contiguous forest that contributes positively to the water quality of the Potomac River, and Chesapeake Bay. The Potomac River originates at Fairfax Stone in Kempton, Maryland, at the foot of Backbone Mountain, flowing 382 miles to the Chesapeake Bay. Chesapeake Bay Ordinance designated Resource Protection Areas (RPA) are associated with the Potomac River and streams within the park (Figure 7).

Due to the park's location in a less developed area of the County relatively isolated from any significant development, no specific watershed management projects are identified in the Watershed Management Plan that are targeted for Riverbend Park. It is the intent of this planning process, however, to establish stormwater management practices that are supportive of the efforts of the Department of Public Works and Environmental Services in protecting Fairfax County's water resources.

The steep slopes of Riverbend Park contain numerous springs and seeps that emerge from groundwater sources. These seeps potentially contain rare invertebrates and are essential to groundwater recharging in the watershed. They also feed the seven permanent and two intermittent streams that flow to the Potomac, seven of which have headwaters in the park. Clark's Branch near the north end of the park is the largest of these streams. The Fairfax County Stream Protection Strategy Baseline Study of 2001 assessed the Pond Branch watershed, including the streams within Riverbend Park, and rated them to be in excellent condition. Park staff are certified stream monitors who monitor these streams, including quarterly stream assessments on Clark's Branch, to support protecting the water quality of the Potomac River Watershed.

Riverbend Park contains two and one-half miles of shoreline along the Potomac River, with a floodplain of varying width between the river and steep, rocky upland slopes. Floods are a frequent natural process on the Potomac River, due to its dynamic nature. Fluctuating water levels continually change and reshape the floodplain within the park, creating distinctive wetlands, including numerous vernal pools essential to amphibian and invertebrate development.

Two ponds have naturally formed within the floodplain as back swamps, created by chutes during flood events. When the chutes become deep enough, they can retain a permanent body of standing water throughout the year. Located in a completely wooded area of the floodplain, Black Pond is the larger of the two at approximately 1 1/2 acres in size and floods periodically during the year, directly receiving water from the Potomac River. Black Pond exists as a significant natural feature of the river floodplain, providing an important habitat for fish, turtles, wood ducks, and other wildlife. Blue Pond, the second back swamp pond is less than one-tenth of an acre, and is located directly north of Black Pond in the same chute. It began permanently retaining water around 2002, and is flooded annually from the Potomac River. Since then a stand of native aquatic plants has sprung up, including pickerelweed and lizard's tail.

Two man made ponds are also located in Riverbend Park. Carper's Pond is approximately 1/2 acre in size and was created during the early 1900s by damming the creek that runs through it, which starts as a spring approximately 70 yards north of the pond. It is surrounded by forest, and bordered on one side by a gravel access road used by staff. The water level fluctuates little even during long dry spells.

The other is Eisner Pond, which was created in the meadow by park staff around 1996. Though it is only about 150 square feet in size, it sits in a wet meadow depression that is soggy and muddy throughout the year. With a stand of cattails that colonized the perimeter, this pond serves as an important habitat for amphibian development. Wood frogs (*Rana sylvatica*), American toads (*Bufo americanus americanus*), pickerel frogs (*Rana palustris*), spring peepers (*Pseudacris crucifer crucifer*), gray tree frogs (*Hyla chrysoscelis*), green frogs (*Rana clamitans melanota*), and red-spotted newts (*Notophtalmus viridescens viridescens*) have been observed at the pond. No fish have appeared in the pond. The pond completely dried during one extended period of low precipitation, but otherwise has held standing water since its creation.

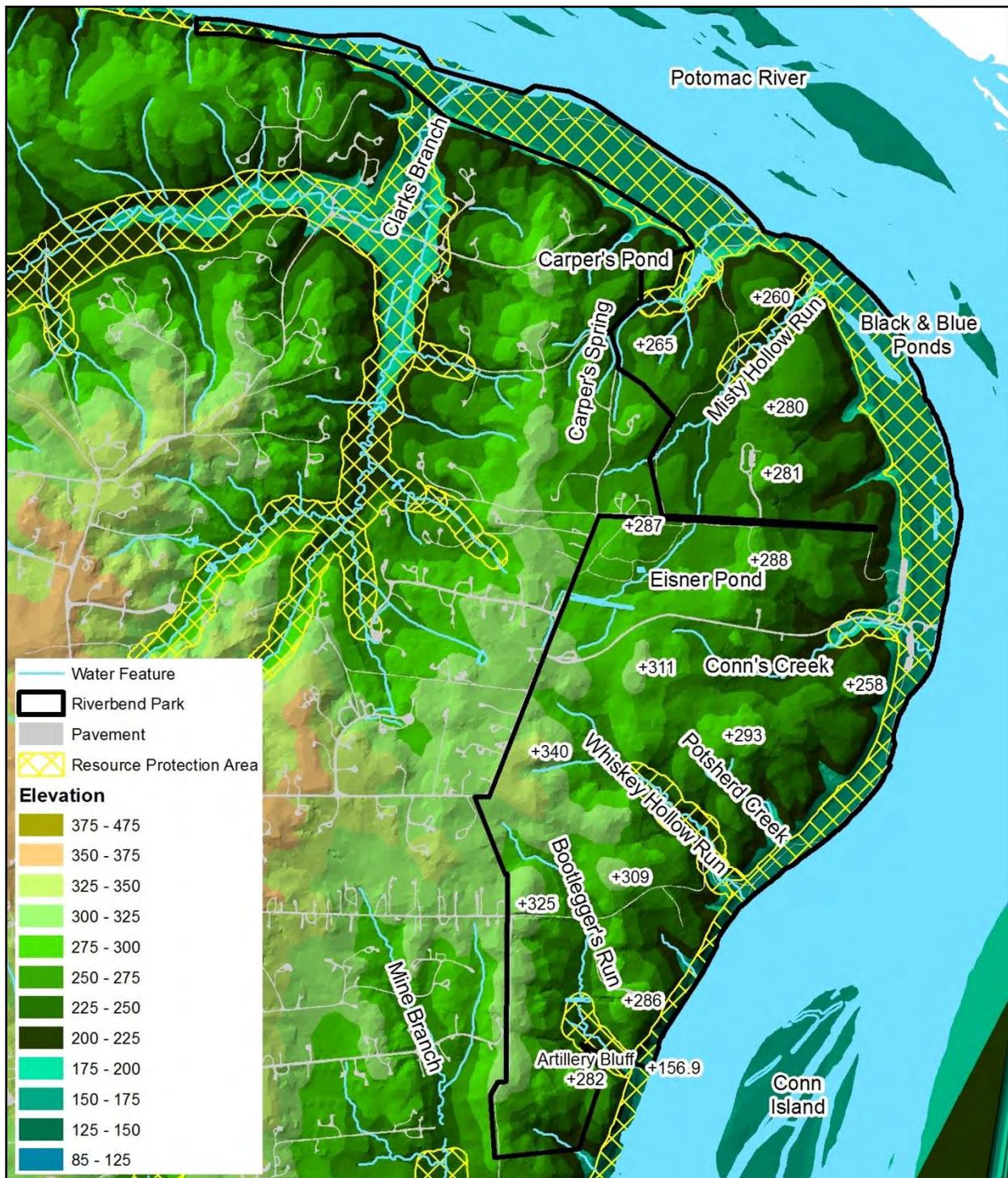


Figure 7: Topography, Hydrology, & Resource Protection Areas (RPA) Map

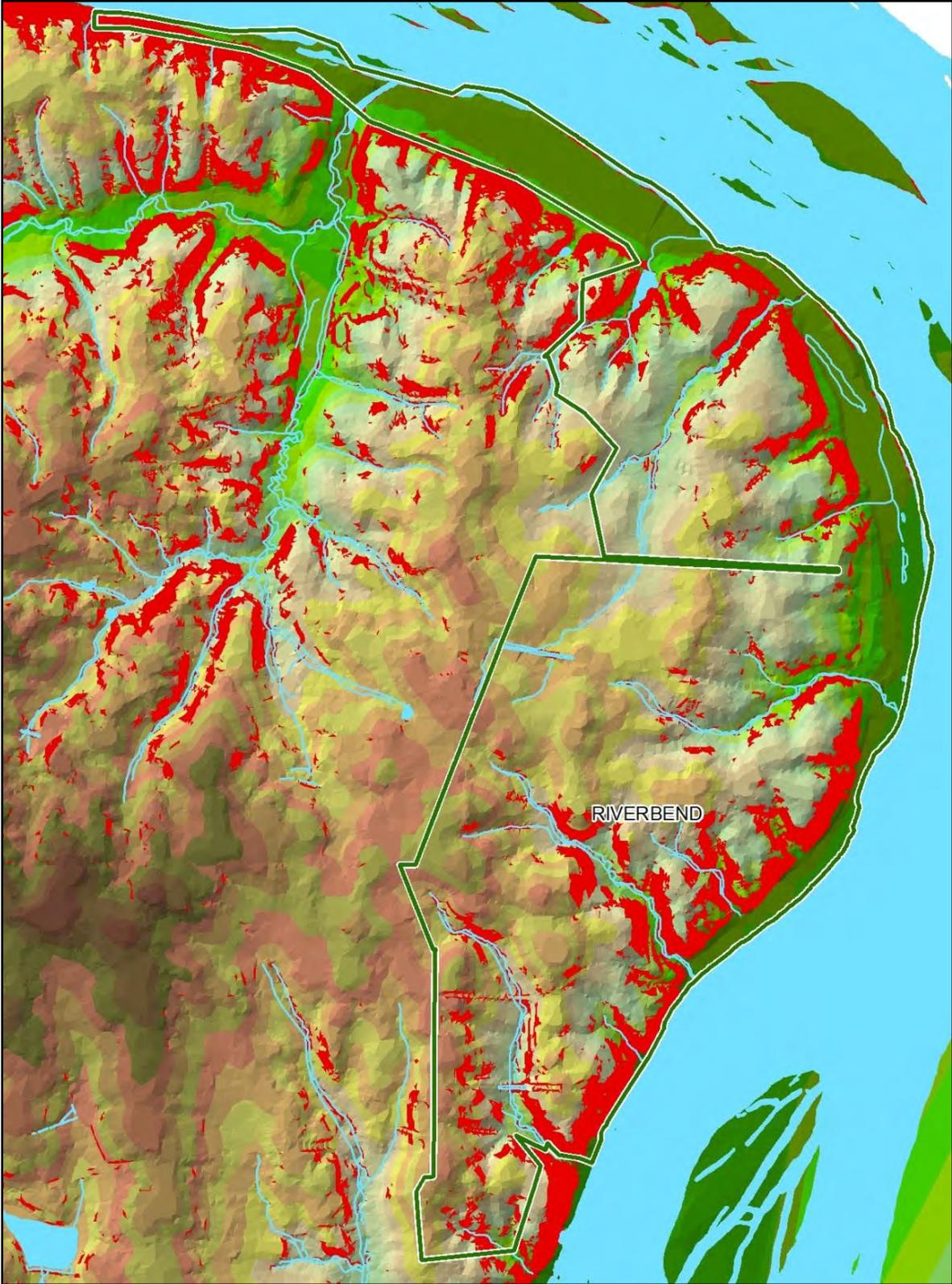


Figure 8: Steep Slopes Map

5. Natural Communities, Plants, & Animals of Riverbend Park

The unusual geology of the Potomac Gorge supports one of the country's most biologically diverse systems of natural communities, plants, and wildlife, which is unique for Northern Virginia. The Riverbend Park Natural Resource Management Plan was developed from extensive fieldwork conducted and documented in conjunction with expert biologists over the last several decades. The park's natural history and special features are summarized below.

Two best practice systems are used at Riverbend Park to understand, manage, and protect the diverse natural communities. As part of the Nature Conservancy, the Natural Heritage Network, collects and analyzes data about plants, animals, and ecological communities, to guide natural resource decisions. Their system ranks plants, animals, and natural communities on two scales of rarity, global or state, based on the number of total occurrences within these scales. Such rankings help direct conservation actions to the rarest species and communities since these are usually the most vulnerable to extinction. Additionally, the Partners in Flight (PIF) North American Landbird Conservation Plan was a critical tool in creating Riverbend's Natural Resource Management Plan. PIF is an internationally recognized organization whose rankings direct conservation actions by classifying bird species into either Watch Listed Species or Stewardship Species. PIF recommends focusing on threatened species habitats in order to preserve critical habitat for all avifauna that also occur within these natural communities.

The Park Authority collaborates closely with The Nature Conservancy, Virginia Department of Conservation and Recreation (DCR), the National Park Service (NPS), and Partners in Flight (PIF) to protect Riverbend Park's natural resources. The classification and delineation of the Riverbend Park ecological communities was completed by the Virginia Department of Conservation and Recreation (DCR) in 2004, as part of The Nature Conservancy's broader study of all plant community classifications within the Potomac Gorge. This comprehensive study of the vegetation ecology of Riverbend Park conducted with site staff participation has provided a broader understanding of the site's environmental significance. Natural community maps were created based on extensive vegetation sampling at Riverbend. These maps provide adequate information to develop management units for use in resource stewardship. For more detailed information, please refer to the Riverbend Park Natural Resources Management Plan.

a. Natural Communities (Vegetation):

Part of the unique character of the Potomac Gorge at Riverbend Park is the unusually high diversity of natural communities that occur in close proximity. Within Riverbend Park, the vegetation is characterized by upland forest with steep ravines, the Potomac River floodplain (riparian area), a managed meadow, and Successional habitat (Figure 9). These vegetative groupings include many natural community types that contribute greatly to the overall biodiversity of the Potomac Gorge. Many of Riverbend's plant communities and plant species are termed "disjuncts", because they are plants that are not typically found in the Washington region. Many of these plants were carried by floods from western Virginia, Maryland, and West Virginia, and are normally found in the mountains.

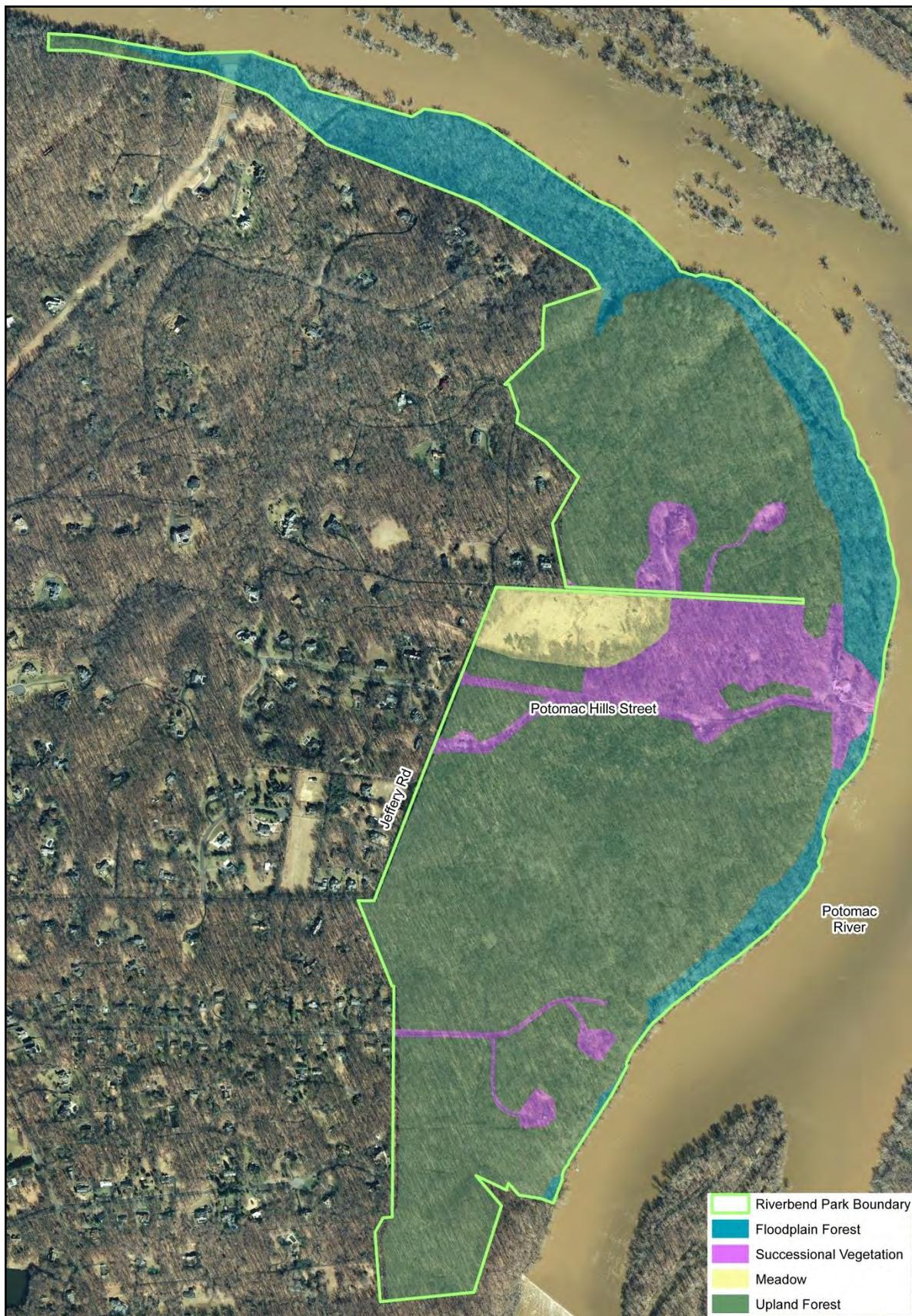


Figure 9: Riverbend Park Primary Vegetation Type

Natural communities are ecological groupings of co-existing, interacting species, considered together with the physical environment and associated processes. These communities have been classified by the Virginia Department of Natural Heritage and are known to be identifiable and recurring in the landscape. At Riverbend, the natural communities have experienced only minimal human alteration or have recovered from anthropogenic disturbance under mostly natural regimes of species interaction and disturbance. Below are listed the major ecological communities of Riverbend Park, grouped by overall habitat type.

b. Uplands:

The Mid-Atlantic Mesic Mixed Hardwood Forest is by far the most extensive upland forest type at Riverbend. Prominent species include American beech (*Fagus grandifolia*), tulip tree (*Liriodendron tulipifera*), white oak (*Quercus alba*), American holly (*Ilex opaca*), Christmas fern (*Polystichum acrostichoides*), and may-apple (*Podophyllum peltatum*). Riverbend park contains the largest known example of this plant community found in the Potomac Gorge, including the only known American Chestnut (*Castanea dentata*) living in the park. This natural community contains a dense understory of woody shrubs and forest wildflowers, along with freshwater springs, seeps, and tributaries that form the headwaters of the creeks in Riverbend Park. This natural community is home to many bird species on the Partners in Flight (PIF) Watch List and Stewardship List of Species. These include Wood Thrush, Scarlet Tanager, Summer Tanager, Ovenbird, Golden-Winged Warbler, Acadian Flycatcher, Yellow-throated Vireo, Black-throated Green Warbler, and Veery. This high-quality habitat with its associated seeps and springs contributes directly to the water quality of the Potomac River, while providing habitat for numerous species including several uncommon dragonflies that breed and forage in the clean, clear water. Prohibiting off-trail activities of visitors as well as their pets, controlling non-native invasive species, and reducing the severe impact of deer browse are critical to preserving this forest type.

The Northern Coastal Plain/Piedmont Basic Mesic Hardwood Forest community covers most of the slopes between the floodplains and upland forests, as well as the steep ravines that protect the tributary streams running through the park. It is characterized by American beech (*Fagus grandifolia*), tulip tree (*Liriodendron tulipifera*), red oak (*Quercus rubra*), paw paw (*Asimina triloba*), and may-apple (*Podophyllum peltatum*). Many of the park's spring wildflowers occur here, including some rare species. Covered by rocks and logs, these steep slopes are ideal nesting habitat for Worm-eating Warblers and Louisiana Waterthrush, both of which are Watch Listed / Stewardship bird species. The very steep slopes of this natural community make the effects of storm damage severe due to falling trees and erosion. Steep slopes are highly sensitive to damage from off-trail use and therefore need to be protected completely.

Several areas of Central Appalachian/Piedmont Rich Boulderfield Forest occur within the park. These areas contain very steep slopes with cliff faces as well as boulder slopes. Characteristic vegetation includes sugar maple (*Acer saccharum*), American basswood (*Tilia americana*), white ash (*Fraxinus americana*), American bladdernut (*Staphylea trifolia*), and jewelweed (*Impatiens pallida*), along with nice

stands of Wild Hydrangea (*Hydrangea arborescens*) and Witch Hazel (*Hamamelis virginiana*). Numerous ferns, such as Maidenhair Fern and Polypody Fern, grow extensively in these communities along with Spring Beauties. Due to the extremely steep slopes, these areas are very sensitive to human impact and must be protected to keep all visitor traffic in other areas. These areas also have some non-native invasive plant problems including Japanese Honeysuckle, Princess-tree, Japanese stilt-grass, and garlic mustard being present. These steep slopes are prime breeding sites for Worm-eating Warblers and Louisiana Waterthrushes, both of which are PIF listed species.

The Piedmont Dry-Mesic Acidic Oak-Hickory Forest natural community only occurs in a few areas on the higher uplands of the park. Characteristic vegetation includes red oak (*Quercus rubra*), white oak (*Quercus alba*), mockernut hickory (*Carya alba*), and flowering dogwood (*Cornus florida*). This upland community produces mast which is an important food source for wild turkeys, deer, and many other species. It also provides a home to at least five of the PIF Watch Listed and Stewardship bird species found within the park, including Wood Thrush, Ovenbird, Scarlet Tanager, Acadian Flycatcher, and Black-Throated Green Warbler. While it does not have as many problems from non-native invasive plants due to the much drier, acidic soils, it is severely impacted by deer browse, dogwood anthracnose, and a lack of naturally occurring wildfires which serve to regenerate this community over time.

Confined to upland areas in scattered patches, the Central Appalachian / North Piedmont Low-Elevation Chestnut Oak Forest is one of the disjunct plant communities more common in the mountainous regions to the west. Distinctive vegetation includes chestnut oak (*Quercus montana*), scarlet oak (*Quercus coccinea*), red oak (*Quercus rubra*), mountain laurel (*Kalmia latifolia*), and high-bush blueberry (*Vaccinium pallidum*). The soils are very dry and extremely acidic, making it very difficult for non-native invasive plants to tolerate. This community offers important habitat for PIF Watch Listed \ Stewardship Birds Species including Worm-eating Warblers, Louisiana Waterthrush, Scarlet Tanagers, Wood Thrush, Red-Bellied Woodpecker, and Red-Shouldered Hawk. Deer browse is less of a problem here as well, as the understory species are primarily made up of Ericaceous shrubs which are not preferred by deer.

c. Riparian:

Riverbend Park contains some exceptionally fine examples of Piedmont/Central Appalachian Scour Bar Herbaceous Vegetation, which is an ephemeral, small-patch natural community that develops on seasonally exposed river shores with fine-textured silty or sandy soils, dominated by quick-growing, annuals with a few low perennials. Common plants include Late Flowering Boneset (*Eupatorium serotinum*), Nodding Smartweed (*Polygonum lapathifolium*), Dotted Smartweed (*Polygonum punctatum*), and Pennsylvania smartweed (*Polygonum pennsylvanicum*) as well as two state-rare plant species. Though considered unmanageable due to its tenuous stability and the constant threat of flooding, park staff have discovered that fallen trees in the river turn downstream, parallel to the riverbank, by the current. Leaving these trees in place creates a depositional build-up behind the fallen trees, which becomes stable enough to allow these plant communities to establish

themselves and grow on their own. Staff is actively practicing this management strategy, with restricted access, and monitoring them to record progress.

The Piedmont/Central Appalachian River Shore Herbaceous Bar natural community often occupies the higher, better-drained, sandy riverbanks and high depositional bars. It is dominated by coarse, tall, herbaceous annuals and perennials, including teal lovegrass (*Eragrostis hypnoides*), marsh seedbox (*Ludwigia palustris*), moist bank pimpernel (*Lindernia dubia*), bearded flatsedge (*Cyperus squarrosus*), and two state-rare plant species. While also considered unmanageable due to ongoing natural pressures from the Potomac River, these natural communities are extremely important in stabilizing steep shoreline areas preventing erosion, and should be protected from erosion due to foot traffic. Additionally, these areas can be overwhelmed by non-native invasive species such as Poison Hemlock and Japanese Hops. Controlling invasive species in these areas is important but is balanced by natural processes that work to reestablish native vegetation.

The Piedmont /Central Appalachian Silver Maple Forest occurs on the lower, more frequently flooded slopes of the Potomac River floodplain within the park. Typical vegetation includes sugar maple (*Acer saccharinum*), boxelder (*Acer negundo*), white snakeroot (*Ageratina altissima*), wood nettle (*Laportea Canadensis*), and Virginia wild rye (*Elymus virginicus*). This community provides essential forest canopy, understory plants, and wildflowers preferred by a great variety of avifauna, mammals, and reptiles including seven Watch Listed / Stewardship Species of birds who use this habitat during migration as well as for breeding purposes. These species include Golden-Winged Warbler, Cerulean Warbler, Louisiana Waterthrush, Yellow-throated Warbler, Yellow-throated Vireo, Blue-headed Vireo, Red-shouldered Hawk, and many others. This natural community is also highly impacted by non-native invasive plants and is highly browsed by deer.

A very rare Piedmont / Central Appalachian Rich Floodplain Forest occurs on the higher, better drained portions of the floodplain and contains many spring wildflowers. Characteristic vegetation includes American sycamore (*Plantanus occidentalis*), boxelder (*Acer negundo*), black walnut (*Juglans nigra*), paw paw (*Asimina triloba*), and Virginia bluebells (*Mertensia virginica*). This area is home to several unique plant species of the Potomac Gorge including many state-rare species of wildflowers. This natural community is very diverse in terms of vegetation, avifauna, reptiles, and mammals. Three PIF Watch Listed Species of birds, Cerulean Warbler, Prothonotary Warbler, and Kentucky Warbler, as well as the state rare Swainson's Warbler nest in this community. Additionally, it is used during the migrations of most of the park's Watch Listed / Stewardship Species. Some of the greatest threats to this community are deer browse, non-native invasive plants, large storm events, and off-trail park use of both humans and pets. Social trails fragment this plant community and should be discouraged.

The Water-Willow Rocky Bar and Shore community contains water willow (*Justicia americana*) and occurs predominantly in and along the Potomac River.

The Central Appalachian/Piedmont Bedrock Floodplain Woodland, another rare natural community, contains incredibly diverse vegetation and subject to natural disturbances from flooding and ice scouring. The vegetation that persists in this area is able to withstand much natural disturbance. Characteristic vegetation includes American Sycamore (*Platanus occidentalis*), Sugar Maple (*Acer saccharinum*), river birch (*Betula nigra*), green ash (*Fraxinus pennsylvanica*), small-spike false nettle (*Boehmeria cylindrical*), Emory's sedge (*Carex emoryi*), and one globally rare plant species. Threats to this community include floods, invasive plants, and humans, both on and off trails. This is a top priority area for active invasive management to maintain the integrity of the plant community.

The rare Mid-Atlantic High Terrace Floodplain Forest is found at two places in Riverbend and includes Sugar Maple (*Acer saccharum*), White Ash (*Fraxus Americana*), American Hornbeam (*Carpinus caroliniana*), and Mayapple (*Podophyllum peltatum*). This natural community also contains stands of Black Maple (*Acer nigrum*), documented only at Riverbend Park within the entire Washington Metropolitan region.

d. Meadow Habitat:

There are three meadows within the park, the largest of which is approximately 14 acres, and was part of the historic Conn Family farm while a smaller approximately one acre meadow is the former location of a fishing camp. Both meadows have grasslands and shrubby edge habitat. Due to Riverbend Park's location on the Potomac River, these meadows are a magnet for migratory birds during both spring and fall migrations. This makes Riverbend Park one of the most reliable spots in the Washington region to see at least 11 species including Nashville Warblers, Tennessee Warblers, Connecticut Warblers, Mourning Warblers, and unusual sparrows such as Savannah's, Lincoln's, Fox, as well as Swamp Sparrows. There have also been rare sightings of Bewick's Wrens, Marsh Wrens, and Vesper Sparrows. These meadows are currently managed using mowing and raking regimes to continue their vital role as migratory stopover habitat. They also contain several unique plant species for the park, including an expanding stand of Butterfly Weed (*Asclepias tuberosa*) and Sugarcane Plumegrass (*Saccharum giganteum*), which within Fairfax County Parks only occurs at Riverbend and Huntley Meadows.

e. Successional areas:

There is an Early-successional forest in the block of former farmland that was originally part of the Conn family farm. It was farmed from the late 1700's until the 1950's, when it was allowed to revert back to forest prior to the creation of Riverbend Park. This habitat runs from the edge of the upper Visitor Center parking lot to the eastern edge of the large meadow, both of which were part of the same farm field. The canopy trees are primarily a monoculture of Tulip Poplars, with an understory severely impacted by deer browse and dominated by non-native invasive plants such as Japanese stiltgrass. While not particularly diverse or biologically significant, this area does provide some stopover habitat for migratory bird species, and habitat for common wildlife species.

Additionally, there are four ponds and nine tributary streams in Riverbend Park, fed by numerous springs and seeps. These features are encompassed in the community descriptions above.

f. Animals:

Much of Riverbend Park is a migratory stopover, meaning that any given species may or may not pass through on any given year, or for multiple years in a row. Park staff, along with volunteers continually observe, study, and survey the wide variety of wildlife hosted by the park. Among the most common species are rabbits, squirrels, white-tailed deer, and geese, all which are typical of the region and would be expected to tolerate park use by visitors. As described in the Natural Resource Management Plan, the park is also frequented by a wide range of creatures that are less common in Fairfax County due to the dense human population. These including bear, fox, bobcat, turkeys, otter, mink, bald eagles, cerulean warblers, and worm eating warblers, which are seen throughout the park.

The white-tailed deer population at Riverbend Park has increased to unsustainable levels that threaten the natural ecology and long-term forest regeneration of most natural communities within the park. As is the case in most of the County, the overpopulation of deer is approximately 6-10 times a sustainable level and is greatly reducing plant regeneration in many of Riverbend's important plant communities. The impacts of deer browse are three-fold. First, the deer eat the vegetative mast produced each year (acorns), thereby reducing the number of seeds available to generate new growth. Second, the deer browse all vegetation lower than 6 feet, which includes most of the new seedlings that do become established. Third, the deer favor native plants over non-native invasive plant species, thereby encouraging non-native growth and harming the native vegetation's ability to compete. Continued management of the deer population towards sustainable levels is of utmost importance to maintaining Riverbend's natural communities.

g. Rare plant and animal species

Due to the high biodiversity, Riverbend Park also supports numerous globally rare, state rare, and regionally rare fauna, including amphibians such as salamanders, reptiles, as well as numerous invertebrates, such as dragonflies. Rare species of mammals, migratory birds, breeding birds, and overwintering birds, can also be seen within the park. The known rare plant and animal species found in Riverbend Park are listed in the following Tables 3, 4, and 5 as provided by Virginia Department of Conservation and Recreation (DCR), Natural Heritage section.

As of 2012, nine plant species within Riverbend Park are tracked by the Virginia Natural Heritage Program as being state- or globally-rare. Species rarity rankings and listings may change over time depending on population size and other known locations.

Common Name	Scientific Name
Sweet-scented Indian Plantain	<i>Hasteola suaveolens</i>
Pink Valerian	<i>Valeriana pauciflora</i>
Stalkless Yellowcress	<i>Rorippa sessiliflora</i>
Dwarf Bulrush	<i>Hemicarpha micrantha</i>
White Trout Lily	<i>Erythronium albidum</i>
Swamp Milkweed	<i>Asclepias incarnata</i>
Harbinger-of-Spring	<i>Erigenia bulbosa</i>
Butternut	<i>Juglans cinerea</i>
Western Beakgrain	<i>Diarrhena obovata</i>

Table 3: Riverbend Park's Rare Plants

As of 2012, seventeen animal species within Riverbend Park are tracked by the Virginia Natural Heritage Program as being state or globally rare. Species rarity rankings and listings may change over time depending on population size and other known locations.

Common Name	Scientific Name
- DRAGONFLIES	
Eastern Ringtail	<i>Erpetogomphus designatus</i>
Laura's Clubtail	<i>Stylurus laurae</i>
Midland Clubtail	<i>Gomphus fraternus</i>
Royal River Cruiser	<i>Macromia taeniolata</i>
Russet-Tipped Clubtail	<i>Stylurus plagiatus</i>
Spine-Crowned Clubtail	<i>Gomphus abbreviatus</i>
Stygian Shadowdragon	<i>Neurocordulia yamaskanensis</i>
Tiger Spiketail	<i>Cordulegaster erronea</i>
Umber Shadowdragon	<i>Neurocordulia obsoleta</i>
- BIRDS	
Red Crossbill	<i>Loxia curvirostra</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Swainson's Warbler	<i>Limnothlypis swainsonii</i>
Peregrine Falcon	<i>Falco peregrinus</i>
Swamp Sparrow	<i>Melospiza georgiana</i>
Common Merganser	<i>Mergus merganser</i>
Caspian Tern	<i>Sterna caspia</i>
- REPTILES	
Wood Turtle	<i>Glyptemys insculpta</i>

Table 4: Riverbend Park's Rare Wildlife

Riverbend Park has recorded occurrences of birds that are included on DCR's list and ranked by the state as rare occurrences, based on a system used by Partners in Flight. Each score is a cumulative score of five significant factors for each species. The five factors combined are listed as the RCS-b score. The higher the score, the more threatened or impacted the species. For more details on the explanation of these ratings, see Partners in Flight Species Assessment Handbook at <http://www.rmbo.org/pubs/downloads/Handbook2005.pdf>.

Common Name	Scientific Name	RCS-b Rank
- PIF Watch Listed Species		
Red-headed Woodpecker	<i>Melanerpes erthrocephalus</i>	13
Wood Thrush	<i>Hylocichla mustelina</i>	16
Prairie Warbler	<i>Dendroica discolor</i>	18
Cerulean Warbler	<i>Dendroica cerulea</i>	16
Prothonotary Warbler	<i>Protonotaria citrea</i>	14
Worm-eating Warbler	<i>Helmitheros vermivorus</i>	13
Kentucky Warbler	<i>Oporonis formosus</i>	15
- PIF Stewardship Species		
Bald Eagle	<i>Haliaeetus leucocephalus</i>	13
Broad-winged Hawk	<i>Buteo platypterus</i>	14
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	12
Acadian Flycatcher	<i>Empidonax virescens</i>	15
Yellow-throated Vireo	<i>Vireo flavifrons</i>	14
Blue-headed Vireo	<i>Vireo solitarius</i>	9
Carolina Wren	<i>Thryothorus ludovicianus</i>	13
Bewick's Wren	<i>Thryomanes bewickii</i>	16
Brown Thrasher	<i>Toxostoma rufum</i>	14
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	10
Yellow-throated Warbler	<i>Dendroica dominica</i>	16
Louisiana Waterthrush	<i>Seiurus motacilla</i>	14
Swainson's Warbler	<i>Limnothlypis swainsonii</i>	18
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	16
Orchard Oriole	<i>Icterus spurius</i>	14
Baltimore Oriole	<i>Icterus galbula</i>	14
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	14
Field Sparrow	<i>Spizella pusilla</i>	17
Indigo Bunting	<i>Passerina cyanea</i>	12
Chimney Swift	<i>Chaetura pelagica</i>	15

Table 5: Riverbend Park's Rare Birds with Partners in Flight (PIF) Rankings

B. CULTURAL RESOURCES

Riverbend Park has nearly 100 archeological sites identified within the park boundaries, most of which are American Indian sites that have been discovered throughout the floodplain and on the top of the hills just above the floodplain. Riverbend Park staff have worked closely with the Park Authority's archaeologists and volunteers to get a baseline understanding of the cultural resources at Riverbend Park. Most of this was done as a Phase I pedestrian survey, which entails archaeologists assisted by volunteers walking the park to assess the landforms and search for clues to past occupation of the park. This Phase I was very fruitful in locating sites with artifacts. During this, and previous surveys, archaeologists have noted approximately one hundred archeological sites, and registered them with Virginia's Department of Historic Resources.

With these sites protected by their inclusion in a resource based park, no further testing has been conducted on the majority of them. However, if land disturbance occurs, such as the construction of the bridge at Clark's Branch, a full-scale archaeological investigation is to be performed to provide guidance for development.

The archeological dig conducted at Clark's Branch unearthed a point and point fragments which date to the Early Archaic/Paleoindian boundary. This same site shows continuous habitation by American Indians all the way to Late Woodland, showing that the area that is now Riverbend Park was inhabited continuously from at least 8,400 years ago through the contact period with European settlers. This makes Riverbend Park one of the richest American Indian history sites in Fairfax County. Further archeological studies may reveal even earlier habitation of the site. A summary of the periods of human habitation at Riverbend is provided below. More information may be found in the Riverbend Park Cultural Resources Management Plan.

1. Early Archaic Period (8,000-6,000 B.C.)

Riverbend Park boasts a known human occupation of over 10,000 years, with its earliest recovered evidence dating to the Early Archaic/Paleoindian transitional period of Native American history. The Early Archaic period is characterized by particular stylistic choices in stone tool manufacture such as corner or side notched spear points. They also used stone knives, drills, scrapers, and other tools. The people of this period lived in a changing environment as the cold, moist Pleistocene Age climate changed to a warmer, drier one prompting sea level rise with changes in flora and fauna. Archaic period Virginia Indians lived in large, mobile bands near food sources, such as the Potomac River, hunting deer, elk, bear, rabbit, fish, as well as gathering foods such as shellfish, fruit, acorns, and hickory nuts (Figure 10).



Figure 10: Illustration of Archaic Period American Indian campsite.

Credit: Thomas R. Whyte, F.H. McClung Museum Archives, Knoxville

2. Middle Archaic (6,000–2,500 B.C.)

By the Middle Archaic period, the Indians of Virginia had enlarged their toolkit in testament to their ingenuity, to master their forested environment with its resources of oak, hickory, walnut, and chestnut. One such tool is the spear thrower or “atlatl” (Figure 11). Archaeologists found a bannerstone, or decorative atlatl weight in Riverbend Park (Figure 12). Bannerstones were drilled and placed at the middle of the spear thrower. This placement improved velocity, balanced, and steadied the spear as the hunter followed through on the throw. During this period, numerous types of spear points were used throughout the eastern United States. Due to this variety, archaeologists use point styles from a particular time to determine the period in which people lived at a site. Other tools that archaeologists often find in domestic sites of the period include mortars and pestles (grinding and hammer stones) used to crush nuts, seeds, and plants during food preparation. Archaeologists have also found stone sinkers for large fishing nets, a clue that the diet of American Indians at this time was expanding to include more fish and shellfish.

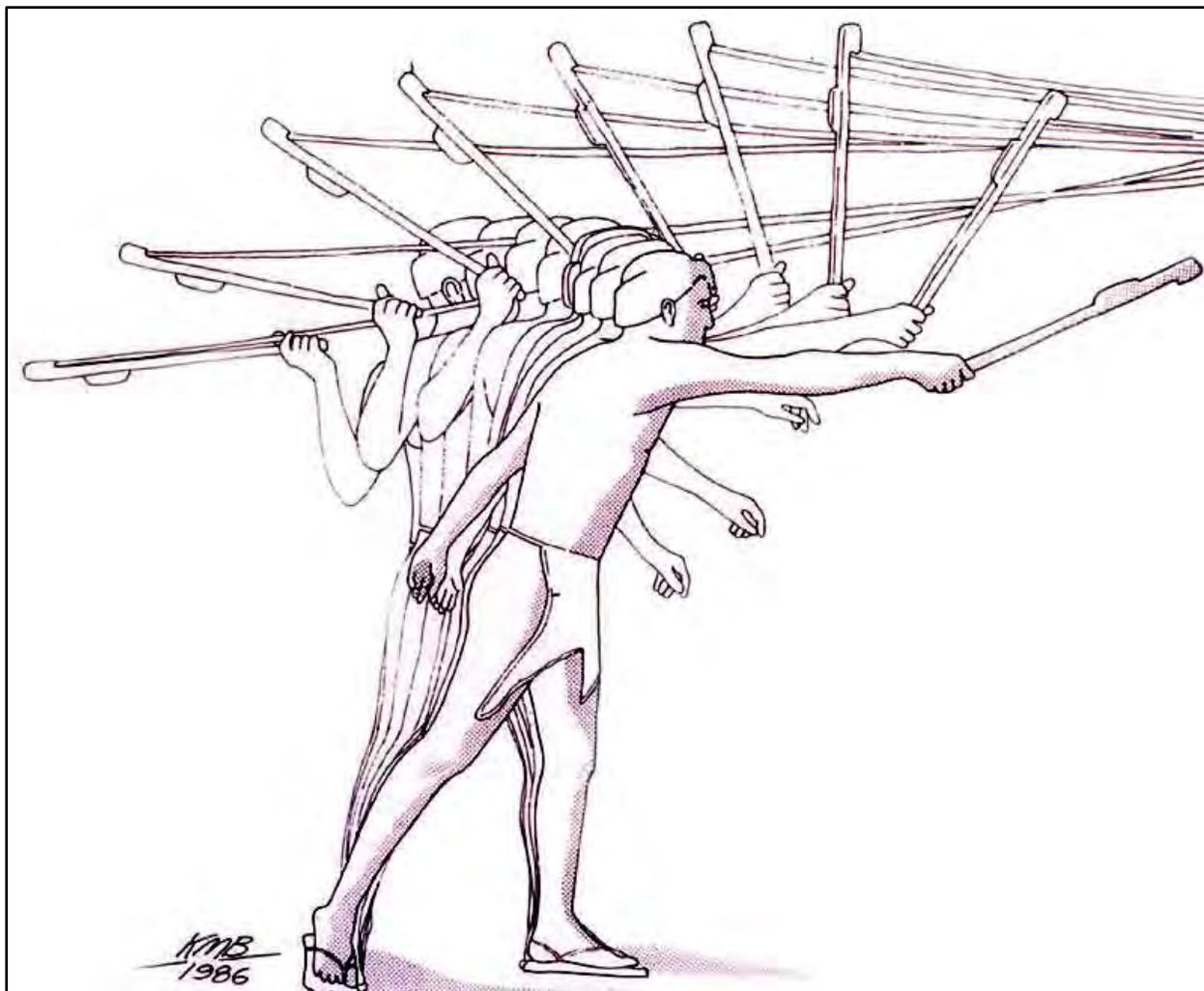


Figure 11: Illustration of Atlatl Use.

From <http://www.texasbeyondhistory.net/glossary/index.html>

The people of the Eastern forest started to produce a large number of chipped stone axes around 4,000 B.C. from tough resilient stone, such as basalt and quartzite. With large axes, the Middle Archaic people could easily cut wood to build houses and make fires. The resulting forest clearings altered the environment in a radical way, by encouraging the growth of beneficial plants such as berry bushes, fruit trees, and nut trees. Deer, bear, turkey, and other animals came to the clearing for berries, nuts, and the tender leaves of low-lying plants, bringing direct benefits to the people from their environmental changes.

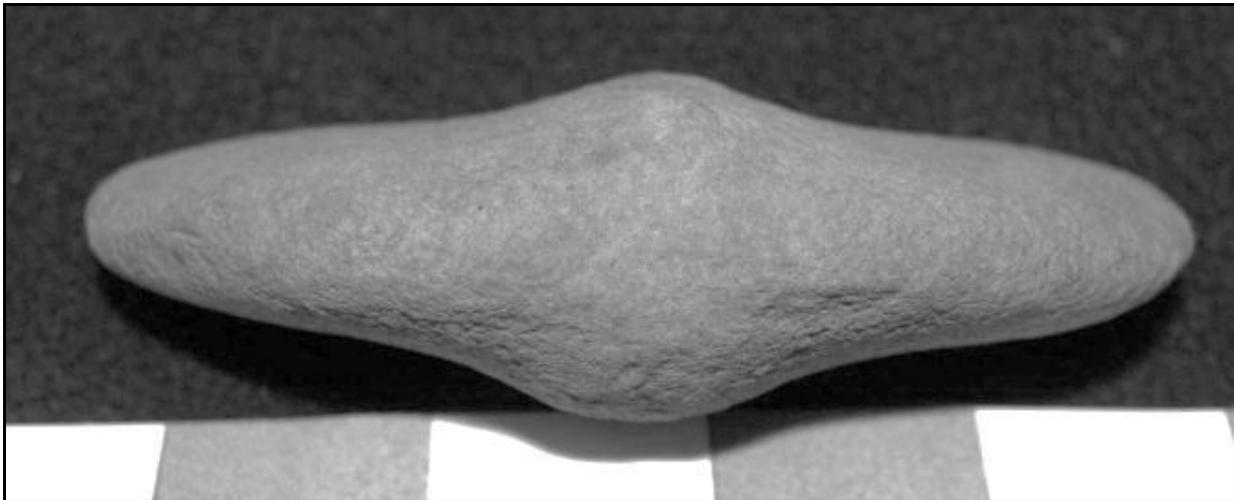


Figure 12: Unfinished Bannerstone Found at Riverbend Park

3. Woodland (1,200 B.C. – 1600 A.D.)

Over time, American Indian technology changed to meet their shifting needs. As populations became more sedentary due to a shift in food procurement from strictly hunting and gathering to a mixed system which included cultivation of maize and beans. These shifts are noted in the archaeological record by seeing refinements in pottery and tool types to meet the changing needs of the people. In Virginia, this period signifies a shift to a more sedentary population, including evidence of more permanent structures. Populations in Virginia grew to the point that small hamlets were scattered across the landscape, particularly along the major river (Potomac) valleys. Eventually, these villages boasted populations of hundreds, and in some cases thousands of people. At times, these were, palisaded, and often arranged with houses in rows around a central plaza with a council house or religious structure nearby. Homes were round or oval in shape, varying between about 15 feet in diameter to 20 feet in length, with storage pits dug into the ground just inside the walls. Support posts dug into the ground are archaeologists' best clues as to the shape, size, and use of these structures.

These larger communities with complex social, economic, and political structures created an environment in which tribal leaders had greater status and responsibility within as well as between groups. This was a period of growth with increased social stratification with artistic objects as well as the increased use of a trade system between groups to acquire these items. Clues to this include specialized craftsmanship in both mundane items such as stone tools, fishhooks, pottery, as well as accessories including beads or pendants made of both local and imported stones, shells, as well as imported copper.

To maintain these populations, increased intensive farming was relied upon for food. Through trade from the South, Virginia Indians added beans and tobacco to their cultivar list. An array of plants, nuts, and berries were also gathered for food or for use in the creation of tools and clothing. In addition, animals such as deer and turkey were hunted heavily, due to Virginia Indians adopting the bow and arrow as a weapon over the spear. Stone tools dating from this period have been found in Riverbend Park, evident to archaeologists by an increase in small triangular shaped projectile points, as

well as the replacement of the grooved axe by an ungrooved axe called a celt. This polished, refined tool allowed people to improve their woodworking techniques.

4. Early Exploration & Settlement (1600-1700)

(Excerpted, from Inashima, 2009)

Few records have been found to document the early exploration and settlement of the area immediately above the Great Falls. In 1608, Captain John Smith explored the Potomac River as far up as the “freshes”, apparently not traveling above the falls nor recording any information on the native groups in that area or beyond (Figure 13). In 1621, a trader named Spilman was sent from Jamestown to trade for corn with the Anacostans near present day Washington, D.C. (Scharf 1967:13, fn 3). During this encounter, all members of the trading party were killed with the exception of a few who were taken captive, including Captain Henry Fleet. After several years of captivity, he was released and he returned to England. In 1631, he sailed back to the Chesapeake Bay, specifically to the Potomac to initiate a trading venture with the natives for beaver pelts. Fleet’s Journals provide a brief glimpse into the area that would become Fairfax County during the time of early exploration and settlement.



Figure 13: “A Map of Virginia: With a Description of the Country, the Commodities, People, Government, and Religion” (SIC) by John Smith (1612)

5. Early Settlement- 1700-1790

On February 2, 1709, Daniel McCarty was the first to obtain a Virginia grant above the falls (Northern Neck Grants 3:248). He obtained a 2,993 acre tract beginning on the side of the Potomac River at the lower end of Sugar Land Island. The term “sugar land” has been used historically to describe areas in which sugar maple trees grew (Figure 14). It is worth noting that sugar maples can be found to this day within Riverbend’s Central Appalachian/Piedmont Rich Boulderfield Forest, Piedmont/Central Appalachian Silver Maple Forest, Central Appalachian/ Piedmont Bedrock Floodplain Woodland, and Mid-Atlantic High Terrace Floodplain Forest natural areas.



Figure 14: Old map showing Fairfax County and the Potomac River

During the early decades of the eighteenth century or possibly earlier, a certain Clark obtained access to lands near Riverbend Park, which were later patented to John Parker. Parker’s Northern Neck Grant (C:88) dated December 16, 1730 provides the only historical document found to date which references the existence of Clark’s Folly. His 215 acre grant was for a tract “being in the said County of Stafford at a Place commonly called Clark’s Folly in the Poison Fields above Difficult Run”. Clark’s residence was sufficiently established to lend his name to the drainage, which has since borne his name as Clark’s Branch, at the northern end of Riverbend Park.

Poison fields refer to fields, which had been cleared by the American Indians, likely through the use of fire (Mitchell 1977:9). Given their common location on arable soils near watercourses, these fields probably referred to horticultural fields more often than to simply areas of native fire burns for hunting. In addition to Parker’s grant, poison fields near Riverbend Park are also mentioned, in the grants of James Carter (Northern Neck Grant C:15) and Bryan Fairfax (Northern Neck Grant I:124-126). Typically,

horticultural fields experience succession back to woodland over a period of 10 to 60 years, depending on site location and characteristics (Kricher and Morrison 1988:100). This period for forest succession suggests that the local poison fields had been left by the natives not long before their discovery by colonial explorers. Unlike European practices of continuous farming, local American Indians followed a tradition of allowing soils to lay fallow once they had begun to show signs of fatigue. Thus, it cannot be said whether such fields were merely being left in fallow or truly had been abandoned.

On September 6, 1722 at Albany, New York, the Five Nations along with the Tuscarora entered into a covenant with the Dominion of Virginia. This covenant later known as the Great Treaty of 1722 stipulated that these tribes would not pass south of the Potomac River nor east of the Allegheny Mountains into Virginia. At the same time, the Indians of Virginia would not travel north of the Potomac River nor west of the mountains. Harrison (1987:149-150) has proposed that it was the signing of this treaty which facilitated the patenting and subsequent settlement of lands above the Great Falls. His proposition is supported by the dates of the Northern Neck Grants along the Potomac River above Great Falls, which followed McCarty's initial grant. The Northern Neck Grants which make up Riverbend Park include John Jenkins on 24 May 1745, which he sold four days later to William Fairfax, James Carter on 5 February 1725, and John Radford on 5 Feb 1725, though this appears to be a double granting as the metes and bounds are the same (Mitchell, 1977:139), plus James Carter 13 June 1731 (Figure 15).

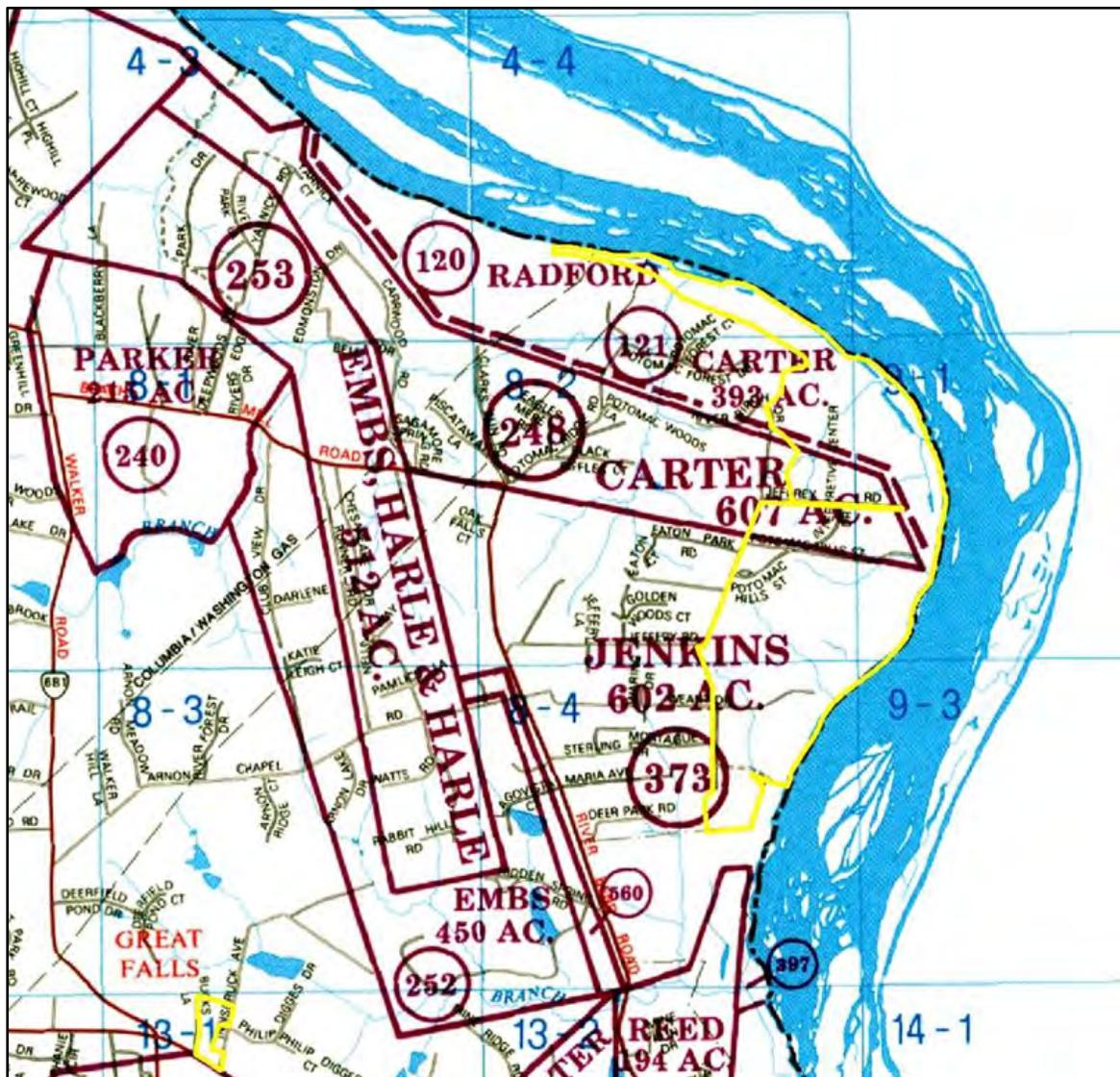


Figure 15: Northern Neck Grants, from Mitchell, 1977.

6. Early National to Civil War 1790-1861

Beginning in 1790, Hugh Conn began to amass parcels near the Potomac, generally encompassed by Carter's earlier patents, including what is now the central portion of Riverbend Park. According to the inventory taken at Hugh Conn's death in 1806, (WB J1-182) Conn was growing tobacco on his property. He also owned eleven slaves, livestock, farm equipment, and a wide variety of household goods, including many high-status items. Though the property was being worked both as a ferry and as a farm, the Conn family lived at another property in Loudoun County. Upon Hugh Conn's death, the ferry tract supported his widow, Susannah and their children, at some point becoming known as "Mrs. Conn's Ferry", which was recognized by the Virginia General Assembly as a legal ferry across the Potomac River in 1812.

In 1814, President James Madison arrived at Conn's Ferry with his entourage the day after they fled Washington D.C. just ahead of a British invasion that burned much of the city. Delayed by severe weather, Madison and his party passed the night at Conn's house and took the ferry over the Potomac to Maryland after the storm calmed at

daybreak. Dolley Madison’s biographer described the Conn’s farmhouse as, “a miserable little hovel in the woods, where the boughs moaned and sobbed around him and the storm expended itself in dismal sighs through the tall trees” (Cutts 1886).

In 1817, one of Conn’s slaves, Ellick, had been leased to a man in Leesburg from whom he escaped. After having been arrested for stealing, then whipped and burned as punishment, he was brought back to Conn’s Ferry where Mrs. Conn had taken up residence. It was from here that he made a successful escape to freedom (Robison 2010), leading to Riverbend Park’s official designation as a Network to Freedom Underground Railroad site.

While the Conn’s sold the ferry in parts over 1830-1831, the name “Conn’s Ferry” remained in use through the Civil War period, as seen on Gustavus Bechler’s 1864 map, though here it is called “Coon’s Ferry” (Bechler 1864)(Figure 16). The island where Washington Aqueduct Dam crosses the river, also bares the Conn family name. Remnants of Conn’s occupation activities in Riverbend Park include the current boat launch at the site of Conn’s Ferry and the large meadow, which was part of Conn’s Farm. Conn’s house and associated buildings were likely located on the hill in what is now the wooded area just above the septic field for the current visitor center.



Figure 16: Military map referring to the campaigns of the Army of the Potomac in Virginia, Bechler 1864.

7. Civil War through Prohibition 1861-1920

During the Civil War, soldiers were stationed around the land that became Riverbend Park to help build and then protect the Washington Aqueduct, whose dam marks the southern boundary of Riverbend Park today (Figure 17). Built in response to the growing population of the District of Columbia, whose water was provided by wells at the time, the aqueduct was developed by Army Corps of Engineer’s Montgomery C.

Meigs beginning in 1852. Meigs' plan diverted water from the Potomac River at Conn's Island with a masonry dam into a 12 mile conduit to D.C. Supplies like cast iron, sand, concrete, brick, and sandstone were brought to the construction site by wagon or by boat on the C&O Canal. The aqueduct's dam was originally built only halfway across the river to Conn Island, with work halted during the Civil War. The aqueduct dam was finally extended to the Virginia side of the Potomac between 1884 and 1885 to meet the District's ever-increasing demand for water (Stone 1985). This dam can be seen from the Potomac National Heritage Scenic Trail, and the Artillery Bluff lookout on the Bootlegger's Trail.

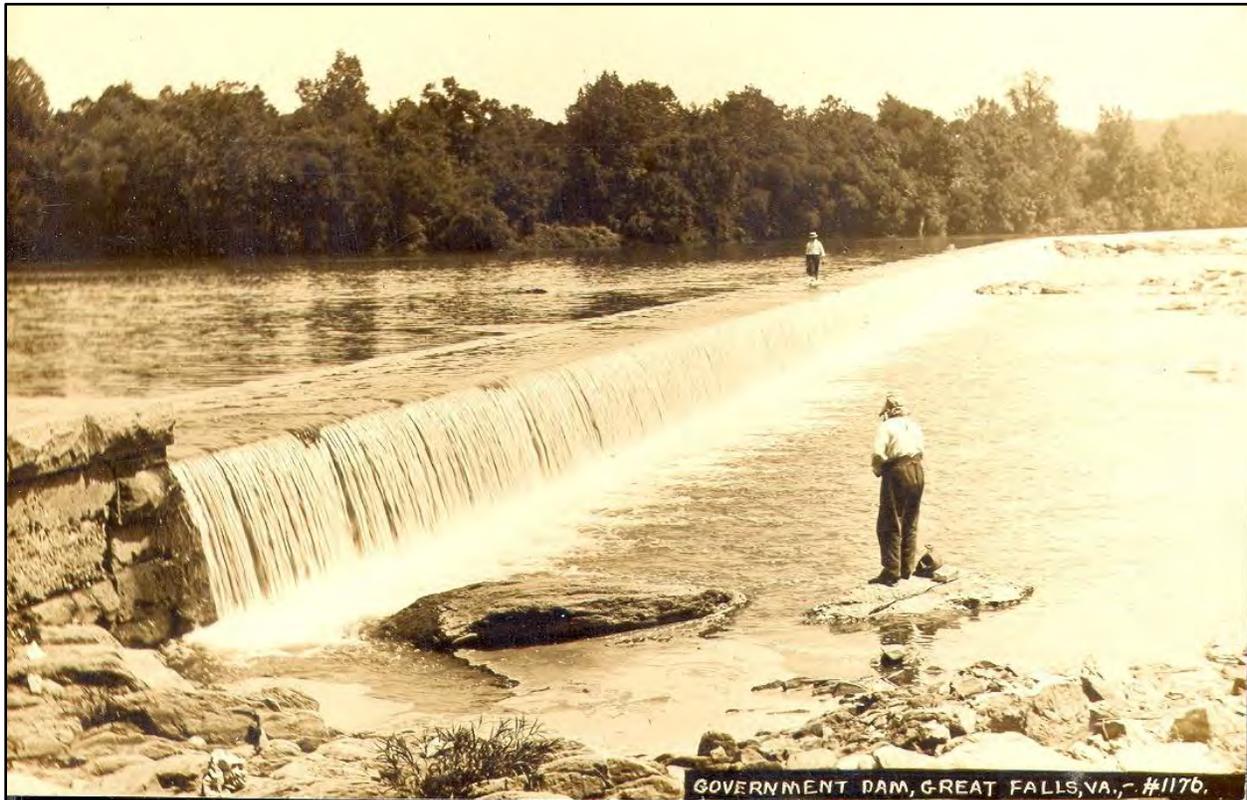


Figure 17: Aqueduct Dam, Circa 1915.

On October 9, 1861, the New York Times ran an article by a staff reporter who had visited the dam and union encampment on the north side of the river. The article indicated a rebel encampment with pickets at Riverbend Park. He then went on to describe a cannonade of the Union camp by the Confederates on the Artillery Bluff above the dam.

8. Prohibition through Park 1920-1970

The land that would become Riverbend Park continued to change hands over the years. In the early 1900s, Dr. John Ladd built several cottages and outbuildings for his River Bend Camp (Figure 18), also operated a fishing camp on the river near the road bearing his name, which he called River View. Between the 1920s and 1960s, Hal Weant, provided cabins and rented boats from this site. The remains of one of his camps can still be found near the picnic area at the end of Weant Drive within the park. Another fishing camp was located in what is now the rock quarry one hundred yards north of the

aqueduct dam. Yet another fishing camp was located in the area surrounding what is now the visitor center.



Figure 18: River Bend Camp Commissary, Late 1800s.

During the period of prohibition, oral history has it that the hollows surrounding the Potomac were filled with moonshiners. The area would indeed be conducive to such activities, as stills needed running water to work, and there are numerous streams throughout the property. Park staff have reported areas deep within the hollows that are filled with bottle debris as well as potential remnants of stills. The thirst for alcohol was great, especially in neighboring Washington D.C. An oral history conducted with Milburn Sanders of Great Falls indicated that the area around the park was called “Hell’s Half-Acre” due to the nefarious nature of activities going on at that time.

Air survey photos taken in 1937 and 1953 clearly show sites now within Riverbend Park being used as farmland. On a 1937 aerial photo, the park property is obviously under cultivation at the areas west of the current visitor’s center and east of the current nature center. In addition, fishing camps are visible at the south end of the park, though there were likely others (Figure 19). What appears to be an orchard near the present nature center is abandoned and grown in with trees between 1937 and 1953 (Figures 19 & 20). However, as with the rest of Fairfax County, by the 1970’s farmland and forest was giving way to large lot suburban development as seen earlier in the 2009 Orthographic Photo (Figure 2). Between 1961 and 1973, the various parcels making up Riverbend Park were acquired by the Fairfax County Park Authority and opened to the public for park use. In 1975, the Park Authority created the original master plan, which has guided Riverbend for the past 37 years (Figure 5).



Figure 19: 1937 Aerial Photo of Riverbend Park with Current Buildings Overlay.



Figure 20: 1953 Aerial Photo of Riverbend Park.

C. EXISTING INFRASTRUCTURE

1. Utilities

The park is supplied with electric and communication services from Jeffery Road. The park is not within public sewer or water service areas. Water is available from wells located on site, and several existing septic systems are located within the park. Three natural gas pipeline easements cross through the northern section of Riverbend Park as they pass from Fairfax County under the Potomac River into Maryland. The largest of these pipelines is owned by Transcontinental Gas Company. The other two pipelines belong to Colonial Gas and Columbia Gas. These easement areas are maintained by the gas companies (Figure 21).

2. Vehicular Access

Two separate entrances provide visitor access to different parts of the park. The main vehicular entrance is located at the intersection of Jeffery and Potomac Hills Street. This main gate and driveway provide access to the Visitor Center, waterfront facilities, trails, and a former residence that predates the park, and associated parking lots. The second vehicular entrance, also from Jeffery Road, leads past the large meadow to the Nature Center parking lot. This access also provides service for electrical and communications utilities, including the Maryland EMS cell tower. Another entrance at Weant Drive also provides vehicular access to the park, although this route is now for authorized service vehicles only. Numerous other service roads exist within the park, that are used only by park staff and emergency services.

3. Pedestrian Access & Trails

Riverbend contains an established trail network consisting of several miles of trails running throughout the park (Figure 22). Some of these are old roads, while others are merely footpaths. Many are restricted to pedestrian only traffic, while others are open to bikers and equestrians. Many of the trails connect to adjacent areas including the very important Potomac Heritage National Scenic Trail (PHNST) a portion of which runs along the Potomac River through Riverbend, connecting to Upper Potomac Regional Park to the north, and Great Falls Park to the south. The PHNST is a national trail linking the Potomac and Ohio River basins along the paths explored by George Washington. Trail entrances to the park are located along the PHNST, at the two main vehicular entrances, both of which support trail heads, as well as numerous social trails that originate from neighbors' yards, some of which are unsanctioned. Due to this trail's importance and location, the Fairfax County Park Authority coordinates closely with the National Park Service on matters related to the PHNST.

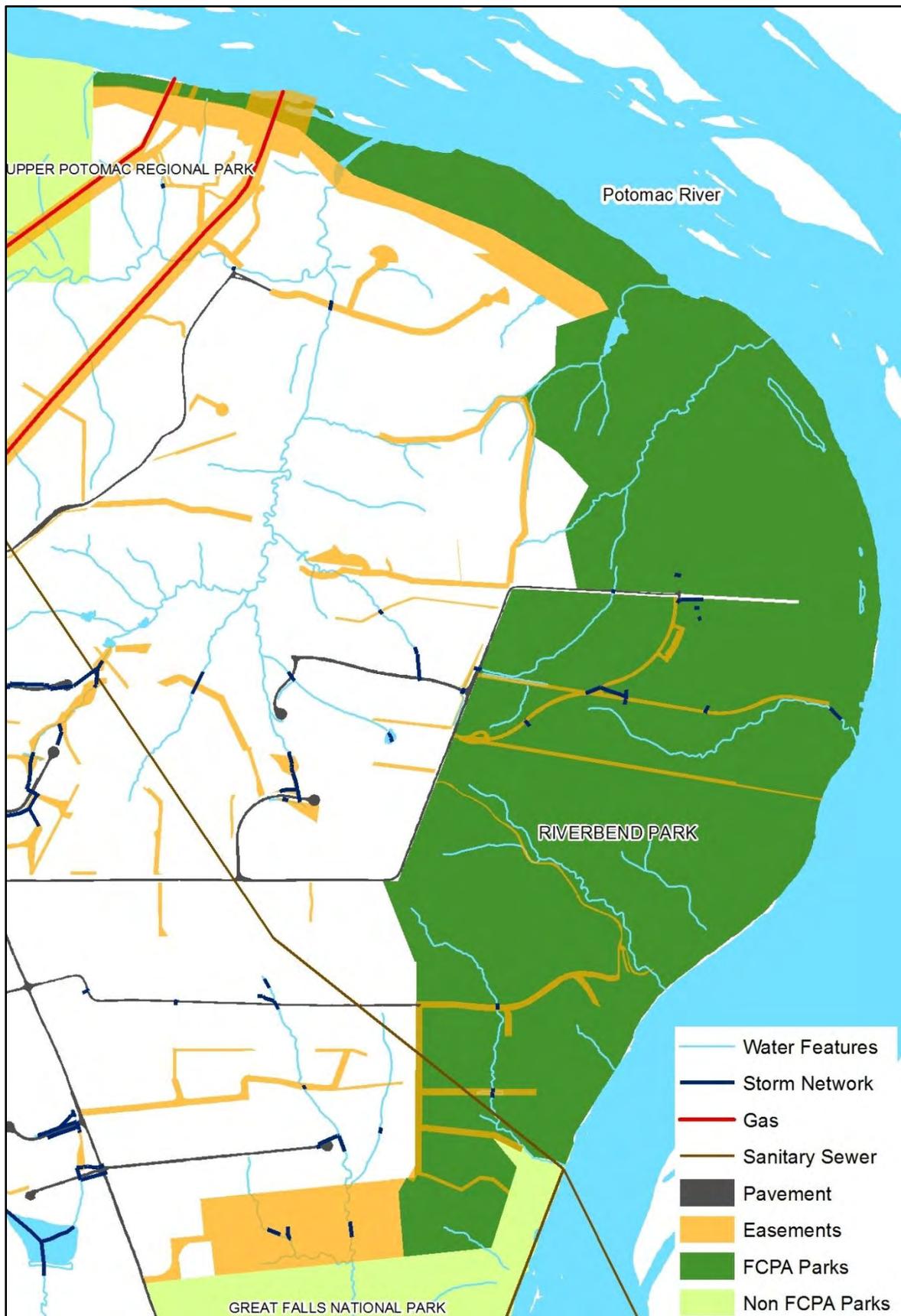


Figure 21: Major Utilities and Easements

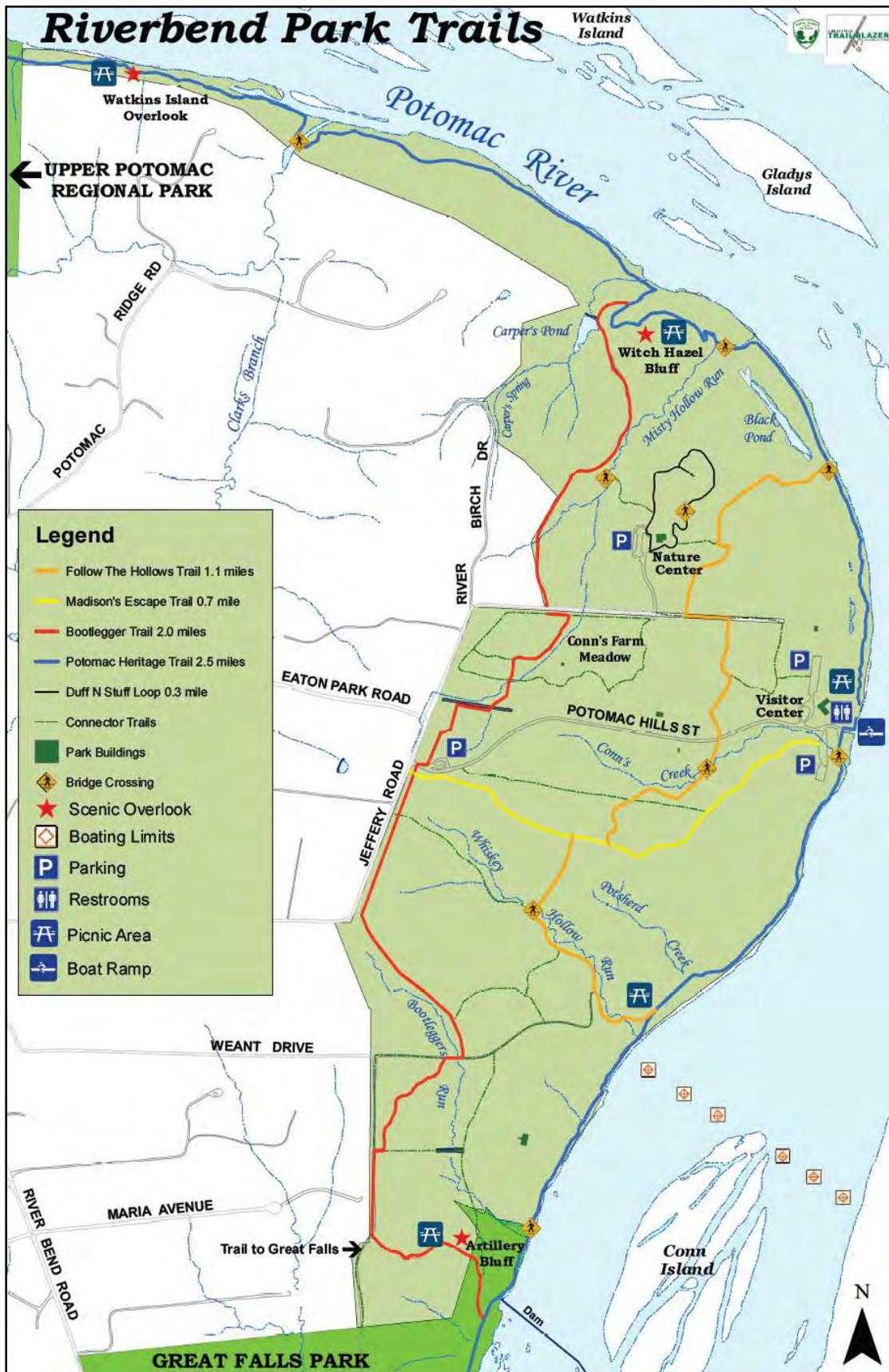


Figure 22: Riverbend Park Trail Map.

D. EXISTING USES & OPERATIONS

Over the past 40 years, Riverbend Park has grown to become one of Fairfax County's premier destination parks. Based on the parks traffic counters, Riverbend hosted over 320,000 visitors in 2011 who arrived by vehicle. Visitors arriving by bike, foot, or on horses are impossible to account for due to the nature of these entry points. Visitors participated in nearly 600 programs, events, and day camps offered in the park. The park offers extensive educational opportunities focusing on environmental and cultural resources. Waterfront and trail use activities are also very popular. Park patrons visit the park for classes, special events, school programs, boating, fishing, astronomy, photography, picnicking, and volleyball. Many return regularly to use the trails for walking, jogging, riding, and enjoying nature. Since its inception, park patronage has steadily increased, and shows no sign of slowing down. Facilities that support the many activities in the park include vehicle and pedestrian entrances, circulation networks, a gatehouse, parking lots, a visitor center, nature center, restrooms, picnic areas, a picnic shelter, volleyball courts, water craft rentals, plus a boat ramp.

The park's increased popularity presents challenges to current operations as well as a need for added and repurposed facilities. Increased park use on peak visitation days and for special events has resulted in traffic backups on Jeffery Road as well as bottlenecks within the park. Due to these existing conditions, inadequate parking, and traffic circulation to support the continuing growth of park usage is also a concern. Improved access, circulation, and parking are needed to support existing as well as future visitors.

The park's key assets are its natural beauty, trails, and waterfront access. Protection of significant and unique resources found in the park is a high priority as is maintaining the serene character of the park's natural beauty.

The need to focus on fiscal sustainability within the park system and at Riverbend Park is increasingly important. The growth in park programs and events increase revenue while meeting the park's educational mission. Opportunities for growth in waterfront activities, sales, and picnic shelter rentals can boost revenues in the park as well. A strong and supportive Friends of Riverbend Park organization provides additional volunteer and financial support.

Located in the floodplain, the Visitor Center has been subject to increased flooding over the years indicating that it will ultimately be reclaimed by the river. The visitor center houses many important functions that compete for limited space, including interpretative exhibits, historic collections, concessions, general store, staff offices, meeting space, sun deck, maintenance, storage, and visitor orientation. Ultimately, these uses should be relocated to a new facility outside the floodplain but within the waterfront area.

Fairfax County Public Schools and many private schools are primary users of Riverbend Park. Many programs are designed to meet the state Standards of Learning requirements. These users as well as staff have identified that the nature center's limited space does not adequately address their needs, which ideally would accommodate six school groups simultaneously. The nature center is poorly designed

for its primary use and its functionality cannot be improved to better accommodate the park's education mission.

Most of Riverbend Park's maintenance is provided by site staff. This includes mowing the grass, removing leaves from developed areas, emptying trash, painting, snow removal, and other similar tasks. Other maintenance tasks include facility and equipment inspections; facility preparation; cleanup; limbing up of trees; tree removal; and repairing pavement as needed. Site staff also responds to any park issues brought to their attention by citizens or staff. Park maintenance facilities and storage are currently located in the basement of the visitor center are substandard. These facilities need to be addressed to provide safe, efficient, as well as adequate space for maintenance activities, equipment, and materials storage.

To manage future growth, as well as the parks resources, Riverbend Park must expand its facilities and programs in an environmentally responsible way. It is the intent of this master plan to guide investments in Riverbend Park to ensure an environmental and financially sustainable future of the park for future generations to enjoy.

IV. PARK ASPIRATIONS

A. PARK PURPOSE

Park purpose statements provide a framework for planning and decision-making. Like other Resource Based Parks in the Park Authority's system, Riverbend is guided by its mission statement:

“Riverbend Park is a nature preserve managed to protect the biological communities and cultural resources of the Potomac Gorge, while providing a natural space for education, research and outdoor recreation that is compatible with preservation goals.”

B. VISITOR EXPERIENCE

Riverbend Park offers a distinct visitor experience similar to that of state or national parks, providing a natural experience with scenery that would have been familiar to Native Americans and Colonial explorers. This visitor experience has evolved over the years as its popularity and visitation have increased. Seeking to serve the diverse needs of patrons, Riverbend Park has continued to expand on offerings that focus on education and interpretation through interactive classes, programs, or events such as the Annual Virginia Indian Festival. For individual and family visitors, Riverbend Park provides opportunities to interact and experience the riverfront, forest, wildlife, and trails in a historic setting with self or staff guided tours.

Casual enjoyment of the park's natural space and historic landscape is part of the visitor experience. Recreation at Riverbend Park includes use of the trail network, picnicking, volleyball, boating, and fishing. This experience is enhanced through interpretive programs and features located along the trail network as well as in the visitor center. The intended visitor experience is to appreciate the preservation of the natural and historic landscape, while providing education as well as appropriate recreation opportunities that appeal to a variety of users.

Typical user visits last one to three hours. The park is staffed and supports the visitor experience in a number of ways, through orientation, supplies, concessions, education, training, interpretation, as well as exhibits. The future overall visitor experience will generally remain consistent with these aims. New and updated infrastructure, amenities, services, and support facilities consistent with the park's growing popularity will be the focus of changes in this master plan.

C. MANAGEMENT OBJECTIVES

In order to achieve the park's purpose, the following objectives, compiled from the parks management plans, will guide actions and strategies for dealing with management issues:

- Riverbend Park is a nature preserve managed to protect the biological communities and cultural resources of the Potomac Gorge.
- Foster attitudes as well as responsible stewardship practices that support conservation of natural and cultural resources.
- Identify, record, manage, as well as preserve the park's natural and cultural resources.
- Riverbend Park will continue to be managed to provide a natural space for public education, research, and outdoor recreation.
- Provide a broad range of educational programs and exhibits promoting an appreciation of nature as well as history.
- Park users should have universal access to any future park facilities when access is possible and feasible. This includes accessibility facilities and accessible connections between different areas of the park.
- Ensure park uses are compatible with preservation goals.

V. GENERAL MANAGEMENT PLAN

The General Management Plan (GMP) is based on the research, site analysis, and data presented in this document. Using this information, the site is organized into management zones that provide a framework for site management and decision making (Figure 23). These zones identify the primary purpose of each area, providing guidance for determining a range of acceptable uses within each zone. Further management of these zones will be as directed by the Riverbend Park Natural Resource Management Plan and Cultural Resource Management Plan, which are administered by site staff.

A. RESOURCE PROTECTION ZONES

Due to the significant natural and cultural resources that exist at Riverbend Park, the majority of the park is classified into various types of Resource Protection Zones (RPZ), all of which will be further guided by the Riverbend Park Natural Resource Management Plan and Cultural Resource Management Plan, which are administered by operational staff. The following RPZs are areas of special consideration containing various habitats, geological features, hydrological features, plus prehistoric, historic, and cultural areas.

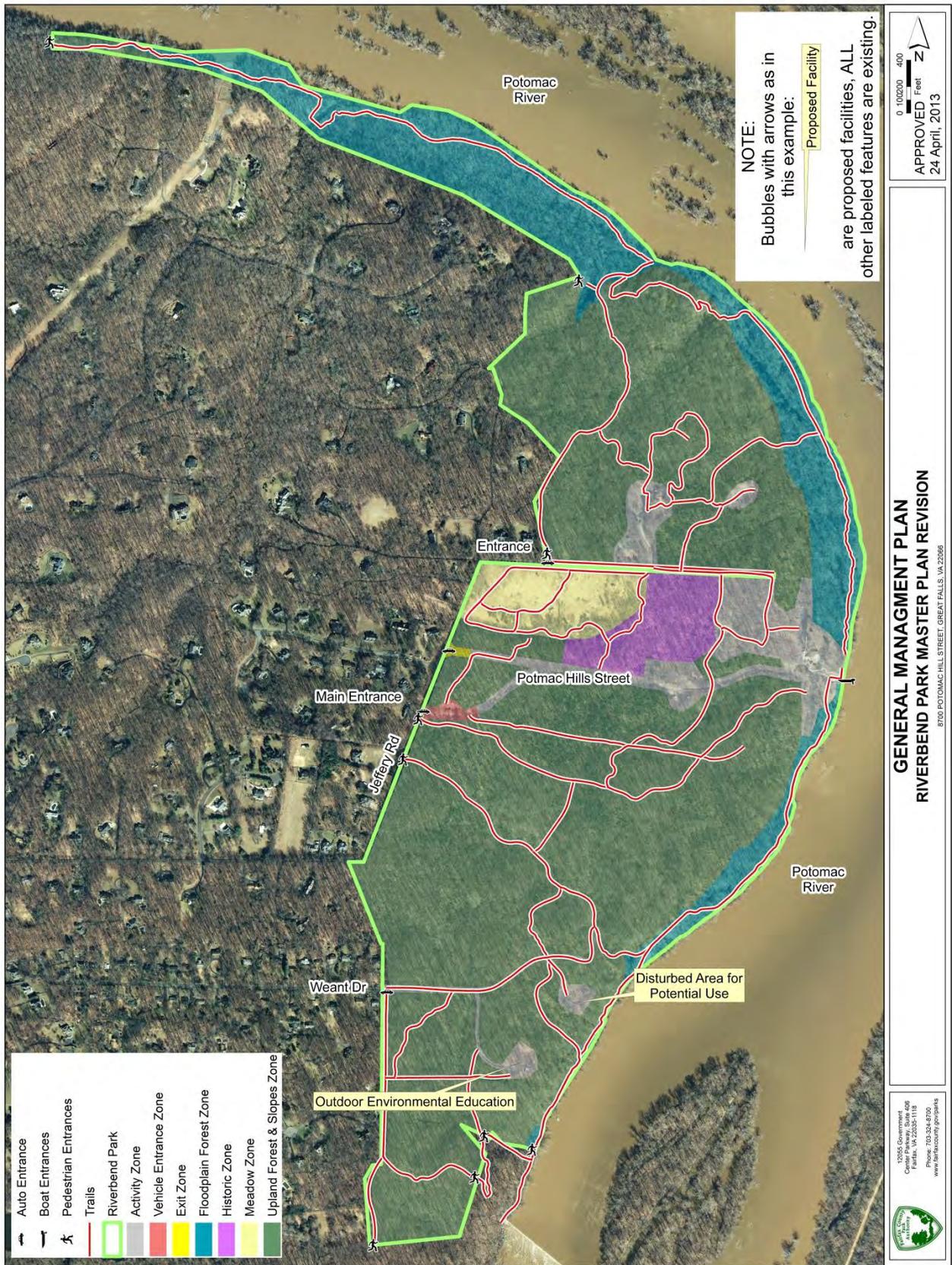


Figure 23: General Management Plan Map (GMP)

1. Upland Forest & Slope Resource Protection Zone

Use within the Upland Forest and Slope RPZs will be restricted to foot traffic on park-maintained trails, with horses and bicycles allowed on designated trails only. Off trail use is prohibited for all visitors and their pets due to the sensitivity of the natural plant communities, rare or unique wildlife species, as well as steepness of the terrain. Additionally, the significance of Riverbend Park's abundant American Indian sites located in the upland forest area highlights the importance of preserving these areas as much as possible in a natural state without disturbance. Designated trails will be maintained within their existing footprints, and no new trails will be constructed in the Upland Forest and Slope RPZs, though existing trails may be rerouted for resource management purposes if they are found to be impacting significant resources. Cultural Resource Management staff should be consulted prior to any ground disturbing activities within this zone, to minimize potential impacts to important archeological sites. Trail maintenance must be carefully coordinated to minimize impacts to all resources. Limited off trail activity will be permitted for resource management activities along with programs scheduled and supervised by the Park Authority that are compatible with resource management goals as described in the site Natural Resource Management Plan and Cultural Resource Management Plan.

This Resource Protection Zone contains some of the finest examples of upland forest communities found in the Potomac Gorge. It is within these upland areas where the only known living American Chestnut (*Castanea dentata*) can be found in the park. Additionally, seven of the nine streams within the park, as well as their headwaters are located within this zone. These uplands are home to many bird species that are on the Partners in Flight (PIF) Watch List, PIF Stewardship Species, rare amphibians, invertebrates, and plants. Protecting the integrity of these forested blocks is critical to the health of the seeps and streams within them. These forests have a thick canopy, which creates deep shade that regulates the hydrology as well as the temperature for the springs, seeps, and tributary streams. This intact forest directly contributes to the water quality of the Potomac River Watershed.

2. Floodplain Forest Resource Protection Zones

The floodplain forest contains many of Riverbend's rare plants and natural communities, some of which represent the finest examples of state rare plants anywhere in the region. There are other very fine examples of more common species such as Virginia bluebells, which are very popular for visitors to see every year. This community is very diverse in terms of vegetation, avifauna, reptiles, and mammals. Three PIF Watch Listed Species of birds nest in this community including Cerulean Warbler, Prothonotary Warbler, and Kentucky Warbler. The state rare Swainson's Warbler has nested in this community at Riverbend Park. Most of the park's Watch Listed and Stewardship Species use this community during migration. Some of the greatest threats to the Floodplain Forest include flooding, erosion, and off trail use. Off trail use here can be particularly devastating, by eroding riverbanks, exposing root systems, trampling extremely rare plants, and opening light gaps which favors more aggressive invasive species to become established in their place. Additionally, the significance of Riverbend's abundant American Indian sites located in the floodplain areas adds to the importance of preserving these areas as much as possible in a natural state without disturbance.

Uses within the Floodplain Forest RPZs will be restricted to foot traffic on park-maintained trails, with horses and bicycles allowed on designated trails only. Off trail use is prohibited for all visitors as well as their pets due to the sensitivity of the natural plant communities, rare or unique wildlife species, the fragility of river, instability of streambanks, and the loose nature of the alluvial soils. No new trails will be constructed in Floodplain Forest RPZs, and existing trails may be rerouted if they are found to be negatively impacting park resources. Trail maintenance must be carefully coordinated with site staff and Cultural Resource Management Staff to minimize impacts to the resources. Limited off trail activity will be permitted for resource management activities and programs scheduled with supervision by the Park Authority that are compatible with resource management goals as described in the site Natural Resource Management Plan and Cultural Resource Management Plan.

3. Meadow Resource Protection Zone

This zone is comprised of a large meadow that was once an agricultural field in part of the historic Conn Family farm. The meadow is managed as native grassland with mixed grass and shrub habitat, specifically for migratory songbirds. Regionally, this meadow is one of the best bird watching locations in Northern Virginia. All year round many migrant birds can be found here, with some notable rarities such as Connecticut Warblers, Mourning Warblers, sparrows including Savannahs, Lincoln's, Fox, Swamp, and Vesper, Bewick's Wren as well as Marsh Wren. Also present are rare species of plants such as Sugarcane Plumegrass (*Saccharum giganteum*), purple milkweed, swamp milkweed, and some orchids. One of the finest stands of native butterflyweed in the region is located here, which is an important food source for migratory butterflies such as monarchs.

As a successional habitat, this meadow requires active management, primarily in the form of mowing, raking, and selective thinning to maintain its current biodiversity. Prescribed fire and grazing with livestock are also potential management tools. The meadow will continue to be actively managed to perpetuate a diverse and rare plant community that provides suitable habitat for grassland migratory bird species. All off trail activities are prohibited unless expressly coordinated by Park Authority staff, and only then as it relates to the site Natural Resource Management Plan. This zone offers an excellent opportunity for nature programming, self-directed nature observation, and resource interpretation. Program support features, trails, resource management, as well as interpretation features focusing on Conn's Farm and the meadow's natural resources are appropriate in this zone.

4. Historic Resource Sensitivity Zone

This zone was part of the former Conn Family farm and contains remnants of Native American sites, as well as scattered building remnants believed to be associated with the Conn family dating to the late 1700's and early 1800's. One building remnant may be where President Madison stayed for one night when he was fleeing the British soldiers, making this site significant as a War of 1812 landmark. As part of the Conn Farm, the area is also associated with the park's designation as an Underground Railroad Escape to Freedom site. Many of the archaeological features identified in this zone have been impacted by past agricultural uses, road, park and/or trail development. However, some features may retain vertical and horizontal integrity. The potential for

historic interpretation in these areas is high, and should be considered as a part of any proposed use. Vegetation in this zone is of low quality, consisting of successional vegetation and invasive plants. Amenities such as interpretive trails with features, expansion of parking, etc. could be undertaken here. Appropriate subsurface archaeological investigation will be required before any development occurs.

B. ENTRANCE, EXIT, ACTIVITY ZONES & CIRCULATION

These areas of the park accommodate the many visitors that enjoy Riverbend Park, numerous park activities, waterfront access, educational facilities, and locations where visitors enter, exit, and move through the park in a safe and manageable fashion throughout the park.

1. Vehicle Entrance Zones

There are two vehicle entrance zones in the park. The primary park Entrance Zone is at the intersection of Jeffery Road and Potomac Hills Street, which serves most of the daily visitors to the park going to the visitor center or waterfront. The other entrance is further north on Jeffery Road leading to the nature center. These zones provide the parks initial impression and should include visitor orientation features such as signage, way finding features, information kiosks, a gatehouse, gates and/or access controls, and parking. Other appropriate uses in these zones are support features including staff areas, benches, trash receptacles, and trailhead signage. All visitor services and routes in these zones should be fully accessible, when feasible.

2. Vehicle Exit Zone

The current vehicle circulation provides two lane roadways that combine entrances and exits. To improve circulation in the site, an added exit only zone is proposed to be added in the location of the park's original entrance that was previously abandoned. This exit zone provides an exit onto Jeffery Road that supports a one way circulation pattern with that improves traffic flow within the park. Trailheads, as well as traffic control such as gates, gatehouse, and signage are appropriate in this zone. All visitor services and routes in these zones should be fully accessible, when feasible.

3. Vehicular Circulation

Two main roads, Potomac Hills Street and Jeffery Road, provide vehicular access from the entrances to parking lots most of which are near the park's main facilities. A service road currently used by park staff only is planned to be upgraded and opened to the public to improve visitor circulation within the park. This will enable visitors to drive between the waterfront and nature center areas without exiting the park will reduce traffic on Jeffery Road. Numerous other service roads allow vehicular access for park staff and emergency services within the park.

4. Pedestrian Entrances

Pedestrians enter the site from several trail connections including the Potomac Heritage National Scenic Trail (PHNST) along the Potomac River between Great Falls Park and Upper Potomac Regional Park, the vehicular entrances, and exit, as well as from adjoining neighborhoods. As appropriate, visitor orientation, benches, trashcans, park identification, way finding, regulation, and interpretive signage may be placed at these pedestrian entrances.

5. Pedestrian Circulation

Riverbend features an established trail network consisting of several miles of trails running throughout the park (Figure 22). Some trails follow former road beds, while others are narrow footpaths. Most are managed for foot travel only, while some are open to bicyclists and equestrians. Many of the trails connect to adjacent areas including a segment of the Potomac Heritage National Scenic Trail (PHNST) along the Potomac River connecting to Upper Potomac Regional Park to the north, and to Great Falls Park to the south. A component of the National Trails System, the PHNST is a network linking the Potomac and Upper Ohio River basins, following many of the paths explored by George Washington. Trail entrances to the park are located along the river, at the two main vehicular entrances, as well as numerous social trails that originate from neighbors' yards, some of which are unsanctioned.

6. Activity Zones

Five Activity Zones are located throughout the park. These include the extended waterfront area, the primary park road network, the nature center area, area around the Emergency cell tower, and former residence sites. To ensure that important park resources are not disturbed, these zones are intentionally located in areas of the park that have been recently disturbed by human activity. This area is managed with the primary purpose of education, interpretation, staff facilities, waterfront access, recreation, and research, with supporting uses.

Activity Zones serve as areas that will support visitation, education, recreation, and outdoor enjoyment. Distributing active uses within these limited zones allows for improved programming, circulation, and distribution through the site and greater protection and less disturbance in the Resource Protection Zones.

Development in the waterfront Activity Zone will focus on visitor orientation and services, education, interpretation, water related activities, social interaction, programs, trails, events, resource management, parking, infrastructure, as well as site support facilities. An interpretation facility is planned in the main activity zone to supplement and/or replace the existing visitor's center. Visitor amenities such as picnic facilities, pavilions, outdoor classrooms, trails, trailheads, benches, trashcans, as well as interpretive, regulatory, and directional signage are suitable outdoor uses for this zone. All visitor services and routes should be fully accessible, as feasible.

The Activity Zone located at the nature center will support educational, group programming, and visitor service functions. Replacement of the nature center should be considered. Outdoor classrooms, picnic shelters, supporting amenities such as play equipment, trails, trailheads, picnic tables, benches, parking, and infrastructure are appropriate in this activity zone. Location of a maintenance facility could also be considered in this zone and should be sited in a safe manner that will be compatible with other uses in this zone.

Activity Zones located in the disturbed areas of the emergency cell tower and former residences are more remote within the park, but are served by access as well as utilities. Uses and programs appropriate to the size of the areas, accessibility, the specific landscapes, as well as user preferences that are consistent with the park

mission should be further explored over time. Possible programming uses may include summer camps, primitive group campsites, hiking support facilities, outdoor classroom, or group picnic shelter.

VI. CONCEPTUAL DEVELOPMENT PLAN

Building on the management objectives and General Management Plan, the Conceptual Development Plan (CDP) consists of two parts that establish the more detailed master plan. The first portion includes the plan text, which describes future park uses and facilities. This section also discusses design concerns that will need to be considered when the CDP is implemented. The second part of the CDP is a graphic depiction of the recommended uses and their general locations (Figure 24). These two parts of the CDP should be used together to understand the full extent of the recommendations.

As most of the park is to remain undeveloped, the Riverbend Park CDP focuses on the central core activity area of the park where facilities exist and future uses are planned. When all or parts of the CDP are funded for implementation, site engineering will be conducted to refine design details. CDPs are general in nature so actual facility locations may shift based on future site engineering and resource studies.

A. VEHICULAR ENTRANCES, EXIT, CIRCULATION, & PARKING

Vehicular access to the park will remain from the two existing entrances along Jeffery Road, located in the Entrance Zones. To improve circulation efficiency as well as reduce traffic backups onto Jeffery Road during peak use days, the traffic gate and gatehouse at the main entrance should be moved or replaced further into the park on Potomac Hills Street. This will allow vehicle queuing to stack along this entry road, thereby alleviating backups onto Jeffery Road. This will also allow the existing parking lot at the entrance to be improved and reconfigured with 20-30 spaces that will serve as a trailhead and overflow parking. To improve traffic control, and reduce backups, this entrance road will become one way down to the intersection with the existing original park entrance road that was abandoned when the new entrance was built. The original entrance road will be improved and reused as a one way exit to Jeffery Road. The one way entrance and exit roads will form a loop that will connect to the main park road that serves the remainder of the park. Parallel parking will be provided in the one way road segments to reuse existing roadway to support expanded parking needs.

The current Nature Center access road shall remain in use with parking added near the intersection of Jeffrey Road and the nature center parking lot entrance across from the meadow. This will better support educational and group program activities in this area of the park.

Traffic control such as signage, gates, bollards, as well as gatehouses can be used at these three entrance and exit locations to control park traffic. These areas are also entrance points for foot traffic as well as locations where visitors disembark their vehicles, so they need to facilitate safe pedestrian circulation. Visitors get their first impression of the park at these points, so visual elements should be in keeping with the park's character and include facilities that support visitor orientation, such as staff stations, kiosks, park identification, directional, regulatory, as well as event signage should be provided. Other amenities such as benches, trashcans, parking, landscaping

and interpretive features are also appropriate in the entrance zones. All visitor services and routes in these zones should be fully accessible, as feasible. A restroom should be provided near the main entrance, trailhead, or gatehouse, either in the form of a composting toilet or integrated with the relocated gatehouse.

To further improve internal circulation a connection from the waterfront area to the nature center, the existing maintenance road should be improved to facilitate better internal circulation in the core areas of the site. Doing so will facilitate traffic in the park, eliminating the need to leave the park to drive on Jeffery Road to get between the two main activity areas of the site. This will provide greater flexibility in controlling traffic and allow better emergency vehicle access within the park, especially during high visitation events.

Parking at Riverbend Park is inadequate on peak days and for special events. Additional parking is needed to support existing and added features in the park. The existing parking lots are to remain, but may be improved and expanded. Traffic islands at the entrance to the main parking lots at the waterfront should be removed to facilitate better traffic flow and allow the lots to be expanded by approximately 40 spaces each. Additional parking is planned as shown on the CDP on the south side of Potomac Hills Street, parallel parking along Potomac Hills Street, within the entrance zones and at the planned interpretive center. Parking will be added to support trailheads, picnic shelters, and outdoor classrooms.

Low impact development (LID) techniques are recommended for the parking lots to reduce stormwater runoff quantity and impacts. Consideration should be given to the use of pervious paving and/or LID structures to manage and reduce stormwater runoff. Use of these techniques, even with new and expanded parking lots, can improve runoff over current conditions.

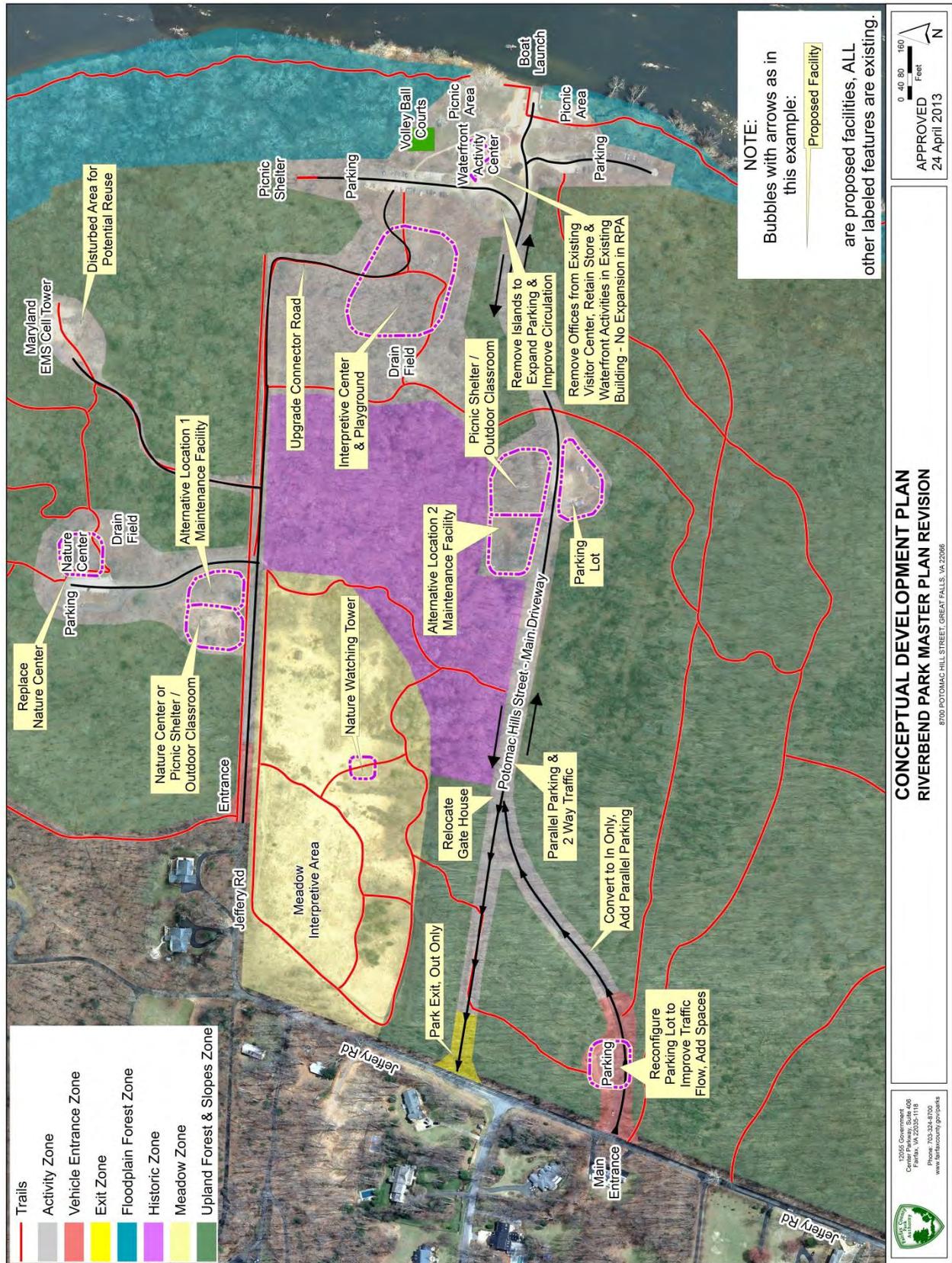


Figure 24: Conceptual Development Plan Map (CDP)

B. TRAIL NETWORK & ACCESS

The extensive trail network throughout Riverbend Park is shown on both the GMP and CDP. These well established, well used trails are sanctioned and maintained for public use when the park is open. The trails support a variety of uses including walking, hiking, nature observation, running, as well as where designated, bikers, and equestrians.

Access to the trail system is from many points around the park. Pedestrians enter the site from several points including the Potomac Heritage National Scenic Trail (PHNST) along the Potomac River between Great Falls Park and Upper Potomac Regional Park, the vehicular entrances, and from adjoining neighborhoods. Since these zones are where visitors first enter the park, they should provide visitor orientation that may include informational kiosks, benches, trashcans, park identification, regulation, way finding, and interpretive signage.

C. WATERFRONT ACTIVITY AREA & VISITOR CENTER

The most active area of the park is along the waterfront, which is designated as the Waterfront Activity Area. This area is heavily used and contains the following existing facilities: boat launch, boat rentals, two parking areas, picnic areas, picnic pavilion, volleyball courts, trails, as well as the visitor's center building.

Built circa 1970, the visitor's center building has interesting architectural features, with angled walls supporting broad windows providing a beautiful view of the Potomac River. The building supports a variety of visitor and staff functions with the space segmented for welcoming, directing visitors, programs, staff offices, meeting/classroom area, interpretive displays, retail sales area, and boat rentals. It also provides public restrooms and a sun deck provides an extended outdoor area. The basement houses a small maintenance shop that provides space for equipment repairs, workspace, and limited storage.

The building's small size and angled walls make it difficult to redesign or re-purpose and it cannot be expanded, as it is located within a Chesapeake Bay Resource Protection Area (RPA). Its location in the Potomac River floodplain, with increasingly frequent flooding, make it vulnerable to increasingly frequent weather events that will eventually claim this structure, after which replacement would not be prudent. Important park functions and administrative facilities need to be relocated elsewhere in preparation for that eventuality. Relocating the interpretive functions, exhibits, staff offices, and support areas into an Interpretive Center located out of the RPA is necessary. Doing so will allow more space for continued building use for increasingly popular waterfront activities, including the general store, small event space, fishing programs, boat rental equipment, as well as waterfront management of patron safety, including a first aid station. These adjustments will allow for removal of the trailer located at the beach that currently supports waterfront rentals. Moving maintenance activities out of the visitor center basement to a dedicated park maintenance facility will also allow for boat storage in the existing basement.

Other amenities provided in the Waterfront Area include trails, picnic tables, boating support features, environmental protection features, benches, trashcans, as well as

interpretive, regulatory, and directional signage. All development in this area will follow all regulations in effect at the time of construction, with all visitor services and routes developed to be as fully accessible as is feasible.

The Waterfront Area also serves as a staging area for public safety, including emergency and river rescue. These activities should not be hindered in any way.

D. INTERPRETIVE FACILITY

A key mission of Riverbend Park is to provide stewardship and education activities. With its long history and relatively undisturbed landscape, Riverbend Park offers a unique opportunity to protect and interpret thousands of years of history with a wide range of archaeological sites that convey the local human ecology, how humans have interacted with their environment over time within one park. The park's popularity is projected to continue to grow in the foreseeable future, while interpretive methods and technologies will continue to evolve.

To help Riverbend Park provide relevant visitor services and education, a new Interpretive Facility is planned in the Waterfront Activity Zone outside the RPA and floodplain in the general area shown on the CDP. This facility is intended to provide visitor orientation, visitor services, expanded Wi-Fi access, interactive exhibits, a sales area, multi-use space large enough for 160 people for classes, programs, meetings, or events, a library, restrooms, staff offices workspace, electronics storage, and general storage. To highlight the park's environment and history, this structure could be styled reminiscent of the fishing lodges that formerly existed at Riverbend. It should also be configured for expansion as necessary to accommodate the eventual demise of the existing visitor center.

This general facility location is planned within a relatively flat disturbed area located between the main parking lot and septic field, overlooking the Waterfront Activity Area. Depending on further engineering and design studies, it may be beneficial to construct this facility within the existing main parking lot and construct new parking in the flat areas above. This facility may be constructed in phases to allow future expansion as necessary. New facilities will meet applicable regulations at the time of construction, including fully accessible visitor services and routes as is feasible. Interpretive, regulatory, and directional signage, native plant landscaping, as well as other suitable outdoor features shall be provided alongside the building. Design of the facility shall consider use of environmentally sensitive and energy efficient building techniques to the greatest extent possible. Demonstration and interpretation of model "green" technologies could be a highlighted feature of the building.

E. MAINTENANCE FACILITY

The majority of Riverbend Park maintenance is conducted by site staff with site equipment and materials. Maintenance facilities, equipment, and materials are housed in the Visitor Center basement, in outdoor storage facilities, as well as in outdoor uncovered areas.

A dedicated maintenance facility with yard is planned to be located in one of two alternate locations, both of which are served by utilities, water, and septic systems. The

first alternative location could be in the area of the former residence on the north side of Potomac Hills Street as shown on the CDP. This area is disturbed and is close proximity to the most active areas of the sites that require frequent maintenance. If located in this area, screening and buffering should protect the view from publicly used areas.

The second alternative location for the maintenance facility is in the disturbed area at the intersection of the Jeffery Road and the nature center parking lot entrance. This area provides a more remote location for maintenance activities but is easily accessed by the secondary road system that connects the waterfront area with the nature center. Additional feasibility studies should be conducted to determine the extent of maintenance facility needs and location.

The new park maintenance facility will provide much needed space with areas for carpentry, display creation, large paint booth, mechanical maintenance with at least four truck size bays, equipment storage for hand tools, tractor, two trucks, gators, rescue boat, trail maintenance equipment, gas powered equipment, stock storage, and facility yard. Also included should be staff office space. A separate material/chemical storage area shall also be provided. Design of the maintenance facility shall consider applicable and feasible green building techniques to the greatest extent possible, including solar power. As an interim measure, temporary sheds may be used for equipment storage.

F. PICNIC AREAS

Several picnic areas exist at various locations within the park including two in the Waterfront Activity Area, at the Nature Center, along the river below Weant Drive, on Artillery Bluff overlooking the dam, near Clark's Branch Bridge, on the Palisades and a few other locations within the park (Figure 22). Additional casual picnic areas can be added to support a positive visitor experience in appropriate locations in the park as determined by site staff. Grills should be provided in the picnic areas, where appropriate.

G. PICNIC SHELTERS / OUTDOOR CLASSROOMS

Riverbend serves a vital role in outdoor education for local school children, often with multiple classes occurring simultaneously. Bus parking is provided in the boat trailer spaces of the lower waterfront parking lot and can also be accommodated at the nature center. User trends indicate a preference to simultaneously host multiple classes (as many as six). Current facilities allow for only three classes to be held at once (two indoors and one outdoors). The existing picnic shelter within the Waterfront Activity Area shall be maintained as long as it is feasible. Additional picnic shelters would enhance the park experience for large groups, while outdoor classrooms would meet the demand for additional educational facilities. Both these needs can be met with the provision of picnic pavilions that can also serve as covered outdoor classrooms. A pavilion large enough for 130 people can host two classes would be ideally located near the maintenance facility or along Potomac Hills Street. Parking on the same side of Potomac Hills Street would be available to accommodate visitors. This location has both electric and water access, so restrooms can be provided using the former residence septic field. Additional pavilions large enough to host at least one class may be provided near the parking lot adjacent to the meadow. This location is a disturbed

area of the park, with existing access to water, electricity, parking, and septic drain fields. At least one of these facilities should be styled as a long house as described in section I. Educational Facilities.

H. OUTDOOR ENVIRONMENTAL EDUCATION AREA (SHOWN ON GMP)

Located in previously disturbed areas of the park (former house sites), this area is intended to provide an area for experiential environmental education and recreation, scheduled with park staff. Due to its former residential use, the site has water, electricity, and a drain field. Potential facilities include small parking lot, picnic areas, primitive campsite, supervised fire rings, and composting toilets. Vehicle access to this area is limited to authorized vehicles.

I. EDUCATIONAL FACILITIES

The public has repeatedly requested more natural resource education programs. The existing nature center is a small facility with oddly arranged, load bearing walls, making the structure difficult to repurpose for public use. Cultural Resources and Management Protection staff have determined that this structure has no historic integrity. This area should be used for new educational facilities that may include a new nature center, outdoor classrooms or some combination of features suitable to support the educational needs of school groups and the general public. Design of facilities should include space for at least two simultaneous classes consisting of 40 children each. Complete replacement of the existing facility should be considered, potentially with a pavilion styled after a long house, with an enclosed end for restrooms, as well as storage. Covered space for 120 students with a fire pit, and roll down sides to provide cover during inclement weather should be considered.

2012 MASTER PLAN REVISION ELEMENTS

Improving Visitor Accessibility and Circulation

-  New and Expanded Parking
-  Connect Entrance Roads
-  Entry/Exit Loop

Add Interpretive Center

-  Improved Exhibit Area
-  Interpretive/Demonstration Area
-  Office Space
-  Restrooms
-  Support Facilities
-  Styled as Fishing Lodge

Separate Maintenance Facility

Repurpose Nature Center

Continue use of Visitor Center as Waterfront Activity Center

New Picnic Pavilions / Outdoor Classrooms

Interpret Conn's Farm

Interpretive & Directional Signs

Playgrounds

Continue use of Volleyball Courts

Nature Watching Tower

Elements Removed - 2012 Master Plan Revision

Demolished Rental Houses

Camping Area (not built)

Youth Hostel (not built)

Equestrian Center (not built)

Temporary Sheds & Trailer

The facilities in this area or the Interpretive Center (Section D) should also consider inclusion of an expanded live wildlife display area that would expand on the live wildlife exhibits currently housed in both the nature and visitor centers. The live displays are

favorites with visitors of all ages and provide during walk-in visitation as well as programs. Indoor and outdoor wildlife interpretive exhibits focusing on the wildlife of the Potomac Gorge will create expanded program opportunities for school groups, birthday parties, and summer camps. Live wildlife exhibits may include birds of prey, small mammals (like otters, mink, flying squirrels), turtles, frogs, snakes, and salamanders. This exhibit space will need to be specially designed to allow visitors to gain a firsthand personal experience with the Potomac Gorge wildlife, making this facility a very popular destination.

J. MEADOW INTERPRETIVE AREA & NATURE WATCHING TOWER

Located in the meadow that was part of Conn's Farm, this area should include interpretive features, historical farm equipment, trails, and hayrides. It will also include a nature watching tower with map and interpretive features about the farm and wildlife.

K. PLAYGROUND

The playground approved in the 1975 Master Plan should be planned near the Interpretive Facility. This location provides easy access from the parking lot and is a complimentary use to the interpretive center, picnic area, volleyball courts, and open grassy area within the Waterfront Activity Zone. Climbing structures should be included within the playground. Nature or history themed equipment would be appropriate. Particular attention on the inclusion of facilities that serve younger children as well as the 12-15 year old age group is warranted.

L. SITE FURNISHINGS

Picnic tables, benches, and trashcans should be provided in appropriate locations throughout the park to support park users.

M. INTERPRETIVE & DIRECTIONAL FEATURES

Interpretive features may be placed at appropriate locations within the park describing important park features. Directional, including distance, regulation, and park identification signs should also be placed as needed in the park. Minimize the number and collocate signs to preserve the natural setting as well as prevent impacts to important resources.

N. STORMWATER MANAGEMENT

Construction of stormwater management facilities may be necessary to address water quality and quantity detention associated with the addition of park facilities. To the extent feasible, Low Impact Development (LID) methods should be used for stormwater management, potentially in the form of pervious pavers, innovative roof systems, rain gardens, and/or bio-retention areas.

VII. DESIGN CONCERNS

Implementation of the master plan will require that engineered plans be prepared and submitted for review and approval prior to development by applicable governing agencies. These plans will be reviewed for applicable county, state, as well as federal codes and requirements, in effect at that time. These reviews ensure that the proposed facilities meet all applicable standards for traffic, parking, size, safety, stormwater management, environmental protection, and zoning with review by the respective

agencies. To ensure that these plans meet the latest development standards, and to responsibly manage the costs associated with creating engineered designs, plans are created during the design phase that precedes construction, after funding has been appropriated. When site design, plan submittal, and development occur, the following concerns should be considered:

A. ACCESSIBILITY

Accessible park elements and facilities should be provided wherever possible and feasible. This includes accessibility facilities and accessible connections between different areas of the park, as per standards in effect at the time of construction.

B. PEDESTRIAN IMPROVEMENTS

Safe pedestrian walkways should be provided adjacent to the entrance roads and parking areas.

C. SOILS & SLOPES

Much of the soils existing on site have various construction limitations, including: steep slopes, low strength, tendencies to cave, shallow bedrock, frequent high water tables, susceptibility to frost action or rutting. These attributes can be detrimental to locating buildings, playgrounds, or other structures that require footings, buried utilities, and stormwater facilities. A geotech study should be conducted to determine the necessary geotechnical engineering. Study and engineering results will be used to determine facility designs and ultimate locations.

D. CULTURAL & NATURAL RESOURCE PROTECTION

Riverbend Park has a wide variety of important natural and cultural resources. These include several state and globally rare, threatened, or endangered species and natural communities, as well as over 80 archaeological sites. Protecting natural and cultural resources should be a primary consideration in any development. In many cases, these resources are not specifically marked to help ensure their protection. Disturbance of others is a federal offense. This master plan has gone to great lengths to designate areas that are safe for future development, and for this reason, no development shall be approved outside of the areas designated by this master plan. Additionally, no development is to take place without first consulting the site staff and the park's Natural Resource Management Plan to ensure that no important natural resources are disturbed. Riverbend Park staff has worked closely with the Cultural Resource Management and Protection Branch archaeologists, Natural Resource Management Branch, the county's stormwater management, as well as the state of Virginia, amassing a great amount of knowledge about the resources contained within their site. For this reason, site and cultural resource management staff should be consulted before any ground disturbing activities occur within the park to ensure no impacts to resources will occur.

E. MITIGATE ENVIRONMENTAL IMPACTS

A small portion of the park will serve a variety of education and recreation uses, while the majority of the park will remain in a natural or minimally disturbed state. Environmental impacts from site development activities should be mitigated to the extent feasible.

F. VEHICULAR ACCESS & CIRCULATION

Neighborhood concerns about park generated traffic were widely expressed during the master plan process. Existing circulation within the park contributes to backups on Jeffery Road on peak use days. Planned entrance, exit, and circulation improvements are intended to reduce neighborhood impacts, improve efficient flow of traffic within the park, and allow for future growth in park visitation. Consultation with Fairfax County Department of Transportation (FCDOT) during the creation of this master plan to identify and address roadway issues identified few official concerns. As new facilities are added and visitation growth continues, coordination with County and State transportation officials should continue.

As with any other public or private development, the Park Authority will meet all applicable county, state, and federal codes and requirements, in effect at that time of development. These reviews ensure that the proposed facilities address potential impacts and meet all applicable standards for traffic, parking, safety, stormwater management, environmental protection, as well as zoning with review by the respective agencies.

G. UTILITIES

The aging utility lines take a surreptitious route through heavily forested areas of the park. These combined factors lead to Riverbend being without power, telephone, or internet, frequently for long periods of time, particularly during storm events. Additionally the park has two very long access roads that need to be cleared of trees and/or snow when storms occur. These conditions should be considered during the design of new facilities. Rerouting or providing underground utilities should be considered.

Problems with utility companies have occurred in the past and careful coordination should be planned for utility work. For instance, Columbia Gas severely trimmed trees within the park, exposing sloped areas to erosion. Work in utility easement areas on parkland should be conducted by permit and monitored.

H. PHASING

Major park development is generally done through the Capital Improvement Program and is budgeted over a five year period. New facilities shown in the master plan are likely to be constructed in phases as funding becomes available. To facilitate any of the conceived uses, adequate park infrastructure, parking, stormwater management, and ADA access (within reason for a wilderness setting), will be required preceding the implementation of these plan elements. A prioritized phasing plan should be created to guide future funding and development.

I. ADDITIONAL SPACE PROGRAMMING & DESIGN

There is an increasing public demand for natural resource education programs that complement the features, exhibits and programs offered at Riverbend Park. Expanded educational facilities and programming is needed to address growth in educational needs from individual visitors, school groups, birthday parties, and summer camps. Expanded programming will also contribute to the site's fiscal sustainability and resource conservation awareness. To ensure that new facilities appropriately meet

these needs while remaining consistent with the park’s mission, additional programming and design studies are needed for the maintenance, interpretive, wildlife, waterfront, and outdoor education facilities. This design process will refine the spatial needs and functions of these facilities to further inform their design options, engineering, as well as ensuring a comprehensive, cohesive architectural style for all future buildings that is compatible with Riverbend Park’s setting and history.

J. FISCAL SUSTAINABILITY

Economic realities require that public park funding be supplemented by revenue generated by park offerings, sponsorships, donations, and volunteerism. Fiscal sustainability within the park system and at Riverbend Park is essential to be incorporated into the master plan implementation. The demand for programs at Riverbend Park’s continues to grow and should be viewed as an opportunity to support the park within the framework of its mission. The master plan revision envisions enhanced and expanded facilities necessary to support programming growth, update obsolete facilities, as well as maintain and manage the significant resources that define this special park. The park operational plan, resource management plans, and fiscal sustainability model should be used in conjunction with this master plan revision to strategically chart the park’s future. Enhanced fiscal sustainability will allow Riverbend Park to address critical maintenance, operational, as well as stewardship program needs by providing latitude in funding options and decisions. Together these plans will serve both the public and the Park Authority by providing a greater opportunity for fiscal sustainability while managing the inevitable needs for capitalized repairs and replacements.

