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Mercer County Parks Inventory and Analysis

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Prepared for

Mercer County Park Commission &
Mercer County Planning Department

Final Draft, December 17, 2021

Prepared by

Rutgers Center for Urban Environmental Sustainability (CUES)

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The consultants responsible for the preparation of this report have made every effort to correctly identify places and names. Any misspellings or misidentification are unintentional and subject to future correction.

Mercer County Park Commission &
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Executive Summary

Overview

The Mercer County Park Commission manages a complex system of public parkland owned by the County of Mercer. To date, the Mercer County Park Commission ("Park Commission") does not have a comprehensive inventory and analysis of the open space and park facility network. The Park Commission commissioned Rutgers Center for Urban Environmental Sustainability (CUES) to inventory the park network and provide recommendations for amenity and ecological enhancements. This analysis documents an overall well maintained, high quality open space system that contributes significantly to the quality of life of Mercer County residents. Continued open space acquisition along with improving non-motorized accessibility and enhanced invasive species management will be important components of a resilient open space system that serves all current and future residents.

Figure 1: Pedestrian Bridge at Mercer Meadows.

1.1 Regional Inventory and Analysis

History

Development patterns are seen to align with Mercer County's historic sites and districts which have a major influence on Mercer County's cultural landscape. Some of the most notable historic districts and parcels include but are not limited to Mercer County are the Delaware and Raritan Canal towpath, Washington Crossing State Park, Abbott Marshlands, and the Pleasant Valley Historic District. These farmlands, battle grounds, and historic transportation routes characterize how the landscape is used today.

Demographics

The population is heavily distributed throughout the industrial epicenter which once occupied the City of Trenton. The rural areas of the north and south have a lower population density with larger swaths of forest and agricultural lands. It is not surprising that the urban area houses a higher percentage of the low-income population, with a higher income population throughout the suburban center of the County.

Land Use

Mountainous regions show signs of early development and today provide pristine hiking/biking trails with the majority of the County's wetlands in the south. Urban land cover is the most predominant land cover type across the County and the progression from 1986 to 2015 exemplifies how rapidly agricultural land use is converted to urban/suburban use. The County Parks are the large parcels which have protected natural lands throughout the County's urban areas and have the highest tree canopy cover density.

Ecology

The County Parks are vitally important for several wildlife species of concern and provide specific habitat resources. The piedmont region (north) of Mercer County contains important upland oak forest resources as well as northern swamps along water courses which are high in biodiversity and encompass vernal habitat. The southern inner coastal plain area contains much coastal plain swamp habitat that provide habitat for abundant species of flora and fauna. Larger areas of tidal and freshwater emergent marshes can be found in John A. Roebling Memorial Park and they provide vital habitat for the endangered pied-billed grebe. The collection of ecologically diverse habitats in Mercer County provides vital resources to all native flora and fauna, maintains the natural heritage of the landscape, which translates into cultural heritage and heterogeneity between each community.

Open Space

Open space identifies the recreational character of Mercer County. It provides habitat for wildlife and flora; and gives people a place to experience the outdoors. The Park Commission manages several different types of open space including but not limited to large regional parks, golf courses, urban parks, and natural areas not managed for recreational use. Acquiring and protecting land is a necessary step in ensuring that the landscape is left intact and can serve the local communities through both recreational opportunities and ecosystem services.

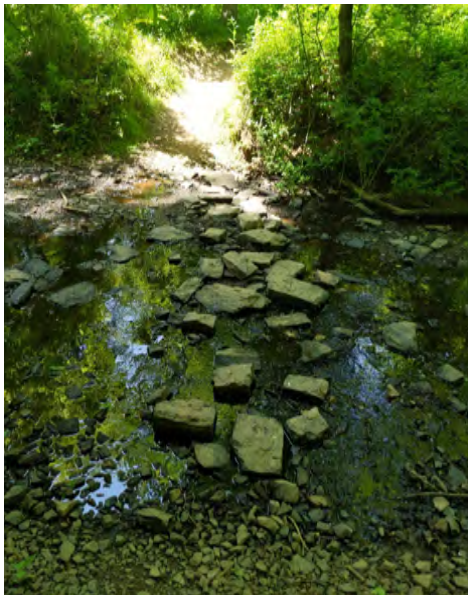

Figure 2: Hiking Trail across Stream.

Figure 3: Hiking Trail across Stream.

1.2 County Open Space Connections

Regional trails provide accessible open space and connections between County owned park facilities, open space, and other non-county owned parks. Forging partnerships and allowing non-profit organizations to support land management will help enhance County owned open space and will lead to the continuation of open space acquisition when resources may be limited. There are numerous examples of non-profit organizations aiding in the creation of County owned open space and even park facilities throughout New Jersey.

1.3 Park Facility Inventory and Analysis

The inventory and analysis of the 12 parks have led to the findings that Mercer County has been excelling at its efforts to undertake land stewardship and management, acquire open space, and provide quality and varied open space for the Mercer County community.

The Active Recreation Regional, Passive Recreation Regional, Golf Courses, and Urban Park facilities managed by the Mercer County Park Commission make up over 7,000 acres of Mercer County's landscape. These Park facilities offer a wide array of recreational opportunities such as mountainous trails, waterfront parks, wetland experiences, golf activities, and active recreational fields. The mountainous northern portion of the county is an ideal location for Passive Recreation Regional Parks with hilly trails and summit views; whereas the southern half of the County is on flatter terrain with more active recreational opportunities.

1.4 County Analysis Summary

Our list of recommendations for the individual park facilities and general recommendations throughout are steppingstones for further studies in land acquisition, habitat quality studies, and open space access and connection opportunities. The priority recommendations include removing dead trees, monitoring native and invasive vegetation, setting trail blazing standards, conducting a desire path study, incorporating ecologically viable stormwater management techniques, discouraging illegal dumping, and increasing bicycle and pedestrian accessibility throughout the County. The next steps recommended post inventory and analysis findings include an extensive examination of each park property with outlined implementation strategies, an open space acquisition study, a regional trail network plan, and finally, a master plan for the Mercer County Park system.

1.5 Appendices

Items in the appendices include:

1. Inventory Definitions: identified by CUES for field inventory purposes
2. Inventory Features & Attributes listed within the ArcCollector Application
3. New Jersey Division of Fish and Wildlife list of New Jersey Endangered and Threatened Wildlife.
4. Natural Heritage Rare and Endangered Plant Species Rank Definitions
5. Natural Heritage Rare and Endangered Plant Species Rank in Mercer County

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Introduction

The Mercer County Park Commission manages a complex system of public parkland owned by the County of Mercer. This well-maintained system, which in general is well used, provides numerous public amenities, including active and passive recreation opportunities and multicultural experiences. Several educational partnerships are established that utilize the park system to enhance environmental education.

To ensure the current high quality of the park system and to plan for a sustainable future it is important to make informed decisions about park maintenance and management. Investments in the current system must be prioritized and appropriate opportunities for expansion of County Park lands must be anticipated.

Immediate decisions and long-term planning require a thorough understanding of the current conditions within each individual park. However, there is currently no comprehensive inventory of the Mercer County Park System. To base management decisions on actual data, a baseline inventory and analysis of current individual properties owned by the Mercer County Parks system is needed. The goal of this report is to develop a baseline inventory, which includes descriptions of general physical conditions, user amenities, and the overall ecological features of individual County Park properties. This will include a review of existing inventories followed by ground truthing of available Geographic Information System (GIS) data.

The inventory of the approximately 10,000 acres of County owned open spaces will be conducted on two levels. For approximately 7,000 acres of park facilities, the inventory will provide field-verified maps assessing current management options and provide the basis for long term parks Master Planning. For the Approx. 3,000 acres of county open space, the remote inventory and assessment will analyze available GIS data. [1] Although there is no on-site assessment of Mercer County's open space (not actively managed), the data will still inform future master planning efforts.

To achieve this objective, the Rutgers Center for Urban Environmental Sustainability (CUES) planning team has worked in close consultation with Mercer County Park Commission and Mercer County Office of Planning to complete the following deliverables: Park facility and open space data review, inventory of core park facilities, remote inventory and analysis of open space, general demographic analysis, ecological and cultural evaluation of the County and Park System, and provided a matrix analysis with overall recommendations for park facility enhancements.

Open Space in Mercer County is protected open space under the New Jersey Department of Environmental Protection's Green Acres Program that is owned by Mercer County and managed by Mercer County Park Commission. Mercer County owns 9,537 acres of open space parcels.[2] This report identifies open space as land not actively managed for public use, but is still protected by Green Acres. Park facilities on the other hand are actively managed properties for public use. [3] They include amenities and programmed activities. Open space, whether it be accessible to the public or not, is still vital to the overall ecological health of the Mercer County landscape playing

Figure 4: Curlis Lake.

an essential, yet unique, role in the Mercer County Park network.

Mercer County has been acquiring open space parcels since the approval of the open space preservation tax in 1989.[4] Land acquisitions have included publicly accessible parklands, preserves, and open space parcels. These acquisitions, along with farmland preservation, are the saving grace in suppressing suburban sprawl throughout the County and increasing the overall protected acreage of natural and naturalized lands. Several Park facility properties-- such as Dam Site 21 and The Quarry at Baldpate Mountain Area, have been acquired some time ago and are just now becoming thriving recreational areas.

This report encompasses a look into Mercer County regional identity by first studying the historic timeline of Mercer County's development which helped us understand the historic landscape as it is today marked by historic districts, properties, and sites across the County. A demographic analysis followed the cultural landscape study to discover the County's population density, income, and racial diversity. The regional scale inventory was completed with land use and natural resource inventory mapping studying Mercer County's topography, physiographic regions, wetlands, forest cover, wildlife habitats of concern, terrestrial macro group habitats etc. This collection of inventory map analysis helped guide the County wide regional open space connection analysis and park facility inventory by first giving us a clearer understanding of the County's landscape and applying the Mercer County Park properties to understand their composition.

After establishing the County wide composition of Mercer County, we studied Mercer County's Park facilities or actively managed open spaces at a finer scale. This analysis incorporates County wide inventory with site specific investigation when each park facility was studied in the field to assess park quality and recommend potential enhancements ranging from amenities and cultural aspects to ecological and ecosystem service potential. The Park facility inventory findings were recorded through ArcGIS mapping, photographs and written documentation later translated into physical maps with written analysis compiled in this report.

The comprehensive of the Mercer County Park system has informed a list of recommendations which include park enhancements as well as recommendations for next phase studies to help inform the master planning process for the entirety of the Mercer County Parks network.

End Notes

[1] Mercer County Planning Department, Mercer County Master Plan Open Space Element, 2021, page 30, Accessed December 7, 2021.

[2] Ibid

[3] New Jersey Department of Environmental Protection under the Green Acres Program Rules defines a facility as "an improvement for recreation and conservation purposes."

[4] "Mercer County Master Plan: Open Space Element" (Mercer County, 2010), pg. 4.

1. Methodology

Introduction

Desktop regional scale inventory was conducted to better understand Mercer County's open space parcel's role in the overall park network and to discover how various landscape conditions pertaining to people, culture, and ecology are reflected onto the landscape. Site specific inventory was conducted in the field to record, in one document, the current status of the park facilities in the Mercer County Park Network. The information below outlines in full detail how each inventory method was completed, and the sources utilized to do so.

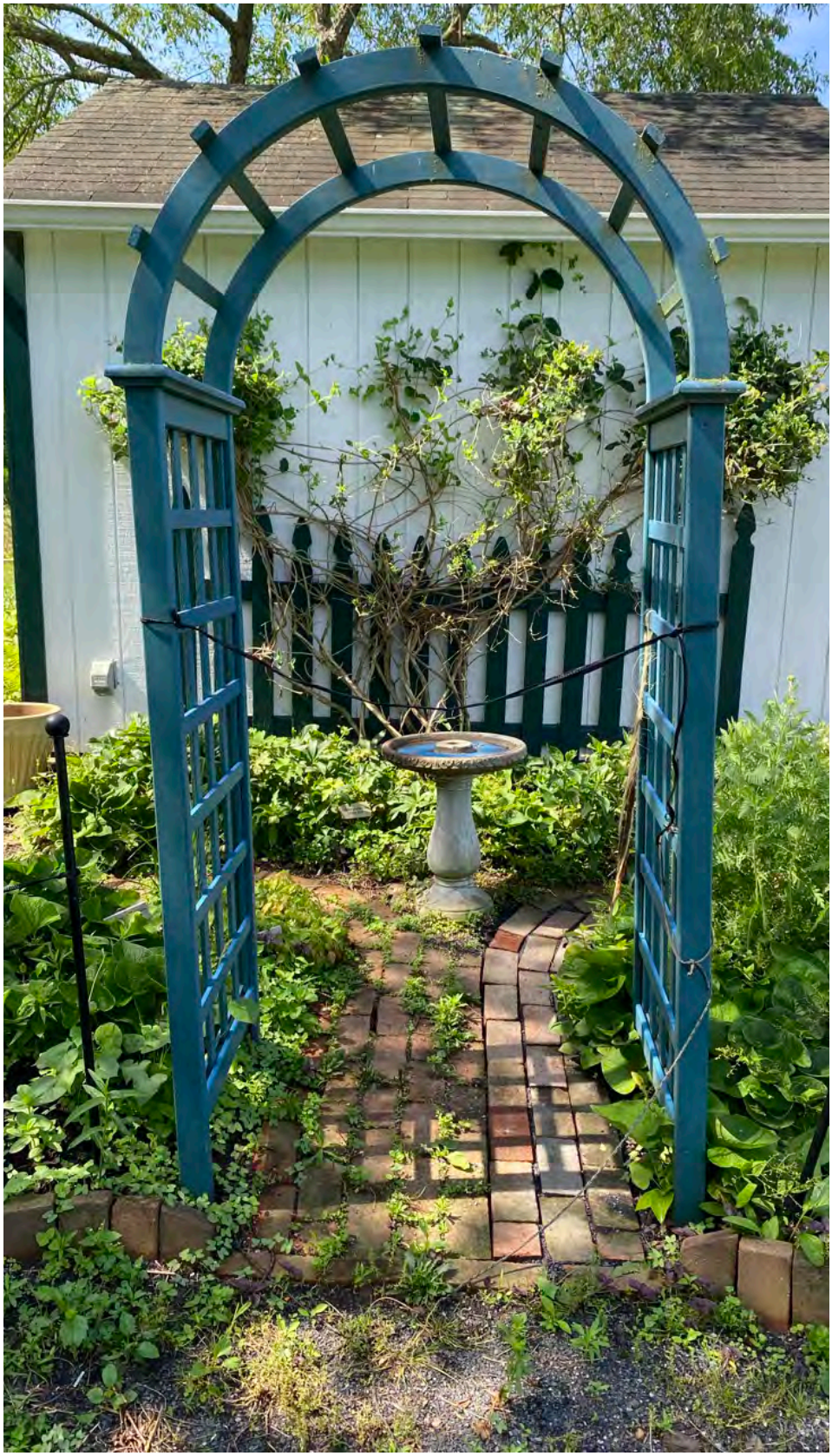


Figure 1.1: Master Gardener Blue Archway.

1.1 Regional Inventory

Regional inventory maps are Mercer County wide maps which helped the CUES team gain an understanding of the County's demographic, cultural, and ecological composition. The regional inventory maps are remote inventory maps created in ArcMap Geographic Information System (GIS).

To begin the regional mapping process, a list of needed inventory maps was comprised. After compiling a list of needed inventory maps a basemap was created. To create the basemap for Mercer County's regional scale remote GIS inventory, datasets available online were overlaid with one another. The basemap consists of information from New Jersey Department of Environmental Protections (NJDEP) Land Use Land Cover data to generate Impervious Surfaces such as building footprints and roadways, bodies of water, County and Municipal boundaries, and NJ State, Local, and Non-profit Open Space.

Mercer County owned open space parcels were visualized on the map and labeled by park facility. Mercer County Open Space was taken from NJDEP Green Acres NJ State, Local, and Non-profit Open Space and by Mercer County Office of Planning's Open Space inventory. The open space parcels reference the role that Mercer County Park Commission plays in the overall makeup of the County and vice versa. For the sake of the project scope and regional mapping process, all open space in the county is not visualized on each regional inventory map only land owned by Mercer County.

Data was acquired for the regional inventory maps through various online sources. These sources include New Jersey Department of Environmental Protection, the National Fish and Wildlife Service, the Nature Conservancy, the United States Census Bureau, National Oceanic and Atmospheric Administration, Federal Emergency Management Agency, Delaware Valley Regional Planning Commission, Mercer County Office of Planning, and Mercer County Park Commission.

The regional inventory maps showcase the unique composition that comprises Mercer County's landscape and cultural character. Each inventory map is analyzed in Chapter Two with an introduction to the overall map topic and a brief analysis as it relates to the County and the County Park open space network. The regional inventory is a representation of available online data edited based on conversations with Mercer County representatives. The data was not ground-truthed unless in varied instances in the park facilities inventory (Chapter 4).

Figure 1.2: Lydia Collecting Data.

1.2 Park Facility Inventory

The Mercer County Actively Managed Parklands were mapped remotely, then ground-truthed through site visitation and field data collection. The objective of completing field inventory for Mercer County's Park facilities was to assess the current state of the parks and apply an expert opinion on priority areas of concern and avenues for opportunity. We looked at the park network from both the ecological and recreational use lens. The team mapped an array of categories that range from ecosystem composition and quality to the assessment of park amenities such as benches, overall maintenance, and access points. Our mapping process revealed the unique character of each park within the Mercer County Parks system and helped identify key priority areas of concern for intervention and/or preservation.

Data Collection, Map Creation, & Site Visit Preparation

The initial source for mapping inventory data was the Mercer County Open Space Map of County Owned Open Space, which included park facilities (actively managed parks) and County open space (not actively managed for public use). Municipal, County, and State open space data was then obtained through an online search of Green Acres open space data provided by the New Jersey Department of Environmental Protection (NJDEP) Bureau of GIS State, Local and Nonprofit Open Space of New Jersey (2021) map.[1] Mercer County Office of Planning and Mercer County Park Commission provided additional open space parcel data, and feedback on the existing NJDEP: Local and Nonprofit Open Space of New Jersey data. From the open space data provided, the CUES team devised a list of the park facilities in Mercer County—based on Mercer County Park Commission's list of actively managed parks crossed referenced with online research—to identify which parks would be inventoried in the field.

To further develop a field study map and later remote desktop basemap to visualize our inventory, the Mercer County Park facilities parcel data was overlaid on the world basemap in ArcGIS. The Mercer County shape boundary was added to the map. The original Mercer County Actively Managed Park list consisted of 35 properties within boundaries clustered by larger regional parks. The property boundaries were later dissolved, in ArcGIS by, "park facility" to create one park outline for the encompassed properties. These

Figure 1.3: CUES Team Working on Desktop Inventory .

1.2 Park Facility Inventory

Park outlines were then overlaid on a map of Mercer County to identify the specific location of each park property. For the sake of field data collection, the individual property outlines remained on the map. The property boundaries and basemap imagery were used to decipher a starting location when an address was not available online or on the park list provided.

To further develop the inventory maps Land Use Land Cover (LULC) data (2015) was retrieved from the New Jersey Department of Environmental Protection (NJDEP) website. Using the park outlines, LULC data was extracted for each park in order to identify the land use categories within the parks including Urban, Forest, Wetland, Barren Land, and Agriculture. Wetlands were further categorized into wetland meadow or forest with NJDEP wetland inventory data.

Additional regional information was initially mapped, printed and combined into a site packet to gain a better understanding of site conditions before arriving and to reference while on site. Trail networks were mapped by using the Greater Mercer Transportation Management Associations available online data which was filtered to only show existing trails.[2] Roadways were mapped from New Jersey Department of Transportation's Roadway Centerline dataset; Terrestrial macrohabitats were used from the Nature Conservancy; wetlands data was provided by NJDEP; Natural Heritage Rare and endangered plant species data was mapped; the Nature Conservancy's Connecting Habitats Across New Jersey's ranked wildlife corridors; NJDEP and Rutgers university's vernal pool habitats, and NJDEP topography were mapped to gain an understanding of each park before visiting.

A full list of inventory categories was created and initially separated by Ecology and Amenities. Ecology related to the non-human natural environment, whereas amenities related to the human built environment. A test site visit was conducted at Mercer Meadows, May 2021. Based on the test visit, it was concluded that the inventory categories needed more detail and separation than just human and non-human components. From this site visit a comprehensive inventory list was created and translated into dataset layers in ArcGIS to be populated with field-based inventory (see appendix for a detailed inventory layer list).

Field Visitation

For the site visit organization, the parks were clustered into five regions then designated to a specific site visit day based on location (Table 1.1). The regions were identified as: Mercer Meadows/Rosedale Lake Area (Days 1 & 2); John A. Roebling Memorial Park Area (Day 3); Individual Golf Courses (Day 4); Baldpate Mountain Area (Day 5); Mercer County Park Area (Days 6 & 7).

The on-site inventory process took place from June 8, 2021 – June 17, 2021. At the start of each inventory visit the CUES team met at a designated location, disseminating into groups of two based on-site layout and overall acreage. In groups of two, the inventory was organized by built features (amenities) and ecology.

Preparation for the field survey included:

-Identification of regional clusters
-Desktop research for site location, accessibility, meeting points, and park hours
-Initial regional data collection at County scale to understand park character
-Development of inventory categories/menus for ArcGIS Collector App and map layers
    -General Inventory Categories
        -Park Facilities and Amenities
        -Trail and Park Maintenance
        -Conservation and Preservation Priority Areas
        -Vegetation Assemblage
        -Invasive Plant Species Presence
        -Shade Trees
        -Horticulture Planting
        -Observations and Recommendations
        -General Wildlife Observations
        -Water Management Concerns and Opportunities

Name	Municipality	Acreage	Visit Date
Day 1 and 2			
Mercer Meadows/Rosedale Park Area (2 days)			**8-9 Jun**
11. North-Western Mercer Park	Hopewell/Lawrence	498.11	8-Jun
37. Hart Farm	Hopewell Township	8.33	8-Jun
3. Rosedale Park	Hopewell/Lawrence	472.99	8-Jun
12. Old Mill Road Greenway	Hopewell Township	32.66	8-Jun
34. North West Connector	Hopewell Township	27.69	8-Jun
22. Burd	Hopewell Township	78.26	8-Jun
14. Curlis Lake	Hopewell Township	125.55	8-Jun
76. Weinberger (Mercer Meadows)	Hopewell Township	9.61	8-Jun
FINISH			**9-Jun**
3. Rosedale Park	Hopewell/Lawrence	472.99	9-Jun
**Hopewell Valley Golf Club	Hopewell	181.72	9-Jun
Day 3			
John A. Roebling Memorial Park Area (1 day)			**10-Jun**
62. Marsh Environment	Hamilton	1.31	10-Jun
32. Diocese	Hamilton	15.78	10-Jun
2. John A. Roebling Memorial Park	Hamilton		10-Jun
68. Rednor	Hamilton	55.29	10-Jun
47. Switlik	Hamilton	122.81	10-Jun
**Mercer County Mill Yard Park	Trenton	0.83	10-Jun
13. Mercer County Waterfront Park	Trenton	15.43	10-Jun
72. South River Walk Park	Trenton	6.42	10-Jun
Day 4			
Golf Courses (1 day)			
7. Mountain View Golf Course	Ewing/Hopewell	172.22	14-Jun
8. Princeton Country Club	Princeton	108.88	14-Jun
Day 5			
Baldpate Mountain Area (1 day)			**15-Jun**
4. Valley Road Picnic Area	Hopewell Township	6.8	15-Jun
75. Hunter Property	Hopewell Township	85.12	15-Jun
9. Howell Living History Farm	Hopewell Township	130.95	15-Jun
16. County Owned Pleasant Valley Road	Hopewell Township		15-Jun
55. Pizzini	Hopewell Township	9.02	15-Jun
38. Tesauro	Hopewell Township	36.84	15-Jun
45. Woodin	Hopewell Township	1.28	15-Jun
39. Birum	Hopewell Township	14.31	15-Jun
6. Belle Mountain Ski Area	Hopewell Township	15.81	15-Jun
79. Peters	Hopewell Township	1.43	15-Jun
23. Baldpate Mountain	Hopewell Township		15-Jun
70. Holly Stone	Hopewell Township	113.1	15-Jun
Day 6 & 7			
Mercer County Park Area (2 day)			**16-17 Jun**
1. Mercer County Park	West-Windsor	> 2500	16-Jun
1. Mercer County Park	West-Windsor	> 2500	17-Jun
**Mercer Oaks East Golf Course	West-Windsor	240.61	17-Jun
**Mercer Oaks West Golf Course	West-Windsor		17-Jun
10. Dam Site 21	W. Wind.,Robb..,Ham.	250	17-Jun

Table 1.1: Site Visit Schedule.

Step-by-Step Data Collection

As stated above, a County wide map was created with park boundaries, basemap aerial imagery, roadways, and paths which were then uploaded to www.arconline.com. The map contained empty layers categorized by their inventory features shown above. The map was shared to the ArcCollector Application to be used by all team members in the field. The map was equipped with point, polygon, and line features set to allow for photograph uploading, and tracking capabilities. The photographs were georeferenced in the ArcCollector App—meaning upon map cleaning the photographs referenced an exact location in the field. Point layers collected individual spot locations; this feature was utilized for specific objects or generalized locations. The polygon feature was applied for larger areas which were later edited in ArcMap online to accurately represent shapes in space. Line features were used to represent linear paths and waterways. Tracking was a tool used to create a georeferenced line feature as the device or device operator moves in space.

On-site mapping first included confirming the object or characteristic matched with aerial imagery, previously mapped data from the County or data found online, and remote regional inventory data. The map accuracy was tracking at an accuracy of 17-25 feet. The points, polygons, and lines were edited in the field comparing them to aerial imagery loaded to the application.

Prior to on-site visitation online research and materials provided were uploaded to the map to ground-truth. These data features included: The Greater Mercer Trails Plan trail network, Mercer Meadows amenities and trail data provided by Mr. Jim Hanson; Baldpate Mountain Area amenities and trails mapped previously by the Friends of Hopewell Valley Open Space (FoHVOS); and County Park maps available on the Mercer County Park Commission official website. [3, 4]

Additional information was mapped on-site that was not remotely mapped prior and collected in created datasets.

To inventory features in the field, attributes were located on ArcCollector based on the operator's location then details were identified through a drop down selection menu. 'Other' and 'Notes' were available for each selection menu if a feature was not listed in

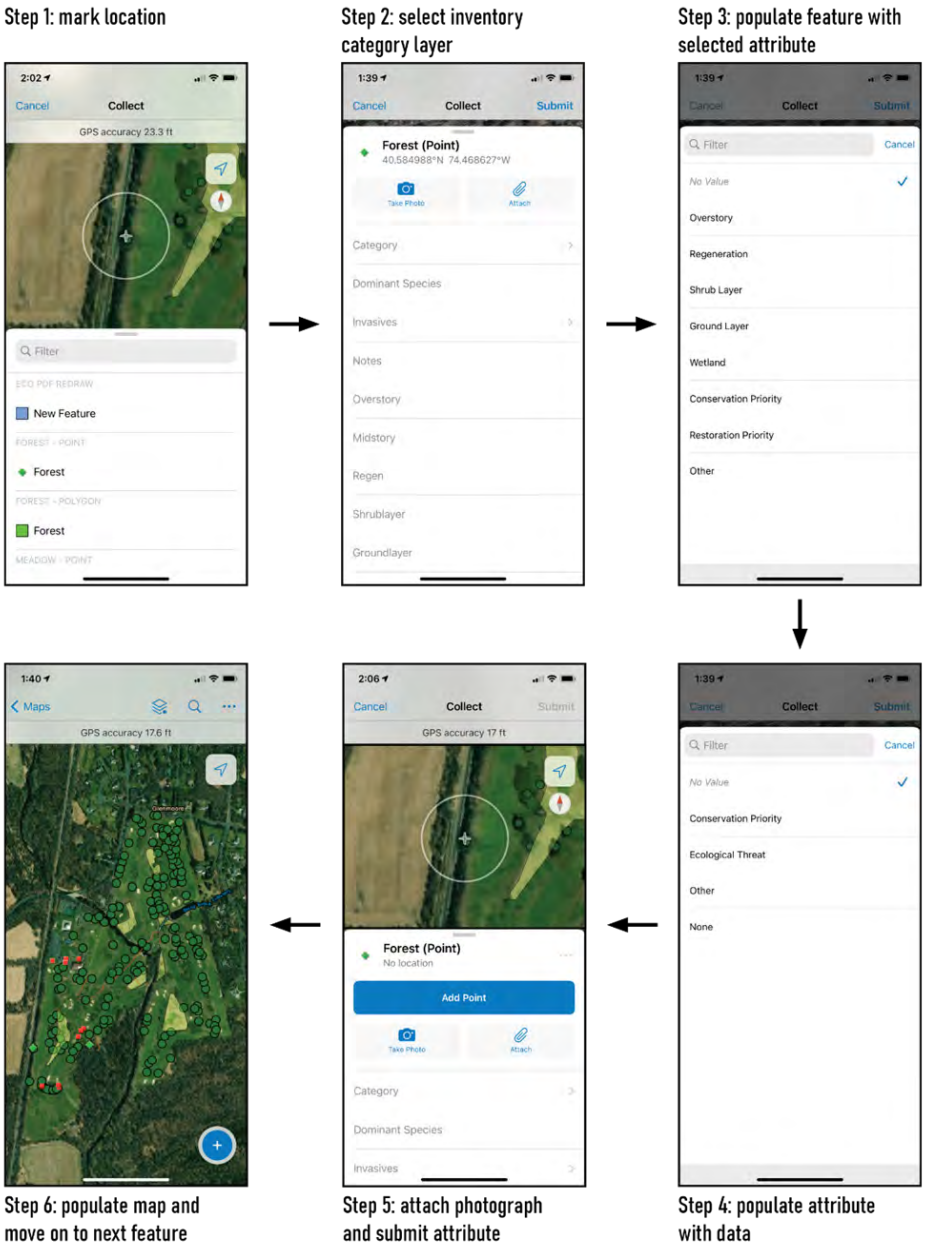


Figure 1.4: Data Collection Step-by-Step Process in ArcCollector App.

the layer selection or was a rare occurrence not warranting its own drop down domain. If the feature was noted repeatedly in notes or other, a feature class was then added to the attribute table during map cleanup. The ArcCollector App was utilized to confirm existing locations that were previously mapped by the County or NJDEP but was mainly used to map new information.

An example of mapped features includes parking lots. A parking lot was located and recorded by creating a polygon attribute. The polygon attribute held information such as the space count (or estimate depending on size), shape, material, accessibility, and condition. Due to the size of the parks and parking lots, certain parking space counts were estimated based on the parking lot area in acres. An additional example includes mapping the occurrence of invasive species within a meadow, or a dead shade tree cluster within a forest which could present a future ecological threat.

The team walked or drove in the parks and utilized golf carts at the golf courses to inventory at least 60% of each County Park facility. The mapping charge was to stay on the main trails within the park facilities as they were marked on County Park maps. If a property was not accessible or had no trespassing signs – such as the Weinberger property in Mercer Meadows—we did not map the location on-site, but supplemented with remote inventory methods to capture land use information, bodies of water, roadways, etc.

Digital images were obtained at each property and georeferenced in the ArcCollector App attached to specific inventory points. Digital images included, but were not limited to entrances, various objects/infrastructure, views, maintenance concerns, vegetation assemblages, people, and items that were considered unique to the specific park. The images are incorporated throughout this report as supporting visual documentation.

A final component of the on-site mapping process was a field inventory notes sheet. The Park surveyor filled out a quantitative data sheet that documented their initial impressions of the park. The sheet provided space for Ecological and Facility/Amenity notes that were not appropriate for the application such as feeling and overall thoughts (this data is referenced throughout the Park Inventory—Initial Impressions in Chapter 4). The data collected and edited with the ArcCollector App were downloaded to the Rutgers server and synced with the CUES account within ArcOnline. The data was regularly backed up on the Rutgers ArcOnline account. Utilizing the map online made data clean up more fluid between multiple users.

Data cleanup took place remotely. Data was reorganized and placed into its appropriate category to ensure the clearest visual communication of the on site inventory. Multiple internal working sessions were held to ensure data was accurately represented. Features were double checked to make sure they were in the correct location with the proper description. Photographs were referenced to update plant species lists and note overall maintenance concerns. The reorganized layers were saved as datasets and organized onto two maps per area to create the final park inventory and analysis maps.

Once the online map was uploaded and shared to the ArcCollector Application, operators were able to input data. Figure 1.4 showcases how in field inventory occurs. The first step is to mark your location on the map. This can be done by standing in place or manually moving the marker over a specific location. Step 2 requires the user to select a category or "field" to input data. For example, the field selected in Figure 1.4 "Step 2" is the Forest feature layer. Step 3 is to select the data or "attributes" pertaining to the feature layer that are needed for inventory. Step 4 involves adding more data to the selected attribute. In this example, in step 3, "Overstory" was selected. Now, in step 4, "Conservation Priority" will be selected. Step 5 involves moving to the upload screen and attaching a photograph by selecting the "Take Photo" or "Add Attachment" option. Upon

Figure 1.5: Field Inventory on Golf Carts.

completion of data entry, a photo upload the operator selects the "submit" option in the top right corner. The feature (point in this scenario) has now been submitted to the map and populates the georeferenced space. Editing capabilities can happen at any time and are not limited to being at the exact location. The user is free to move on to the next inventory point.

Map Creation

At the beginning of the inventory development process, one basic simple and functional map was created showing the outlines of each park in Mercer County. This working map was used during the site visits and during preparatory computer lab work. The preliminary map led to the creation of a more complete, but still basic, base map, which provided detailed information about park infrastructure and helped to orient on site visits. Once the data was added, ground-truthed and cleaned up, the final presentation maps were created.

Using ArcMap, outlines and all layers associated with each park were added and updated. Park outlines, and land use data were altered as needed to reflect existing conditions. Each Park was then systematically edited using colored symbols to identify each object in each layer. Bodies of water were colored blue, forested areas dark green, wetlands were defined by a hatch and color dependent on the cover type: meadow, forested etc. and areas with mown lawn and shaded by trees were colored green with hatch marks. Lines were smoothed, and roads and pathways were scaled to show the hierarchy of pedestrian versus vehicular access. Roadways and paths were edited based on their true location. Pedestrian created pathways (desire paths) were colored orange. Pedestrian paths and trails were colored white or remained the color they are represented in official Mercer County trail maps. Golf cart trails were colored yellow, and sports fields were colored orange.

The inventory of unique site characteristics was identified with colored symbology designated for the associated feature. Once the basemaps were created, the images were exported to PDF's and imported into InDesign. Inventory and analysis icons were overlaid onto the maps to better visualize the information. Blue icons identify inventory items whereas yellow icons identify analytic items, which need additional attention.

The maps were presented and discussed in full detail with County representatives in various working session meetings held via zoom. Based on County feedback, relating to visual representation, content, and priority, the maps were revised and reprinted. The maps help visualize locations for recommendations and priority concern areas. Statistics (quick facts) were compiled for each park through GIS calculation from on site inventory counts. A collection of key images was compiled for each park location. The matrix chart was created for the County Parks to identify their role in the overall park system and to identify areas calling for priority attention.

To gain feedback from County representatives, working session meetings were held via zoom. Table 1.2 is the feedback meeting schedule with discussion topics per meeting.

Feedback and Revision Process

All meeting feedback was incorporated and considered in the mapping process. This included but is not limited to data sources and fact checking, open discussion about park findings from the County representatives' perspectives, and open space usage. The above informed discussions led to the outcomes of this report's findings and recommendations.

Date	Topic
May 10, 2021	Kick-off meeting
June 6, 2021	Initial Progress Meeting: -Discussed site visit schedule & mapping progress -Shared findings from initial regional mapping exercises
July 12, 2021	Park Inventory Draft Maps: -Shared first draft of park inventory maps and gained feedback on park categories and visual representation
August 20, 2021	Compiled Park Inventory Drafts -Shared a more complete set of park inventory maps and discussed inventory findings, analysis, recommendations, and priority concerns for the Mercer County Park Commission as it pertains to park facilities and local ecology.
August 26, 2021	Golf Course Inventory Draft Maps and Regional Inventory maps -Continuation of the previous meeting to share Golf Course inventory and analysis -Discussed regional inventory maps and how they relate to the overall Mercer County Parks system.
To Be Determined	Draft Report Feedback

Table 1.2: Meeting Schedule and Topic Summary.

End Notes

[1] Land Use Land Cover of New Jersey 2015 (Download)," NJDEP Bureau of GIS, accessed September 27, 2021.

[2] "Greater Mercer Trails Plan," Arcgis web application (Greater Mercer Transportation Management Association, 2021).

[3] "FoHVOS Ted Stile & Fiddler's Creek Preserves," Google my maps (Google), accessed September 27, 2021.

[4] Mercer County Park Commission, 2021.

2. Regional Inventory & Analysis

Overview

Mercer County holds a rich history which is celebrated throughout the County owned park facilities. This extensive history informs how the landscape has been developed over time and relates to the cultural importance of Mercer County's land. Historical development patterns relate very closely to Mercer County's natural landscape. Topography, wetlands, and adjacency to the rivers have played a major role in the shape of Mercer County's landscape today and the demographic distribution. The regional scale inventory takes a look at the County scale composition of Mercer County and relates it to individual park facilities to gain a better understanding of the Park's history, demographics, ecology, natural resources, and land use to discover how the parks impact local human and non-human communities.

Figure 2.1: John A. Roebling Memorial Park Path along Gas Line.

2.1 Mercer County History

Mercer County's roots can be traced back to the late 1600s. The territory had formerly been the land of the Native Americans of the Lenape tribe, known by the Delaware Indians by the English. As the story goes, when early settlers asked them their name, they responded with "N-del-la-wowe", meaning "the Original People". It just so happened that the governor of Jamestown at the time was a man by the name of Lord de la Warr, whom the English decided to honor by giving the name to both the tribe and the Delaware River. [1]

The first major sign of colonialism was the founding of Trenton, which was first settled in 1679 by Mahlon Stacy. Stacy, a Quaker, had set up a gristmill in the region to support local farmers. Good soil led to more farms, and Trenton became an early economic center. Two men by the names Samuel Green and William Trent also played a significant role in this development, creating an ironworks, a forge, and cloth mill. Trenton later got its name from William Trent. [2]

Amidst the burgeoning economic sector, pre-revolutionary sentiments were gathering in the region. In 1754, the former College of New Jersey was set to transfer over to the New Brunswick area, in exchange for both better land and funding. However, before the deal was closed a more lucrative offer came from Princeton County, an offer that was accepted and led to the eventual adoption of the Princeton name for the university. The future Princeton University was a hotbed of news and colonial gossip, as both a center of learning and a travel route for stagecoaches. It wasn't long before anti-British sentiment overtook the campus, and this was in fact encouraged by prominent community members such as Reverend John Witherspoon and lawyer Richard Stockton. The period of the 1760s – 70s were marked by protests against British rule, which turned to celebration with the announcement of the Declaration of Independence. [3]

The region's protests would soon escalate into warfare, with the area playing host to two prominent battles of the Revolution. The Battle of Trenton, immortalized in Washington's famous crossing of the Delaware River, took place in late December of 1776. Having suffered a series of devastating blows and corresponding morale losses, and with many of the soldiers' enlistments set to expire, Washington led his troops to attack the Hessian mercenaries in a desperate attempt to turn the tide of the war. Completing the crossing on the daybreak of the 26th, Washington's ragged army underwent a 10-mile march towards Trenton, taking the Hessians by surprise and routing the garrison of 1500 men. This victory solidified the Continental Army's position both militarily and in the hearts of the people, proving that against all odds, the revolution had a chance of success.

The second major battle was the Battle of Princeton, taking place only a few days after the rout at Trenton. Washington sought out a strategic position in the Ramapo Mountains, acting on reports that the current British troops were too scattered to halt their advance. [4] The information was flawed, and the British swiftly came for the Continental Army. Pinned against the Assunpink Creek by Charles Cornwallis, Washington split his army and moved the main force under cover of darkness towards the college town of Princeton, who were sympathetic to the revolutionary cause. However, on the way they encountered British troops led by Charles Mahwood, who had previously had been keeping Princeton secure before moving forward to meet with Cornwallis. Now fighting in a traditional sense, as opposed to the surprise attack at Trenton, Washington detached brigades led by Hugh Mercer and John Cadwalader to intercept the

Figure 2.2: Roebling Relic.

Figure 2.3: Trenton Industry.

British. When they fell, Washington led the rest of the army personally into battle, breaking the British line and pursuing them through the town.

Trenton's significance was not lost on the early Congress. The area was seen by many as a possible site for political matters, a precedent set by the meeting of the first New Jersey state legislature at Princeton. After the war, it the area also served as the base of operations for the 85 representatives of the First Provincial Congress. Trenton was in fact in the running to become the nation's new capital, with engineers and carpenters already on site to begin work. However, George Washington strongly opposed the measure, and with his status quickly turned attention towards Virginia. In the end, Trenton did serve in many administrative capacities, from an unofficial "working capital" to the preferred offices of President John Adams. In fact, it was shortly after his administration that Mercer County would be officially recognized, as part of a redrawing of county lines. Mercer County was formed from parts of Hunterdon, Burlington, Middlesex, and Somerset counties in 1838, taking its name from the war hero Hugh Mercer, who fell at the Battle of Princeton. [5]

Figure 2.4: Historic Hunt House.

The region would soon be engulfed in another revolution, that of industry. During the revolution, progress had not stopped for Trenton and the surrounding area. On the contrary, they flourished, adding plating and blade mills, tanning yards, paper mills, and other industries to support both the army and the common man. Iron and steel in particular were famous in the region, and rose to worldwide prominence in 1847, with the advent of the Trenton Iron Company. The Cooper-Hewitt "Universal Mill" was the first to roll wrought iron beams in order to create "fire-proof buildings", which were used in structures such as the Capitol Building and the Treasury Building. A second war, the Civil War, would further boost the local economy, with the Trenton Iron Company supplying gun metal for the Trenton-Springfield rifle. [6]

1848 would introduce Trenton to one of the most influential figures of the time, John A. Roebling. Convinced by Cooper that the transportation network and neighboring industries had incredible potential, Roebling moved his wire rope operation from Pennsylvania to Trenton. [7] His own success was short-lived, being fatally injured in 1856, but his company went on to work on monumental projects, such as the George Washington Bridge and the Golden Gate Bridge. Efforts in World Wars 1 and 2, as well as the Korean War, were also bolstered by the company, which produced not only weapons but steel strands used to hoist 5,000-ton ocean


Figure 2.5: Historic Farm House.

radar stations, to warn of enemy incursion.

Metalworking was one of the three main pillars of the Mercer County economy, with the other two being rubber and ceramic production. Rubber became a major industry in 1870, when Alan Magowan converted the old Whitehead Factory into a rubber mill, founding the Trenton Rubber Company. It was an early investment into what would become a thriving business, as cars became more accessible to the general public after 1900. Trenton would be known as the nation's tire capital, and there were 18 tire companies in Mercer alone. Demand for rubber was again bolstered by World War I. [8]

Ceramics had an earlier start, with the first permanent pottery factory opening in 1799. [9] However, it truly came into its own in the mid to late 1800s, with a series of breakthroughs in ceramic manufacturing, Yellow and white Rockinghamware, glazed earthware, and porcelain all helped to put Trenton on the map. Trenton became known as the "Staffordshire of America", based on an English town renowned for its pottery. The Lenox company, founded by

Walter Lenox and Jonathan Coxen, produced what was considered to be some of the best China in the world, with several US presidents commissioning them for the White House. Trenton ceramics have also been portrayed in museums, embassies, and palaces across the world.

A large part of Trenton, and therefore Mercer County's success, is its valuable location. As Cooper portray to Roebling, Trenton is almost equidistant to New York and Philadelphia, two major American cities. In the early days, it was also nearby New Amsterdam, travel between the two establishing a network of trails, with a regular stagecoach line in operation by 1738. Travel by water was made possible by the nearby Delaware River, and was made even more efficient with the construction of the Delaware and Raritan Canal in 1838. At the same time, the Camden and Amboy Railroad was constructed, connecting Trenton and New Brunswick. By 1905, the population of Mercer County was over 100,000, with Trenton easily making up the lion's share at 96,000.

Trenton's decline began around the 1920's, with the widespread mechanization of the industrial sector. The use of machines in factories led to a loss of jobs and a corresponding weaking of unions. Many companies, sensing a shift in Trenton's fortunes, opted to leave the city. The final nail in the coffin was the advent of the Great Depression, with the city barely managing to stay afloat. Trenton was no longer the hub of economic prosperity, instead now a place of racial tensions and controversial development projects.

Mercer County's prosperity may have declined since its heyday, but its rich history still offers many interesting avenues of discussion. For example, the county is home to a series of artificial lakes. These lakes vary from size and function. Mercer Lake, one of the largest, was created in 1975 as a result of a nearby dam. The dam was erected to control flooding in nearby Trenton, and the resulting change in water flow formed Mercer Lake nearby. Carnegie Lake, on the other hand, was created for entirely different motives. Funded by Andrew Carnegie, the lake was created for the use of a rowing team. Upon its completion, Carnegie donated the lake to Princeton.

Another point of interest lies in the preserved land of the region, and the archeological discoveries made there. This was in large part due to the contributions of naturalist Charles Abbot, who made many of those discoveries. [10] Artifacts from the aforementioned Lenape tribe were plentiful in the area, and helped draw attention to Mercer County's historic significance in a time of heavy development. In the late 1930s, the Park Project Committee made a significant purchase of 77 acres of land within the County, in response to the threat of development. With some effort, they also convinced the Roebling family to purchase another 227 acres of land. [11] The entire acreage was then sold to the county for a grand total of 1 dollar, on the condition that it be used as a dedicated wildlife refuge for passive recreation. [12] The area explored by Abbot became known as the Abbot Marshlands, and is recognized as the largest site for Middle Woodland occupation in the Northeast. The rest of the land became known as the John A. Roebling Memorial Park.

2.2 Mercer County Cultural Landscape

Mercer County's extensive colonial, revolutionary, and industrial history is a defining feature of the County's cultural landscape. The Cultural Landscape Foundation provides a helpful definition in stating:

"Cultural landscapes are landscapes that have been affected, influenced, or shaped by human involvement. A cultural landscape can be associated with a person or event. It can be thousands of acres or a tiny homestead. It can be a grand estate, industrial site, park, garden, cemetery, campus, and more. Collectively, cultural landscapes are works of art, narratives of culture, and expressions of regional identity." [13]

The Historic Locations Map locates historic sites and districts which play an influential role in expressing Mercer County's historical significance to those who occupy the landscape today.

Figure 2.6: Howell Living History Farm Visitor Center.

Historical Locations

Mercer County has a rich history that influences how the landscape is experienced throughout the county today. The County's history has influenced heritage trails, central park features, and the creation of regional trails networks along historic districts. The Historic Preservation Office (HPO) has supplied Mercer County with Land Trust Grants to protect the indigenous tribe, colonial settlement, revolutionary war, industrial, and modernist histories which are Mercer County's unique landscapes.

The Historical Locations Map showcases the many historic properties and districts throughout the Mercer County landscape. According to NJDEP, a historic district is defined as a significant set of buildings linked by a continuous aesthetic or historic plan and development. Locations that are included within historic districts include the following: (1) National Historic Landmarks, (2) Properties included in the New Jersey or National Registers of Historic Places, (3) Properties that have been determined eligible for inclusion in the registers through federal or state processes administered by the HPO, (4) Properties that have been designated as Local Historic Districts by local government, (5) Properties that have been identified through cultural resource survey or other documentation on file at the HPO.[14]

Historic preservation in Mercer County includes but is not limited to archeological sites, battle grounds, and farms. Abbott Farm Historic District, part of John A. Roebling Memorial Park in Hamilton Township and Bordentown (Burlington County) is home to many archeological artifacts.[15, 16] This area offers a great deal of insight into the indigenous Leni Lenape community that once inhabited the region. The character of John A. Roebling Memorial Park reflects the natural environment of the Delaware River Floodplain and is a pristine ecological habitat, while the White City Amusement Park remains at Spring Lake show Mercer County's 19th century history.[17]

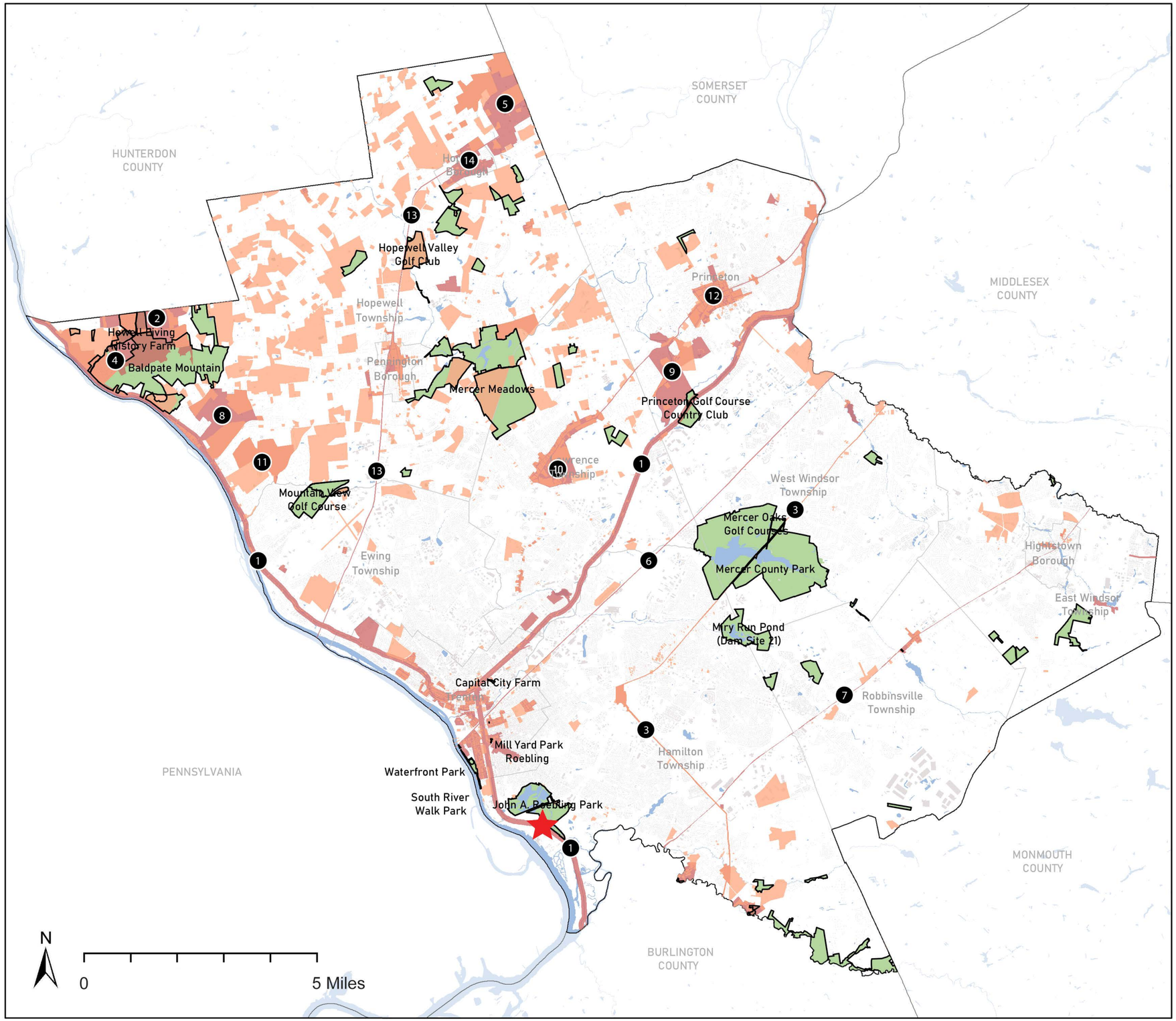
Trenton has numerous historic properties which are dedicated to its Quaker and gristmill heritage, not the mention the extensive industrial history which almost once made Trenton the nation's capital city. The Delaware and Raritan Canal Historic District (1) is the largest historic district in Mercer County and runs through the entire central region of the county. The Pleasant Valley Historic District (2 & 4) is the second largest district in the county and encompasses the northern half of Baldpate Mountain Area. The Pleasant Valley district is home to preserved farmland and Howell Living History Farm, an active living history farm. At Baldpate Mountain Area, archeological artifacts are unearthed and present along trails. Historic transmission and rail line right-of-ways are the major linear historic districts seen throughout the county. The Camden and Amboy Railroad Main Line Historic District (7) runs through a stretch of open space which is owned by the state, county, and municipalities. Mercer Meadows is home to multiple historic farm properties and districts. A large portion of the county to the north is comprised of historic and preserved farmlands.

The historic property and district types lend to the extensive history of Mercer County while also highlighting the development patterns within the county. There is a strong precolonial presence along the Delaware River. Revolutionary war battlegrounds are present north of the piedmont/coastal plain divide ranging from Hopewell to Princeton. Industrial History is predominantly clustered in Trenton. Historic farming districts and farm properties are throughout the northern piedmont. While transportation and transmission lines stretch across the entire county from New York to Trenton in the north, central and west regions (1, 3, 6, 7, 13).

The historic character of Mercer County provides a unique cultural aspect to the parks network which fosters opportunities to create a central identity specific to an individual park. Programming and interpretative signage provide opportunities to showcase Mercer County's history within the park system.

Figure 2.7: Fold-Out-Map, Historic Properties and Districts (Right).

HISTORIC PROPERTIES AND DISTRICTS



Top 14 Largest Historic Districts (By Area)

1. Delaware and Raritan Canal Historic District
2. Pleasant Valley Historic District (Proposed Boundary Increase and Decrease)
3. Metuchen to Burlington Transmission Line
4. Pleasant Valley Historic District
5. Stout/Weart Rural Historic District
6. Pennsylvania Railroad New York to Philadelphia Historic District
7. Camden and Amboy Railroad Main Line Historic District
8. Washington Crossing State Park
9. Princeton Battlefield / Stony Brook Village Historic District
10. Lawrence Township Historic District
11. Bear Tavern Road / Jacobs Creek Crossing Rural Historic District
12. Princeton Historic District
13. Delaware and Bound Brook (Reading) Railroad Historic District
14. Hopewell Borough Historic District

★ Abbott Farm Historic District

Historic Properties

Historic Districts

County Owned Open Space

Map Created by: CUES, Rutgers University
For: Mercer County Park Commission
Date: August, 2021
Source: New Jersey Department of Environmental Protection & The Historic Preservation Office

2.3 Mercer County Demographic Analysis

The people of Mercer County and distribution is a result of historic development patterns. Mercer County has a widespread distribution of people with clustered urban centers evidenced by higher population density in clustered regions. In order to understand the distribution of residents in Mercer County it is important to study population density. To further study the needs of geographic locations this report analyzes the distribution of the low-income population and racial minority populations. Understanding income helps to identify open space access needs, while studying racial diversity begins to unveil potential cultural preferences within the park facilities to better represent the surrounding communities.

Figure 2.9: People at Mercer County Park.

Figure 2.8: Bridge Overlook.

Figure 2.10: Grandparents Grove Picnic Area.

Population Density

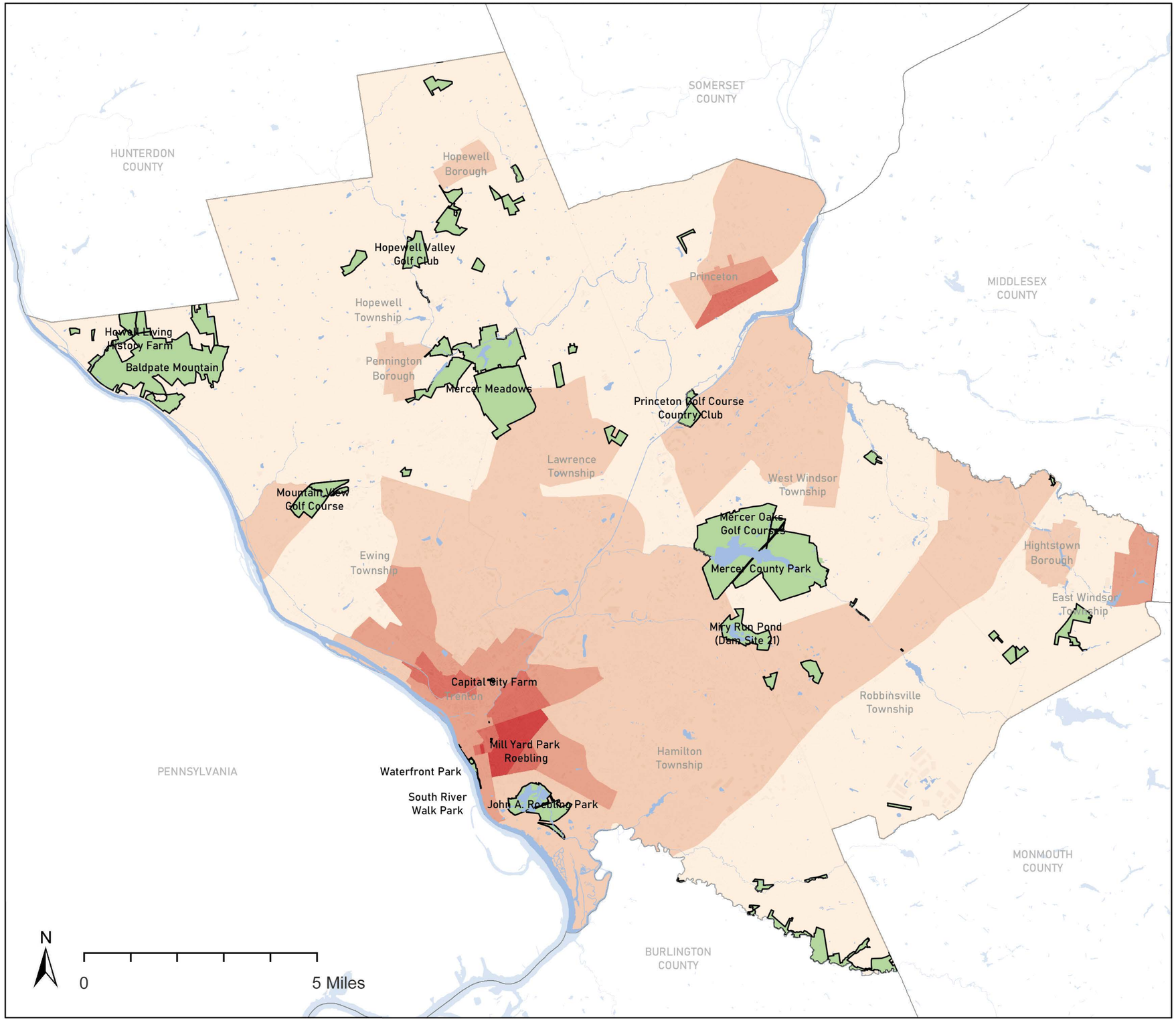
Population density is calculated by the United States Census Bureau and is derived by dividing the total population estimate by total square mileage of the associated geography, in this scenario, census block geography was utilized.[18] The metric of population density and its spatial distribution throughout the county influences intensity of park facility usage, which defines planning considerations and management regimes. Population density is also a precursor to specific land use characteristics, such urban or suburban cover, as well as how park distribution serves the population of the County.

The Mercer County Population Density Map depicts a gradient of densities that range from 227 to 30,544 people per square mile. Most of the county area contains less than 5,000 people per square mile, most of which is even less than 1,000. Most of the county park land cover, including the three largest parks (Baldpate Mountain Area, Mercer Meadows, and Mercer County Park), are located in low population density areas. This distribution pattern may be related to historic settlement patterns as less populated areas had larger land tracts that were not developed.

The highest population densities are clustered tightly around the City of Trenton of which are relatively far from the largest County Parks. Yet, five County Parks are in or near Trenton. Three of the five parks are small urban plaza-style parks (Mill Yard Roebling Park, Waterfront Park, and South River Walk Park). Another small park is Capital City Farm, an active community garden which serves an inner-city population. John A. Roebling Memorial Park is the only city-proximity park that is larger and contains natural resources such as waterbodies, a marsh, and forests. This Park is the only natural area that directly serves this inner-city population and is critical to local residents' quality of life. Therefore, it expresses the importance of offering and maintaining quality open space and access in and near Trenton.

Figure 2.11: Fold-Out-Map, Population Density (Right).

POPULATION DENSITY



Number of People Per Square Mile

- 0 - 1,000
- 1,001 - 5,000
- 5,001 - 10,000
- 10,001 - 20,000
- >20,001

County Owned Open Space

Map Created by: CUES, Rutgers University
For: Mercer County Park Commission
Date: August, 2021
Source: United States Census Bureau (2019)

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Low-Income Population

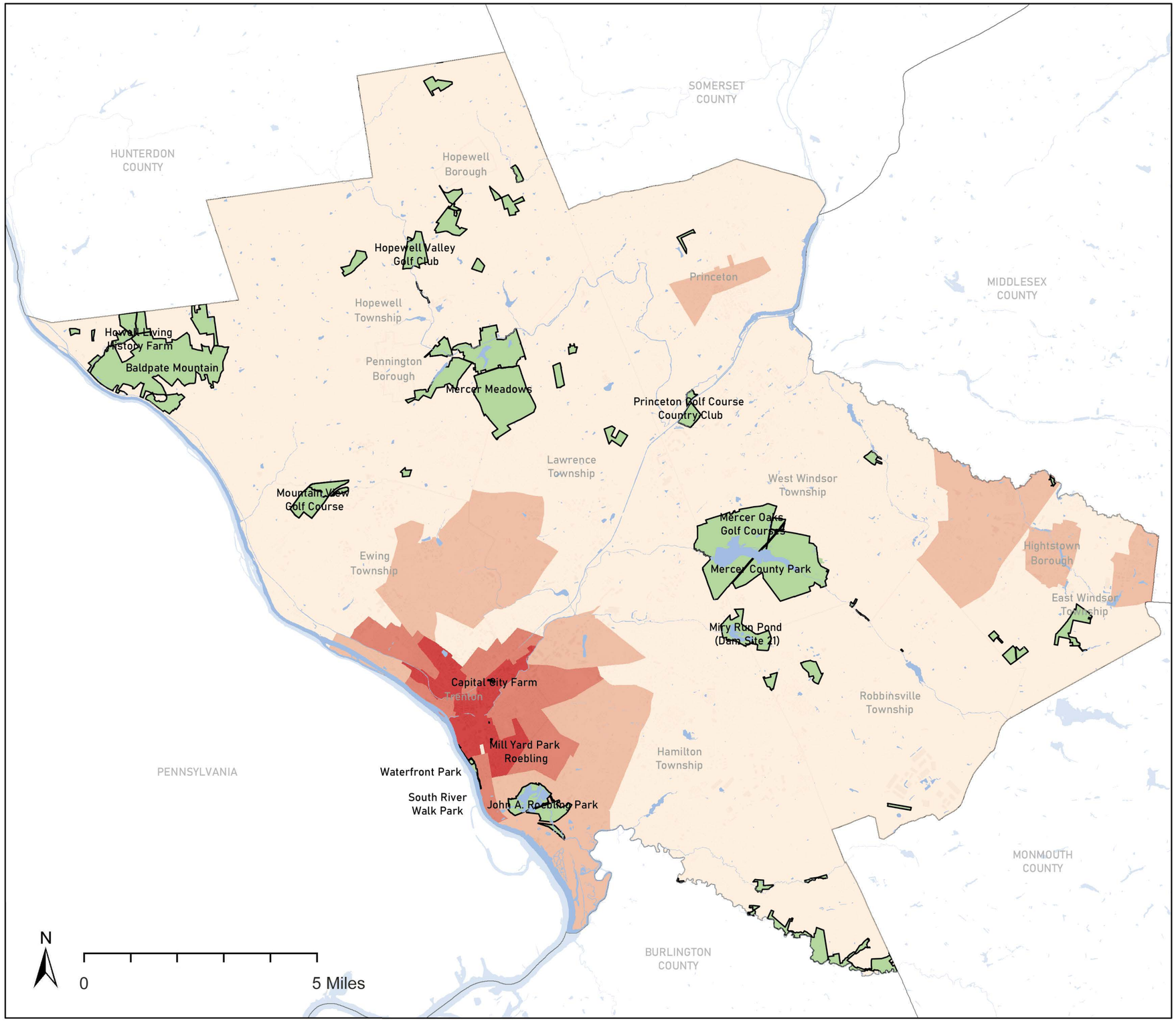
The Delaware Valley Regional Planning Commission defines a low-income population as, "a person or multiple people like a family (poverty level shifts for each person added) having a yearly income below 200% of the poverty level." [19] This means a household's total annual income is below the poverty line by 200%. The Low-Income Population Map of Mercer County displays a very similar pattern to the Population Density Map (pg X). The highest percentile of low-income residents is seen in the Trenton area, followed by the urbanized areas in Princeton, East Windsor, and Hightstown.

The low-income populations of Mercer County have less close-proximity access to County owned open space in comparison to the more affluent neighbors. More specifically, park facilities appear to be lacking or are much smaller in scale, in the low-income areas. This map does not account for municipal and state-owned parks, but instead highlights Mercer County Park Commission's role in relation to the County's demographics. Yet, the low-income populations around the City of Trenton are served with smaller urban parks including Capital City Farm, Mill Yard Roebling Park, Waterfront Park, South River Walk, and the more naturalized John A. Roebling Memorial Park. Further analysis, beyond the scope of this project, would be beneficial to assess the walkability to county parks such as the walkability to John A. Roebling Memorial Park for low-income residents within the heart of Trenton.

Access to park facilities increases the overall quality of life for residents, not only for human health but for overall wellbeing. County Park access is potentially more difficult for the low- income population, especially those Mercer County Park facilities that are predominantly accessible by car. Greater need of vehicular transportation to access park facilities is evident in the distribution of the Regional County Parks: Mercer Meadows, Mercer County Park, and Baldpate Mountain Area. As the County continues to consider open space acquisition opportunities and maintain quality park offerings, it is important to prioritize opportunities within low-income communities. Although large parks may not be an option in highly urbanized areas, smaller parcels can offer an accessible retreat.

Figure 2.12: Fold-Out-Map, Low Income Population (Right).

LOW INCOME POPULATION



Population Bracket Defined as Low Income

- 0 - 20%
- 21 - 40%
- 41 - 60%
- 61 - 100%
- County Owned Open Space

Map Created by: CUES, Rutgers University
For: Mercer County Park Commission
Date: August, 2021
Source: Delaware Valley Regional Planning Commission (2019)

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Racial Minority Populations

Race Is defined by United States Census Bureau "as a person's self-identification with one or more social groups. An individual can report as White, Black or African American, Asian, American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander, or some other race." [20] Racial social groups vary throughout Mercer County contributing to the diverse needs for and within open spaces adjacent to these culturally diverse areas. The Racial Minority Populations map shows the composition of minority racial groups throughout Mercer County by census block geography. Minority, is defined by the Oxford English Dictionary, as a smaller group than the majority.[21] According to the American Community Survey (2019), Mercer County's total population is roughly 59.6% White (alone). [22, 23] Meaning, the racial minority in Mercer County are groups, based on the U.S. Census survey data, who identify as racial groups other than White.

Mercer County's highest percentage of the racial minority population is present in Trenton and the surrounding area of Ewing and Hamilton Townships. There is a higher percentage of the racial minority population in West Windsor, East Windsor, and Robbinsville. The Princeton area shows a racial minority population percentage of 21-40% throughout, except for a geographic grouping in the center of Princeton between 0-20%. The more rural areas north and south of the County have the lowest percentage presence of racial diversity.

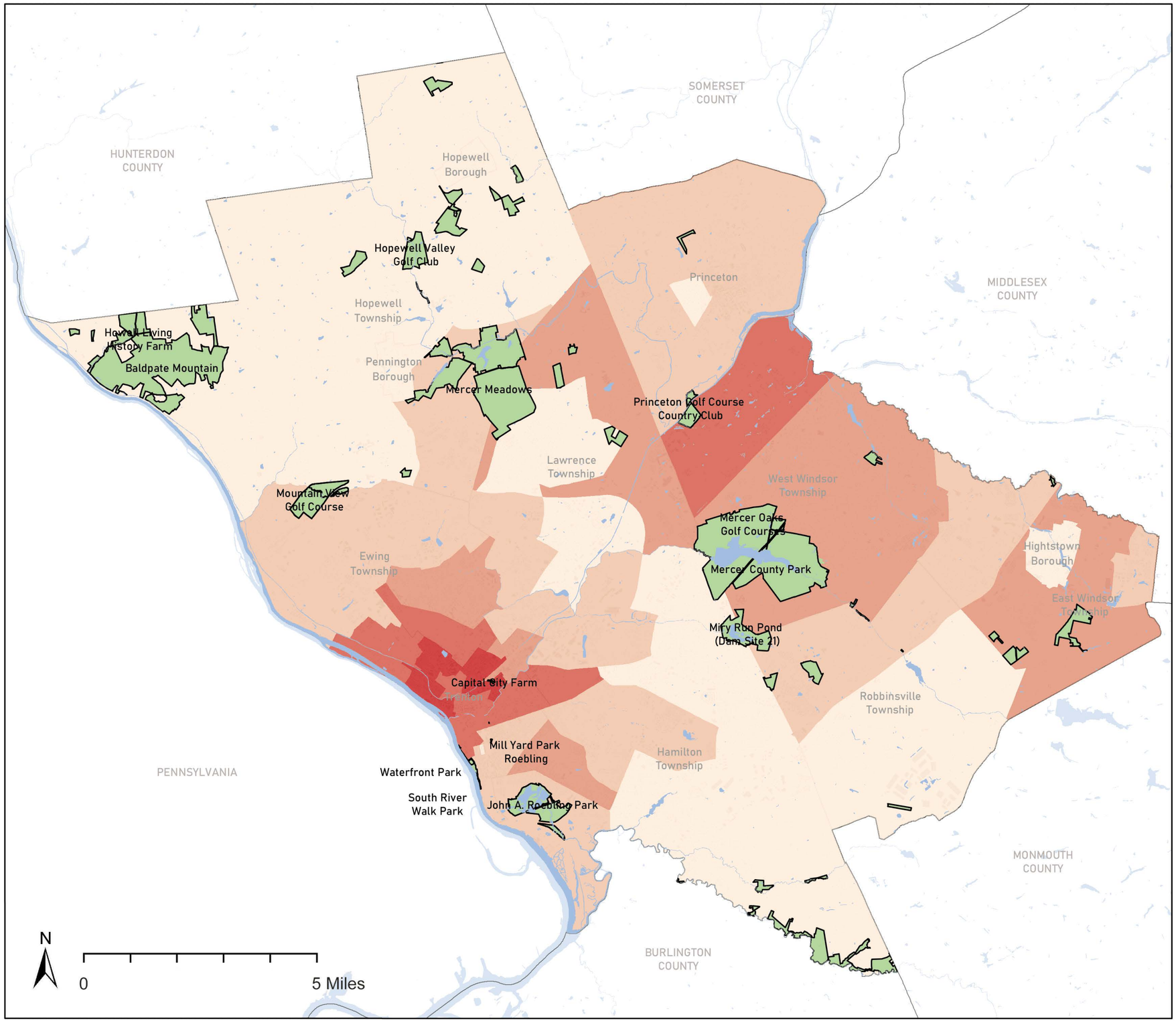
The racial minority population percentage dispersal loosely follows the pattern of the Population Density map. A more diverse population is present throughout areas with higher density such as Trenton and West Windsor. The central area of the county is where the maps begin to differ; the central region has lower density with a racial minority percentage fluctuating between three brackets: 0-20%, 21-40%, and 41-60%. The central region of the county is where three of five regional parks lie (regional parks identified in a chapter X).

Mercer County Park, Mercer Meadows, Mountain View Golf Course, Dam Site 21-Miry Run Ponds, and John A. Roebling Memorial Park are near racial minority populations ranging between 21-60%. Princeton Golf Course Country Club serves a more diverse community with a racial minority percentage between 61-80%. The Trenton area has the smallest County Park coverage with the highest percentage of a racial minority population. However, Trenton contains Capital City Farm, which is a small community farm, small Urban Parks, and proximity to state and municipal open space.

In analyzing the newly available 2020 Decennial Census Race data it is apparent that the higher racial minority areas in West Windsor and East Windsor identify as Asian, whereas Trenton residents have a higher occurrence of identifying as Black or African American.[24] These two groups are not the only racial minorities present in these areas but represent the vast majority. Understanding the racial identity as it diversifies throughout the County will help the county appropriately plan open space improvements and additions around the needs of diverse groups and cultural preferences.

Figure 2.13: Fold-Out-Map, Racial Minority Populations (Right).

RACIAL MINORITY POPULATIONS



Population Bracket Defined as Racial Minority

- 0 - 20%
- 21 - 40%
- 41 - 60%
- 61 - 80%
- 81 - 100%

County Owned Open Space

Map Created by: CUES, Rutgers University
For: Mercer County Park Commission
Date: August, 2021
Source: Delaware Valley Regional Planning Commission (2019)

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2.4 Mercer County Land Use and Natural Resources

Mercer County is comprised of two very diverse physiographic regions, the Northern Piedmont and Coastal Plain. These physiographic regions' natural compositions influence the overall land uses and urbanization within the County. The Land-Use and Natural Resources inventory maps explore the topography, natural and urban land cover, terrestrial habitats, and wildlife. Understanding the County's land use and natural landscapes clarifies the County's ecosystem character and human influences. These maps showcase the Park Facilities within the County scale in relation to surrounding features and one another. These maps inform appropriate future recommendations for the County Parks network.

Figure 2.14: Moores Creek, Baldpate Mountain Area.

Topography

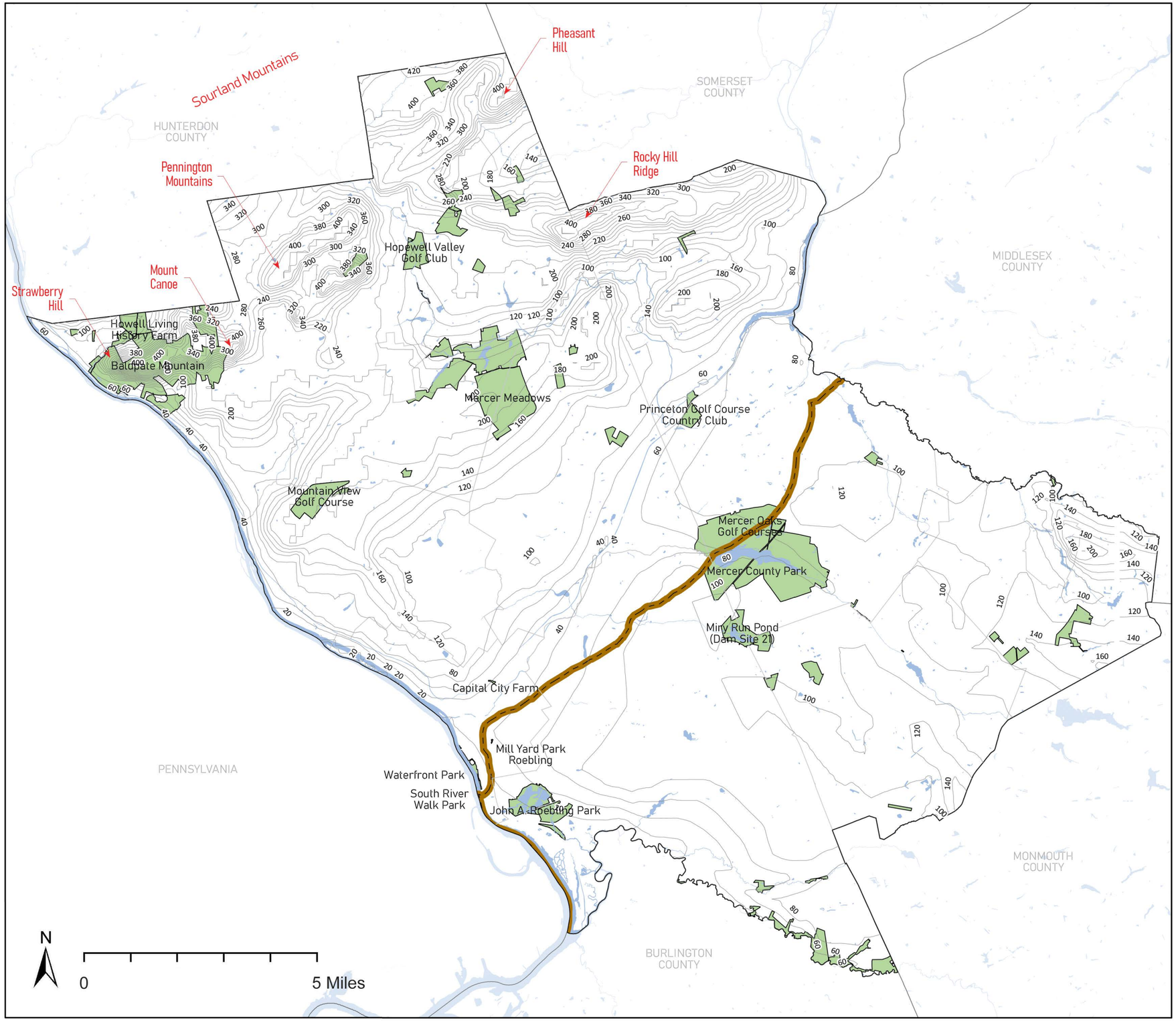
The base of the Sourlands Mountain Range extends southeastward along the mountainous terrain of northern Mercer County. Much of this area is near to 400 feet above sea level and greater at the summits of Pheasant Hill (447ft), Rocky Hill Ridge (406ft) above Princeton, Pennington Mountain (458ft) west of Hopewell Valley Golf Club, and Baldpate Mountain Area (477ft) which encompasses Mt. Canoe (405ft) and Strawberry Hill (481ft). The descending gentle slopes of Hopewell Valley, which lies between Pennington Mountain and Rocky Hill Ridge, extends southward beyond Mercer Meadows. This northern half of Mercer County is part of the Northern Piedmont physiographic region.

The Inner Coastal Plain Physiographic Region occupies the southern half of the County and is topographically differentiated. It is defined by the flatter terrain that allows for more expansive water courses, wetlands, and floodplains, such as those in Mercer Meadows. The lowest elevation in the county reaches 20 feet in the southwest region at the Delaware River edge just beyond John A. Roebling Park.

The geologic landforms defined Mercer County's culture, such as the diabase formations in the mountains, where trap rock was historically mined, or the fertile soils of Hopewell valley that were used for agriculture, both of which influenced historic development patterns.[25] The varied geomorphology also influenced Mercer County's natural heritage which is exemplified in the physiographic differences (see pages...). Topographic landforms effect everyday Mercer County life at the many inspiring vistas loved by the community for their role in enhancing the wellbeing of those who frequent the park facilities. Baldpate Mountain Area's terrain create challenging hikes along forested trails with breathtaking views to the Delaware River; Mercer Meadows relaxed slopes make it for an ideal walking experience with expansive views; and Mercer County Park's more flat terrain lends to the ideal use for active recreation on land and water. In addition to the elevations defining the parks use, the topographic character of the Mercer County shapes future environmental decisions regarding water management, watershed areas, wetlands, and ecological habitats, as water (a precious resource) storage and movement is dictated by landforms. Land management and priorities within the park facilities and preserved open space will vary based on topography.

Figure 2.15: Fold-Out-Map, Topography (Right).

TOPOGRAPHY



Contour Line

Northern Piedmont (North) & Coastal Plain (South) Boundary

County Owned Open Space

Map Created by: CUES, Rutgers University
For: Mercer County Park Commission
Date: August, 2021
Source: New Jersey Department of Environmental Protection & the Nature Conservancy

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Land Use Land Cover

The Land Use Land Cover Map displays basic land uses, zoning, and their spatial distribution throughout Mercer County. The urban designation in this map represents all developed land including those considered inner-city urban, suburban, active recreational land, and roadways. Urban land cover dominates the county and is concentrated across the central corridor. The northern half of the county has more natural land cover including forest and wetlands. Likewise, the southern half of the county has similar amounts of natural land cover, yet there is more wetland than forest. The wetland land cover in the map includes all terrestrial wetland types including tidal marsh, emergent freshwater wetland, and swamp (which is a forested wetland). Forest land cover consists of non-developed upland forest, therefore forest land cover in this map does not include forested swamps that are designated wetland, nor street tree urban forests (shade trees).

Agricultural land cover is predominantly found in the far north and southern regions of the county. When comparing the land use land cover changes from 1986 to 2015, agricultural land cover significantly decreased and urbanized (see Land Use Land Cover maps from 1986 to 2015). Notably, the greatest shifts from agriculture to urban cover occurred across the northern mountainous areas, around Pennington and Hopewell Townships, and in the southern swath of agricultural lands by Robbinsville. This conversion emphasizes the importance of farmland preservation and the acquisition of open space that are threatened by future development.

Barren land cover, which includes landfills, brownfields, and quarries, is distributed sparsely throughout the County in varying sizes. The two largest barren land parcels are quarries owned by Trap Rock Industries. One quarry is located in Baldpate Mountain Area and the other sits west of Hopewell Valley Golf Club. The quarry by Baldpate Mountain Area is slated to close in 2023 and be converted to county park land.[26] In the southern half of the county, scattered barren land parcels occur interspersed between the other land use types yet are commonly found adjacent to wetlands as they were historically placed in wetlands.

Of the County's Park facilities, the larger regional parks contain large areas of forest (Baldpate Mountain Area), wetland (John A. Roebling Park), agriculture (Mercer Meadows), and urban land where active recreation was developed (Mercer County Park). The golf courses contain predominantly urban land as fairways, though they contain greens and shade trees, are not natural landscapes. The inner-city parks are considered urban land. The land use land cover spatial data reveals potential areas of concern surrounding the higher concentrations of urban and barren land as well as areas lacking sufficient natural land cover types that provide ecosystem service. This is a primary investigatory step to decipher how spatial distribution of land use affects the environment and where potential park facility and open space acquisition may be implemented on various scales.

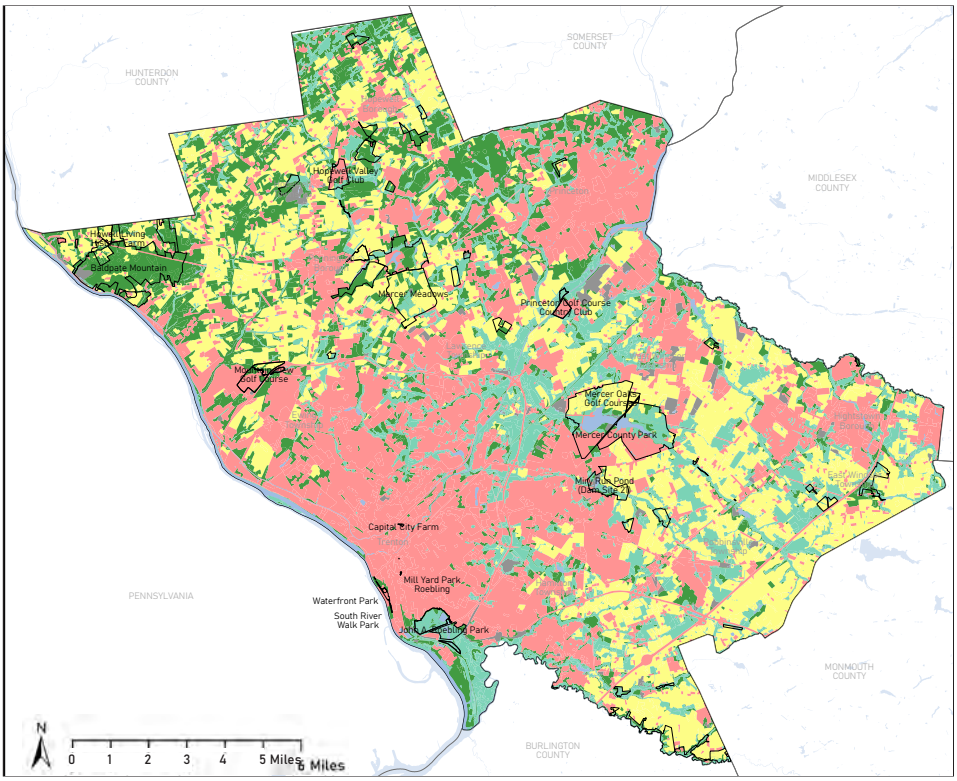
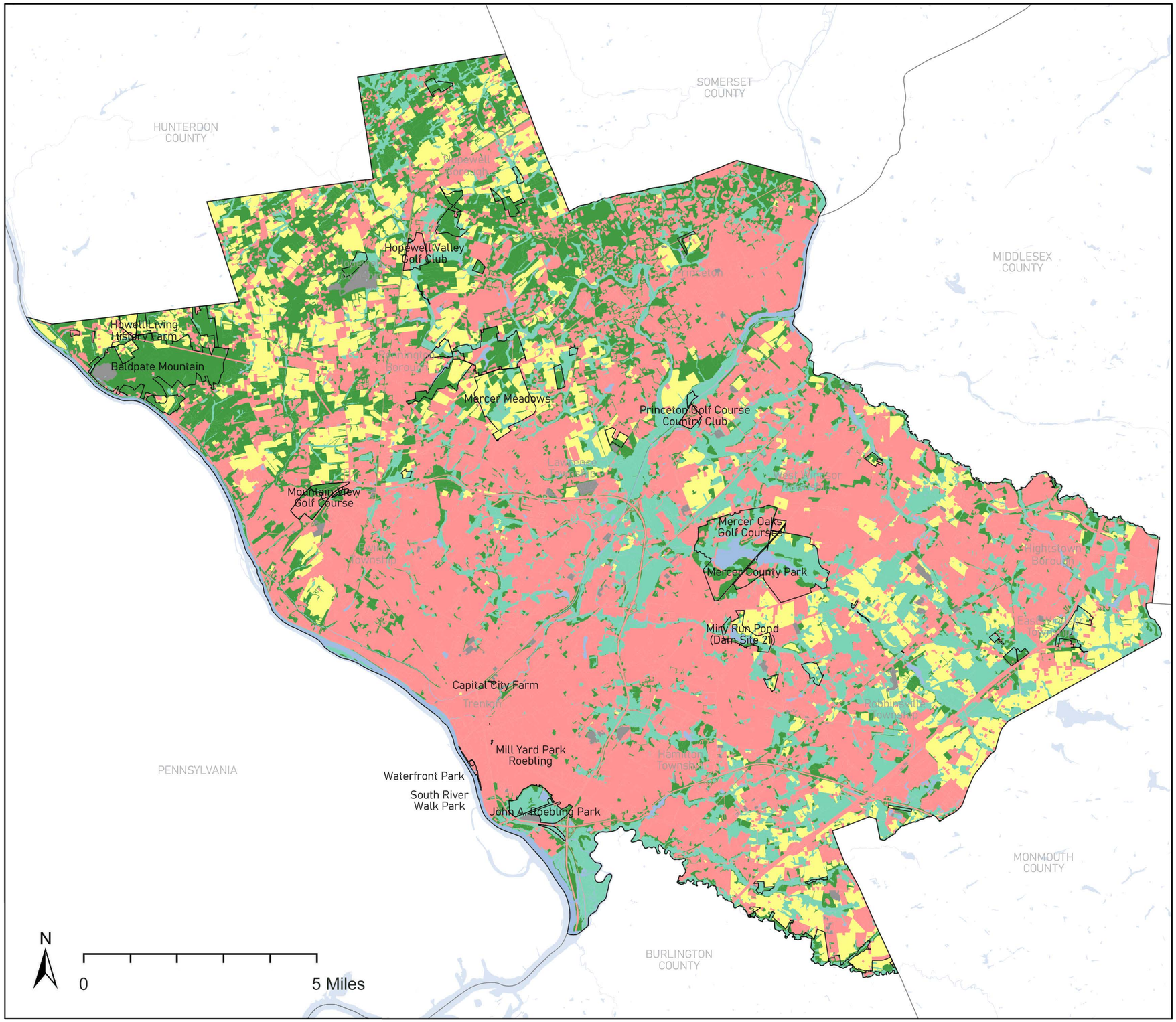


Figure 2.16: New Jersey Department of Environmental Protection Land Use Land Cover, 1986.

Figure 2.17: Fold-Out-Map, Land Use Land Cover, 2015 (Right).

LAND USE LAND COVER 2015



AGRICULTURE

BARREN LAND

FOREST

URBAN

WATER

WETLANDS

County Owned Open Space

Map Created by: CUES, Rutgers University
For: Mercer County Park Commission
Date: August, 2021
Source: New Jersey Department of Environmental Protection

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Impervious Surface

An impervious surface is one that prevents water infiltration into the ground, which then reduces groundwater recharge capabilities and increases water runoff volume as well as flooding intensity. Buildings, roadways, sidewalks, patios, and driveways are all considered impervious. Impervious surfaces in high densities pose significant threats to their communities as they drastically amplify negative effects of flooding. In addition to life threatening dangers of flooding, it also jeopardizes water quality as harmful compounds are carried in surface runoff into local streams as non-point source pollution. Furthermore, amplified flooding intensity can harm or destroy the overburdened pervious surfaces in low lying areas like floodplain forests and wetlands.

The Impervious Surface Map details the various types of impervious surfaces that cover much of Mercer County; the types include building footprints, roads, parking lots, and other which includes sidewalks, driveways, patios and other surfaces of similar material (asphalt and concrete). The impervious surfaces of Mercer County were originally mapped by the New Jersey Department of Environmental Protection (NJDEP) as a part of the land use land cover data through aerial imagery and estimation.[27]

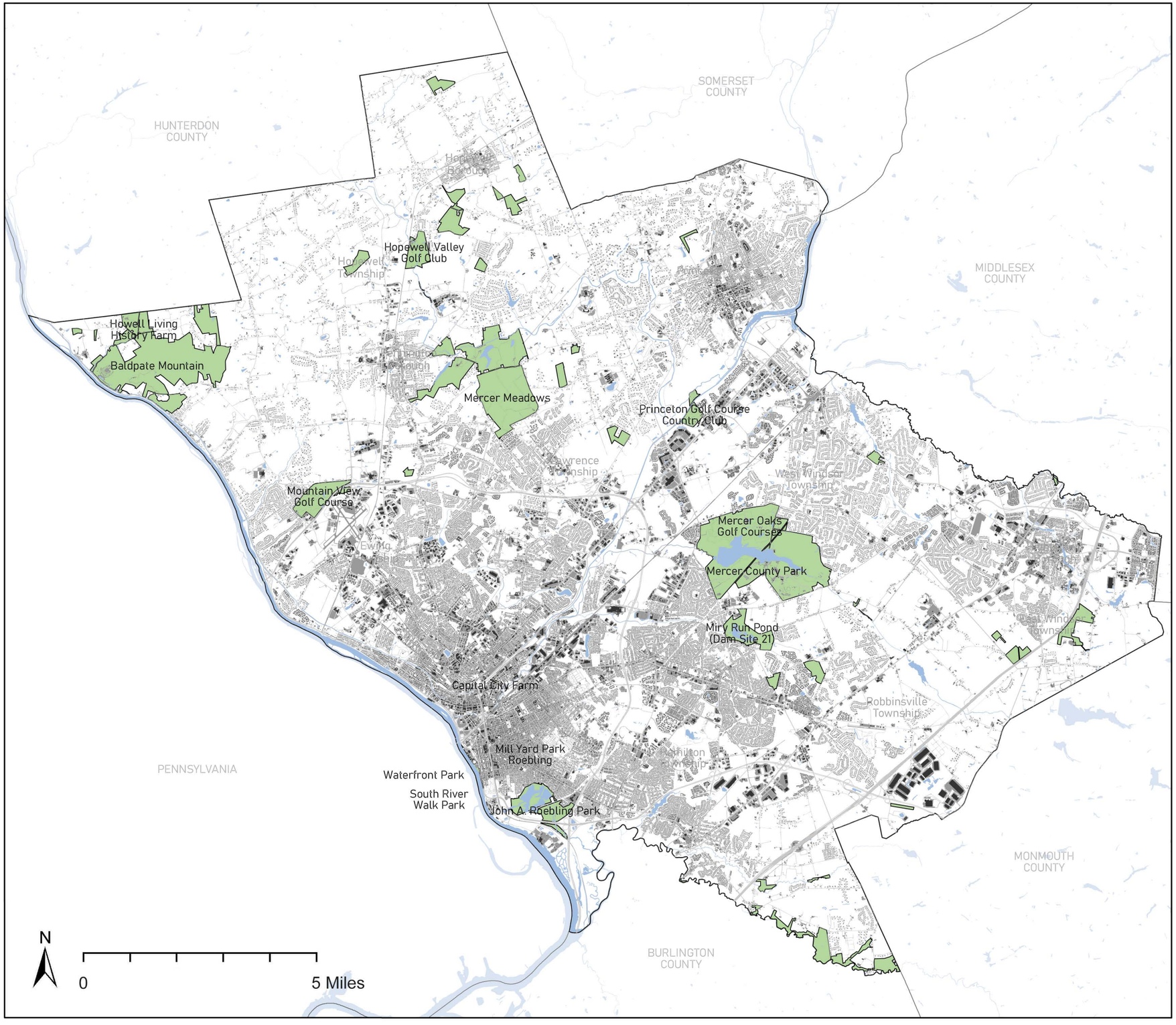
Impervious surface density and distribution in Mercer County correlates closely with the urban land cover from the previous map. As such, the City of Trenton has the greatest impervious surface cover. The pattern of development is clearly displayed by the density and impervious surface web expanding from Trenton through the center of the County to Princeton and East Windsor. This pattern also demonstrates which County Parks are potentially subject to negative effects of increased impervious surfaces. Such parks include Capital City Farm, Mill Yard Roebling Park, Waterfront and South River Walk Park, Mercer County Park, and Dam Site 21-Miry Run Ponds. Of all the park properties, Mercer County Park contains the most impervious surface due to its multiple roads, abundant parking lots, and active recreation areas. Importantly, paved roadways and paths allow safe access for park use. However, all impervious infrastructure must be carefully planned so not to negatively impact the landscape.

The least impervious surface cover is found in the northwest and southeast sections of the County as they have less developed land and more agriculture, wetland, or forested land cover. Both Baldpate Mountain Area and Mercer Meadows, for example, maintain lower impervious surface cover as they provide more passive recreation opportunities.

Figure 2.18: Parking Lot at Mercer County Park.

Figure 2.19: Fold-Out-Map, Impervious Surface (Right).

IMPERVIOUS SURFACE



Impervious Surface Type

- Building
- Parking Lots and Other
- Road

- County Owned Open Space

Map Created by: CUES, Rutgers University
For: Mercer County Park Commission
Date: August, 2021
Source: New Jersey Department of Environmental Protection

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Groundwater Recharge

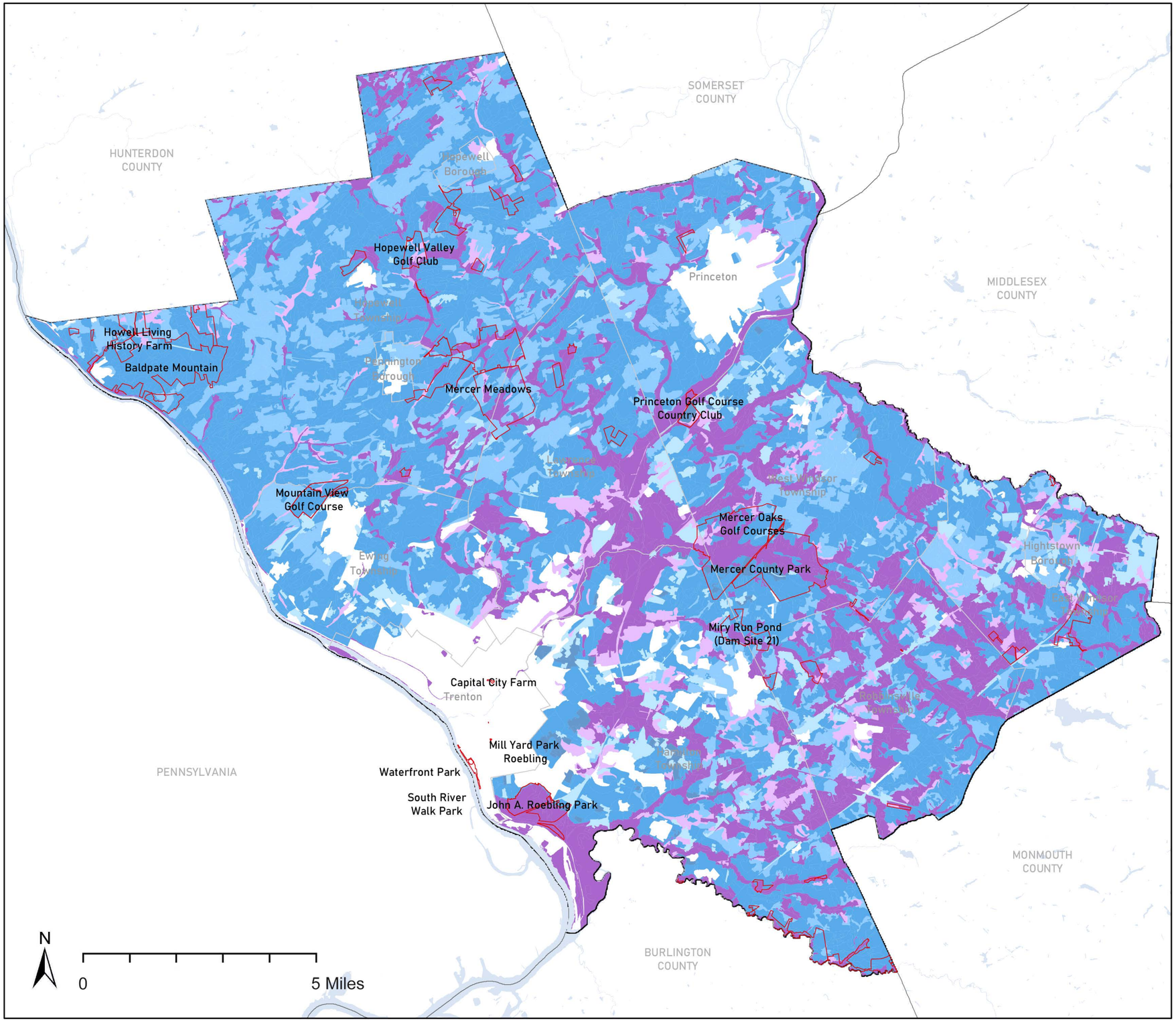
The process of groundwater recharge is defined by NJDEP as precipitation that infiltrates into the soil and is not evapotranspired.[28] Groundwater recharge is the process that replenishes water in underground aquifers which is critical to domestic water use, irrigation, and agricultural practices. Importantly, areas with higher groundwater recharge rate potential reduce surface runoff and flash flood intensity. This helps to reduce excessive river swelling and streambank erosion that negatively impact developed areas and natural areas in floodplains.

The Groundwater Recharge Areas Map of Mercer County displays recharge zones delineated by water infiltration rate in inches per year. No recharge rates were calculated for hydric soil areas or water bodies as they are usually saturated and infiltration rates could not be calculated. Yet, it is important to note that water bodies and wetlands naturally leak water into groundwater reserves even though the rates or amounts are more difficult to estimate. Groundwater recharge rates are estimated by NJDEP through the combination of NJ Geological Soil Survey data, Land Use Land Cover data, and municipality based climactic data.[29] A noticeably blank area with no groundwater recharge calculated is in the City of Trenton. The assumption is made that the high impervious surface cover leads to inaccuracy or the inability to calculate this estimation.

Areas within park facilities consisting of higher estimated groundwater recharge rates occur in Mercer County Park, Mercer Meadows, and Miry Run Ponds. These Park facilities contain waterbodies and wetland cover with surrounding higher infiltration rate parcels. It is important to limit any additional impervious surface cover in these parks due to their high wetland cover and infiltration rates that serve the surrounding communities. John A. Roebling Memorial Park, is mostly open water and wetlands, therefore, this park also should limit impervious surfaces as well. Furthermore, the adjacent communities are highly urbanized with significant impervious surface cover (see Impervious Surface Map) which increases the importance of the County Parks' groundwater recharge capabilities and maintaining higher infiltration rates.

Figure 2.20: Fold-Out-Map, Groundwater Recharge (Right).

GROUNDWATER RECHARGE



Annual Recharge Rate

- 0 in/yr
- 1 to 7 in/yr
- 8 to 10 in/yr
- 11 to 15 in/yr
- 16 to 23 in/yr
- Hydric Soil (No Recharge Calulated)
- Wetlands, Open Water (No Recharge Calculated)
- County Owned Open Space

Map Created by: CUES, Rutgers University
For: Mercer County Park Commission
Date: September, 2021
Source: New Jersey Department of Environmental Protection & Mercer County Park Commission

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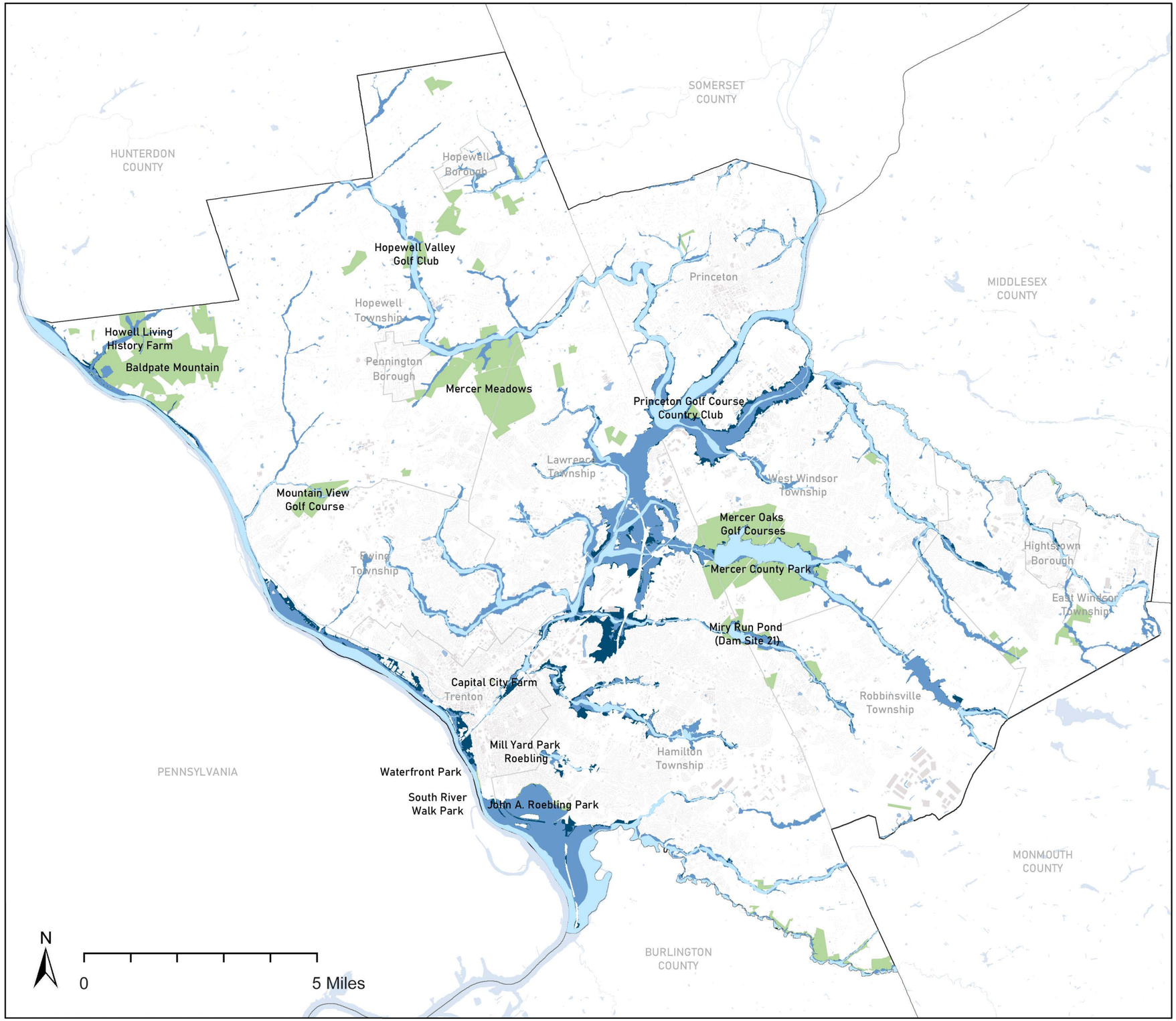
Seasonal Flood Risk

Seasonal flood risk is posing a growing threat as a result of climate change and increased development, especially within floodplains. Open space is one of the first lines of defense when it comes to slowing and trapping stormwater, increasing groundwater recharge, and water storage. The Seasonal Flood Risk Map is a representation of the Federal Emergency Management Agency (FEMA) flood risk zones. The map details flood risk for 100-year (0.1% annual chance) and 500-year (0.2% annual chance) flood events.[30] To paraphrase, FEMA defines a flood as, "a general and temporary water inundation of land that is usually dry." [31, 32]

The Seasonal Flood Map illustrates the County's rivers, lakes, reservoirs, and other various waterbodies that run like veins through the County. Associated with the riverine systems and County water bodies is the 100-year and 500-year floodplain. The floodplains intersect clusters of developed land throughout the County posing potential risk to communities throughout its boundaries. Urban and suburban settlements built on floodplains, especially those closest to the river itself (100-year flood zones) are in the most danger when it comes to flood risk. This map shows most of the County has minimal risk from even the largest 500-year floods. Nonetheless, areas immediately adjacent to water bodies are at significantly great risk such as urbanized locations within the triangle of Trenton, Lawrence Township and Hamilton Township as well as some developed areas of West Windsor. In the County Parks, the most at risk of seasonal flooding include John A. Roebling Park, Miry Run Pond, Princeton Golf Course, and Hopewell Valley Golf Club. With the added risk of climate change, it is more critical than ever to know where the 100-year flood risk areas are in order to implement resiliency measures should they intersect with urban or suburban environments. The same can be said for 500-year flood hazard zones as in recent decades New Jersey has experienced increased frequency of 500-year storm events.

Figure 2.21: Fold-Out-Map, Seasonal Flood Risk (Right).

SEASONAL FLOOD RISK



1% Annual Chance Flood

0.2% Annual Chance Flood

Floodway

County Owned Open Space

Map Created by: CUES, Rutgers University
For: Mercer County Park Commission
Date: August, 2021
Source: Federal Emergency Management Agency
Data Published 2020

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Surface Waters

Water is an essential resource that is utilized for various purposes such as necessary daily uses like drinking water and recreational uses which enhance overall quality of life. Like most landscapes in New Jersey, waterbodies define the County's border. The Delaware River denotes the western border, Crosswicks Creek defines the southern border dividing Mercer and Burlington Counties, and the Millstone River divides Mercer and Middlesex Counties. In addition, surface waters provide water storage and recharge in aquifers below ground as previously mentioned. Importantly, surface waters provide invaluable aquatic habitat for hundreds of wildlife species including those that are protected like several endangered and threatened mussels, the great blue heron, a species of concern (see appendix), or the state threatened osprey, which both rely on waterbodies with ample fish populations.[33, 34]

Three major watershed management areas intersect Mercer County: Central Delaware, Millstone, and Assiscunk, Crosswicks, and Doctors.[35] The Millstone Watershed lies in the northeast third of the County which contains several tributaries of the Millstone River including the Stony Brook. The Central Delaware Watershed contains surface waters that drain into the Delaware River including Moores Creek, Jacob's Creek, and the Shabakunk Creek and Miry Run that meet the long Assunpink Creek, which encompasses Mercer Lake. The Assiscunk, Crosswicks, and Doctors Watershed, along the southern border contain freshwater tributaries that also flow into the Delaware River by John A. Roebling Park and the greater Abbott Marshlands where southernmost locations are tidally influenced. Interestingly, the man-made Delaware and Raritan Canal (D & R Canal) defies watershed boundaries and runs across the County.

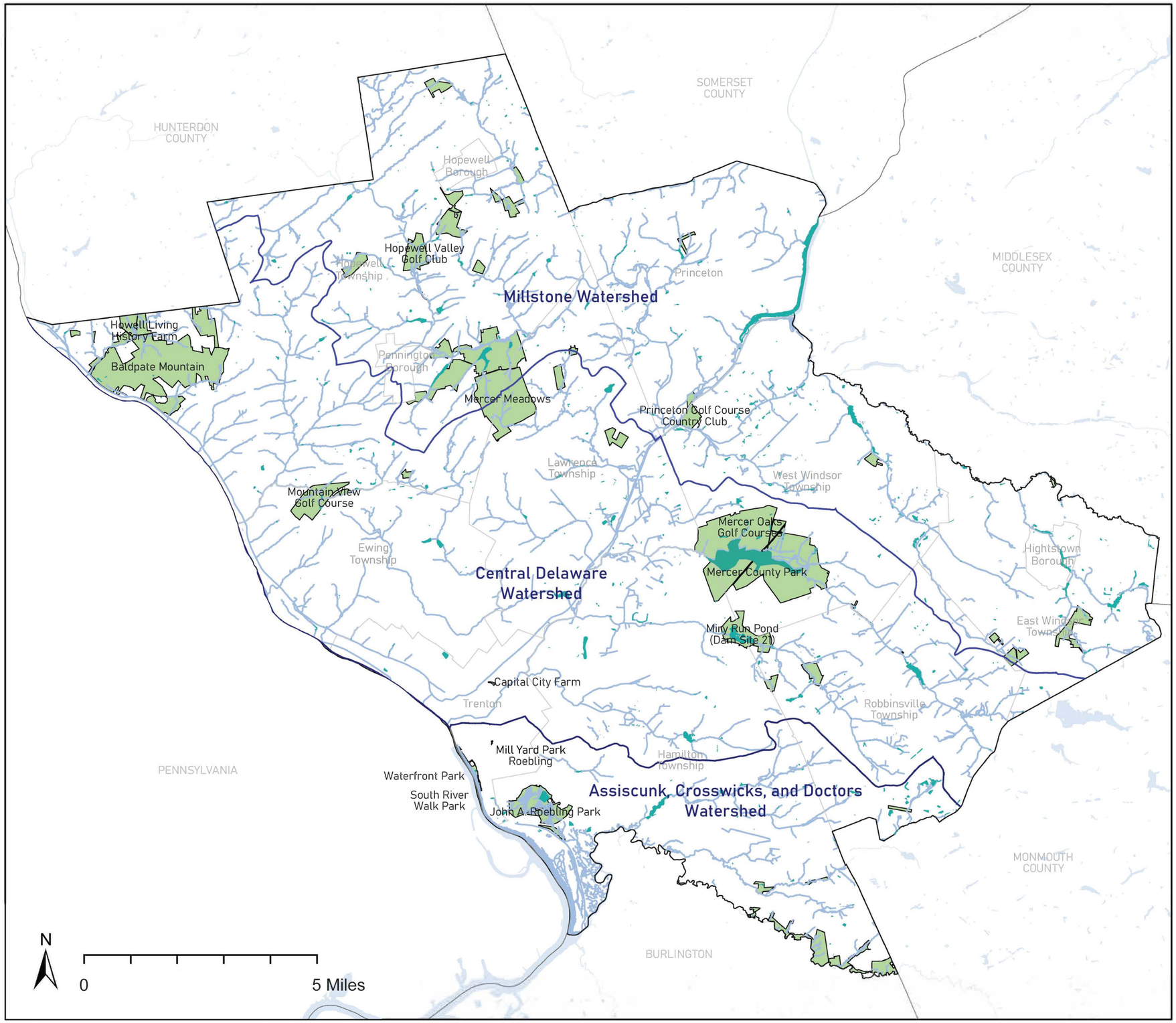
Rivers and streams provide distinct character and valuable ecological services to park facilities and open spaces; they also create vital habitat connections as well as transportation connections across the Mercer County landscape. For example, the D & R Canal, which crosses Princeton Golf Course Country Club, is home to the historic D & R Canal State Park Trail is 77 miles long and crosses Mercer and two other counties; it is an important part of New Jersey's cultural history as well as everyday life for those that live near it. The Stony Brook, that passes through Hopewell Valley Golf Club and Mercer Meadows as it subtly defines those landscapes, is one of the few reported watercourses that maintain a population of the state endangered brook floater mussel.[36] In Baldpate Mountain Area, Fiddler's Creek defines an entire section of the park landscape as it created a ravine that provides a distinct hiking experience as well as unique forested ravine habitat.

In Mercer County, there are abundant natural lakes and ponds as well as man-made waterbodies along natural brooks; in total there are approximately 878 recorded lakes or ponds.[37, 38, 39] Multiple Mercer County lakes and ponds are central features in the park landscapes. Mercer Lake, which is the largest lake, is roughly 300 acres and is located in the center of Mercer County Park. Mercer Lake hosts Olympic training water sport, fishing, and habitat, while also providing a serene backdrop for casual visitors. Mercer Meadows contains Rosedale Lake, Willow Pond, and Curlis Lake, which are all man-made and connected to the Stony Brook. Miry Run Pond (formerly named Dam Site 21) is an artificially created large reservoir, which was dammed, but still part of the Miry Run watercourse. Also, Spring Lake and Rowan Lake are located in John A. Roebling Memorial Park and support vital ecological habitat as well as passive recreation activities.

The lakes throughout the park facilities are predominantly artificial. In context of their connected water courses, their spatial distribution within watersheds determines management actions such as those that mitigate eutrophication. Management of these waterbodies is challenging as they cross over countless properties of differing ownership and influences. Even so, management and communication between watershed neighbors is vital in order to protect water quality, ecological health of aquatic habitats, and to maintain safe access to recreational waters. The central and essential nature of the many park waterbodies highlights the imperative role park management plays in surface water quality across the entire county.

Figure 2.22: Fold-Out-Map, Surface Waters (Right).

SURFACE WATERS



Artificial Lakes

Surface Water

County Owned Public Space

Watershed Boundaries

Map Created by: CUES, Rutgers University
For: Mercer County Park Commission
Date: August, 2021
Source: New Jersey Department of Environmental Protection

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Wetlands

The legal definition of wetlands are "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." [40] Wetlands allow for the continuance of countless invaluable ecosystem services, yet are very sensitive to adjacent land influences that can harm their functioning or destroy them. Thus, wetlands and adjacent areas have specific protections placed on them through the Clean Water Act and state level protections through the NJDEP Freshwater Wetland Protections Act. [41, 42] Therefore, their spatial distribution throughout the County and park facilities is a key factor in determining management plans, regimes, and prioritizing landscape-scale projects.

The Wetland Type Map displays six different categories of wetland (terrestrial wetlands and waterbodies designated as wetland) within the Mercer County landscape. Even though wetlands are all protected under the same laws, their management regimes and conservation priorities may differ according to wetland type.

The most prevalent wetland type throughout Mercer County and the park facilities is freshwater forested/shrub wetland, which are dominated by woody plants (trees and shrubs). This wetland type encompasses freshwater swamps and floodplain forests that provide vital ecosystem services to the county. Examples of such services include flood risk protection, soil water infiltration, water retention and storage, carbon storage, filtration of pollutants that cause eutrophication in adjacent waterbodies, and valuable habitat provision for biodiverse assemblages of flora and fauna.[43] The southern portion or Coastal Plain of Mercer County contains the highest concentrations of freshwater forested/shrub wetland. Localized areas that lack freshwater forested/shrub wetlands are at greater risk of flooding, drought, eutrophication, and loss of biodiversity.

The scattered distribution of freshwater emergent wetlands is primarily associated with several tributaries of primary rivers such as the Stony Brook in Mercer Meadows that flows into the Millstone River as well as to the Assunpink Creek that flows through Mercer County Park and Miry Run that flow into the Delaware river. The largest concentration of freshwater emergent wetlands is seen in the John A. Roebling Memorial Park area and the Hamilton Marsh/Abbott Marshlands (not County owned). Freshwater emergent wetlands, also known as freshwater marshes, are dominated by herbaceous (non-woody) vegetation which provide high value habitat for wildlife including marsh-dependent endangered species such as breeding populations of the pied-billed grebe.[44, 45] In addition, freshwater emergent wetlands provide stormwater buffering between the built environment and water bodies, which help to reduce flooding impacts and eutrophication.

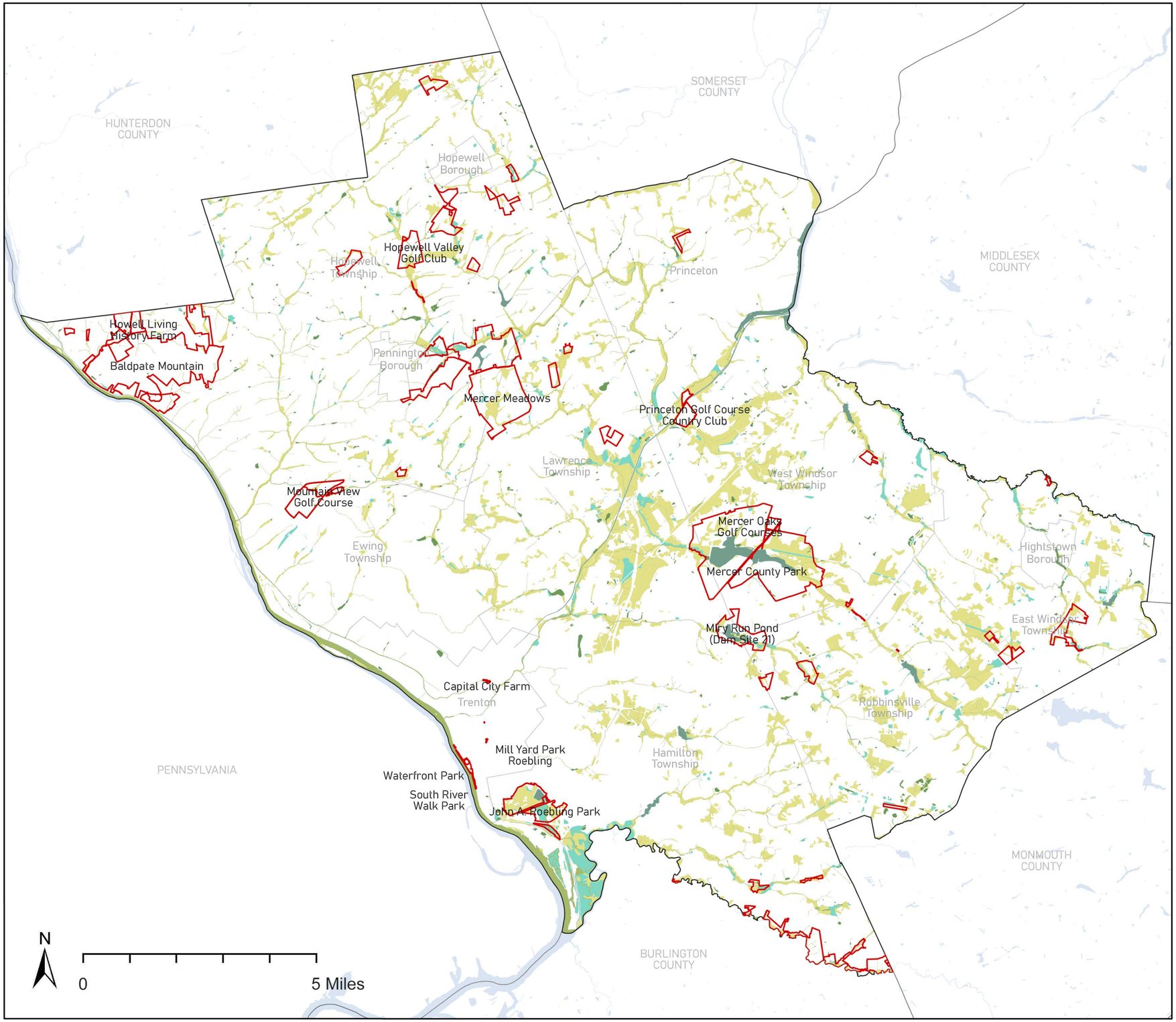
The categories of wetland waterbodies represented in this map include, freshwater pond, lake, and riverine. Riverine is the classification for the Delaware River. Freshwater ponds are much smaller and shallower than lakes are the dominant waterbody in Mercer County Parks. Lakes are valuable habitats for aquatic and terrestrial wildlife, are superb recreational areas for local communities, and they provide functional benefits such as water storage (Surface Waters Map).

Wetland type distribution and coverage across the County landscape demonstrates which areas provide invaluable water management ecosystem services as well as locations in need of mitigation to reduce negative impacts of flooding and storm water, habitat loss, and eutrophication.

Figure 2.X: Sensitive Ferns at Mercer County Park.

Figure 2.23: Fold-Out-Map, Wetlands (Right).

WETLANDS



Wetland Type

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

- County Owned Open Space

Map Created by: CUES, Rutgers University
For: Mercer County Park Commission
Date: August, 2021
Source: New Jersey Department of Environmental Protection

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Wildlife Habitats of Concern

The Wildlife Habitats of Concern Map is comprised of two datasets that are drawn from field verified and remote data of native wildlife movement and habitat utilization. The ranked habitat parcels dataset of threatened and endangered wildlife species, was derived from the Division of Fish and Wildlife's Connecting Habitats Across New Jersey (CHANJ) research program. [46] The rankings range from 1 to 5 according to the level of protection assigned to wildlife species that utilize each parcel. The second dataset of vernal pool locations and surrounding habitats was sourced from NJDEP and Rutgers University Center for Remote Sensing and Spatial Analysis (CRSSA).[47, 48] A vernal pool habitat is described in accordance with the Freshwater Wetlands Protection Act (N.J.A.C. 7:7A-1.4), as a habitat that includes a vernal pool plus any freshwater wetlands adjacent to the vernal pool. The vernal locations have a 300 ft buffer to estimate habitat protection extent.

More than half of the county provides either specific habitat requirements or valuable habitat for species of concern. Most main river courses and several larger waterbodies throughout the County provide habitat for state endangered and federally listed species (ranks 4 and 5). For example, the endangered short-nose sturgeon utilizes aquatic habitat in the Delaware River. The highest concentration of federally listed, rank 5 wildlife habitats in the northeast of the county which is predominantly due to habitat for the Northern myotis. Also known as the Northern long-eared bat, this species has suffered from severe (98%) decline of their populations due to habitat loss and white-nose syndrome.[49] They require dense forest habitat for adequate roosting and foraging, which is an issue as this area contains a mix of land uses including forest, wetland, urban, and agriculture cover, and some of which is protected land (see Open Space Map). This northeast rank 5 area is in greatest threat of species disturbance since it is predominantly not protected and on the fringe of urban land use. Therefore, there is a palpable risk of extirpation for the Northern long-eared bat within Mercer County. When prioritized, the higher-ranking areas require more immediate attention and greater protection from habitat destruction or degradation. Yet, in general, all the delineated habitats of concern require protection and prevention of land-use change to urbanization.

The southern portion of the County contains the greatest numbers and highest concentration of vernal pool habitat zones, which is likely due to the later timing of development and greater extent of preserved natural land, especially of forested swamps and fringing land of wetlands. However, much of the vernal pool habitat area is not within ranked habitat areas of concern, nor within protected land (see Open Space Map), but occur in urban land (see Land Use Land Cover Map). This distribution will contribute to further declines of species that utilize vernal pools if not properly conserved and protected.

According to the CHANJ data, the large regional parks provide species habitat requirements (rank 1) and valuable habitat for species of concern as well as threatened and endangered species (ranks 2, 3, and 4). Species such as the bald eagle, Cooper's hawk, and great blue heron actively utilize the waterbodies and riparian corridors of John A. Roebling Park, Dam Site 21-Miry Run Pond, Mercer County Park, and Mercer Meadows (see appendix table). Notably, the state endangered (rank 4) pied-billed grebe utilizes specific marsh habitat at John Roebling Park, which is the only recorded habitat for this endangered species in the entire county. The forested swamps of Miry Run Ponds and Mercer County Park are habitats for the Eastern box turtle and brown thrasher; both contain vernal pool habitat as well. The meadows of Mercer County Park, including the ROW, are breeding habitat for the threatened grasshopper sparrow. The complexes of forests and meadows of Mercer Meadows are habitat for the threatened long-eared owl, bobolink, American kestrel, and wood turtle, as well as the short-eared owl and Eastern meadowlark, both species of concern, and contain vernal pools.

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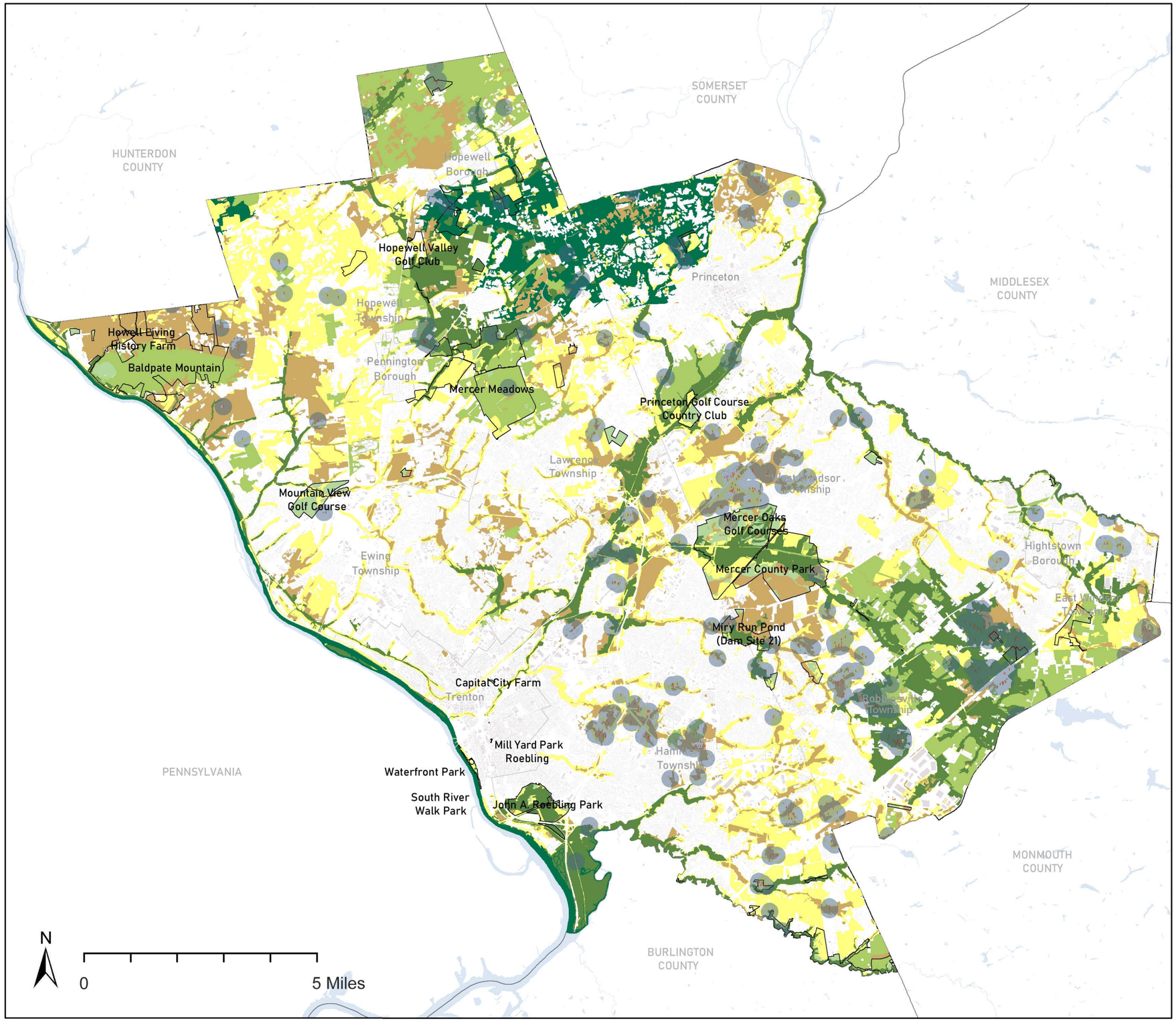
Figure 2.24: Fold-Out-Map, Wildlife Habitats of Concern (Right).

WILDLIFE HABITATS OF CONCERN



Endangered Habitat Rank

- Rank 1 - Habitat Specific Requirements
- Rank 2 - Special Concern
- Rank 3 - State Threatened
- Rank 4 - State Endangered
- Rank 5 - Federal Listed

Vernal Pool Habitat

- Vernal Pools & Buffer
- County Owned Open Space

Map Created by: CUES, Rutgers University
For: Mercer County Park Commission
Date: August, 2021
Source: New Jersey Department of Environmental Protection & The Division of Fish and Wildlife

At Baldpate Mountain, Area numerous species utilize habitat in the upland forests and meadows such as the endangered bald eagle, the threatened American kestrel, and the following species of concern: brown thrasher; Fowler's toad; Kentucky Warbler; and Northern copperhead. The Northern copperhead has den sites at Baldpate Mountain Area, which are the most southerly reaches of its habitat in the state. The New Jersey Endangered and Non-game Advisory Committee recommended that Northern Copperhead be changed to rank 3, state threatened status in 2016.[50] In addition to the species listed in the CHANJ data, the stewardship department of Mercer County Parks has recorded sightings of endangered bobcat (rank 4) at Baldpate.[51] Once these records are shared and processed by the NJDEP, areas of Baldpate Mountain Area will likely become rank 4 habitat.

Of the four county golf courses, Mercer Oaks and Hopewell Valley Golf Club encompass rank 4 habitat as they contain bald eagle nesting sites. Hopewell Valley Golf Club also contains habitat for the great blue heron in the Stony Brook as well as some fringing area of a large habitat tracts where bobcat sightings were recorded.

All the above highlights how protecting county parks and remaining open spaces, as well as ecologically restoring/mitigating adjacent urban lands are critical actions that support wildlife habitat. In many cases, lack of conservation actions or changes in land use can destroy habitat and lead to extirpation or local extinction. Therefore, is it truly vital to support conservation and restoration actions (especially those of the Stewardship Department) in Mercer County Parks and promote conservation steps throughout the County that can increase habitat conservation and connections.

Terrestrial Macrohabitats

Mercer County is divided in two physiographic regions, the piedmont to the north and the inner coastal plain to the south.[52] The key differences between the regions include diverging geological histories that influenced the differences in topography and soil type formation, which then lead to supporting different vegetation assemblages, forest types, and faunal associations.[53] In the high-quality conserved natural areas, the specific habitats, and species compositions are unique to each region which gives them local identity, naturally and culturally.

The macrohabitats dataset contains spatial distribution of each main terrestrial habitat based on vegetative character. The most prominent macrohabitats within Mercer County are central oak-pine forest, northern hardwood & conifer, coastal plain swamp, northern swamp, emergent marsh, with a concentration of tidal marsh and swamp cover by the Delaware River in the south of the County.

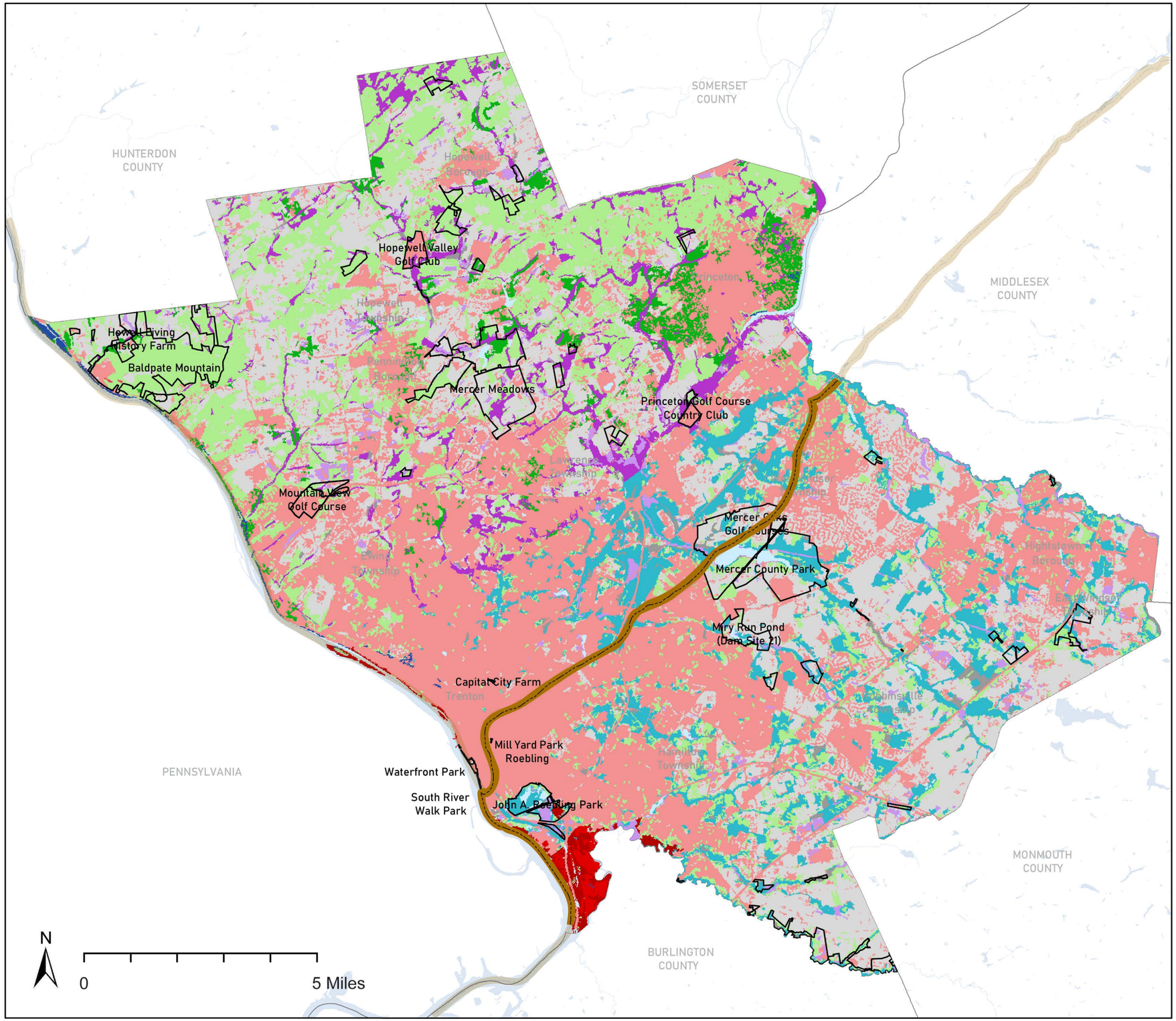
Of the two main upland forest types in Mercer County, the majority are central oak-pine forests, which are dominated by mixed upland oak species which support and host thousands of faunal species that are critical to local food webs.[54] By region, the central oak-pine vegetation differs slightly in composition; in the piedmont, they are called Northeast Interior Dry-Mesic Oak Forests and in addition to several oak species, the forest includes hickories, maples, and black and yellow birch.[55] In disturbed forests species like tuliptree and white ash are components. Examples of this forest type can be experienced throughout Baldpate Mountain Area where they even support populations of protected rare plants such as wild comfrey and slender toothwort (see appendix).[56] In the inner coastal plain, these forests are called Northern Atlantic Coastal Plain Hardwood Forests, again dominated by oaks, but also birch, sassafras, American holly, and pitch pine, as well as health shrubs in the ground layer.[57] This forest type can be found in upland areas of Mercer County Park. The northern hardwood & conifer forest type is scattered across the northern portion of the piedmont region, which is the southernmost occurrence of this forest type in New Jersey. This forest type is typically defined by dominant sugar maple, American beech, and yellow birch with included stands of eastern hemlock.[58] Yet in habitats near development or those that have been altered by agricultural practices, like in Mercer County, these forests contain more black cherry, tuliptree, and white pine. An example of this forest type can be found in select parts of Mercer Meadows east of Rosedale Lake.

Swamps are lowland forested habitats, dominated by trees, that are wetlands as they are permanently or intermittently saturated.[59] In the County there are three different swamp cover types northern swamp, coastal plain swamp, and tidal swamp. The northern swamp is associated with the northern hardwood & conifer forest as it's wetter counterpart; is also restricted to the piedmont and at its southern range limit in Mercer County. This northern swamp type contains red maple and black gum as dominant hardwoods, historically contained hemlock, and is often blanketed with ferns. Examples of this can be found along the Stony Brook in Mercer Meadows and Hopewell Valley Golf Club. The coastal plain swamp occurs only in the southern region and is mainly distributed in floodplains. It is dominated by red maple, sweet gum, and black gum trees as well as lowland oak species with dense understories of ferns, greenbrier, and wetland shrubs like sweet pepperbush.[60, 61] Much of the Mercer County Parks forests are coastal plain swamps and even support a documented population of an endangered plant, death-camus (see appendix).[62] The tidal swamp are forested areas associated with adjacent tidal marshes; they are restricted to the wetlands in the southern and western edge of the county and represent the most northerly occurrence on the Delaware River. This type of tidal swamp, North Atlantic Coastal Plain Tidal Swamp is very similar to the coastal plain swamps in vegetative composition, but differ in that they are tidally influenced. An example of the swamp type can be found in the Watson Woods area of John A. Roebling Park.[63]

Continued on next page...

Figure 2.25: Fold-Out-Map, Terrestrial Macrohabitats and Physiographic Regions (Right).

TERRESTRIAL MACROHABITATS & PHYSIOGRAPHIC REGIONS



- Agricultural
- Central Hardwood Swamp
- Central Oak-Pine
- Cliff and Talus
- Coastal Plain Peatland
- Coastal Plain Swamp
- Emergent Marsh
- Large River Floodplain
- Northern Hardwood & Conifer
- Northern Swamp
- Tidal Marsh
- Tidal Swamp
- Developed Land
- Water
- Wet Meadow / Shrub Marsh
- County Owned Open Space
- Piedmont and Coastal Plain Border

Map Created by: CUES, Rutgers University
For: Mercer County Park Commission
Date: August, 2021
Source: New Jersey Department of Environmental Protection & The Nature Conservancy

Marshes are wetland areas dominated by herbaceous vegetation.[64] Mercer County contains two different types, tidal marsh and emergent marsh. The tidal marsh habitats are dominated by saltmarsh cordgrass (Spartina spp.) and experience differences in water levels through the day.[65] The tidal marshes are associated with the previously mentioned tidal swamp and also extend to its northerly limits along the Delaware River in Mercer County. The much more widely distributed emergent marshes in Mercer County are not tidally influenced, occur mainly along rivers and brooks, and are usually adjacent to swamps. Specially, the Mercer County emergent marsh habitat is classified as Laurentian-Acadian Freshwater Marsh, which are dominated by wetland obligate sedges, rushes, ferns as well as cattails and showy aquatic herbs like pickerelweed.[66] They can be found in streamside pockets in many of the County parks. Both the marsh habitats provide critical habitat for flora including many species of concern such as the estuary burr-marigold (appendix rare plant table).[67]

The collection of ecologically diverse habitats in Mercer County provides vital resources to all native flora and fauna, maintain the natural heritage of the landscape, and which translates into cultural heritage and heterogeneity between each community. In addition, the habitats provide and support invaluable ecosystem services to our local communities. Their presence, spatial distribution, and ecologically specific attributes inform where to focus conservation actions as well as open space preservation.[68] Furthermore, spatial patterns of the habitats identify key transitional zones adjacent to developed land where future mitigation and restoration can prevent negative impacts, such as pollution and invasive species spread, that cause ecological degradation. The terrestrial composition also helps define the ecological character making for unique visitor experiences across the County Park system.

Tree Canopy Cover

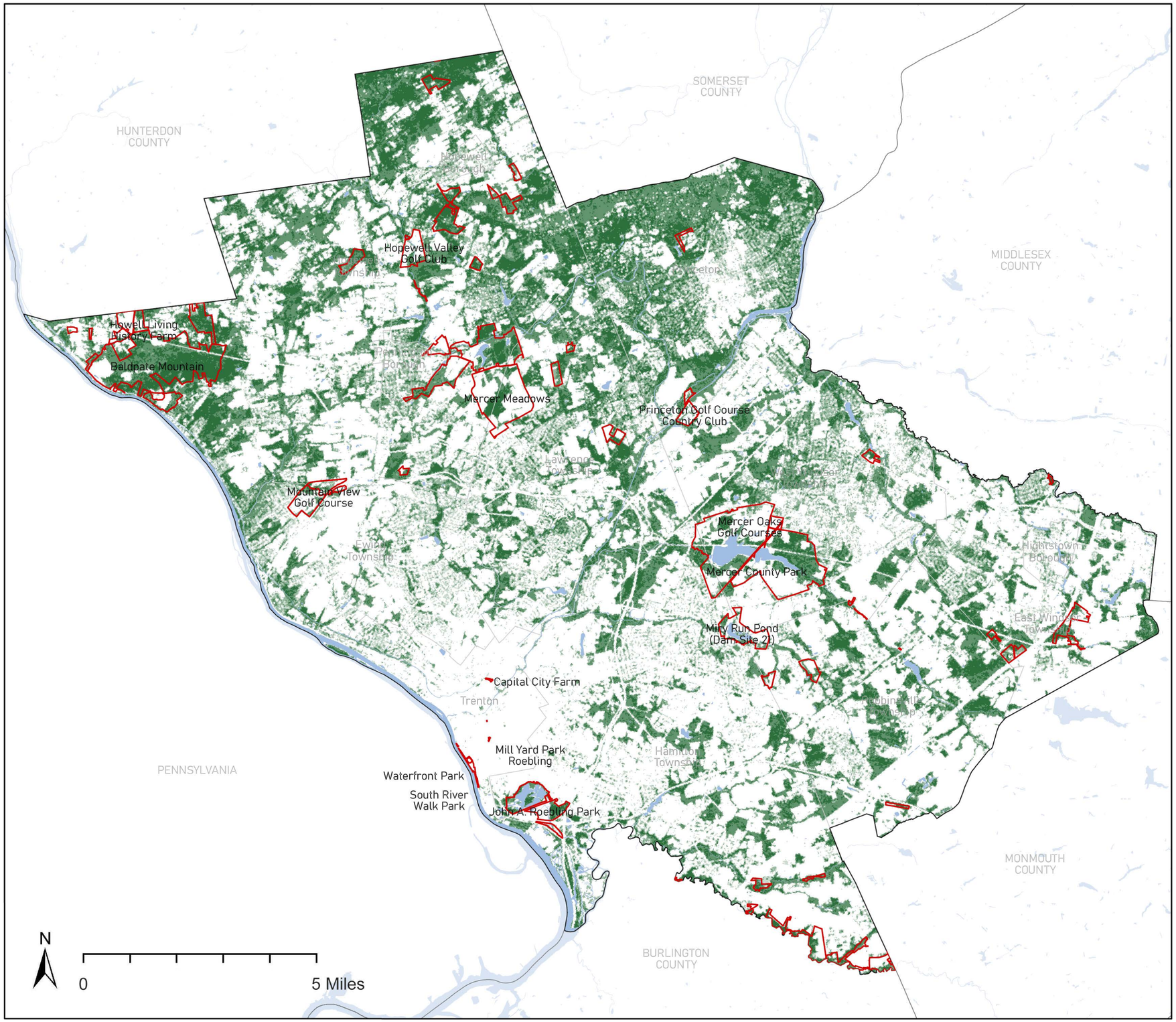
Tree canopy cover encompasses shade tree cover of the urban forest and natural canopy cover in forested tracts. The Tree Canopy Cover Map displays tree canopy density in percentile ranges of physical canopy coverage and their spatial distribution throughout Mercer County. Tree canopy cover is mapped from satellite imagery identifying percentage canopy cover from 0-100%.[67]

Mercer County's densest tree canopy cover exists in the contiguous forests of the Baldpate Mountain Area and in the foothills of the Sourland Mountains in northern parcels. Tree canopy cover is checkered throughout the central and southern region of the County and patterned around development, which also highlights canopy covered water courses. It is important to note that agricultural lands, meadows, and marshes usually lack tree cover, therefore, even though vegetated, they appear in the less than 24% canopy cover category on this map. Examples of this can be found in Mercer Meadows. In places that have many recreational fields, like Mercer County Park, display low canopy cover. These are areas that may be enhanced with increased shade tree cover if the cover does not interfere with the current active uses. Furthermore, this tree canopy cover data does not encompass tree losses from the recent July 2021 tornado that struck the Baldpate Mountain Area nor tree cover losses from Hurricane Ida.

The tree canopy cover spatial information enhances the efficacy of the forest land cover data while highlighting areas that lack dense canopy cover such as urbanized land that radiates from the City of Trenton. The lack of tree canopy cover in conjunction with urbanization and high impervious surface cover are early indicators of potential human and environmental risks such as urban heat island effect in disadvantaged areas which could lead to increased health hazards like heath stroke. Further analysis should be done with this information to establish the role Mercer County Park Commission plays in increasing shade tree cover within urban communities and initiatives that can be created to incorporate urban forestry efforts into city planning.

Figure 2.26: Fold-Out-Map, Tree Canopy Cover (Right).

TREE CANOPY COVER



Percentage Tree Canopy Cover

- Less than 24
- 25 - 44
- 45 - 64
- 65 - 82
- More than 83

- County Owned Open Space

Map Created by: CUES, Rutgers University
For: Mercer County Park Commission
Date: August, 2021
Source: New Jersey Department of Environmental Protection

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Open Space

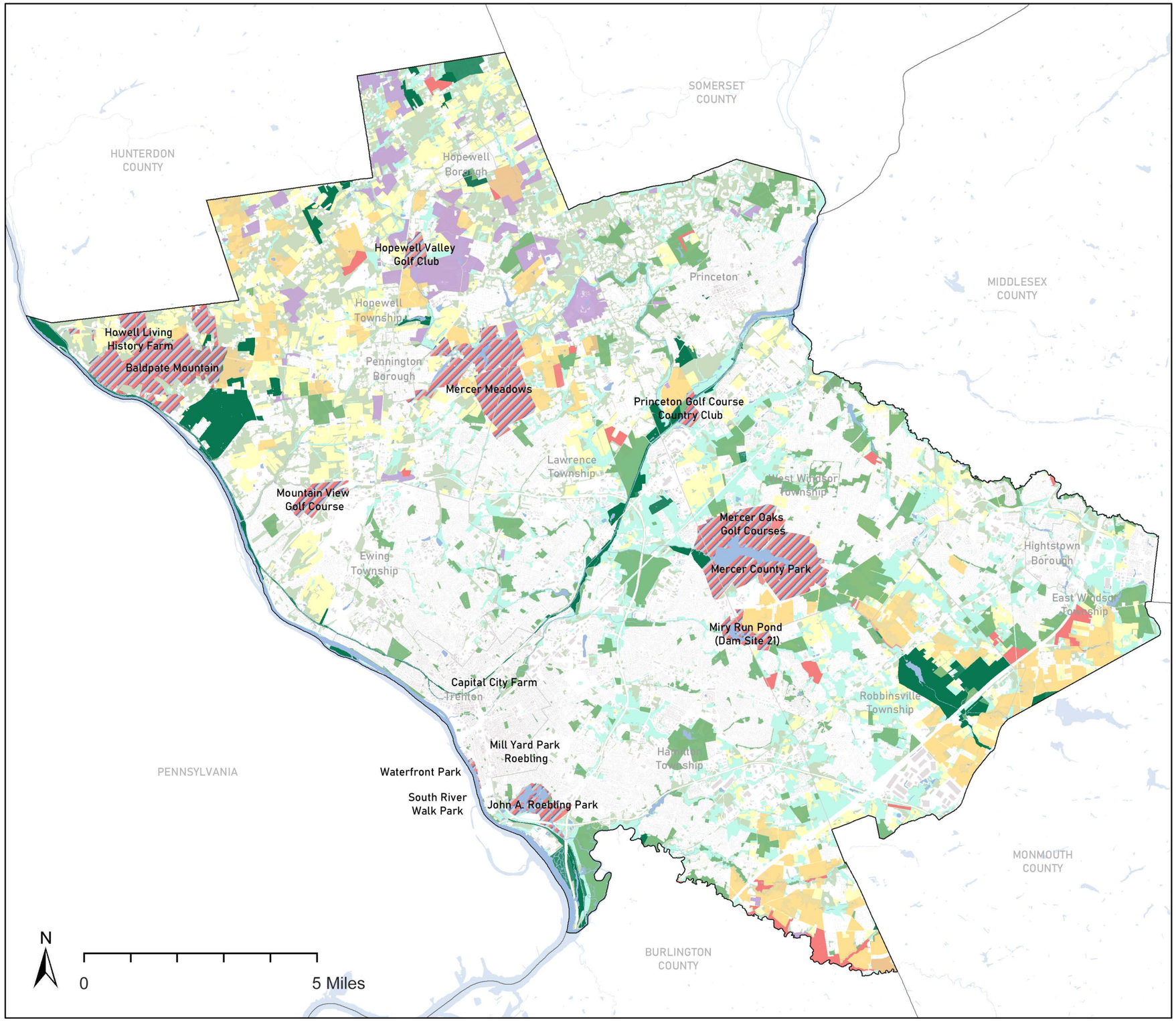
Protected open space ensures that recreational use and natural lands remain indefinitely. The New Jersey Department of Environmental Protection (NJDEP) through the Green Acres program aids communities in preserving open space for recreational use and natural habitat. In Mercer County, there are a plethora of protected open spaces that are managed by various entities including state, county, municipal, and nonprofit organizations. Preserved farmland is noted on the map. The Open Space Map displays which open spaces are managed by which entities and separates county managed park facilitates from county managed open space. This map also points out the natural lands in the County such as forest, wetland, and agriculture land cover which are not protected by Green Acres open space.

In the northern region of the County there is noticeable land cover of non-protected natural and agricultural lands. The northeast contains large parcels of unprotected forest land cover surrounded by urban development (Land Use Land Cover map), where the northwest and northern central regions of the County have a higher concentration of non-preserved farmland. The Coastal Plain, in the southern region of the County, has more wetland cover not within protected open space. Wetlands are themselves protected by NJDEP under the Freshwater Wetlands Act. The more concerning parcels in threat of future urbanization are non-protected forest and non-preserved farmland.

State managed open space plays a major role governing the County's recreational landscape. Duck Island in Hamilton Township, the Delaware and Raritan Canal State Park Trail running through the middle of the County, and Washington Crossing State Park are all critical components of the County's open space network and cultural identity. Municipally managed open spaces are scattered throughout the central region of the County. Their distributions are likely due to historic settlement patterns. On the other hand, nonprofit managed open space is almost exclusively in the northern region of the County (around Hopewell Borough and Hopewell Township) which is primarily due to dedicated efforts of the Friends of Hopewell Valley Open Space. Overall, Mercer County has a mostly even dispersal of protected open spaces except for the urban areas of Hightstown Borough and the City of Trenton.

Figure 2.27: Fold-Out-Map, Open Space (Right).

OPEN SPACE



Protected Open Space

- County (Park Facilities)
- State
- County (Open Space)
- Municipal
- Nonprofit
- Preserved Farmland

Natural Land Not Protected

- Agriculture
- Forest
- Wetlands

Map Created by: CUES, Rutgers University
For: Mercer County Park Commission
Date: September, 2021
Source: New Jersey Department of Environmental Protection & Mercer County Park Commission

Conclusion

Analysis of Mercer County's regional character has helped identify the important qualities that have shaped and are the result of Mercer County's vast history. Development patterns are seen to align with Mercer County's historic sites and districts which have a major influence on Mercer County's cultural landscape. Some of the most notable historic districts and parcels include but are not limited to Mercer County are the Delaware and Raritan Canal towpath, Washington Crossing State Park, Abbott Marshlands, and the Historic Pole District. These farmlands, battle grounds, and historic transportation routes characterize how the landscape is used today.

Not only has the history of Mercer County defined it recreational use, but it first heavily influenced its population distribution. The population is heavily distributed throughout the industrial epicenter which once occupied the City of Trenton. The rural areas of the north and south have a lower population density with larger swaths of forest and agricultural lands. It is not surprising that urban area houses a higher percentage of the low-income population. Spatial distribution of low-income populations is similar to the pop density map, but it shows greater populations of low-income families around the city of Trenton. The larger Regional Parks are closer to low-density and medium to high income populations, whereas smaller urban and linear parks serve more densely populated areas of Trenton, Princeton and the Windsors.

Land use and settlement patterns have historically aligned with the earth's natural resources. Mountainous regions show signs of early development and today provide pristine hiking/biking trails, and are a source for the County's mining. Whereas, the south is where many of the County's wetlands are located. Urban land cover is the most predominant land cover type across the County and the progression from 1986 to 2015 exemplifies how rapidly agricultural land use is converted to urban/suburban use. The County Parks are the large parcels which have protected natural lands throughout the urban areas of the County and the highest density of tree canopy cover. Baldpate has a high presence of forest cover, Mercer Meadows is predominantly agricultural cover, John A. Roebling Memorial Park is mainly wetland cover, and Mercer County Park is a mixture of wetland, forest and urban land cover. There are scattered unprotected forest and agricultural lands throughout the County.

The impervious surface web surrounding the Parks showcases the essential importance of open space and the need for careful planning to not incorporate excessive impervious surface cover into future park plans. It is important to limit any additional impervious surface cover in these parks due to their high wetland cover and infiltration rates that serve the surrounding communities. Mercer County Park, Mercer Meadows, and Dam Site 21-Miry Run Ponds contain waterbodies and wetland cover with surrounding higher ground water infiltration rate parcels. John A. Roebling Park, is mostly open water and wetlands, therefore, any enhancements within this park should limit impervious surfaces as well.

Protecting natural lands from future development not only aids in human wellbeing through recreational opportunities and ecosystem services, but is essential for local wildlife. The County Parks are vitally important for several wildlife species of concern and provide specific habitat resources. The county parks are home to the endangered bald eagle, bobcat, pied-billed grebe and many other species of concern; without the current and future stewardship efforts the parks would no longer persist and could become locally extinct or extirpated. Specific areas of rank 4 and 5 habitat are critical for protection in and around county park land.

Figure 2.28: Roebling Wetland.

Figure 2.29: Delaware River View from South River Walk Park.

The terrestrial land habitats are a product of the landscape pre-colonial settlement and natural lands that are left after rapid urbanization. The piedmont region of Mercer County contains important upland oak forest resources (like in Baldpate) for many wildlife species including the endangered bobcat as well as northern swamps along water courses (like in mercer meadows) that are high in biodiversity and encompass vernal habitat. The southern inner coastal plain area contains much coastal plain swamp habitat (like those in Mercer County Park and Roebling) that provide habitat for abundant species of flora and fauna. Emergent marshes include tidal and freshwater and large areas can be found in Roebling Park; they provide vital habitat for the endangered pied-billed grebe. The collection of ecologically diverse habitats in Mercer County provides vital resources to all native flora and fauna, maintains the natural heritage of the landscape, and which translates into cultural heritage and heterogeneity between each community.

Open space identifies the recreational character of Mercer County. It provides habitat for wildlife and flora, and gives people a place to experience the outdoors. Acquiring and protecting land is a necessary step in ensuring that the landscape is left intact and can serve the local communities. Creating connections between Mercer County's open spaces is a way to enhance accessibility to parks and tap into various resources to maintain various park lands.

Figure 2.30: Forest at Mercer Lake.

Figure 2.31: Agriculture at Baldpate.

Figure 2.32: Mercer Stables Recreation.

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[24] Race: 2020 Decennial Redistricting Data (PL 94-171); Table ID P1. United States Census Bureau, 2020.

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[31] FEMA's full definition of a flood: "A general and temporary condition of partial or complete inundation of 2 or more acres of normally dry land

area or of 2 or more properties (at least 1 of which is the policyholder's property) from: Overflow of inland or tidal waters; Unusual and rapid accumulation or runoff of surface waters from any source; or Mudflow; Collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclic."

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3. County Open Space Connections

Introduction

Quality open space is essential for human wellbeing and ecological habitat health. There is a plethora of open space throughout Mercer County, some linked to one another and others not. Providing connections through regional trail network extensions adds accessible green spaces to the County which are lower maintenance than full on park facilities. The existing regional trails of Mercer County traverse municipal boundaries and create pedestrian/bicyclist access to multiple park facilities across the County. Open space parcels managed by Mercer County are scattered throughout the county but are adjacent to open space parcels managed by other government entities such as state and municipal level management. As seen in the previous chapter (Chapter 2: Open Space Map), there are many potential connections through mixed-management type open space properties.

The objective of this chapter is to discuss the role of that County owned and managed open space plays in the overall park system and potential opportunities to forge connections between open space parcels. Creating connections between park facilities and existing open space will enhance the park users experience and ultimately increase open space access throughout the County. This chapter will outline existing regional trails, recommend connection opportunities in need of further analysis, and discuss future park plans which will grow the Mercer County Park network. Non-profit organizations which have a strong impact on Mercer County Parks and landscape management will be discussed to identify existing efforts and potential partnerships to secure resources.

Figure 3.1: Rednor Area at John A. Roebling Memorial Park

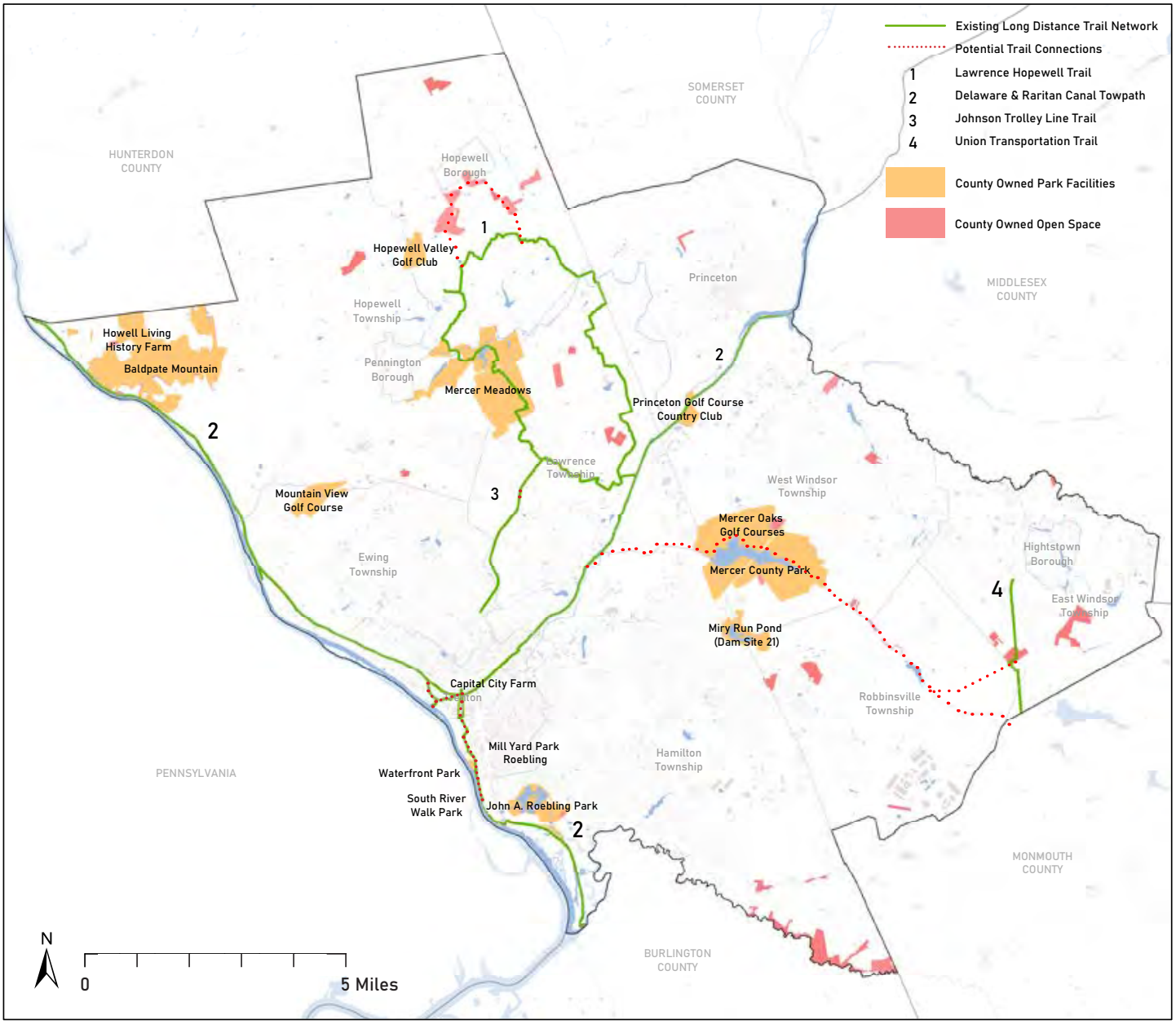


Figure 3.2: County Open Space and Regional Trails Map.

3.1 Existing Regional Trail Networks

Regional trails supply hiking and bicycle trail networks across municipal and county borders. They emulate the County's cultural character by subtly transcribing the landscapes history to the trail user. Not only do the regional trails provide recreational linkages, but their buffers are potentially valuable habitat corridors for wildlife. Expanding on this network and closing gaps has the likelihood to increase overall ecological health as well as forge expanded pedestrian accessibility.

The expansion of trail networks could link County Park facilities and County open space to increase passive recreational opportunities while limiting the need for extensive maintenance throughout open space parcels. Due to the expansive and varied open space throughout Mercer County, an essential relationship to garner would be the connection of mixed management type open space through one cohesive trail. This report will highlight where additional research and which existing resources can enhance the present county network. A recommended next step includes further analysis into land acquisition throughout the urban center of Mercer County to increase access to open space for high-density and low-income populations.

Four major regional trails currently connect Mercer County's landscapes. These trails include Delaware and Raritan Canal State Park Towpath, Lawrence Hopewell Trail, Old Union Transportation Trail, and Johnson Trolley Line Trail. Each trail offers a unique user experience and caters to different regions of the County (Figure 3.2). These trails are managed by various entities but provide cohesion for pedestrians and bicyclists across the county.

The regional trail networks have been mapped through desktop inventory and analysis with available online data. The main sources used to create this map and analyze connections were the Delaware Valley Regional Planning Commission: Greater Philadelphia Multi-Use Trail Network (The Circuit) dataset and Greater Mercer Trails Plan (GMT) online interactive map (existing trails).[1, 2] The GMT plan data was cross referenced with Google Maps and Imagery to establish if connections truly existed. These trails were not ground-truthed by the CUES team nor was a feasibility analysis conducted for any potential connection suggestions.

The Delaware and Raritan Canal Towpath

The Delaware and Raritan Canal Towpath is owned and managed by the State of New Jersey. The trail navigates through Middlesex, Mercer, Burlington, and Hunterdon counties. The path begins in New Brunswick, Middlesex County; crosses into Somerset County; passes through Trenton in Mercer County, ending in Milford, Hunterdon County. The path connects Middlesex and Mercer counties at the Millstone River (near Carnegie Lake in Princeton) cutting east to west to the Delaware River. The path travels along municipal, county, and state-owned open space parcels.

The D&R Canal Towpath splits in Trenton (west) and travels the length of the Delaware River (north) into Hunterdon County. South of the Trenton D&R Canal Towpath trail split, there are fragmented path connections throughout Trenton. The trail officially begins again at the intersection of Canal Road and Lamberton Road continuing into Burlington County. Fragments of the trail meet near the Waterfront and South River Walk Park facilities, and John A. Roebling Memorial Park. Although the D&R Canal Towpath is fragmented throughout Trenton, it still provides an excellent open space opportunity for Trenton residents directly linking people to the Delaware River. Forging safe pedestrian connections between the fragmented trail links in Trenton will provide more access for locals to naturalized areas such as John A. Roebling Memorial Park, Duck Island, and the associated surrounding Abbott Marshlands.

The Open Space map (Figure 3.2) reveals potential for the D&R Canal Towpath trail to branch off creating additional regional trails catering to various regions of the County. For example, even though there is not an official trail connection to Mercer County Park from the D&R Canal Towpath, the Assunpink Creek connects with Mercer Lake providing an ideal regional trail. An in-depth analysis is required to assess the feasibility to add a regional trail connection from the D&R Canal towpath along the Assunpink Creek to Mercer County Park, continuing to traverse the state, county and municipal open space parcels all the way to the Monmouth County border (southeast). This feasibility study would decipher where safe paths can be incorporated into existing underpasses for pedestrian navigation of Route 295—such as Lawrence Station Road in Lawrence Township. The Greater Mercer Trails Plan (discussed in the next section) begins to outline these potential path connections.

Lawrence Hopewell Trail

The Lawrence Hopewell Trail (LHT) (~22 miles) is a large 16-segment loop which connects Lawrence Township, Hopewell Township, Pennington Borough, and the edge of Princeton.[4] This trail network caters to the rural and suburban north portion of the county and cuts through the center of Mercer Meadows linking with small "connector trails" throughout the park facility. There are additional connector trails in Princeton and Ewing. The LHT is a strong network catering to the northern portion of the County; forging additional connections to "connector trails" throughout the surrounding municipalities will help increase the overall connection to park facilities for the community. A potential connection would be through in the northern portion of the LHT loop west of Hopewell Valley Golf Club. There is a cluster of County owned open space parcels and non-profit managed open space parcels which could connect to the LHT (further study is required).

Johnson Trolley Line Trail

The Johnson Trolley Line Trail is a 1.9-mile trail that is divided into two sections by Interstate 95.[5] The two segments are disconnected from one another. The northern portion of the trail connects to the Lawrence Hopewell Trail, while the southern portion travels through Loveless Nature Preserve, Lawrence Township (Municipal management) and Rider University property. The trail ends at the corner of 5th Street and Irven Street in Trenton. Through Google Imagery, it is apparent that there is no trail marker to signify public access in Trenton; instead, there is a commercial property and unkempt path. It is to be noted that the trail heads connecting Lawrence Township to the LHT in the Lawrenceville area are clear and marked, completely opposite to the southern segment's urban entrance.

Maintaining a clear trail entrance and adding a trail marker is a great way to connect residents to this slice of historic open space less than a mile from the Loveless Nature Preserve. A more substantial intervention would be to implement a pedestrian bridge over Interstate 95 to connect the fragmented trail network. The Middlesex Greenway pedestrian bridge over Route 1 in Edison Township provides an example for a safe pedestrian path connecting trail segments over a major roadway. However, a short-term goal is to provide safe, cleared, and marked entry points to the existing segments.

Union Transportation Trail

The Union Transportation Trail is a historic trail which was once a rail line right-of-way connecting Pemberton, Burlington County with Hightstown, Mercer County to transport dairy products.[6] The rail line closed due to low traffic and in 2010 became a trail. Today, the Union Transportation Trail is a 9-mile regional trail that crosses the Monmouth and Mercer County borders. The Union Transportation Trail cuts through County owned open space in East Windsor Township and various municipally owned open spaces.

Extensions of the Union Transportation trail have the potential to create a greenway network (through existing open space) in East Windsor Township. The transmission right-of-way is an ideal starting point for analysis.

An additional avenue to discover potential open space connections through regional trails is looking into stream corridors. Navigating the tributaries of the Millstone and Delaware Rivers throughout the County will help outline potential regional trails since the waterways already traverse the parks and various owned open space parcels.

Figure 3.3: Lawrence Hopewell Trail Sign at Mercer Meadows.

3.2 Local Non-Profit Organizations

There are numerous non-profit organizations working to enhance the regional trail networks and the quality of open space throughout Mercer County. Various "Friends" stewardship groups cater to specific areas across the County. These various Friends groups aid in securing funding and management of open space. Friends of Abbott Marshlands, Friends of Hopewell Valley Open Space (FoHVOS), Friends of Princeton Open Space, Friends of Lawrence Greenway, and Friends of West Windsor Open Space are just several the non-profit organizations working to enhance and protect Mercer County's open space.

These non-profit organizations are land stewards to the local ecology and enhance the overall recreational experience for open space users. Friends of Hopewell Valley Open Space, Friends of Princeton Open Space, Friends of Lawrence Greenway, and Friends of West Windsor Open Space are all non-profit organizations that cater to the best land management practices, in specific areas, within the northern portion of the county.[7] These non-profits aim to continue preserving and conserving natural areas. They work by finding avenues to assist local governments in land acquisition efforts while they perform land management. Non-profit organizations offer educational opportunities for the surrounding communities and overall continue to monitor and maintain passive recreational spaces. Non-profit organizations reduce the need for County land management due funding sources beyond taxpayer moneys, and the inclusion of volunteerism. Working with NGO's will only add to the County's resources for land management strategies as has been seen already.

A unique non-profit organization working to enhance access to Mercer County open space is the Greater Mercer Transportation Management Association (GMTMA).[8] This NGO is a prominent leader in creating an interconnected bike and pedestrian system throughout Mercer County. The Greater Mercer Transportation Management Association (GMTMA) developed a study titled the Greater Mercer Trails Plan. This plan consists of a comprehensive county-wide analysis to determine accessible locations for bike and pedestrian trails throughout the greater Mercer area. The Greater Mercer Trails Plan lists numerous existing and proposed long distance (regional) bike and pedestrian trails throughout the County. Forging a partnership with the GMTMA creates an opportunity for combining county and non-profit resources to better prioritize County level trail implementations. The GMTMA has done a great deal of research to create trail connections, but county resources could enhance the efficacy and accuracy of this effort.

The Middlesex Greenway is an ideal example of a non-profit organization working to enhance County open space. The Edison Greenways Group was an instrumental leader in the acquisition of the abandoned Lehigh Valley Rail corridor which is today the Middlesex Greenway.[9] The Edison Greenway Group has worked with Edison to acquire over 900 acres of land in Edison. They are also heavily involved in bicycle and pedestrian planning throughout Middlesex County.[10]

Non-profit organizations are a great way to manage additional open space acquisitions. It is essential for the overall health of Mercer County's ecological habitat and human wellbeing that Mercer County Park Commission continues to acquire open space parcels. Although the parcels may not be planned for park facilities or even hands on land management, acquisition makes a large impact in reducing the threat of future development. Non-profit organizations are an essential entity to continue acquiring land throughout the county. Non-profit organizations provide additional resources for land acquisition, secure funding, and can provide future management where County resources may be limited.

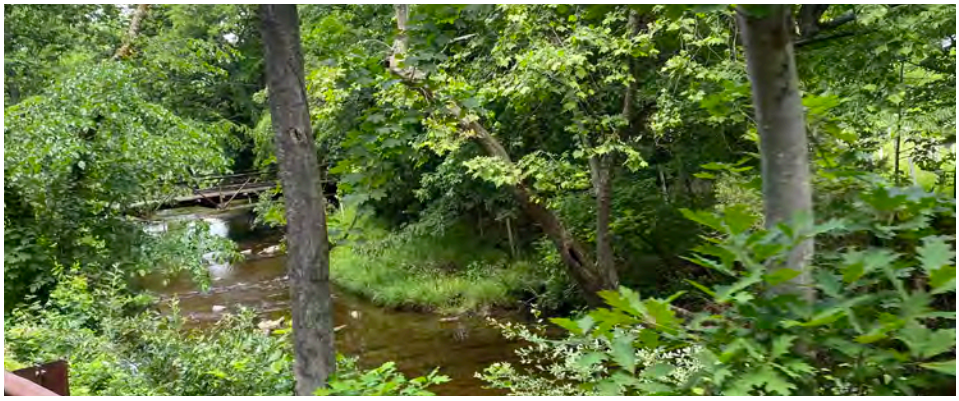


Figure 3.4: Baldpate Mountain Area.

3.3 Current Park Plans

There are three recently County acquired properties that are currently under or have undergone preparation to be added to the Mercer County Park Commission's network of park facilities. Two parcels, Dam Site 21-Miry Run Ponds and Moores Station Quarry have already undergone the planning and public outreach process. These properties have full plan proposals which are available on the Mercer County Park website. Capital City Farm is a community farm which is already accessible for Trenton residents, it is owned by Trenton but is managed by Mercer County Park Commission. These three parks will enhance the overall recreational experience in Mercer County by adding to the regional parks network and enhancing access for the community.

Dam Site 21-Miry Run Ponds

Dam Site 21-Miry Run Ponds (originally Dam Site 21) is located between the three towns of Hamilton, Robbinsville, and West Windsor. The property was first acquired by Mercer County in 1978. In 2017, Mercer County acquired 4.3 additional acres on Hughes Drive encompassing a total of 279-acres.[11] The newly acquired Dam Site 21 property combined with the existing parcels are proposed to be renamed "Miry Run Ponds" as one of the newest Mercer County Park facilities.

An ecological assessment and award-winning design proposal were completed by Princeton Hydro LLC. and Simone Collins Landscape Architecture and approved in 2020. The design proposal showcases passive recreational activities such as trails and lake access centered around environmental education and ecological restoration. The total park will encompass the 279 acres (including the Hughes Drive acquisition), with over half of the park planned to be created or protected habitats. The proposal includes 34 acres of reforestation, 64 acres of new meadows, 19 acres of vernal pools, and 7.9 miles of walking trails.[12] Site disturbances such as trails, parking, playgrounds, driveways are limited to a total of 17 acres of parkland – comprising 7.4% of the total site. New plans for Miry Run Ponds are designed with limited parking throughout the park and no proposed parking near residential areas to assure that resident concerns about additional noise are tended to.

The proposed Miry Run Ponds Park facility adds ecological biodiversity and enhances the local ecosystem of the surrounding community, while offering new opportunities for recreation. The Park will be separated into 6 different areas: (1) Core Activities area, (2) Old Trenton Road Site Access, (3) Vernal Pool Management & Interpretation Area, (4) Flock Road Forest Area, (5) Line Rd Meadow & Marsh Area, (6) Site Stewardship Area. The proposed park facility has the potential to offer a similar character to John A. Roebling Memorial Park or Mercer Meadows where passive recreation is centered around water, ecological restoration, and education opportunities.

Figure 3.5: Dam Site 21.

Moores Station Quarry

The Moores Station Quarry was acquired by Mercer County in 1998 and is located at the intersection of Route 29 and Pleasant Valley Road in Hopewell Township. The quarry is located at the base of Baldpate Mountain Area, adjacent to the Delaware and Raritan Canal State Park Towpath, Ted Stiles Preserve, and Washington Crossing State Park. The quarry landscape is comprised of approximately 166 acres operated by Trap Rock Industries, Inc. The quarry is currently active deriving materials such as diabase trap rock, a primary construction material.

The 1978 Reclamation Plan with the 1997 update states that Mercer County will assume management of the quarry property in 2023. The Moores Station Quarry Park Planning process is currently taking place. The plan development has relied on public outreach to create a master plan for a park with multiple ecological and recreational goals. Three preliminary concepts were presented that cater to different park uses. One centers on passive recreation, one which is water centric, and the third is geared towards active recreation or adventure sports. [13]

The initial quarry property assessment and analysis exemplified the need to identify preservation areas, establish buffers along hiking trails and recreational areas, site rehabilitation, creating facilities and activities that suit the area, and on-site access for public and emergency vehicles. [14] The Draft Master Plan showcases seven different areas proposed for the future park:(1) River Road Entrance, (2) The Primary Overlook, (3) The Stone Yard, (4) Western Ledge, (5) Lower Pond, (6) Northern Meadow, (7) Baldpate Mountain Area Connections. Only 11% of the total site will remain as built or recreational amenities, while the other 89% will be planted as meadow or undergo reforestation efforts. New ponds are proposed throughout the central portion of the park which will aid in stormwater management for the surrounding area, increase aquatic ecological habitat, and enhance the user experience by adding water access in the Baldpate area.[15]

Capital City Farm

Capital City Farm is a two-acre farm located in the city of Trenton. The farm was acquired in 2014 by the City of Trenton with funding from Mercer County Open Space. The City of Trenton owns the farm, but Mercer County Park Commission provides staff and management.[16] Volunteers help grow a variety of seasonal fruit, flowers, and vegetables to distribute throughout the Trenton community. The farm grows culturally relevant produce for the diverse local community.

Capital City Farm is adjacent to the Trenton Area Soup Kitchen (TASK).[17] Produce is typically donated to TASK for distribution throughout the community. A design firm, Designing the WE, is working with the farm to foster and build the relationship between the farm and residents, organizations, and businesses within the community.[18]

Capital City Farm is a unique program and open space parcel within the Mercer County Parks network. Not only does it offer green space to the underserved community, but it offers a place for people to connect with the food they eat. Capital City Farm is an example of governmental agencies working for their community and meeting the unique needs of individual areas. There is an opportunity for additional urban farms to occupy the inner-city landscape. The residents of Mercer County would benefit in a multitude of ways if additional small farms with similar programming were incorporated into the park network across the county. There is significant potential for open space connections and enhancements throughout Mercer County. Regional trails provide accessible open space and connections between County owned park facilities and other non-county owned parks. Regional trails also have the potential to pass through open space parcels that are not particularly managed as park facilities but can cater to the public meeting Green Acres requirements to provide quality open space for the public. Forging partnerships and allowing non-profit organizations to spearhead land management will help enhance County owned open space and will lead to the continuation of open space acquisition when resources may be limited. There are numerous examples of non-profit organizations aiding in the creation of County owned open space and even park facilities throughout New Jersey. Taking a deeper look into open space and park facilities will help identify where the County should prioritize their resources. In the next chapter we take an even deeper look at County Park Facilities through onsite inventory of the existing site conditions for each park facility followed by specific recommendations per park.

Conclusion

There is significant potential for open space connections and enhancements throughout Mercer County. Regional trails provide accessible open space and connections between County owned park facilities and other non-county owned parks. Regional trails also have the potential to pass through open space parcels that are not particularly managed as park facilities but can cater to the public meeting Green Acres requirements to provide quality open space for the public. Forging partnerships and allowing non-profit organizations to spearhead land management will help enhance County owned open space and will lead to the continuation of open space acquisition when resources may be limited. There are numerous examples of non-profit organizations aiding in the creation of County owned open space and even park facilities throughout New Jersey. Taking a deeper look into open space and park facilities will help identify where the County should prioritize their resources. In the next chapter we take an even deeper look at County Park Facilities through onsite inventory of the existing site conditions for each park facility followed by specific recommendations per park.

End Notes

[1] "Greater Philadelphia Multi-Use Trail Network (the Circuit)," NJGIN Open Data (Delaware Valley Regional Planning Commission, July 2021).

[2] "Greater Mercer Trails Plan," Arcgis web application (Greater Mercer Transportation Management Association, 2021).

[3] Ibid.

[4] "Home," Lawrence Hopewell Trail, September 25, 2021, https://lhtrail.org/.

[5] "Johnson Trolley Line," Circuit, November 28, 2016.

[6] County of Monmouth, "Monmouth County Park System," Monmouth County Park System Parks Union Transportation Trail, accessed September 29, 2021.

[7] "Open Space," Mercer County Sustainability Coalition, March 2, 2016.

[8] Greater Mercer TMA, "About the Association: GMTMA," Greater Mercer TMA (Greater Mercer TMA, July 24, 2019).

[9] "Middlesex Greenway," Middlesex County, accessed September 28, 2021.

[10] "Edison Greenways Group: Who We Are," Edison greenways group (Edison greenways group), accessed September 28, 2021.

[11] https://mercercountyparks.org/assets/DS21-FAQs-final.pdf

[12] "Miry Run PONDS Master Plan Wins 2021 Landscape Architectural Chapter Award," PRINCETON HYDRO, April 19, 2021.

[13] Moores Station Quarry Park Draft Report, June 2021.

[14] Ibid.

[15] "A New Partnership for Capital City Farm," MidJersey.News, August 3, 2021, https://midjersey.news/2021/08/03/a-new-partnership-for-capital-city-farm/.

[16] "Capital City Farm," D&R Greenway, accessed October 2, 2021.

[17] "Capital City Farm," designing the WE, accessed October 2, 2021.
** The land preservation organization dedicated to preserving and caring for the land and inspiring conservation ethics.

[18] Ibid.

4. Park Facility Inventory and Analysis

Introduction

Each Park Facility in the Mercer County Park network was inventoried on-site with associated analysis to identify opportunities for enhancements specific to each park facility. The County Park Facilities are categorized by Regional Passive and Active Recreational Parks, Golf Courses, and Urban Parks.

Figure 4.1: Howell Living History Farm Stables.

Figure 4.2: Pond at Mercer Oaks Golf Course.

4.1 Park Categories

Introduction

The Mercer County Park Facilities inventory has been organized by park categories. In total, there are 12 park facilities which were inventoried on-site (Table X).

Golf Course

Golf Courses are county owned golf facilities that are available to the public. The golf courses encompass their own properties or are in association with the Regional Parks. The central feature is a golf course, but may include a club house or space for other activities.

Urban

Urban Parks tend to be smaller in scale and cater to a higher density population within Mercer County's city areas. The Urban Parks of Mercer County sit adjacent to highly impervious areas and typically contain higher impervious surface cover than their suburban counter-parts.

Figure 4.3: Active Regional, Mercer County Park.

Figure 4.4: Golf Course, Mercer Oaks East.

Figure 4.5: Urban Park, South River Walk Park.

Regional

We define regional parks as park facilities that offer an array of activities. Regional parks are large in size and traverse municipality boundaries catering to multiple communities. Regional parks have been divided further into Passive and Active Recreation Regional Parks. Passive Regional Parks offer mainly leisure activities such as hiking and bicycle trails, playgrounds, open fields, and nature preserves. Active Regional Parks offer the same variety of activities as Passive Recreation Regional Parks with the addition of sports fields and areas for programmed activities such as baseball, soccer, cricket and more.

Figure 4.6: Passive Regional. John A. Roebling Memorial Park.

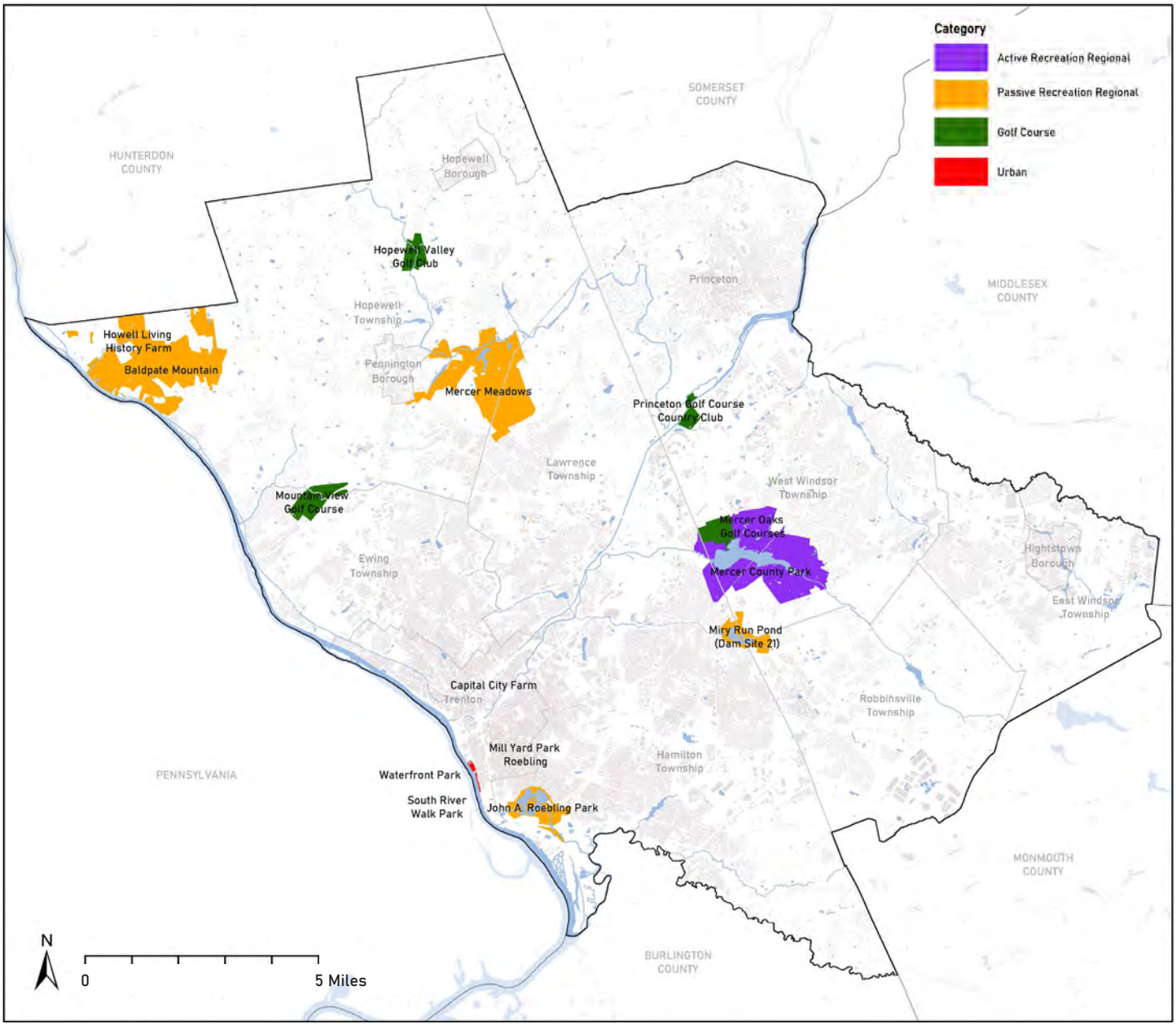


Figure 4.7: Park Facilities by Category Map.

Park Facility	Park Category
Baldpate Mountain Area	Passive Recreation Regional
Mercer Meadows	Passive Recreation Regional
John A. Roebling Memorial Park	Passive Recreation Regional
Dam Site 21- Miry Run Ponds	Passive Recreation Regional
Mercer County Park	Active Recreation Regional
Mercer Oaks East and West	Golf Course
Hopewell Valley Golf Club	Golf Course
Princeton Country Club	Golf Course
Mountain View Golf Course	Golf Course
Millyard Roebling Park	Urban
Waterfront Park	Urban
South River Walk Park	Urban

Table 4.1: Park Facilities by Category as the Parks Appear in the Inventory Chapter.

4.2 Inventory and Analysis by Park Facility

Total Quick Facts

The following is a list of counts and calculations, based on the research conducted in the inventory phase of this project. While all numbers represent what was found either at the parks, aerial imagery, or NJDEP Land Use Land Cover data, they are subject to errors of omission or approximation.

The totals only include the park facility properties considered in this inventory and the physical amenities that our team counted on-site.

7379 Acres of Land

2877 Acres of Forest

984 Acres of Agriculture/ Meadow

100 Acres of Barren Land

1569 Acres of Wetland

480 Acres of Water

1384 Acres of Urban Land

23 Acres of Impervious Surface

13 Miles of Roads

50 Sports Fields

17 Playgrounds

3571 Parking Spaces

220 Picnic Tables

5 Pavilions

240 Benches

12 Boat Docks/ Storages

26 Comfort Stations

4 Dog Parks

Legends

Land Type and Ecolgical Points

- Field / Meadow
- Barren Land
- Forest
- Developed / Lawn Cover
- Riparian Edge
- Water
- Wetlands
- Sports Fields
- Restoration Zones County
- Shade Tree Point
- Shade Tree Canopy Cover
- Conservation Priority
- Ecological Threat
- Horticulture Point

Infrastructure

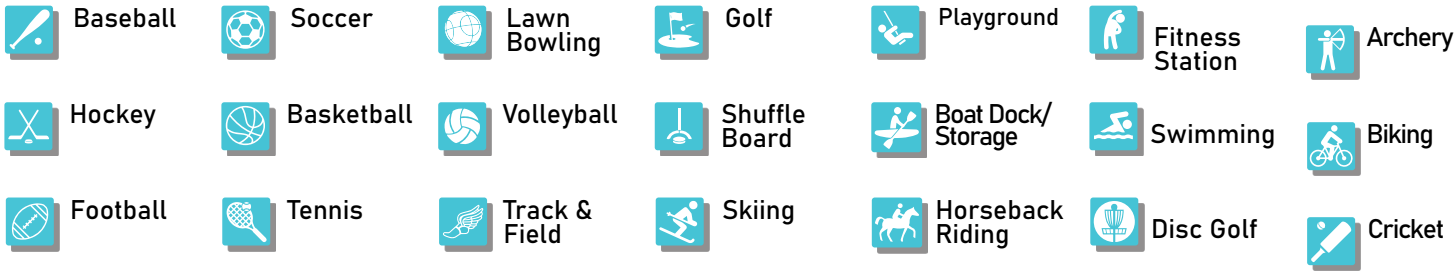
- Trails
- Transmission Lines
- Desire path
- Road
- Golf Cart Paths
- County Park Boundary
- Parking
- Buildings

Amenity Points

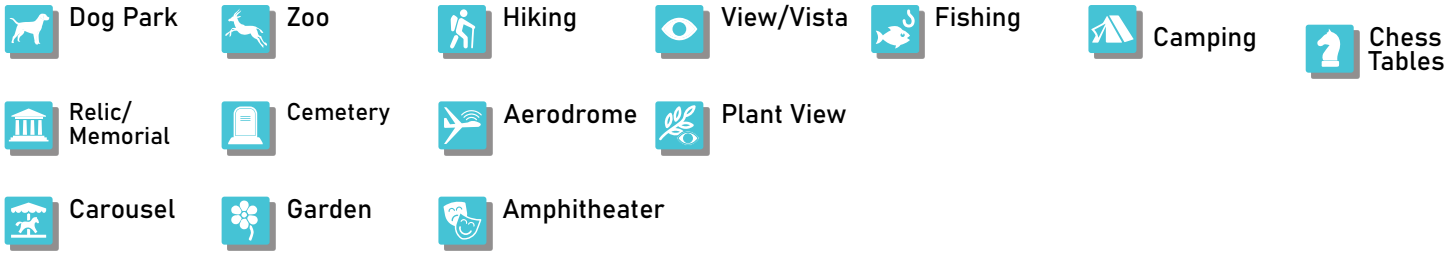
- Ball Cleaner
- Bicycle Rack
- Bicycle Share
- Boat House or Rental area
- Boat Launch or Dock
- Comfort Station
- Dog Park
- Dumpster
- Existing Event Space
- Fitness Station
- Garbage Can
- Gathering Area
- Gazebo
- Grill
- Interpretive Signage
- Memorial or Relic
- Other
- Outdoor Stage
- Park Bench
- Park Concessions
- Picnic Area
- Picnic Pavillion
- Picnic Table
- Playground
- Scenic Overlook
- Utilities
- Water Fountain
- Wildlife Housing

INVENTORY ICONS

ACTIVE RECREATION



PASSIVE RECREATION



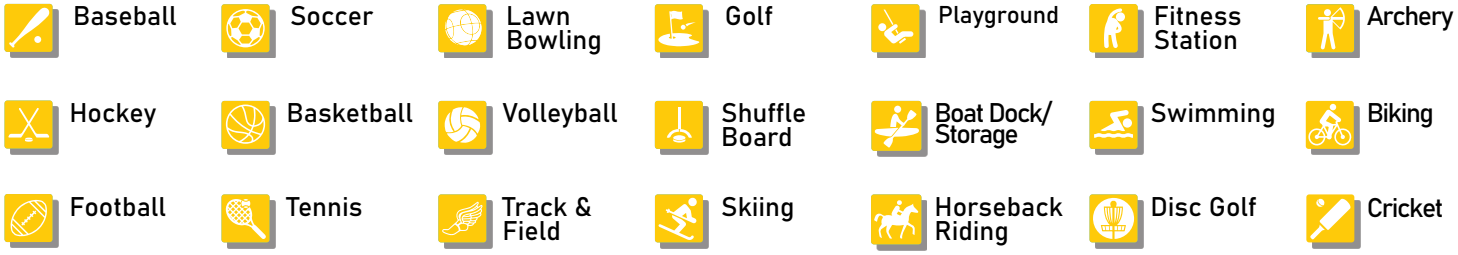
AMENITIES

MAINTENANCE

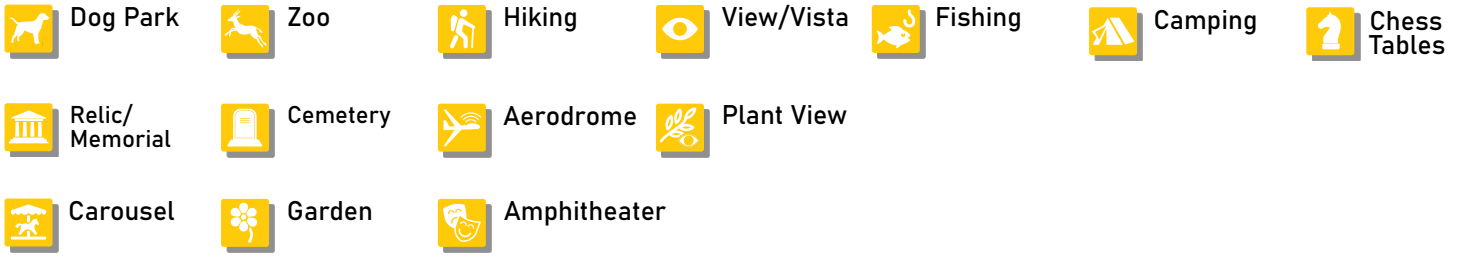
LEGENDS

ANALYSIS ICONS

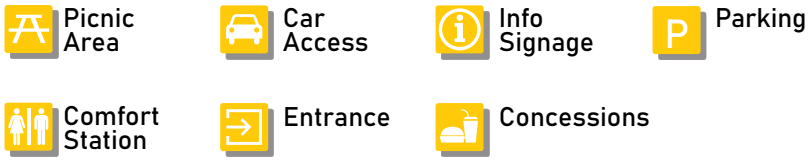
CALL ATTENTION TO ACTIVE SPACE



CALL ATTENTION TO PASSIVE SPACE

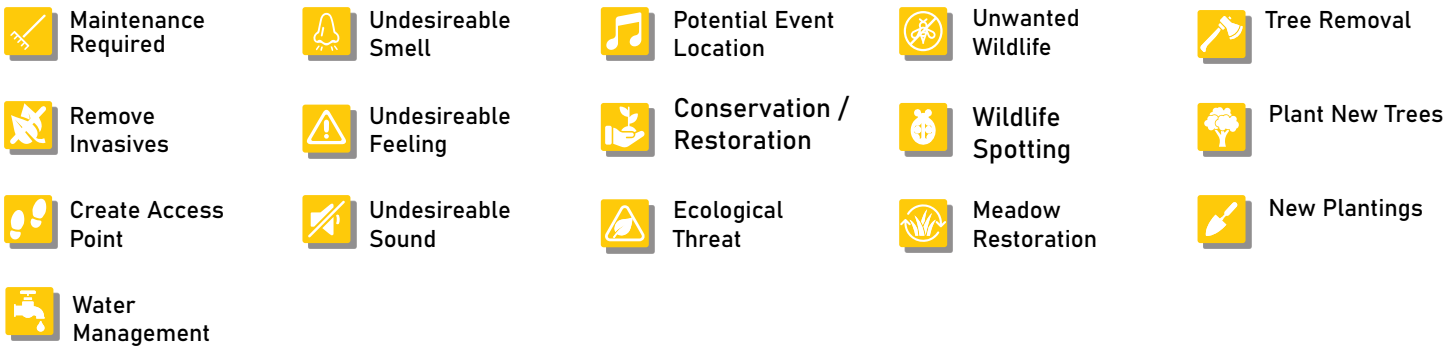


CALL ATTENTION TO AMENITIES



CALL ATTENTION TO MAINTENANCE AREAS

CALL TO PERFORM ACTION/OTHERS



Baldpate Mountain Area

Overview

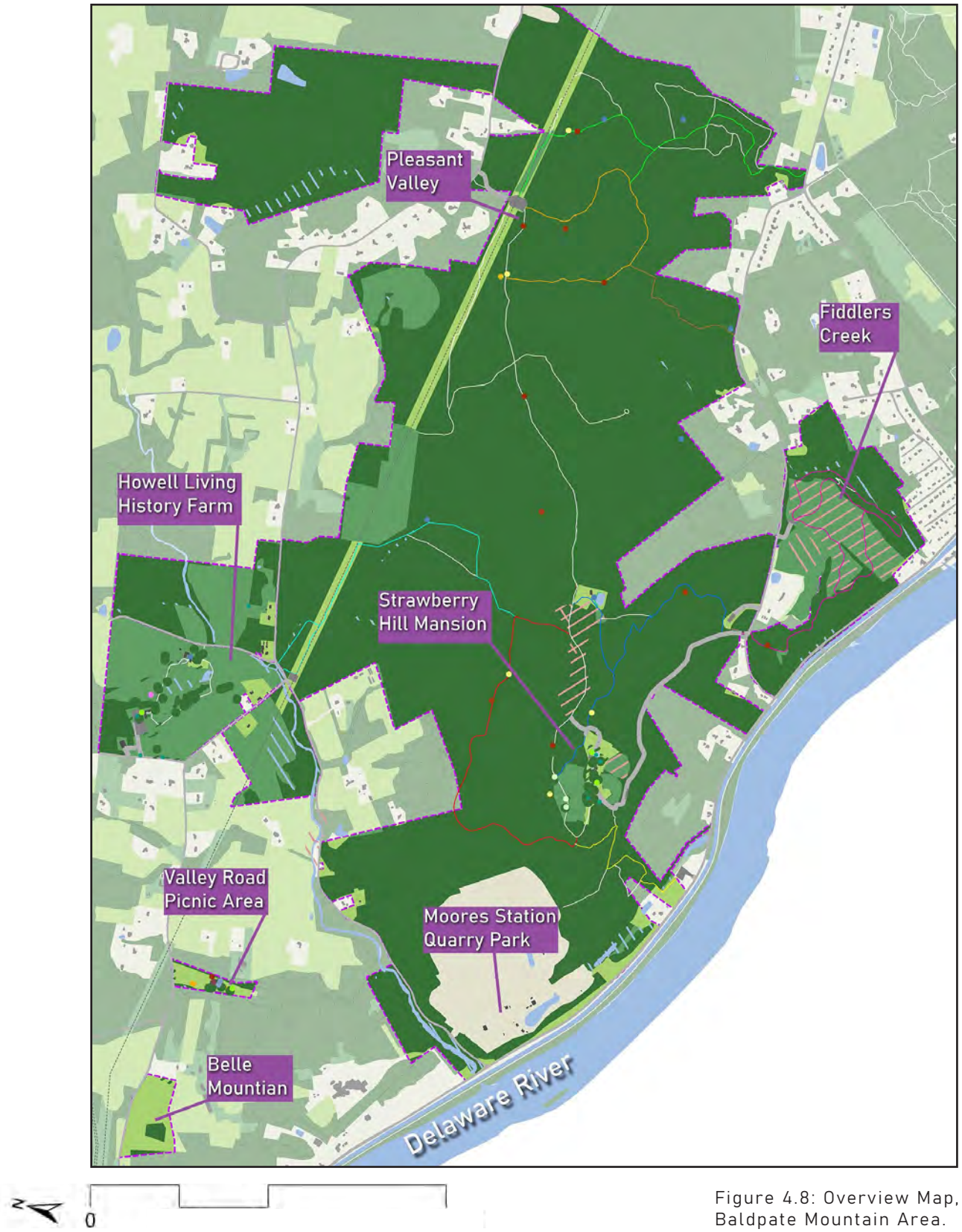


Figure 4.8: Overview Map, Baldpate Mountain Area.

Passive Recreation Regional Park - Overview

Baldpate Mountain Area, also known as the Ted Stiles Preserve can be split into five main districts: Strawberry Hill Mansion, Fiddler's Creek, Howell Living History Farm, Pleasant Valley, and the two additional areas that are disconnected from the main park: Belle Mountain and the Valley Road Picnic area. These five areas come together to create a park facility with biking and hiking trails to connect with nature, historical sites and artifacts, or to just relax.[1]

Previously known as Kuser Mountain, the land was owned by the Kuser family who then sold it to Trap Rock Industries as a quarry expansion. However, plans for expansion fell through and the then failed quarry was labeled as ideal for luxury housing development. Thankfully, due to public concern and efforts from the late conservationist Ted Stiles, the county acquired the property in 1998 preventing further development.[2]

As a result of the acquisition, Baldpate is home to one of the largest and least disturbed tracts of woodland in the region. This allows for large numbers of rare wildlife to live throughout Baldpate Mountain Area natural habitats, enriching the area's ecological significance. Additionally, the Kuser family's existing main house, barns, lodges, stone foundations, and other remnant buildings remain untouched - adding to the historical lore of the mountains. Thus, making Baldpate Mountain Area a model home for historical and ecological conservation and rehabilitation in the county.

The forest preserve of Baldpate provides unique ecological resources in the undulating terrain of the upland oak-hickory forests, mountain seeps, and tributary ravines. This distinctive county landscape provides vital habitat for many protected species of New Jersey. Several rare bird species and rare plants have been observed and recorded by the Mercer County Park Commission Stewardship Department. In addition, bobcat (Endangered in NJ) sightings have been reported at Baldpate along with numerous northern copperhead (species of special concern in NJ) sightings. Baldpate has also been mapped for rare flora by the NJDEP Natural Heritage program, including sandbar lovegrass, slender toothwort, buttonbush dodder, spring avens, wild comfrey, Willdenow's sedge, and specific areas of sensitive habitats.[3]

Unfortunately, Baldpate Mountain Area is plagued by incoming and established invasive plant species, such as multiflora rose, of which their spread is facilitated by forest canopy gaps created by losses of ash trees who have succumbed to the invasive emerald ash borer. A newer pest, the spotted lanternfly, has been observed and found in high concentrations in recently disturbed forests and edge habitats that contain the invasive tree of heaven. Yet, the Stewardship Department has actively performed large-scale forest and meadow restorations across the landscape to combat these ecological threats. In addition, this park has an established deer hunting program, reducing detrimental browse levels and allowing for successful regeneration of tree saplings in the native forested areas.[4]

After the June 2021 field assessment, on July 29th 2021, the forest of Baldpate Mountain Area tragically experienced severe storm damage and loss of hundreds of trees caused by an EF-2 tornado that tore across the landscape. Unfortunately, this intense and large-scale disturbance has caused critical forest health management challenges that will last long into several decades.

Quick Facts

Park Districts

-Strawberry Hill Mansion Area
-Fiddler's Creek and Summit Trail
-Pleasant Valley
-Valley Road Picnic Area

Figure 4.9: Native Planting Bed.

Strawberry Hill Mansion Area

Inventory

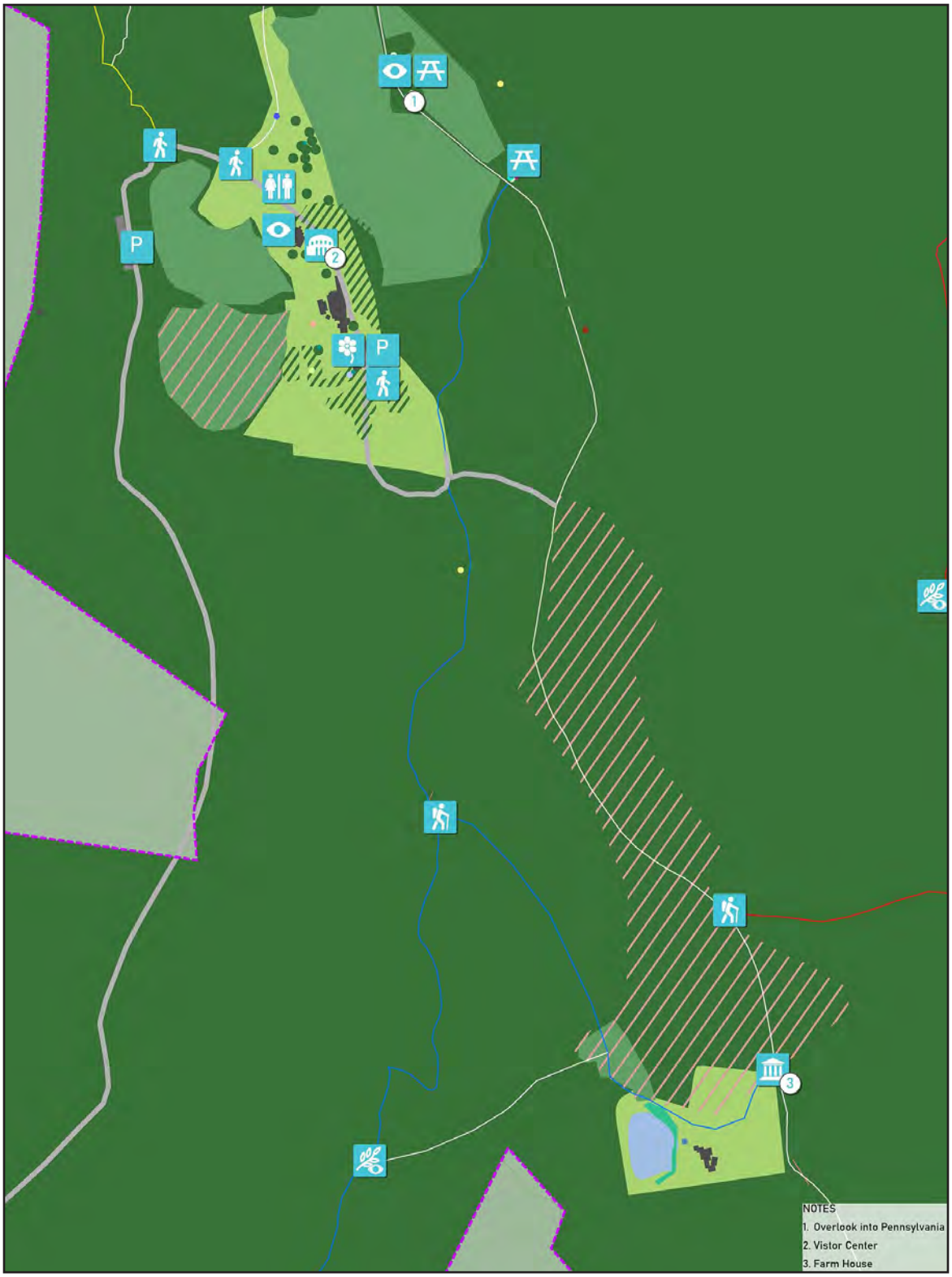


Figure 4.10: Inventory Map, Strawberry Hill Mansion Area.

Overview

Originally belonging to the Kuser family, the renovated Strawberry Hill Mansion lies in the southwest part of the park just two thousand feet away from the Delaware River. This area houses the visitor center, restrooms, a rentable catering hall for special events, and office space for the Friends of Hopewell Valley Open Space (FoHVOS). This is a central hub of the park as it has many facilities, like restrooms, picnic areas, and ample parking, as well as several trail connections including the Ridge Trail (white), Summit Trail (blue), Switch Back Trail (yellow), and Northwest Loop Trail (red) which connects to the Pleasant Valley Trail (turquoise). The forests and meadows in this area are biodiversity hotspots; several rare plants have been documented here as well as numerous sightings of northern copperheads, bobcats, and rare birds.[5, 6]

Initial Impressions

With amenities, uses, connections, and parking, the Strawberry Hill area was observed to be the ideal entry point to the park. The older style buildings provide a historical ambiance. The sloping terrain, open lawns, and meadows gave way to excellent view sheds, serving as quaint seating and picnic areas.

The forested habitats along the trails were biodiverse and lovely to experience. The ecological signage about restorations and protected habitats were very informative adding to a positive user experience.

Facilities Inventory

Overall, the historical feel of the central mansion area was palpable and provided an authentic experience. Some of the amenities in this area looked tired, worn, or in need of maintenance. It is likely their status was due to the COVID-19 pandemic-related reduction in maintenance, such as plumbing issues in the women's restroom. Picnic areas and seating were ample, yet sometimes difficult to find in the Mansion area. Overall, it was an enjoyable place to walk around and experience the diversity between each landscape section.

The interpretive signage in the main gathering areas were relatively clear and informative. Directional signage was less ample, making trail navigation difficult. Navigating between the sections and finding trailheads was a little confusing without a trail map in hand and may negatively impact the experience for first time visitors. The Northwest Loop (red) intersection with the Ridge Trail (white) was not well marked. Even so, the Ridge Trail was a quaint hiking path as it was mostly flat, easily walkable, and allowed one to feel immersed in nature. This was in large contrast to the Summit Trail (blue) which descended the mountain side with sloping trails and entertaining rock scrambles, but they may pose challenges to some hikers with ambulatory limitations.

Ecology Inventory

There are several specimen trees that contain hazards and pose risks to people, roadways, and buildings. The small orchard is in fair shape. Horticultural planting beds around the mansion are variable in their aesthetic and ecological conditions; most need some maintenance. The native plant garden behind the mansion contains high biodiversity and a nice collection of species for display, which helps to encourage native planting gardening for visitors.

Ash decline and canopy gaps were observed throughout the forest and trails, while invasive plants were observed throughout managed green spaces and the forest trail-sides. It was noticeable that higher invasive plant densities occurred where mature ash trees were declining. Notable areas that had less invasive plant pressures were along the Northwest Loop Trail (red) and the trailhead of the Summit Trail (blue) where signage indicates valuable habitat. To the team's pleasure a rare chestnut tree was spotted trailside.

The many large-scale restoration areas demonstrated to the public that there is a significant and concerted effort to mitigate ecological threats and conserve native biodiversity. The restoration meadows behind the mansion were in the process of being restored and signage helped the visitors to understand the goal. The meadows uphill and north of the mansion were in fair condition and interpretive signage was very informative. The view from this location was awe-inspiring and the backdrop of white pines added pleasant screening as well as ecologically important locations for nesting birds.

Strawberry Hill Mansion Area

Analysis

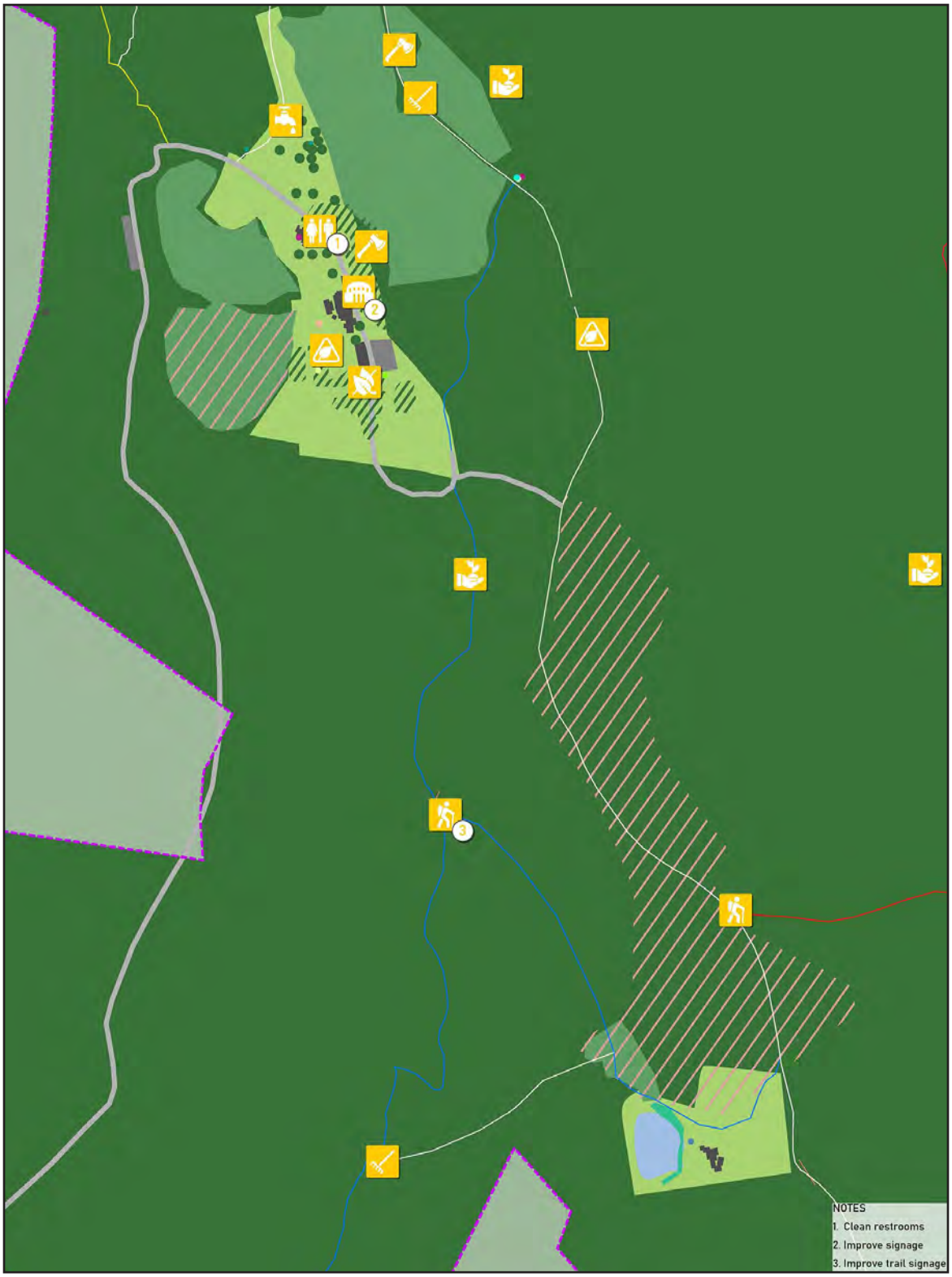


Figure 4.11: Analysis Map, Strawberry Hill Mansion Area.

Facilities Analysis

In general, increased maintenance is needed to enhance the condition of the building structures and human-made landscape features. We recommend restoration efforts for the historical aspects and structures to restore and/or emphasize their importance. Trail signage and markers, a consistent recommendation for the entirety of Baldpate Mountain Area, would benefit from being updated to New York-New Jersey Trail Conference standards.[7]

Tree hazards along trails need to be removed for safety and to allow easier passage. Trail adjustments can be performed to reduce water pooling in particular locations. The women's restroom was not in the most pleasant condition and needed maintenance. Enlisting a regular cleaning schedule for park facilities will help eliminate overlooked cleaning.

Ecology Analysis

The specimen tree hazards need immediate attention as they pose high risks to people in gathering places, roadways, or to nearby buildings. Horticultural gardens would benefit from weeding and installation of new, more sustainable native plant species (natives preferred).[8] The one bamboo grove should be physically confined or completely removed to ensure ecological safety of the nearby meadow and forest.

The particular forested locations where fewer invasive plants occurred are conservation priorities. To protect them, constant monitoring for invasive species spread or introductions is needed as the losses of canopy trees increase with storm disturbances and facilitate further invasion. More restoration areas (fenced-in exclosures recommended) will provide great successes in ensuring healthy forest canopy trees for the future.

Note, all the above was observed and recorded before the 7/29/21 tornado hit Baldpate. Increased trail clearance work, reductions of tree hazards, invasive species monitoring and treatment, as well as forest restorations will likely be needed to reduce threats and facilitate ecological recovery.

Figure 4.13: Blue Trail.

Figure 4.12: Informational Signage.

Figure 4.14: Native Plant Meadow.

Fiddler's Creek & Summit Trail Area

Inventory

Figure 4.15: Inventory Map, Fiddler's Creek & Summit Trail Area.

Overview

The 108-acre Fiddler's Creek Preserve, also known as the Hollystone Preserve, is located in the southernmost part of Baldpate Mountain Area's park boundary and contains a biodiverse assemblage of meadows, restoration areas, early-succession woodlands, and older forests containing the creek amid a ravine. The older forested areas are rich in biodiversity because they were never directly converted to agricultural land uses. Much of the meadow areas and restoration efforts are within a fenced exclosure to protect young, planted trees and shrubs from deer browse. The Fiddler's Creek area contains fantastic hiking opportunities and views of the Fiddler's Creek ravine as well as the Delaware River.

Initial Impressions

Hiking south from the Strawberry Hill Mansion along the Summit Trail (blue) was a delight as one traverses across rock stairways and scrambles. At the end of the blue trail was a standard parking area. The parking area had unclear signage to reach Fiddler's Creek Preserve across the main road; the parking lot's actual location did not match the available park map. The western leg of Fiddler's Creek Trail (magenta) in the Fiddler Creek Preserve was easier to navigate and was within an open woodland that led to a well-maintained restoration area. The driveway entrance to the Fiddler's Creek parking area was challenging to find by car as signage was not easily visible nor was the soil driveway clearly visible from the road. Overall, the Fiddler's Creek Ravine and forest provided a beautiful ambiance to the hiking trail.

Facilities Inventory

The western parking area was in good condition, had adequate signage from the road, and provided clear access to the Summit Trail (blue), which connects to the Strawberry Hill Mansion Area. The main parking area also provided access to the western entrance of the Fiddler's Creek Trail (magenta) across Fiddler's Creek Road. However, trail signage was confusing, and the entrance location did not match up with the available county trail map. The car access to the Fiddler Creek Preserve Parking area lacked clear entrance signage. The road leading to the Fiddler Creek parking lot was uneven and unpaved. The roadway may pose difficulty for some cars due to the uneven terrain and potential safety issues since the road was only wide enough for one way traffic. However, the unpaved parking lot was a fitting size. The restoration area exclosure fence was in great condition in the places that were observed. Signage on trails was unclear; forks and bends did not have enough blazes. There were no restrooms found in this area.

Ecology Inventory

The Summit trail (blue) contained oak-tulip associated forest vegetation and common invasive plants scattered throughout. Higher concentrations of invasive plants were observed in the vicinity of canopy gaps due to declining ash trees. The western section of the Fiddler's Creek Preserve was inundated with invasive plants, vines, shrubs, and tree species plus the invasive spotted lanternfly. The neighboring restoration area was in good condition with little to no evident mortality of planted trees and shrubs. However, invasive vines, such as porcelain berry, were spotted and pose serious threats to native flora in the restoration area. The older growth forested ravine was a mix of oak, beech, tulip, and sugar maple with patches of native understory ferns and herbs.

Figure 4.16: Blue Trail Views.

Fiddler's Creek & Summit Trail Area

Analysis

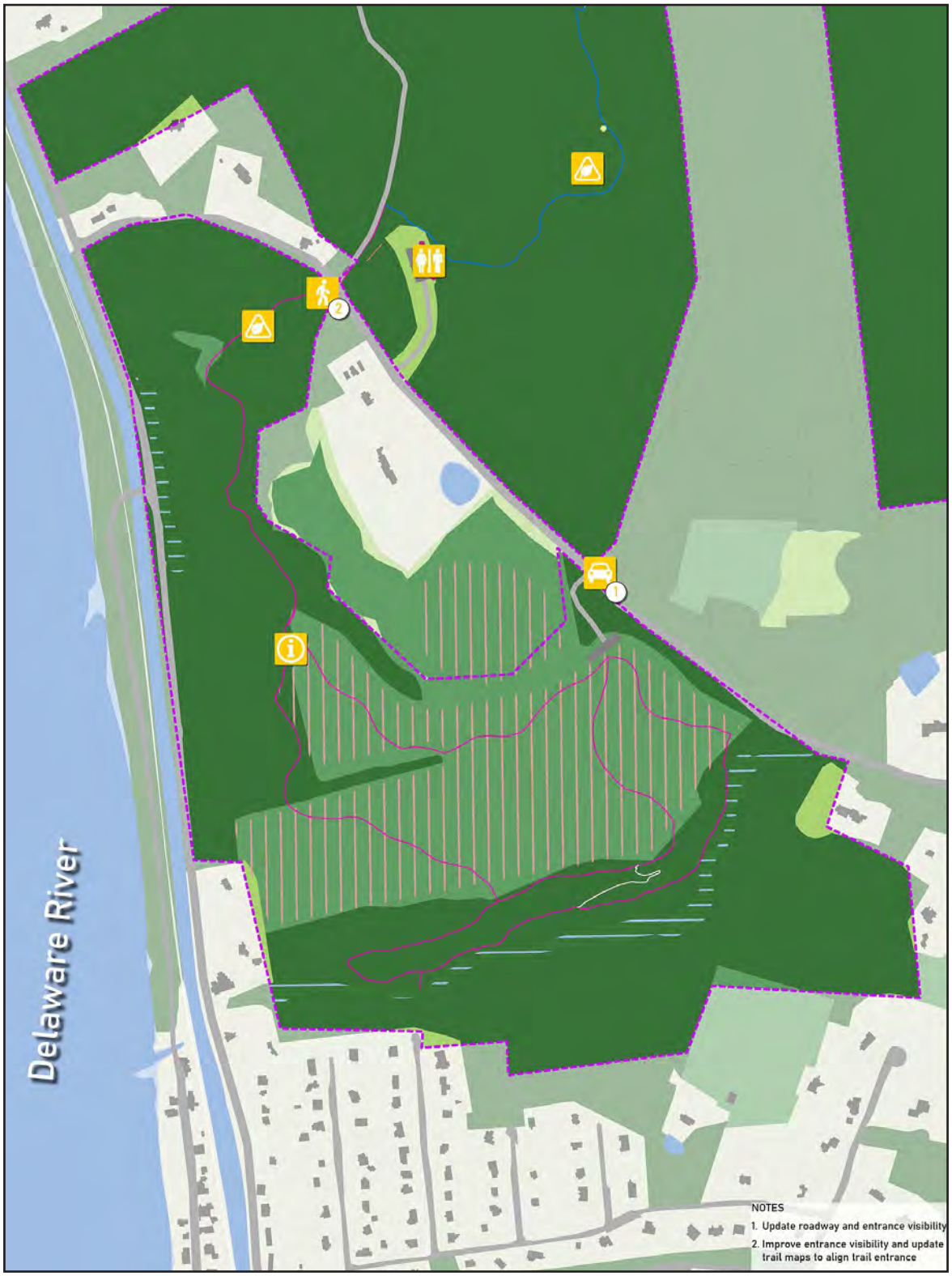


Figure 4.17: Analysis Map, Fiddler's Creek & Summit Trail Area.

Facilities Analysis

In general, the directional trail signage would benefit from updating blazing standards. Consider having Summit Trailhead signage to warn about trail difficulty as rock scrabbles lie ahead. Available county maps should be updated to account for the accurate location of the western trail entrance to Fiddler's Creek Preserve just south of the Summit Trail parking area. A restroom or port-able bathroom would be beneficial in both or either parking areas. The enclosed restoration area is a great opportunity for ecological interpretive signage and informative signage about the county's ongoing ecological efforts. Clearer signage to the Fiddler's Creek parking area would be greatly beneficial. Consider permeable pavement upgrades to the Fiddler's Creek driveway and parking area to allow access for all.

Ecology Analysis

The forested ravine of Fiddler's Creek is a conservation priority and is threatened by nearby invasive species including the fast spreading, newly emerging, invasive nematode that infects beech trees and causes beech leaf disease. Regular monitoring and restoration plans to mitigate losses of beech in the future are needed in addition to the significant tree and canopy losses from the July 2021 tornado and ash tree decline. The western portion of Fiddler's Creek Preserve contains high amounts of reproducing invasive species, which poses major threats to the surrounding area, especially recent storm damaged locations. Consider large scale restoration methods such as controlled burns or treatments and removals of invasive plants with subsequent large-scale, native plantings in addition to the existing. Even though immense restorative efforts have been observed, the latest tornado and incoming threats to canopy cover will create the need for more extensive reforestation efforts.

Figure 4.18: Blue Trail Views.

*Note, all the above was observed and recorded before the 7/29/21 tornado hit Baldpate. Increased trail clearance work, reductions of tree hazards, invasive species monitoring and treatment, as well as forest restorations will likely be needed to reduce threats and facilitate ecological recovery.

Pleasant Valley

Inventory

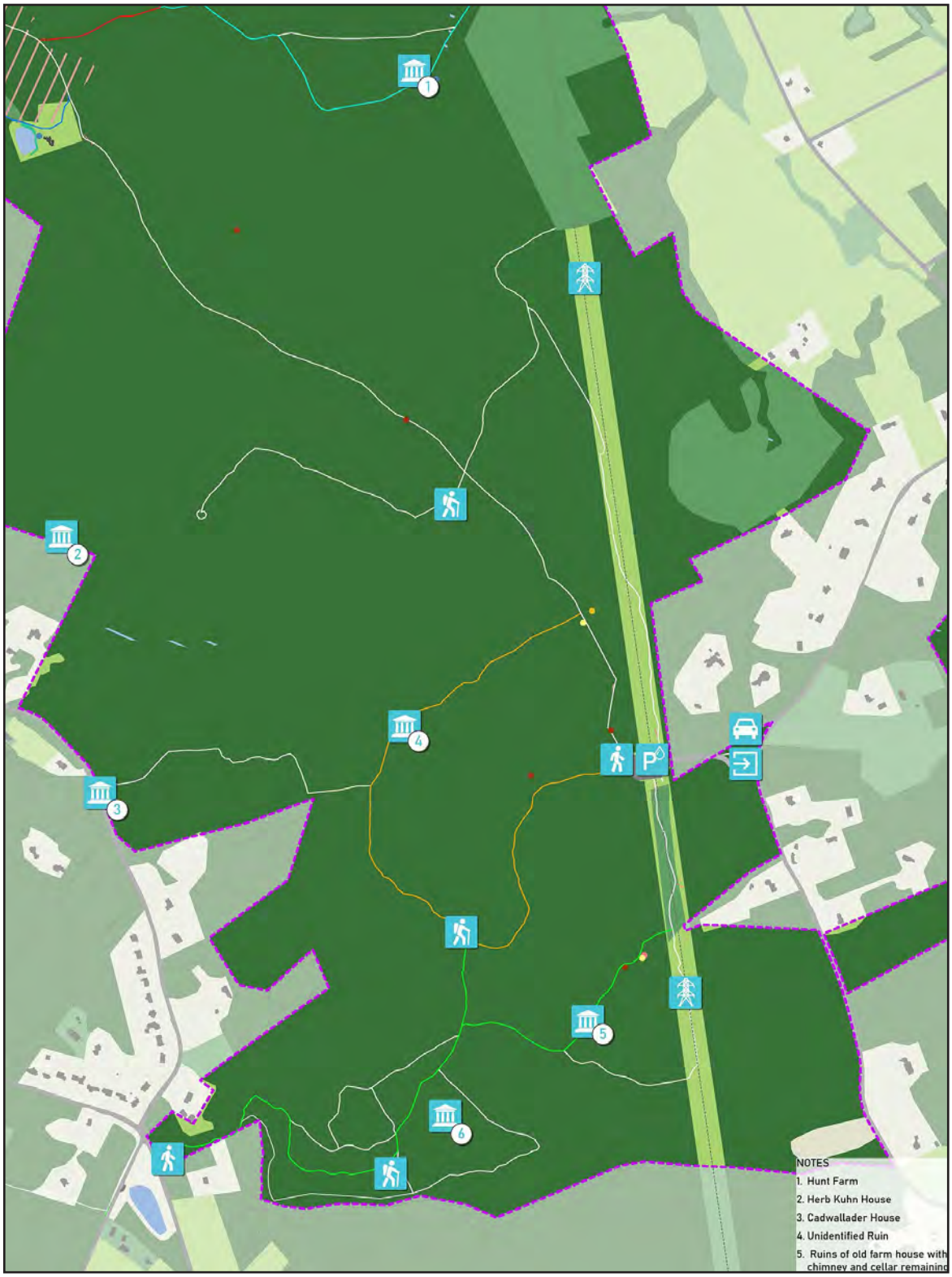


Figure 4.19: Inventory Map, Pleasant Valley.

Overview

The Pleasant Valley area, at the easternmost section of the park, contains a popular parking area that provides access to three main hiking trails: Ridge Trail (white); Copper Hill Trail (orange); Kuser Trail (green). A major power line right-of-way bisects the park above this parking lot which is otherwise surrounded by conserved forestland. The forests of this area are home to many rare understory plants, rare birds and other wildlife.[9, 10]

Initial Impressions

Upon arrival at the parking area, one feels surrounded by nature and forests. The permeable pavers in the parking area were nice to observe and demonstrate a progressive commitment to the environment and stormwater management. The kiosk and trail map were very informative, yet the trailheads were not clearly marked. All the trails in this area provided a "pleasant" and peaceful hiking experience with a few intriguing historical structure remnants in particular locations.

Facilities Inventory

The entrance towards the Pleasant Valley parking lot had clear signage and was easy to navigate. The parking lot was constructed with permeable concrete pavers, allowing for water to infiltrate, which was fitting as the lot sits at the bottom of a small meadowed hillside. The informational kiosk with the Park trail map was helpful, yet when entering the trailheads, signage was unclear and made initial orienteering confusing. The right-of-way consisted of an unmarked, mown trail entrance to the orange trail. The parking area did not contain other facilities such as a comfort station or picnic area. Along each of the trails, remnants of old dwellings and rock walls were observed and serve as intriguing historical features for hikers.

Ecology Inventory

The entire area was primarily an upland mixed oak-hickory forest with intermixed tulip-ash inclusions. Secondary tree species included sugar maple, red maple, beech, birch, black walnut, sassafras, and elm. The midstory had some regenerating tree species. The ground layer contained many native plants and a variety of native herbs such as mayapple and doll's eyes. Some areas were heavily invaded with common invasive shrubs and vines which decreased native plant presence, especially along much of the Ridge Trail (white) and in areas where ash trees were declining and creating canopy gaps due to emerald ash borer infestation.

Figure 4.20: Pervious Parking.

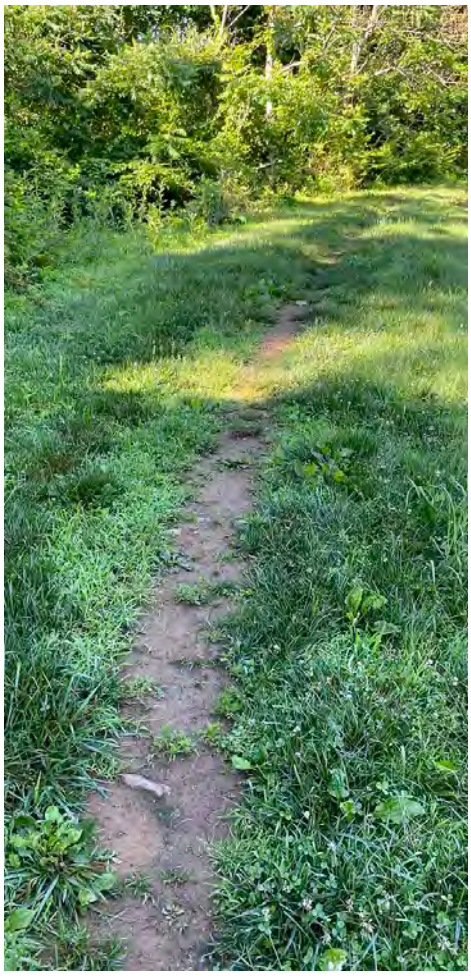


Figure 4.21: Orange Trail.

Pleasant Valley

Analysis

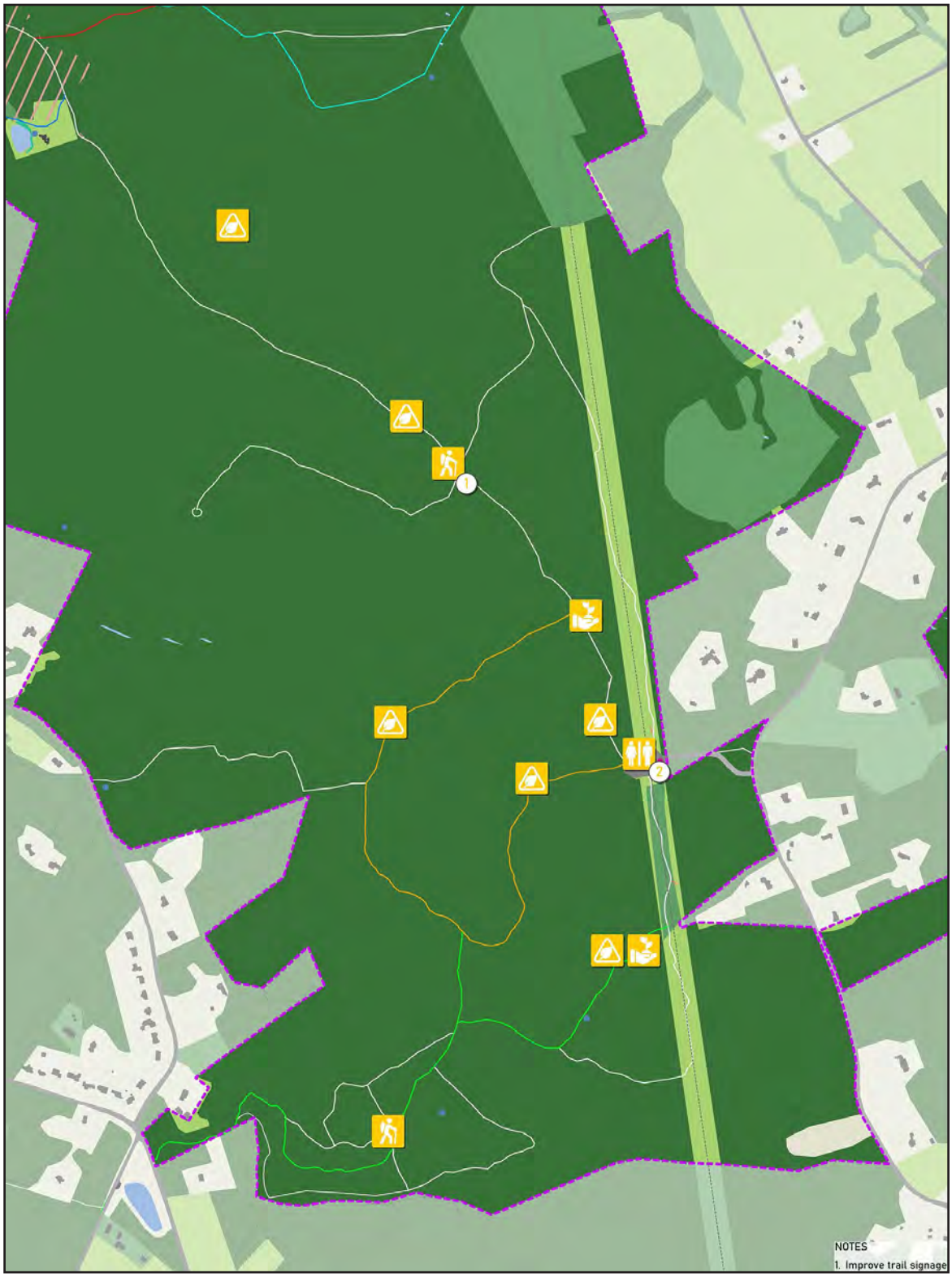


Figure 4.22: Analysis Map, Pleasant Valley.

Facilities Analysis

Clearer blazes of trailheads would greatly benefit the hiking experience as well as ample blazes along each trail, especially where forks occur. The trailhead kiosk is a great location to find more information about each trail and their unique histories. Consider some interpretive signage about each trail that describes the differing attributes and hiking experiences. A restroom at the parking area would be greatly beneficial to the public.

Ecology Analysis

The forested areas dominated by native plants in the understory are conservation priorities. In the suggested conservation priority area early detection rapid response (EDRR) should be practiced frequently to prevent invasion of exotic plants and loss of native biodiversity. The areas of dense invasive plant cover pose threats to nearby conservation priority areas and need restoration. It is likely that losses of trees and canopy due to the July tornado created many more areas in need of restoration.

Figure 4.23: Pervious Parking.

Figure 4.25: Orange Trail Entrance.

Figure 4.27: Beardtongue.

Figure 4.24: Restoration Zone.

Figure 4.26: Closed Bridge.

Figure 4.28: Winterberry Holly.

*Note, all the above was observed and recorded before the 7/29/21 tornado hit Baldpate. Increased trail clearance work, reductions of tree hazards, invasive species monitoring and treatment, as well as forest restorations will likely be needed to reduce threats and facilitate ecological recovery.

Valley Road Picnic Area

Inventory

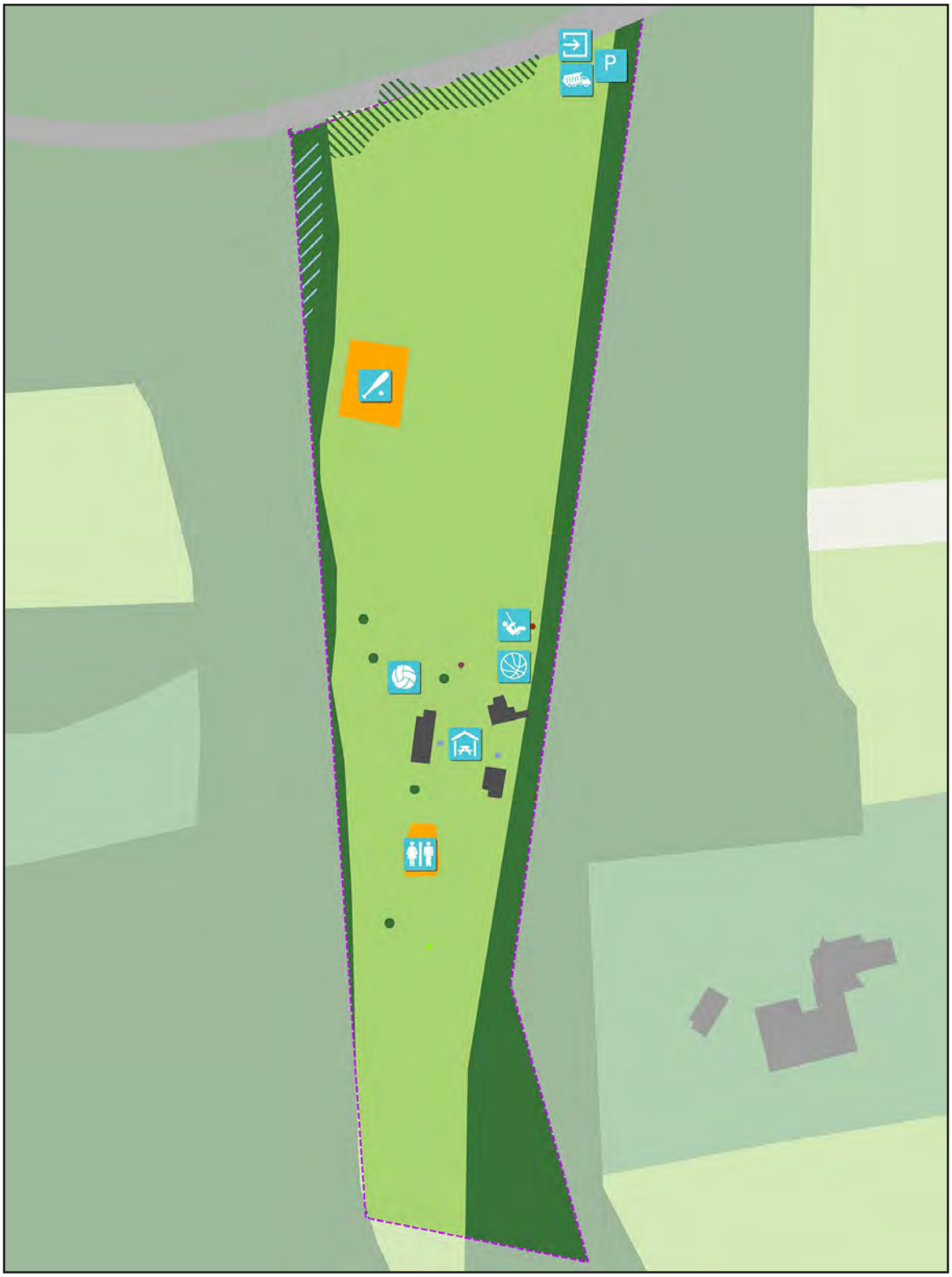


Figure 4.29: Inventory Map, Valley Road Picnic Area.

Overview

Valley Road Picnic area is a 19-acre rentable area located off Valley Road within the Baldpate Mountain Area. This space remains closed to the public when not being utilized. This area is often rented and is full of well-kept amenities from ball courses to bathrooms.

Facilities Inventory

The entrance of the picnic area is gated with a small gravel lot just outside of the gate. The expansive lawn serves as overflow parking just within the gate. There are multiple small fields such as a small volleyball court, half basketball court, and small baseball field. There is also a playground. This area is equipped with amenities; there is a 30-foot by 60-foot outdoor kitchen with two charcoal grills, a barbeque pit, electricity, running water, and space to deposit used coal. The bathrooms are ADA accessible, male and female facilities in a standalone building further into the picnic area.

Ecology Inventory

The picnic area is predominantly grass with a few shade trees throughout. Common signs of forest edge invasive plant species were seen along the picnic area edge as it is surrounded by dense forest. There were sightings of mugwort, Japanese stiltgrass, and Japanese honeysuckle.

Figure 4.30: Small Basketball Court.

Figure 4.31: Picnic Area Seating.

Valley Road Picnic Area

Analysis

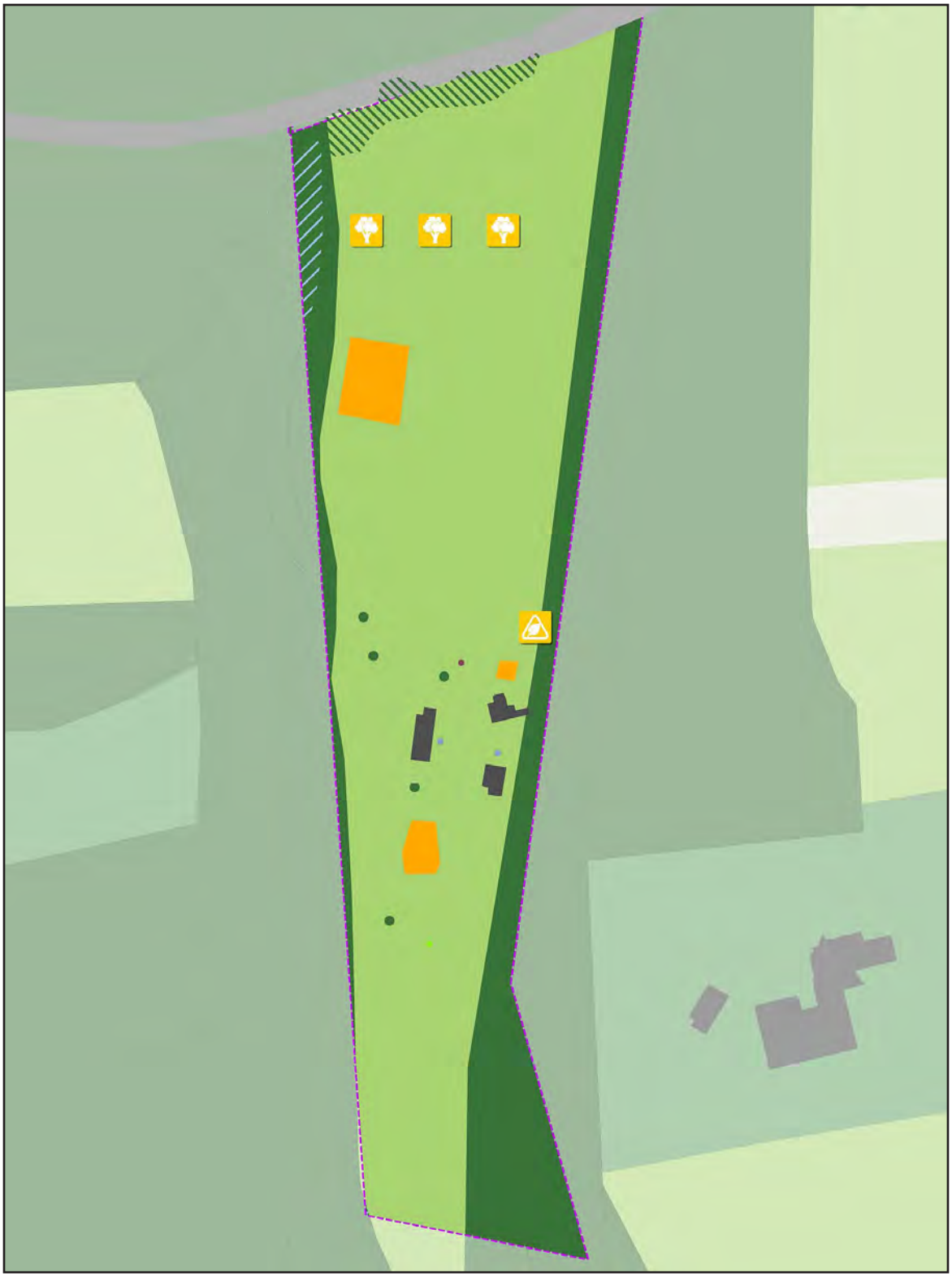


Figure 4.32: Analysis Map, Valley Road Picnic Area.

Facilities Analysis

The facilities were well maintained. Garbage cans, bathrooms, and fields were all clean and free from debris. The kitchen area and bathrooms seemed to be in working order. Overall, this was a pristine picnic area, which can be attributed to it being only open when rented use and its regular maintenance in the Howell Living History Farm area.

Ecology Analysis

Monitoring invasive vegetation along the forest edge and the addition of native shade trees in the lawn area are the main recommendations for the picnic area. There were no instances of horticulture plantings that could potentially threaten the surrounding forest.

Figure 4.33: Sign to Fiddler's Creek.

Figure 4.34: Volleyball Court.

Figure 4.35: Comfort Station.

Howell Living History Farm

Inventory

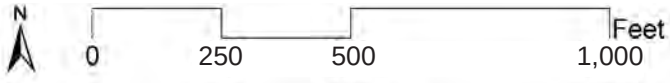


Figure 4.36: Inventory Map, Howell Living History Farm.

Overview

Howell Living History Farm, also known as the Joseph Phillips Farm, is a 285-year-old working historical farm located in Titusville in Hopewell Township. Initially, 126 acres were donated by the Howell Family of Pennington to the Mercer County Park Commission for land preservation.[11] Mercer County Park Commission not only preserved the farmland but maintained its use as a historic farm. It was listed on the National and State Registers for Historic Places in 1978 and is maintained as a late 19th to early 20th century farm.[12] The farm continues to actively preserve and restore historical farmland properties around the area to expand and further their operations.

As a living history farm, it continues to operate on a full working scale following the techniques of raising crops and livestock during the years of 1890 to 1910.[13] Howell Farm produces several varieties of wheat and hay, squash, corn, wool, eggs, honey, maple syrup and other products.

During the COVID-19 pandemic, farm production adapted to the changing demand due to the necessary closure to the public. Opposed to regular tours they were able to donate surplus crops to the local food kitchen. The farm is typically open to the public and schools providing educational tours and hands-on farming experiences to families and students of all ages.

Initial Impressions

Howell Living History Farm is a rich contributor to the character of the Pleasant Valley area at Baldpate Mountain Area. The farm's-maintained character and active role in the community has contributed to the acquisition of potentially developable lands in the surrounding area, saving it as indefinitely preserved open space.

The landscape of the farm was well maintained and cared for. The main entryway was a gravel driveway that opened the view for visitors to the farm and barn. The main trail was a large loop around the farm passing by vegetable gardens, over a scenic brook, to a bee apiary, to the horse barn, and passed a lake. The walk was scenic, educational, and highly entertaining.

The farm director, Mr. Pete Watson, gave CUES a full tour of the farm and its associated open space parcels. Through this tour, the team was able to gain a firsthand understanding of the farm's role in the overall park system. Not only does the farm cater to the educational and historic component of the community, but it works to implement sustainable practices into daily operations. The land acquisition practices in this area can be emulated throughout Mercer County, conjoining additional open space parcels with Mercer County's already expansive Park network.

Facilities Inventory

The main parking lot and facilities parking lot are gravel surfaces. The facilities parking and warehouse is tucked within the forested area hiding any unsightly views from the public. The main parking lot had ample trees providing shade cover, and was made of a gravel (permeable) surface. Restrooms were located adjacent to the main parking lot and were accessible from both inside and outside the main building.

Overall, the property is in good condition and is well maintained. Many of the adjacent properties are not easily accessible by foot. These properties are used as farmlands, are interpretive historic sites, and are used for additional farm facilities such as staff housing. A number of the adjacent County owned open spaces are not clearly marked, specifically the facilities utilized as historic sites and educational properties.

The farm features livestock such as sheep, chickens, pigs, and horses. The horses help plow the fields while the others supply food items and materials. There are several types crops that are grown in the fields including timothy hay, wheat, corn, squashes, and others. There is also an apiary on the farm, and they sell local honey. Interestingly, pond management techniques utilize barley as an environmentally friendly alternative for eutrophication reduction.[14]

Ecology Inventory

The vegetation throughout Howell Living History Farm was well maintained. However, there were noted appearances of invasive plant species, such as mugwort and Japanese knotweed, along the Moores Creek riparian edge. Native and non-native vegetation were interspersed throughout the naturalized areas of the farm. A large Norway Maple was noted at the overpass over the Moores Creek. However, this tree holds high cultural value to farm staff for its age and location along the stream.

Howell Living History Farm

Analysis

Figure 4.37: Analysis Map, Howell Living History Farm.

Facilities Analysis

Wayfinding signage throughout the Howell Living History Farm area would create an even greater sense of place and character in this area. Uniform signage and markers enhance the park visitors' experience by allowing unguided tours of exterior facilities and giving people a greater understanding of the surrounding landscape. Connecting paths across roadways by securing safe pedestrian passage will help enhance connections to other areas of Baldpate Mountain Area. A specific pedestrian safe passage worth creating is at the Valley Road and Pleasant Valley Road Bridge. This connection point is perpendicular to the Right-of-way where there could be a potential, yet unofficial, trail connecting the Pleasant Valley parking lot to the Historic farm area.

Ecology Analysis

Consider small plantings of native flowering herbs to support native pollinators and predatory insects, which benefit agricultural crops on site. Likewise, replacing non-native tree cover with native trees supports predatory insect populations, which benefit agricultural plants. Consider new plantings of native species such as serviceberry, elderberry, blueberry, and bee balm which all have edible parts and can be harvested. Utilizing native plants in agricultural operations promotes a more sustainable future and provides habitat for hundreds of species of flora and fauna. Monitor invasive plant species spread along the creek edge.

Figure 4.38: Director Pete Watson Showing Lydia Educational Signage.

Figure 4.40: Timothy Hay Field.

Figure 4.39: Livestock in Field.

Figure 4.41: Chicken under a Norway Maple Tree.

Mercer Meadows

Overview

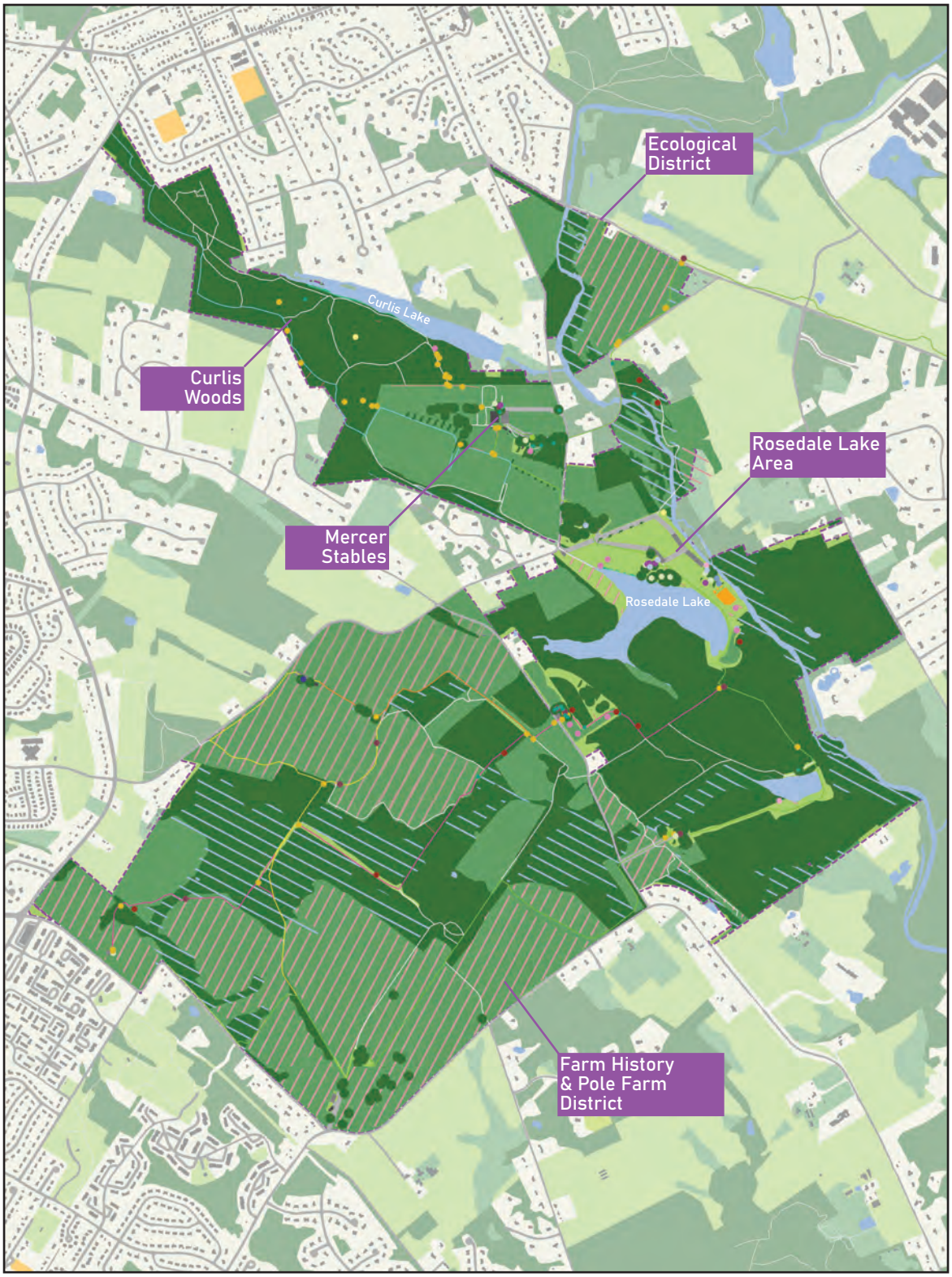


Figure 4.42: Overview Map, Mercer Meadows.

Passive Recreation Regional Park - Overview

Mercer Meadows is a 1619-acre regional park that stretches across Hopewell Township and Lawrence Township. The Lawrence Hopewell Trail (green) is a major trail that runs through Mercer Meadows. This Park boasts a wide variety of recreational opportunities from horseback riding, gardening, historical immersion, bird watching, kayaking, fishing, picnicking, dog walking, hiking, bicycle riding and various types of educational programming. The well-maintained facilities and amenities ensure safe and inclusive participation. Throughout the entire park the ongoing efforts towards reforestation, ecological restoration, and sustainable uses were ever-present, which demonstrate the County's commitment to the environment and green future. Notably, the vast meadows, many of which were undergoing restoration, provide its distinct ecological and cultural identity among the other large County Parks.

Quick Facts

- 1683 Acres of Land
- 584 Acres of Forest
- 630 Acres of Agriculture/ Meadow
- 0 Acres of Barren Land
- 329 Acres of Wetland
- 53 Acres of Water
- 89 Acres of Urban Land
- 2 Acres of Impervious Surface
- 1.75 Miles of Roads

Park Districts

-Rosedale Lake Area
-Farm History & Pole Farm District
-Ecological District,
Mercer Stables,
& Curlis Woods

Figure 4.44: Bridge.

Figure 4.45: Trail Blaze.

Figure 4.43: Green Acres Sign at Lawrence Hopewell Trail.

Rosedale Lake Area

Inventory

Figure 4.46: Inventory Map, Rosedale Lake Area.

Overview

The Rosedale Lake Park Area boasts a variety of natural features including scenic water bodies (the Stony Brook, Willow Pond, and Rosedale Lake) amid vast lawns, meadows, and woodlands. The variety of landscape features allows for a plethora of public facilities for recreational use such as sports fields and courts, playgrounds, a dog park, picnic areas, a floating fishing dock, a boat ramp, andmany hiking and biking trails including part of the Lawrence Hopewell Trail (green). In addition, the surrounding natural landscape provides invaluable wildlife habitat throughout the forests, restoration areas, meadows, and riparian wetlands, which all enhance passive recreation opportunities. Notably, both the barred owl and long-eared owl utilize the forest near Rosedale Lake for roosting habitat.

Initial Impressions

Upon the first visit to the Rosedale Lake area, it was notably clean and generally well maintained. The many amenities provided to the public, including the restrooms, paved trails, new playground, and new dog park, demonstrated the park commission's ongoing commitment to the local community. The storybook walk along the Maidenhead Trail enhanced the visitors' experience. The surrounding natural landscapes of forest, meadows, and waterways created a quaint ambiance and maintained beautiful viewsheds. The extent of the mowed lawn seemed excessive but was well manicured. Some gathering areas and commonly used locations, like parking lots and walkways, were very hot in the full summer sun and lacked sufficient shade.

Facilities Inventory

Many of the amenities in Rosedale Park such as park benches, picnic areas, playgrounds, light posts, and restrooms were in very good condition. There were waterless composting toilets as well as traditional bathrooms next to the rentable picnic pavilions. Roadways showed no need for improvement, yet some trails had evidence of water pooling, erosion, and damage from maintenance machinery. Trailways were adequately labeled; some areas by Willow Pond had litter on the ground. All trails were actively used by walkers, joggers, and bicyclists. The boat launch at Rosedale Lake displayed issues with erosion, water pooling, and ground surface damage since there was no official boat ramp roadway or structure. Even so, many people were observed recreating on the water in kayaks and boats.

Ecology Inventory

Many of the larger shade trees by Rosedale Lake above picnic benches were declining and hazardous (most were the invasive species Norway maple). Smaller classes of shade trees were planted by the playground and dog park. Many planted shade trees lacked mulched tree rings. When in grass, the root flares and trunks showed mechanical damage from mowing. Horticultural planting beds were few and lacked native species.

Willow Pond contained various species of aquatic plants and had no sign of eutrophication. The edge of Rosedale Lake contained many patches of emergent vegetation. Though mixed with several invasive plants, they provided habitat and deterred geese from nesting and herding. There were signs of eutrophication at Rosedale Lake especially near the fishing dock and boat ramp. Signage regarding algal blooms was noted; dangerous algal blooms are a frequent issue here in hot summer months.

The large patches of restoration areas were in good shape and survivorship of plants were high. The riparian forest around the Stony Brook made for an enjoyable user experience and contained high native plant biodiversity, though many invasive plants (garlic mustard, stiltgrass, Asiatic bittersweet, autumn olive, multiflora rose, Japanese honeysuckle, etc.) were infiltrating. The same invasive plants were abundant along the forest edges. The natural forested canopies in upland areas were a mix of oak, hickory, and black walnut and mesic to wet floodplains containing sycamore, river birch, willow, elm, ash, and red and silver maple. The ash were declining due to emerald ash borer infestation and their losses facilitated the spread of understory invasive plants.

Figure 4.47 Bridge over Drainage.

Rosedale Lake Area

Analysis

Figure 4.48: Analysis Map, Rosedale Lake Area.

Facilities Analysis

Some of the older benches, like those at the edge of Rosedale Lake and near the baseball field along the stream edge, can be updated to match newer amenities. The sports fields near the picnic area need maintenance even if they only aim to serve the picnic area occupants. There is an opportunity to add rentable picnic areas in the large lawn covered areas with the addition of shade trees throughout. The Lawrence Hopewell Trail and exit roadway share a path. Adding a lane for pedestrian and bicycle use will ensure safety for pedestrians entering the Rosedale Lake area from the new bridge. More interpretive signage about the restoration areas would be beneficial as well as fishing rules, invasive aquatic species, and lake management. Additional plantings would help incorporate outdoor kitchens into the landscape.

meadow in manageable patches to reduce mowing maintenance and increase wildlife resources.

Invasive plants in less infested areas should be controlled to reduce ecological threats to conservation priorities, like the riparian forest by the picnic pavilion and the mature forest by Willow Pond. Climbing invasive vines such as Asiatic bittersweet can be cut and treated to protect midstory and canopy trees from damage or death by vine strangling.

Around Rosedale Lake, consider installing greater expanses of emergent vegetation along the riparian edge, such as wide-leaf cattails and native wetland shrubs to improve water quality, further deter geese, and increase habitat. To mitigate algal blooms, we recommend hiring a pond management contractor to develop and perform a waterbody restoration plan.

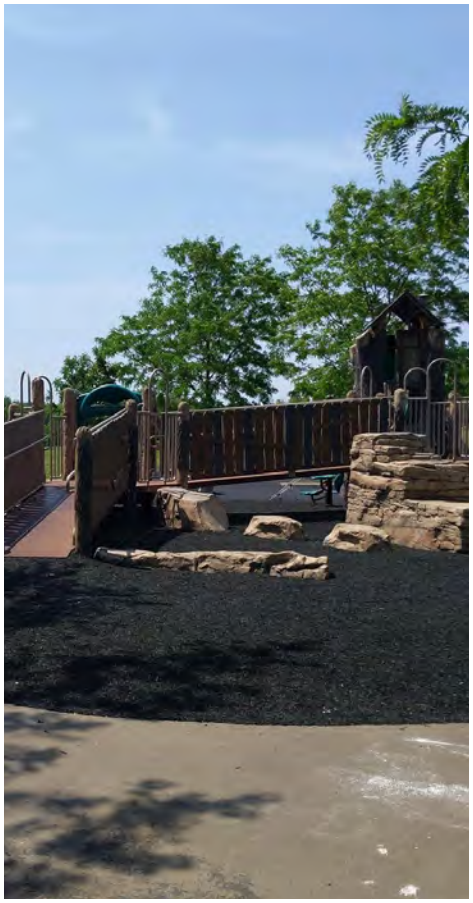


Figure 4.49: New Playground.

Ecology Analysis

New native shade trees plantings would secure shaded canopies over the picnic tables at Rosedale Lake because the Norway maples in this area will require removal as they decline. Consider new shade tree plantings by the parking lots and along some open pathways. Suggested shade tree species include black gum, sweet gum, Princeton elm, sycamore, and swamp white oak.

Horticultural plantings can be replaced with or enhanced with pollinator plants and native deer resistant shrubs like northern bayberry. Some of the extensive lawn can be converted to pollinator

Figure 4.50: Dock on Rosedale Lake.

Farm History & Pole Farm Districts

Inventory

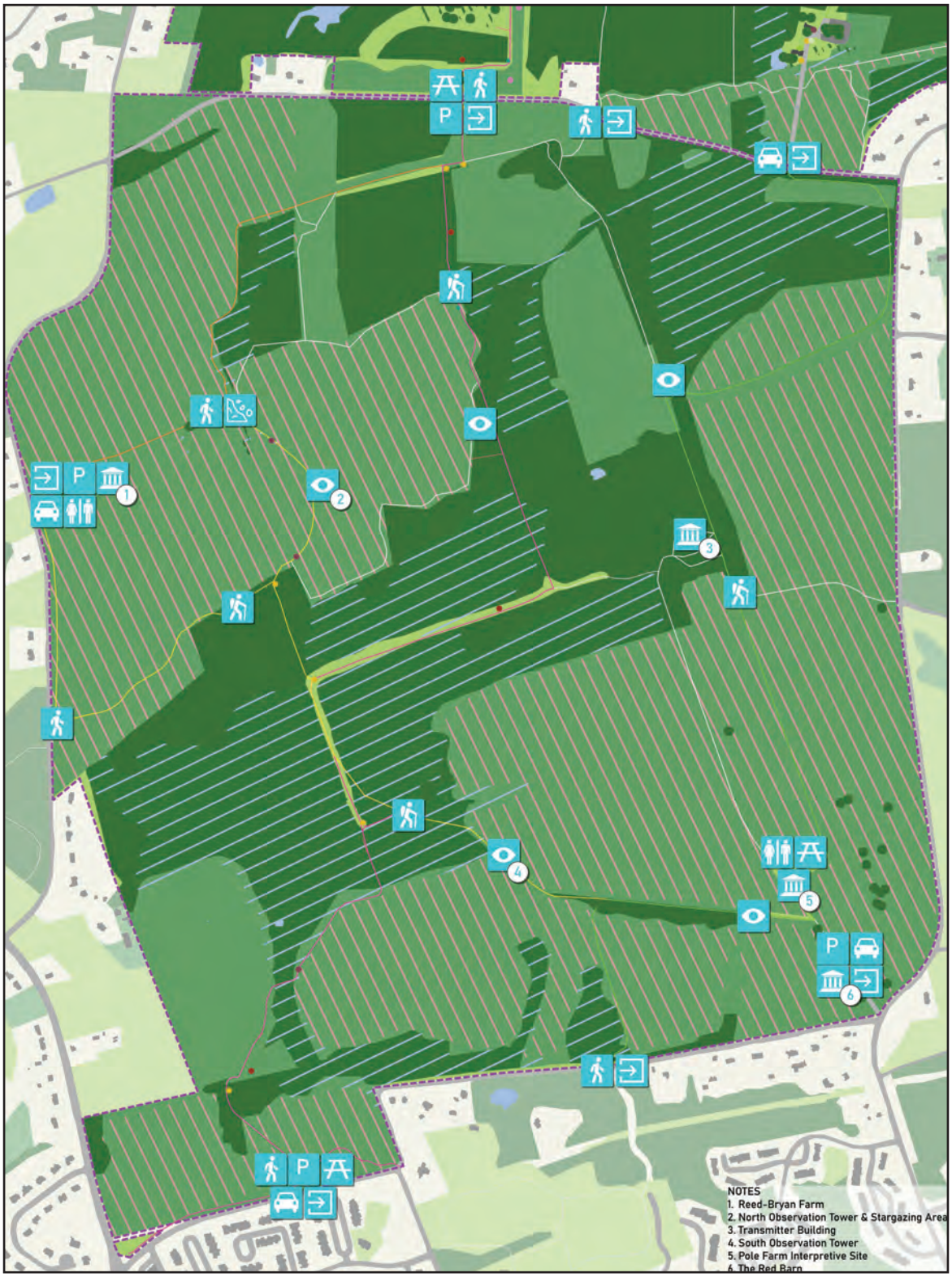


Figure 4.51: Inventory Map, Farm History & Pole Farm Districts.

Overview

The Farm History District is an ode to New Jersey's agricultural past. Remnants of 18th and 19th century farmsteads are evident throughout including the Historical Hunt House built in the mid-18th century by Noah Hunt – this building has since been restored and is now the location of the Mercer County Park Commission. The Pole Farm district was first acquired in 1998; in 2012, a 435-acre restoration project reverted the former agriculture fields to meadow and forest. Native grasses and wildflowers were planted to support rare and threatened wildlife species such as grassland birds and insects like the arogos skipper. The wetland forests along the Maidenhead Trail (magenta) support several rare plant and animal species, vernal pool habitat, as well as roosting habitat for long-eared owls. In addition, a trail network provides connections throughout this expansive area including the Lawrence Hopewell trail (green), Twin Pines Trail (yellow), and Farm History Trail (orange).

Initial Impressions

The many long trails provide visitors with an immersive experience and various choices for supplying scenic opportunities, even stargazing within designated areas. Among historic fields and restoration meadows one can see far distances and the beautiful wildflowers dotted across the landscape (white beardtongue was in boom at the time of our visit). Interpretive signage helped to describe the history and the conservation goals utilized to restore valuable habitat. The elevated lookout provided a special experience for 360-degree views of the vast meadows and forested backdrop. The shaded Maidenhead Trail following the edge of the wetland forest bisecting the property allowed one to escape the sun and observe wildlife in this biodiversity hotspot. The lookouts, wooden walkways, and the bird blind were wonderful attributes that enhanced wildlife viewing opportunities and kept visitors in designated areas just outside of sensitive habitat. Chirping crickets, cicadas, birds, and frogs were heard throughout and were a constant reminder of how vital this conserved parcel is for wildlife habitat.

Facilities Inventory

Infrastructure such as benches, bird blinds, wooden walkways, and the elevated lookout were in great condition. Each amenity added much diversity in how visitors can experience the landscape and observe differing attributes and views. Trail signage looked rather new, was nicely designed, and was also in good condition. Likewise, interpretive signage, like those describing conservation, were very informative, well designed, and added much value to the visitor's experience.

One bridge had some erosion damage at its foundation, yet it was still safe to cross. Some areas had pooling water in the trail or alongside, which could provide breeding locations for mosquitoes. There were multiple unmarked trail entrances along Cold Soil Road. One in particular cuts through a field and leads to the connection with Van Kirk Road. This entrance appears to be regularly used and creates access for the community on the eastern side of the park.

Ecology Inventory

The large restoration meadows and efforts to encourage its success were palpable. Thriving native plants such as switchgrass and beardtongue were observed in several meadow restoration areas. Nonetheless, invasive plants along trails, scattered along meadow edges, and in the forested wetland pose serious ecological threats. Species such as autumn olive, multiflora rose, Asiatic bittersweet, mile-a-minute vine, mugwort, common reed, and Japanese stiltgrass were observed in many locations. Forest edges and canopy gaps, created from losses of ash trees, had the densest quantities of invasive plants. The forest canopy was otherwise composed of native trees such as red maple, black cherry, and black walnut, vines like wild grape and Virginia creeper, along with patches of ferns, jewelweed, sedges, and rushes, which all provide valuable habitat for wildlife. Several frog calls were heard, even among the loud chirping of the periodic cicadas. Sufficient tree regeneration was observed in all size classes, particularly of red maple in the forested wetlands, but invasive plants, especially vines, threatened their structure and long-term survival into the canopy.

Farm History & Pole Farm Districts

Analysis

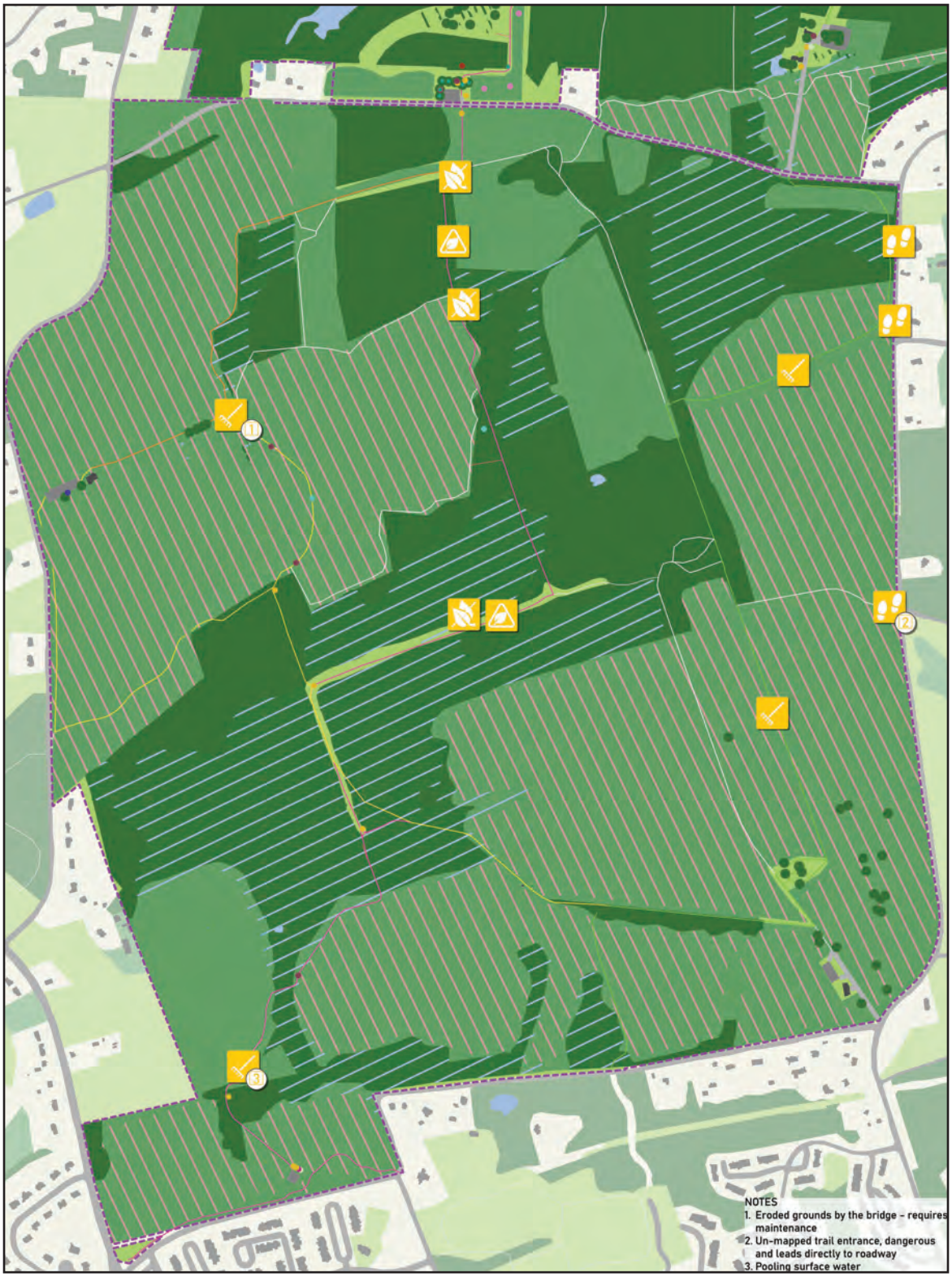


Figure 4.52: Analysis Map, Farm History & Pole Farm Districts.

Facilities Analysis

Most amenities in this district were newly created and installed, therefore all were generally in great condition throughout. The minor bridge foundation needs minor repair. Pooling water needs to be monitored and potentially landscape changes could be made, or mosquito larvicide can be used to reduce populations and potential disease.

It is recommended that safe pedestrian crossing measures be implemented on Cold Soil Road leading to the trail connection at Van Kirk Road. There are two additional unofficial trail opening along Cold Soil Road north of Van Kirk Road. One of these entrances has bollards to mark the connection but has lawn between the road and the path within the park. Connecting this path to the road with a more stable material would be beneficial for bicyclists and the addition of a pedestrian safe crossing on Cold Soil Road. The roadway leading into the Mercer County Park Commission office at Pole Farm was seen to be used as an entrance into Mercer Meadows. Adding a separate path of stone or compacted soil would add pedestrian safety by limiting the need for pedestrians and bicyclists to share the roadway with cars. The trail (green), used by bicyclists, leading from Pole Farm to Blackwell Road requires maintenance. The material of the path is loose and causes potential safety risks to those on bicycles. Considering a more stable material alternative such as asphalt is recommended.

Ecology Analysis

The central forested wetland provides high habitat value for several species, such as the long-eared owl, frogs and other amphibians, as well as songbirds, and insects. The central forested wetland is a conservation priority. Consider aggressive invasive plant control to protect conservation priorities from ecological degradation. Specifically, invasive vines like Asiatic bittersweet were observed actively strangling smaller trees and can destroy this valuable age class, which would hinder future canopy development. Removal treatment of invasive vines is critical to the future of the forest.

Figure 4.53: Restoration Signage.

Figure 4.54: Look out Point.

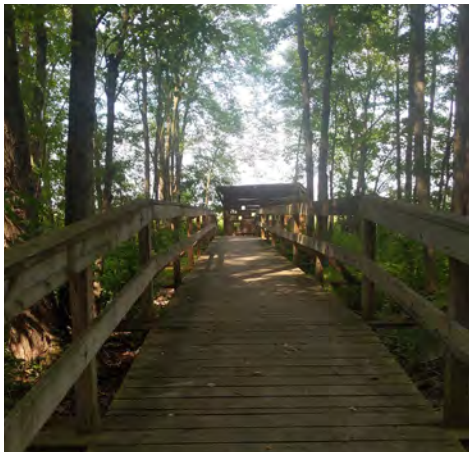


Figure 4.55: Bridge to Bird Blind.

Mercer Stables & Curlis Woods

Inventory

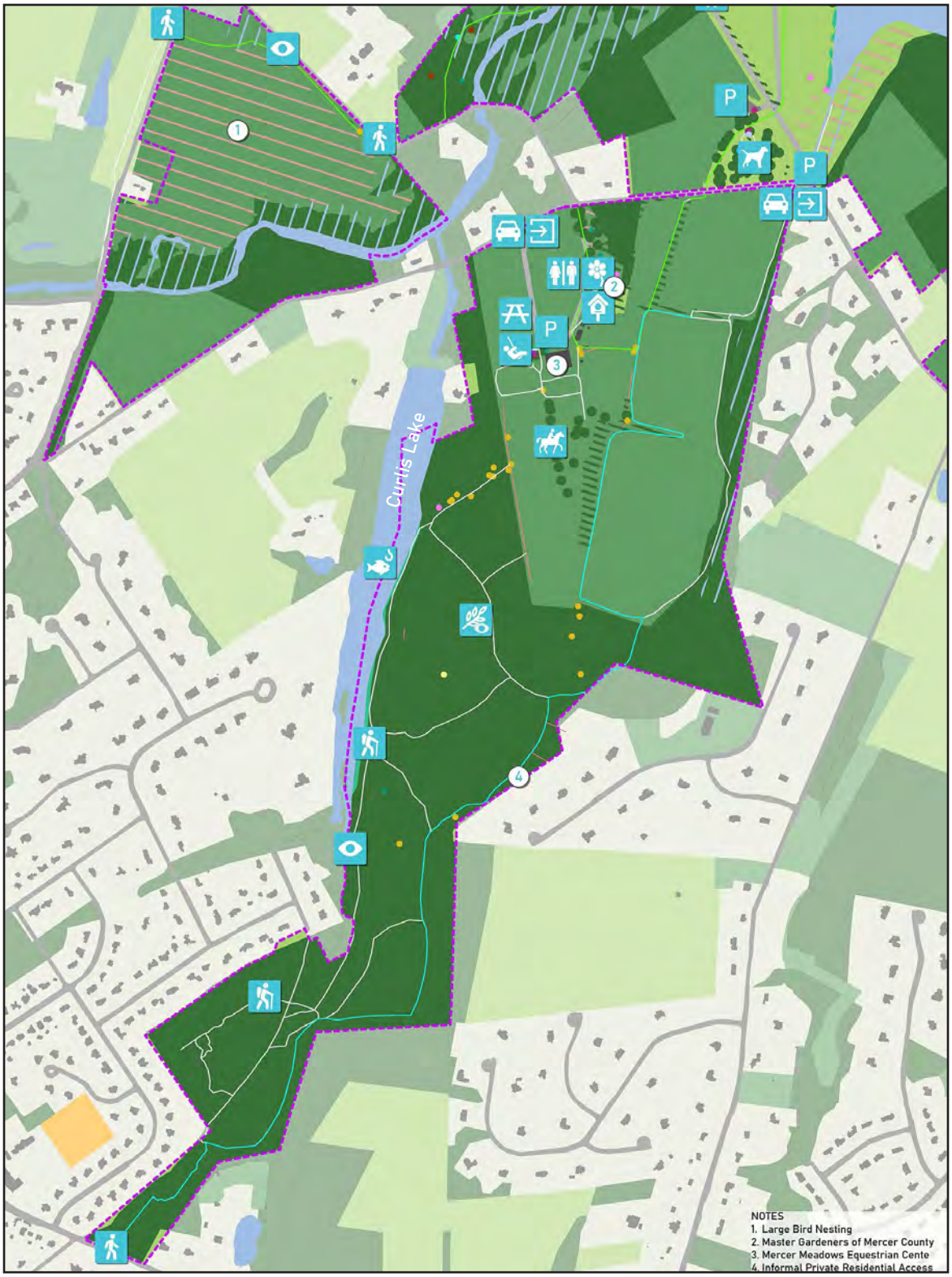


Figure 4.56: Inventory Map, Mercer Stables & Curlis Woods.

Overview

South of Federal City Road are Mercer Stables which contain 50 horse stalls, one indoor and two outdoor rings. The Mercer Stables offer lessons, Equine assisted psychotherapy, and horses and youth (HAY) programs specifically for children of underserved areas. The Mercer Stables are adjacent to Curlis Woods outfitted with hiking trails for horseback riders and hikers. Curlis Lake along the eastern boundary of the park is shared with private residences. Nestled next to the Mercer Stables is the Mercer Educational Gardens, which is maintained by Rutgers' Master Gardeners of Mercer County and boasts several garden beds and a restored meadow with a wide array of wildflower species and ornamental plants, accompanied by elaborate education signage.

Initial Impressions

The restoration meadows and riparian forests along the trails were teeming with pollinators and wildlife. The Mercer Stables and amenities looked newly renovated. The adjacent playground and parking area looked to need some ornamental plantings and shade trees. The adjacent Curlis Woods provided a peaceful immersion into a mature shady forest of oaks and beech complimented by the adjacent calm of Curlis Lake.

The Mercer Educational Garden housed countless floral species and little garden nooks and a variety of seating areas, bird houses, and interpretive signage; the immense effort to tend to these gardens was evident.

Facilities Inventory

The parking area had ample parking and the adjacent playground was in great condition. The Mercer Stables building looked newly renovated. Trails around the center were maintained well for horseback riding and hiking. Signage along the trails was sparse and made navigation confusing especially when entering Curlis Woods as there were several entrances and trails. Trail signage within Curlis Woods was also sparse which, along with the many desire paths leading to private residences all along the southern boundary of the park, was confusing. Signage for fishing and boating in Curlis Lake was absent. The Weinberger parcel discouraged public usage with numerous "No Trespassing" signs. The main trail entrance to Curlis Woods from Mercer Stables traveled through the enclosures along an unmarked mown path.

The Mercer Educational Gardens offered a picnic area, ample seating, a new bathroom facility, bird watching and other passive recreation opportunities. The interpretive signage in the gardens was delightful and very educational. Some wooden infrastructure to garden beds, bird houses, and seating was deteriorating and needed replacement.

Ecology Inventory

The Ecological District contained restored meadows dominated by native species (goldenrods, beardtongue, grasses, etc.). However some invasive plant species were scattered throughout. The riparian forest trails were heavily invaded by many invasive species (multiflora rose, Japanese honeysuckle, stiltgrass, etc.), which pose severe threats to nearby restoration areas.

At Mercer Stables, existing shade trees did not provide enough shade in the parking area, playground, and the equestrian building. Adjacent to the parking lot was the Mercer Educational Gardens containing several shade trees (some needed pruning) with countless plant species that support pollinators and other wildlife including the restored wildflower meadow. Many songbirds were observed utilizing the meadows, bird houses, and perching in trees.

Along the open trails of Mercer Stables, invasive trees like white mulberry were growing and overtaking other trees; many trees were covered in vines, some of which were invasive species. A few fields were overgrown into meadows with native plants, yet with some dense patches of invasive plants. Curlis Woods, the edges of Mercer Stables and along the park boundary, had many patches of invasive species. Many pose severe ecological threats to the interior oak-beech forest, which is mainly free of invasive plants. The mature oak-beech forest looked healthy and free of pests and disease. The riparian edge of Curlis Lake contains many native wetland species, including several ferns, which provide valuable habitat for wildlife. The Lake was in good condition during the visit (June, 2021) with no signs of eutrophication. However, the vast lawns on the residential side likely cause high nutrient run-off to enter the lake and eutrophication issues later in the hot summer months.

Mercer Stables & Curlis Woods

Analysis

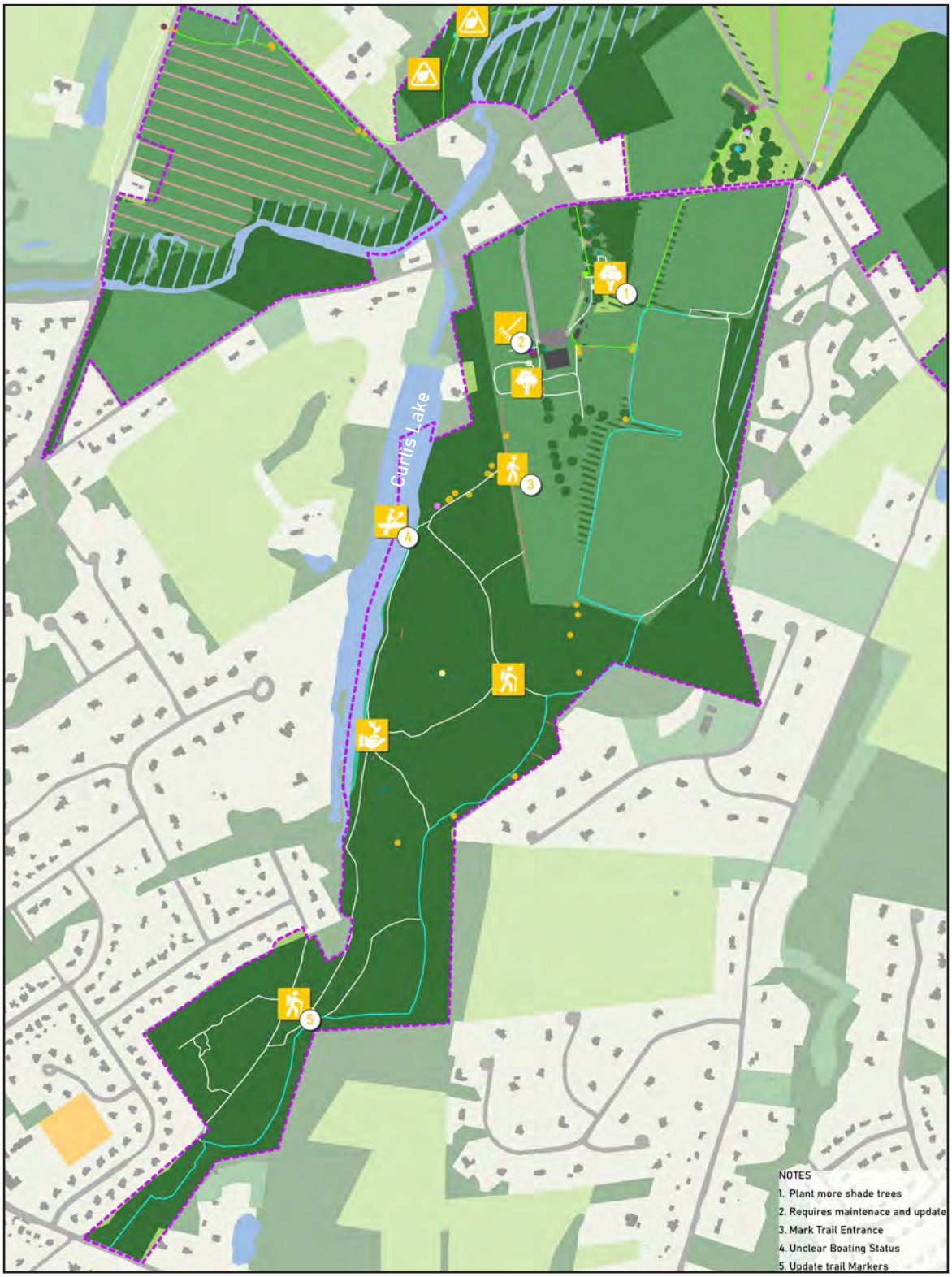


Figure 4.57: Analysis Map, Mercer Stables & Curlis Woods.

Facilities Analysis

Signage along the trail system needs improvement to aid in visitor navigation. Consider using traditional blazing methods. Signage regarding usage rules of Curlis Lake is needed to ensure proper recreational use of the waterbody. A designated kayak launch will help reduce water entry from multiple locations. Infrastructure improvements to Mercer Educational Gardens' beds, seating, and pathways would support future garden enhancements and maintenance. A large kiosk in the main parking area with a detailed map and other information would be helpful for visitors.

Ecology Analysis

Shade trees can be planted south of the playground to provide shade during hot summer months. Invasive trees, such as white mulberry, and invasive shrubs and vines can be removed along the fields at Mercer Stables to reduce ecological threats to the nearby forest edge. In Curlis Woods, multi-faceted invasive plant management techniques can be utilized to prevent spread of stiltgrass patches, barberry, multiflora rose, wineberry and others. The invasive plant infiltration is mostly on the forest edges, but needs to be controlled in order to aptly conserve the interior oak-beech forest. The many beech trees must be monitored regularly for a new invasive pest, the Litylenchus crenata Nematode, which causes deadly beech leaf disease.[15]

Figure 4.58: Inventory in Ecological District.

Figure 4.61: Fisherman.

Figure 4.59: Curlis Woods.

Figure 4.62: Playground.

Figure 4.60: Curlis Lake edge at Mercer Meadows.

John A. Roebling Memorial Park

Inventory

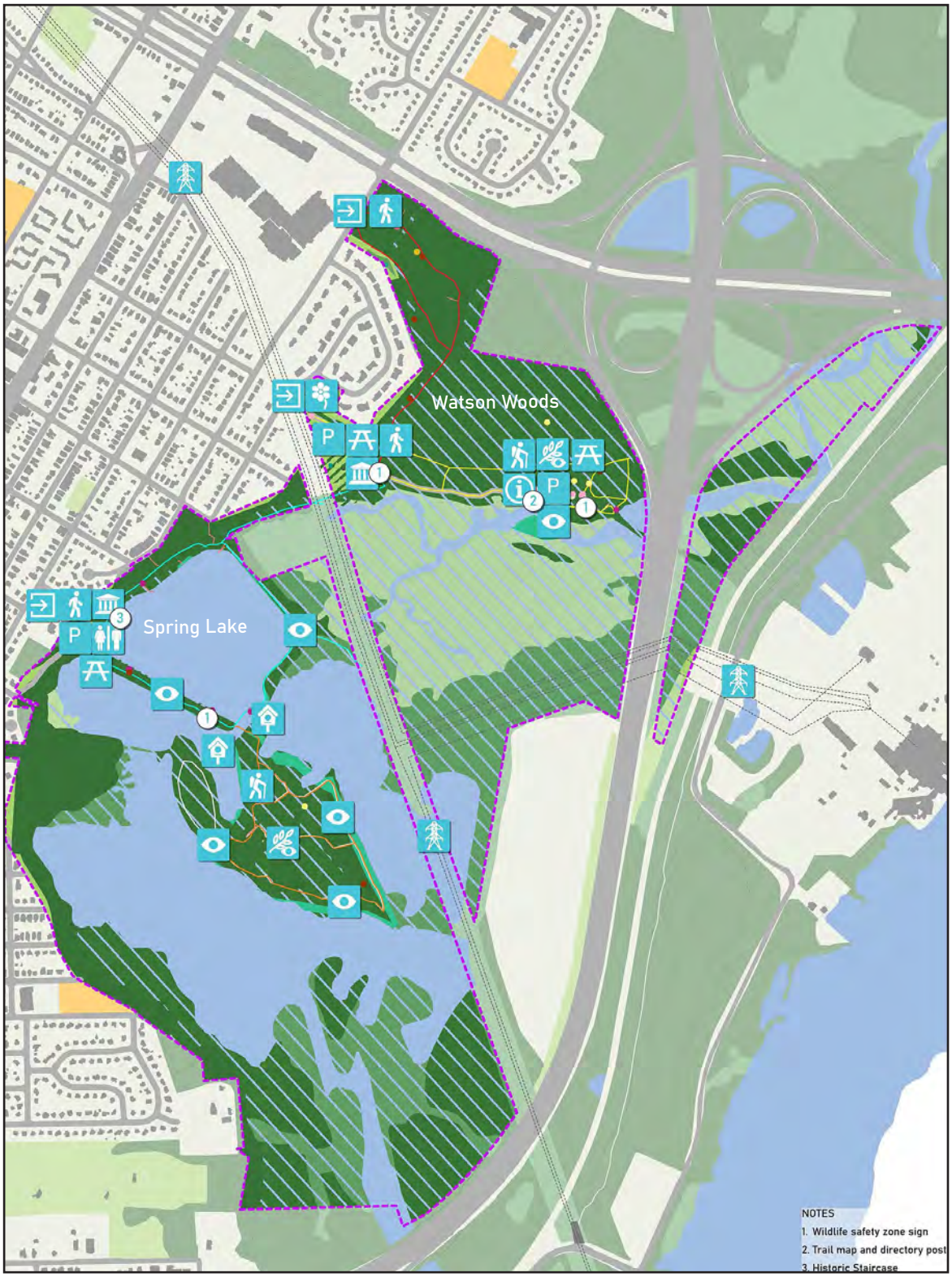


Figure 4.63: Inventory Map, John A. Roebling Memorial Park.

Passive Recreation Regional Park - Overview

John A. Roebling Memorial Park is rich in history as well as ecological diversity. In the 1860s archaeologist Charles Conrad Abbott (namesake of the marshlands) was the first to discover artifacts that dated back to the origins of Trenton as well as relics of Native American local culture. The oldest house in Mercer County, the Watson House, is located at the east end of the park and was built in 1708. It is also currently the state headquarters of the Daughters of the American Revolution. Another notable historic feature of the park sits next to the parking lot of Spring Lake along the steep hillside, a grand double staircase built in 1895 as part of the famed "White City" amusement park chain.

The famed Abbott marshlands and surrounding forests of Roebling Park are home to a variety of habitats from tidal marshes to upland forest and everything in between. The park is an ecological gem amid a dense urban area and is home to over 1200 species of flora and fauna. It is a destination site for nature enthusiasts and multiple locations for passive recreation activities such as biking, hiking, bird watching, fishing and access for kayaking. It is also home to the Tulpehaking Nature Center, which is named for the Lenape word meaning 'Land of the Turtle' as, "the turtle is a totem for one of the Lenape clans."[16] It currently welcomes visitors every weekend and provides a variety of programs about local nature and culture of the indigenous Lenape people.

Initial Impressions

The hiking path around Spring Lake and the connected Island Trails (white and orange) were absolutely tranquil. The views of the lake were beautiful and filled with lush aquatic plants teeming with wildlife. The terrain was flat and provided access to all ages and people with ambulatory difficulties. The Eastern side of the park, called Watson Woods, has an active nature center and is the site of the historic Watson House. The property in between offers parking and a clean location to picnic and rest between hiking; these areas were all well-maintained. The drive to the lower parking area was clear, but lined with hordes of invasive plants. The lower parking area contained many dying shade trees oaks, but offered a nice view of the tidal marsh and access to the Abbott Brook Trail (yellow)

Quick Facts

- 405 Acres of Land
- 52 Acres of Forest
- 0 Acres of Agriculture/ Meadow
- 0 Acres of Barren Land
- 315 Acres of Wetland
- 30 Acres of Water
- 89 Acres of Urban Land
- .4 Acres of Impervious Surface
- .5 Miles of Roads

Figure 4.64: Marsh and Restoration.

Watson Woods

The Tulpehaking Nature Center was closed during our visit, yet it was in good condition and clean in the area; there was sufficient street parking to accommodate visitors when it reopens. Entryway signage to the Watson Woods and parking area was clear; the parking lot was small but in good condition. The historic Watson House was in fair condition and an intriguing sight. The few informational signs were helpful when discovering the area.

The roadway to the lower parking area was clear and in fair condition. Signage to the trails along the road was unclear and difficult to find. The lower roadway ended at a picnic area with ample parking, a heavily used port-a-john, and a spectacular view of the Abbott Marshlands. The marshlands interpretive signage shared valuable information and was clearly displayed. The Abbott Brook Trail (yellow) entrances in this area were not clearly marked and easily confused with other nearby unmarked trails. The Bluff Trail (red) exits out of the wetlands up a steep slope that showed some signs of erosion. Along the Bluff Trail loop there was an old encampment full of litter and may still be a current gathering area. Several areas were littered, had old fire pits, and one location was vandalized with graffiti on trees. The Independence Avenue trailhead was not clearly marked, seemed hidden, creating an area for uses hidden from pedestrian view.

Spring Lake

A small old sign with white, blue, and black sharpie marks the entrance to the trail that connects north to Spring Lake from the Watson Woods access road. Car access to Spring Lake is hidden at the end of a dead-end road and leads to Spring Lake, a parking lot, and the historic grand staircase. At the parking area are picnic tables, a fenced port-a-john, and trail entrances to either end of the Spring Lake Loop. One trailhead has a nicely designed trail map kiosk with a solid roof. The loop trail was very scenic, had many desire line off-shoots and landings to experience lakeside views; the trail was well maintained and surrounded by greenery. There was signage promoting people to photograph change in the landscape as a part of a restoration effort. At the bridge crossing the Island trails (orange and white) begin. They were narrower and needed a little more clearance for adequate passage. Yet they were pretty well maintained. A couple creatively upcycled/constructed items were found that were unsafe for public use, such a bridge made using many items including old electrical cords.

Figure 4.65: Pickerelweed.

Figure 4.66: Jean Taking Inventory.

Figure 4.67: Artwork in the Woods.

Ecology Inventory

Watson Woods

The Tulpehaking Nature Center was surrounded by native plantings, but adjacent to a stand of invasive black locust. The picnic area by the Watson House also had an adjacent native plant garden and several large trees, some black locust, but provided ample shade and some screening to the nearby right-of-way. Nearer to the Watson House, the garden area was planted with exotic plants. Many boxwoods were planted formally to line the path and were experiencing health issues as they are susceptible to several diseases and pests. Next to the Watson House was a giant tree of heaven, which was the mother tree of the many smaller tree of heaven trees along the access road, which is also inundated with an array of invasive plants including the seriously threatening porcelain berry. Hundreds of spotted lanternfly crawlers were spotted along this access road as they are attracted to the tree of heaven.

The lower parking and picnic area had several pin oaks as shade trees, many of which were dying or had dead branches that needed attention. Watson woods in general had many invasive plants along the edges and infiltrating where canopy gaps occurred, many due to declining ash trees. Specific interior locations of Abbott Brook Trail (yellow) near the brook were not highly invaded and maintained fern glades, aquatic herbs, and native trees of all age classes. The nearby spartina marsh, as seen from the viewing area, was in good condition and teeming with birds and winged insects.

Spring Lake

The area around the Spring Lake parking lot was inundated with invasive plants. Japanese knotweed covered the steep slope on both sides of the grand staircase. Invasive trees, like Norway maple, white mulberry, and tree of heaven, shrubs like autumn and multiflora rose, vines like Asiatic bittersweet, and herbs like garlic mustard and Japanese stiltgrass, dominated the areas surrounding the parking lot. As one proceeds down the trails away from the parking area, invasive dominance lessened. The location of greatest terrestrial native plant diversity and intact plant communities was found along the Island Trails (orange and white); yet, some small patches of invasive plants were spotted here as well as small restoration areas.

The lakes and wetlands were filled with spatterdock and many other aquatic plants such as purple pickerelweed, arrow arum, and duck potato. Only minor signs of eutrophication were seen at the shoreline by the parking lot. Along the trail many birds were spotted flying across the water, some frogs were seen and heard, cicadas and dragonflies were greatly abundant, and a beaver den was observed.

Figure 4.68: Restoration Outreach.

Figure 4.69: Mushrooms.

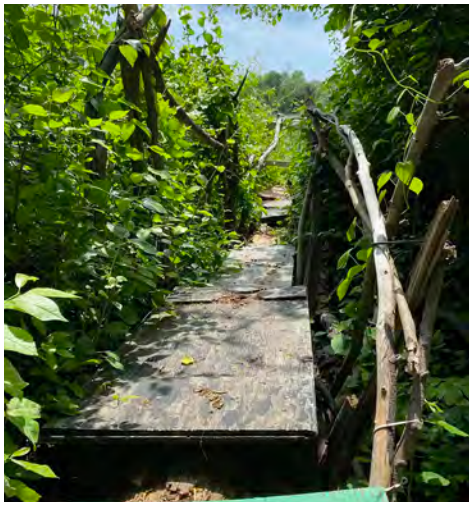


Figure 4.70: Foraged Bridge.

John A. Roebling Memorial Park

Analysis

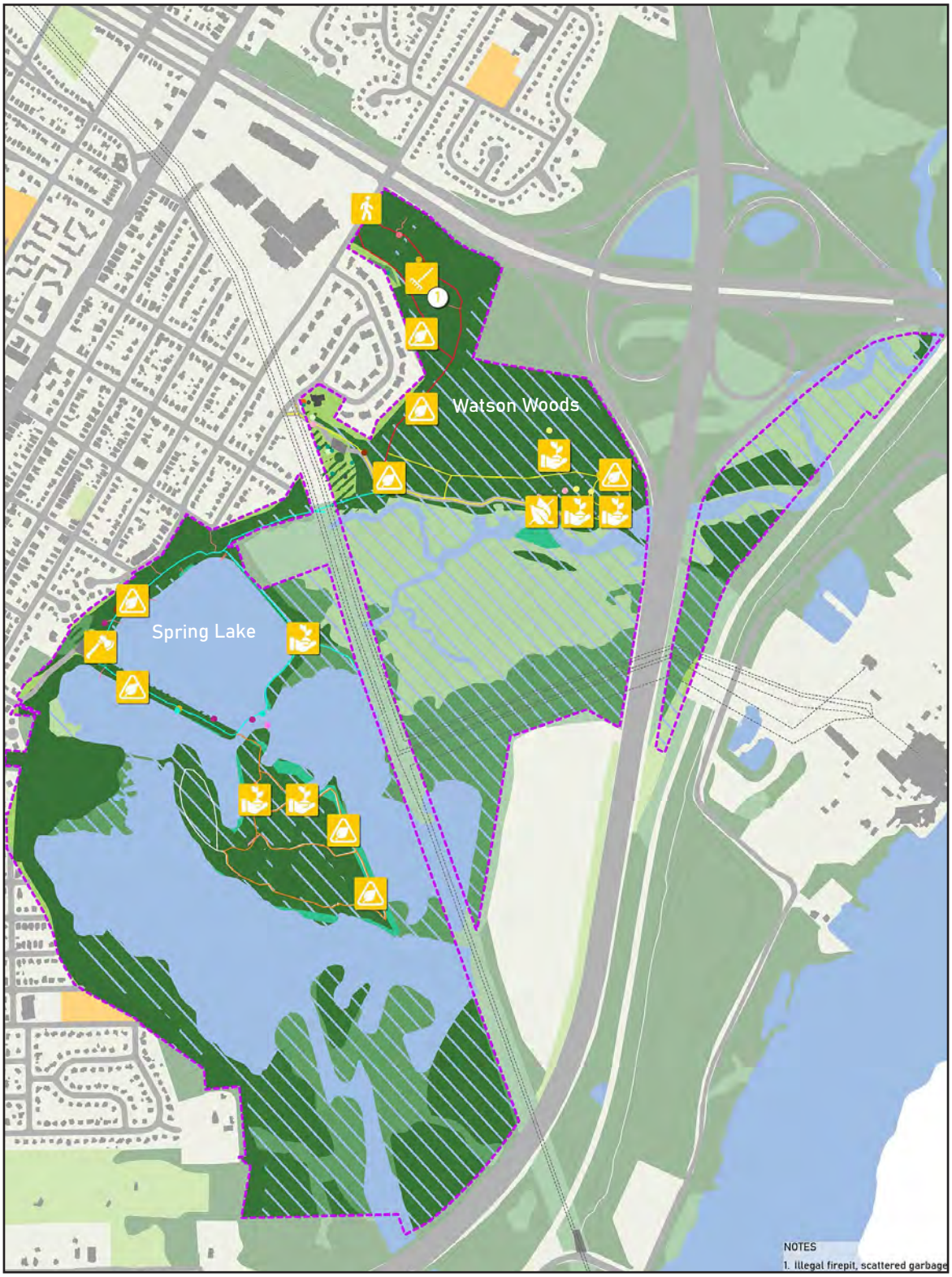


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Figure 4.71: Analysis Map,
John A. Roebling Memorial Park.

Facilities Analysis

The interpretive signage was in great condition and very informative; consider including more interpretive signage in more locations, such as the pristine spot along Abbott Brook. It would be best to update all trail signage to conform to traditional trail blazing standards; it would decrease confusion for visitors. The desire paths in Watson Woods should be closed off and only official trails should remain open. More frequent litter pick up would be beneficial along the Bluff Trail. If illegal activities do not cease along the Bluff Trail, consider officially closing and blocking off the entrance on Independence Ave. Along the Spring Lake Loop Trail, more benches or seating at viewpoints would be ideal. Any unauthorized upcycled structures should be removed to ensure public safety. It would be beneficial to increase maintenance frequency of the port-a-john units to keep them in better condition.

Ecology Analysis

Watson Woods

It would be beneficial to plant new native shade trees below the black locust as they are short lived, but should be removed in any case before they spread further. The boxwood hedges along the pathway to the Watson House were in poor shape and should be removed and replaced with a native alternative like northern bayberry. The invaded area along the access road is an ecological threat and any intervention would be long-term and extensive. However, to control spotted lanternfly, the trap tree method could be used which involves removing all but one of two trees of heaven, leaving them as trap trees, which are then treated with insecticide. The lower picnic area contains several hazardous pin oaks that require removal or pruning. Underplant here also with new native trees to ensure canopy cover in the future.

The interior wetland area of Watson Woods is a conservation priority as it maintains ecological health, function, and biodiversity as seen from the Abbott Brook Trail (yellow). The surrounding invaded areas pose significant threats which are amplified by the patchy losses of canopy due to declining ash trees. Consideration of targeted invasive plant treatments in nearby areas would be greatly beneficial and provide protection to the interior conservation priority habitat.

Spring Lake

The invasive plants around the parking lot pose serious ecological threats to the native terrestrial plant communities nearby. Ideally, a major restoration could take place to remove the Japanese knotweed and invaded forest surrounding the parking lot and replace them with a native plant community. Yet, this would be a very large undertaking that would also require decades of intensive stewardship work.

The terrestrial habitats along the orange and white Island Trails are in great condition and must be a conservation priority. As such, early detection rapid response (EDRR) should be performed frequently to conserve this area and prevent incoming invasive plants from taking hold. Additionally, the water bodies and aquatic habitats are also in great condition and are conservation priorities.

Figure 4.72: Abbott Marsh Signage.

Figure 4.73: Picnic Area.

Figure 4.74: Marsh View.

Dam Site 21 - Miry Run Ponds

Inventory

Figure 4.75: Inventory Map, Dam Site 21 - Miry Run Ponds.

Passive Recreation Regional Park - Overview

Located between the three towns of Hamilton, Robbinsville, and West Windsor – Dam Site 21 - Miry Run Ponds was first acquired by Mercer County in 1979 to create a recreational area and as a flood control facility. In 2017, Mercer County acquired 4.3 acres on Hughes Drive as an addition to Dam Site 21 and is now planning to incorporate it into the larger dam site."[17] The newly combined park is to be named "Miry Run Ponds" to showcase a one-of-a-kind facility with unique settings and environment. Activities within the park will be geared towards passive recreation centered around environmental education and ecological restoration. The total park size is to be 279 acres with over half being labeled as new or protected habitats.

Initial Impressions

Once one of the discreet entrances to this park is found, one walks through the dense wetland forest and approachs the water's edge to witness flourishing aquatic and wetland plants teeming with frogs, fish, as well as birds catching insects. It is quiet and attracts few people at one time. The surrounding forest provides an effective screening that allows one to feel hidden or disconnected from the adjacent residential neighborhoods. Overall, it is serene park with great opportunities for viewing wildlife as it provides invaluable habitat for a thriving native ecosystem that supports threatened and endangered species.

Inventory Ecology

The forest surrounding the water bodies was dominated by sweet gum and included other swamp tree species such as red maple, willow, and pin oak. The fringing forest understory was primarily invaded with the typical culprits autumn olive, multiflora rose, garlic mustard and Japanese stiltgrass. However, some pockets of backyard escapees are infiltrated by Chinese wisteria and English ivy. Even so, a few scattered areas of native understory swamp plants prevailed such as elderberry, highbush blueberry, greenbrier, and deer tongue grass.

The meadows in the western area of the park are in moderate condition as they have common native species like dogbane and common milkweed, but also common invasives like mugwort and Chinese lespedeza. However, the meadows are a more sustainable option to the large expanses of mowed turf grass on the berm of the dam and the lower floodplain.

At the water's edge contains a plethora of native aquatic plants including pickerelweed, arrow arum, arrowhead, spatterdock, swamp rose mallow, buttonbush and many more. They all provide valuable floral resources, forage, larval hosting or shelter for amphibians, insects (aquatic and flying), birds and waterfowl. A local fisherman seen on site explained there is an array of fish species living in the ponds including bass, perch, pickerel and unfortunately, the dangerously invasive snakehead.

Quick Facts

Figure 4.76: Birch at Stream Edge.

Figure 4.77: Meadow Meets Forest.

Dam Site 21- Miry Run Ponds

Analysis

Figure 4.78: Analysis Map,
Dam Site 21 - Miry Run Ponds.

Ecology Analysis

As the entire park provides valuable habitat for threatened and endangered species and is in generally good ecological condition, it is a conservation priority as a whole. The terrestrial invasive plants in the forest pose significant ecological threats to the ecosystem of this park, especially the wisteria observed spreading by the cul-de-sac on the eastern edge of the park. Any improvements should include serious invasive plant control to restore infiltrated areas.

The ponds looked to be healthy and lacked signs of eutrophication. The many aquatic plants and widespread spatterdock are very beneficial to the health of the waterbodies and aquatic ecosystem. Their conservation should be considered a high priority. In addition, a plan should be devised and seen through to rid the Miry Run ponds of the invasive snakehead fish, which poses a significant ecological threat to the aquatic ecosystem.

Figure 4.79: Entrance from Hughes Drive.

Figure 4.80: Parking on Hughes Drive.

Figure 4.81: Vegetation.

Mercer County Park

Overview

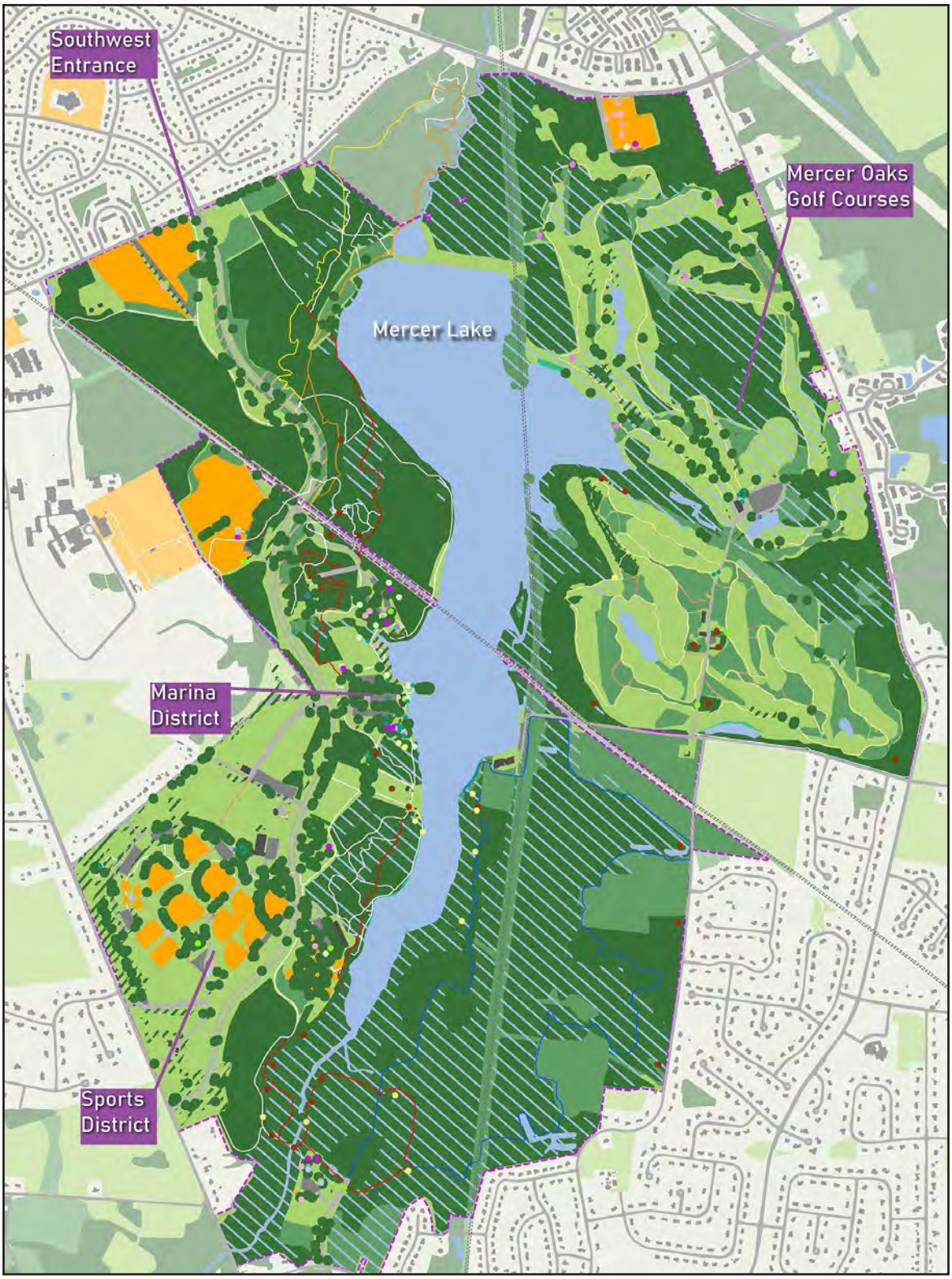


Figure 4.82: Overview Map, Mercer County Park.

Active Recreation Regional Park - Overview

Mercer County Park is the largest park in Mercer County (2500-acres) which lies in West Windsor, Hamilton, and Lawrence Townships. The Park is open year-round to the public at no fee. This Park features open access to basketball courts, baseball fields, tennis courts, an ice-skating center, 17 large multi-use athletic fields, mountain biking trails, cricket pitches, disc golf, kayaking, and more; it is the county's active recreation hot spot. Mercer County Park also offers many passive recreation opportunities in designated picnic areas, playgrounds, dog park, and along the extensive hiking trails which weave through meadows and forested tracts. In the center of the park is the beautiful Mercer Lake, which is part of the Assunpink Creek; it is surrounded by inner coastal plain forests, some of which are pristine and provide high-value habitat for many rare and endangered flora and fauna species. In general, there is something for everyone in Mercer County Park; it even hosts hundreds of different events and festivals, which have become a staple for Mercer County life.

Figure 4.83: Red Trail.

Quick Facts

- 2156 Acres of Land
- 418 Acres of Forest
- 70 Acres of Agriculture/ Meadow
- 0 Acres of Barren Land
- 670 Acres of Wetland
- 283 Acres of Water
- 709 Acres of Urban Land
- 8.5 Acres of Impervious Surface
- 7.5 Miles of Roads

Park Districts

-Marina District
-Southwest Main Entrance
-Sports District
-Mercer Oaks & West Golf Courses

Figure 4.85: Spray Park.

Figure 4.86: Picnic Pavilion.

Figure 4.84: Tennis Court Area.

Marina District

Inventory

Figure 4.87: Inventory Map, Marina District.

Overview

The Marina District is the central hub of Mercer County Park. It provides abundant parking for the many recreational activities available and events that take place here. This location provides access to many popular gathering spaces, playgrounds, picnic areas and many trails including the red hiking trail which crosses the length of the park. The marina/boathouse offers a free small boat ramp and kayak, pedal boat, and rowboat rentals as well as a snack bar and large capacity restrooms.

Initial Impressions

The beautiful views of Mercer Lake steal the show in the Marina District. The many seating areas, picnic locations, playgrounds and trails feature Mercer Lake as the main backdrop to passive and active recreation. The many gathering spaces were clean and well-maintained. The playground and spray park were new installations and very nicely designed. Grandparents Grove was a thoughtfully created space for spending time with family and viewing the lake, under the light shade of mature trees. The vast parking lots were heavily used and could benefit from more shade trees.

Facilities Inventory

The Marina District offers a wide array of amenities and activities. There are numerous paths which encourage shared bicycle and pedestrian usage. The rentable picnic areas are plentiful and relatively new. Two picnic areas overlook Mercer Lake providing an ideal ambiance. There are numerous garbage cans, dumpsters, and benches placed throughout the Marina District in hopes of maintaining a litter free environment.

Mercer Lake is a central feature of the Marina District. A pier extends from the bottom of the wide Marina path from the main parking area out over the lake. The path is lined with shade trees and benches leading to a gazebo that overlooks the water. The view of the lake at the gazebo is breathtaking, but undoubtably reveals signs of human imposition on the landscape. It is difficult to overlook the two transmission lines crossing one another over the lake. At the lake edge there is a large facility for renting kayaks.

The playgrounds to the east of the main parking lot cater to multiple age groups and even have an ADA accessible swing set. This is one of the few areas noted to have ADA accessible play equipment throughout the park. The water park within the playground area was brand new and very clean. The material throughout the playground was rubber grounding for safe play. Seating and shade trees were ample in the play areas.

Ecology Inventory

The forested stands to the east and west of the parking area have invasive plants along the forest edges, such as Asiatic bittersweet and autumn olive. The western forests are primarily composed of floodplain forest species - red maple, sweet gum, pin oak, swamp white oak, and black cherry. The eastern forest stand is an exceptional inner coastal plain forest ecosystem dominated by swamp white oak and black oak and include black birch, red maple, American holly, black gum, sassafras, and even some chestnut trees, which are very rare. Deer rub damage was found on most tree saplings. The understory ground layer was an intact grove of huckleberry, lowbush blueberry, greenbrier, and Pennsylvania sedge, which exemplify the natural plant community. Even pink lady's slipper orchids were observed in protective fencing in this special forest stand. The forested riparian edge along the lake provides valuable habitat and erosion control for the shoreline and is composed of a biodiverse assemblage of naturally occurring coastal plain species.

Figure 4.88: Regeneration.

Marina District

Analysis

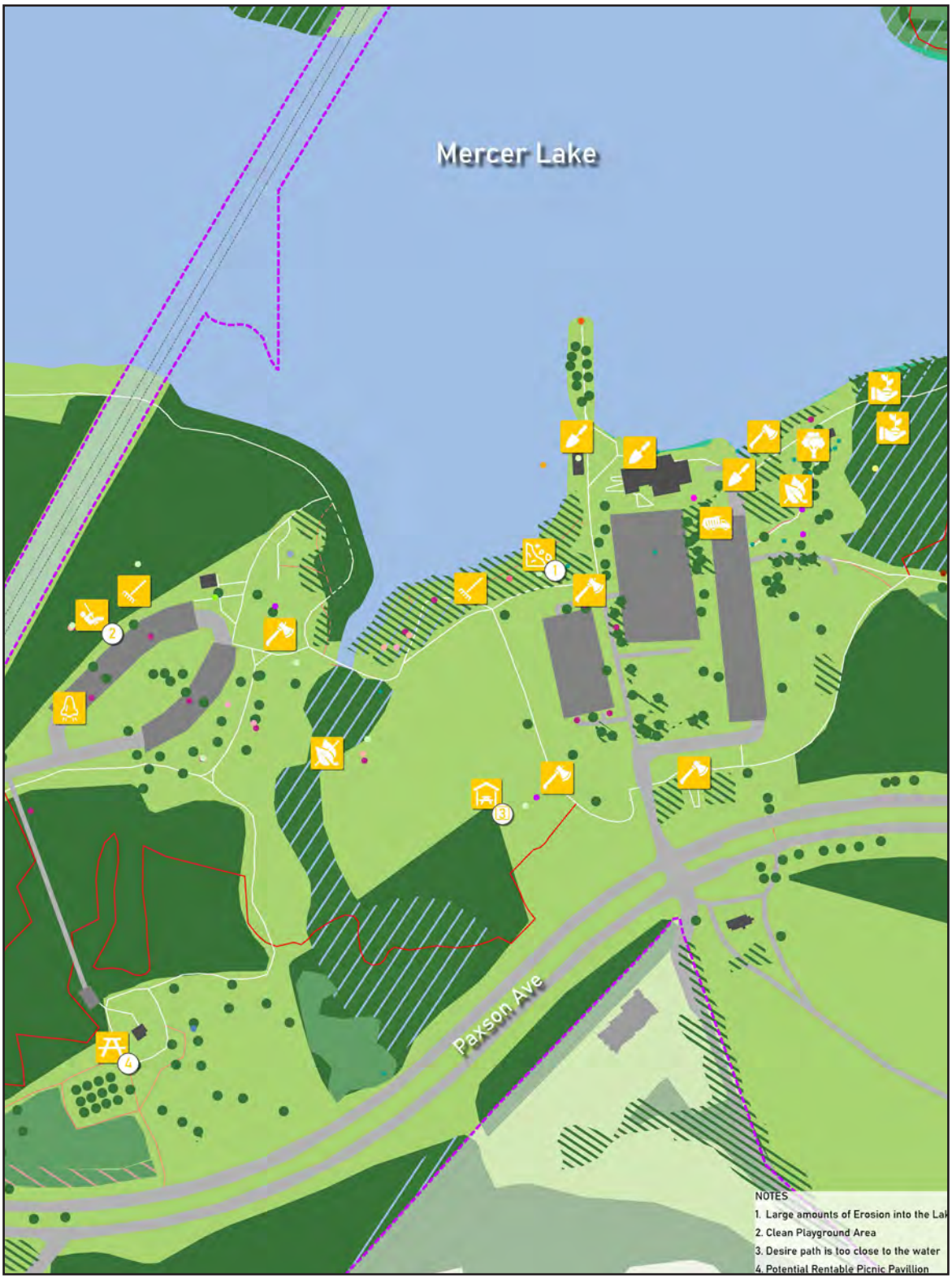


Figure 4.89: Analysis Map, Marina District.

Facilities Analysis

The amenities in the Marina District were well maintained and accessible. There were a few instances where more attentive upkeep was needed. Near Grandparents Grove and along the lake edge there was excessive litter scattered around the garbage cans, picnic tables, and slope to the lake. The charcoal pits in the picnic areas were also filled with trash. There were noticeable signs to deter dumping, but these were ignored. Full dumpsters were noticed in the parking lot in full sun, this created an unpleasant experience when walking passed these dumpsters. More consistent maintenance and monitoring will help with excessive litter throughout the park.

A small wooden fence near Grandparents Grove along the slope leading to Mercer Lake had fallen over posing a potential safety risk. However, the fence has not prevented visitors from venturing lakeside as evidenced by the desire path along the slope. The prevention of desire paths can be handled through various methods including trail blocking with forest debris, vegetation, and or fencing.

Ecology Analysis

Declining Zelkova in the parking areas should be removed and replaced with hardy native tree species. Most shade trees over the parking areas would be beneficial. Invasive plants below shade tree canopies and in the marina garden beds should be controlled and monitored regularly. Consider a new, more sustainable, native planting palette to replace invasive and exotic plants in the marina/ boathouse garden beds.

Invasive plants near the forests and along forest edges should be actively controlled and monitored to prevent further invasion as they pose ecological threats to the entire area. Most importantly, the protection of the inner coastal plain forest adjacent to the spray park and shoreline barbecue area are very high conservation priorities. Consider added protections, like small exclosures, to prevent damage in the barbecue area along the shoreline. Also consider a large deer exclosure for the main forest stand to protect sensitive species, like the pink lady's slipper and to prevent further buck rub to saplings. If a large exclosure is not possible, consider single tree stem protection to prevent buck rub at the least. Constant damage to the sapling layer will cause significant discrepancies in future canopy cover and may cause this precious forest tract to be lost. This needs to be prevented.

Figure 4.90: Picnic Area.

Figure 4.91: View over Mercer Lake.

Figure 4.92: Playground Area.

Southwest Entrance

Inventory

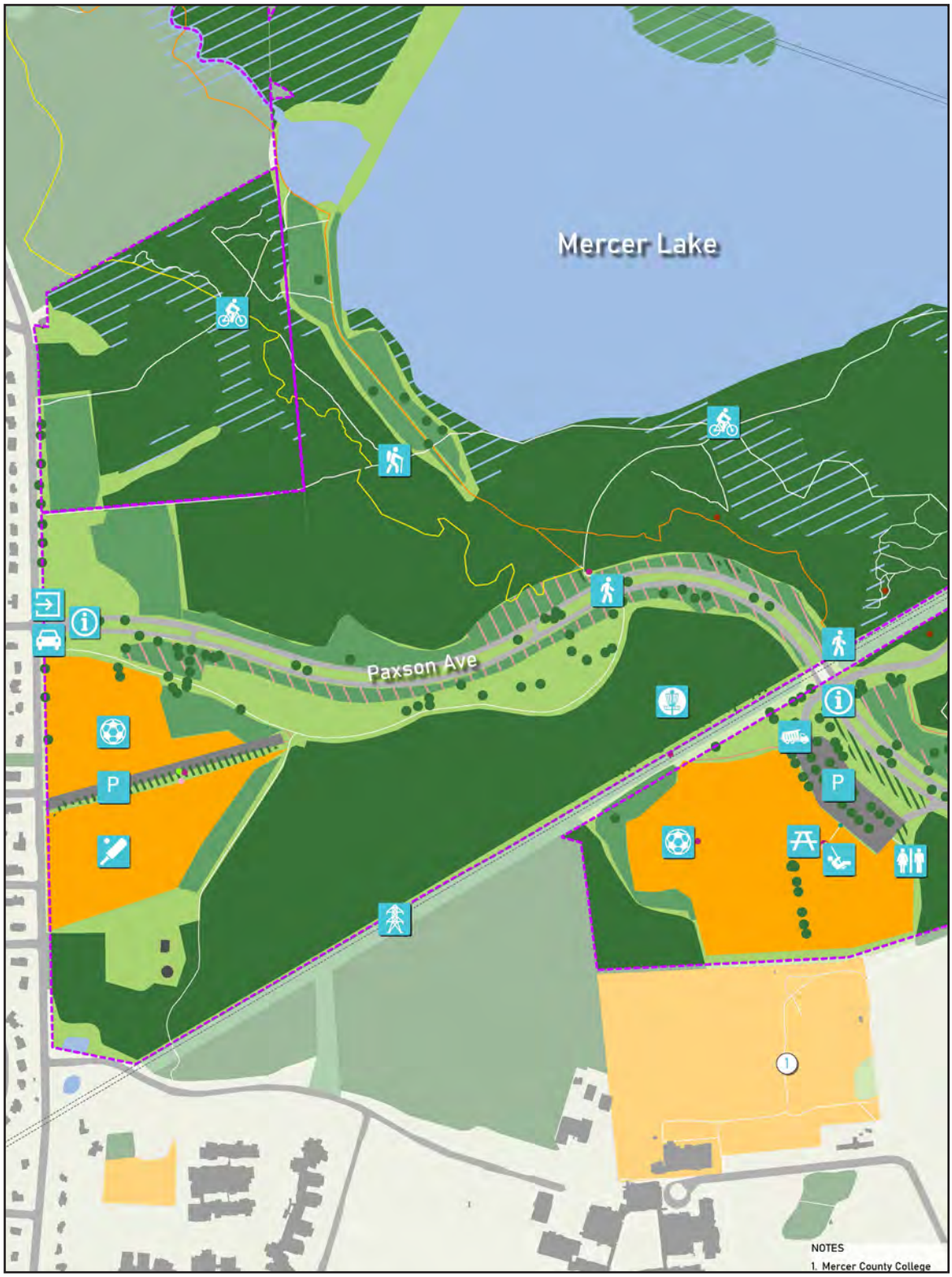


Figure 4.93: Inventory Map, Southwest Entrance

Overview

Located off Hughes Drive, the Southwest Main Entrance is hard to miss - with large welcoming signs and horticultural plantings. This entryway boasts new restoration meadows with forested backdrops along both sides of Paxson Avenue. Paxon Avenue is a true parkway drive in that it undulates through the park taking visitors all the way from the West to the East side of the park. The meadow edges and expansive forest tracts contain multiple scenic long-distance hiking and biking trails. The Southwest area notably houses several large sports fields for various activities such as cricket, soccer, football, disc golf. This area is also home to picnic areas, an adult work out area, and playgrounds.

Initial Impressions

The Southwest Park entrance is located on Hughes Drive and was very easy to find. The entrance to the park is scenic having the feeling of a traditional parkway entrance. Upon initial arrival the Southwest Entrance feels more secluded and quieter than the rest of Mercer County Park. This area had features which were tucked behind the tree groves along the park drive with trails throughout the forested area and along the meadows.

Facilities Inventory

The Southwest Entrance area features amenities such as soccer fields, a cricket pitch, a disc golf course, expansive meadows, multiple trails through the forested areas, ample parking, and a historic building. The path which connects the amenities was in great condition and well maintained. Ample parking was present throughout this area in association with the areas designated for recreation. Parking Lot 1 had pooling water and some degradation to the asphalt. Near the cricket pitch toward the park's edge, there was a large pile of debris that appeared to not look intentional.

The gravel path along Paxson Avenue is narrow and is used by both pedestrians and bicyclists. However, there is a designated pedestrian path at the Southwest main entrance which takes pedestrians along the soccer fields toward the disk golf area leading to a crosswalk on Paxson Avenue. This is where the path connects with the orange

Figure 4.94: Southwest entrance parking lot.

trail into the forested area along Mercer Lake. The Park entrance from Hughes Drive has pedestrian crossing and an inviting LED sign. The surrounding neighborhood has sidewalk connections creating safe access points into the park.

When entering Paxson Avenue from Hughes Drive the roadway is lined with meadow restoration projects making for a pleasant entryway experience. The meadows and winding layout of the roadway has the feel of a traditional park way similar to Fredrick Law Olmsted style park roads. This area is serene with expansive views beginning with the meadows continuing to the dense surrounding forest patches.

John Rogers' Historic House is located on Paxson Road and is an intriguing point of interest. However, road crossing near the John Rogers' House was difficult because there was no pedestrian crossing even though the soil path leads directly to Paxson Avenue.

Ecology Inventory

The tree-lined parking area adjacent to the cricket pitch had a mix of invasive trees like white mulberry and Norway maple that were in poor structural condition, along with native black cherry and poplars. The invasive tangle of vines and plants below was in poor aesthetic and ecological condition. In contrast, the alley of oaks between Paxson Avenue and the parking area farther east was in good condition. Sweet gum shade trees were planted through the parking lot and their growth over time will provide more shade in the future.

The restoration meadows along Paxson Avenue were in relatively good ecological condition except for areas where the common invader, mugwort, was dominant. The forest tract adjacent to the disc golf course had a heavily dominant sweetgum overstory, but the layers below were heavily invaded with Asiatic bittersweet vine, autumn olive, garlic mustard and Japanese stiltgrass, especially along forest edges. The long pathway in the ROW to the disc golf area had a slight swale inundated with a new invader, poison hemlock, which is a serious hazard to public health.

The floodplain forests north of Paxson Avenue were dominated by sweet gum and red maple canopy trees. The regeneration was primarily sweet gum, yet covered in invasive Asiatic bittersweet vine which was found strangling many trees. The shrub layer is infested with invasives like multiflora rose and autumn olive and the ground layer is dominated by Japanese stiltgrass. Some patches of the fern, ebony spleenwort, were spotted, but they will be lost in time as invasive plants persist. The oak-black birch forest area near the powerline right of way along the beginning of the orange trail was in better shape. Even though the common invasive plants were present, there were still patches of native groundcover persisting such as glades of New York fern, Pennsylvania sedge, and natural thickets of huckleberry, dangleberry, and greenbrier.

Figure 4.95: New Event Space.

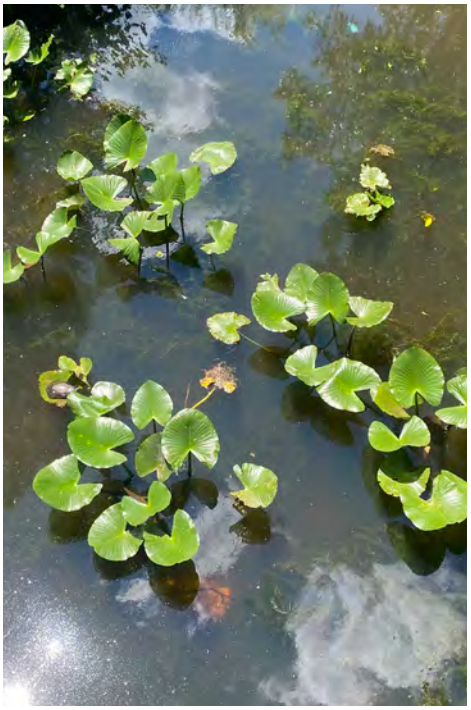


Figure 4.96: Aquatic Life.

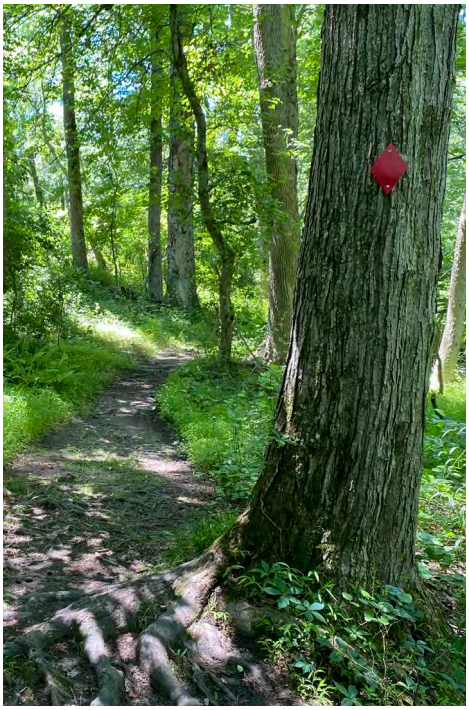


Figure 4.97: Red Trail.

Southwest Entrance

Analysis

Figure 4.98: Analysis Map, Southwest Entrance.

Facilities Analysis

The main recommendations in this area include repairing cracked asphalt in parking lots, or replacing asphalt with previous material, relocating the unsightly debris pile to a location hidden from public view, and incorporating more pedestrian crossing across Paxson Avenue. Crosswalks along the main roadway will deter people from crossing at random locations and increase pedestrian safety. Incorporating a crosswalk in front of John Rogers' House and updating the path leading to the house from Paxson Avenue will make this a more formal entrance to a historic feature within the park. The rear entrance to John Rogers' House is nicely paved with handicap parking. Material to match the back entrance would enhance the overall experience of John Rogers' House from Paxson Avenue, marked with wayfinding signage.

Ecology Analysis

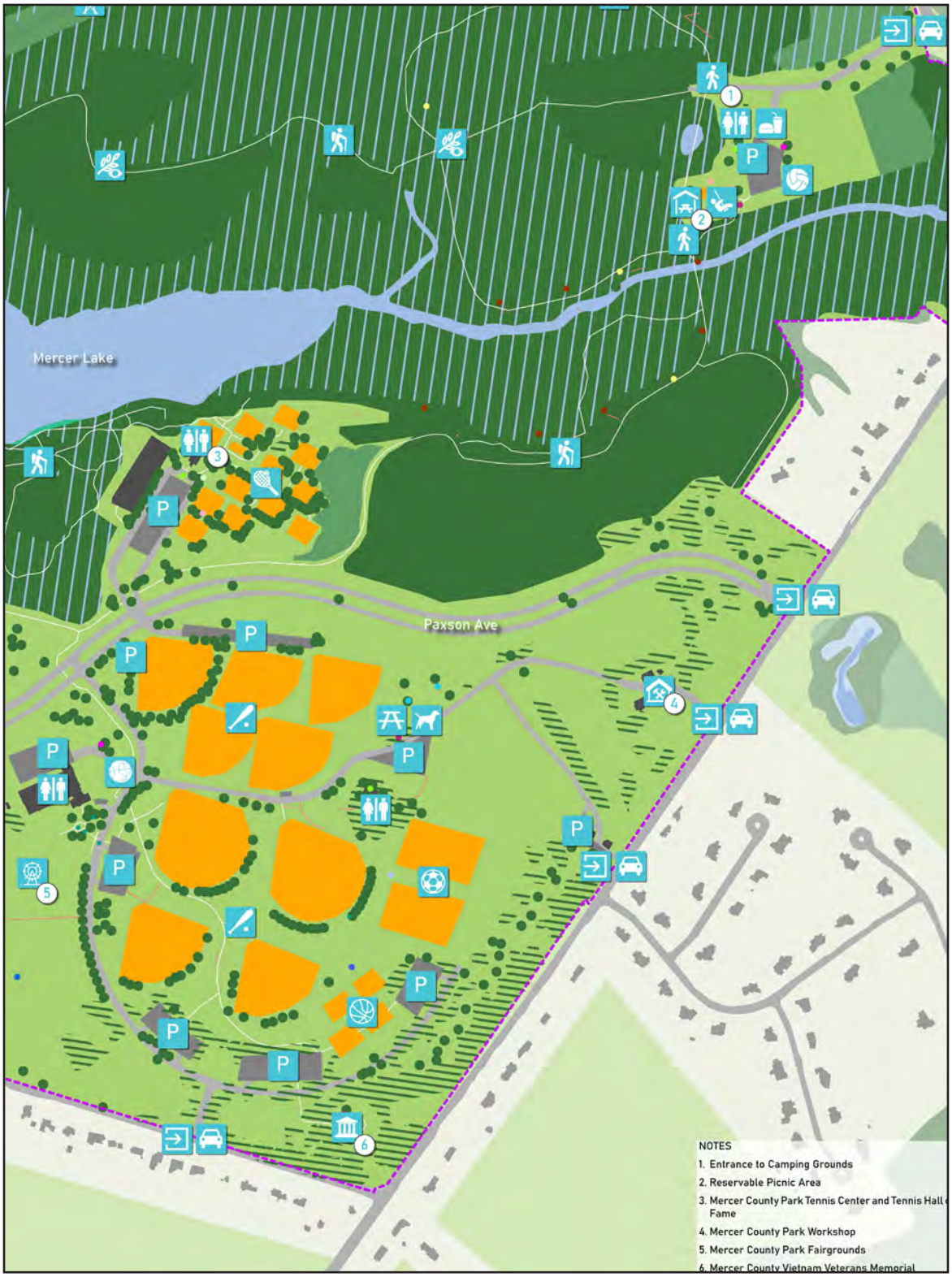
Consider treatment of mugwort and other invasive plants in the meadow restorations and further planting of aggressive native plants, like the ones already in the meadow- switchgrass and common milkweed. The one area in the ROW where poison hemlock is proliferating should be carefully treated and monitored, with the goal of total eradication. Every part of poison hemlock is dangerously poisonous to humans and all mammals. This is a public health issue.

Areas where the forest is inundated with invasive understory species pose serious multifaceted ecological threats which would be very costly and timely to mitigate. However, the overstory and midstory layers are salvageable. The first step would be to cut away Asiatic bittersweet from trees and then treat the cut portion, so the existing canopy and future canopy trees are not strangled by vines. Monitoring every year would be beneficial. The oak-black birch portion of the forest by the eastern entrance of the orange trail has glades of persisting native ground cover which could be conserved with intensive effort. Conservation tactics in this area would be greatly beneficial, yet they would be difficult as many invasive plants surround this area.

Figure 4.99: New Planting.

Sports District

Inventory



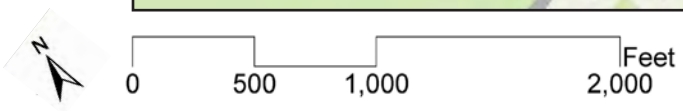


Figure 4.100: Inventory Map, Sports District.

Overview

The eastern side of Mercer County Park houses the sports district; it is an all-encompassing area for various active sports including tennis, baseball, softball, basketball, soccer, and football. It is the home to many of Mercer County's sports teams who utilize the fields for practices and games. This section also contains a dog park and a workshop, which offers various classes that are open to the public. Importantly, just west of the baseball fields is a newly built festival ground designated for concerts, festivals, and fireworks displays. Just north, across Assunpink Creek, is a parking lot, picnic areas, a pavilion, playground, volleyball court, and access to the red and blue forested hiking trails and the paved bike trail that leads to active recreation areas.

Initial Impressions

The sports district is quite large and impressive with the number of fields that accommodate a variety of activities. The baseball fields appeared to be newly constructed and were very well maintained. There were many basketball courts, but they did not have hoops and backboards. The tennis court area was very well maintained and clean. The southern parking lots provide ample parking and are surrounded by trees and hedges creating sufficient shade. The Vietnam Veterans Memorial was a beautifully maintained space and had a nicely designed winding entrance pathway.

The eastern parking area off Edinburg Road provided a very different ambiance from the active sports district to the south. It was a quieter section and offered access to passive recreation hiking trails, playgrounds, and gathering spaces for picnics and casual family fun; it was all well-maintained.

Facilities Inventory

The sports fields were generally well maintained. It was evident where newer amenities were in comparison to older ones. For example, the baseball fields were very well equipped with new signage and maintained seating. The basketball courts, however, needed repair. The backboards were removed from all courts and the score boards appeared to be heavily worn.

There were two dog parks in the Sports district, one for small dogs and the other for large dogs. The signage was new and clearly marked. The parking lot for the dog park had pooling water and some cracks in the asphalt. Overall, all of the parking lots (beside the newly paved ones) needed asphalt repair. The bathroom in the area with the dog park and baseball fields was well maintained but lacked a path leading to it making it difficult to find.

The newly built festival grounds had brand new parking lots and a rain garden in the front of the building. The rain garden was newly planted with river birch. This was a great example in incorporating rain gardens in other areas of the parks adjacent to paved areas.

The East Picnic has a rentable pavilion with ample picnic tables. This area also had a "gaga" court, playground, outdoor kitchen, sandpit for sports, a bathroom, and its own parking area. In general, it was well maintained, and people were sitting at the picnic tables enjoying their lunch while we were there.

The East Picnic area had access to the red and blue trails through the forested wetland. The trails were well maintained with desire paths cutting to the main trail. Along the red trail there was what appeared to be debris, such as an old refrigerator and tires, that were dumped in the woods some time ago. The red trail led to the tennis area but did not have a clearly marked entrance from the trail to the tennis area. There was a desire path to connect people from the red trail to the tennis area.

The tennis was bustling with people upon our visit. The buildings were new, and the courts were fenced. Online research led to the finding that the courses are not open to the public but can be reserved.

Figure 4.101: Memorial Signage.

Ecology Inventory

The parking areas in the sports district had sufficient shade from nearby trees. The horticultural plantings in the Vietnam Veterans Memorial were highly manicured, yet ornamental trees in the area were over-mulched, some in the "volcano mulch" fashion. Most species were exotic and some were invasive.

The eastern parking lot had no shade trees and the surrounding lawn areas had few, some of which were invasive Zelkova and Norway maple that typically have poor structure at maturity and become hazardous. The planted white pine shade trees were in good condition.

Throughout the baseball fields there were shade trees which lined the outside semi-circle of the outfield. The shade trees consisted of mainly Norway Spruce trees. In some locations trees were missing, or dying. On the outer edge of the park there were very large Norway spruce trees with exotic tree species growing at their base.

The floodplain forest along the Assunpink Creek was composed of red maple, ash, sweet gum, and oaks in the overstory. Black walnut and sassafras were observed in drier trailside areas along the paved bike path. The understory contained greenbrier, a native vine that helps prevent deer herbivory and passage when in dense clusters. Native ferns and sedges were observed in patches. However, the entire riparian and floodplain forest had varying levels of ecological degradation, due to infestation of invasive plants, like multiflora rose, autumn olive, Asiatic bittersweet, and Japanese stiltgrass. More invasive plants were found in areas where ash was declining and opening canopy gaps. In addition, scattered areas of old dumped appliances were observed.

The forest along the northern side of the red trail and blue trail was in better ecological condition as there were fewer areas of dense invasive plants and more native understory vegetation.

Figure 4.102: Sensitive Fern.

Figure 4.103: Red Trail Hiker.

Figure 4.104: Dead Shade Trees.

Figure 4.105: Tennis Players.

Figure 4.108: Playground.

Figure 4.111: East Picnic Area.

Figure 4.106: Tennis Court.

Figure 4.109: Tennis Players.

Figure 4.112: Pooling Surface Water.

Figure 4.107: Pooling Water.

Figure 4.110: Picnic Area.

Figure 4.113: Soccer Seating.

Sports District

Analysis

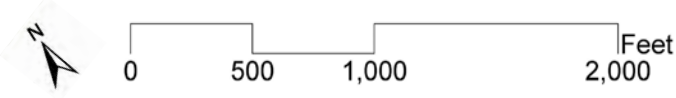


Figure 4.114: Analysis Map, Sports District.

Facilities Analysis

The facilities were predominantly in good condition. Consider reducing pooling water throughout the area. Revamping existing parking lots which are deteriorating with pervious pavement, or the pervious grid (seen in Baldpate Mountain Area) is a great way to reduce impervious surface cover within the park. Pooling water throughout the baseball field area can be reduced by implementing small meadow patches in areas with high instances of pooling water. Created meadow or "no mow" strips has the potential to reduce pooling water through the vegetation absorbing more water.

Ecology Analysis

Avoid over-mulching tree rings and beds. Ensure the root flares of all trees, large and small, are exposed, not covered in mulch and are each surrounded by an aptly-sized mulch ring. In areas that do not require a highly manicured aesthetic, mulching is not necessary and leaf litter can be blown off lawns into garden beds to provide a more sustainable form of natural mulch. As exotic and invasive ornamental plantings and shade trees decline with age, consider native alternative replacements.

The northern portions of the forested areas along the northern red trail loop and the blue trail are conservation priorities as they have few invasives and maintain native biodiversity and provide high-value habitat. To ensure these areas remain intact, perform frequent monitoring for invasive plants and work to remove invasives that are escaping for adjacent ecological threat zones, such as those along the forest edge, in canopy gaps from ash losses, and in degraded sections along the creek. A delineation between invasive plant threat areas and clear native forest areas would be beneficial to put in map form to aid in long term stewardship and conservation management planning. A large deer enclosure would help to prevent invasion facilitated by deer movement and herbivory as well as preventing browse and buck rub on regenerating trees.

The dying and dead trident maple trees in the tennis court area and the dying spruce trees in the baseball field area are in need or replacing. These trees pose a threat to people in the area and are unsightly. Replacing them with native trees such as American holly, is a great way to add native and aesthetically pleasing plant species to the area.

Figure 4.116: Handicap Parking.


Figure 4.117: Basketball Court.


Figure 4.115: Bathroom.

Mercer Oaks East & West Golf Courses

Inventory

N
0 650 1,300 2,600 Feet

Figure 4.118: Inventory Map, Mercer Oaks East & West Golf Courses.

Overview

Mercer Oaks East and West Golf Courses are championship courses which occupy the northwest region of Mercer County Park. The courses offer a unique experience to golfers through the differing vegetation types between the courses. Mercer Oaks East is more difficult and predominantly meadows (links-style); whereas Mercer Oaks West has more shade trees (traditional style) for a more relaxed user experience. The courses are surrounded by forested areas. Both courses feature human-made lakes and ponds with native vegetation along the edges.

Initial Impressions

The golf course was very well organized, had good circulation and effectively merged the East and West courses together through the center club house. The amenities were well maintained and monitored. There is ample opportunity for high ecological habitats due to the amount of space and current efforts seen planted throughout the courses. Mercer Oaks East had meadows throughout the course and was buzzing with songbird activity. Mercer Oaks West had very nice shade tree cover which made for a scenic and rather cool experience on a very hot summer day.

Facilities Inventory

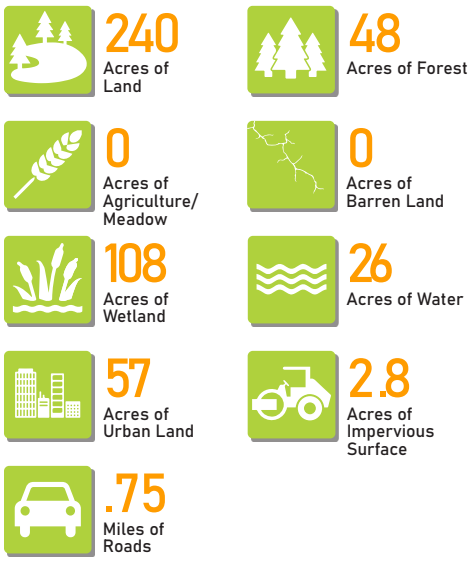
When entering the golf course for Village Road West, there is a long driveway lined with shade trees leading to a newly paved parking lot. Running along the parking lot is a mixed-use path which connects to Village Road West and Mercer County Park. The neighborhood just outside of the golf course entrance has sidewalks and provides a safe pedestrian connection to the path leading into the golf course. Although it is likely not encouraged, the path travels through the center of the two golf courses and connects to Conover Fields on Conover Road connecting to the northern forested area of Mercer County Park.

Mercer Oaks East and West offer a multitude of upscale amenities including: a driving range, a golf shop, beverage cart, and dining areas. The clubhouse is well maintained inside and out. The golf cart paths were predominantly in good condition with clean garbage cans and ball cleaners along the way. Benches lined the golf cart paths located in both shady and sunny locations.

Ecological Inventory

Horticultural planting beds throughout the property generally contained invasive plants, exotics, or native plants that were not appropriate for site conditions, such as flowering dogwood in droughty soil and full sun. Shade trees in parking areas were sparse. The west course had ample shade trees and differed in ambiance from the east course that had fewer trees and more open meadow areas. The meadows were dominated by the invasive plants mugwort and Chinese lespedeza, but also had ample common milkweed, switchgrass, and many bird houses. Several songbirds were observed utilizing this habitat. Forested clustered and periphery woodlands were dominated by sweet gum and black cherry, with invasive shrubs in the understory. A few wooded areas contained hickory and oaks which provide valuable habitat including the protected nesting location for bald eagles. A few wooded areas near maintenance buildings were dominated by the invasive tree of heaven and white mulberry. There was a Bald Eagle habitat in the East course where wild turkeys were seen running about.

Quick Facts



Mercer Oaks East & West Golf Courses

Analysis

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Figure 4.119: Analysis Map, Mercer Oaks East & West Golf Courses.

Facilities Analysis

The facilities throughout both courses were overall clean and kept up well. However, wayfinding was a miniscule issue. Course direction and cart drop-off boundaries were not noticeably marked, even though the map provided clear guidance. The addition of signage throughout the course would help golfers make their way around the course without using the available map.

Ecology Analysis

Horticultural plantings can be enhanced with native plant replacements to invasive plants. The few flowering dogwoods in full sun can be transplanted elsewhere or fast-growing native shade trees can be planted adjacent to them to provide a more conducive environment. Consider treatment of invasive mugwort and lespedeza in meadows and plant more switchgrass and native grasses along with deer resistant herbs like bee balm. Treatment of invasive woody plants will be necessary to reduce ecological threats to adjacent areas and sensitive locations such as the bald eagle nesting area, which is a conservation priority.

Figure 4.121: Milkweed on Pond Edge.

Figure 4.122: Golf Cart Path.

Figure 4.120: Horticultural Planting.

Figure 4.123: Bald Eagle Habitat.

Figure 4.124: Meadow.

Hopewell Valley Golf Club

Inventory

N

0 350 700 Feet 1,400

Figure 4.125: Inventory Map, Hopewell Valley Golf Club.

Overview

Hopewell Valley Golf Club is located in Hopewell Township and is a 186-acre, 18-hole course. The facility includes a clubhouse, ballroom, and pro-shop along with other amenities and active recreational opportunities. This golf course previously operated as a private golf club, which opened in 1927. It was designed by Thomas Winton, a golf course architect.[18] The recent county acquisition of the golf club will allow residents to have an additional form of recreation (including the public pool) catering to the local community.

Initial Impressions

Our visit occurred while the property was still closed to the public and renovations were in progress. The expertly designed landscape still showed through. Every viewshed was pleasant and alluring. Each section flowed from one to another through its groupings of trees, winding paths, and waterbodies, which created smooth transitions and a harmonious landscape ambiance. The perimeters of the property were all screened by forest cover, providing a distinct sense of place and privacy from neighbors. Many of the shade trees and ground flora throughout the course required attention and further maintenance. The roadways and paths needed attention as well in various isolated areas around the course.

Facilities Inventory

At the time of visit in June, the club was undergoing renovations and was projected to open Mid-August. Therefore, the following inventory reflects the under-construction condition of the golf facility.

Hopewell Valley Golf Club is a large facility with the Stony Brook running through its center. The grounds consisted of multiple drainage paths and partially vegetated swales leading to the Stony Brook. This was an effective way to manage stormwater onsite. However, it may pose a risk to the ecological health of the brook. A bridge over a stormwater swale in the southwest of the golf facility was not present during the visit, making it difficult to pass.

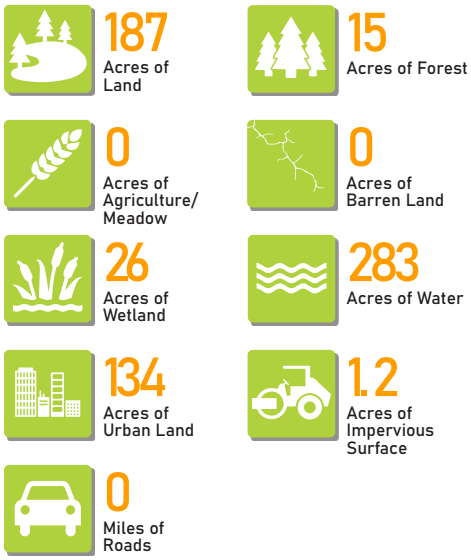
Overall, the path system was easy to navigate and guided throughout the entirety of the course. On multiple occasions unpaved pathways or randomly ending trails led to muddy and uneven terrain. The path was overall a pleasant experience, in that there was a plethora of shade trees along portions of the golf course trail.

Ecological Inventory

There were a variety of shade tree species planted on site, many of which were healthy such as the white pines, dawn redwood, and swamp white oak. There were many mature ash trees on site that were dying or dead due to emerald ash borer infestation. The invasive tree, Norway maple, was in decline throughout. Most of the horticultural plantings contained both intentional and unintentioal invasive species. Most of the mowed meadow areas were dominated by invasive plants like mugwort.

The forested areas along the periphery were dominated by healthy shade trees of mostly oak and black walnut, yet with groupings of dying ash. At the edges of forest and in canopy gaps, the dense understory vegetation was invaded by many invasive shrubs, vines, and herbs. The forested area provides valuable habitat for many wildlife species as well as the adjacent Stony Brook bisecting the property. A great blue heron was spotted on the brook, which demonstrates the likelihood of aquatic life supporting the greater surrounding ecosystem. In addition, bird houses were scattered on the property, which shows efforts for habitat provision.

Quick Facts



*All below inventory and analysis were based on information collected during a June site visit, two months prior to public opening. Therefore, many maintenance issues may have already been repaired or altered.

Hopewell Valley Golf Club

Analysis

N

0 350 700 Feet 1,400

Figure 4.126: Analysis Map, Hopewell Valley Golf Club

Facilities Analysis

The priority recommendation for Hopewell Valley Golf Club is trail maintenance and upkeep. This includes shade tree monitoring and pruning along trails to ensure pedestrian safety, as well as pothole repair. There was one portable bathroom located along the course trail. Adding portable bathrooms in the northeast and northwest portion of the course would add to the user experience due to the outer limits of the course being further from the main house. Along the path there were instances with pooling water. Regarding the pathways, it is recommended that clear signs of use are visible.

Ecology Analysis

All dying ash and Norway maple trees must be removed as they pose hazards to visitors. Consider replacement tree species that are native, yet new to the site to increase sustainability and biodiversity, such as black gum, sorrel tree, or tulip tree. Consider removals of invasive plants in horticultural beds (Japanese maple, Kousa Dogwood, and Chinese miscanthus. Cross reference the New Jersey Invasive Species Strike Team Do Not Plant list before planting new species. Replace invasive plant species with native showy species such as red bud, serviceberry, big bluestem, switchgrass, and little bluestem (refer to New Jersey Native Plant Society for extensive native plant list appropriate for Mercer County). The meadow areas require invasive plant treatment and replacement with deer resistant natives, such as mountain mint, bee balm, blue mistflower and more milkweeds. Consider invasive plant treatment along forest periphery and riparian edge to reduce ecological threats on the property.

Figure 4.127: Shade Tree.

Figure 4.129: Pooling Water.

Figure 4.131: Dying Shade Tree.

Figure 4.128: Extra Parking.

Figure 4.130: Sign and Bench.

Figure 4.132: Stony Brook.

Princeton Country Club Golf Course

Inventory

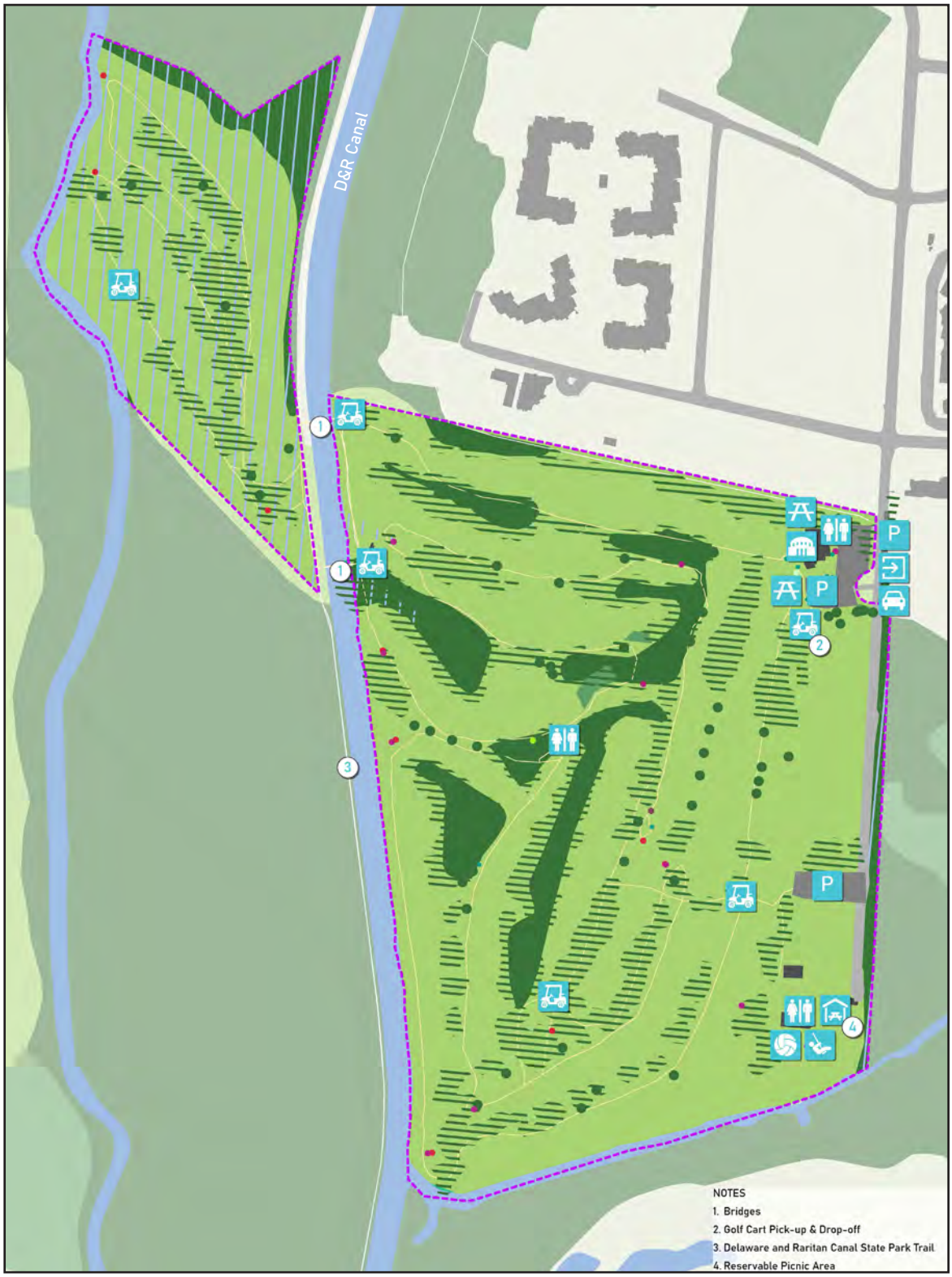


Figure 4.133: Inventory Map, Princeton Country Club Golf Course.

Overview

Princeton Country Club is located in West Windsor, and is an 18-hole championship golf course which opened in 1958.[19] It was acquired by the Mercer County Park Commission in 1965 and is home to the Mercer County Golf Academy. The clubhouse was renovated in 2015 with a new irrigation system and golf bunkers in 2014. It is lined with tight clusters of trees to provide privacy screening. The front and back courses are divided by the Delaware and Raritan Canal, while the back-nine course is bordered by the Stony Brook and occupies a portion of the Brook's flood plain.

Initial Impressions

Princeton Country Club is a well maintained and visibly popular golf club due to the volume of users during the site visit. The parking lot was full of numerous people walking about the common area. At the end of Wheeler Way there was a rentable picnic area with an associated parking lot. This golf course is smaller than the other park facility golf courses presumably because it is in a more densely populated area outside of Princeton. The course was well designed in an organized fashion to utilize all available space on a smaller parcel of land and is divided into separate areas. The trees surrounding the edges of the property create fantastic visuals, and physical barriers to the outside streets - especially since there were new housing developments being built not too far down the road.

Facilities Inventory

The golf facility had a well-stocked and well-maintained golf cart area off of the main parking lot. The main parking lot was accessible off Wheeler Way with overflow parking along the entire length of the roadway. A large sign marked the golf course entrance but appeared to need maintenance as there was dying vegetation and a large pothole collecting water.

The pathways along the golf course were moderately well kept and easy to navigate. There were a few instances of potholes and broken asphalt which led to pooling surface water. Traveling from the front course to the back-nine over a bridge was easy to navigate and the bridge's metal and wood material made for a unique user experience over the D & R Canal, lending to the canal's historic era. The D & R Canal path did not contain any signage of overhead golf balls but was heavily used by pedestrians on the towpath.

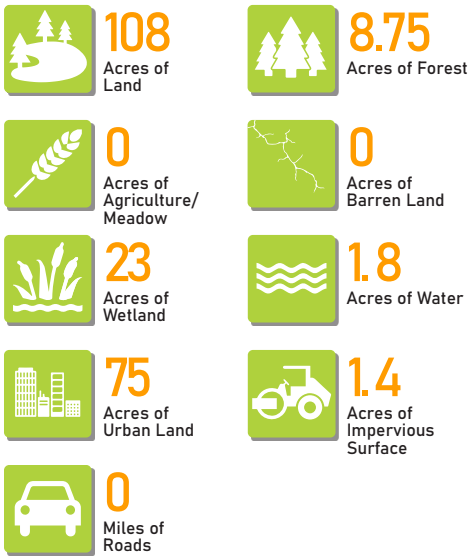
The benches, ball cleaners, and garbage receptacles throughout the course appeared to be new, clean, and in working condition. Although this course was crowded, it had well maintained and clean amenities throughout including the bathrooms in the main building. The lawn was well kept in most areas with a few patches of missing turf.

Ecological Inventory

The horticultural planting beds at the main house entrance need maintenance. The planting beds appeared to be overgrown with invasive weeds, a few wilted plants, and unintentionally bare soil between the plantings and mulch. Ornamental plant species in these beds consisted mainly of Japanese spirea-- a non-native plant species. Throughout the golf course there were numerous ash trees that showed signs of decay. The riparian edge had the appearance of invasive species such as mugwort.

Along the Stony Brook there were instances of native tree regeneration as there were white oak, and silver maple saplings. Black cherry and silver maple were some of the native trees occupying the forest edge between the Stony Brook and the golf course. There were hundreds of periodic (17 year) cicadas throughout.

Quick Facts



Princeton Country Club Golf Course

Analysis

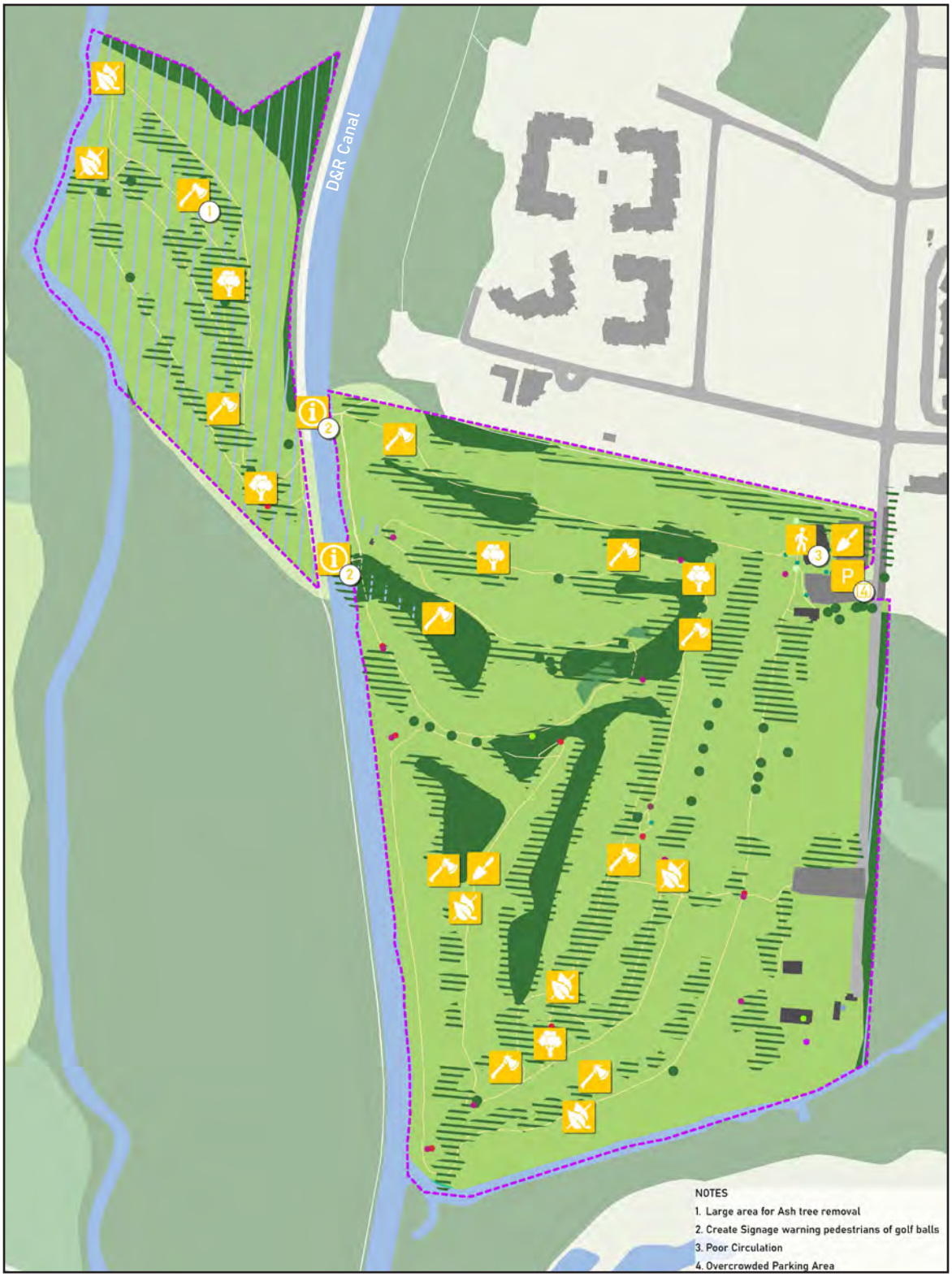


Figure 4.134: Analysis Map, Princeton Country Club Golf Course.

Facilities Analysis

Parking and stormwater issues were the primary areas in need of attention. This golf course is clearly heavily utilized and caters to the surrounding community. There did not appear to be enough parking for the number of course users. Overflow parking was present along Wheeler Way; while the parking lot for the rented facility down the street did not appear to be utilized to its full potential. Supplying overflow or temporary parking would be beneficial for daytime users potentially in the picnic area parking lot or creating a multi-use parking lot elsewhere.

Stormwater concerns on the back portion of the golf course are not unknown. The back of the course occupies designated wetlands and is within the Stony Brook floodplain. Swales with riprap were located throughout the back portion as well as large shade trees. More vegetation in these swales and the replacement of dying shade trees could help with intaking more stormwater.

Ecology Analysis

Unfortunately, the dying ash trees onsite require removal as they are dangerous hazards to public safety. It is recommended that the ash trees along the main path system are the prioritized intervention specimens to ensure public safety. Consider replacements with a variety of native tree species such as red maple, swamp white oak, and black gum to ensure all species will not suffer if a pest or disease harms one specific species.

Restoration of horticultural beds can include planting of low maintenance and deer resistant native plants (mountain mint, monarda, bayberry etc.). However, the need to monitor and weed invasive plants will remain constant. Native planting techniques would complement Princeton Country Club's character well. The appearance of a "cottage style" garden and the intimate feeling of the golf course entrance have the potential to create an experience unlike the other courses in Mercer County which have a more formal or classic style.

Figure 4.136: Golf Cart Path.

Figure 4.137: Shade Trees in Lawn.

Figure 4.135: D&R Canal.

Figure 4.138: Vegetation.

Mountain View Golf Course

Inventory

Figure 4.139: Inventory Map, Mountain View Golf Course.

Overview

Mountain View Golf Course is located in Ewing and comprises a mature 172 acres. The course is an 18-hole championship golf course that was opened in 1958 and is characterized by its natural terrain of rolling hills and valleys – it was designed by R. Ault, Clark & Associates. The clubhouse was completed in 2007 – replacing the 50-year-old original.[20] This course is frequently used by the public for golf outings, weddings, private parties, and corporate functions. Mountain View is home to one of the nation's top clubhouses as rated by Golf Inc. There are two outdoor verandas adding to the user experience.

Initial Impressions

Mountain View golf course was easily navigable and expansive. The golf club house provided a clear entry point and viewpoint when entering from the roadway. A small pond in the northeast had stimulating views and was well maintained. There were piles of leaf litter which were used as a mulch alternative. Overall, this course was well cared for from the course to the clubhouse.

Facilities Inventory

The golf cart pathways were in good shape with the exclusion of a few potholes and pooling surface water in isolated instances. There were many culverts moving stormwater throughout the course. The clubhouse exterior was well maintained with ample parking. The dumpster was located at the end of the very large parking lot away from visitors. Golf carts were easily accessible and had a clear return location. The golf course map was well created as it was easy to follow in order to navigate the course.

Ecological Inventory

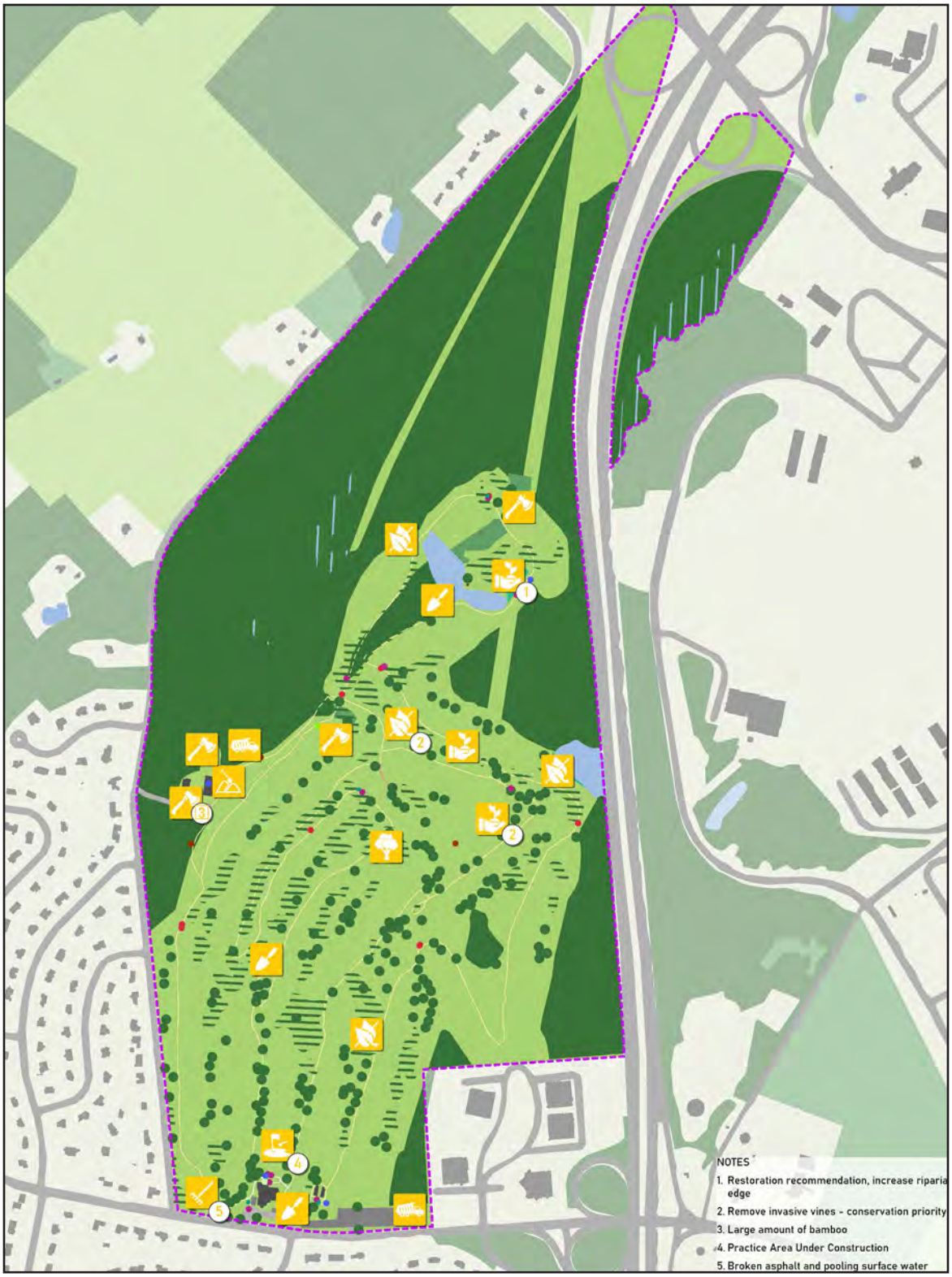
At the main club house there was a mix of horticultural plantings. Winterberry Holly's were located around the main building which is a great native species for horticulture planting beds. Throughout the course there were trees that were dying or were in need of pruning. Near the maintenance building was a bamboo forest which was abutting a forested area posing a threat to the forest's biodiversity. Along the Ewing Creek's riparian there were native sensitive ferns and red maples mixed in with exotic plant species.

Quick Facts

Figure 4.140: Horticulture Planting at Main Drive.

Mountain View Golf Course

Analysis



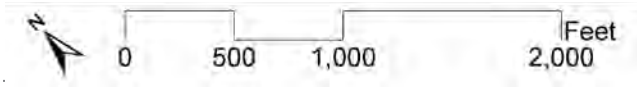


Figure 4.141: Analysis Map, Mountain View Golf Course.

Facilities Analysis

Culverts around the golf course require maintenance as plantings were interfering with water movement though the culverts. Pooling water was seen throughout the golf course which can pose as a breeding ground for mosquitos. The golf cart drop-off and pick-up areas are in great locations and easily accessible. They circulation worked well with the parking lot and main club house. However, the horticulture plantings surrounding the cart drop-off area were very tall blocking views to the parking lot, this did not appear to be intentional and felt slightly unsafe.

Ecology Analysis

Removal of the bamboo grove near the maintenance building requires removal to avoid spreading into the forest. Pedestrian safety would benefit if dying ash trees closest to the paths and heavily used areas of the courser were removed first. Monitoring the vegetation along the creek will help reduce invasive plant species pressure while encouraging the native species present to thrive.

Figure 4.143: Evergreens and Lawn.

Figure 4.145: Leaf Mulch.

Figure 4.144: Dying Ash Tree.

Figure 4.146: Main Entrance.

Figure 4.142: Lake View.

Waterfront & South River Walk Parks

Inventory

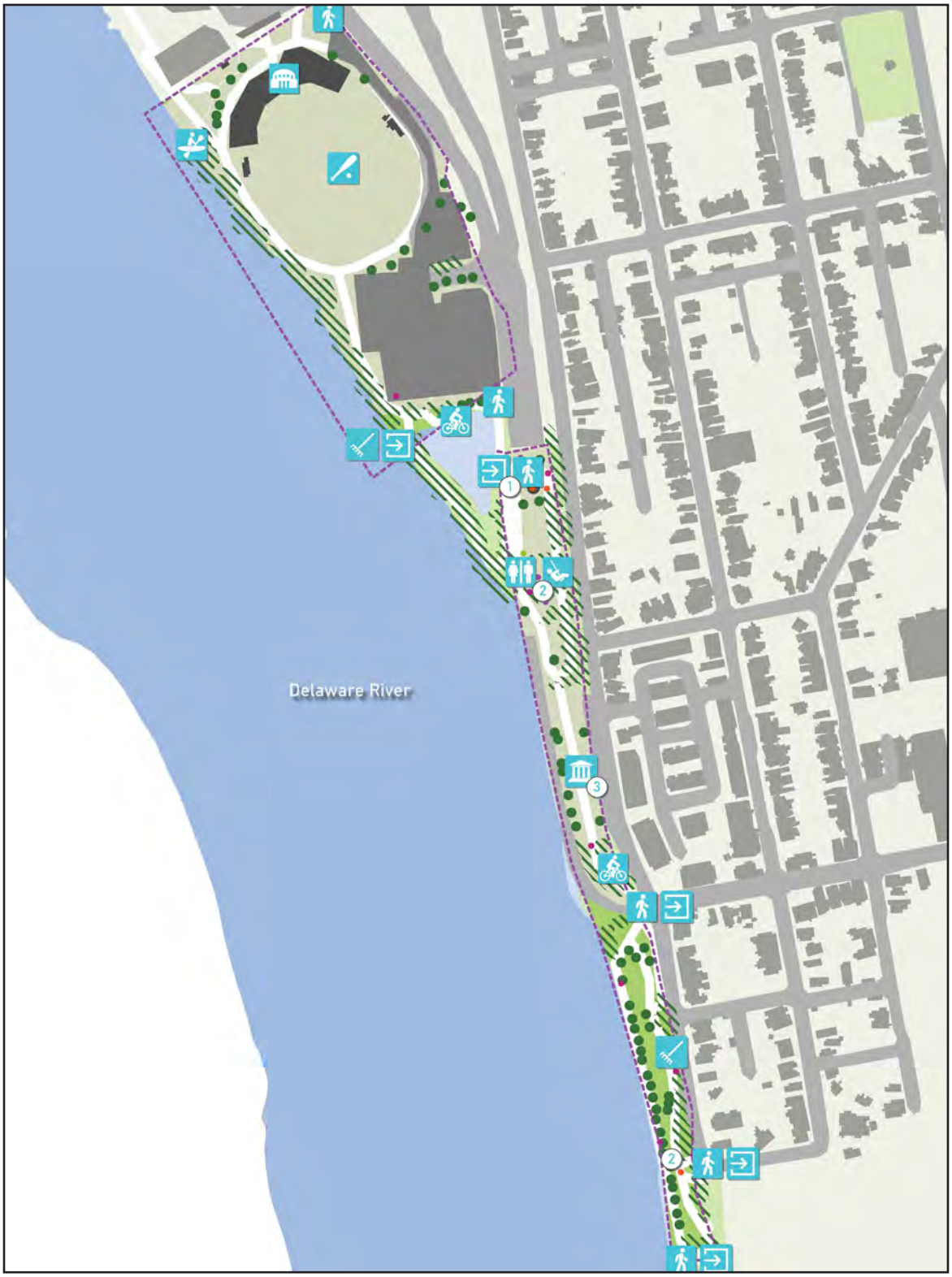


Figure 4.147: Inventory Map, Waterfront & South River Walk Parks.

Urban Parks - Overview

Waterfront Park and South River Walk Park are located along the Delaware River in Trenton. Both parks provide a unique view of the river by their varied location. Waterfront Park is located at the top of the bluff and leads to the Delaware River through a dock extending over the water behind the Arm & Hammer Park Baseball Stadium. South River Walk is a raised park or rooftop garden which caters to the residential area above Route NJ-29. The view of the Delaware River is from a much higher elevation offering a very diverse experience from the view at the river's edge at Waterfront Park.

These Urban Parks aim to tell Trenton's long history. South River Walk Park connected to Lalor Street Park is home to a linear sculpture, which tells Trenton's settlement history. This park also has interpretive signage that lends details to each era noted throughout the sculpture. The informational signage is located along the outer edge of the park which overlooks the Delaware River.

Initial Impressions

The Waterfront and South River Walk Park are both well situated parks along Trenton's waterfront. These parks offer river access in a highly dense commercial and residential area. The Waterfront Park has a large dock that would be a great place to host events and connect to the adjacent business center on the other side of the fence. The dock entrance was not marked until the gate. South River Walk Park is a frequently utilized quant park.

It is well maintained and has ample seating and lighting throughout. Multiple playgrounds and gazebos add interest to the park, shade, and entertainment areas. People were seen in these parks walking, working out, or just enjoying the riverfront view. In a busy city these waterfront parks offer a quiet space with garden beds throughout.

Facilities Inventory

The facilities in both parks were well cared for. The dock at the Waterfront Park was secure, clean, and had functional fencing. The slope to the dock from the sidewalk was very steep and almost difficult to ascend. The baseball stadium provided ample parking but needed repair. The asphalt was cracking while shade trees were missing or dying. There was an overall lack of shade in the very hot parking lot. However, the trees which were planted appeared to be younger and will eventually provide more shade.

The two parks are great examples of urban parks that cater to the local community. They are lightly used for passive recreation by mixed age groups. It was noticeable that the users of these two parks either lived in the surrounding area or walked from the nearby business center. The playgrounds were well kept, and the pavers were in good condition. The gazebos provided ample shade but had inappropriate graffiti spray painted on it. Seating and lighting were consistent throughout the park, and multiple access points were located along the residential roadway leading into the South River Walk Park. There were no bathrooms available, which is presumably due to safety issues. There were voids in the shrub planting where people were using the "restroom" evidenced by vegetation gaps and toilet paper.

Ecology Inventory

The vegetation assemblage throughout the South Riverwalk Park was a mix of ornamental species and native perennials such as purple coneflower. Woody species were kwanzan cherry, and viburnum spp., and burning bush. There were native perennial plant species in the South River Walk Park planting beds with scattered non-native shrub and ornamental tree species. The shade trees in the parking area consisted of pear trees. There were signs of invasive species along the river's edge at the top of the bluff such as mugwort. Tree species along the riparian edge included red maple, silver maple, and black gum.

Quick Facts

Waterfront & South River Walk Parks

Analysis

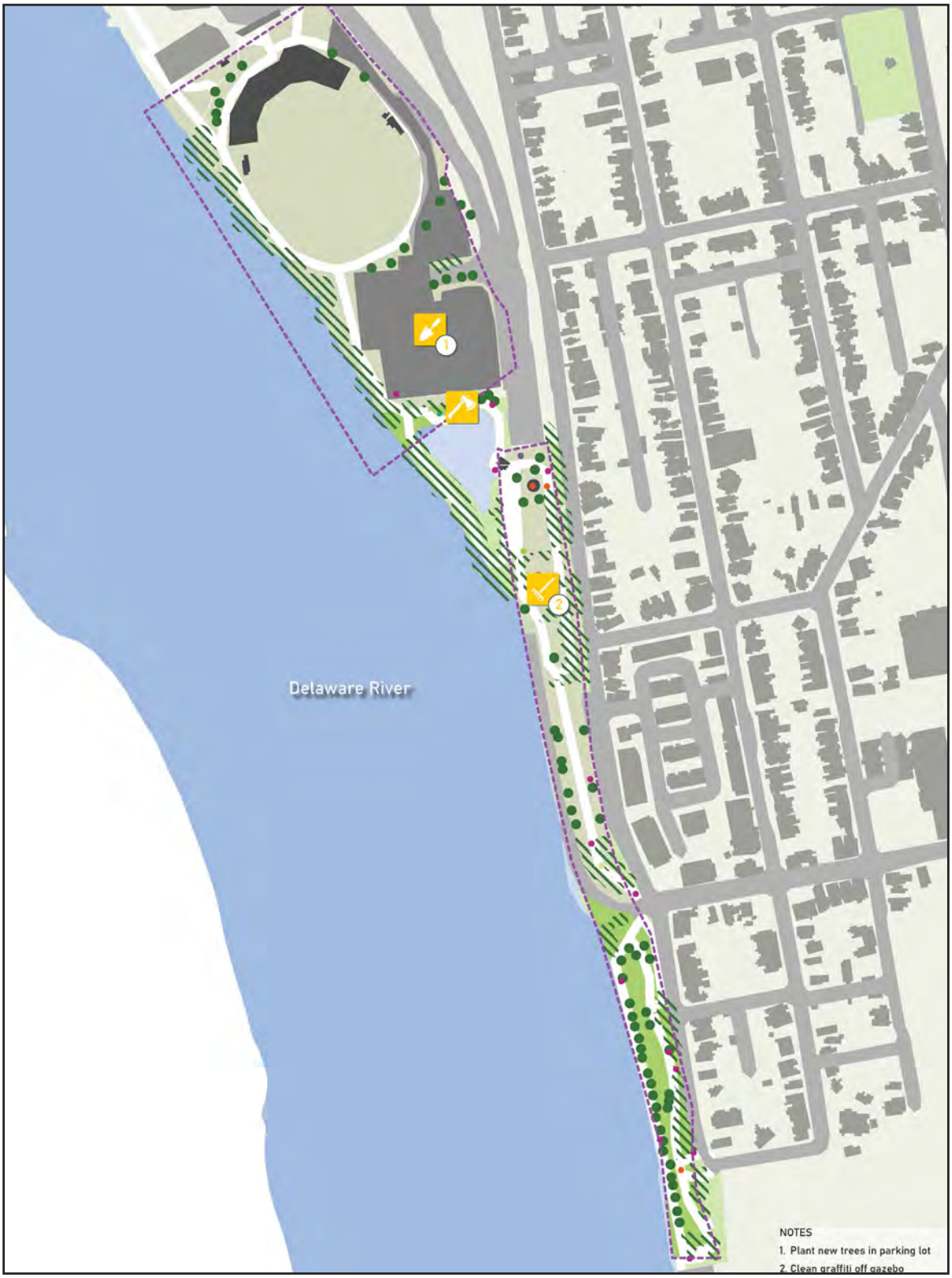


Figure 4.148: Analysis Map, Waterfront & South River Walk Parks.

Analysis

South River Walk Park and the dock at the Waterfront Park appeared to be in good condition and utilized by community members. The dock entrance would benefit from wayfinding signage along the path leading to the dock to let people know there is water access. The parks had clear access to the business area and residential community. Cleaning graffiti from the gazebo near the playground is a main priority for South River Walk Park. Signage, seating, and lawn maintenance appeared to be in good condition. However, horticultural plantings require updating and maintenance within and around the parking lot. Shade trees in the parking lots (pear trees) would benefit from replacement of dying, dead, or missing species. Geese management is also necessary. There was a family of Geese utilizing the emergency dock entrance to get to the Delaware River's edge. Providing access to the river for public use may be beneficial in this area to create a water connection for the City of Trenton; potentially considering a kayak launch around this location, or encouraging it at the emergency access location through signage. The small pond between the two parks (not County Park property) has signs of eutrophication and had litter floating at the edges. This small park appears to be in association with the other parks; consider collaborating with the small parks owner/management to ensure the park represents the character of Mercer County Parks.

Figure 4.149: Timeline Sculpture.

Figure 4.153: Maintenance Path

Figure 4.150: Informative Signage.

Figure 4.151: Maintenance.

Figure 4.154: Waterfront Dock.

Figure 4.152: NJDOT Managed Park with Small Pond.

Mill Yard Roebling Park

Inventory

Figure 4.155: Inventory Map, Mill Yard Roebling Park.

Urban Parks - Overview

Mill Yard Roebling Park is a small urban plaza park in South Trenton. It is a small industrial themed outdoor cafe which reflects Trenton's industrial character consistent with the surrounding architecture. The Park provides many benches, a semi-circle of honey locust shade trees, and an interactive water fountain. The Park is in the center of a bustling area with commercial and industrial uses and is adjacent to Trenton Market.

Initial Impressions

Mill Yard Roebling Park is a quant park in the center of a busy commercial district. It is heavily policed with constant on the ground surveillance. There is plentiful seating and a great deal of potential for this small urban park. People were seated in the shade and walking through the park to get from one point to another. The trees provided a nice shady experience and overall, just sitting in this park was very enjoyable.

Facilities Inventory

Mill Yard Roebling Park contains ample seating, water fountains, stone pavers, and numerous planting beds. There is no designated parking for this small park, but it is easily accessible on foot and surrounded by sidewalks. There is a water fountain that can be utilized by children in the community and based on online research it has been used for such purposes. There are no bathrooms within the park, but multiple access points to private establishments. There appears to be a location in the large planting bed at the edge of the park where people are using the "restroom." There are several planting beds lining the park's perimeter that appear to have desire paths cutting through the middle and patches of missing or dying vegetation. The pavers are beginning to rise and shift around the base of the shade trees throughout the park. The shade trees are in good condition and supply ample shade in the center of the urban area.

Ecology Inventory

Horticultural planting beds consist mainly of Liriope grasses, daylilies, and honey-locust trees. The vegetation is places appear to be dying or vacant. There are two apple trees with peeling bark in a bed of liriope. There were patches of dead grasses throughout the planting bed, which looked like places where pets may have been relieving themselves. Overall, the plantings throughout the park require maintenance and replacement.

Quick Facts

- .9 Acres of Land
- 0 Acres of Forest
- 0 Acres of Agriculture/ Meadow
- 0 Acres of Barren Land
- 0 Acres of Wetland
- 0 Acres of Water
- .9 Acres of Urban Land
- .9 Acres of Impervious Surface
- 0 Miles of Roads

Figure 4.156: Fountain View.

Figure 4.157: Planting Bed.

Mill Yard Roebling Park

Analysis

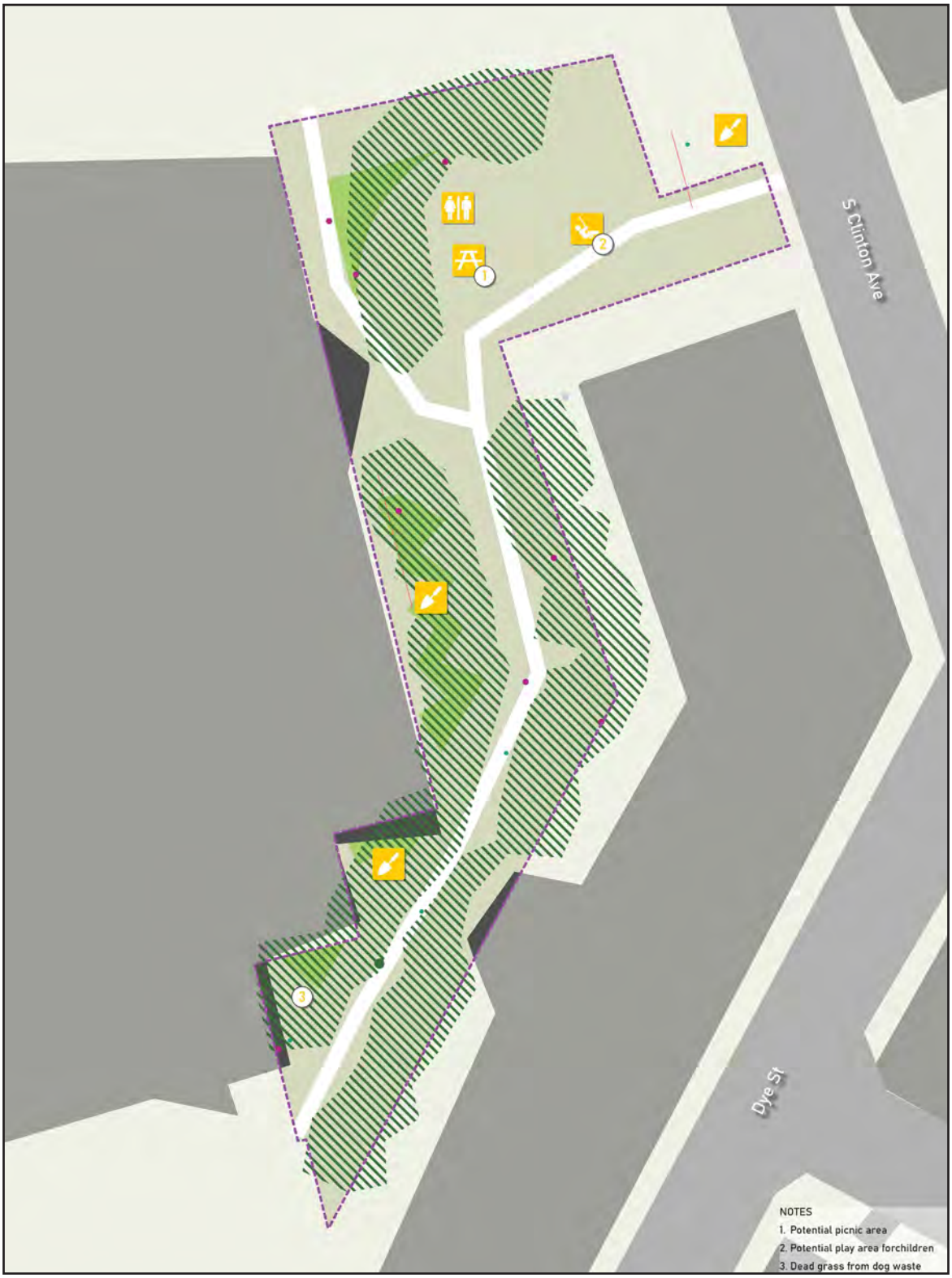


Figure 4.158: Analysis Map, Mill Yard Roebling Park.

Analysis

It is clear that people regularly use this small urban park for its shade and ample seating. There are signs of heavy use noted by the desire paths and missing plantings. There is a plum tree underneath the honey-locusts which looks to be outgrowing its intended purpose. This tree should be replaced with understory shrubs that will not outgrow the location. The apple trees are also in need of replacement. Consider a hardier plant species that is better suited for an urban park.

The pavers at the base of the shade trees require replacement. Throughout the park, the pavers around the base of the honey-locust trees are lifting. Replacing the pavers will help with pedestrian safety to avoid tripping hazards.

The fountain at the front of the park provides an ideal oasis for park users during hot summer days and its use is encouraged for children. If the fountain is encouraging unanticipated bathing, this analysis could pave the way for additional research into ideal spray park locations in Trenton. A programed waterpark in Trenton would help with environmental injustices such as urban heat island and increase the overall quality of life for children within the community. A waterpark similar to the Mercer County Park Spray Park would be an ideal way to repurpose a vacant lot in Trenton creating a safe fenced in and programmed oasis for children.

Figure 4.159: Industrial character.

Figure 4.162: Park Perimeter

Figure 4.160: Park Bench.

Figure 4.163: Dying Grasses.

Figure 4.161: Plaza View.

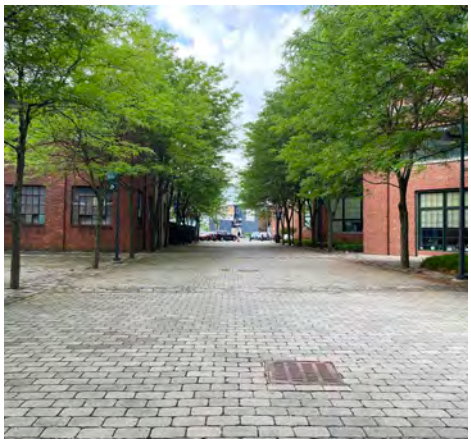


Figure 4.164: Alley View.

Conclusion

The in-depth analysis of Mercer County Park facilities shows the vast differences and close similarities between all of the park facilities. Visiting Regional Parks, Golf Courses, and Urban Parks exemplifies the many opportunities to highlight and enhance all the great happenings throughout the County Park network. Overall Mercer County Park facilities are well maintained, clean, and safe. It is evident that park quality and management is a priority for Mercer County Park Commission.

Each Park facility has been inventoried in detail, but the generalized findings are that the park facilities contain several dead or dying shade trees, would benefit from enhancing open space connections through regional trail networks, and have prime locations for conservation or vegetation management opportunities. The Regional Parks have many trails providing an immersive nature experience for pedestrians and bicyclists. Updating trail maps and markers will help with wayfinding issues when in the parks. Amenities such as benches and picnic areas appeared to be vastly in good condition despite rare instances of dilapidated park equipment. There is room throughout the regional parks for additional rentable park pavilions. Each Park facility justifies the diverse character of the Mercer County Park's network which caters to the surrounding community.

Endnotes

[1] "Fare to Midlands," Bald Pate Mountain, Washington's Crossing, Howell Farm (Skylands Visitor Magazine, 2008).

[2] "Mercer County Park Commission," Mercer County Park Commission, 2021.

[3] "Natural Heritage Grid Map (Table) for New Jersey," NJDEP Bureau of GIS (New Jersey Department of Environmental Protection, 2019.

[4] "Park Commission to Conduct Deer Management Program at Baldpate Mountain," Mercer County, NJ (Mercer County, NJ, 2018).

[5] "Natural Heritage Grid Map (Table) for New Jersey," NJDEP Bureau of GIS (New Jersey Department of Environmental Protection, 2019).

[6] "Terrestrial Wildlife Habitat Cores and Corridors in New Jersey, Connecting Habitat across New Jersey (CHANJ)," NJDEP Bureau of GIS, 2019.

[7] John Magerlein, "Trail Design Standards Practice," New York - New Jersey Trail Conference, February 17, 2017.

[8] The Native Plant Society provides an extensive native Plant Species List appropriate for Mercer County.

[9] "Natural Heritage Grid Map (Table) for New Jersey," NJDEP Bureau of GIS (New Jersey Department of Environmental Protection, 2019).

[10] "Terrestrial Wildlife Habitat Cores and Corridors in New Jersey, Connecting Habitat across New Jersey (CHANJ)," NJDEP Bureau of GIS, 2019.

[11] "The Pleasant Valley Historical Park," Howell Living History Farm (Mercer County Park Commission), accessed September 24, 2021.

[12] National Register of Historic Place Inventory— Nomination Form, Howell Farm, Mercer County, Dec. 13, 1976.

[13] "The Pleasant Valley Historical Park," Howell Living History Farm (Mercer County Park Commission), accessed September 24, 2021.

[14] Director Pete Watson informed the CUES team that Barley was used for pond management while on-site on June 15, 2021.

[15] "Beech Leaf Disease Is Continuing to Emerge and All Cultivars in America and Europe Are at Risk," Arborjet, February 28, 2020.

[16] "Tulpehaking Nature Center," Abbott Marshlands, accessed September 24, 2021.

[17] "Dam Site 21 Frequently Asked Questions" (Mercer County Park Commission, n.d.).

[18] "Mercer County Completes Purchase of Hopewell Valley Golf Club," Community News, December 2, 2020.

[19] "Mercer County Park Commission," Mercer County Park Commission, accessed September 24, 2021.

[20] "Mercer County Park Commission," Mercer County Park Commission, accessed September 24, 2021.

5. County Analysis Summary

Introduction

Inventory and analysis for each park facility has helped determine the role and character of each park within the Mercer County Park Network. This chapter will outline a matrix analysis for each park's offerings followed by general recommendations across all park facilities.

Matrix Analysis

The Matrix analysis is a summation of the park inventory conclusions. A chart was created to highlight which of the Mercer County Park facilities contain certain park attributes. Each Park was given a label: (+) Contains, (-) Does Not Contain, or (+/-) Neutral/ Potential to identify if the attribute is featured in the given park. A neutral/Potential label was applied if the park did not directly contain/ not contain a specific attribute, or if the attribute was in the near vicinity. The parks were scored based on our inventory and interpretation of the park system through field inventory and desktop research. Not all parks contain all or even half of the amenities listed, which illustrates the variety within County owned parks. Certain attributes pertain to a park's character and size but would not be suitable in others. Regional Parks have significantly more and diverse attributes than Urban Parks simply because of their scale and purpose.

The Matrix analysis chart (Figure 5.2) records attributes as they relate to the 11 park facility groupings analyzed in Chapter 4. There are 21 attributes recorded and are further defined in Table 5.1. The 21 attributes were identified because they were inventoried in multiple properties and appeared to be central park features contributing to the park facility's character. The matrix analysis visualizes the role of each park within the overall County wide Park network putting them into perspective of the four main park categories: Active and Passive Recreation Regional, Golf Course, and Urban.

The Matrix Analysis Chart (Figure 5.2) reveals that the Regional Parks have the most varied array of offered activities. Mercer County Park and Mercer Meadows are the only park facilities to contain all but one attributes listed, followed by Baldpate Mountain Area, then John A. Roebling Memorial Park. What this information tells us is not that smaller scale parks and Golf Courses are lacking, but that they have a more unique and narrowed purpose as noted throughout the park facility inventory and analysis.

Figure 5.2: Brook Hopewell Valley Golf Club.

Figure 5.1: Gazebo South River Walk Park.

5.1 Matrix Analysis: County Park Summary

Matrix Attributes

The attributes listed include park facility amenities and ecological components. All attribute terminology within the table is defined in the Matrix Attribute Definitions Table (Table 5.1) to better clarify the language utilized throughout this analysis. These terms were defined by our team based on our interpretation of the park attributes.

The Matrix analysis chart (Table 5.2) records attributes as they relate to the 11 park facility groupings analyzed in Chapter 4. There are 21 attributes recorded and are further defined in Table 5.2. The 21 attributes were identified because they were inventoried in multiple properties and appeared to be central park features contributing to the park facility's character. The matrix analysis visualizes the role of each park within the overall County wide Park network putting them into perspective of the four main park categories: Active and Passive Recreation Regional, Golf Course, and Urban.

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Attribute	Definition
Bicycle Share	A Mercer County Parks program for bicycle rentals. Bicycle racks are located in the parks with 10 rentable bikes per rack.[1]
Bicycle Trails	Mixed use trails wider than traditional walking paths made of crushed stone or asphalt.
Boat/Kayak Launch	Ramp or marked launch allowing access to waterway.
Car Access/Parking	Able to drive into the park and park motorized vehicles in designated location.
Comfort Stations	Open bathrooms available to the public.
Concessions	Purchasable food/drink offerings available to the public.
Conservation Priority	Conservation of natural areas is highly recommended.
Dog Park	Designated, fenced in area, for dogs off-leash.
Fishing	Fishing is allowed.
Hiking Trails	Trails designated for pedestrians.
Generally Well Maintained	Clean, unbroken, and updated facilities.
Native Horticultural Planting	Indigenous plant species planted in garden beds, generally around amenities and buildings.
Pedestrian Access	Adjacent areas outside of the park facility have sidewalks allowing safe pedestrian access on foot or bicycle.
Picnic Areas	Areas with picnic tables available to the public on first come first serve basis.
Picnic Pavilion (Rentable)	Rentable areas that must be reserved, these areas have a roof structure and outdoor kitchen.
Playgrounds	Traditional play equipment such as swings and jungle-jims.
Regional Trail Connection	Park trails connect to one of the four regional trails in Mercer County.
Restoration	Ecological restoration efforts are taking place within the park.
Sports/Fields/Courts	All outdoor sports fields (not including golf courses).
Wildlife Habitat	Natural/naturalized areas which support wildlife.
Water Management	Strategies and infrastructure to reduce pooling water.

Table 5.1: Attributes and Definitions.

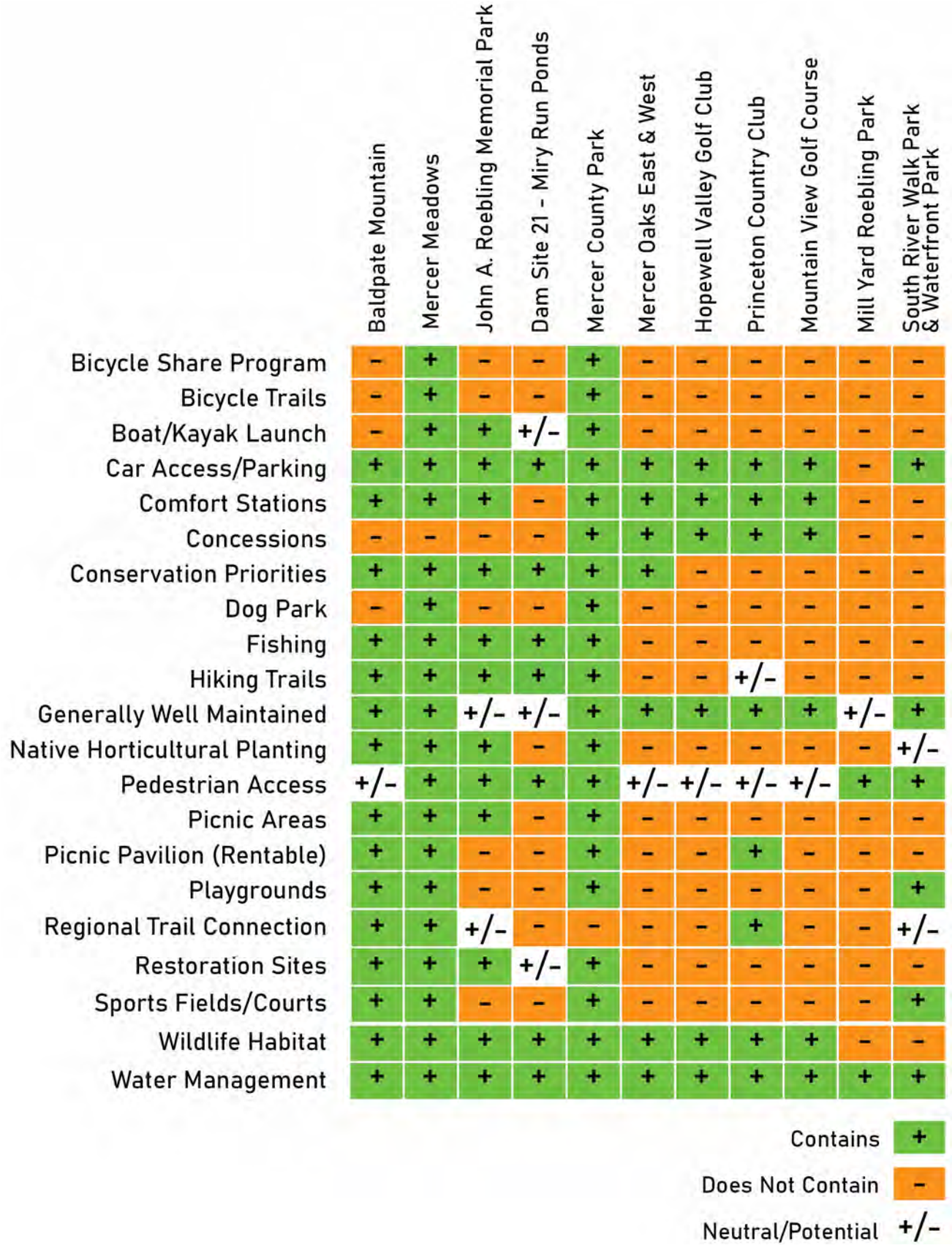

Table 5.2: Matrix Analysis.

County Park Summary by Attribute

Two Park facilities offer rentable bicycles as a part of Mercer County's Bicycle Share program. Mercer County Park and Mercer Meadows contain bicycle racks with ten rentable bicycles per rack. At the time of our visit bicycles were not available on the racks (due to COVID-19 pandemic restrictions, June 2021). Bicycle racks (without rentable bicycles) were available throughout the park facilities in mixed conditions with varied bicycle slots.

Bicycle trails cater to users beyond pedestrians on foot but have potential to attract the mountain biking community. For the sake of this analysis, we identify parks to have bicycle trails if the trail was identified as mixed use on the available County Park maps and behavioral signage at the parks promoted bicycle usage on trails. Mercer County Park and Mercer Meadows were the only two parks that obviously allowed and promoted bicycle usage on the trails. Although bicycles were seen throughout the park facilities, it was not obvious if usage was intended or promoted.

Car access and parking are ample amenities throughout all park facilities. Mill Yard Roebling Park is the only park facility that does not have designated parking offered. However, due to its location parking is unnecessary. Mill Yard Roebling Park is intended to be used by people frequenting the local businesses and occupants within the city area. Mercer County Park, the largest County Park and Regional Park, has numerous parking lots throughout the facility catering to the array of activities offered on park grounds. Mercer Meadows has ample parking for the park facilities offered, but due to less active sports and structures there is a reduced need for excessive parking. Baldpate Mountain Area has several parking lots ranging in scale and material. John A. Roebling Memorial Park has gravel parking lots at each main entrance, while Dam Site 21- Miry Run Ponds has a small lot and street parking (new plans incorporate parking). All Golf Courses are equipped with parking and car access. The two urban parks, Waterfront and South River Walk Parks, are supplied with parking at the baseball stadium.

The four main parks with large waterbodies as their central features all had boat/kayak access to the water in some way. Mercer Meadows and Mercer County Park had formal boat/kayak launch docks located on the lakes, while John A. Roebling Memorial Park had access points along the waterbodies with behavioral signage to inform the public that boat/kayak access was allowed. A Neutral/Potential designation was applied to Dam Site 21- Miry Run Ponds even though there was not a formal kayak launch or behavioral signage spotted. When onsite, a person fishing was seen in a kayak on the pond, confirming that access was possible without a designated launch.

Comfort stations (bathrooms) were seen at all Regional Parks and Golf Courses, beside Dam Site 21- Miry Run Ponds. The Urban Parks did not have comfort stations available for the public and are not planned to have this amenity available due to safety concerns. Comfort stations range in type form compost- no water bathrooms, portable bathrooms, and fully equipped bathrooms with running water and electricity. The portable bathrooms in John A. Roebling Memorial Park were fenced for public safety and locked at night by park rangers. The Park Inventory Chapter 4 discussed in more detail the analysis and needs pertaining to the park comfort stations.

Mercer County Park and all Golf Courses offered concessions to the public. Mercer County Park had a concession stand at the Marina District main building and a vending machine at the East Picnic Area. All Golf Courses had a main building that offered some type of food or beverage. Drink carts were available at the Golf Courses for golfers. The Golf Courses had restaurants and/or catering halls with outside seating associated with the main club house.

All Regional Parks and Mercer Oaks East and West Golf Course had areas that we identified as conservation priority areas. Pristine areas were seen throughout the natural landscapes that need implemented conservation strategies soon to

Figure 5.3: Fishing Dock at Mercer Meadows.

protect the current plant community from potential degradation or invasive plant species pressure. As seen with the recent tornadoes, disturbance can happen at any time. Having a conservation strategy in place for these areas will help secure funds to reduce the impact of disturbance. The Regional Parks had natural and naturalized areas with meadows and forest cover. In some instances, the Regional Parks provide the largest swath of naturalized land within the urban core of Mercer County.

Mercer County Park and Mercer Meadows both have dog parks. Mercer County Park has two dog parks in the Sports district. One is for small dogs and the other is designated for large dogs. Mercer Meadows has one dog park at the entrance of the Rosedale Lake parking area. The dog parks were well maintained, properly fenced for dog and park user safety, and were being utilized while our team was onsite.

All the Regional Park lakes and ponds allowed for fishing. When onsite, our team noticed people on kayaks or in the water fishing at each of the waterbodies. At Mercer Meadows signage encouraged fishing and we noticed people fishing on Rosedale Lake and Curlis Lake. At John A. Roebling Memorial Park behavioral signage suggested that fishing was allowed at Spring Lake, and we saw people fishing.

Regional Parks were equipped with an array of hiking trails. The trails ranged from soil trails to asphalt paths. The Regional Parks had trails that passed through natural areas, along the waterbodies, through historic districts, and unveiled the unique characteristics hidden throughout each Regional Park. The Princeton County Club Golf Course received a Neutral/Potential score for hiking trails because it is adjacent to the Delaware and Raritan Canal Towpath, but the towpath is not officially a part of the golf course. Baldpate Mountain Area is known for its hiking trails throughout the mountain area, Mercer County Park has many paths that intertwine throughout the natural regions of the park, and Mercer Meadows is home to a segment of the Lawrence Hopewell Trail. Dam Site 21-Miry Run Ponds trails cater to the local neighborhood and is planned for an accessible trail network unique to its landscape. John A. Roebling Memorial Park is known for its trail network which allows pedestrians to experience the marsh, forested wetlands, and lake.

Mercer County Park Commission does an excellent job in maintaining its park facilities. The Regional Parks within the suburban and rural areas of the County were immaculate beside isolated instances of dumping, litter, and vegetation maintenance needed along the trails. While at the parks, we consistently noticed staff members tending to the park grounds. The Golf Courses were all well-kept aside for undergoing construction to enhance the courses. South River Walk Park and Waterfront Park were clean and well maintained. John A. Roebling Memorial Park received a Neutral/Potential score because it needed trail maintenance and had the appearance of looking more heavily used. Structures throughout the marsh needed maintenance to ensure pedestrian safety. Mill Yard Roebling Park needs updating but poses no threat to human health or wellbeing.

Native horticultural plantings are a wonderful way to add biodiversity to the front entrances of park facilities and structures. Horticulture plantings only apply to parks that had buildings and formal garden beds. Mercer County Park, John A. Roebling Memorial Park, Mercer Meadows, and Baldpate Mountain Area had garden beds throughout the park facilities that were comprised in part of native plantings (not all plants were native). Dam Site 21-Miry Run Ponds did not have garden beds. The Golf Courses planting beds did not contain native plant species in their plant palettes similar to Mill Yard Roebling Park with zero native plant species. South River Walk Park had native perennial plants throughout the garden beds featuring purple coneflower, black eyed Susan's, and Viburnum species.

Safe pedestrian access is a terrific way to reduce the dependency on car transportation to enter parks. This report identifies areas with safe pedestrian access as parks with sidewalks in the adjacent communities and clear pedestrian trail entrances. Mercer County Park, Mercer Meadows, John A. Roebling Park, and Dam Site 21-Miry Run Ponds had safe pedestrian access. However, Baldpate Mountain Area had instances with lacking sidewalks and safe passages between park areas along roadways. The Golf Courses were surrounded by suburban communities with sidewalks and the Urban Parks were in the heart of the urban center and easily accessible on foot. Mill Yard Roebling Park was surrounded by sidewalks, while the Waterfront Park and South River Walk Park were near the business corridor and residential neighborhood with

clearly marked entrances.

All Regional Parks had publicly accessible picnic areas. These areas are first come first serve and typically have picnic tables and or park benches, in some instances these areas had charcoal grills and garbage cans. The only Regional Park to not have this feature was Dam Site 21-Miry Run Ponds which is planned to have this amenity in the future. The Golf Courses do not have picnic areas by our definition that are open for anyone in the public to come in and use. The Urban Parks have ample park benches, but do not have picnic areas.

There are five rentable picnic pavilions throughout the Mercer County Park system. Picnic pavilions are roofed outdoor kitchens which are equipped with utilities such as water and electricity. The pavilions are available for the public to rent. The five pavilions include: (1) Valley Road Picnic Area near Baldpate Mountain Area, (2) East Mercer County Park, (3) West Mercer County Park, (4) Princeton Country Club, (5) Rosedale Park. The Princeton Country Club picnic pavilion is located at the end of the road and is not directly in the Golf Course.

The main parks to feature playgrounds were Baldpate Mountain Area, Mercer Meadows, Mercer County Park, and South River Walk Park. The style and number of playgrounds within each park facility varied even among the playgrounds within the parks. Playground ground materials were different as well as the overall age from playground to playground. The playgrounds throughout the park system were well maintained and appeared safe. A notable feature in Mercer County Park and South River Walk Park were playgrounds that catered to a diverse group of children. Both parks had playgrounds for different age groups (evident by the equipment size). Mercer County Park is the only park that has American Disabilities Act (ADA) accessible play equipment with an ADA swing set near the spray park.

Regional trail networks provide connections between county park (and all management type) open space and park facilities. There are two park facilities directly connected to one of the four regional trails in Mercer County and three that are adjacent to but not directly connected to a regional trail. Baldpate Mountain Area and Princeton Country Club Golf Course touch upon the Delaware and Raritan Canal Towpath, and the Lawrence Hopewell Trail runs through Mercer Meadows. John A. Roebling Memorial Park, Waterfront Park and South River Walk Park are adjacent to the D&R Canal Towpath but not directly connected to it.

The Regional Parks have restoration areas within the natural/naturalized areas. The restoration areas include fenced and non-fenced meadow and forest restoration efforts run by Mercer County Park Commission. The restoration areas plant composition varies based on the zone's location (upland or wetland). Restoration was noted throughout each Regional Park and are a planned activity for the future construction at Dam Site 21-Miry Run Ponds. The Golf Courses do not contain restoration areas. However, there are various planting efforts to incorporate meadows and no-mow areas within the courses.

Mercer County Park is the only park that has been identified as an Active Recreation Regional Park. As it has been previously defined active recreational areas promote sports and other active uses. Although Mercer County Park is the only Active Recreational Park, the other Regional Parks contain sports fields within the rentable picnic areas. The Waterfront Park and South River Walk Park are listed as having a sports field because this property is also home to the Minor League Baseball Stadium in Trenton.

All Regional Parks and Golf Courses contain wildlife habitat.

Figure 5.4: Picnic Area
Mercer County Park.

Figure 5.5: ADA Swing-Set
Mercer County Park.

The Regional Parks have vast natural areas home to various wildlife species. The Golf Courses are surrounded by forest, contain meadows and lakes, and are filled with shade trees. These differing landscape typologies are home to unique wildlife species. When onsite, we saw several different songbirds frequenting the Golf Courses. In Mercer Oaks East there were wild turkeys and a designated Bald Eagle habitat. The only parks to not offer wildlife habitat were the Urban Parks as they were not in natural areas, but at the heart of the urban center of Trenton.

All parks in some way incorporated water management features into the landscape. Swales leading to drainage ditches and small streams were the main water management strategies throughout the Golf Courses. Baldpate Mountain Area features an impervious parking lot and gravel lots to reduce imperious surface and stormwater runoff. Mercer Meadows has culverts and streams running under trails throughout the meadow areas. South River Walk has large outflow pipes that take excess water from the park and release it into the Delaware River. Although all parks incorporate water management technology, there is room for improvement in each park facility, evidenced by some standing water at each park.

The inclusion or limitation of park amenities within each park does not suggest a park is lacking but helps summarize the character of each park and the role it plays in the overall Mercer County Park network. Regional Parks are significantly different from the smaller Urban Parks throughout Mercer County. The Golf Courses occupy the middle ground even though they are designated for a specific type of user. The summation of park attributes plus the park facility and open space inventory leads to the identification of priority recommendations for the overall Mercer County Park network.

Figure 5.6: Master Gardener's Bench Mercer Meadows.

5.2 Priority Intervention Recommendations

Overview

This section outlines recommendations that were recurring throughout our regional inventory, open space analysis, and park facilities inventory and analysis. These recommendations are general recommendations for the entirety of the Mercer County Park Network and do not provide site specific, situational recommendations. Recommendation topics include removal of hazardous trees, vegetation monitoring of ecological threats, conservation measures in priority areas, improving stormwater management techniques, upgrading trail blazing standards, extending regional trail networks, performing desire path analysis, and discouraging illegal dumping.

Tree Removal

Ash tree removal and replacement is a prime recommendation. Dead and dying ash trees were seen throughout the parks and most noticeably within the golf courses as many were standing dead hazards by pathways. With the ever-growing threat of the Emerald Ash Borer spreading throughout the ash tree population our recommendation suggests removing all ash trees that pose a risk to park goers, employees, buildings, and facilities. Ash tree death due to the Emerald Ash Borer is an ecological crisis and where people gather it is an incredible safety concern. We recommend looking into additional federal and state funding or fundraising to assist with the immense costs of county-wide tree work.

Tree removal on a large scale is a costly endeavor. Our recommendation is to prioritize ash tree removal based on their vicinity to areas with high human activity. The highest priority area to remove dead and dying ash trees would be near paths, gathering areas, parking areas, and roadways; the second priority area would be around buildings and structures; the third level priority removal area is in wooded areas with planned restoration and reforestation. In woodlands and forested areas that have no human activity, the dead and dying ash can be left in place.

There are several tree species that would be appropriate replacements for ash trees. An essential point to consider when making tree species selections is planning for biodiversity to ensure long term sustainability, which fosters resilient ecological communities. Planning for biodiversity encompasses planting many species from several genera and not planting a monoculture or few species in one area. This will ensure that one pathogen or pest that is often obligate to a species or genus will not cause such widespread damage in one area. A simplified list of ash tree replacement species in moist to wet sites (like in lowlands and floodplains) includes, but is not limited to black gum, sycamore, sweet gum, red maple, swamp white oak, bitternut hickory. Upland site ash replacements include but are not limited to white pine, American holly, white oak, chestnut oak, black walnut, hackberry, and shagbark hickory. These species are native to the area, currently pose no known threats to the local ecosystem, and are not species that are currently subject to a targeted, severe disease or pest in New Jersey.

Figure 5.7: Dying Shade Tree Mercer Meadows.

Vegetation Monitoring

Vegetation monitoring is an ongoing effort throughout Mercer County's parks. There are numerous restoration areas in Mercer County Park, Baldpate Mountain Area, John A. Roebling Memorial Park, and Mercer Meadows. In conjunction with the fantastic restoration efforts, it is the necessity to monitor and protect pristine ecological habitats that may be experiencing initial stages of invasive plant species pressure or are pristine and need more conservation steps for best protection. Our report identified general locations for conservation priority areas where we recommend regular monitoring as well as monitoring and prevention of invasive plant spread in neighboring locations. In certain areas with high deer pressure or land-use pressure, fencing for protection may be beneficial.

Beech Leaf Disease is newly emerging and targets only Beech trees (Fagus spp.). Beach Leaf Disease is caused by an invasive nematode, Litylenchus crenatae, and inflicts damage to the trees' leaves.[2] In areas with an established invasion, 100% of beech trees become affected. It can kill mature beech within six to ten years. There is no official treatment to save beech trees from infestations either. Although Beech Leaf Disease is not yet common in Mercer County, it has been found in Morris County where it has infected several acres of mature oak-beech forests. It is important to begin preparing for this invasion and potential widespread loss of beech trees. Monitoring the mature forests that contain beech is critical. With hope there will be a treatment available that is cost-effective which can save beech if infected in Mercer County Parks.

Bacterial Leaf Scorch is threatening oak trees and forests. It is essential to monitor for its occurrence and spread. Planning for removal is essential for oak tree survival and to ensure overall optimal forest health.

Ecological threats have been identified throughout the park facilities, most of which are invasive plant species infiltration or dominance that pose significant threats to the surrounding ecological communities. For example, some invasive vines, like wisteria or Asiatic bittersweet, not only take over the understory and shrub layer but strangle overstory trees as they climb to the canopy, which leads to total forest destruction. In planted restoration meadows, species like mugwort and Chinese lespedeza, can invade and displace native plants.

In no-mow meadows (those not planted) invasive plants dominate the areas and allow further invasion to peripheral areas at forest edges. It is essential to monitor and mitigate the noted ecological threat zones to reduce invasive plant species pressure on surrounding ecological communities, especially those adjacent to waterways. Additionally, invasive plant species such as the tree of heaven are the larval host to the newer invasive insect species, the spotted lantern fly, which is now rampant in Mercer County. The spotted lanternfly can cause significant destruction to non-host plant species including black walnut, sumac, red maple, and wild grape. To prevent further destruction, we recommend removal of tree of heaven to reduce hosting locations to reduce ecological damage to native species.

Figure 5.8: Meadow Mercer Oaks East Golf Course.

Trail Blazing Standards

In multiple park facilities the trail systems were hard to follow and lacked a clear blazing system. On forested trails blazes were very few and often forks in and turns were not marked. Painted trail markers could help avoid tree damage while adding a more permanent and inexpensive wayfinding system. A standard system across the park facility network would create a cohesive aesthetic throughout the park network that is recognizable between parks.

The New Jersey/New York Trail Conference Guidelines for Blazing Trails manual is an excellent resource for standard trail blazing and best blazing practices.[3] The guidebook identifies two approaches to blazing either paint or tag, and how to properly mark the trails for the best user experience. Not only is it important to develop a standard blazing system, but it is essential to update all existing markers to ensure they are correct. We highly recommend the above guidelines as the blaze design and blaze frequency follow the most universal blazing system in America, which most hikers know how to interpret.

Digital applications and County Park maps provide the most accurate means for navigating the park trails. Updating the trail maps to reflect the current park conditions while discouraging desire trail use will help with wayfinding efforts within the parks.

Desire Path Study

A desire path is a path that humans and animals create for ease of access and were not designed as intentional paths by the landowner. Desire paths were observed and recorded throughout the County Park facilities and are a typical find in public park environments. Desire paths often led to residential properties abutting trails, cut through naturalized areas, and led to waterfronts. In some instances, desire paths were the only way to access certain areas of the associated park, and in other areas desire paths led unnecessarily into heavily forested areas or unauthorized gathering spots

There are instances where desire paths appear necessary and can be made into authorized trails. For example, the red trail in Mercer County Park did not have an access point behind the Tennis area. However, the park trail map looked as if the trail was meant to connect at these locations. There was a desire path that connected the tennis area with the red trail. We also utilized this desire path to exit the red trail. Another example of useful desire paths are the paths around Spring Lake in John A. Roebling Park, that lead to lake vistas from the main trail. Some of these should be kept as they enhance the visitors' experience.

In several areas desire paths were destructive. They often cut through natural vegetation which increases fragmentation and disturbance, that leads to infiltration of invasive species. Often times desire paths lead to private residences, yet these self-serving paths can unknowingly lead trespassers to private property. Few paths were found leading to unauthorized gathering spaces like some in Watson Woods, where further evidence of illegal activity was observed, such as fire pits, encampments, and vandalism. An in-depth study is recommended for the entire park facility system of all desire paths. The study should conclude if a path is appropriate at this location and should be marked or designated as a trail entrance; or if the desire path is detrimental to the surrounding environment and should be discouraged.

Trail encouragement should be celebrated with signage marking entrances and exits. Some desire paths can be added to the park maps as secondary or main trails depending on their usage and should be properly blazed to avoid user confusion. In the case where desire paths are harmful, there are several ways to discourage path use. Vegetation planting or placement of vegetive debris piles can block access to desire paths and will help deter people from using them. Fencing is a more intensive process but will eliminate any unwanted trail use. Whether blocking off desire paths or keeping them, the best way to manage the trail system begins with utilizing a standardized blazing system.

Figure 5.9: Trail Blaze Curlis Woods.

Stormwater Management

Throughout all of Mercer County Park Facilities there were recorded instances of pooling water on paths, in paved areas, and in throughout turf lawns. Pooling water has the potential to encourage mosquitoes and is unpleasant for park users. Management of pooling water could be as simple as repairing potholes in parking areas, performing trail adjustments along paths, or incorporating vegetation and rain gardens to absorb more water within turf areas.

Planting standards throughout the park system would help reduce standing water near parking areas and in turf areas. The incorporation of rain gardens near buildings, parking lots, and in open lawn areas where water pools will reduce pooling water while increasing biodiversity and aesthetics. The new rain garden outside of the Fair Grounds at Mercer County Park is an excellent example for additions to improved pooling surface water. There are also pockets of mown turf throughout the Golf Courses which could serve as vegetated water management areas. The New Jersey Department of Environmental Protection provides the NJ Stormwater Best Management Practices Manual which can guide the County's water management applications.[4] The manual discusses varied scale green infrastructure potential which can be applied across the park networks. Further we suggest that any necessary repairs of roads and parking areas trigger a conversation about whether asphalt can be reduced or replaced by pervious materials.

Discourage Illegal Dumping

Illegal dumping was seen in several natural areas within the regional parks as well as some parking areas. Litter was an issue throughout and the County does have ample trash cans that satisfy those that use them. Yet many visitors choose not to. Therefore, we encourage more signage and perhaps a volunteer group to come to help clean the parks.

There were also instances of larger debris dumping in some parking areas that looked to be dropped off by vehicles. This occurred in the parking areas that were not as frequently used, had instances of litter, looked more visually closed off, and were not in the best condition. We recommend some added enhancements to some of these parking areas, perhaps with new pavement, new trash cans, more open viewshed (less screening) and more frequent litter pick up. One thing that facilitates littering and dumping is existing litter and dumped debris. If areas are clear and look clean, people are less likely to trash them.

Increase Bicyclist & Pedestrian Accessibility

The last general recommendation is to extend the regional trail networks. Extending the regional trail networks with increase pedestrian and bicycle accessibility and lead to an increase of human wellbeing throughout Mercer County. Expanding the regional trail network will reduce car traffic and contribute to lower emissions by needing less gasoline powered vehicles to get to the parks. This will help identify Mercer County's role in the fight against climate change. The Fredrick Law Olmsted Parkway System in Buffalo, New York is a prime example of how Mercer County can connect its large regional parks and naturalized areas through greenway corridors.

Adding more bicycle racks as a part of the Mercer County Park Bicycle Share program is a great way to encourage park users to use bicycles instead of their cars. Having more bicycles and racks available throughout the various parks could help encourage people to venture from one park to another along regional trail networks.

Figure 5.10: Litter in Charcoal Pit Mercer County Park.

5.3 Next Phase

Overview

An integral next step to this general inventory and analysis report would be to create a prioritized actions summary for each individual park facility, undertake an Open Space Acquisition Study, and facilitate a regional trail network feasibility study.

Park Facility Recommendations

The Park facility analysis next steps should expand on the analysis and recommendations within this report and provide detailed recommendations per park property. The recommendations would specify specific goals within each park and prioritize interventions based on short, medium, and long-term goals. The goals would be supported with implementation strategy recommendations.

The analysis of County Park facilities could be expanded to include the public's opinion on the current parks' quality and access. Surveys and public comment opportunities could be made available to understand the user experience within the parks. These surveys would ask "how often do you visit the parks; which are your favorite; what do you dislike about the park etc."

An on-going public engagement process which would help with park maintenance moving forward could include self-reporting park maintenance issues. Park users could take pictures and upload comments to a County Parks application to help the County understand where park maintenance is needed from the park user's perspective.

An in-depth park implementation and management plan would help the County organize the next steps to better each park facility while giving the public an opportunity to identify priority concerns within the parks.

Open Space Aquisition

An Open Space Acquisition analysis will help identify specific properties which are not protected by NJDEP Green Acres Land Trust. Forest, agricultural, wetland, and other naturalized lands would be studied to assess the feasibility of potential open space acquisition. This is a streamlined process to pinpoint specific land parcels that can be acquired in the future through Green Acres funding or preserved through the NJ Farmland Preservation Program.

This land acquisition study would provide a framework for future decisions and should be utilized when land acquisition takes place through the open space trust fund. The study would incorporate residents access to open space, walkability, and park facility access.

Additionally, it is essential that other branches of county government also take the overall goals and initiatives into consideration, for example for transportation planning or infrastructure improvements. Municipal governments will be encouraged to utilize the proposed document for local planning and redevelopment efforts. It can for example be used to outline actions that mitigate environmental detriments of zoning variances or other impactful investment decisions.

However, this document does not replace municipal environmental resource inventories or environmental impact statements but can inform them.

Figure 5.11: Regional Trail Signage at Mercer Meadows.

Regional Trail Study

A regional trail network is an outstanding way to increase park facility and open space access in Mercer County. Noted in Chapter 3, there are many potential avenues to increase and connect regional trails to one another and to Mercer County's Park facilities. Enhancing this already existing network of trails will increase park access while reducing the need to drive a motorized vehicle to a park. Many of the larger regional parks throughout Mercer County require a car to get to them. Increasing access to parks through pedestrian and bicycle trails creates safe access while reducing Mercer County's carbon footprint reducing the negative impacts of climate change seen ravaging the landscapes and human safety. Providing more access to trails and parks is a great way to enhance the resident's connection to nature and the parks by bringing the beginning of the trails right to their doors.

An extensive feasibility study can show where potential connections can be made and fostered. Some connections may already exist whereas others may need more construction to implement. Throughout Mercer County there are streams, rivers, lakes, canals, rail line rights-of-way, transmission line rights-of-way, historic districts, and abandoned barren lands which would make for excellent linear paths between parks. This would help Mercer County Parks reach a wider array of users across the entire county opposed to limiting the reach to larger regional parks in the northwest, central, and southwest regions of the County.

Master Plan

A comprehensive master plan for Mercer County Parks would include these three components to enhance the overall park system. The plan would focus on enhancing the current park facility network with an outline plan to do so, acquiring more open space parcels through an open space acquisition study, and increasing residents' accessibility to County owned open space while reducing car dependency through the expansion of a County wide regional trail network.

The next phase of the process could encompass a team effort, engaging local community groups, stakeholders, and the public along with government officials on the municipal, county, and state level.

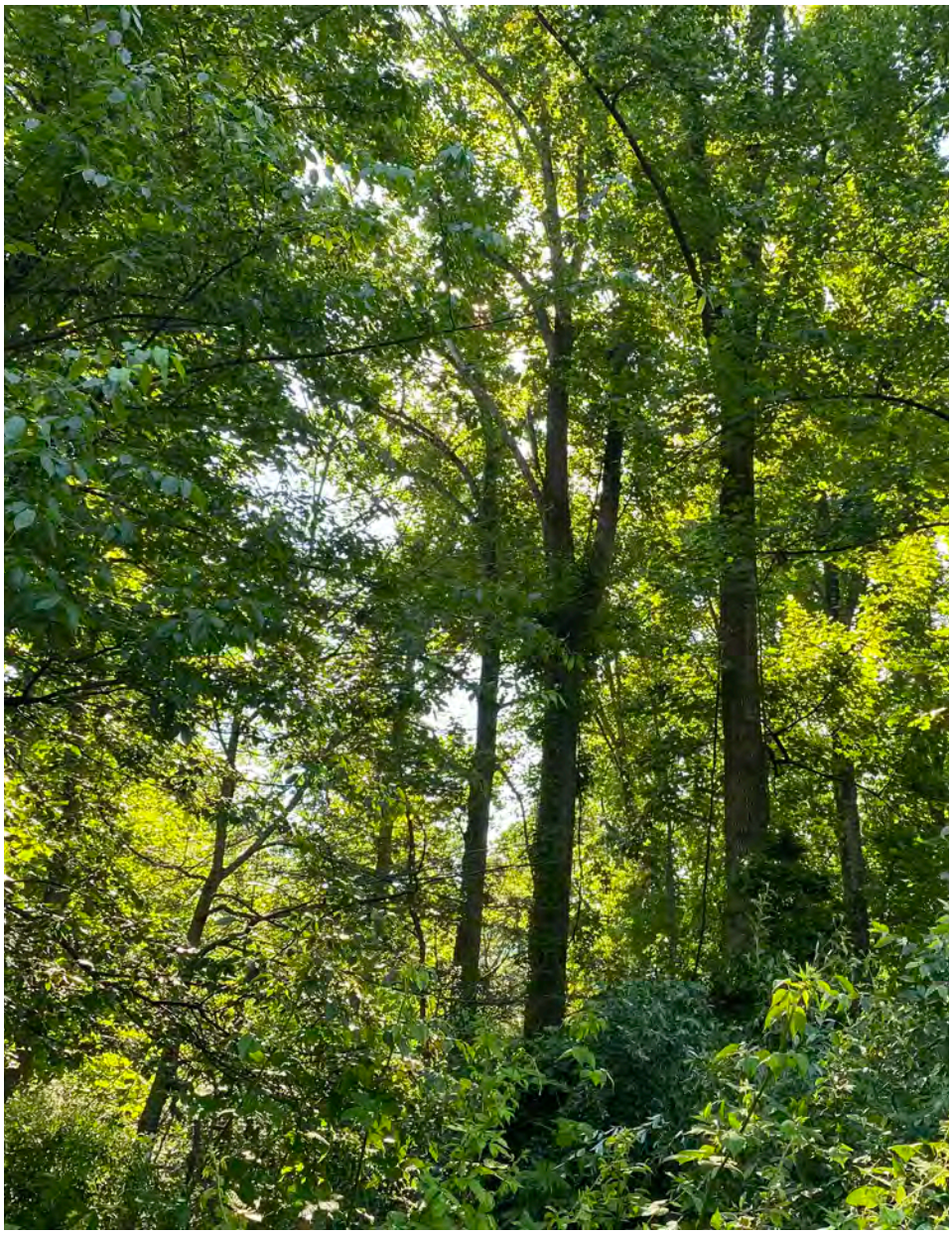

Figure 5.12: Forest at Baldpate Mountain.

Conclusion

The Mercer County Parks inventory and analysis has led to the findings that Mercer County Park Commission has been excelling at its efforts to undertake land stewardship and management, acquire open space, and provide quality open space the Mercer County Community. Throughout the park facilities, Mercer County Park Commission's attention to detail was evident by the presence of new facilities and numerous restoration efforts. The Park facilities were clean and well kept. Although there is always room for improvement, the ecological efforts throughout Mercer County are evident by the vast expanse of protected open space.

Preliminary inventory studies to assess the county wide landscape helped us to understand the ecological and cultural diversities across Mercer County's built and natural environments. The mountainous northern portion of the county is an ideal location for Passive Recreation Regional Parks with hilly trails and summit views; whereas the southern half of the County is on flatter terrain with more active recreational opportunities. Waterways, wetlands, and forest land cover make up a large portion of the park systems property hosting many rare and endangered wildlife species and habitats. The many man-made lakes create wildlife habitats and recreational opportunities across the Regional Parks. The many streams and waterways cutting through Mercer County's landscape provide both recreational and habitat corridor connections.

Active conservation and restoration efforts are the only way to ensure habitat resilience and sustainability for the future. Not to mention that these habitats offer groundwater recharge opportunities, surface water storage, and healthy hydrological systems to help aid in climate risk reduction for the surrounding communities. County support for the ongoing stewardship efforts in Mercer County is crucial in protecting existing open space and reducing the pressures of future development.

Our list of recommendations for the individual park facilities and general recommendations throughout are steppingstones for further studies in land acquisition, habitat quality studies, and open space access and connection opportunities. With continued work and support of non-profit organizations Mercer County has the opportunity to enhance the park systems recreational, habitat, and trail connection quality reaching the entire community through an interconnected web of County owned park properties and open space parcels.

End Notes

[1] "MERCER COUNTY OFFERS BIKE SHARE, BIKE NATURE TOURS," Mercer County, June 2021.

[2] Daniel Volk and Leigh Greenwood, "Beech Leaf Disease," Don't Move Firewood, August 21, 2021.

[3] NJ/NY Trails Conference Guidelines for Blazing Trails manual, 2016.

[4] New Jersey Department of Environmental Protection (NJDEP). NJ Stormwater Best Management Practices Manual. March 2021. (Date Accessed September 20, 2021).

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Appendices

Inventory Definitions

FOREST: a land area that is forested, containing not only naturally growing trees (not planted unless for reforestation purposes), but multiple layers (or strata) of natural (or invaded) vegetation as outlined below. Some strata may be missing due to anthropogenic effects and degradation. However, forests are different from mass plantings of shade trees as shade trees are planted and designed to create shade for human use below and usually do not have other lower layers of vegetation except for turf grass or horticultural plantings.

OVERSTORY: the composition of trees that occupy the canopy in a forest

MIDSTORY: the next generation of trees growing towards the canopy above 10cm DBH in a forest

REGENERATION: tree seedlings and sapling below 10cm DBH in a forest

SHRUB LAYER: this vertical stratum is shared with regeneration but includes shrub and vine species, not trees. Shrubs are defined as multi-stemmed woody plants that generally do not exceed 15 feet in height at maturity (exception of height maximum includes witch hazel). Woody vines generally remain in the shrub layer and can climb up overstory trees, but typically do not reach canopy height (unless the vines are invasive and have smothered an entire forest top to bottom, which can happen on occasion with species such as wisteria and porcelainberry)

GROUND LAYER: the layer below mature shrubs that can include ground vines but are typically filled with flowering herbs, ferns, and graminoids (grasses and grass-like plants i.e. sedges and rushes).

CONDITION: in this inventory has a dropdown choice of CONSERVATION PRIORITIES, ECOLOGICAL THREATS, or OTHER according to the species composition and health of each layer above. These terms are relative within the county.

CONSERVATION PRIORITY: an area of high habitat quality or biodiversity that closely exemplifies a natural plant community and needs to be protected from degradation into the future to maintain habitat quality. Steps to conserve typically include deer fencing, EDRR (early detection rapid response) for invasive species, and regular monitoring.

ECOLOGICAL THREAT: an area that had high amounts of reproducing invasive species, had canopy losses due to tree health issues which facilitate invasive species spread, or contain notable anthropogenically caused degradation.

MEADOW: an open area free of canopy trees that is dominated by herbaceous plants (flowering perennials, graminoids, and ferns) and can include some shrubs (shrub meadow), regeneration, and vines. In Mercer County parks, the meadows are generally herbaceous and contains few shrubs. No shrub dominant meadows were found in the field site visits.

RIPARIAN EDGE: a specifically distinct area between the dry upland and the water's edge of a river, pond, lake, or other waterbody. It can contain forest vegetation or can be dominated by wetland emergent herbaceous plants such as cattails or phragmites. Usually, the plant species include vegetation that is OBL, FACW, and FAC, but can also include FACU and UPL along the upper boundary.

SHADE TREE: a planted (sometimes not planted) tree or grouping of trees that provide shade over areas of recreational use or transportation, such as over turf grass, picnic areas, gathering spaces, playgrounds, sidewalks, roadways, and parking lots. Shade trees differ from forests as shade trees' primary function is to provide shade and temperature regulation benefits over areas that humans use, and they do not have natural forest vegetative layers below. Sometimes, invaded meadows with vines can occupy below a shade tree clump, such as few in Mercer Co. golf courses, because of decreased maintenance regimes. However, shade tree clump areas that have not been maintained in years may include tree regeneration, midstory trees, and shrubs, are reverting to forest and will be considered as such.

HORTICULTURAL PLANTING: intentionally planted mainly for aesthetics and ambiance enhancements, including herbaceous plants, grasses, and/or shrubs such as garden beds; they can occur under shade tree areas as well as occurring without shade trees. Lawn or turf grass is not included in this category.

RESTORATION AREA: these zones can include a meadow restoration or woody plant restoration or both.

-Meadow restorations are usually a mix of native herbaceous plants (flowering and non flowering) that were seeded and/or planted as plugs and are mowed on average once per year to prevent woody plant succession.

-Woody plant restorations include native tree and shrub species for reforestation and are tightly planted in a fenced area or each individual plant is protected by a cage or tube. Woody plant restoration can occur within meadows where succession is promoted.

NJDEP
Land Use Land Cover
Definitions

Agriculture: This Level I category includes all lands used primarily for the production of food and fiber and some of the structures associated with this production. These areas are easily distinguished from the other categories and represent a significant land use in New Jersey. The Level II categories of Agricultural Land are; Cropland and Pastureland; Orchards; Vineyards; Nurseries and Horticultural Areas; Confined Feeding Operations; and Other environmental concern because of the non-point source pollution associated with confined feeding operations.

Barren: characterized by thin soil, sand or rocks and a lack of vegetative cover in a non-urban setting. Vegetation, if present, is widely spaced. Barren land such as beaches and rock faces are found in nature but also result as a product of man's activities. Extraction mining operations, landfills and other disposal sites compose the majority of man-altered barren lands.

Forest: This Level I category contains any lands covered by woody vegetation other than wetlands. These areas are capable of producing timber and other wood products, and of supporting many kinds of outdoor recreation. Forestland is an important category environmentally, because it affects air quality, water quality, wildlife habitat, climate, and many other aspects of the ecology of an area. The Level II categories under Forestland are Deciduous; Coniferous; Mixed Deciduous-Coniferous; and Brushland.

Urban: intensive land use where the landscape has been altered by human activities.

Wetland: The wetlands are those areas that are inundated or saturated by surface or ground waters at a frequency and duration sufficient to support vegetation adapted for life in saturated soil conditions. Included in this category are naturally vegetated swamps, marshes, bogs and savannas which are normally associated with topographically low elevations but may be located at any elevation where water perches over an aquiclude. Wetlands that have been modified for recreation, agriculture, or industry will not be included here but described under the specific use category.

The wetlands of New Jersey are located around the numerous interior stream systems, and along the coastal rivers and bays. New Jersey, by its numerous different physiographic regions, supports various wetland habitats dependent upon physiographic and geological variables. The Level II classification separates wetlands into two categories based on the location relative to a tidal water system: Coastal Wetlands and Interior Wetlands.

Inventory Features & Attributes.

The list below are layers or feature classes created in ArcMap. The layers were added to one map to be populated with field inventory.

Layer Breakdown:
1. Feature Class (Category)
2. Attribute (Object or Type)
3. Domain (Dropdown Menu Selections)

INVENTORY LAYERS

Forest: Points and Polygon
-Overstory (Dominant Species)
-Midstory (Dominant Species)
-Shrub Layer (Dominant Species)
-Ground Layer (Dominant Species)
--Regen (Dominant Species)
--Ecological Condition
--Conservation Priority
--Notes

Ecological Condition
-Threat
-Priority (Low, Medium, High, None, Other)
-Invasives (Zero, Few Clustered, Few Scattered, Most, All)
-Other & Notes
-Attach Photo

Restoration Zone: Points and Polygon
-Habit (herbaceous, shrubs, vines, shade trees, understory trees, mixed, other)
-Dominant Species (list)
-Deer damage (Severe, moderate, limited, other)
-Survival (most, half, few, other, none)
-Invasives (Zero, Few Clustered, Few Scattered, Most, All)
-Other & Notes
-Attach Photograph

Meadow: Points and Polygon
-Dominant Species
-Invasives (Zero, Few Clustered, Few Scattered, Most, All)
-Restoration Area (Yes, No, Unsure)
-Other & Notes
-Attach Photograph

Riparian Emergent Water Edge: Points and Polygon
-Dominant Species
-Invasives (Zero, Few Clustered, Few Scattered, Most, All)

Ecological Condition (Conservation Priority, Ecological Threat, Other, None)
-Other & Notes
-Attach Photograph

Wildlife Observations: Points and Polygon
-Wildlife Observation
-Geese Sighting
-Geese Feces
-Deer Sighting
-Deer Browse
-Deer Buck Rub
-Species Sighting Common Name
-Wasp Nest
-Wasp Other
-Tick Sighting
-Tick Nest
-Tick Other
-Invasive Insect Sighting
-Species Sighting Common Name
-Other and Notes
-Attach Photograph

Shade trees: Points and Polygon
-Count or Estimate
-Dominant species
-Invasive Quantity (zero, few, scattered, half, most, all, other)
-Tree Maintenance (pruning, mulch ring, removal, planting new/more, other)
-Other and Notes

Horticulture: Points and Polygon
-Species Habit (ornamental tree, ornamental shrubs, flowering plants, ferns, grass-like plants, mixed, other)
-Dominant species
-Invasive Quantity (zero, few, scattered, half, most, all, other)
-Maintenance required (pruning, weeding, mulch, removal, replacement, plant health issues, mow, other)
-Recommendation
-Other and Notes
-Attach Photograph

Water Management: Points, Polygon, Line
-Water Structures (Dam, levee, Culvert, drain, Inflow Pipe, Rain garden, Other)
-Condition (new, good, moderate, poor, other)
-Maintenance Recommendation (Replace, clean, update, repair, other)
-Issues
-Poor Drainage
-Pooling Surface Water
-Stagnant Water
-Clogged Drainage
-Erosion
-Eutrophication
-Other
-Recommendations
--Drainage Basin
--Rain Garden
--Alternate Path
--Bioswale
--Erosion Control Measures
--Other
--Floating Wetland
--Other and Notes
-Attach Photograph

Waterbody: Points, Polygon, Line
-Type (lake/pond, river, stream,

ephemeral stream or pond)
-Quality (good, moderate, poor, other)
-Eutrophication (Y, N, Unsure, Notes)
-Fishing allowed (y, n, other, don't know)
-Fish Stocked (y, n, other, don't know)
-Other and Notes
-Attach Photograph

Unintended Use: Points, Polygon, Line
-Category (Illegal, Vandalism, Dumping, Encampment, Other)
-Hazardous (Yes, No, Unsure)
-Other & Notes
-Attach Photograph
Path: Line
-Type (pavement, gravel, pavers, boardwalk, soil, desire path, other)
-Usage type (pedestrian only, ped and bike, car, other)
-Other and Notes

Access: Points and Polygon
Park Entrance
Car Access
Maintenance Only
Inaccessible
Access Point Potential
Other
Amenities: Points and Polygon
-Ball Cleaner
-Bike Rack
-Bike Share
-Boat Dock
-Boat House or Rental Area
-Comfort Station (Clean, Needs Maintenance)
-Dumpster (maintained, full)
-Festival Ground
Fishing
-Fitness Station
-Garbage Can (maintained, full)
-Garden
-Gathering Area
-Gazebo/Pavilion
-Grill
-Interpretive Signage
-Observational Point
-Outdoor Stage
-Park Bench
-Park Concessions
-Pedestrian Crossing
-Picnic Area
-Picnic Table
-Playground
-Relics/Memorials
-Scenic Overlook
-Sports Field (Type- Baseball, Basketball, Soccer, Football, Tennis, Volleyball, Cricket, Lacrosse, Indoor Sporting Facility (ice-skating, other), Equestrian- Stables Other)
-Utilities
-Water fountain (working, non-working, clean, needs maintenance)
-Wildlife Housing
-Other
--Maintenance Condition
-Other and Notes
-Attach Photograph

Parking: Points and Polygon
-Parking Type (Lot, Street, Other)
-Space Count
-Handicap Parking Spaces (Count)
-Material (Gravel, Asphalt, Soil,
-Pavers, Pervious Asphalt, Other)
-Maintenance Condition
-Access
-Public
-Permit
-Meter
-Park Personnel Only
-Other
-Recommendations
--Reduce Size
--Increase Size
--Change Material
--Change Color
--Provide Barrier
--Other
--Notes

General Observations: Points and Polygon
-Maintenance Required (Damaged, Neglected, Notes: Item and Description)
-Undesirable Quality (sight, sound, smell, feeling)
-Used for activities other than intended use
-Overused Area
-Garbage/Litter
-Excessive Lawn Cover
-Other and Notes
-Attach Photograph

WILDLIFE HABITAT SPECIES OF CONCERN RANK

Rank	Common Name	Scientific Name	Baldpate	Mercer Meadows	Mercer County Park	Miry Run Ponds	Roebling	South River Walk Park	Waterfront	Mill Yard	Captial City Farm	Hopewell Valley Golf Club	Mountain View Golf	Princeton Golf	Mercer Oaks	Outside Park Facilities
1	Core Forest	n/a	X	X	X							X				X
1	Freshwater Mussel Habitat	n/a														X
1	Grassland	n/a	X	X	X											X
1	Other Specific Habitat	n/a														X
1	Riparian Corridor	n/a	X	X	X	X	X	X	X			X	X	X	X	X
1	Wetlands	n/a					X									X
2	Black-throated Green Warbler	*Dendroica virens*														X
2	Brown Thrasher	*Toxostoma rufum*	X		X											X
2	Canada Warbler	*Wilsonia canadensis*														X
2	Cliff Sparrow	*Petrochelidon pyrrhonota*														X
2	Cobra Clubtail	*Gomphus vastus*														X
2	Cooper's Hawk	*Accipiter cooperii*		X												X
2	Eastern Box Turtle	*Terrapene carolina carolina*			X	X										X
2	Eastern Meadowlark	*Sturnella magna*	X													X
2	Fowler's Toad	*Anaxyrus fowleri*	X				X									X
2	Great Blue Heron	*Ardea herodias*			X	X	X		X				X	X	X	X
2	Kentucky Warbler	*Oporornis formosus*	X													X
2	Least Flycatcher	*Empidonax minimus*														X
2	Northern Copperhead	*Agkistrodon contortrix mokasen*	X													X
2	Sharp-shinned Hawk	*Accipiter striatus*														X
2	Short-eared Owl	*Asio flammeus*		X												X
2	Spotted Turtle	*Clemmys guttata*														X
2	Veery	*Catharus fuscescens*														X
2	Wood Trush	*Hylocichla mustelina*														X
2	Yellow-breasted Chat	*Icteria virens*														X
3	American Kestrel	*Falco sparverius*	X	X												X
3	Barred Owl	*Strix varia*												X		X
3	Bobolink	*Dolichonyx oryzivorus*		X												X
3	Frost Elfin	*Callophrys irus*														X
3	Grasshopper Sparrow	*Ammodramus savannarum*			X									X		X
3	Long-eared Owl	*Asio otus*		X												X
3	Red-headed Woodpecker	*Melanerpes erythrocephalus*														X
3	Red-shouldered Hawk	*Buteo lineatus*														X
3	Savannah Sparrow	*Passerculus sandwichensis*														X
3	Wood Turtle	*Glyptemys insculpta*		X								X				X
4	Bald Eagle	*Haliaeetus leucocephalus*	X	X	X	X	X					X		X	X	X
4	Bobcat	*Lynx rufus*	???									X				X
4	Pied-billed Grebe	*Podilymbus podiceps*					X									X
4	Upland Sandpiper	*Bartramia longicauda*														X
4	Vesper Sparrow	*Pooecetes gramineus*													X	X
5	Northern Myotis	*Myotis septentrionalis*														X
5	Shortnose Sturgeon	*Acipenser brevirostrum*							X							X

Rank Categories
1 Specific habitat requirements
2 Special concern in NJ
3 State threatened NJ
4 State Endangered NJ
5 Federally listed as Threatened or Endangered

Table 6.1: NJ Division of Fish and Wildlife. New Jersey Endangered and Threatened Wildlife.

Plant Species Rank Definitions.

Plant Rank	Definition
SH	(Endangered) Elements of historical occurrence in New Jersey. Despite some searching of historical occurrences and/or potential habitat, no extant occurrences are known. Since not all of the historical occurrences have been field surveyed, and unsearched potential habitat remains, historically ranked taxa are considered possibly extant, and remain a conservation priority for continued field work with the expectation they may be rediscovered
S1	Critically imperiled (Endangered) in New Jersey because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres). Elements so ranked are often restricted to very specialized conditions or habitats and/or restricted to an extremely small geographical area of the state. Also included are elements which were formerly more abundant, but because of habitat destruction or some other critical factor of its biology, they have been demonstrably reduced in abundance. In essence, these are elements for which, even with intensive searching, sizable additional occurrences are unlikely to be discovered.
S2	Imperiled in New Jersey because of rarity (6 to 20 occurrences). Historically many of these elements may have been more frequent but are now known from very few extant occurrences, primarily because of habitat destruction. Diligent searching may yield additional occurrences.
S3	Rare in state with 21 to 100 occurrences (plant species and ecological communities in this category have only 21 to 50 occurrences). Includes elements which are widely distributed in the state but with small populations/acreage or elements with restricted distribution, but locally abun-dant. Not yet imperiled in state but may soon be if current trends continue. Searching often yields additional occurrences.

Table 6.2: Plant Rank & Definitions.

Rare and Endangered Plant Species

Rank	Common Name	Scientific Name	Baldpate	Mercer Meadows	Mercer County Park	Miry Run Ponds	Roebling	South River Walk Park	Waterfroni	Mill Yard	Captial City Farm	Hopewell Valley Golf Club	Mountain View Golf	Princeton Golf	Mercer Oaks	Outside Park Facilities
-	Data Senstive Ecological Community		X		X	X										X
SH	Death-camus	*Zigadenus leimanthoides*			X											X
SH	Downy Phlox	*Phlox pilosa* var. *pilosa*														X
SH	Spotted Sheath Panic Grass	*Panicum dichotomum* var. *yadkinense*														X
SH	Wafer Ash	*Ptelea trifoliata* var. *trifoliata*														X
S1	Buttonbush Dodder	*Cuscuta cephalanthi*	X													X
S1	Cloud Sedge	*Carex haydenii*													X	X
S1	Pale Wild Caraway	*Arnoglossum atriplicifolium*														X
S1	Sword Bogmat	*Wolffiella gladiata*					X									X
S2	Blunt-lobe Grape Fern	*Botrychium oneidense*														X
S2	Estuary Burr-marigold	*Bidens bidenoides*					X	X								X
S2	Giant-Hyssop, Purple	*Agastache scrophularifolia*							X	X	X					X
S2	Giant-Hyssop, Yellow	*Agastache nepetoides*														X
S2	Hedge-nettle, Hyssop	*Stachys hyssopifolia*			X											X
S2	Long-beak Water Buttercup	*Ranunculus longirostris*					X									X
S2	Love Grass, Frank's	*Eragrotis frankii*	X													X
S2	Low Spearwort	*Ranunculus pusillus* var. *pusillus*		X												X
S2	Lowland Fragile Fern	*Cystopteris protrusa*											X			X
S2	Pawpaw	*Asimina triloba*					X									X
S2	Pennywort, Virginia	*Oblaria virginica*														X
S2	Robbinsii Pondweed	*Potamogeton robbinsii*														X
S2	Wild Comfrey	*Cynoglossum virginianum* var. *virginianum*	X													X
S2	Willdenow's Sedge,	*Carex willdenowii* var. *willdenowii*	X													X
S3	Hedge-nettle, Smooth	*Stachys tenuifolia*														X
S3	Slender Toothwort	*Cardamine angustata*	X													X
No data	Franks sedge	*Carex frankii*														

Table 6.3: Natural Heritage Grid Table for New Jersey; Showing Mercer County Park Facilities.

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