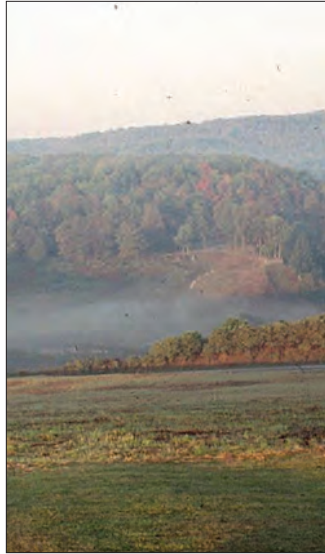




CULTURAL LANDSCAPE REPORT FOR JOHNSTOWN FLOOD NATIONAL MEMORIAL

NATIONAL PARKS OF WESTERN PENNSYLVANIA



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NATIONAL PARKS OF WESTERN PENNSYLVANIA

CAMBRIA COUNTY, PENNSYLVANIA

SITE HISTORY

EXISTING CONDITIONS

ANALYSIS AND EVALUATION

TREATMENT

RECORD OF TREATMENT

LAKEBED VEGETATION MANAGEMENT

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Olmsted Center for Landscape Preservation
National Park Service, Boston, Massachusetts, 2021

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Cover Photo: View east across the former lakebed of Lake Conemaugh, c. 2005, Nancy Smith, Western Parks of Pennsylvania.

Title Page: View northeast across the lakebed to Lake View Farm and the Johnstown Flood National Memorial Visitor Center, 2018, Olmsted Center for Landscape Preservation.

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FOREWORD

Johnstown Flood National Memorial was created August 31, 1964 “to commemorate the tragic Johnstown Flood of May 31, 1889.” While this purpose focuses on one specific day, it encompasses the management of many extant landscapes and historic structures that bore witness to that day. The memorial’s important cultural landscape includes the South Fork Dam remains and the dry lakebed of former Lake Conemaugh, where 20,000,000 tons of water was unleashed on a 15-mile path to Johnstown, ultimately leading to the death of 2,209 people; the Lake View House and Farm on the bluff above the former lake, which served as the home of Col. Elias J. Unger, manager of the South Fork Fishing and Hunting Club; and the Clubhouse and National Park Service-owned cottages of the South Fork Fishing and Hunting Club in St. Michael. All of these resources deserve to have their history captured in an overarching report however, it is not apparent on today’s landscape that these features are interconnected. Visitors have been unable to comprehend the magnitude of former Lake Conemaugh as they view a dry lakebed much altered from its 1889 appearance. Railroad tracks, trees and vegetation have obscured the fact that a large lake once existed there. Additionally, the cultural landscape of the South Fork Fishing and Hunting Club has changed dramatically. The Club’s Clubhouse and cottages that once sat on lakefront property are now absorbed into the residential streets of St. Michael, a village that developed in a portion of the former lakebed.

The Olmsted Center for Landscape Preservation undertook this Cultural Landscape Report to link the shared history of these important resources and create a treatment plan for the dry lakebed which serves as the largest tangible reminder of the 1889 flood. Research began in 2018, followed by a treatment workshop on June 24, 2019 involving staff from Johnstown Flood National Memorial, Olmsted Center for Landscape Preservation, and the Eastern Rivers and Mountains Network. Throughout the project, natural resource specialists, hydrologists, ecologists, cultural landscape specialists, cultural resource specialists, interpretive specialists, facility managers, and wildland fire managers, among others, formed an impressive team ensuring all aspects of this cultural landscape were considered. This important document provides a full understanding of the significance of Johnstown Flood National Memorial’s cultural landscape, which will ensure protection and preservation of its nationally significant resources as well as provide visitors with a better understanding of the landscape and the interconnectedness of the resources.

Stephen M. Clark
Superintendent, National Parks of Western Pennsylvania

ACKNOWLEDGEMENTS

The Cultural Landscape Report for Johnstown Flood National Memorial is the result of a successful collaboration between many people and programs of the Northeast Region of the National Park Service. Led by the Olmsted Center for Landscape Preservation in close partnership with the National Parks of Western Pennsylvania, this document is evidence of the importance of many perspectives in identifying the best solutions. The report was written by Jennifer Hanna, Historical Landscape Architect with the Olmsted Center for Landscape Preservation, and Eliot Foulds served as Senior Project Manager. Robert Page, Director of the Olmsted Center, and Michael Stachowicz, Preservation Maintenance Program Manager, provided technical expertise in landscape treatment and implementation. In addition, this document builds upon the strong foundation provided by the *Cultural Landscape Inventory for the Johnstown Flood National Memorial*, written by Jeffrey Killion, Historical Landscape Architect with the Olmsted Center.

The Olmsted Center team gratefully acknowledges the invaluable contributions of the staff of the National Parks of Western Pennsylvania, led by Superintendent Stephen Clark, including Douglas Bosley, Johnstown Flood National Memorial Site Manager/Chief of Interpretation, Colleen Curry, Cultural Resource Manager/Chief of Resource Management, Brenda Wasler, Natural Resource Manager, Joshua Manley, Project Manager, Brad Thomas, Chief of Facilities, James Neff, ALPO/JOFL Maintenance Work Supervisor, Kathy Penrod, former Natural Resources Manager, and Nancy Smith, former Cultural Resources Manager. The collaborative process benefitted from the expertise of the National Park Service Northeast Region Fire Management Program, including Fire Management Officers Mark Musitano and Bill Crolley, and Matt Boss, Fire Operations Specialist. Stephanie Perles, Plant Ecologist for the Northeast Region, Peter Sharpe, Hydrologist, and Brian McDonnell, Natural Resource Specialist - Northeast Invasive Plant Management Team, were also integral to developing a successful cultural landscape treatment plan.

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Johnstown Flood National Memorial, ca. 2000

INTRODUCTION

PURPOSE, SCOPE, AND METHODOLOGY

SUMMARY OF FINDINGS

The Johnstown Flood National Memorial was authorized as a unit of the National Park Service in 1964 to commemorate the tragic Johnstown Flood of May 31, 1889, when the South Fork Dam failed, causing flooding that killed more than two thousand people. The park is in southwestern Cambria County, situated in south-central Pennsylvania, approximately eighty-two miles east of Pittsburgh and 131 miles west of Harrisburg. The park straddles the South Fork of the Little Conemaugh River, which was dammed in 1853 to supply water to a canal in Johnstown, twelve miles downstream. When the Commonwealth of Pennsylvania built it, the dam impounded one of the largest artificial lakes in the nation, more than two miles long and as much as a mile wide. The dam failed in 1862 and remained abandoned until 1879 when repairs by the South Fork Fishing and Hunting Club began. The South Fork Fishing and Hunting Club, a social club for prominent wealthy families from Pittsburgh, was founded in 1879 and included members of the Carnegie, Frick, and Mellon families. For approximately ten years, the social club's development centered around the dam's impoundment, named Lake Conemaugh, until the dam broke in May 1889 and killed 2,209 people in Johnstown and other villages along the Little Conemaugh River.

The 178-acre national memorial preserves the remains of the South Fork Dam, which consists of two trapezoidal-shaped earthen and rock abutments cloaked in grasses and trees separated by an opening more than four hundred feet in length. Traces of the club's carriage road extend across the top of the abutments to overlooks where visitors can view the dam's breach, the river, and the former empty lakebed that stretches upstream from the dam. To the north of the North Abutment, trails also cross the dam's historic spillway, a rock-cut now filled with forbs and grasses. Pedestrian trails also pass through the bottom of the dam breach on the south abutment side, where the Little Conemaugh River flows past the stone and timber ruins of the dam's original sluice culvert and valve control tower. On a hillside meadow overlooking the dam and lakebed is the Lake View Farm and the Lake View House, the former farmstead and rehabilitated home of Elias Unger, the club's president at the time of the disaster, as well as a reconstructed spring house. Additional historic resources are in two discontinuous parcels about one mile south of the dam in the village of St. Michael. They include the wooden balloon frame clubhouse, a double cottage, and two cottages, all associated with the South Fork Fishing and Hunting Club's tenure. The park's visitor center, built between 1988 and 1989 as part of the commemoration of the one hundredth anniversary of the disaster, is located at the Lake View Farm and resembles the former Unger barn. Here visitors can view exhibits, watch a film about the flood, and contemplate the panoramic views of the dam and lakebed. The park also includes a picnic area, maintenance facility, and parking area near the South Abutment, and a parking area near the Visitor Center and along Lake Road.¹

As a national memorial within the National Park System, the Johnstown Flood National Memorial was administratively listed on the National Register of Historic Places on October 15, 1966, with the passage of the National Historic Preservation Act. On July 31, 1983, documentation for the 5.6-acre South Fork Fishing and Hunting Club Historic District in the town of St. Michael, including the clubhouse and cottages now incorporated into the Johnstown Flood National Memorial, was accepted by the Keeper of the National Register. The National Register of Historic Places documentation for the National Memorial was last updated in 2018 (pending).

Johnstown Flood National Memorial is nationally significant under National Register Criterion A in the areas of Social History and Entertainment/Recreation and locally significant under Criterion C in the area of Architecture. The period of significance for the park begins with the organization of the South Fork Fishing and Hunting Club in 1879 and ends with the Johnstown Flood of May 31, 1889, and the immediate recovery activities that followed. This time period encompasses the construction of all the resources associated with the club, including the repair and modification of the South Fork Dam for recreational purposes.²

PURPOSE, SCOPE, AND METHODOLOGY

A cultural landscape report is the primary document used by the National Park Service to manage its historically significant landscapes. The Olmsted Center for Landscape Preservation produced this report consistent with the methodology outlined in *A Guide to Cultural Landscape Reports: Content, Process, and Techniques*.³ This report builds upon previous planning documentation, including the *General Management Plan for Allegheny Portage Railroad National Historic Site and Johnstown Flood National Memorial* (1980), which was updated in 1992. Management objectives related to the visitor experience and the cultural landscape are also guided by the *Johnstown Flood Interpretive Prospectus and Development Concept Plan* (1984) and the *Foundation Document for the Johnstown Flood National Memorial* published in 2013 to document park's foundational resources, values, and history. Management of park infrastructure is accomplished using computer-aided facility management software, called the National Park Service Facility Management Software System (FMSS). These planning initiatives and how they inform the treatment of the Johnstown Flood National Memorial cultural landscape, are described in detail in the Treatment section of this document.

Additional research for this report was completed at a thorough level of investigation, and included a review of all available primary and secondary source material.⁴ Primary source material includes archival records from the collections

of the Johnstown Flood National Memorial, the Johnstown Flood Museum, and the Cambria County Historical Society. Secondary sources used in this report's production, including the *Cultural Landscape Inventory for Johnstown Flood National Memorial* (2017) by Jeffrey Killion, are included in the references section.

Project planning for the *Cultural Landscape Report for Johnstown Flood National Memorial* and the cyclical maintenance project entitled, "Restoration of the Lakebed," began concurrently in the spring of 2019. The goal of the funded cyclical project was to clear the lakebed of woody vegetation so that memorial visitors might understand the magnitude of the former Lake Conemaugh and thus the impact of the South Fork Dam's failure. Research and planning for the *Cultural Landscape Report for Johnstown Flood National Memorial* guided preparation for the cyclical maintenance project. To help inform the cyclical maintenance project, which was scheduled for winter 2020, the Olmsted Center for Landscape Preservation focused on completing the Treatment chapter of the Cultural Landscape Report first. In June 2019, the Olmsted Center convened a team of park and regional experts in natural resources, cultural resources, fire management, and park administration at a Landscape Treatment Workshop where treatment alternatives were presented and paths to project compliance discussed. Workshop outcomes included a preferred treatment alternative and an outline for project compliance which helped to further planning for the cyclical maintenance project. Following completion of the first two phases of the cyclical maintenance project, "Restoration of the Lakebed," in the winters of 2020 and 2021, a chapter documenting the clearing of the lakebed was included in the Cultural Landscape Report.

Therefore, this Cultural Landscape Report is organized into six chapters, beginning with a detailed site history tracing the landscape's physical development. The history is followed by documentation of the landscape's existing conditions and then an analysis and evaluation of the significance and integrity of the landscapes identified in the National Register of Historic Places documentation. The fourth chapter includes treatment recommendations to guide the rehabilitation of the historic lakebed and the properties associated with the national memorial's period of significance. The fifth chapter provides a Record of Treatment for the National Park Service's clearing of woody vegetation in the lakebed in 2019. Finally, the sixth chapter outlines a maintenance strategy for ongoing management of the lakebed's low growing meadow and wetland vegetation.

SUMMARY OF FINDINGS

SITE HISTORY

The first chapter, site history, is organized into five sections that correspond to distinct periods in the development of the land that became the Johnstown Flood National Memorial. Based on documentary research, each section describes the key developments tied to important individuals and events that have precipitated physical change in the landscape. The site history is accompanied by photographs, maps, diagrams, and period plans that illustrate the landscape during each historical period.

The origins of the Western Reservoir in Cambria County began in the 1790s, as part of a complex engineering scheme to fashion a canal route from Philadelphia to Lake Erie, known as the Union Canal Scheme. Like much of the land in western Pennsylvania in the late eighteenth century, the land that became the South Fork Dam and Western Reservoir was first warranted by absentee investors. These men were wealthy, educated members of Philadelphia's elite who purchased the land in the late eighteenth century because they believed that increased demand, precipitated by technological advances in transportation and resource extraction, would drive up prices. Reverend William Smith, David Rittenhouse, and other American Philosophical Society members promoted plans for a complex transportation network. Whether the men knew that the land that now makes up the Johnstown Flood National Memorial was ideal for a canal reservoir is not entirely clear. Regardless, in the 1820s, when the state began investigations into the reservoir placement, they reexamined the 1791 Union Scheme design. In 1834 the Commonwealth of Pennsylvania opened the Main Line of Public Works, a 394-mile system of canals and portage railroads between Philadelphia and Pittsburgh, to transport coal and other resources. To ensure a reliable water supply for the canal section near Johnstown, the Commonwealth began constructing the South Fork Dam and Western Reservoir in 1840. Funding shortfalls hampered the project's construction, and in 1847 the half-completed dam failed for the first time, causing minor flooding in Johnstown. When finished in 1853, the dam was 931 feet long, 72 feet high, five hundred feet wide at the bottom, and ten feet wide at the top.

The South Fork Dam and Western Reservoir functioned as designed that first year, but the following year the state put the Main Line up for sale due to competition from the expanding railroads. In 1857 the entire system, including the dam and reservoir, was purchased by the Pennsylvania Railroad Company who continued to operate the canal until 1863 when, following a breach in the dam, the dam and reservoir were abandoned. Having no use for a broken dam and empty reservoir, the Pennsylvania Railroad Company sold the site to recently elected

U.S. Congressman John Reilly in 1875. By this time, trees and shrubs grew in the reservoir bed. Reilly made no improvements to the dam or bed during the two years that he owned the property. The unused sluice pipes at the bottom of the dam were sold for scrap, and the timber frame valve control tower used to open and close the pipes burned down. In 1879 Reilly sold the dam and reservoir to the South Fork Fishing and Hunting Club.

The purpose of the South Fork Fishing and Hunting Club was to develop a private multi-family retreat on the grounds of the former reservoir by creating a large lake on whose shores Pittsburgh's elite families would build their large summer "cottages." Between 1880 and 1881, the club repaired and modified the South Fork Dam and refilled the reservoir with water to form Lake Conemaugh. Simultaneously, the club constructed a clubhouse on the lake's southwestern shoreline, about one mile upstream from the dam. After an addition was added in 1886, the two- and three-story clubhouse featured numerous bedrooms, and a large dining and gathering rooms. The club also built a separate two-story annex building with covered porches and additional guestrooms and apartments for member use. From 1881-88, sixteen private cottages were constructed in a row northwest and southeast of the clubhouse. Although called "cottages," many of the houses were substantial in size, with large front porches overlooking the lake. The houses were connected through a wooden boardwalk that paralleled the row of buildings and shoreline. The resort also included boathouses, docks, and stables, as well as two large steam yachts, four sailing boats, and about fifty canoes and rowboats.

Some of the South Fork Fishing and Hunting Club members owned lands bordering Lake Conemaugh, such as club president Elias Unger who built a house and outbuildings on a hill overlooking the dam and lake between 1883 and 1888. A carriage road running along the crest of the dam connected to the Lake View Farm via a wooden bridge stretching across the upper end of the spillway. The carriage road transported club members from the train station in South Fork to the club grounds.

For almost ten years, the resort served as a retreat for members of Pittsburgh's wealthy social elite who would travel by train and then by carriage to the shores of Lake Conemaugh. However, on May 31, 1889, a slow-moving rainstorm pushed water levels in Lake Conemaugh to catastrophic extremes. That morning Unger and others attempted to dig a second spillway and raise the dam's height with an earthen dike, but the discharge through the spillway could not keep pace with the rising lake. By noon water began flowing over the top of the dam, cutting a channel in its rocky downstream face. About 2:50 pm, the center portion of the dam (the section reconstructed by the club) pushed outward and collapsed, unleashing a torrent of fourteen million tons (four billion gallons) of lake water in about thirty minutes. The forty-foot high floodwater wall moved as fast as forty

miles per hour down the narrow Little Conemaugh River Valley, home to nearly 39,000 people. The water and debris hit Johnstown around 4:00 pm, devastating the city in less than ten minutes, killing at least 2209 people, injuring hundreds, and leaving thousands homeless. The tragedy received a massive amount of news coverage and led to an outpouring of help from around the nation and world. Recovery efforts spearheaded by Clara Barton and the American Red Cross in the months following the flood led to the organization's recognition as the premier entity for disaster relief in the United States.

Blame for the disaster was quickly placed on the members of the South Fork Fishing and Hunting Club, as implied several days later in the Johnstown Daily Tribune, "We think we know what struck us, and it was not the hand of Providence. Our misery is the work of man..." Several club members rendered personal services and aided relief efforts, but most disassociated themselves from the club for fear of litigation. In the years following the tragedy, several lawsuits were filed against the club, but none were successful as the courts interpreted the unprecedented rainfall as an act of Providence.⁵ Eventually, however, the courts' inability to establish nexus between the club's actions and the loss of life and property associated with the dam failure led to major revisions in American tort law.

Investigations of the dam's failure by engineers determined that several actions of the South Fork Fishing and Hunting Club had weakened the dam when it was rebuilt in 1880-81. First, the club had lowered the crest in the center portion of the dam to gain fill material to repair the earlier break in the dam. This decreased the distance between the top of the dam and the maximum water level in the reservoir by two feet, and thus widened the carriage road over the dam. Second, the club decided not to reinstall sluice pipes at the bottom of the dam, which eliminated any means to proactively release water from the lake to perform maintenance or in case of an emergency. Lastly, the club's attachment of fish screens on the carriage road bridge at the upper end of the spillway collected debris during the flood and blocked floodwater flow through the spillway.

Eventually most members divested their shares in the South Fork Fishing and Hunting Club and their properties. In 1891 a rail line was built through the breach in the South Fork Dam curving through the bottom of the lakebed. By 1904, roads traced the former shorelines and dipped into the lakebed, one of which used the old spillway as its base. The coal industry company town of St. Michael was established in 1907. Its roads and buildings were laid out in front of the remaining clubhouse and cottages within the former lakebed. The Unger family sold Lake View Farm in the early twentieth century, and the property operated as a family farm until it was incorporated into Johnstown National Memorial decades later.

The growth of St. Michael and other villages in the lakebed and the rise in automobile use lead to the development of highway State Route 869 southwest

of the dam's south abutment in the 1930s and the construction of U.S. Route 219 downstream from the dam abutments in the mid-1960s. When Johnstown Flood National Memorial was established in 1964, these highways formed the boundary lines of the memorial. Park property initially included the two dam abutments, a small portion of the adjacent lakebed, and a wooded hillside southwest of the south abutment. Although it was no longer possible to reclaim the entire lakebed, boundary increases in 1972, 1978, and 2004 allowed the park to acquire additional lakebed lands; the Lake View Farm; the clubhouse, double cottage, and two cottages in St. Michael; as well as other lands to screen incompatible development.

During its stewardship, the National Park Service has constructed a visitor center at the site of the old Unger barn; rehabilitated the Lake View House for park offices; developed picnic, maintenance, and parking facilities; and installed interpretive trails and waysides. The park cleared woody vegetation in the lakebed between the 1970s and 2007. Following this period, trees and shrubs again grew to cloak the lakebed until recently when work began to clear the lakebed of vegetation and establish a meadow of primarily low-growing native plant communities.

EXISTING CONDITIONS

The second chapter, existing conditions, documents the condition of the Johnstown Flood National Memorial landscape in 2018 through narrative and graphics. The property includes the earthwork remnants of the former South Fork Dam and the contours of the dry lakebed of the Western Reservoir or Lake Conemaugh traversed with interpretative trails. The landscape also includes the sloping meadows, visitor center and farm buildings of Lake View Farm. A maintenance area and a picnic area are located south of the southern dam abutment, as well the carriage road trace ascending the wooded hillsides overlooking the lakebed. One mile south in St. Michael, the South Fork Fishing and Hunting Club cottages and clubhouse remain within the village grid, reminders of the late nineteenth-century resort on Lake Conemaugh.

A team of historical landscape architects from the Olmsted Center for Landscape Preservation worked with Johnstown Flood National Memorial staff in May 2018 and June 2019 to collect and update existing conditions documentation in the field. Base map sources included the 2017 Cultural Landscape Inventory for Johnstown Flood, as well as GPS data for vegetative communities and wetland delineation. In addition, the National Park Service CRIS-Historic Structures data as well as Facility Management Software System data have been incorporated into this assessment. This chapter also addresses the regional context and park operations as they pertain to the cultural landscape.

ANALYSIS AND EVALUATION

The third chapter, analysis and evaluation, provides an overview of the historic significance of the Johnstown Flood National Memorial based on National Register of Historic Places documentation, evaluates the integrity of the cultural landscape, and evaluates the characteristics and features that contribute to the significance of the landscape. This analysis and evaluation section is based on the criteria developed by the National Register of Historic Places. Johnstown Flood National Memorial was administratively listed on the National Register of Historic Places on October 15, 1966, with the passage of the National Historic Preservation Act. Documentation supporting this nomination was updated in 2016 and remains in draft form.

The physical integrity of Johnstown Flood National Memorial is evaluated by comparing landscape characteristics and features present during the period of significance – 1879 to 1889 – with the existing conditions as assessed in 2018. Many of the park’s historic characteristics and features remain today. The landforms, hydrology, and topography that made this site ideal for the construction of the South Fork Dam and Western Reservoir in 1840-53 are still evident in the landscape. The remnant abutments and spillway reveal the dam’s original design and construction while the breach in the dam and the ruins of the sluice culvert and valve control tower are reminders of poor decisions made during the dam’s reconstruction. Upstream from the dam, the park-owned portions of the old lakebed are now a mix of grasslands, shrublands, and woodlands returning to forest. The hill near the south abutment remains forested and includes the trace of the club’s carriage road, while the hill overlooking the north abutment is mostly open fields associated with Elias Unger’s farm. The park has rehabilitated Unger’s Lake View House and spring house and designed the nearby visitor center to evoke the appearance of the old Unger barn. Views from the visitor center and Lake View House look down at the dam and spillway, and across the lakebed to the clubhouse and cottages that once bordered the lake’s southwestern shoreline. Today, the park owns four former club buildings that still retain some of their Victorian-era designs, including the long covered front porches that overlooked the lake. Trails provide access to the top of the dam abutments and passage through the breach on the south side of the river, and a footbridge crosses the upper end of the spillway on the north abutment near where a historic carriage road bridge once stood.

Landscape changes have inevitably occurred in the 132 years that have passed since the May 1889 Johnstown Flood. Within the park’s boundaries, an active train line dating to the early 1890s still passes through the gap in the dam and travels along the bottom of the old lake. Its raised bed has long impacted the hydrology of the river and incoming tributaries, and now helps sustain several wetlands.

By 2018, trees that were cleared by the park from 1977 through 2007 had returned and obscured the earthen contours of the lakebed and the dam abutments, which are key to the park's interpretive program. Picnic, parking, and maintenance facilities are sited to minimize their impact on the park's historic characteristics and features, especially its viewsheds. More significant changes have occurred just beyond park boundaries, including the establishment of St. Michael in the lakebed next to the club buildings and the construction of the four-lane state highway, U.S. Route 219, just downstream from the dam.

LANDSCAPE TREATMENT

The fourth chapter, Treatment, outlines the primary objective of the landscape treatment plan: to reveal the contours of the former lakebed and dam abutments through economically and environmentally sustainable methods. The treatment recommendations and tasks included in this chapter were developed in collaboration with park and regional staff beginning with a treatment workshop held in St. Michael, Pennsylvania on June 24, 2019. The recommended treatment approach for the landscape of the Johnstown Flood National Memorial is rehabilitation. Careful management of woody vegetation, long blocking views of the river valley, will give to park visitors a visual reference for understanding the magnitude of the former lake and dam. Within most areas of the lakebed under the management of the National Park Service, existing woodland will be converted over time to ground cover vegetation, resetting ecological succession. Vegetation will be managed to recover historic views from key vantage points and screen off-site contemporary development, including U.S. Route 219, to support a positive visitor experience and effective historical interpretation. Treatment will preserve natural resource values, including the integrity of local wetlands. Treatment will also avoid erosion by limiting ground disturbance in proximity to waterways and will support the integrity of existing low growing, native plant communities. Treatment of the cottages' grounds will reinforce their residential scale and use as summer homes before the dam's destruction.

RECORD OF TREATMENT: LAKEBED CLEARING

The implementation of the lakebed treatment, as well as its result, is described in the fifth chapter, Record of Treatment. Following environmental compliance in the autumn of 2019, and in alignment with the treatment tasks outlined in this document, clearing of Lake Conemaugh's former lakebed began in January 2020. In this initial effort, a small-scale masticator was mounted on a skid steer to remove trees on relatively flat land to the west and south of the Conemaugh River. Goats were then used to clear vegetation on the south abutment slope. The following autumn 2020, the administration of Johnstown Flood National Memorial contracted with a tree work company to remove tree cover within

the project area by using masticators, hydraulic shearers, chainsaws, and other equipment. The contractors were able to remove woody vegetation and restore views from the Visitor's Center to the southwest portion of the lakebed, the spillway, and a portion of the engineered abutments.

LAKEBED VEGETATION MANAGEMENT

The final chapter, Lakebed Vegetation Management, describes a strategy for completing vegetative clearing in the lakebed and maintaining the cleared areas through mowing, prescribing burning, and selected tree clearing on a cyclical basis. These recommendations are detailed through a multi-year maintenance calendar.

ENDNOTES, INTRODUCTION

1 Jeffrey Killion, Et. al., Cultural Landscape Inventory for Johnstown Flood National Memorial, (Department of the Interior, National Park Service), 2017.

2 Laura Kline, Gretchen Pineo, and Kristen Heitert, National Register of Historic Places Nomination Form for Johnstown Flood National Memorial, (Washington, D.C.: United States Department of the Interior, National Park Service, Draft 2016). Sec. 8: 22.

3 Robert R. Page, Cathy A. Gilbert, and Susan A. Dolan, A Guide to Cultural Landscape Reports: Contents, Process, and Techniques, (Washington, D.C.: National Park Service, second printing), 2005.

4 As defined in the National Park Service Cultural Resource Management Guideline (DO-28, 1998), “thorough” means research in selected published and documentary sources of known or presumed relevance that are readily accessible without extensive travel and that promise expeditious extraction of relevant data; interviewing all knowledgeable persons who are readily available, non-destructive investigation, and resending findings in no greater detail than required by the task directive.

5 Paula Degen and Carl Degen, The Johnstown Flood of 1889: The Tragedy of the Conemaugh, (New York: Eastern National Publishing Center for Cultural Resources), 2013, 16, 61.



Johnstown Area Heritage Association, ca. 1890

SITE HISTORY

PRIOR TO 1834

1834–1888

1889–1939

1940–1964

1965–PRESENT

The following site history details the physical evolution of the landscape of Johnstown Flood National Memorial organized into five historic periods. The first period describes land use and settlement before 1834, the year the property was first surveyed as a site for the Western Reservoir by the Commonwealth of Pennsylvania. The second period, 1834 to 1889, includes the development of the Western Reservoir and South Fork Dam, the South Fork Fishing and Hunting Club's conversion of the reservoir and dam into a private recreational resort, and the dam's failure in the spring of 1889. The third period, 1889 to 1939, details changes to the lakebed and dam following the Johnstown Flood tragedy, the expansion of the coal industry in the area, and the continued use of the former Lake View Farm for agriculture. The fourth period, 1940 to 1964, begins with land-use changes spurred by increased suburbanization through acquisition by the National Park Service. The period between 1964 and the present describes the National Park Service's early development of the property through its present-day management. The historic narrative focuses on the evolution of three physical areas: the dam and lakebed, the former Lake View Farm in South Fork, and the South Fork Fishing and Hunting Club cottages and clubhouse in St. Michael. Areas beyond the boundaries of the memorial are addressed to the extent that they inform the landscape's social context and physical development.

PRIOR TO 1834

INDIGENOUS LAND USE AND BOUNDARY SETTLEMENT

The cultural and natural resources at Johnstown Flood National Memorial are largely a result of human manipulation of the geologic features that formed this landscape. The memorial lies within the Allegheny Mountain section of the Appalachian Plateau, a physiographic province characterized by parallel ridges cut by steep valleys. Earliest known evidence of the use of the area by indigenous peoples dates to ten thousand years ago from excavations at "Sheep Rock" on the Raystown Branch of the Juniata River near Huntingdon and at other local sites where archaeologists have excavated artifacts and revealed occasional use of land for hunting and gathering by people from the Middle Archaic through the Late Woodland periods.¹

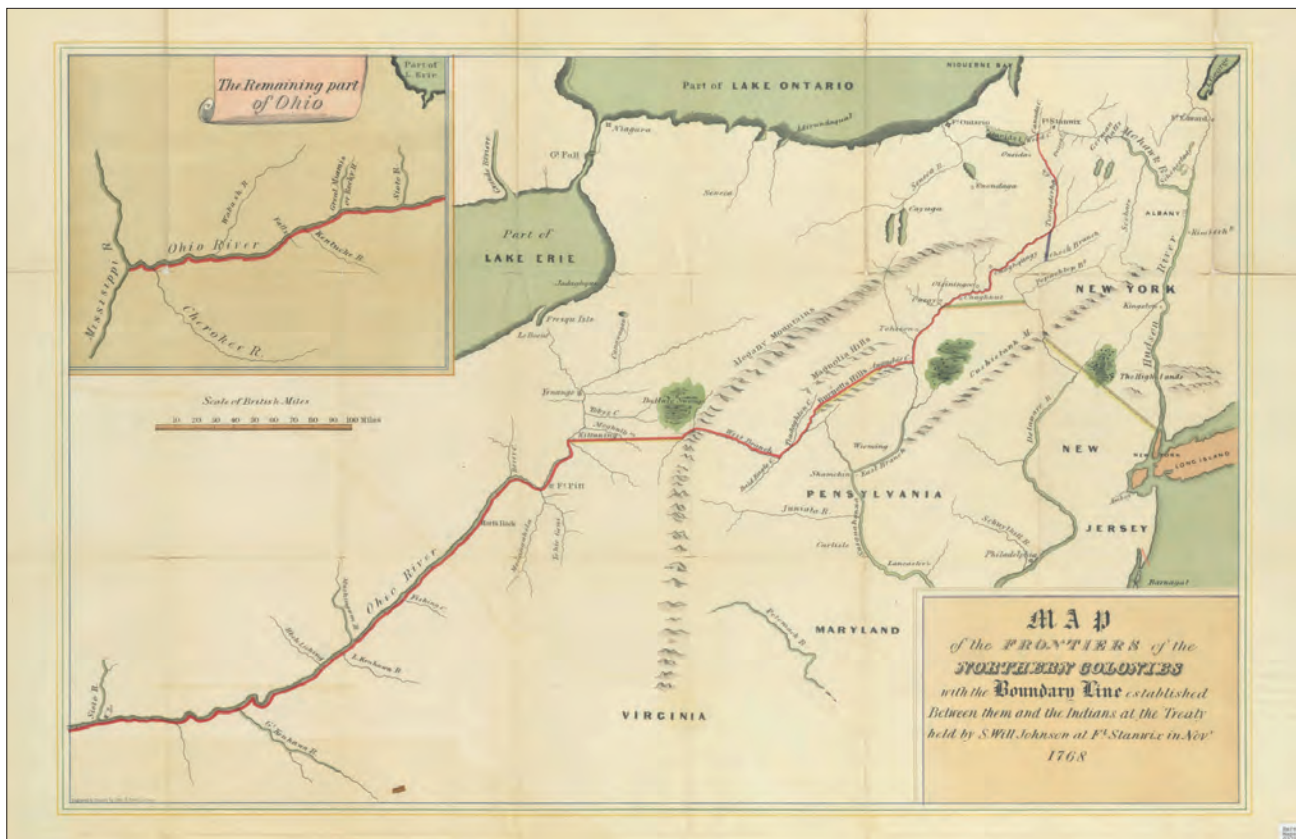
The pre-contact and early modern eras' valley floors, though influenced by solar aspect and microclimate, had large stands of white oak with other oaks, chestnut, maples, and pines as secondary species. Scarlet, black, and chestnut oak trees dominated ridgetops. Red oak was most prevalent on the upper slopes of ridges, with white oak, red oak, hickory, and hemlock dominated the lower slopes.² While much of south-central Pennsylvania is forested today, nearly all of this earlier

forest was removed through timbering, agriculture, charcoal and iron manufacture in the nineteenth century. Most of the remaining forest contains secondary communities dissimilar to the earlier forest associations.³

Until the mid-eighteenth century, the Allegheny Mountain's rugged terrain and the strong occupational rights of the region's indigenous groups deterred permanent European settlement. Before European settlement, the land that became the Johnstown Flood National Memorial was the ancestral ground of the Six Nations Confederacy, which included the Mohawk, Oneida, Cayuga, Seneca, Onondaga, and Tuscarora nations.⁴

To quell unrest and assert settlement rights, following the Treaty of Paris in 1763 ending the French and Indian War, King George III unilaterally issued a royal proclamation establishing a boundary between lands belonging to the indigenous nations and land open for colonization. This boundary line started at Fort Stanwix in north-central New York and extended south and west to the confluence of the Ohio and Kanawha Rivers. The boundary then followed the Kanawha River to its headwaters in present-day West Virginia before continuing south to the Spanish border in east Florida. All land to the east of the 1763 boundary was open to colonization, and land to the west remained the indigenous nations' land. This attempt to resolve land rights ambiguity, between the pan-Indian alliance led by the Six Nations Confederacy and British colonists, failed. Therefore, colonialists

Figure 1.1. Map of the Frontiers of the Northern Colonies: with the Boundary Line established between them and the Indians at the Treaty held by S. Will Johnson at Ft. Stanwix in Novr. 1768 showing the relationship between the Juniata River and the 1768 Boundary Line. (Pennsylvania State University, Special Collections Library).



continued to speculatively purchase and settle on land west of the boundary, while members of indigenous nations lived on land east of the boundary.⁵

In 1768 another Boundary Line Treaty was signed at Fort Stanwix between the British government, represented by members of the Penn family, and representatives of the Six Nations, who also signed on behalf of the Shawnee, Delaware, Mingo, and others within the alliance. This boundary line began at Fort Stanwix and extended west from the north-south 1763 Proclamation boundary, proceeding south and west to the confluence of the Ohio and Kanawha Rivers (Figure 1.1). It then followed the Ohio River's alignment south to its confluence of the Tennessee River (then known as the Cherokee or Hogohege River).⁶ In signing the treaty, the indigenous nations ceded to Great Britain their interest in land east and south of the boundary, which included all the Pennsylvania colony. With the title to the land clear, the British colonial government opened the territory to settlement, though colonists were already surveying land for speculation. One year earlier, the Reverend William Smith, a friend and colleague of the Penn family, laid out a small town on the Juniata River called Huntington, sixty miles west of the future Johnstown.⁷ In 1793, the Reverend William Smith and his son Charles purchased warrants for the land that would become the site of the Western Reservoir, the future Lake Conemaugh. Their purchases were speculative, linked to what they hoped would be a future canal.

REVEREND WILLIAM SMITH AND EARLY LAND SPECULATION IN WESTERN PENNSYLVANIA

The Reverend William Smith, an Episcopal priest, was the first provost of the College of Philadelphia, later the University of Pennsylvania, and would become, by his death in 1803, one of the founding fathers of American higher education (Figure 1.2). He was deeply involved in the American Philosophical Society, and through that organization and others, he promoted the development of canal technology. Along with James Wilson, who was appointed as a Supreme Court Justice by George Washington, and Smith's son, Charles Smith, Reverend Smith was granted the original land warrants in the location of the future Western Reservoir and South Fork Dam (Figure 1.3).

William Smith was born in 1727 in Aberdeen, Scotland. With support of the Society for the Education of Parochial Schoolmasters, he attended the University of Aberdeen and graduated in 1747. After a few years working in London for charitable religious institutions, Smith came to America as a private tutor for a family on Long Island. At the age of twenty-six, Smith published a pamphlet in which he presented his ideas for establishing a new college in the New York colony. After reading Smith's pamphlet, Benjamin Franklin invited Smith to see the Academy of Philadelphia, a new academy and charity school he recently

helped to establish. In 1753, after first taking Holy Orders in the Church of England, Reverend Smith joined the school's faculty.

Reverend Smith advocated for the advancement of colonial industry, science, and technology throughout his career as leader in the American Philosophical Society. He began as a teacher of logic, rhetoric, and natural and moral philosophy, and became provost when the Philadelphia Academy became the College of Philadelphia in 1755. Reverend Smith, whose Anglican education contrasted with the prevailing Quaker theology, was briefly jailed in 1758 for criticizing the military policy of the Quaker-run colony.⁸ He shared the jail with Justice William Moore, also a vocal critic of Quaker pacifism, and soon after Smith married Justice Moore's daughter, Rebecca Moore (1733-1793). Despite his anti-Quaker views, Smith successfully advanced his career and raised money for the College of Philadelphia by strengthening his bond with the ruling Penn family. Smith's penchant for sharing detailed information about political alliances in the province endeared him to the Penn family.⁹ However, his actions alienated those who wanted less proprietary oversight, including Benjamin Franklin. Though he was a loyalist, Penn supported independent colonial scientific advancement and became a leader in the American Philosophical Society.¹⁰

Figure 1.2. In this painting of the Reverend William Smith by Gilbert Stuart, circa 1801, a theodolite, an instrument with two telescopes used for measuring horizontal and vertical angles in surveying land, is partially visible at the far left of the painting. (Collection of the Crystal Bridges Museum of American Art).

The American Philosophical Society was founded in Philadelphia by Benjamin Franklin and the botanist John Bartram in 1743 to promote the advancement of knowledge. In 1769 it was combined with another organization and relaunched



as the American Philosophical Society Held at Philadelphia for Promoting Useful Knowledge, with Franklin again president.¹¹ About the same time, Smith became a mentor and friend of David Rittenhouse (1732–1796), a young surveyor and he advocated on Rittenhouse's behalf for an honorary Master's Degree from the College of Philadelphia, though the young man was entirely self-taught (Figure 1.4). Smith and Rittenhouse became friends and collaborated on projects together, including astronomical observations and surveying endeavors supported through the Society.¹²

The American Philosophical Society for Promoting Useful Knowledge held a standing committee on American Improvements sponsoring research on infrastructure projects to increase access to land, resources, and trade. Improving transportation, including analysis of potential turnpike and canal routes in the colonies, was an important focus of the Society. The society supported Rittenhouse and Smith in their collaboration to identify a route for a canal linking the Schuylkill with the Susquehanna River. Under Smith's leadership they also funded Thomas Gilpin (1727-1778), a Quaker born in the Brandywine Valley region. He produced one of the first maps of a canal system in the colonies, known as the "Canal Plate," which was described in the Society's minutes as "a map of Pennsylvania and Maryland, intended to show at one view, the several places proposed for opening a Communication between the Waters of Delaware and Chesapeake Bays."¹³ It was published 1771 in the first volume of the Transactions from the American Philosophical Society at Philadelphia,

Figure 1.3. A miniature portrait watercolor of Supreme Court Justice James Wilson, 1792. (Smithsonian American Art Museum, Museum purchase through the Catherine Walden Myer Fund).



accompanied by extensive plans and estimates (Figure 1.5).¹⁴ As for many members of the Society, Gilpin's scientific and infrastructure proposals were not divorced from his financial prospects. Gilpin had acquired land on the Chester River on the Eastern Shore of Maryland, which he suggested as the location for the Chesapeake-Delaware canal.¹⁵ A few years later, Rittenhouse was charged by the Pennsylvania Assembly with measuring levels of the Susquehanna, Schuylkill and Lehigh Rivers to determine the feasibility of a canal between the Delaware and Susquehanna Rivers.

Despite the promotion of transportation improvements by the American Philosophical Society and others, capital funding for such projects remained limited and so there were few physical land improvements. Yet in the last decade of the eighteenth century, Smith would make speculative land purchases in western Pennsylvania based upon the engineering and scientific studies completed years earlier. He was betting on the ability of American ingenuity to carve transportation routes through the hills and valleys of Alleghenies. Of course, Smith was not alone in his faith in technological progress, and many others joined him in purchasing large tracks of undeveloped land in western Pennsylvania.

Though Smith was a great booster of infrastructure projects, he was also a known loyalist. During the Revolutionary War, Reverend Smith relocated to Maryland, away from the center of patriot fervor. While there, he established Washington College and devoted his attention to ecclesiastical issues. He also remained active in the American Philosophical Society and in 1789 was invited back to the

Figure 1.4. Portrait of David Rittenhouse by Charles Willson Peale, 1796. As in the portrait of the Reverend William Smith, Rittenhouse is painted with the tools of his trade. (Collection of the National Portrait Gallery)



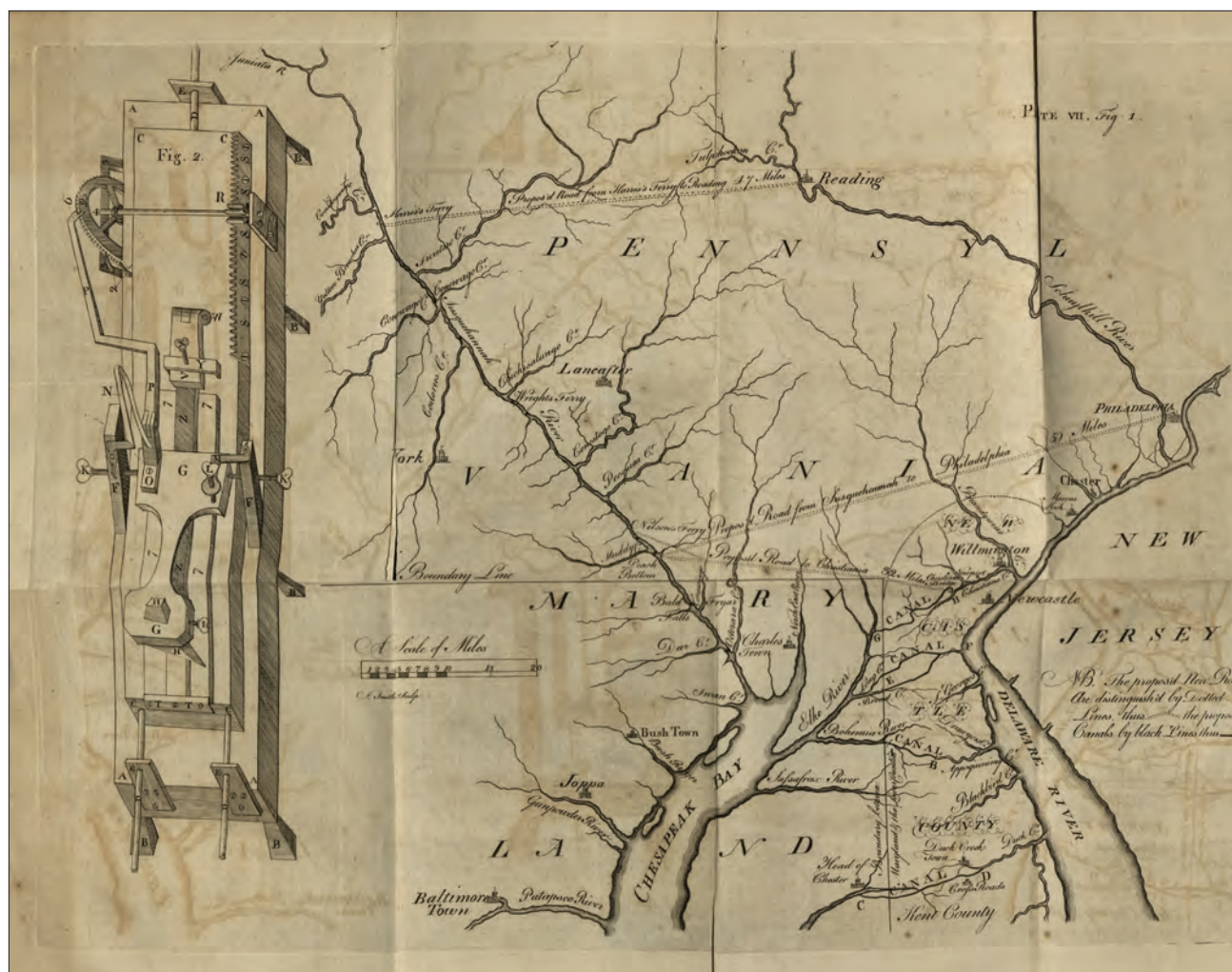


Figure 1.5. The first canal map published in America, *The Thomas Gilpin Map*, J[ames] Smither engraver, published in the *Transactions of the American Philosophical Society*, Volume 1, 1771. The map illustrates early plans for a system of canals and toll roads in Pennsylvania between “the waters of Delaware and the Chesapeake Bay.” (Collection of the American Philosophical Society)

College of Philadelphia as Provost. In 1791 when the college merged with the University of the State of Pennsylvania to become the University of Pennsylvania, Smith retired from academia to his country home at the Falls of the Schuylkill in Philadelphia. He continued to promote infrastructure and industry development by studying and documenting water sources and heights in Western Pennsylvania for incorporation into a canal system. In the late 1780s, Smith partnered with James Nicolson, Comptroller General of Pennsylvania, and Robert Morris, a Revolutionary War financier and president of the American Philosophical Society, in various development endeavors. For instance, the men tried to develop a manufacturing complex at the Falls of Schuylkill, not far from Smith’s home and helped form the Lehigh Coal Mine Company, one of the first commercial ventures to mine anthracite coal.¹⁶

The origins of the Western Reservoir in Cambria County began in the 1790s, as part of a complex engineering scheme to fashion a canal route from Philadelphia to Lake Erie. In 1791, Smith, together with David Rittenhouse and John Nicolson, proposed to connect the Atlantic seaboard with Lake Erie through a network of roads and canals through Pennsylvania. Their proposed plan included a 426-mile canal connecting Philadelphia with Pittsburgh. The men detailed their plan

Figure 1.6. A Map Exhibiting a General View of the Roads and Inland Navigation of Pennsylvania, and part of the Adjacent States, John Adlum, 1791. Reverend Smith, David Rittenhouse, and John Nicholson included this map with their plan for a 426-mile canal system between Pittsburgh and Philadelphia which they presented to the Pennsylvania Assembly in 1791. (Norman B. Leventhal Map Center, Boston Public Library)

through an account entitled “Of the Rise, Progress and Present State of the canal navigation in Pennsylvania. With an appendix containing abstracts of the acts of the Legislature since the year 1790, and their grants of money for improving roads and navigable waters throughout the state”; to which is annexed, “an explanatory map” (Figure 1.6). Cost estimates for the system’s construction were presented for each segment, including a segment sixty-nine miles long between Conemaugh and Kiskeminetas to the Allegheny, which would cost a mere 7150 pounds.¹⁷ They successfully lobbied the Pennsylvania Assembly. The Schuylkill and Susquehanna Navigation Company incorporated on September 29, 1791, to “open a communication between the Schuylkill and Susquehanna rivers from Reading on the Schuylkill to Middletown on the Susquehanna.” Robert Morris was president.¹⁸ Construction on the canal began in 1792, but the project was fraught with financial difficulty, and even this short section was not completed for almost three decades.



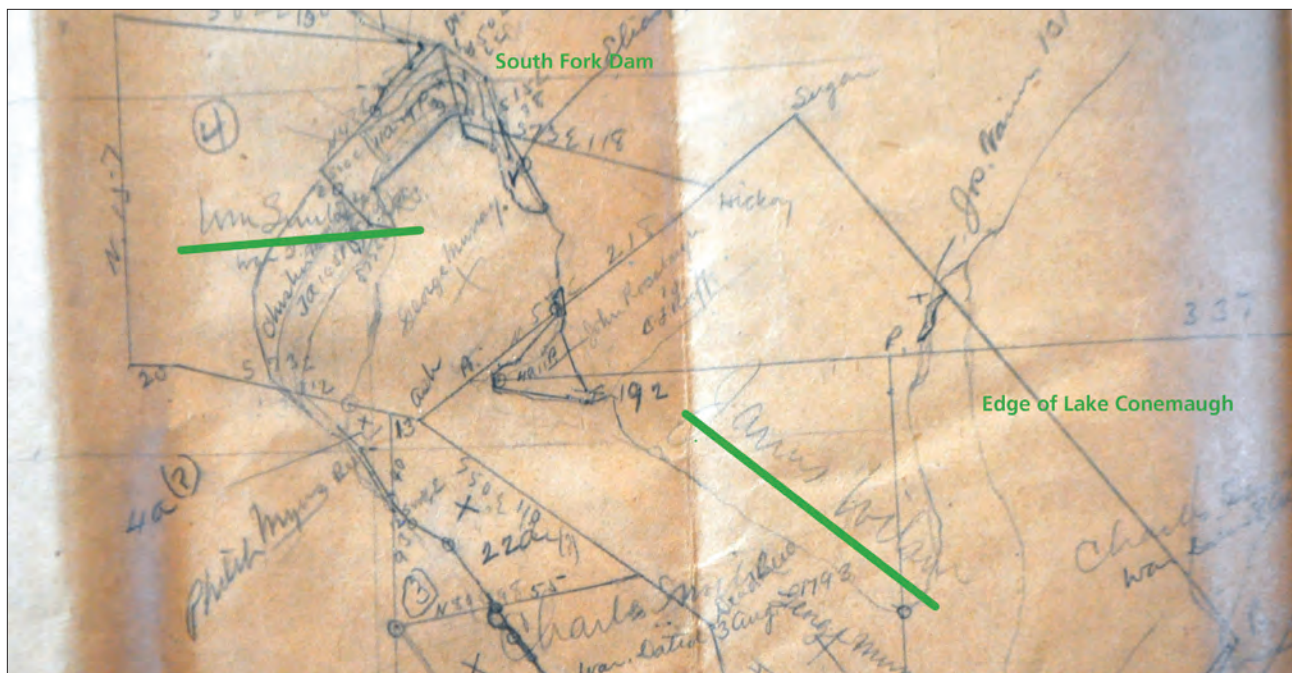


Figure 1.7. A sketch detailing the chain of title for the property near the South Fork Dam by Conemaugh Lake Company attorney John Kephart, used to plot the land boundaries detailed in the chain of title to the South Fork Fishing and Hunting Club lands. The names written largest were those that received land warrants, including James Wilson, Charles Smith, and William Smith (underlined in green). (Cambria County Historical Society Collections; OCLP)

On August 3, 1793, Smith was issued a warrant for one-hundred-and-eighty-six acres of land in the location of the future Western Reservoir, adjacent to where his colleague Supreme Court Justice James Wilson, who also taught at the University of Philadelphia, had recently purchased land (Figure 1.7). On August 8, the Reverend's son Charles received a warrant for four hundred and forty acres adjoining his father's land. Warrants in the area were also issued in the names of his sons, William M. and Richard Smith, and the Reverend's wife, Rebecca, though she died the next month during a yellow fever epidemic (Figure 1.8).¹⁹

The Smith family was not alone in their Western Pennsylvania land speculation.²⁰ When the speculative bubble burst and land values plummeted in late 1796, Morris and Nicholson could not settle their debts and landed in debtor's prison. Justice James Wilson lost his fortune too and spent time in debtors' prison while serving on the Supreme Court. Their gamble was based on hope for developing a modern transportation network, but hope proved to be a poor investment. Reverend Smith, who was not as greatly invested nor extended as his compatriots, escaped prison. When the Reverend died in 1803, his son Charles inherited his now almost worthless tracts of land, and the canal remained an unrealized dream.

DEVELOPMENT OF CAMBRIA COUNTY

Though the 1768 Treaty of Fort Stanwix, had opened western Pennsylvania to European settlement, most land lay undeveloped in the late eighteenth century. Though the region's natural resources were abundant, infrastructure in the rugged terrain was expensive, and capital was limited. Nevertheless, some people did settle there. Samuel, Solomon, and Rachel Adams, for whom present-day Adams Township is named, were the first settlers "to locate, improve and till the soil"



Figure 1.8. This detail of the 1867 *Pomoroy Cambria County Map*, reveals the original warrant holders through the font size. The names of the Reverend Smith, his wife Rebecca, and their sons, William M. and Charles Smith, are highlighted. Interestingly, James Wilson, who did not hold his warrant very long, is not included on the map. (Library of Congress; OCLP).

within the present limits of Cambria County and likely arrived shortly after the 1768 Treaty.²¹ About the same time, Charles Campbell took out a warrant for 249 acres on the Little Conemaugh and Stoneycreek (Stony Creek) rivers in what is now the city of Johnstown. His purchase was likely speculative, and his land remained undeveloped.²² In 1793 Joseph Johns (the namesake of Johnstown) purchased the former Campbell warrant. Johns began laying out the lots and streets of Johnstown in 1800. Around the same time, Reverend Reese Lloyd, a Congregational minister who had come from Wales with his family around 1796, founded Ebensburg, about ten miles north of present-day South Fork.²³ In 1804, Cambria County by taking the townships of Frankstown from Huntingdon County, and the townships of Cambria and Conemaugh from Somerset County, as well as a small section of northwest Bedford County.²⁴ Ebensburg was declared the county seat of Cambria County, and a courthouse built on the property of Reverend Lloyd and his two sons. Years later, Reverend Lloyd purchased land once owned by Supreme Court Associate Justice James Wilson, where the Commonwealth of Pennsylvania would build the South Fork Dam.

LAND OWNERSHIP PRIOR TO THE SOUTH FORK DAM AND WESTERN RESERVOIR

Like much of the land in western Pennsylvania in the late eighteenth century, the land that became the location of the South Fork Dam and Western Reservoir was first warranted by absentee investors. These men were wealthy, educated members of Philadelphia's elite who purchased the land because they believed that increased demand, precipitated by technological advances in transportation and resource extraction, would drive up prices. Reverend Smith, David Rittenhouse, and others promoted a plan, through the American Philosophical Society, for a complex transportation network. Whether the men knew that the land that now makes up the Johnstown Flood National Memorial was ideal for a canal reservoir is not entirely clear. Regardless, in the 1820s when the Commonwealth began investigations into the reservoir placement, they reexamined the 1791 Union

Scheme design. Yet, the Commonwealth did not implement the plan, the market in land speculation crashed, and eventually, these founding fathers lost the land to local families.

Almost all the land that became Lake Conemaugh was contained within warrants first held by the Reverend William Smith (186 acres), his son Charles Smith (440 acres), and Justice James Wilson (386) acres. All three men gained little from their investment, and eventually, they or their inheritors sold the land to settle debts. For instance, when Justice Wilson died in 1798 of malaria his finances were in shambles, and his 386 acres of land was sold for three dollars and eighty-four cents in unpaid taxes. Reverend Reese Lloyd paid eight dollars for Wilson's property to settle the tax debt and pay the costs of land transfer. In 1827 Reverend Lloyd transferred the still unimproved land to his grandsons, Stephen and John Lloyd, who lived in Ebensburg ten miles to the north (Figure 1.9). Later, Stephen Lloyd sold the property to Peter Collins and Michael Dan McGeehan, of Ebensburg, who then transferred the deed to Jacob Neff in 1840 for four hundred dollars.²⁵ Two years later Jacob and his wife Elizabeth Neff sold the property to George Murray, local supervisor for the construction of the South Fork Dam and Reservoir, for fifteen hundred dollars.²⁶

Figure 1.9. This map shows development during the time that Reverend Reese Lloyd and Reverend William Smith owned the lands that became the Western Reservoir. *Map of Cambria County, Melish-Whiteside, 1821*, (Collections of the Pennsylvania State Archives).

The Cambria County lands of Reverend William Smith and lands, interest and claims in lands in other western Pennsylvania counties remained in probate until the 1840s. To settle the estates of both the Reverend Smith and that of his deceased son Charles, their land holdings were sold at auction in 1843.²⁷ The one



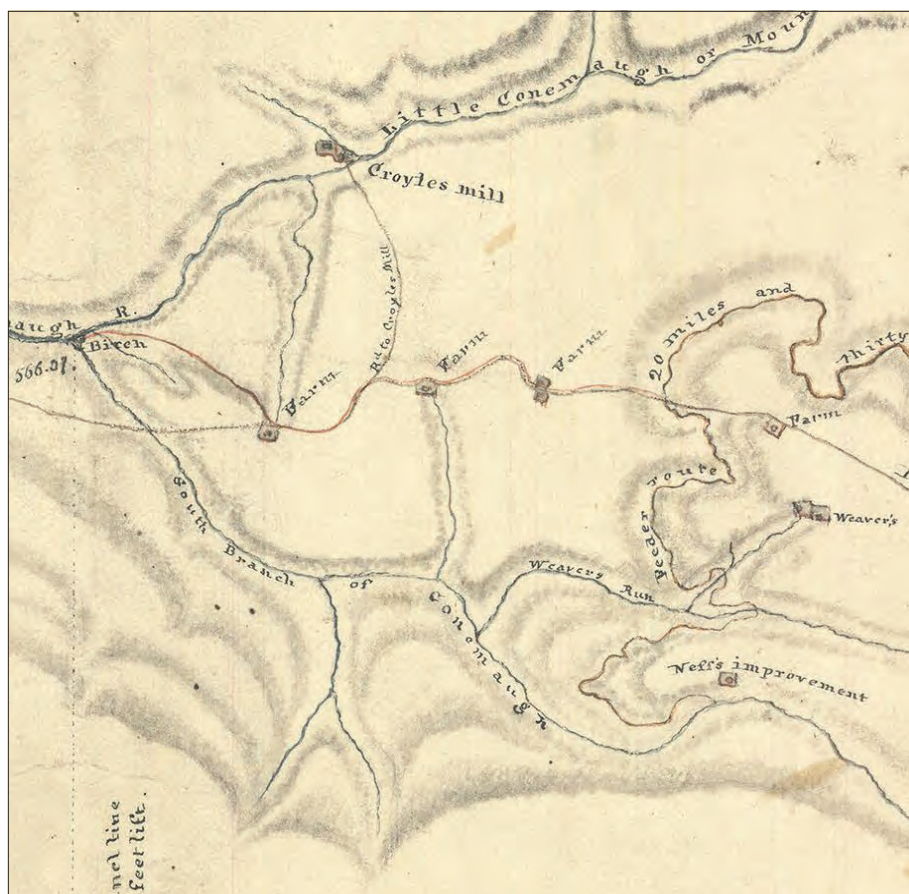


Figure 1.10. Interestingly, this map illustrates development, including roads and mills, in Cambria County in 1824, which was prior to the construction of the Main Line. *Plan and Profile of the Allegheny Mountain between the head waters of Blair's Creek, a branch of the Juniata, and the mountain branch of the Conemaugh with the proposed Tunnel Line connecting the two streams; and the Reservoir and Feeders. State of Pennsylvania, 1824, Jacob Holgate, Charles Treziulny, Map Book 19.* (Collection of the Pennsylvania Historical and Museum Commission)

hundred eighty-six acres of land once warranted by Reverend Smith was sold by Leonard Kimball, executor of Smith's estate, to George Murray for six hundred sixty dollars on February 12, 1843.²⁸ The 440 acres owned by Charles Smith was auctioned to Thomas McCough for four hundred and fifteen dollars.²⁹

McCough did not retain the property for long. In 1847 to settle a legal dispute, Willison Burroughs & Clark vs. Thomas McCough, one hundred and seventy acres of the former Charles Smith warrant, described as "partly in Summerhill and partly in Richland Townships" were auctioned. By this point, of the one hundred and seventy acres, approximately one hundred and twenty were cleared and had a cabin and a stable. Though the land was assessed at seven hundred and seventy-nine dollars, the highest bidder, John Fenlon, purchased it for fifty dollars. One year later, John Fenlon assigned the deed to James Murray for five hundred dollars.³⁰ James Murray and his wife Elizabeth then exchanged the one hundred and seventy acres with James and Mary Myers for three hundred and twenty-five acres elsewhere in Cambria Township.³¹ A small section of land of the Western Reservoir did not fall within Smith or Wilson's warrants but instead was part of an 1837 warrant from the Commonwealth of Pennsylvania to Conrad Fry.³² At Fry's

Figure 1.11. This detail of the 1824 map, highlights the area that would become the site of the Western Reservoir, just south of Croyles Mill in 1824, (Collection of the Pennsylvania Historical and Museum Commission)



death in 1852, his will stipulated that his land be sold and the proceeds divided amongst his children.

In 1854, following the completion of the construction of the South Fork Dam and Western Reservoir, the Commonwealth of Pennsylvania finally provided compensation to the landowners for the property they had already “taken and appropriated in the construction and erection of the Western Reservoir.”³³ The Murray family, who had been acquiring property since the early 1840s, was owed the largest compensation. In May 1854, George and Harriet Murray conveyed to the Commonwealth of Pennsylvania 344 acres for \$4524, all within the bounds of the impoundment area.³⁴ In June 1854, the children of Conrad Fry also sold slightly more than nineteen acres of their inherited land to the Commonwealth, as did James and Mary Myers, who sold ninety-three acres.³⁵

THE MAIN LINE OF PUBLIC WORKS

Though most of the land the Commonwealth of Pennsylvania acquired to construct the Western Reservoir in the 1840s was forested and unimproved, the discovery of coal deposits accelerated settlement throughout the broader area. Johnstown and other small villages along the Little Conemaugh grew quickly as coal mining in Cambria County increased. So too, did increased transportation routes. A couple of decades earlier, in 1824, the Commonwealth



Figure 1.12. This section entitled, *From Laurel Run, 4 miles to Johnstown, from Map and Profile of the Proposed Route For a Railway & Canal From The Head Of Juniata Canal To The Head Of Kiskiminitas Feeder*, the area where the Conemaugh River flows into Johnstown is visible. Surveyed 1826 by G. P. Olmsted, Assistant Engineer, Book 9, Page 15 (Collections of the Pennsylvania Historical and Museum Commission).

completed a survey and initial design plans for a railroad and canal system through Pennsylvania (Figures 1.10 and 1.11). In 1826 the Commonwealth began construction of the Main Line of Public Works, a system which stretched across southern Pennsylvania between Philadelphia and Pittsburgh, to provide access to the timber, mining, agricultural, and manufacturing resources of the central and western portions of the state. Even as early as 1826, the Conemaugh River's seasonal low water level concerned the canal's engineers (Figures 1.12 and 1.13).

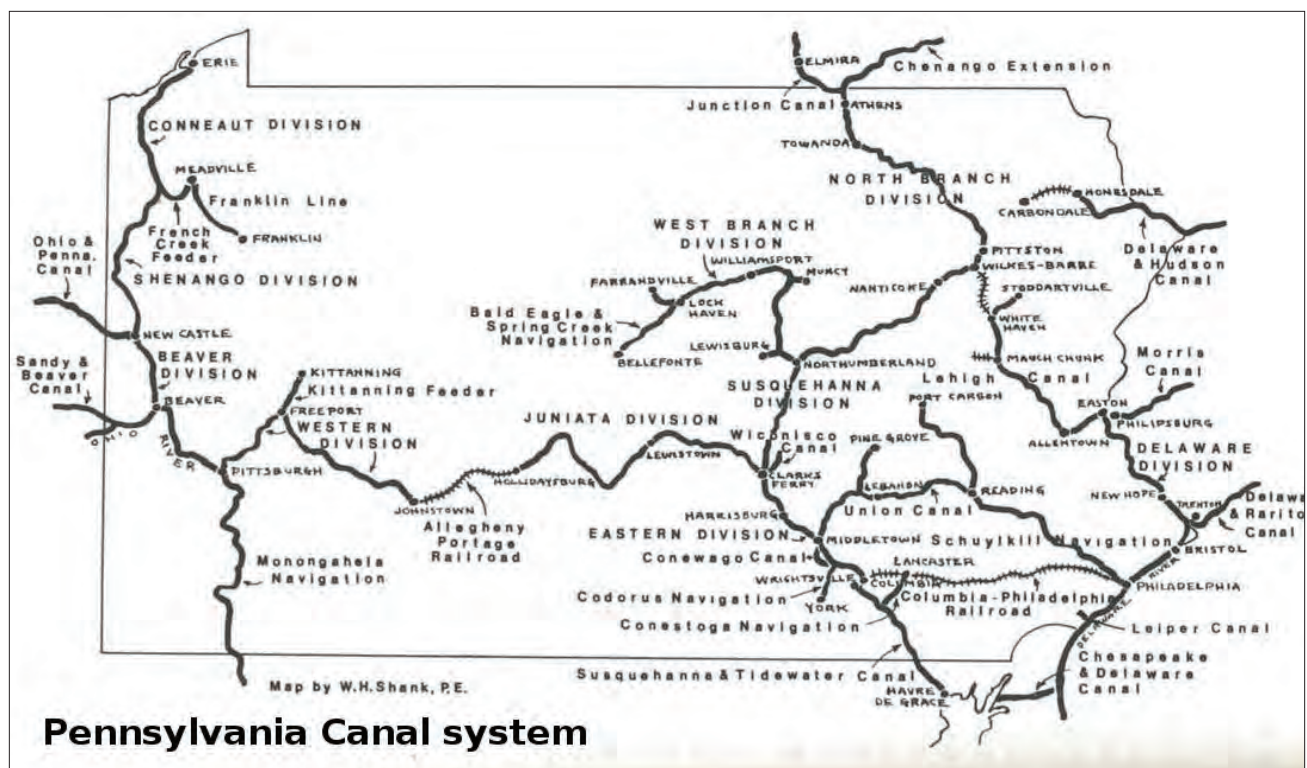
The five principal sections of the system, from east to west, included the Columbia and Philadelphia Railroad (Philadelphia to the Susquehanna River at Columbia, 81.6 miles), Eastern Division (canal from Columbia to Clarks Ferry along the Susquehanna River, 44.5 miles), Juniata Division (canal from Clarks Ferry to Hollidaysburg along the Juniata River, 127.5 miles), Allegheny Portage Railroad (Hollidaysburg to Johnstown, 36.7 miles), and the Western Division (canal from Johnstown to Pittsburgh, 104.25 miles). The Commonwealth finally completed the 394-mile Main Line in 1834 (Figure 1.14).³⁶

Although segments of the Main Line Canal operated as early as 1829, the entire system was not completed until the portage railroad over the Allegheny Mountains opened in the spring of 1834. The canal's largest vessels could be no more than eighty feet long and fourteen feet wide to navigate the locks. In addition, these boats could draw no more than three and a half feet of water when fully loaded. Vessels then had to be unloaded at Hollidaysburg for the trip via the portage railroad over the Allegheny Mountains to Johnstown. Here canal men

Figure 1.13. A detail from the previous map, just north of Johnstown where the Conemaugh River flows into the canal illustrating the need for the Reservoir with the words "dry bed in low water." (Collection of the Pennsylvania Historical and Museum Commission).



Figure 1.14. The branches of the Main Line Canal are illustrated in this map from *The Amazing Pennsylvania Canals* by William Shank, 1965. (Historical Society of York County, Pennsylvania).



reloaded the cargo for the trip to Pittsburgh.³⁷ Frequent delays in canal traffic were caused by too much water from floods in the spring and too little water by drought in the summer and fall.

LANDSCAPE SUMMARY, PRIOR TO 1834

Little existing primary or secondary documentation describes the characteristics of the landscape of the future Johnstown Flood National Memorial before construction of the South Fork Dam and Western Reservoir. In 1834 when Sylvester Welch, the engineer of the Juniata and Western Division of the Main Line Canal, proposed the location of the reservoir, he described the land as almost entirely undeveloped and of “comparatively little value,” forested except for one small open field.³⁸ Forested hillsides sloped down to the South Fork of the Little Conemaugh River, cutting through the valley floor. The floods and freshets seasonally scoured native riparian vegetation that grew along the river’s edge. This riparian understory likely included steeplebush (*Spiraea tomentosa*), Allegheny blackberry (*Rubus allegheniensis*), and black raspberry (*Rubus occidentalis*), river birch (*Betula nigra*), red maple (*Acer rubrum*), and black cherry, among others. Native tree species, including sugar maple (*Acer saccharum*), black cherry (*Prunus serotina*), butternut (*Juglans cinerea*), hickory (*Cary sp.*), chestnut (*Castanea dentata*), ash (*Fraxinus sp.*), oak (*Quercus sp.*), hemlock (*Tsuga sp.*), and spruce (*Picea sp.*), cloaked the hillsides and valleys.

1834 – 1888: DEVELOPMENT OF THE WESTERN RESERVOIR AND THE SOUTH FORK FISHING AND HUNTING CLUB

This period, 1834 – 1888, describes the development of the Western Reservoir and South Fork Dam, the South Fork Fishing and Hunting Club’s conversion of the landscape surrounding reservoir and dam into a private recreational resort, and the use of the resort prior to the South Fork Dam’s failure in the spring of 1889.

THE SOUTH FORK DAM AND WESTERN RESERVOIR

As soon as the Commonwealth put the Main Line’s Western Division into operation in 1834, it became clear that the local streams would not provide enough water supply to the canal during the area’s dry seasons. The canal section between Johnstown and Blairsville was particularly susceptible to low water and prompted the Canal Commissioners to build a water storage reservoir east of Johnstown. During the summer and fall of 1834, the Canal Commissioners tasked Sylvester Welch, the Juniata and Western Divisions engineer, to conduct preliminary surveys for a reservoir. In November 1834, Welch reported that the most favorable site for a dam and reservoir would be about fourteen miles

upstream from Johnstown on the South Fork of the Little Conemaugh River, commencing about two miles upstream from its confluence with the north fork, and extending “up the stream about two and a fourth mile.”³⁹ The location had been identified as ideal for the reservoir previously. Welch had copies of earlier surveys, including the 1791 Union Canal Scheme survey. He also had an 1822 federal engineers report, which had recommended to President Monroe via a report to the Senate, a dam at the South Fork Little Conemaugh’s headwaters to furnish water for a western canal.⁴⁰ The planned reservoir would impound the water from an area of fifty square miles at an elevation of four hundred feet above the canal at Johnstown.

According to Welch, in 1834 the proposed site of the dam and reservoir was undeveloped except for a small field, and “the adjacent country for some miles in extent, is principally a forest, and the land is of comparatively little value.”⁴¹ Welch located the dam where the distance across the river valley was less than any other point above or below it and calculated that a dam here would be 840 feet wide and would create an impoundment of 485 million cubic feet of water covering a surface area of 417 acres. He also prepared a cross-section drawing of the proposed dam, which included a sluice at the bottom to release water into the river and a spillway cut into the rock at one end to discharge surplus water stormwater. Welch estimated the total cost for clearing four hundred and seventeen acres of the site and building the dam at \$125,705. The dam would consist of an embankment and a masonry wall, though he noted that cost could be reduced thirty percent if a puddled embankment replaced the masonry wall.⁴² The puddling technique incorporated successive layers of packed down (puddled) local clay earth. Each layer was then cured under a skim of water to make it airtight, and stone and gravel layers supported the puddled core on both sides.⁴³ He further calculated that even after evaporation during the dry season, the reservoir would supply the canal with 458 million cubic feet of water, “for a period of nearly 130 days without any augmentation from rain.”⁴⁴

In April 1835 the state legislature appropriated \$100,000 for various public works, including “the commencement of a reservoir near Johnstown.”⁴⁵ Eventually, however, the state shifted the appropriation to other public works and thus stalled the project. In the meantime, Welch further refined his design and increased the reservoir’s capacity to 524 million cubic feet of water over an area of 465 acres. Welch proposed constructing the dam to provide a seventy-two-foot water depth above the bottom of the sluice pipes. Wastewater would be carried through a solid rock channel beyond the end of the dam and into the ravine below. No water would be permitted to pass over the dam, and the sluice, through which the water would be drawn from the reservoir, would be made of cast-iron set in masonry.⁴⁶

The five cast iron sluice pipes set in a masonry culvert directed outflow water into a creek that emptied into the river just downstream from the dam. The revised

design for the dam and reservoir was estimated to cost \$113,330 (less than estimated the year before even though it was larger). The summer seasons of 1835-37 were not abnormally dry enough to severely hinder canal operations. Still, low water conditions in the summer of 1838 prompted the Canal Commissioners to restate the need for the Western Reservoir. In July 1839, the state legislature appropriated \$70,000 for construction of both the Eastern and Western Reservoirs, far short of the one hundred and thirteen thousand dollars estimated for just the Western Reservoir.⁴⁷

In July 1839 the Canal Commissioners appointed William E. Morris, one of the new state engineers of the Western Division of the Pennsylvania Canal, as the principal engineer of the project.⁴⁸ After conducting additional surveys and calculations, Morris confirmed Welch's earlier recommendation to build the dam and reservoir on the South Fork Little Conemaugh River, stating that the site "is the only one that drains a sufficient extent of country, to render certain a supply of water for the reservoir." He went further stating,

This site combines more advantages for the construction of a reservoir, than any other upon the waters of the Conemaugh, or Stony creek. It is not remote from Johnstown and is less than two miles from the railroad. It is situated upon a stream that will furnish an abundance of water to fill the reservoir; and from the floods of which but little danger is to be apprehended; if proper channels are to be constructed for their discharge. The valley is narrow at the dam, and widens immediately above, into an extensive basin. The land intended to be flooded, except a few acres is covered with timber and consequently but small injury will result to private property. There is solid rock at both ends of the dam in which channels may be cut for the discharge of wastewater in time of floods. This fact has been satisfactorily ascertained by a full examination by means of drifts and shafts sunk for the purpose. Abundance of the best material for the formation of the dam is found convenient.⁴⁹

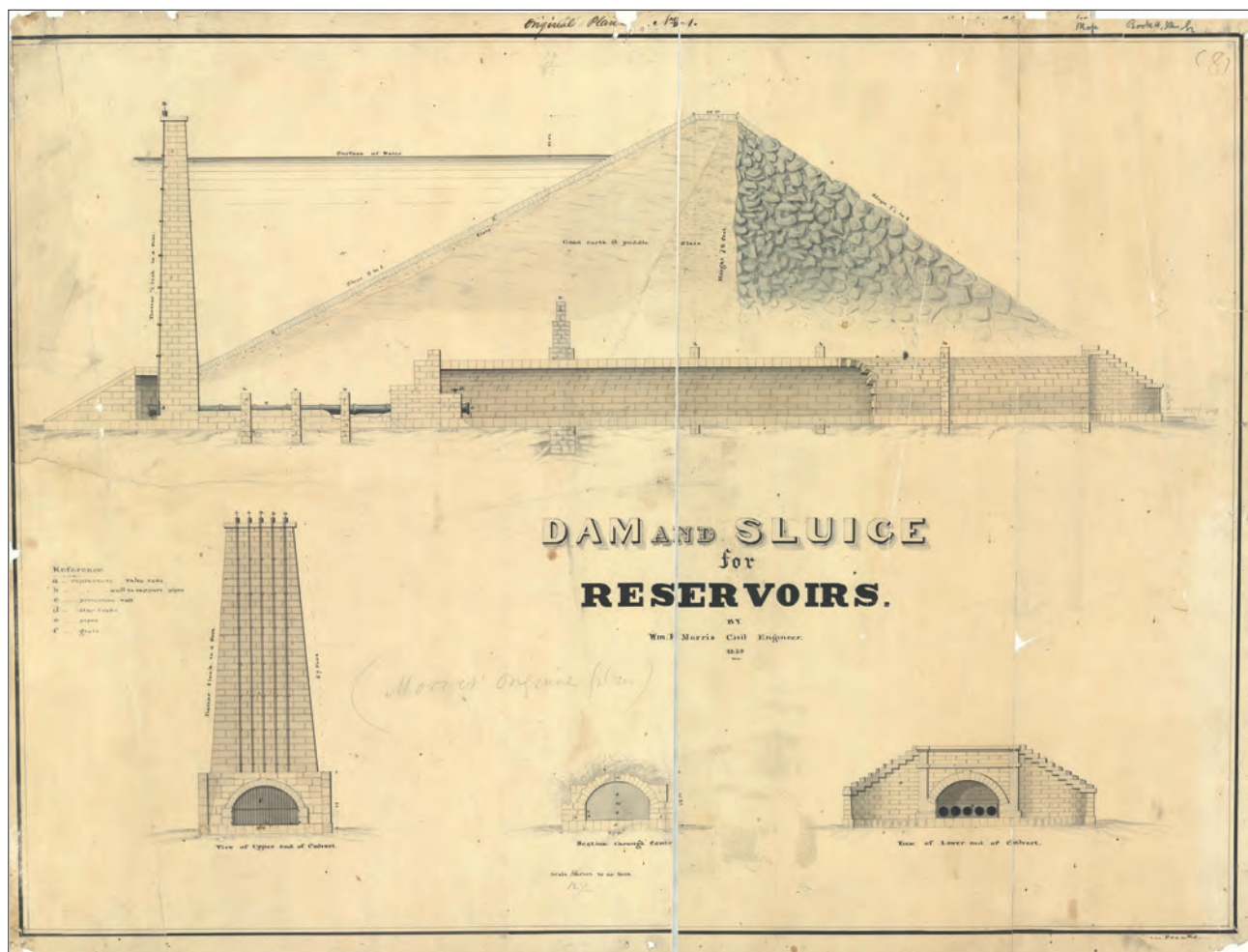
He also concurred with Welch's stone and earth embankment design for the dam. Morris, however, reduced the capacity of the reservoir to 448 million cubic feet of water over an area of four hundred acres. He also increased the cost estimate of the project to \$188,000. Morris's plan for the construction of the dam and reservoir – along with detailed specifications for tree clearing, dam foundation work, and dam and sluice construction – was accepted by the Canal Commissioners. The plan included a drawing of a masonry valve control tower located in the water on the dam's upstream side, which housed the mechanisms that opened and closed the five pipes in the sluice culvert (Figure 1.15). Detailed specifications were also made for the clearing of the property that would be incorporated into the reservoirs, though according to the property deeds, the State did not yet own the land. The land was to be cleared to twenty feet above the level of the water in the reservoir.⁵⁰

The whole area of ground intended to be covered by water: and if required, to twenty feet outside and beyond water line, shall be cleared of all trees, stumps, logs, brush, leaves and vegetable matter of every description whatsoever--and of any roots, that may be turned up;-all of which shall be entirely burned.

In addition to the above, any trees in the vicinity of the Reservoir, which, in the opinion of the Engineer, are likely to fall into the water, shall be felled and burned. All trees and saplings, that are less than 10 inches in diameter, shall be chopped off even with the surface of the ground. Trees of larger size may be cut with a stump a foot in height. In no case will the contractors be permitted to throw any portion of the aforesaid material into the streams--neither shall they deposit it upon the adjacent land, without a written permission from the Landholder, endorsed by the Engineer. The streams shall, at all times during the progress of the clearing, be kept free from obstruction, and open to the passage of water, by the immediate removal of any trees, brush, or other matter that may fall into them. Any timber that may be suitable for any part of the work about the reservoir, and shall be wanted for such purpose, and any fencing rails or posts, that may be left on the ground by the landholder, upon notice from the Engineer, shall be carefully deposited in some secure place and not destroyed, and the contractor will be held responsible for the same. The CLEARING will be let in lots, numbered from the dam upwards, marked upon the ground, each containing about fifty acres of woodland. That portion of the ground now cleared and enclosed, will not be bid for as land to clear, nor measured as such, except so far as to include fence rows, and any un-cleared land, properly such, within the fences.⁵¹

Figure 1.15. The design for the South Fork Dam, specifying a masonry valve control tower. *Dam and Sluice for Reservoirs* by Wm. E. Morris, Civil Engineer, 1839, Original Plan No. 1, Book 4. (Collections of the Pennsylvania Historical and Museum Commission)

With state money in hand, the project was put out to bid, and in January 1840 a contract was awarded to General James K. Moorhead of Pittsburgh and Judge Hezekiah B. Packer of Williamsport. Moorhead was experienced in dam

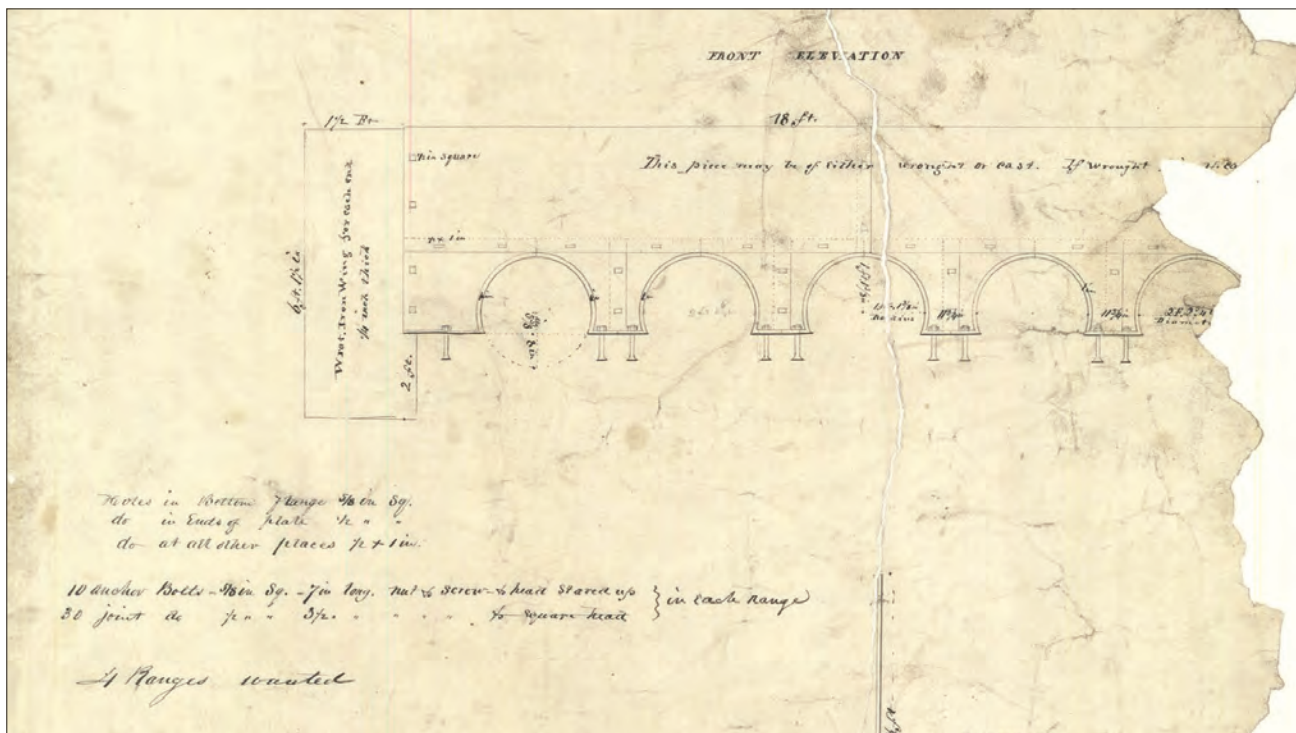


construction in Pennsylvania and Packer was the brother of a future governor of the Commonwealth.⁵² Work began in April 1840 and by November enough progress had been made that engineer Morris predicted the reservoir would be ready the following summer if additional funds could be secured. In May 1840 another contract was let for construction of a brick and stone house and a stable at the reservoir site. The house and stable were intended for the construction supervisor and later for the person charged with the maintenance and operation of the dam and reservoir.⁵³

Despite the progress made on the dam, a nationwide economic depression, precipitated by a crash in cotton prices, impacted the state's finances and resulted in the suspension of numerous public works projects. In Pennsylvania, The Second Bank of the United States, a Pennsylvania chartered bank, ceased operation drastically reducing available capital and forcing the state to fund only essential operations. As a stopgap measure, in early April 1841 the state legislature passed an act appropriating \$50,000 to fund work through the end of the month. After that contractors were required to fund the outlay necessary to pay for their work. Nevertheless, a considerable portion of the embankment was completed by year-end, along with installation of some sluice pipes (Figure 1.16).⁵⁴

Yet the public's frustration with management of the complex project was growing. When the Main Line was first completed in the 1830s, many thought the canal would generate revenue for the state treasury. However, canal revenue did not even cover construction debt. When additional taxes were required to meet the debt payments, support for selling the canal grew. In 1841, the state was permitted to request bids, but the two bids received were dismissed as unreasonable.⁵⁵ For

Figure 1.16. Sketch of Piling Iron [for] Western Reservoir showing the front elevation of the design of the sluice pipes, N.D. (Collection of the Pennsylvania Historical and Museum Commission)



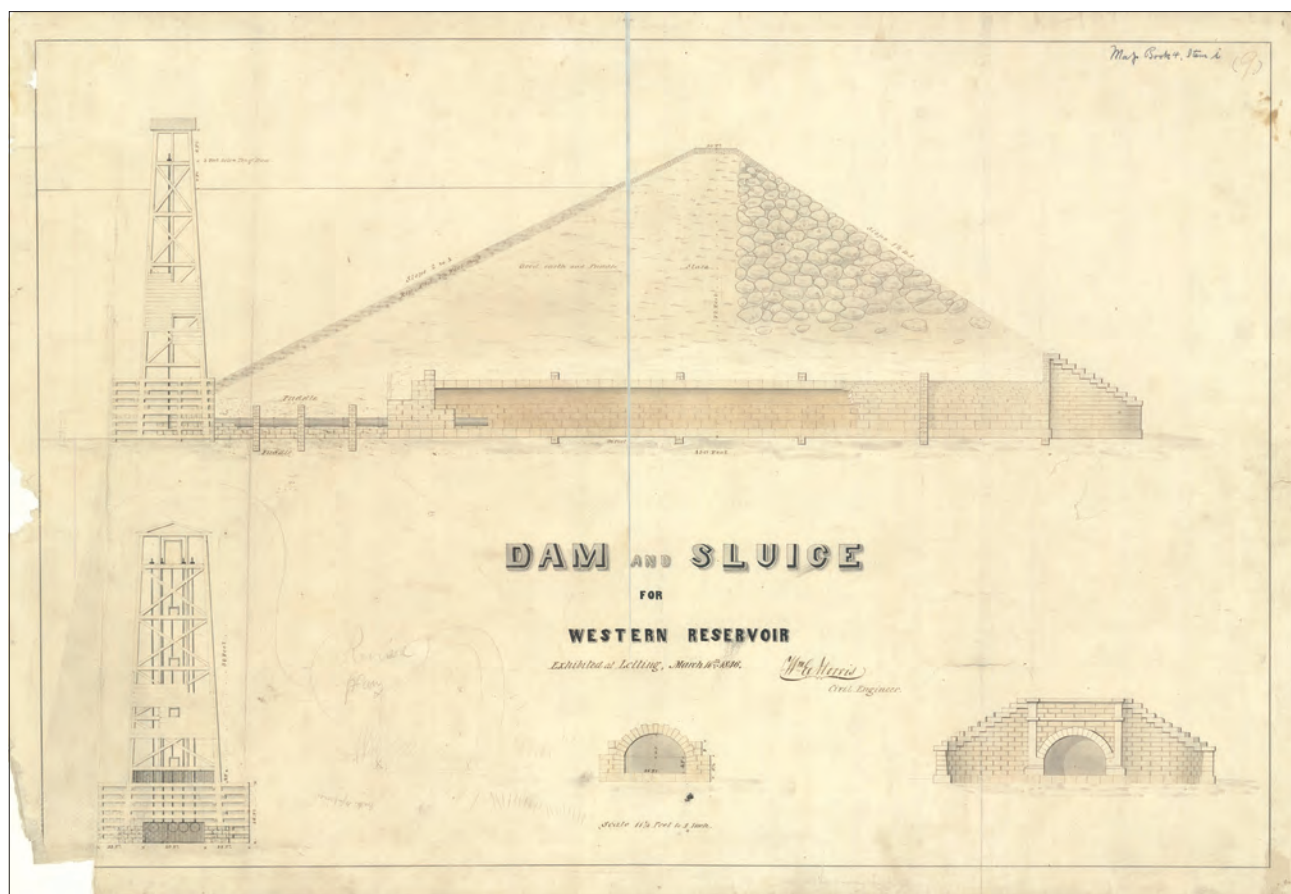


Figure 1.17. Revisions from the earlier plans for the South Fork Dam include a wooden tower instead of masonry. *Dam and Sluice for Western Reservoir, William. E. Morris, Civil Engineer. Exhibited at Letting, March 10th, 1846, Book 4.* (Collections of the Pennsylvania Historical and Museum Commission)

the next few years, the Canal Commissioners lobbied for special appropriations to complete the project, but in the difficult economic climate, they were denied.⁵⁶

In January 1846 the state appropriated \$20,000 for the project, at which time the materials for the dam's valve control tower were changed from masonry to wood (Figure 1.17). The Canal Commissioners received new bids in March to complete the dam and finish clearing the reservoir, including bids from Moorhead and Packer, who argued their January 1840 contract had not been abandoned because the work had merely ceased when the appropriation was depleted.⁵⁷

However, before the Canal Commissioners could render a decision, a flood in the spring of 1846 caused extensive damage to the Main Line and the state appropriation was redirected toward emergency repairs. In 1847 the partially completed South Fork Dam, which was described as “annually wasting away,” broke and caused a minor flood in Johnstown.⁵⁸

Work at the dam and reservoir was also halted in 1848 and 1849 by a cholera epidemic that swept through southwestern Pennsylvania. During this period of inactivity, the Canal Commissioners continued to urge the state legislature for money to resume the work.⁵⁹ Finally, in 1850 at the urging of Governor William F. Johnston, the state legislature appropriated \$45,000 for the completion of the project. Moorhead and Packer again demanded that they be allowed to finish the work under their January 1840 contract. When they threatened to take legal

action, the Canal Commissioners permitted them to proceed under their original contract, but the delay caused by the controversy resulted in the appropriation reverting to the state's general fund.⁶⁰

The sum of \$55,000 was still needed to complete the work. At the Canal Commissioners' urging, the state legislature provided the additional money in May 1852, allowing the work to continue. The cost of the project was now fifty percent more than the 1839 estimate. By June, work on the valve control tower had advanced, and the sluice pipes were closed to prepare for the dry summer season. By the end of August, water in the reservoir had accumulated to a depth of forty feet above the sluice culvert, enough to provide an ample supply for fully loaded boats to pass the Western Division of the canal throughout the summer.⁶¹ In the spring of 1853, the contractors completed the work on the dam and reservoir at a cost of \$166,647.50. Since the embankment of the dam was new and had not fully consolidated, it was considered unsafe to fill the reservoir to a height greater than fifty feet above the sluice culvert for the 1853 season. That summer was unusually dry, and the reservoir was exhausted before fall.⁶²

THE COMPLETED SOUTH FORK DAM AND WESTERN RESERVOIR

When completed in 1853, the South Fork Dam and Western Reservoir project was hailed as an engineering masterpiece (Figure 1.18). According to some sources, the reservoir was said to be the largest artificial reservoir in the United States.⁶³ Although limited to a fifty-foot depth adjacent to the dam, the reservoir covered an area of 424.85 acres.⁶⁴ The dam itself was an engineered mound of earth and clay seventy-two feet high and 931 feet long. The top of the dam rose ten feet above the reservoir's maximum water level of sixty-two feet. Though preliminary plans had specified a central core of masonry, the dam was composed of puddled clay. This puddled clay core was supported on both sides by stone and gravel layers. The dam's outer face was armored with large loose rocks, while the inner face was armored with a two-and-a-half-foot thick layer of smaller stones. Between the outer armored stone and inner core was a layer of native four-inch slate pieces. The outer face was angled at a sixty-degree slope while that of the inner face was at a slightly gentler slope of fifty percent.

The dam's control mechanism consisted of a sluice gate of five two-foot diameter cast iron pipes covered by a cut stone arch culvert, twenty-five wide at the base, extending through the dam's base. Water was discharged from the reservoir through these pipes into the South Fork Little Conemaugh River and ultimately down the Conemaugh to feed the canal at Johnstown twelve to fourteen miles downriver. A timber frame valve control tower, with a log and stone foundation at the bottom of the reservoir, extended about fifteen feet above the top of the water surface.



Figure 1.18. Map of the Western Reservoir For Pennsylvania Canal, Cambria County, Pa., 1853, R. S. Alexander. (Collection of the Pennsylvania Historical and Museum Commission)

The western end of the dam was anchored to the hillside by a stone wall twenty feet high and buttressed every twenty feet through the base. To prevent the water behind the dam from rising to the top and flowing over its crest, a spillway was cut through the solid rock at the eastern end of the dam. The spillway was approximately seventy feet wide at its narrowest and its inlet was ten feet below the crest of the dam.⁶⁵

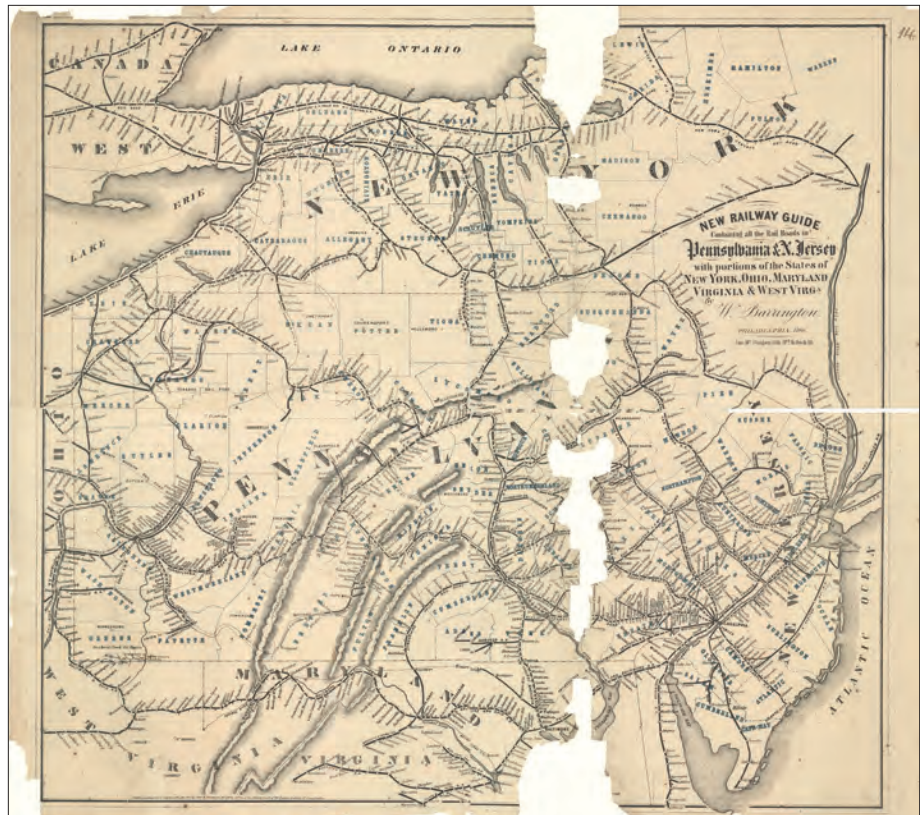
The reservoir succeeded immediately in supplying water for the Western Division canal. Though the Canal Commissioners regularly performed general maintenance operations on the dam, and an inspection in 1856 found it to be in excellent condition, there were periodic emergencies. For instance, in the spring of 1856, the winter's heavy snowfall melted quickly, and the reservoir overflowed through the spillway. A leak in the dam added to the general alarm, but the water soon receded, and the leak was repaired. The *Johnstown Tribune* later observed that,

the sudden precipitation of the entire body of water upon the Conemaugh Valley would have done a vast amount of damage to personal property, while families who lived in the line of the threatened torrent went to bed of a night for a season with no security given them that they would not find a watery grave before morning.⁶⁶

ABANDONMENT OF THE SOUTH FORK DAM AND WESTERN RESERVOIR

At the same time as the Western Reservoir was being built by the State, new technology would soon render it obsolete. In 1852, the Pennsylvania Railroad Company completed a line from Pittsburgh to Philadelphia, spanning the two sections of the Main Line: the Columbia-Philadelphia Railroad and the Allegheny Portage Railroad. By February 1854, the railroad had completed a large horseshoe curve near Altoona, eliminating the cumbersome use of the inclined planes of the portage over the Allegheny Mountains (Figure 1.19). By the time the Western Reservoir was completed in 1853, the State had long contemplated selling the

Figure 1.19. This map from 1866, reveals the enormous investment made in rail lines by the time the Main Line Canal system was declared obsolete. *New Railway Guide Containing all of the Rail Roads in Pennsylvania & N. Jersey with portions of the States of New York, Ohio, Maryland, Virginia & West Virginia* By W. Barrington." Philadelphia, 1866. Jas. McGuigan, Lith. 3rd & Dock St, Book 4. (Collection of the Pennsylvania Historical and Museum Commission)



Main Line. The Pennsylvania Railroad's new route again prompted the State to try and sell its public works. The State priced the mainline at \$10,000,000 but required the purchaser to maintain and operate the canal in perpetuity. The State failed to identify a buyer. A year later, the State again offered the Main Line for sale. This time, the Pennsylvania Railroad offered \$7,500,000 subject to the abandonment of the Allegheny Portage Railroad and the canal's Western Division. This offer was initially refused, but in 1857 the terms were accepted. The railroad took possession on August 1, 1857.⁶⁷ The portage railroad was immediately discontinued, which left a gap in the line, separating the Western Division from the rest of the canal. Consequently, the portion of the Western Division between Johnstown and Blairsville was abandoned in 1863, followed by the rest of the Western Division in 1864.

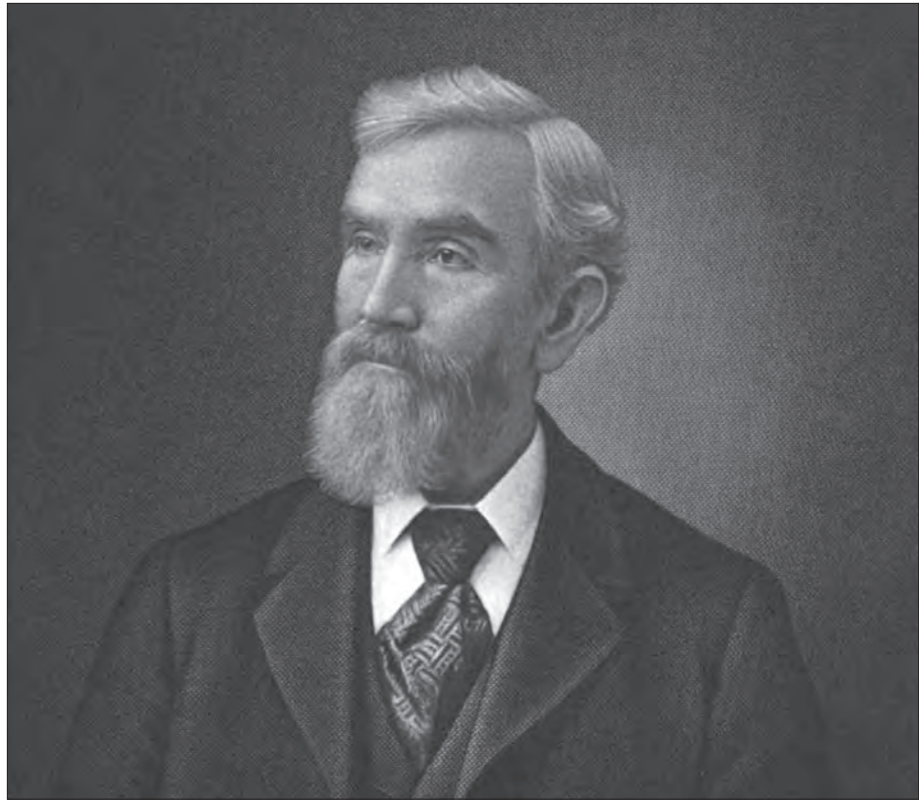
When the Western Reservoir supplied water to the canal system, the South Fork Dam continued to suffer breaks, including a major break in 1862. That July, monitors observed that the dam had sprung a leak in the sluice culvert, and a portion of the headwall arch had fallen. A couple of weeks later, the culvert collapsed during heavy rain, and a nearly two-hundred-foot length of the dam embankment partially washed out. Fortunately, the reservoir was only partially filled because of the dry summer, and Little Conemaugh River rose only three feet.⁶⁸ Joseph Leckey, the railroad company watchman living near the dam, was one of the first to witness the break. He quickly released the intense water pressure by opening the sluice gates, while another employee telegraphed warning of the break to Johnstown. A few days later the local newspaper, the "Cambria Tribune", described the damage,

The Reservoir dam, the precarious condition of which we noticed two weeks ago, gave way on Saturday morning last and emptied its waters into the Conemaugh. The announcing of the breaking of the dam caused considerable alarm in town but owing to the low stage of water in the creek, the flow from the Reservoir produced but an inconsiderable rise, and the excitement and the flood both soon subsided. No loss or damage was sustained by anybody so far as we can learn. . . Many people were badly scared about the breaking of the Reservoir, but nobody was hurt by it.⁶⁹

The Pennsylvania Railroad planned to close the canal between Johnstown and Blairsville, so they did not repair the break in the dam. On May 1, 1863, the canal was closed to navigation. The reservoir banks became grassy slopes where livestock grazed. Local farmers fished in the pools that collected near the remains of the dam, cultivated fields near the shallows, and grazed livestock on the grasses that quickly filled the dried-up southeastern end of the reservoir.

Having little need for the dam and reservoir, the Pennsylvania Railroad Company sold the property unencumbered (agreeing to pay off the debt that remained to the Commonwealth of Pennsylvania), amounting to approximately five hundred acres to Congressman John Reilly of Altoona in March 1875 for \$2,500.⁷⁰ Reilly had worked for the railroad since 1854, serving as a superintendent of

Figure 1.20. Portrait of John Reilly from Godcharles, Frederic Antes, 1872-, Ernest Spofford, Thomas Lynch Montgomery, and John W. (John Woolf) Jordan. *Encyclopedia of Pennsylvania Biography: Illustrated*. New York: Lewis Historical Publishing Co., 1914.



transportation from 1865 to 1875. He was elected as a Democrat in 1874 to the Forty-Fourth Congress and ran an unsuccessful reelection campaign in 1876 (Figure 1.20). Following his political loss, Reilly rejoined the Pennsylvania Railroad Company.⁷¹ Around 1878, the wooden valve control tower operating the sluice valves caught fire and burned. Reilly sold the five unused sluice pipes for scrap but otherwise did nothing with the property. On January 17, 1880 John Reilly and his wife, agreed to sell the property for \$2000 to Benjamin Ruff, and officially transferred the property on March 15th.⁷²

DEVELOPMENT OF THE SOUTH FORK FISHING AND HUNTING CLUB ON LAKE CONEMAUGH

In the late 1870s, Benjamin F. Ruff, a railroad tunnel contractor, coke salesman, and real-estate broker, had an idea to convert the former Western Reservoir into a lakefront resort. The Allegheny Mountains had few natural lakes, so the setting would provide a rare opportunity to engage in active outdoor pursuits. Yet creating the infrastructure for such an enterprise, rebuilding the dam, and constructing the roads and buildings necessary to support the community, would be expensive. He needed to find others interested in his idea. Andrew Carnegie and Henry Clay Frick, wealthy Pittsburgh industrialists who would become involved in the development of the resort at Lake Conemaugh, summered first at the resort in Cresson. Cresson was founded before the Civil War and centered on a therapeutic spring eighty miles east of Pittsburgh. The Pennsylvania Railroad



Figure 1.21. Mountain House in Cresson Springs prior to 1880–1881 expansion by the railroad. (Album of Pennsylvania R.R. Scenery, Historical Collections and Labor Archives, Special Collections Library, University Libraries, Pennsylvania State University)



acquired the Cresson Springs property in the early 1880s and undertook a significant expansion of the Mountain House Hotel, which may have encouraged Pittsburgh's wealthiest families to invest in the more intimate South Fork Fishing and Hunting Club (Figures 1.21 and 1.22). Exclusive resort landscapes, like Cresson and the future South Fork Fishing and Hunting Club, blurred the lines between business and leisure, and provided opportunities for networking between leading families and businessmen. Under Ruff's plan, following the new resort's construction, access would be granted to Lake Conemaugh only for club members and their guests. In time, Ruff was able to convince Frick, and others within his circle, of the merits of his new purpose for the Western Reservoir.

The South Fork Fishing and Hunting Club of Pittsburgh was incorporated on March 19, 1879. In November, the club received its formal charter from the Court of Common Pleas of Allegheny County with the stated purpose of "protection and propagation of game and game fish, and the enforcement of all laws of this State against the unlawful killing or wounding of the same."⁷³ With the formal charter, they created an insignia of a man fishing on the shores of a lake that they later used to emboss official documents (Figure 1.23). The charter's primary purpose was likely to raise funds for club facilities, for it set the organization's capital stock at \$10,000. The charter divided the stock into one hundred equal shares and listed sixteen subscribers holding forty-two shares total. Ruff owned eight shares and served as the first president. Ruff's friend Henry Clay Frick, thirty-one years old at the time and wealthy from the Pittsburgh coke industry, owned six shares.⁷⁴ Members each bought a share in the corporation and paid an initial fee of eight hundred dollars.⁷⁵

Before the new club purchased the land from John Reilly, word of new plans for the Western Reservoir were made public. In October 1879, the "Johnstown Daily

Figure 1.23. The insignia of the South Fork Fishing and Hunting Club was created at the time that their charter was approved on November 17, 1879 and used for embossing official club documents. (Collection of the Cambria County Historical Society)



Tribune” reported erroneously that the “Western Game and Fish Association of Pittsburgh” were advertising for fifty men and that,

It is the intention of the corporation named to commence rebuilding the dam and putting the extensive grounds in proper shape for the erection of a summer resort, and no better location can be found in Western Pennsylvania for this purpose. As soon as the necessary buildings are erected and all the improvements made it will be a formidable rival to Cresson, and in course of time will undoubtedly become one of the best rural resorts in the country.⁷⁶

Ruff, who had no experience in waterworks or dam construction, originally planned to rebuild the entire South Fork Dam to a height of about forty feet and lower the existing spillway by twenty feet to divert the overflow. However, the cost of this approach proved greater than repairing the break in the dam from July 1862. Repairing the dam’s break and preserving the structure at its original height would save money and time by preserving the bedrock base of the overflow spillway at its original depth. Ruff hired Edward Pearson, an employee of the local freight department of the Pennsylvania Railroad, as construction foreman and superintendent. Like Ruff, Pearson had no prior engineering training or experience in dam construction or waterworks management.⁷⁷

As the dam repair progressed, observers with more experience criticized numerous aspects of the work. P.F. Brendlinger, a member of the American Society of Civil Engineers, visited the dam in 1880 and was critical of the materials and methods of the repairs. Daniel J. Morrell, general manager of the Cambria Iron Company, was worried to the point of sending John Fulton, a trained geologist and engineer, to inspect the work. Experienced in mining, canal, and railroad works, Fulton echoed Brendlinger’s concerns and raised his own over the club’s decision not to replace the sluice pipes and instead fill in what remained of the sluice culvert. Fulton protested that lowering the lake level to address the leaks would be impossible without the reinstallation of the sluice pipes. Still, Ruff responded that the arched culvert’s failure caused the leaks and that eliminating the pipes penetrating the earthen structure would eliminate the leaks. Concerned about the “perpetual menace to the lives and the property of those residing in the upper valley of the Conemaugh,” Morrell offered to assist Ruff in funding a major overhaul of the dam and installation of a new discharge system.⁷⁸ He likely understood that the failure in the dam threatened the Cambria Iron Company’s iron works in Johnstown. The club rejected the offered assistance.⁷⁹

In addition to rebuilding the center section of the dam, the club widened the gravel wagon road atop the dam’s crest, from ten feet to twenty feet, so that two carriages could pass and to provide more fill to repair the dam (Figure 1.24).⁸⁰ Yet lowering the center of the dam from seventy-two feet to seventy feet left a mere eight-foot difference between the top of the dam and the maximum water level in the reservoir. The club also constructed two timber trestle bridges across the spillway as part of the carriage road system (Figure 1.25). Wire screens were

Figure 1.24. View southwest along the carriage road over the South Fork Dam, revealing the width of the carriage road, no date. (Louis Semple Clarke Collection, Johnstown Area Heritage Association)



Figure 1.25. A detail from a photograph of the trestle bridge over the spillway looking southeast immediately after the flood, 1889. (Johnstown Flood National Memorial Archives)



Figure 1.26. Note the wooden boom in the lake near the spillway bridge, looking southeast. (Louis Semple Clarke Collection, Johnstown Area Heritage Association)



attached to the bridge's support posts over the spillway to prevent their stocked fish from escaping the lake during high water. A V-shaped log boom was installed in front of the spillway to prevent debris from blocking the screens (Figure 1.26). During periods of water flow through the spillway, these features impaired water flow.⁸¹ To prevent fish from swimming out of the lake and to the frustration of local farmers, the club also erected screens or dams at the mouths of the four tributary streams that drained into Lake Conemaugh, including Rorabaugh's Creek, Muddy Run, South Fork, and Topper's Run.⁸² Finally, the opening of the remaining stone culvert was boarded up with hemlock planks.

In June 1881, heavy rains caused uneasiness among Johnstown residents. Rumors that the dam was breaking on the morning of June 10th prompted the Cambria Iron Company to send two of its engineers to inspect the dam. They reported that the lake's water was two feet below the crest of the dam and the spillway was diverting excess water, but there were no leaks. Around the same time, Robert Pitcairn, the division head of the Pennsylvania Railroad between Altoona and Pittsburgh and a member of the South Fork Fishing and Hunting Club, took several of his engineers to inspect the dam. His primary concern was that the leaks at the bottom of the dam would increase. Ruff accompanied the men and claimed that the rumored leaks were springs from the hillsides at either end of the dam. When Ruff promised to take remedial action, Pitcairn was satisfied, although he asked his men to continue periodic inspections (Figure 1.27).⁸³

Ruff and Pearson completed the dam repairs in 1881 at the cost of approximately \$17,000. Afterward, they stocked the lake with 1,000 black bass from Lake Erie. The lake was between sixty and sixty-five feet deep, stretching three miles in length and up to a mile wide (Figure 1.28).⁸⁴ In the spring of 1881, the club amended its charter to raise additional capital by issuing one hundred additional stock shares at \$100 per share. The amended charter also allowed for additional

Figure 1.27. In the center of the photograph, the western face of the dam illustrating the smaller rip rap stones used in its construction, and the blocked stone culvert is visible circa. 1880s. The carriage drive climbing the hill west of the dam is also visible in the upper right hand corner of the photograph. (Louis Semple Clarke Collection, Johnstown Area Heritage Association)



Figure 1.28. This photograph of a woman on the shores of Lake Conemaugh, likely posing in a *tableau vivant*, captures the enormous breadth of the lake. Lake View Farm is visible in the upper right-hand corner of the image and note the fencing behind the woman, no date. (Louis Semple Clarke Collection, Johnstown Area Heritage Association)



Figure 1.29. View toward the clubhouse, circa 1888, The gabled building to the left is the original structure, completed in 1881, while the larger section to the right is the Annex, completed in circa 1887. (Louis Semple Clarke Collection, Johnstown Area Heritage Association)



members in the future, but the total number of members, or shares, could not exceed four hundred.⁸⁵ Shortly before the stock offering, the club made the first of eight separate land purchases to create a buffer between the club and surrounding property owners and provide land to build a clubhouse and cottages. The club also purchased small parcels of land newly submerged by the lake.⁸⁶

While the repair on the dam was underway, the club began developing the clubhouse and cottages. The largest centrally located lot was reserved for the clubhouse (Figure 1.29). Lots for future cottages were laid out along the lakeshore, no larger than one hundred feet wide along the lake and one hundred and fifty feet deep from the water's edge (Figure 1.30). Club members could enter a ninety-nine-year lease, upon which they would be required to begin construction of a cottage within six months. Not all the lots were leased immediately. Lewis Irwin



Figure 1.30. Note how closely the cottages are spaced on their lots as well as the proximity of the woods to their rear facades. From left to right, the five structures pictured were cottages owned by Charles J. Clarke (1833-1899), Henry Holdship (1833-1897), Moses Bedell Suydam (1832-1895), J.J. Lawrence (1827-1893), and Christopher Curtis "C." Hussey (1840-1884). The club house is barely visible beyond the Hussey cottage. The Clarke, Lawrence, and Hussey cottages, as well as the addition to the Clubhouse, remain standing today. (Louis Semple Clarke Collection, Johnstown Area Heritage Association)

entered a ninety-nine-year lease for "Lot 13" in 1885 for one dollar, but it wasn't until 1888 that Henry Holdship entered the same lease for "Lot 11". Whether they built a private cottage or not, each club member was permitted two weeks of accommodation for his family at the clubhouse.

Most club members began their journey to the South Fork Fishing and Hunting Club in Pittsburgh, where they took the Pennsylvania Railroad southeast approximately two hours to the South Fork Station. They then headed south about two miles by carriage to the South Fork Dam. At the dam, the carriage road forked. One road continued south parallel with the lake's eastern edge, and one road veered right or west and crossed directly over the dam. Once over the dam, the road headed southwest, tracked along a wooded hillside, and continued south to the main club grounds on the southwestern shore of the lake, about one mile from the dam (Figure 1.31).

DEVELOPMENT OF THE SOUTH FORK FISHING AND HUNTING CLUB COTTAGES AND CLUBHOUSE

The clubhouse was located at the core of the club complex. The clubhouse was originally constructed as residential-scale two story, frame building with seventeen guest rooms and a dining room that seated ninety under a cross-gable roof.⁸⁷ In 1885 the "Johnstown Tribune" published an article highlighting the potential need for a public hotel to alleviate crowding at the resort, especially in the dining room and when member guests came to visit.

There are now about a dozen very tasty cottages and a Club House, which provides meals for all the guests. The seating capacity of the dining room is only ninety, however, so that the guests are greatly inconvenienced . . . The cottages and Club House are on the right hand side of the lake as you enter the grounds from the old Frankstown road and about a mile distant from the breast of the dam or lake. Directly opposite the Club House is the beautiful Rorabaugh farm, sloping gently to the water's edge. The cottages are built in a damp, bad

Figure 1.31. A group of members of the South Fork Fishing and Hunting Club sit at the edge of Lake Conemaugh at the base of the South Fork Dam, near a boat put in where the carriage road met the base of the south abutment. The carriage road is visible in the background of the photograph. Also note the grassy banks at the lake edge. (Louis Semple Clarke Collection, Johnstown Area Heritage Association).



smelling woods. The Rorabaugh farm lies open to the sun and the breeze and is susceptible of any degree of artificial beautifying. Here would be the place for the great hotel. Col. Ruff, of Pittsburgh, who is a member of the association, also owns individually a fine stretch of dry woodland facing the lake.⁸⁸

Perhaps to partially address this perceived incapacity, the club expanded the clubhouse with a large three-story frame addition to the northwest in 1886, designed by architect “J. Miller Knox,” and constructed a year later a two-story double cottage northwest of the clubhouse. The frame double cottage provided apartments for four families and included covered porches overlooking the lake. There may have been an outhouse and icehouse between or behind these buildings.⁸⁹ The calm water of Lake Conemaugh lapped about fifty feet from the base of the cottages. In February 1888, the last known measurement of the size of the lake was made. The length was 1.93 miles. The width of lake, opposite the lower end of the boathouse, was about one-third of a mile.⁹⁰

Figure 1.32. From left to right, the cottages in this photograph were constructed by: Maxwell K. Moorhead (1831–1897), P. Knox (1853–1921), Jesse H. Lippincott (1842–1894), James W. Brown (1844–1909), and Lewis Irwin (1846–1918), c. 1888. (Louis Semple Clarke Collection, Johnstown Area Heritage Association)



Figure 1.33. In the background, from left to right, are the cottages built by Maxwell K. Moorhead (1831–1897), P. Knox (1853–1921), Jesse H. Lippincott (1842–1894), and Lewis Irwin (1846–1918). The vacant space between the Lippincott cottage and the Irwin cottage was filled with a cottage owned by James W. Brown (1844–1909) in 1888. That cottage is still standing, and it is known as the Brown Cottage. The cottages built by Knox and Lippincott are both still standing as well, c. 1888. (Louis Semple Clarke Collection, Johnstown Area Heritage Association)



Figure 1.34. This cottage was constructed by Jesse H. Lippincott (1842–1894) in 1885. Note the rough grasses, simple steps down the embankment, native trees, and lack of foundation plantings, c. 1888. (Louis Semple Clarke Collection, Johnstown Area Heritage Association)



Figure 1.35. A group poses in the center of the photograph near the cottage of P. Knox (1853–1921), which was built in 1885. To the left, the corner of Maxwell K. Moorhead's (1831–1897) cottage is visible. To the right, the cottage built by Jesse H. Lippincott (1842–1894) is visible. (Louis Semple Clarke Collection, Johnstown Area Heritage Association)



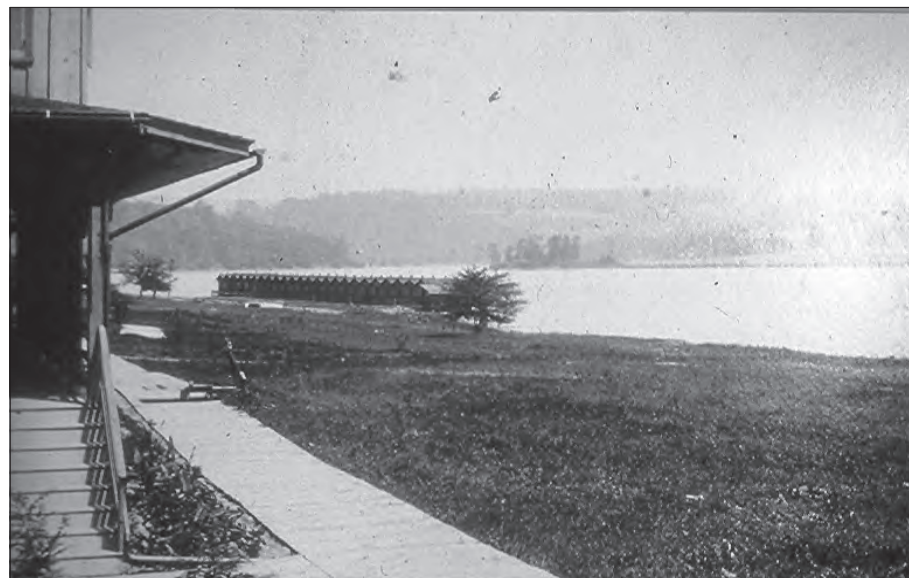
Figure 1.36. This photograph shows the 1887 addition of the club house. The photo, circa 1907–1920, was taken when the clubhouse functioned as the Sechler Hotel. (Photograph from the Costlow Collection, Johnstown Area Heritage Association)



Figure 1.37. The cottage on the left was built by Lewis Irwin (1846–1918) and is no longer extant. The cottage to the right was built by Charles John Clarke (1833–1899) and it remains today. The steamboat in the foreground of the photograph belonged to the club. (Louis Semple Clarke Collection, Johnstown Area Heritage Association)



Figure 1.38. In this view northwest from in front of the Clarke cottage, the approximately twenty gable roofed boathouses, are visible on the lake shore in front of the Club House, as is the boardwalk. (Louis Semple Clarke Collection, Johnstown Area Heritage Association)



According to Adams Township tax records, by 1889, sixteen wooden cottages were located northwest and southeast of the clubhouse and double cottage. The cottages were constructed in the Queen Anne-style characteristic of the time (Figures 1.32 – 1.35). They were typically three-stories high with tall ceilings, long windows, and covered porches framing views of the lake. The houses did not have kitchens because club members typically dined together in the clubhouse. Most presumably included privies; archeological investigations reveal at least two cottages had privies in the back yards. It is also likely that barns and stables were present behind these buildings for the horses and carriages

that transported club members from the South Fork train station to the club grounds.⁹¹ By 1888, the clubhouse featured forty-seven furnished bedrooms, a dining room with seating for one hundred and fifty, an office, billiard room, parlor, kitchen, bakery, and a long covered front porch overlooking the lake (Figure 1.36).

The resort of the South Fork Fishing and Hunting Club included boathouses, docks, and stables, as well as two large steam yachts, four sailing boats, and about fifty canoes and rowboats (Figures 1.37 and 1.38). Occasionally the club hosted special sporting events, such as a two-day shooting match and gala in June 1885. They also held *tableau vivant* performances, where participants posed silently on a stage for short periods of time in scenes from literature, art, history, or everyday life on a stage. For the members of the club, the stage was the natural landscape surrounding the cottages (Figure 1.39). The *tableau vivant* performances and daily activities of the club member's children were captured on film by Louis Semple Clarke. Clarke's family owned a cottage on the lake. His photographs included his family and friends engaged in leisure activities that were, for the most part, more informal than at the wealthy resorts at Newport, Tuxedo Park, and Saratoga Springs (Figure 1.40). Decades later, long after the club was gone, a local historian described the social scene on the shores of Lake Conemaugh,

There was no display at South Fork. The young men wore flannel shirts and crush hats, and the girl's plain costumes that would not be injured in scrambling over rugged rocks or fishing in turbulent streams. There were a few modest cottages along the borders of the lake and a clubhouse. It was a comfortable home-like place and was as different from the ordinary fashionable summer



Figure 1.39. Here, club members pose again in another *tableau vivant*, nearer the lake shore with thick meadow grass underfoot. A rustic log fence is visible in the background. (Louis Semple Clarke Collection, Johnstown Area Heritage Association).

Figure 1.40. Here, Clarke captures the far side of the lake, likely just south of Lake View Farm, as well as club members enjoying a sail and a row on Lake Conemaugh. (Louis Semple Clarke Collection, Johnstown Area Heritage Association)



Figure 1.41. This photograph captures cottages of the South Fork Fishing and Hunting Club, including the Irwin Cottage in the foreground, connected to the others by the wooden boardwalk. (Louis Semple Clarke Collection, Johnstown Area Heritage Association)



resort as could well be conceived. The beautiful sheet of water bore upon its bosom in the soft evening's gay parties of young folks, some of whom would strum the mandolin or guitar... The club was a happy family party, and nothing more. There was an atmosphere of repose over South Fork Lake that it seemed nothing could disturb...⁹²

The rustic grounds of the cottages and clubhouse mirrored the relatively unpretentious activities of the members. A wooden boardwalk ran along the shoreline, parallel to the lake-side façades of the cottages (Figure 1.41). A single long plank lay in the meadow grasses between the boardwalk and the shore connecting the homes to the water (Figure 1.42). Steps and bridges were built along the boardwalk to overcome the hilly topography and streams, while rock walls and embankments armored some of the steeper slopes. The rusticated railings along the walkways and bridges had twisted bark-covered

Figure 1.42. Simple wooden planks connect the boardwalk with the docks at the edge of the lake near the Clarke cottage. Note the stone rip rap and boards along the stream bank to help prevent erosion. (Louis Semple Clarke Collection, Johnstown Area Heritage Association)



Figure 1.43. Rusticated bridges over the streams near the Clarke cottage. (Louis Semple Clarke Collection, Johnstown Area Heritage Association)



Figure 1.44. A boat planted with flowers and a Victorian-style flower bed of bedded out annuals is visible next to the board walk below. (Louis Semple Clarke Collection, Johnstown Area Heritage Association).



Figure 1.45. Here, Agnes Clarke (left), sister of Louis Semple Clarke (1866-1957), relaxes in the natural wooded landscape between the cottages. The picturesque log pergola or gazebo fits within the wild wooded landscape which contrasts with the pastoral farm fields nearby. (Louis Semple Clarke Collection, Johnstown Area Heritage Association).



Figure 1.46. Agnes Clark (left most figure), her brother Louis Semple Clark (in sailor suit), and friends sit on the rocky ledge of the spillway outfall. Note the fence along the edge of the cliff above them (Louis Semple Clarke Collection, Johnstown Area Heritage Association).



Figure 1.47. The women drink from a dipper near what may be a spring house on the cottage grounds. (Louis Semple Clarke Collection, Johnstown Area Heritage Association)



branches formed into patterns of horizontals and diagonals (Figure 1.43). A few ornamental garden beds, designed in the Victorian bedding out style, grew along the boardwalk (Figure 1.44). But most of the landscape around the cottages was native vegetation, the thick woods cleared of some undergrowth but left wild to encourage interaction with the natural environment (Figures 1.45 – 1.47). The houses set at the edge of the woods while grass and wildflower meadows grew in front of the homes to the lakeshore. There were likely two main reasons for the rustic, naturalistic appearance of the landscape. The first was that the resort was new, less than ten years old, with construction occurring throughout its short history and leaving little time for bedding out annuals and turf lawns. Secondly, the contrast between the rusticated wild aesthetic of the resort landscape and agrarian utilitarian countryside would have appealed to many club members.⁹³ A local writer for the *Johnstown Tribune* revealed her distain of the wild aesthetic when she wrote, “the cottages are built in a damp, bad smelling woods. The Rorabaugh farm lies open to the sun and the breeze and is susceptible of any degree of artificial beautifying,” (Figure 1.48).⁹⁴ By 1889 there were sixty-eight families in the club’s membership, including those of some of the most prominent financiers of the time, Andrew Carnegie, Andrew Mellon, and Henry Clay Frick. If they wanted to “artificially beautify” their homes, they likely would have done so.

In December 1888, the stockholders in the club corporation agreed to issue a bond to raise funds against the value of the property owned by the club. They passed an act providing that “indebtedness and a mortgage should be executed upon all and singular property real, personal and mixed, of said corporation.”⁹⁵ Though many holders of the bonds were club members, the club also sold the investment bonds to individuals and organizations not previously associated with the club. For instance, the Women’s Industrial Exchange purchased two bonds, numbers 13 and 14, at the advice of club member, Mrs. H. Sellers McKee, who gave the Women’s Industrial Exchange the one thousand dollars to invest.⁹⁶ The

Figure 1.48. The cottages are just barely visible in the distance against the woods, contrasting with the rolling meadows of what may be the Rorabaugh farm. (Louis Semple Clarke Collection, Johnstown Area Heritage Association)



Figure 1.49. In this photograph, looking northeast from the far northwest corner of the lake near the dam, the breast of the dam is visible. The proposed sewerline would extended from the cottages, along the southwestern shore of the lake to this location, and then over the breast of the dam. As a number of photographs show boats docked in this location, this was likely the location of a boat launch. (Louis Semple Clarke Collection, Johnstown Area Heritage Association)



Figure 1.50. Bond Certificate to support infrastructure improvements to the South Fork Fishing and Hunting Club grounds. (Cambria County Historical Society)



Women's Industrial Exchange was a nonprofit charity founded nationally in 1880 with the mission of helping needy women help themselves.⁹⁷ Following the construction of additional cottages and the clubhouse's expansion, in October 1888, the club's directors voted to install a sewer line. Every bondholder, including the Women's Industrial Exchange, had a legal stake in the club, though not a shareholder or member's voting rights. Though the bonds would be rendered worthless shortly after their issuance, they would prove problematic as the club attempted to divest their real estate in the years following the Johnstown Flood.

The following April, the club began installing a cast iron sewer line from the club buildings to the dam, running along the southwestern shore of the lake. A branch

Figure 1.51. This farmhouse, which was likely owned by Joseph Lecky (Leahey), was located on the downstream side of side on the northeast corner of the dam, down the hill from Lake View Farm. The area of the dam repaired by the South Fork Fishing and Hunting Club is characterized by rip wrapped stones. (Johnstown Flood National Memorial Archives)



line would connect each cottage to the sewer main before draining over the crest of the dam (Figure 1.49).

About this time, John Grubb Parke Jr, a recent engineering graduate of the University of Pennsylvania, revised the sewer construction cost from five thousand to twelve thousand dollars. On May 1, the South Fork Fishing and Hunting Club signed an indenture with club members Henry Holdship and Benjamin Thaw to issue a bond for \$36,000 to provide additional funds to improve the property. Lewis Irwin, an owner of one of the cottages, signed as club treasurer. The club floated seventy-five twenty-year bond shares at five hundred dollars each (Figure 1.50). Investors were guaranteed six percent interest per annum paid each November and May until the bond was due, for a total of about \$1,603.

LAKE VIEW FARM

Local farmer, Joseph Lecky (also spelled Leahey), owned a large farm on Lake Conemaugh's northwest side, which he claimed included eight acres submerged when the South Fork Fishing and Hunting Club restored the South Fork Dam. While Lecky believed this loss entitled him to fish in the lake, club members considered his fishing an intrusion and so decided to protect their interests by acquiring his property. When Lecky refused to sell to the club members at a fair price, club member Colonel Elias J. Unger purchased the property in his own name through a local intermediary. On September 22, 1882, Unger bought two adjoining tracts of land totaling one hundred and three acres from Lecky for \$4,000. He later sold just over four of those acres along the lake's edge and across the north end of the dam to the club and retained the rest of the farm for himself.⁹⁸ The four acres were part of the property the club had disputed with Lecky. The deed included an agreement that the club would, at its own expense, erect and maintain a "good fence" between its land and the Unger property, as well as a road



Figure 1.52. Lake View Farm on the hillside overlooking the former lake. The young vegetative growth in the former lakebed reveals that the photograph was taken shortly after the failure of the dam. (Louis Semple Clarke Collection, Johnstown Area Heritage Association)

that ran through the conveyed tract, guaranteeing future owners of the farm the right of way (Figure 1.51).⁹⁹

Unger began his career as a brakeman, a transport worker who applied the brake on an individual railcar to assist with stopping the train, for the Pennsylvania Railroad. He worked his way up to train conductor before switching to hotel management positions. He had extensive facility management experience, including positions as the Seventh Avenue Hotel's proprietor, one of Pittsburgh's leading hotels, and at the Mountain House Hotel at Cresson Springs. Many of the members of the South Fork Fishing and Hunting Club had been guests at Cresson Springs. Unger was then hired to manage the South Fork Fishing and Hunting Club.

Between 1882 and 1888, the Ungers built the Lake View House on a broad sloping meadow on the former Leckey property.¹⁰⁰ Unger also constructed several agricultural outbuildings around the house, including the spring house that stood on the extant stone foundation of the Lake View spring house and a barn on the current site of the National Park Service Visitor Center. In 1887 he assumed leadership of the club after Benjamin Ruff died unexpectedly.

Unger and his wife occupied the property year-round and purchased more than one hundred additional acres on the lake's north shore. The Unger's home on the hillside, approximately two hundred yards beyond the dam, was designed in a Gothic Revival-style.¹⁰¹ The southwest elevation of the house featured a covered two-story porch overlooking the lake. The complex also included a two and a half-story barn and one and a half-story carriage shed, a two-story spring house, privy, and other outbuildings, all of which were sited uphill from the house (Figure 1.52). A sloping meadow between the buildings and the lake allowed a clear view of the

dam and a distant view of the clubhouse and cottages across the lake. The Lake View Farm was likely accessed from the carriage road that began at the timber trestle bridge over the spillway's upper end.¹⁰² Unger hired tenant farmers and laborers to work his farm, as he worked full-time overseeing the care of the club properties and the South Fork Dam.¹⁰³ According to tax assessments, residents on Unger's property were George King on the Myers [Moyers] tract, George C. Fisher on the two-acre Burtnett tract, and J. Vonstein [Vaunstein J.] on the Leahey [Leckey] tract.¹⁰⁴

Throughout the 1880s, periodic heavy rains raised concern among those living downstream. Opinions on the stability of the structure varied even among those who lived near it. John Rorabaugh, whose family owned a farm near the club was quoted in the local newspaper stating that the dam was "in an unsafe condition."¹⁰⁵ In contrast George Grambling, another local resident, implied there was no cause for alarm because the dam would likely fail in pieces gradually, preventing major flooding. "A break would not affect Johnstown to any considerable degree" he was quoted in the "Johnstown Tribune" unless it "occurred in conjunction with a great flood in the Conemaugh Valley, which is one of the possibilities not worth worrying about."¹⁰⁶

LANDSCAPE SUMMARY, 1888

By 1888, Lake Conemaugh stretched a mile across and two miles long, one of the largest humanmade lakes in the nation.¹⁰⁷ Gentle waves lapped against the shore just fifty feet from the sixteen large wood-framed cottages that stood in a line along its southern shore. A rustic boardwalk of thick unfinished planks laid side-by-side linked the homes to each other. Steps and bridges with picturesque rustic log railings traversed steep terrain. Rock walls and boulders held back embankments. A single long plank was laid through the grassy banks between the boardwalk and the lake to provide access to the water. There were only a few formal garden beds. Instead, the cottages backed up to the woods and meadows of native vegetations, including short grasses, weeds and wildflowers grew from the foundations of the cottages to the water's edge.

Most of the typically three-story high cottages were constructed in the Queen Anne-style with irregular massing, tall ceilings, long windows, and covered porches framing views of the lake. The lots included outbuildings, such as privies and stables.¹⁰⁸ The centrally located clubhouse featured forty-seven furnished bedrooms, a dining room with seating for one hundred and fifty, an office, billiard room, parlor, kitchen, bakery, and a long covered front porch overlooking the lake. At the time of the flood, the cottage area of the South Fork Fishing and Hunting Club included boathouses, docks, as well as two large steam yachts, four sailing boats, and about fifty canoes and rowboats.

The Unger family's Lake View Farm was located about a mile north of cottages, across Lake Conemaugh. The Unger farm occupied the hillside approximately two hundred yards from the dam. The dwelling was designed in a Gothic Revival-style and featured a covered two-story porch overlooking the lake on its southwest elevation. A large two-and-a-half-story timber frame barn was sited uphill from the house, as well as a one-a-half story carriage shed, a two-story spring house, a privy, and additional unidentified outbuildings. A gently sloping meadow between the buildings and the lake allowed clear views of the lake, dam, and in the distance, the clubhouse and cottages on the far side of the lake. A fence was erected on the hillside above the spillway, marking the property line between the club lands and the Unger property, while another fence encircled the house.¹⁰⁹ A fence also encircled a two-story gabled farmhouse and barn cluster near the downstream side of the north abutment. This may have been the Leckey (Leahey) Farm (no longer extant). Most of the land on the hillsides north of the dam was cleared for farming, though the swales of the unnamed tributaries flowing into Lake Conemaugh remained forested. The farm was likely accessed from the carriage road that began at the timber trestle bridge over the upper end of the spillway and passed around the western edge of the field south of the house before turning east toward the cluster of farm buildings.

The approximately twenty-foot-wide dirt and gravel carriage road extended to the southwest from the spillway along the crest of the dam. Stones edged the north side of the road. Grasses and young trees grew at the dam's lakeside edge, while larger trees grew on the downstream side of the abutments, though not in the central area rebuilt by the club. A put-in or boat launch belonging to the South Fork Fishing and Hunting Club was located at the dam's southern end. Telephone poles too extended along the edge of the carriage drive across the dam, likely carrying the line to the club house. The carriage drive south of the dam led up the wooded hillside parallel to the lake's edge, then south through the rolling pastoral fields to the clubhouse and cottages.

1889 – 1939: THE JOHNSTOWN FLOOD AND POST FLOOD DEVELOPMENT

Set between two rivers and surrounded by steep hillsides threaded with seams of coal, Johnstown owed much of its growth in the nineteenth century to its location (Figure 1.53). The city prospered following the completion of the Main Line works in the 1830s and the arrival of the Pennsylvania Railroad Company and the Cambria Iron Company in the 1850s. By 1889 Johnstown was a flourishing city of 30,000 people, most of whom labored in the Cambria iron mines and mills. The town was built on the floodplain at the confluence of the Little Conemaugh River and Stony Creek. Its hillsides were clear cut and its river channels narrowed by

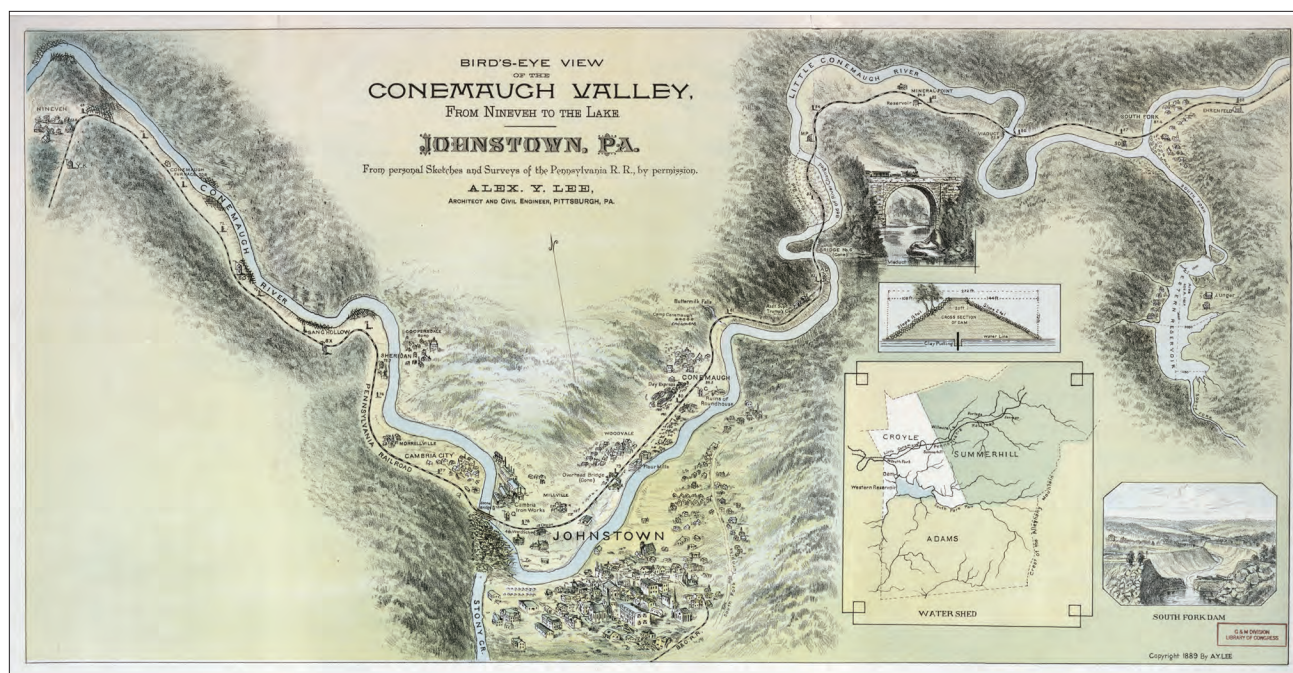


Figure 1.53. Map of Conemaugh Valley, 1889, shows the relationship between the South Fork Dam and the city of Johnstown. (Library of Congress)

development as the city spread. Each spring rivers flooded, but never enough to cause extensive damage. Every rainy season there were some who worried that the South Fork Dam might break, but for ten years the dam held, and steel production thrived in the company town.¹¹⁰

THE FLOOD

In late May 1889, just as Memorial Day festivities were wrapping up in Johnstown, rain began to fall. A large slow-moving storm was spreading over the entire mid-Atlantic and beyond, drenching ground already saturated from a wet spring. That morning club president Elias Unger, the caretaker at the club grounds, W.Y. Boyer, and John G. Parke, the resident engineer installing the new sewer system, met at the dam. The lake had risen two feet overnight and was still rising. Parke rode quickly to the other end of the lake to investigate and found the upper quarter of Lake Conemaugh covered by debris. The meandering stream Muddy Run was a torrent and South Fork Creek was roiling and stripping the lower branches from trees. By the time Parke returned to the clubhouse, the level of the lake had almost reached the crest of the dam.¹¹¹

Meanwhile at the dam, with water levels rising nearly a foot an hour, the severity of the situation became clearer. At Unger's direction workmen there for the sewer excavation began digging a trench across the south end of the dam. Unger hoped that if they could dig deep enough the trench would redirect water from the overflowing spillway at the north and relieve pressure on the dam. Using picks and shovels the workmen scratched out a trench only two feet wide by fourteen inches deep. Impounded water rushing into the narrow trench, however, quickly scooped out a trough twenty-five feet wide by twenty inches deep. Unger then

directed the men to plow a dike along the crest of the dam to create a temporary barrier in hopes of preventing the rising water from overtopping the dam.¹¹²

The water in the spillway at the north end of the dam was now seven feet deep and could hold no more water. At first, water had rushed through the timber trestle bridge over the spillway, unclogged by debris. But in time, trees and branches caught in the fish screens and v-shaped log boom that projected out into the lake. Unger ordered the workmen to remove the flooring of the timber trestle bridge, the fish screens and log boom, and to free the trees and branches clogging the entrance to the spillway.¹¹³ Parke left the club house and rode to South Fork to telegraph Johnstown with a warning that the dam might collapse. Despite the efforts of Unger and the workmen, by late morning, water began to flow over the dam. It began in the center where it had been repaired by the South Fork Fishing and Hunting Club and quickly the narrow rills stretched to a swath

Figure 1.54. The view looking south towards the breach in the dam and the empty lakebed of Lake Conemaugh, circa 1889. (Johnstown Area Heritage Association)



Figure 1.55. The South Fork Dam Sluice Gate, following the flood, looking south through the breach in the dam, circa July 1889. ((Johnstown Flood National Memorial).





Figure 1.56. The city of Johnstown prior to the Johnstown Flood, circa 1880s. (Johnstown Area Heritage Association)

three hundred feet wide. The water flowing over the crest cut a channel into the dam. When Parke returned to the dam from South Fork, he realized that they should cut a spillway directly through the dam “proper at one end” to slow the release of water and allow it to “cut away...towards the center of the dam.” Yet though his measurements revealed the lake level was almost seven and a half feet above normal and still rising, he did not order the spillway cut. For if the dam was breeched purposefully by the spillway, he knew it would mean “the positive destruction of the dam.”¹¹⁴

Figure 1.57. The city of Johnstown after the Johnstown Flood, 1889. (Johnstown Area Heritage Association)

At 3:15 the dam failed completely. According to Parke, “The dam did not break. It simply moved away.” Another observer said, “The whole dam seemed to push out all at once. No, not a break, just one big push.” Those on hand estimated the lake was reduced to a stream in about 45 minutes (Figures 1.54 and 1.55).¹¹⁵ As the dam pushed away the pressure was released and a wall of water thirty to forty feet high



Figure 1.58. *The Great Conemaugh Valley Disaster, Flood and Fire at Johnstown, Pennsylvania, 1890*, was among the many dramatic illustrations of the tragedy at Johnstown that captured public attention, lithograph. (Kurz and Allison Collection of the Detroit Institute of Art)



rushed as fast as forty miles per hour down the narrow mountain valley. It picked up speed and debris as it swept through the towns of South Fork, Mineral Point, East Conemaugh, Woodvale, and Conemaugh Borough toward Johnstown. The wave struck the people of Johnstown about 4 pm. The destruction in the city took about ten minutes (Figures 1.56 and 1.57).¹¹⁶

At the time, more than 39,000 people lived in the narrow valley of the Little Conemaugh River. The flood killed at least 2,209 of them, injured hundreds, and left thousands homeless. The volume of water pouring out of Lake Conemaugh and into the already-flooded valley was later computed by engineering authorities. According to their calculations, an estimated five billion gallons of water made a rush of water five hundred feet wide, twenty feet deep, and five miles long. The vast body of water plunging through the valley of the Little Conemaugh River dropped about four hundred feet over the twelve miles to Johnstown, pushing with a force enough to roll locomotives about a mile.¹¹⁷

In Johnstown, survivors faced immediate and critical need; there was no medicine, water, food, or dry clothes. Nearly all stores in town were leveled, and there was no gas or electricity. Fires burned out of control (Figure 1.58). Telephone and telegraph lines were destroyed. The railroad and roads were impassable, and bridges simply washed away. Corpses of the human beings and animals who drowned in the water threatened to spread disease. Survivors on high ground formed rescue parties and work committees to begin the recovery effort.¹¹⁸

Robert Pitcairn was a few miles downstream from Johnstown on a train held at Sang Hollow when flood debris and survivors began floating downstream. Pitcairn quickly sent a telegraph to the Pittsburgh Commercial Gazette saying



Figure 1.59 The Republican Monopoly Pleasure Club & Its Dangerous Dam, from the satirical magazine, *Puck*, June 19, 1889.

that the city had been destroyed and help was needed. In the days that followed hundreds of reporters and photographers arrived to document the disaster. The reporting on the story captured the attention of the country, eliciting readers' pity and empathy with evocative descriptions of the tragic loss of life and property. In addition, the dam's destruction was used by social commentators as an allegory for the control the monopolies of wealthy industrialists placed on American industry (Figure 1.59). Stories of the Johnstown Flood were published around the nation and the world and resulted in an enormous outpouring of money, food, clothing, supplies, and services for the families who lost loved ones and homes.¹¹⁹

The charity was certainly needed; not only were there more than 28,000 survivors, there were at least six thousand relief workers to be fed. Relief organization including the Pittsburgh Relief Corps, state militia, and the recently organized American Red Cross led massive efforts to find and dispose of bodies, clear the wreckage, restore water and utilities, and distribute provisions and funds. The Red Cross, led by founder Clara Barton, stayed in Johnstown for five months, distributing supplies and directing volunteers (Figure 1.60). They also oversaw the construction of temporary housing called "Red Cross Hotels," as well as a warehouse and



Figure 1.60. Photograph of Clara Barton, founder of the American Red Cross, Newark, N.J., circa 1879 - 1881. (Library of Congress)

Figure 1.61. View south into the empty lakebed from the breached dam, standing near the farmhouse in figure 1.51, and showing some of the vast gravel bar resulting from the dam's destruction. (Johnstown Flood National Memorial)



Figure 1.62. View southeast toward the South Fork Fishing and Hunting Club Cottages following the dam failure, 1889. (Johnstown Flood National Memorial)



infirmary. By mid-summer 1889, some of the club's cottages on the shore of the empty Lake Conemaugh were also used to house flood survivors.¹²⁰

Back at South Fork Dam, the gap in the center of the dam measured around four hundred and twenty feet wide at the top and between fifty and two-hundred feet wide at bottom, extending "clear down to bedrock in the old bed of the stream expanse that had pleased the eye. . . days before."¹²¹ A vast gravel bar lay below the dam, measuring fifteen hundred feet long, five to twelve feet high, and one hundred and sixty feet wide (Figures 1.61 and 1.62). Only days after the tragedy, a New York Times reporter described the scene,

At the present time the lake looks like a cross between the crater of a volcano and a huge mud puddle, with stumps of trees and rocks scattered over it.¹²²

Blame for the disaster was quickly placed on members of the South Fork Fishing and Hunting Club. Valley residents, public officials, and reporters widely censured

Figure 1.63. The view looking northwest through the dam breach from the hillside south of Lake View Farm. (Johnstown Flood National Memorial).



Figure 1.64. The South Fork Dam, edge of the South Abutment (West edge of the dam break), July 28, 1889. (Johnstown Flood National Memorial)



the club, including George Swank of the Johnstown Daily Tribune who wrote, “We think we know what struck us, and it was not the hand of Providence. Our misery is the work of man...”¹²³

In the immediate aftermath of the tragedy, investigations by editors and engineers of a leading professional engineering journal, *Engineering News and American Railway Journal*, identified four primary causes for the failure of the reconstructed dam. These were the (1) lowering of the crest; (2) central sag in the crest; (3) closing of the bottom culvert; and (4) obstruction of the spillway.¹²⁴ Just days after the dam failure, their preliminary findings were quoted in the New York Times which brought the question of fault in the disaster to the national stage. Yet on June 5th, 1889, a committee led by James B. Francis was appointed by the American Society of Civil Engineers to visit the South Fork Dam and investigate the cause of its failure (Figures 1.63 – 1.70). In their findings, published in 1890, they argued

Figure 1.65. The South Fork Dam, edge of the South Abutment, looking southwest toward carriage drive, No Date. (Johnstown Flood National Memorial)



Figure 1.66. The view looking south towards the breach in the dam and the empty lakebed of Lake Conemaugh, from the hillside north of the dam. The carriage road climbing the hill side is clearly visible in the upper right hand corner. (Johnstown Flood National Memorial)



that the changes made to the dam by the South Fork Fishing and Hunting Club, did not cause the disaster.¹²⁵

In the controversy that followed the disaster, several club members offered to help with the recovery effort and donated money to support relief, but most tried to dissociate themselves from the club and avoided reporters. Although the South Fork Fishing and Hunting Club never accepted legal responsibility for the disaster and none of the many civil suits brought against its members were successful, the event ultimately contributed to a major shift in American tort law toward holding property owners liable for damages incurred as a result of their negligence.¹²⁶

Prior to the flood, most state courts ascribed to the precedent of the fault doctrine, which required proof of negligence when determining liability. This approach to case law favored industry by placing the burden of proof of fault on those suffering personal injury or loss of property. As fault was difficult to prove

Figure 1.67. This photograph, circa 1889, was taken shortly after the failure of the South Fork Dam, Lake View Farm is visible in the distance, as is the smaller farmhouse by the north abutment on the left. The approximate cone of view of the photograph is illustrated in the accompanying map. (Johnstown Flood National Memorial)



in the case of the failure of the South Fork Dam, victims of the Johnstown Flood received no compensation for damages through the courts. Beginning in 1890, many states shifted from the fault doctrine to a definition of strict liability in which industry could be responsible for damage and loss of life resulting from its use of land and resources, without proof of negligence. Though many factors influenced states to adopt this approach, the Johnstown Flood and other dam failures helped to sway judiciaries, particularly elected ones, toward a broader interpretation of liability.¹²⁷



Following the Johnstown Flood tragedy, representatives of the South Fork Fishing and Hunting Club members focused on settling their financial liability from the bond sale and divesting real estate assets.

DEVELOPMENT AT THE FORMER LAKE CONEMAUGH

The use of the club for leisure ended after the flood. A few members occasionally returned for brief stays, but the resort never again functioned as it had during the 1880s (Figure 1.71). In July 1891, the South Fork Branch Railroad, a subsidiary of the main line of the Pennsylvania Railroad, purchased a 14.46-acre right of way through the empty lakebed. A single track was laid parallel to the South Fork Little Conemaugh River, through the breach in the dam, as part of an eight-mile rail line stretching from the main line in South Fork southwest to the town of Windber (Figures 1.72 and 1.73). The new rail line facilitated mining and transportation of the region's bituminous coal by the Windber based, Berwind-White Coal Mining Company.¹²⁸

Figure 1.68. The South Fork Dam Sluice, circa July 1889. (Johnstown Flood National Memorial)



Figure 1.69. The South Fork Dam, edge of the North Abutment, (East edge of the dam break) July 28, 1889. (Johnstown Flood National Memorial)



Figure 1.70. View looking east of the empty lakebed with Lake View Farm in the distance on the hillside, circa 1889. (Johnstown Flood National Memorial)





Figure 1.71. *Adams Township Map, from Cambria County Atlas, 1890, showing the cottage locations along the former Lake Conemaugh, after the flood, (Library of Congress).*

As mining was expanding in the region and the railroad was acquiring property, members of the South Fork Fishing and Hunting Club worked to divest the club of its assets and settle obligations to bondholders. In May 1891, a legal dispute was filed between Henry Holdship and Benjamin Thaw, as Trustees for the Bond Holders of the South Fork Fishing and Hunting Club, and the South Fork Fishing and Hunting Club Corporation with Elias Unger, president, and Lewis Irwin, Treasurer. Judgment was made against the defendants. The amount liquidated was thirty-six thousand dollars, the original amount of the mortgage on the South Fork Fishing and Hunting Club property held by Holdship and Thaw.¹²⁹ As a result, a portion of the club grounds were advertised at a sheriff's sale in June 1891. On September 9, 1891, the sale closed, and Edward Brown (E.B.) Alsop purchased about six hundred and twenty-four acres of the South Fork Fishing and Hunting Club Corporation land for six hundred dollars.¹³⁰ The acreage included most of the land owned by the South Fork Fishing and Hunting Club except for land laid out as lots for cottages by the club in the 1880s and the land between the cottages and the former lake¹³¹ Alsop did not purchase the land solely for his own investment. He was officially appointed Trustee by the bondholders who tasked him with holding the recently purchased land in trust.¹³²

Following the Johnstown Flood, the South Fork Fishing and Hunting Club Corporation was reorganized as the Conemaugh Lake Company. A young attorney from Ebensburg, John William Kephart, was hired as accountant (Figure 1.74). As counsel to the Conemaugh Lake Company, Kephart identified the bond owners to settle the company's bond obligations – many of whom were club members. He also examined twenty-seven titles for the property owned by the club and held in



Figure 1.72. Map of Coal Lands Somerset and Cambria County, PA, January 1905, Trout and South Fork Branches shows the route of the South Fork Branch rail road through the former lake bed and well as the complicated nature of coal land ownership. (Cambria County Historical Society)



Figure 1.73. Detail from the Map of Coal Lands Somerset and Cambria County, PA, January 1905, Trout and South Fork Branches 1905, detailing the roads and rail road routes east of the lakebed. (Cambria County Historical Society)

trust by Alsop to identify any encumbrances to the property titles prior to its sale (Figure 1.75).

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Edward Alsop was born in 1835 in Philadelphia and married Emma Hussey, sister of club member C.C. Hussey, after relocating to Pittsburgh in his youth. C.C. Hussey co-owned a shovel manufacturing company with Edward Binns, and later Alsop became a Vice President of Hussey-Binns Shovel Company. Though many members of the Hussey family visited the South Fork Fishing and Hunting Club, membership was held only by C. C. Hussey.¹³⁴

While Alsop was never a member he was involved in the club through his marriage to Emma Hussey, and between 1901 and 1903, he helped negotiate the sale of the former club lands to George Hershberger.



Figure 1.74. John William Kephart, the attorney and accountant of the Conemaugh Lake Company, Obituary, no date. (Cambria County Historical Society)

Prior to Hershberger's purchase, Dr. S.S. Kring of Allegheny explored the feasibility of converting the club property into a public sanitarium, but found the cost of repairing the dilapidated buildings too high.¹³⁵ In March 1901, Dr. Kring



Figure 1.75. Sketch by Kephart of the land tracks purchased by the South Fork Fishing and Hunting Club as part of the title search, circa 1903. (Cambria County Historical Society)

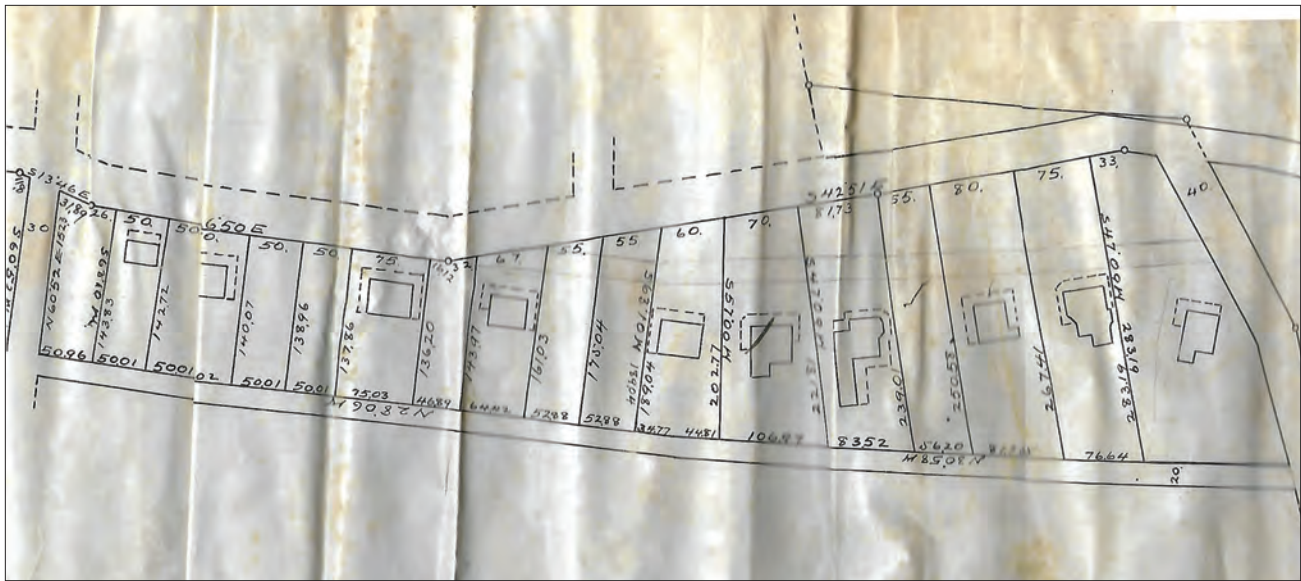


Figure 1.76. Wertz Map 1902, showing the building footprints of the cottages. (Cambria County Historical Society)

sent a letter encouraging local landowner, George Hershberger, to approach Alsop with an offer to purchase the property. In the letter Kring confided that he had assured Alsop that the “coal was 1000 feet deep” and “of no value” and therefore he was sure Alsop would respond well to Hershberger’s reasonable offer.¹³⁶ A few days later, Hershberger signed an option contract with Alsop for one hundred dollars for the right to purchase the property and shortly thereafter signed a contract promising to purchase the land.¹³⁷ Approximately two years later, Hershberger finally purchased the former club land held by Alsop in trust for \$25,360.¹³⁸ A few days after the sale, Alsop wrote to the bond holders stating that settlement arising from the sale of the property would be divided amongst the bond holders.¹³⁹ After the sale was complete, Kephart helped to negotiate a payment of \$25,413 by the Conemaugh Lake Company to Trustee E.B. Alsop for “real estate.”¹⁴⁰ He also paid Alsop, on behalf of the Conemaugh Lake Company, two-hundred-and-fifty-dollars for the Hussey Cottage and paid C.I. Holdship one-hundred dollars for an unidentified cottage.¹⁴¹ In December 1903 furnishings associated with the club house, including numerous four piece bedroom suites, were sold to Hershberger for five hundred dollars.¹⁴² Hershberger, after amassing the club’s land as well as surrounding parcels, sold the mining rights to W. I. Steinman for fifty-six thousand dollars.¹⁴³

MARYLAND COAL COMPANY AND THE VILLAGE OF ST. MICHAEL

Bituminous coal mining and coke manufacturing for the steel industry dominated much of western Pennsylvania’s economy during the late nineteenth and early twentieth centuries. Hundreds of coal mines were scattered across the region. By 1901 the South Fork Coal Mining Company was active in the area. In 1907, George Hershberger, who had previously sold the mineral rights of the club land, sold two tracts, a six-hundred-and-twenty-four-acre tract and a forty-nine-acre tract to George M. Wertz.¹⁴⁴ Wertz had the land surveyed and subdivided (Figures

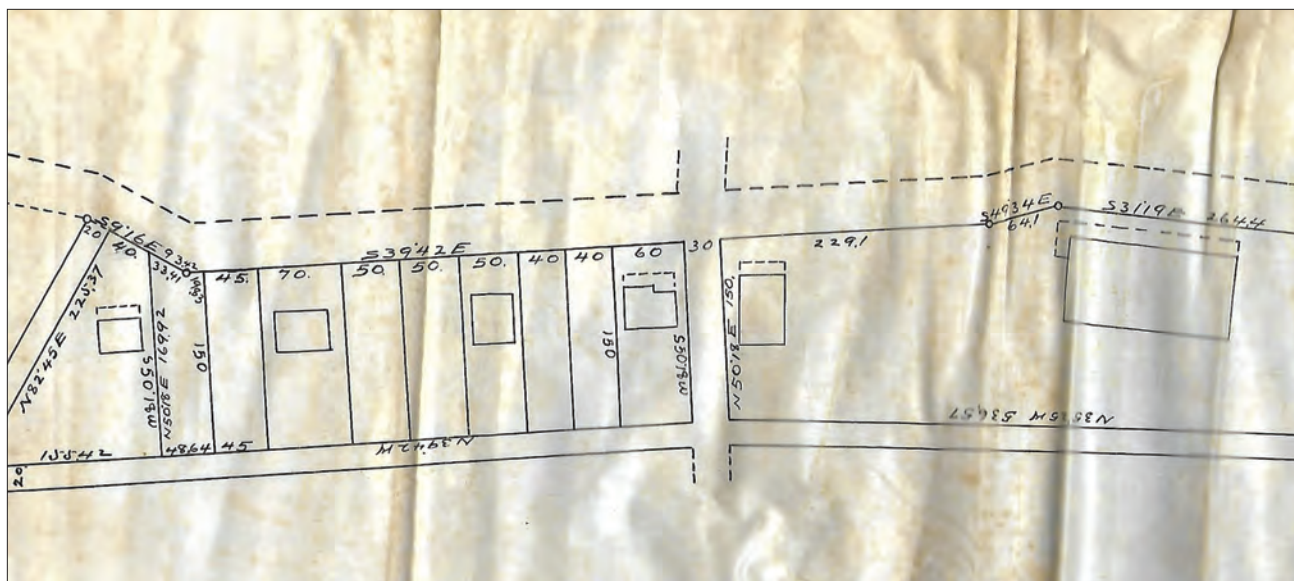
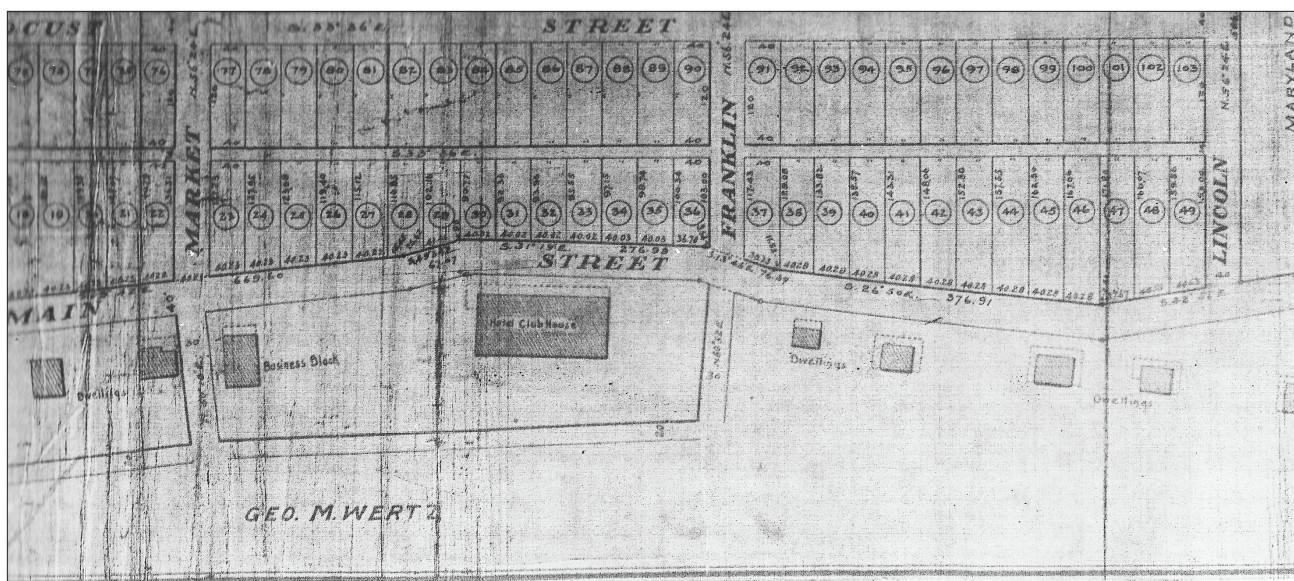


Figure 1.77. Wertz Map 1902, detail of the Clubhouse and double cottage. (Cambria County Historical Society)

1.76 and 1.77). The Maryland Coal Company, which formed in 1906 following the discovery of coal in the former lakebed, purchased a 40.9-acre tract from Wertz. By 1908, the company had constructed Mine Shaft No.1 near Topper Run, a stream in the ravine around 1,500 feet south of the clubhouse and cottages. Wertz also sold a 30.9-acre tract, including the land occupied by the clubhouse, to John L. Sechler.¹⁴⁵

Figure 1.78. Sechler Map, 1907 laying out the town of St. Michael, Pennsylvania. The South Fork Fishing and Hunting Club Cottages and Clubhouse were identified as locations of businesses and a school. (Cambria County Historical Society)

Sechler's plan was to develop a company town, St. Michael, for the workers employed in the local mines. John Sechler laid out a plan of 208 building lots in the former lakebed (Figure 1.78). The new lots were laid out in a rectangular-shaped grid just north of the former club cottages. Main Street, which connected to an existing dirt road along the lake's southwestern shoreline, ran along the front of the clubhouse and cottages, but made slight turns due to orientation of the buildings with the former shoreline. The double cottage lot northwest of the clubhouse was identified as "business block," and one of the cottages to the



northwest was intended as a school. A street (now Lake Avenue) running behind the clubhouse and cottages provided access to additional lots. This street may have been in the location of the club's carriage road that entered the club grounds from the dam.¹⁴⁶

The Maryland Coal Company purchased some of the former club cottages as housing for managers. Most of the houses were altered by their occupants, and a few were razed in the 1920s. Several cottages were eventually reconfigured as duplexes, including the Brown Cottage in 1921 and the Lippincott (Moorhead) Cottage in the 1930s. The company also built inexpensive duplexes in the 1920s to house miners and their families, mainly in compactly designed plat behind (west of) the row of cottages. The development was much less dense than initially proposed in the 1907 plan. Sechler also converted the former clubhouse into a hotel and tavern but lost the business in a sheriff's sale in 1920. From 1921 to approximately 1950, the hotel business was operated by the Cruikshank family, who removed the building's original two-story block sometime after 1939. By the late 1930s, the swath of trees behind the southernmost cottages was still growing, and the old carriage road trace was still visible, if not used (Figures 1.79 – 1.81).¹⁴⁷

To facilitate transportation of the coal, the Maryland Coal Company constructed a railroad spur from the South Fork Branch Railroad to the mine. The public road network was also modified to support the local coal industry. By 1904, roads encircled the former lakebed. On the southwestern shoreline, a new

Figure 1.79. 1939 Aerial photograph of Cambria County, Pennsylvania, annotations Olmsted Center for Landscape Preservation. (PennPilot Imagery)



Figure 1.80. Detail of a 1939 aerial photograph revealing the successional vegetation on the hillside south of the South Fork Dam, as well as the terracing of the former Lake View Farm. (PennPilot Aerials)



Figure 1.81. 1939 Aerial Imagery, detail of St. Michael revealing development around the former South Fork Fishing and Hunting Club cottages and clubhouse, annotation Olmsted Center for Landscape Preservation. (PennPilot Aerial Imagery)

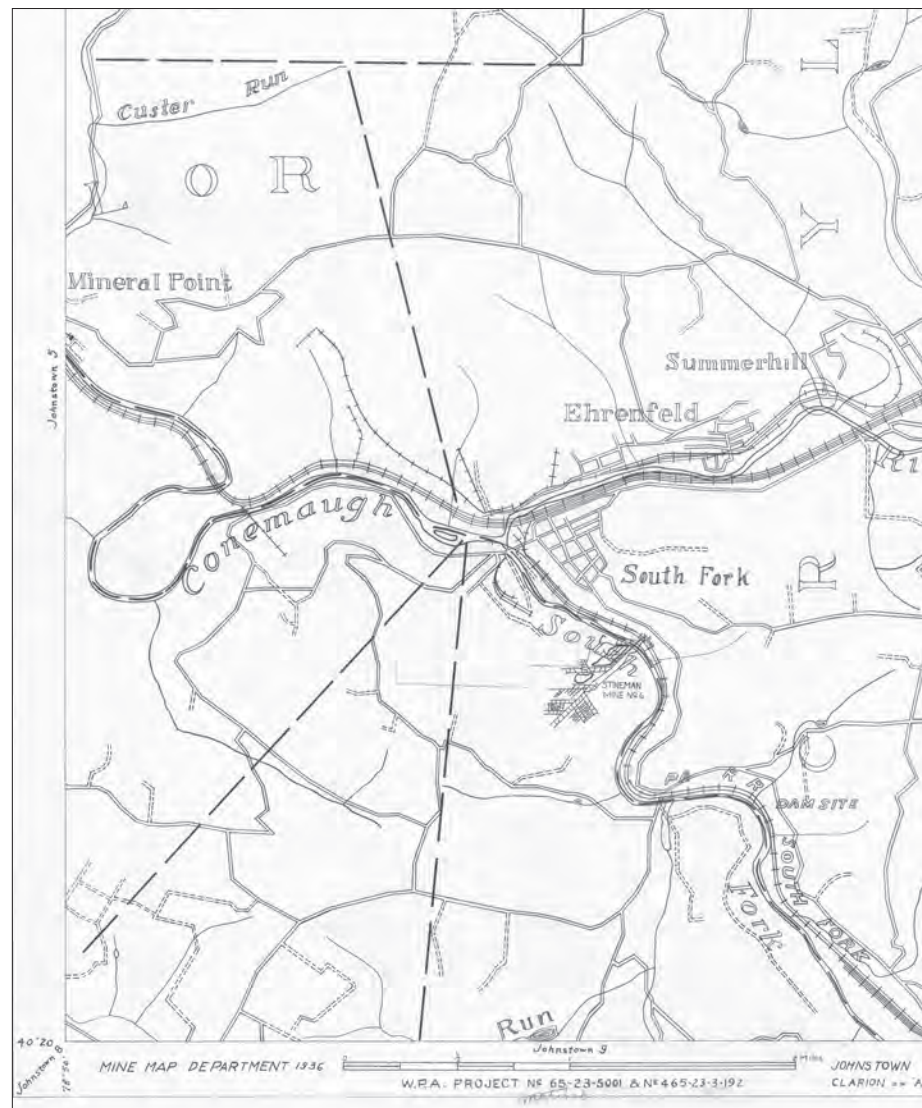


dirt road circled the hill west of the dam, part of which was built just downhill from the club's old carriage road. The new road continued southeasterly along the shoreline where it joined the former carriage road. At the club complex, the road passed in front of some of the cottages ending at the base of the hill, near what is now known as the Brown Cottage. The road reappeared at a river crossing southeast of the club grounds, where a more substantial road (later called Township Road 352/Lake Road) crossed the railroad tracks (at grade) and

traversed along the eastern shoreline to the old spillway, passing directly through it and continuing north.¹⁴⁸

Improvements to local roads proceeded concurrently with the expansion of St. Michael and surrounding towns and the growth in the ownership of personal automobiles. In the 1930s the formerly unimproved road on the southwestern shore of the lake was designated State Route 869. The road was paved, and stone retaining walls and culvert headwalls were constructed along the segment encircling the wooded hill southwest of the dam. The road's route through St. Michael was shifted one block eastward, from Main Street to Locust Street. The road continued southeast through coal company property to the junction with Township Road 352, where another platted subdivision of homes was developed (now Sidman). Between 1939 and 1958, the segment of State Route 869 around the hill southwest of the dam was abandoned and replaced with a new shorter road segment to the southwest. The abandoned highway segment was retained for local use and renamed Township Road 308.¹⁴⁹

Figure 1.82. In this *Works Progress Administration Map of the Bituminous Coal Mines*, 1936, note the patterns of the circulation, including the drive into Lake View Farm. (Pennsylvania State University Digital Collections)



The Maryland Coal Company transferred its holdings to the Berwind-White Coal Mining Company in 1933, but the mine continued to operate under the old name. By this time, the new owner had also acquired the South Fork Dam, portions of the lakebed, and the hill southwest of the dam. Much of the forest vegetation on the hillsides surrounding the former lakebed was clear cut to support the coal industry. Between 1934 and 1936, the Pennsylvania Bureau of Mines sponsored a Works Progress Administration project to map the bituminous coal mines within Pennsylvania. As part of this effort, the land around the South Fork Dam was mapped in 1936, documenting the road running parallel to the east bank of the South Fork of the Conemaugh River and the railroad right of way through the lakebed (Figure 1.82).

LAKE VIEW FARM

Compared to the dramatic physical changes on the southwestern side of the former lake, the landscape remained essentially intact to the northeast. Upon Elias J. Unger's death in 1896, his 103-acre farm property passed to his wife Annie C. Unger and was later sold to David E. Unger in 1901. Few improvements were made to the farm during this period. Between 1909 and 1912, the property transferred three times, to Herman Haupt and the heirs of George Stineman, to George E. Flenner et. ux., and finally to Jacob W. and Elizabeth Holsopple. As a result of these many transactions, the farm was reduced to 78.9 acres.¹⁵⁰

From 1912 to 1949, the Holsopples operated a working family farm, raising corn, oats, wheat, barley, and timothy hay, the latter being sold to the local mines as mule feed. A large area toward the spring house was cleared and enriched with manure for a vegetable garden, and apple and pear orchards were located uphill

Figure 1.83. Aerial imagery from 1939 reveals the fields of the strip farming on the slope above the South Fork Dam remnants at Lake View Farm. (PennPilot Aerial Imagery)



from the barn. The family also sold milk, butter, eggs, apple cider, and apple butter, and raised thoroughbred horses.¹⁵¹ To prevent erosion, the field south of the house and barn was cultivated in wide strip fields roughly parallel with the former edge of the lake (Figure 1.83).

A walk from the northeast porch led to the privy north of the house. The family replaced the cupolas on the original barn and carriage/wagon/machine shed with dormers and painted both structures red with white trim. The Holsopples also added new structures, including a wooden silo in the “heel” of the L-formed by the barn and the carriage shed, which stood slightly taller than the barn; a cinder-block well house just to the south of the spring house; and a smokehouse and chicken coop uphill from the house. A pig pen and another chicken coop, both present when the Holsopples arrived, stood uphill from the barn. A photograph from the late 1910s and early 1920s suggests a picket fence surrounding the house, with a gate in the center of the southwest side. Presumably, there was also a gate in the center of the north side at the bottom of the northeast porch steps. The picket fencing was eventually replaced with barbed wire (Figure 1.84).¹⁵²



Figure 1.84. This photograph of Lake View Farm, circa 1910-1920, shows picket fencing around the porch facade of Lake View House. (Johnstown Flood National Memorial, *Unger House Historic Structures Report*, 1986)

LANDSCAPE SUMMARY, 1939

By 1939, the land that would become the Johnstown Flood National Memorial was used for the coal industry and for agriculture, linked with the surrounding communities of South Fork and St. Michael by roads and rail lines. Aerial photography from 1939, documents successional vegetation which was beginning to cloak the lakebed west of the South Fork of the Little Conemaugh River. To the east of the river and the railroad right of way, the vegetation remained low growing, suggesting wetlands. The carriage road trace remained visible through young forest growth on the hillside south and west of the old dam abutments, as well as along the ridge of the dam abutments. State Route 869 remained a dirt road, and a road still passed though the bed of the former South Fork Dam spillway. The former meadow on the hillside above the dam was terraced into crop fields. In addition to the main house and barn, the Holsopple family added

structures to the farm including a wooden silo in the “heel” of the L-formed by the barn and the carriage shed, which stood slightly taller than the barn; a cinder-block well house just to the south of the spring house; and a smokehouse and chicken coop uphill from the house. A pig pen and another chicken coop, both present when the Holsopples arrived, stood uphill from the barn. Trees cloaked the ravine south of the farm, while much of the hillside remained cleared in meadow and field.

In St. Michael, the cottages and the club house that once stood alone along the shore of Lake Conemaugh, were joined by additional small residences and buildings in the former lakebed. Only the 1880s wing of the clubhouse remained, and only fifteen hundred feet away, a mine shaft delved deep into the earth. The carriage road trace remained visible behind the clubhouse and cottages.

1940 TO 1964: SUBURBAN DEVELOPMENT AND THE DECLINE OF THE COAL INDUSTRY

While the coal mining industry remained active in the lakebed into the 1950s, the Great Depression severely impacted the regional economy. Both small-scale agriculture and mining suffered, and the remaining smaller companies and farms consolidated. By 1941, only about seventy-five coal companies remained active in Cambria County, reduced from about twice as many in the early twentieth century.¹⁵³ Perhaps due to the declining economy, the condition of Lake View Farm deteriorated. As early as 1953, the National Park Service was asked by Congress to determine whether it would be advisable for the federal government to acquire the remnants of the South Fork Dam. Although the National Park Service determined that federal ownership was not advisable based on questions of the property’s significance, by the early 1960s, the agency was planning for the new national memorial. In 1964, seventy-five years after the South Fork Dam’s failure and following the proposed construction of US Highway 219, the Johnstown Flood National Memorial was established by the US Congress.

ST. MICHAEL AND THE FORMER SOUTH FORK FISHING AND HUNTING CLUB

Following Sechler’s loss of the former club house property in a sheriff’s sale, the property was purchased in 1921 by James Cruikshank.¹⁵⁴ The Cruikshank family owned the property, which included the double cottage, until 1950 when they sold it to Albert and Lucy Clement.¹⁵⁵ During their ownership, the Cruikshanks used the double cottage as guest rooms and removed its two-story front porch sometime after 1940. Between 1950 and 1958, two additions were added at the rear of the former club house’s remaining block, either by the Cruikshanks or the Clements. Subsequent owners operated the building as a rooming house,

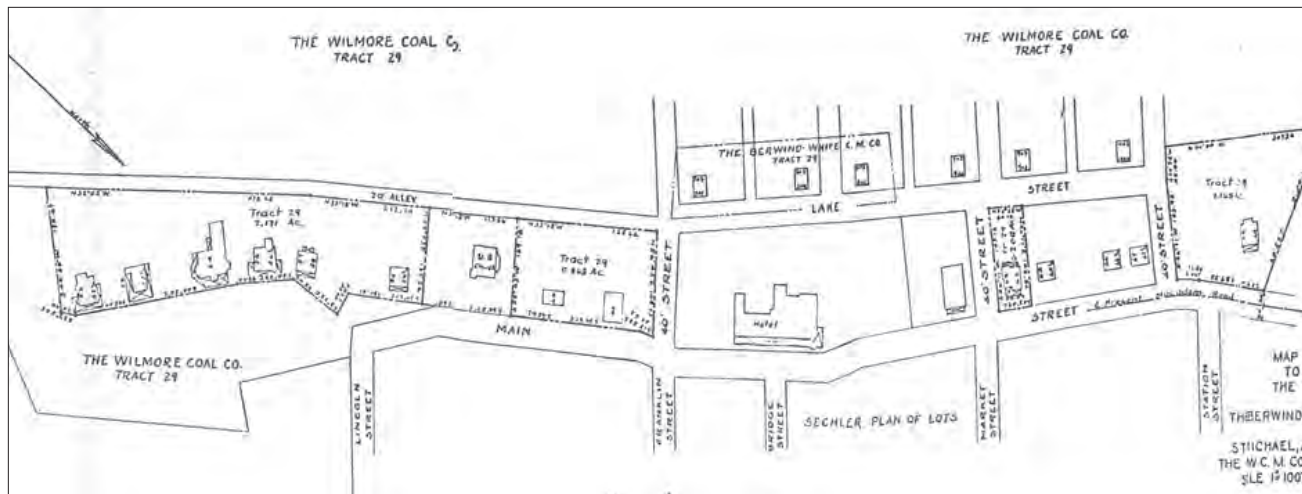


Figure 1.85. This survey from the mid twentieth century illustrates land ownership in St. Michael of Wilmore Coal, a land holding subsidiary of the Berwind White Coal Company, as well as the building footprints of the former South Fork Fishing and Hunting Club clubhouse and cottages. (Johnstown Flood National Memorial)

restaurant, and lounge. After 1950 the former double cottage was used as apartments, and by 1962 a long one-story garage was located behind the building fronting Lake Avenue.¹⁵⁶

By the late 1950s and early 1960s, the declining national demand for coal and the availability of cheaper fuels like natural gas and petroleum brought an end to the region's coal mining.¹⁵⁷ By 1955, the South Fork Fishing and Hunting Club's former cottages were all transferred to private ownership.¹⁵⁸ About 1958 the Berwind-White coal company closed the mine in the lakebed and a few years later the company was reorganized into the Berwind Company, to manage the former coal company's real estate assets (Figure 1.85).¹⁵⁹ Aerial photography from

Figure 1.86. Aerial photograph of Cambria County from 1958 reveals the strip cultivation in the fields of Lake View Farm as well as successional vegetation in the former lakebed. (PennPilot Aerial Imagery; OCLP).

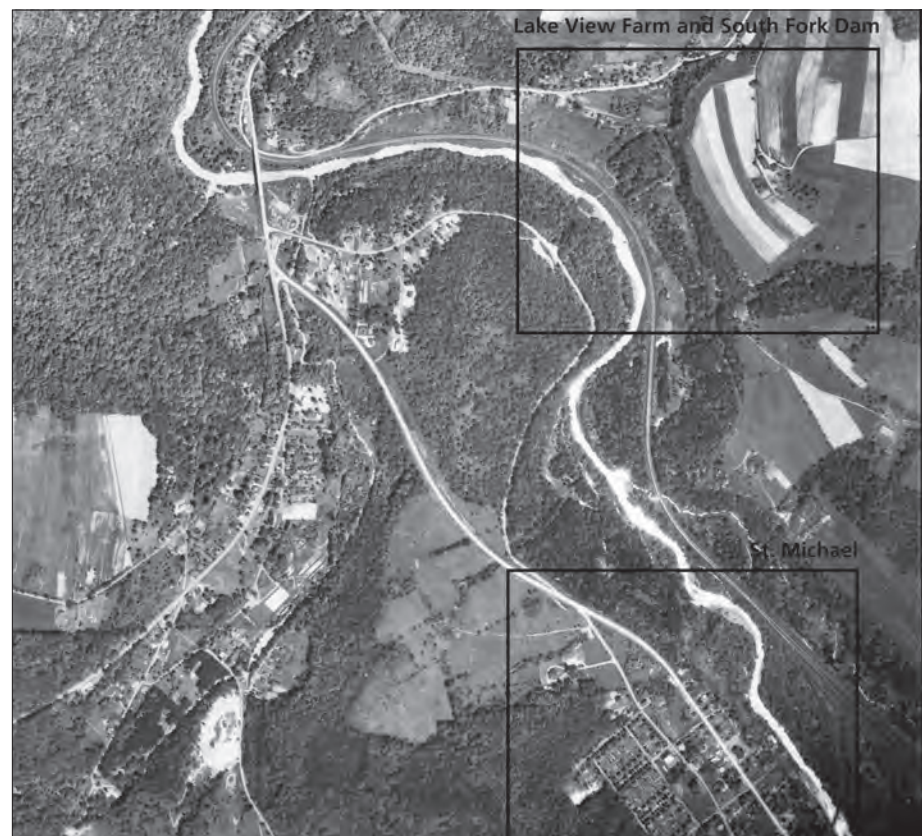


Figure 1.87. Detail of the areas of Lake View Farm and the Dam abutments from the 1958 Aerial photograph reveal the increased growth of successional vegetation in the former lakebed. (PennPilot Aerial Imagery)



Figure 1.88. In this detail of the area of St. Michael from the 1958 aerial, note vegetation between the double cottage and club house. (PennPilot Aerial Imagery).



the 1950s reveals that the slopes of the former lakebed and surrounding hillsides to the south were now forested in successional vegetation, while Lake View Farm's land remained in agriculture. The area's road system remained relatively unchanged from the early twentieth century (Figures 1.86 – 1.88).

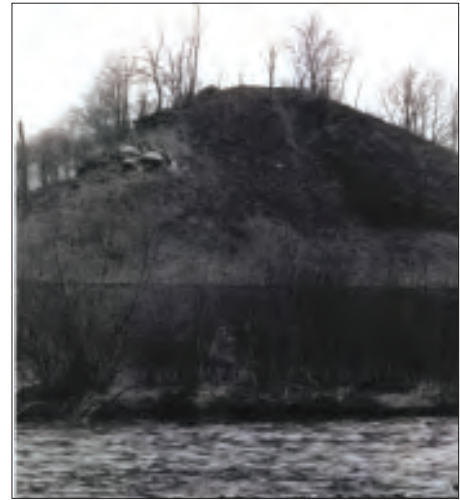
LAKE VIEW FARM

The Holsopples sold their 78.9-acre farm property to Robert E. and Lois M. Furlong in October 1950. The Furlongs continued farm operations through the

1950s and into the early 1960s, raising field crops including corn, oats, hay, and other grains for feed. They also owned cows, horses, and pigs, and at one point kept nearly two hundred chickens. The Furlongs used the spring house for cooling milk and the area above the spring house as a slaughtering site.¹⁶⁰

By the time the Furlongs moved to the farm, the old Lake View House, barn, and outbuildings were declining. Although they redecorated the house's interior and painted the exterior white with green trim, the failing northeast porch had to be removed around 1957. Because of the carriage shed's deteriorating condition, the Furlongs built a new garage in the 1960s for their vehicles near the site of

Figure 1.89. These photographs from "Reconnaissance Report" detailing feasibility of a future Johnstown Flood National Memorial, show the "left" or south abutment on left and "right" or north abutment on right, bottom photograph taken from corner of entrance drive to park and south abutment. (National Park Service, ETIC files)



the original privy. The three-bay wide garage was constructed on fill excavated from the adjacent hillside.¹⁶¹ Crops were planted on terraced hillsides above the remnants of the South Fork Dam below, which, like most of the former lakebed, was now cloaked in trees and shrubs.

ESTABLISHMENT OF THE JOHNSTOWN FLOOD NATIONAL MEMORIAL

In January 1953, United States Representative John P. Saylor of the 22nd Congressional District of Pennsylvania wrote a letter to the Secretary of the Interior Conrad Wirth requesting that the National Park Service assess whether the South Fork Dam and the Conemaugh Gap would be suitable for acquisition as a National Monument. By April, the National Park Service had completed a “Reconnaissance Report,” assessing the feasibility of preserving the South Fork Dam and Conemaugh Gap as a national park. In the report, they evaluate the suitability of park facilities at the former dam.

Existing physical conditions at the old dam tend to restrict public use developments to a limited area in the environs of the dam remnant on the left bank of the river. Any monument or other trail-side exhibits erected on this area would be placed advantageously between the highway and the dam. The crest of that portion of the dam, properly conditioned to prevent erosion, could be used as an overlook to the Conemaugh River and old reservoir bed. Auto parking accommodations and any picnic ground development which-might be desired, would be somewhat limited.¹⁶²

In summary, the report recommended that the South Fork Dam property should not be preserved through national monument status as its historic significance did not rise to the level of national importance (Figure 1.89). The Conemaugh Gap landscape was considered unsuitable for national park status as well. Yet the property associated with the South Fork Dam and the former South Fork Fishing and Hunting Club Cottages remained important to the local community.

In September 1960, the Wilmore Coal Company, a subsidiary of Berwind-White who had previously acquired the Maryland Coal Company, sold the former lands of the South Fork Fishing and Hunting club, including the damaged dam and former Lake View Farm property to the 1889 South Fork Fishing and Hunting Club Historical Preservation Society for one dollar. The coal company specified that the transfer of ownership referred only to the above-ground rights and the buildings, not to the mineral and mining rights.¹⁶³ The property was described as,

Beginning at a railroad spike located in the township road leading from State Legislative Route No 11019 to Creslo, common corner of the Grantor’s George M. Hershberger Tract of which apart of the parcel hereby conveyed is a part, land now or formerly of Henry Burtnett and land now or formerly of Robert E. and Lois M. Furlong; thence by line...etc.¹⁶⁴

In 1963, following the transfer of the land to the historical society, the National Parks Services’ Division of National Park & Recreation Area Planning of the

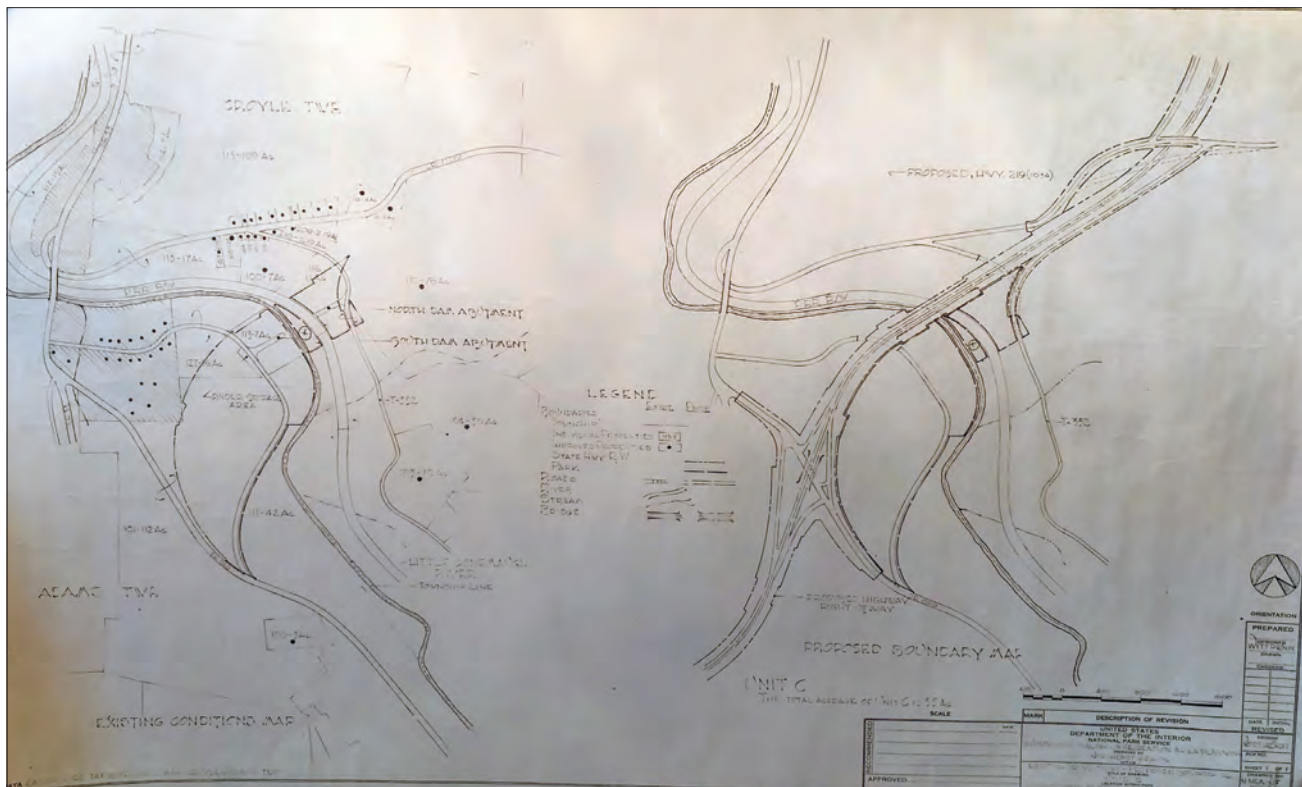


Figure 1.90. A map illustrating the existing conditions and proposed design of the Johnstown Flood National Memorial, 1963. (Johnstown Flood National Memorial).

Northeast Region prepared an existing conditions survey and map illustrating the proposed boundaries of a future Johnstown Flood National Memorial. The existing conditions map documented surrounding roads and the railroad right of way through the former lakebed. On the map, the former carriage drive is documented on the dam abutments, as is the road through the former spillway. A cinder storage area is marked near the South Dam Abutment (Figure 1.90).

Seventy-five years after the Johnstown Flood, and despite the National Park Service's earlier recommendations, on August 31, 1964, Congress authorized the Johnstown Flood National Memorial and Allegheny Portage Railroad National Historic Site (P.L.88-546, 78 Stat.752). The act authorized the Secretary of the Interior to designate up to fifty-five acres of land for the Johnstown Flood National Memorial for use in commemorating the tragic Johnstown flood of May 31, 1889. It also made possible the development of cooperative agreements to erect and maintain tablets or markers.¹⁶⁵

END OF PERIOD SUMMARY, 1939 – 1964

By 1964, the former lakebed and the remnants of the South Fork Dam were almost entirely forested. Only the area immediately east of the railroad right-of-way remained in grasses and low growing vegetation. The old road, which once followed the eastern edge of the lake, remained in the former sluiceway's alignment. Lake View Farm fields overlooking the lakebed were terraced in

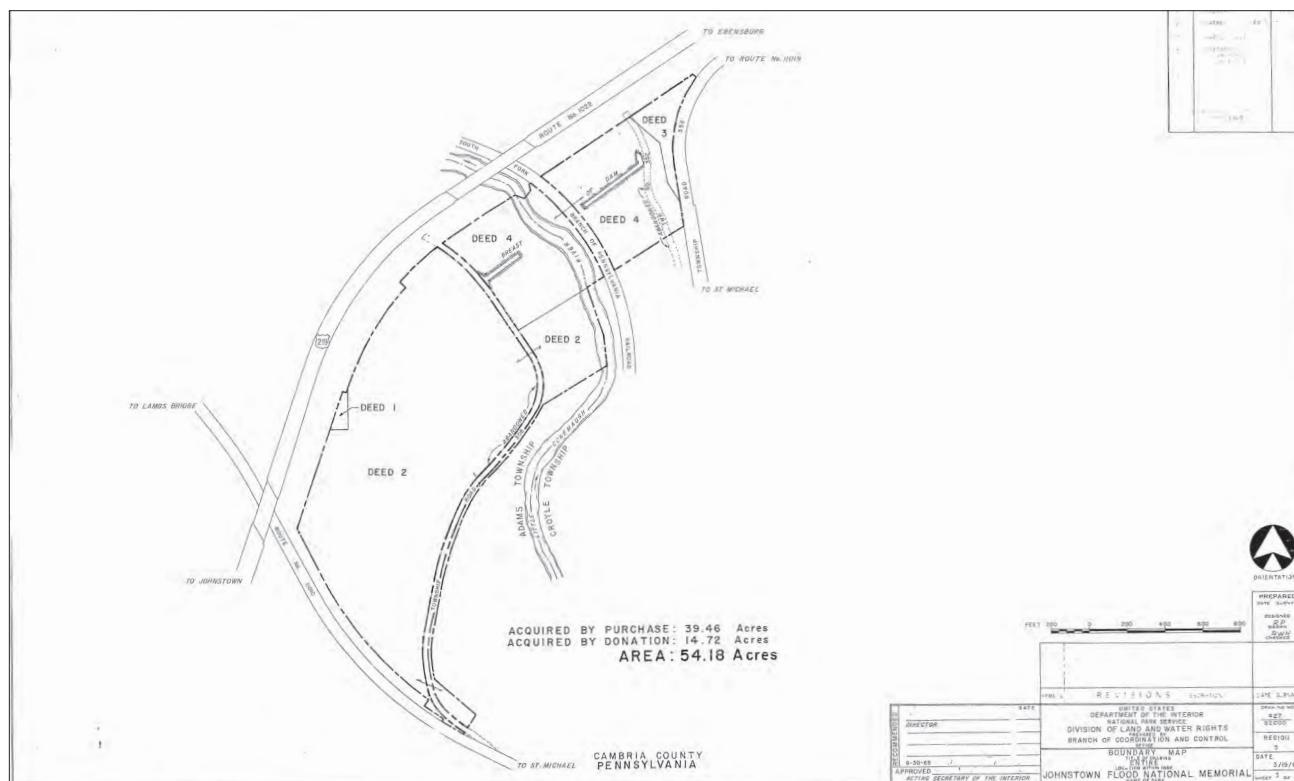
strips parallel to conform to the hilly topography. Scattered trees grew within an orchard south of the farmhouse.

The newly established Johnstown Flood National Memorial's proposed boundaries followed the alignment of the right-of-way of proposed Highway 219. In St. Michael, the grounds of the former clubhouse were open except for a grove of trees between the clubhouse and the double cottage. A subdivision of thirty-six homes on small rectangular lots was located immediately to the west of the clubhouse. In contrast, the former lakebed between the clubhouse and the Little Conemaugh River contained residential and commercial development. The circulation patterns in St. Michael and the surrounding area remained similar to the patterns in the early twentieth century, reflective of the increasing suburbanization and land use by the coal industry.

1965 - PRESENT: DEVELOPMENT OF JOHNSTOWN FLOOD NATIONAL MEMORIAL

Between the time of the park's authorization in 1964 and its official establishment on June 30, 1969, the landscape surrounding the remnants of the South Fork Dam was dramatically changed by the construction of U.S. Highway 219 just northwest of the dam. The new four-lane highway crossed the river valley on a seventy-foot high bridge located around four-hundred-and-fifty feet downstream from the dam remnants. The highway's right-of-way (and embankments) severed Township Road 308 and Township Road 352 northwest of the dam and created an

Figure 1.91. This map illustrates the boundaries of the 54.18-acre Johnstown Flood National Memorial, in 1969 prior to the acquisition of the Lake View Farm property. (National Park Service, ETIC files)



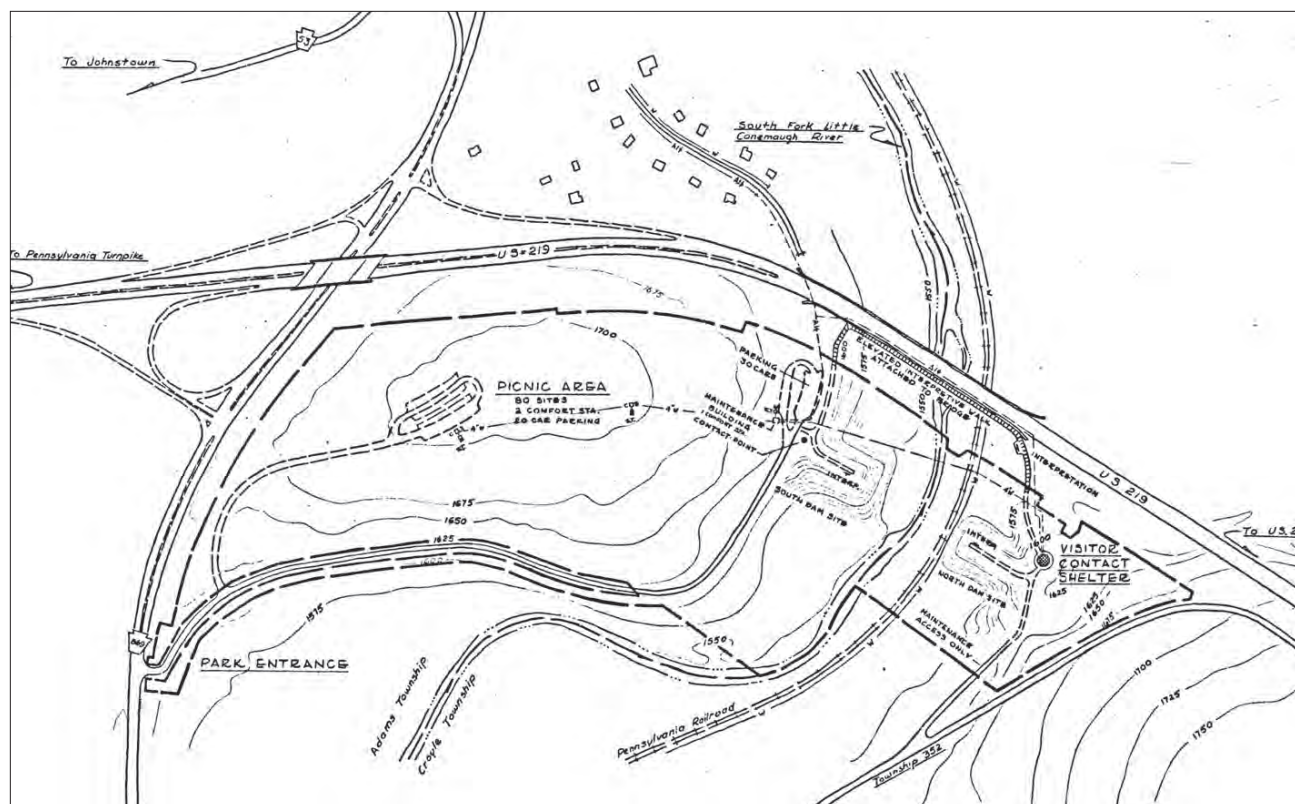


Figure 1.92. 1968 Plan for Johnstown Flood National Memorial showing the locations of picnic areas, a future visitor center and park entrance. (Johnstown Flood National Memorial)



Figure 1.93. This 1967 aerial photograph shows the recent construction of US. Route 219. (PennPilot Aerial Imagery; OCLP)

interchange with the 1939-58 realignment of State Route 869 (Locust Street). As a result, Township Road 308 was abandoned, and Township Road 352 was realigned and reconstructed on the hill above the spillway.¹⁶⁶

The road construction and realignment projects ultimately shaped the boundaries of the Johnstown Flood National Memorial. At the establishment of the park, lands included both abutments of the South Fork Dam, a segment of the adjacent lakebed (excluding the railroad right-of-way), the spillway (abandoned Township Road 352), and a wooded hillside area to the southwest bordered by

Figure 1.94. Detail of the South Fork Dam remnants, lakebed and Lake View Farm from the 1967 aerial photograph. (Penn Pilot Aerial Imagery)



Figure 1.95. This detail of an aerial photograph from 1967 reveals the village of St. Michael. (PennPilot Aerial Imagery)



abandoned Township Road 308, State Route 869, and U.S. Route 219. The lands were acquired through purchases and donations and totaled 54.18 acres (Figure 1.91).¹⁶⁷

As most park land was located west of the dam remnants, the park entrance was located off State Route 869. In 1968, park development plans proposed using abandoned Township Road 308 as the entrance road into the park, which would provide access to a hillside picnic area with a parking lot and comfort station, and to another parking lot near the south abutment (Figure 1.92). The plan indicated a contact station and small comfort station/maintenance building near the south abutment, and a visitor contact shelter at the spillway at the north abutment. Trails equipped with interpretative waysides connected both contact stations via an elevated pedestrian bridge attached to the south side of the Highway 219 bridge (not on park property) (Figures 1.93– 1.95).¹⁶⁸

Portions of the 1968 plan were constructed in between 1972 and 1973. The park entrance road (now South Abutment Road) was improved with steel guardrails, paved gutters, and additional culverts with stone headwalls to match the existing headwalls (Figure 1.96). At the hillside picnic area, trees were removed to construct a curving access road (now Picnic Grounds Road), terminating in an elongated loop in the location of a former cinder pit. The National Park Service built a thirty-space parking lot on the east side of the loop next to the picnic sites but did not install the comfort station at this time. Barbeque grills and picnic tables were spread out under the shade trees east of the parking lot¹⁶⁹

Figure 1.96. This 1977 aerial shows the newly constructed entrance drive, parking areas, and lakebed vegetation clearing at Johnstown Flood National Memorial. (Pennsylvania State University Archives)



A proposed pedestrian route adjacent to the Highway 219 bridge was never constructed, but by the late 1970s, the park had built several other features shown on the 1968 plan, although some locations changed. At the picnic grounds, a small maintenance storage shed was constructed north of the parking lot. A hiking trail (now Arbor Nature Trail) was cut through the woods between the picnic grounds and the south abutment. At the south abutment, a small temporary visitor center was located on the south side of the parking lot. An interpretive overlook sign was installed on the abutment, and a loop trail extended from the parking lot to the river around the abutment. There was also a temporary park office and restroom adjacent to the parking lot.

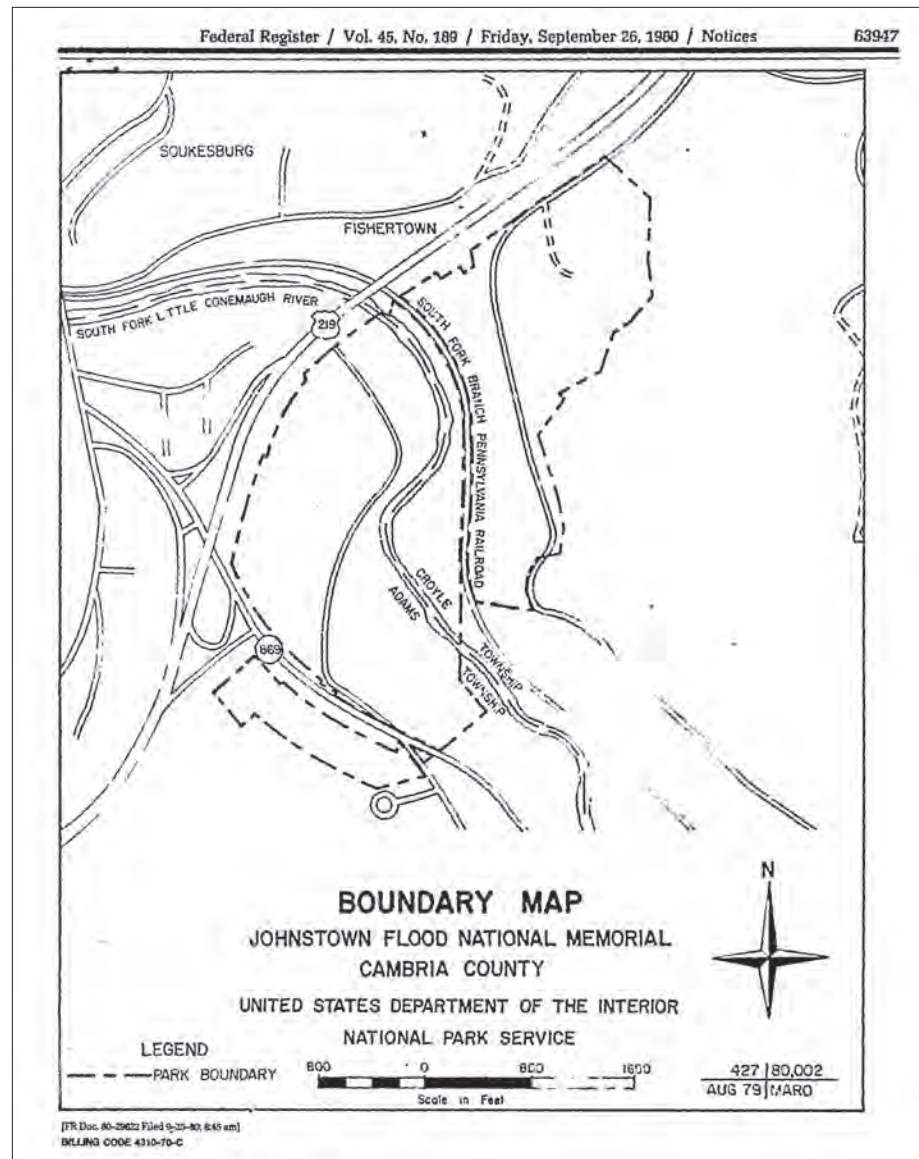
The park also cleared trees within the lakebed to help visitors visualize the former lake (see Figure 1.96). A major flood in 1977 reportedly damaged several trails, footbridges, and walks in the park, which were repaired by park staff and the Youth Conservation Corps. Access to the north abutment at this time was likely along the abandoned portion of Township Road 352. However, the park only owned the section through the spillway and could not develop parking facilities off the new alignment of Township Road 352 until years later.¹⁷⁰

PARK BOUNDARY EXPANSION

Concurrent with these developments, the park was actively pursuing the acquisition of additional lands to buffer the memorial and to improve visitor access and interpretative programs. A boundary increase on April 11, 1972 (P.L. 92-272, 86 Stat. 120) authorized an addition of approximately 53.6 acres of land to the park through donations and purchases. The new lands encompassed a forested area straddling the river in the former lakebed between the railroad tracks and State Route 869, as well as the mostly open area on the other side (south) of Route 869.¹⁷¹

Much of this land was donated by the Adams-Croyle Recreation Authority, which announced plans to develop a recreation area for picnicking, baseball, and fishing southeast of park lands, in the southeastern end of the lakebed. A second boundary increase on November 10, 1978 (P.L. 95-625, 92 Stat. 3477) authorized an addition of approximately sixty-seven acres of land through donations and purchases (Figure 1.97). The new lands included the mostly open Lake View Farm and a forested lakebed area between the railroad tracks and Township Road 352 (Tracts 01-124, 127, 129). The addition also included the 2,300-foot section of the railroad right-of-way, which would allow for future acquisition if it were abandoned and provide a contiguous land area of the original dam and lakebed. The cottages and clubhouse were not owned by the National Park Service yet.¹⁷²

Figure 1.97. This Boundary Map from 1979 includes the lands acquired by the memorial in the late 1970s. (Johnstown Flood National Memorial).

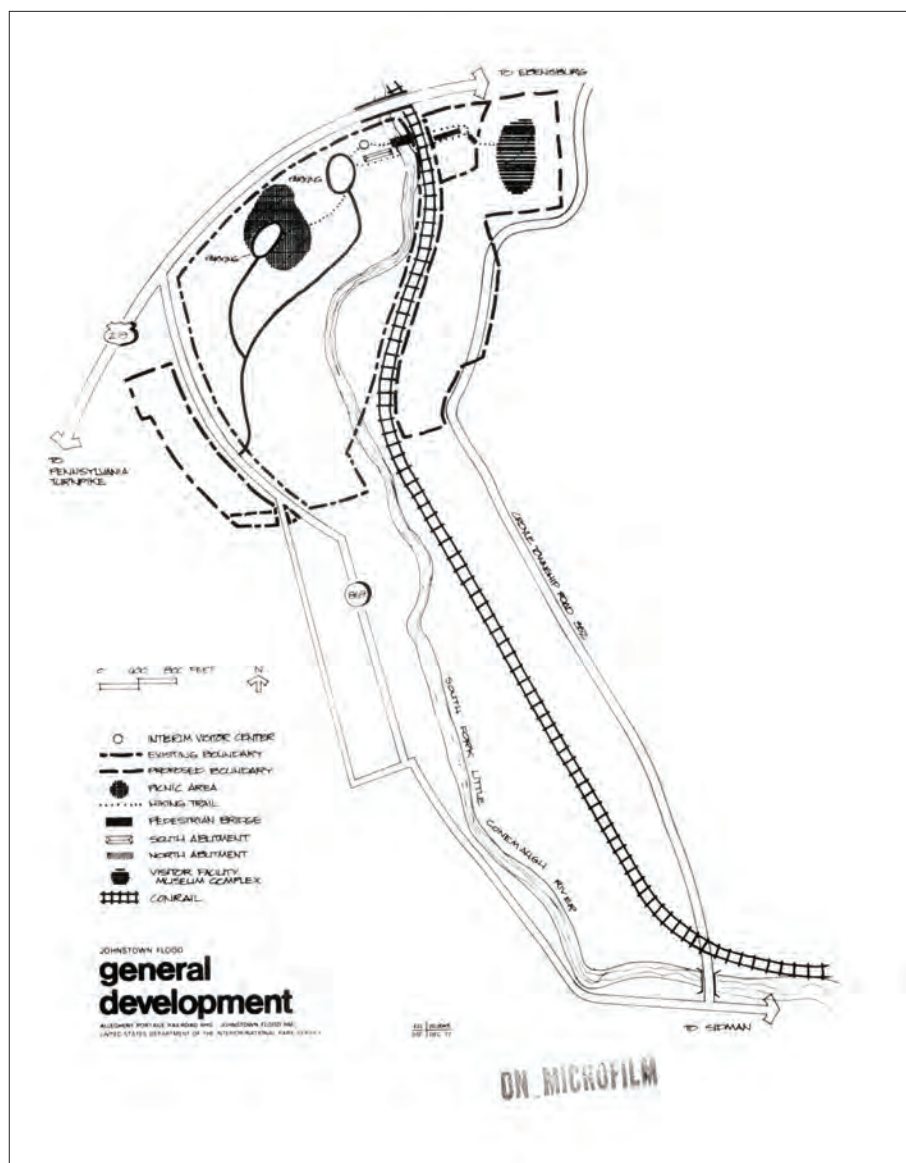


By the early 1980s, existing facilities at the south abutment include a paved two-level, thirty-car parking loop built on a former cinder pit, an interim visitor facility, an interpretive overlook sign, a loop trail around the abutment down to the river, a hilltop picnic area served by an access road, hiking trails, and a small maintenance storage shed.¹⁷³

PARK PLANNING

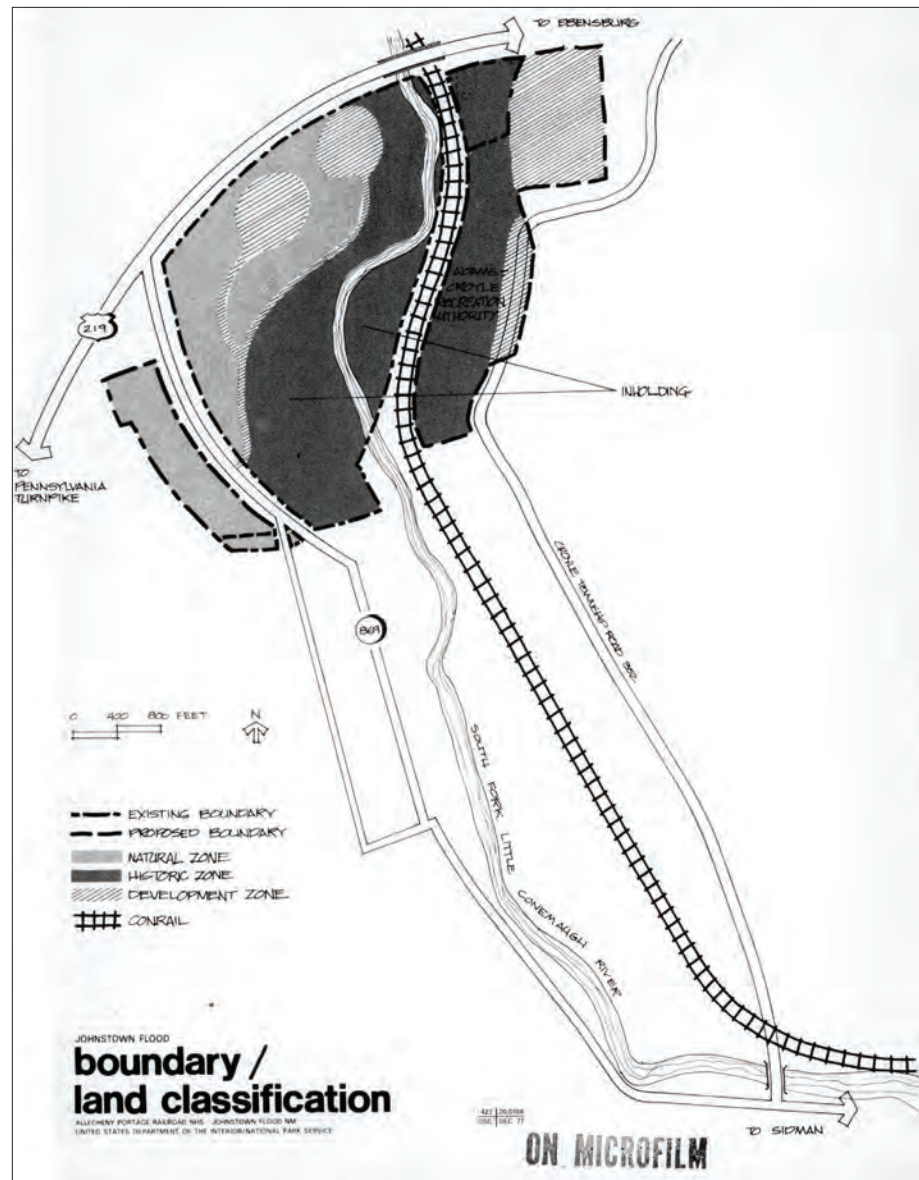
With the acquisition of additional lands, the park updated and developed several planning documents in the early 1980s to guide future actions. Chief among the reports were the Statement for Management, a General Management Plan, and an Interpretive Prospectus and Development Concept Plan. The documents collectively shaped management of existing resources and the development of additional park facilities beginning in the mid-1980s and onward.

Figure 1.98. The General Development Plan from the 1980 Management Plan for Johnstown Flood National Memorial. (Johnstown Flood National Memorial)



The park approved a “Statement for Management” in 1980. It stated that “The purpose of the Johnstown Flood National Memorial is to commemorate the tragic Johnstown Flood of May 31, 1889, by preserving the remnants of the South Fork Dam and interpreting the story of its failure and the results that followed.” The report identified six goals designed to meet the stated purpose of the park. The first was to identify, evaluate, protect, maintain and interpret the park’s cultural resources, to preserve their original fabric and workmanship, and where necessary, to stabilize and rehabilitate them in a manner consistent with legislative mandates and National Park Service policies. The park would be preserved and maintained to reflect conditions in the year 1889. Memorial administration would also promote environmental conservation and public awareness of the value of land use planning by interpreting historic land-use changes and activities—such as water storage, mining, and logging—that have left their mark on the park’s historic resources. Memorial administration would also strive to interpret the relationship of

Figure 1.99. The 1980 *General Management Plan* illustrating the three “Management Zones,” Historic, Natural and Development. (Johnstown Flood National Memorial)



the other floods affecting Johnstown to the 1889 flood and to the topography and human occupation of the valley. Limited opportunities for recreational activities compatible with preservation and interpretation of the park's historic resources would also be incorporated into the memorial's design. The final identified goal was to perpetuate natural ecological communities in the park's natural zone and to enhance the value of these lands as aesthetic buffers around significant resources.¹⁷⁴

The new lands identified in the two boundary increases were included in the development of a *General Management Plan* or GMP, completed in 1980 (Figure 1.98). The GMP identified three primary park management zones, including natural, historic, and development, but did not elaborate on the management intent (Figure 1.99). Definitions for the management zones were, however, provided in a 1993 update to the *Statement for Management*, as follows:

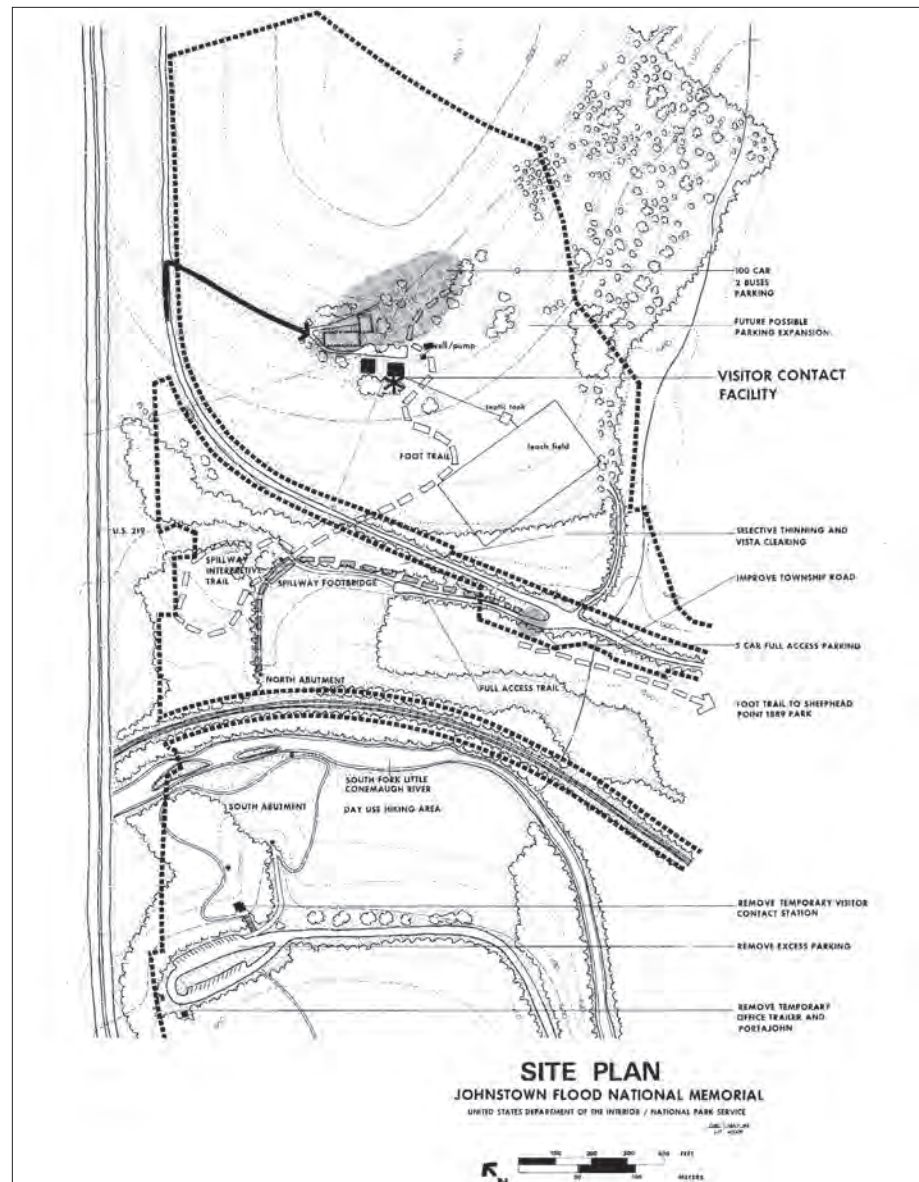
- Historic Zone: Lands that will be managed for the preservation, protection and interpretation of cultural resources and their settings and to provide for their use and enjoyment by the public. The historic zone consists of the historic lakebed, dam abutments, spillway, culvert stones, and the Lake View House.
- Natural Zone: Lands and waters that will be managed to conserve natural resources and ecological processes and to provide for their use and enjoyment by the public. The natural zone consists of variety of open fields, brush, and forest bordering the historical and developed areas. In this park the natural zone offers buffer to historic resources from intrusive adjacent land uses or activities.
- Development Zone: Lands that will be managed to provide and maintain facilities serving park visitors and management. The development zone includes the maintenance area, picnic area, the visitor center, the spring house, and associated access roads and parking areas.¹⁷⁵

Importantly, the plan recommended two actions to ensure effective preservation, management, and public use and understanding of the Johnstown flood and the South Fork Dam. The first was to acquire additional lands to preserve the historic scene surrounding the South Fork Dam. The second was to refocus park development by locating the main interpretative facilities to the north abutment area to increase visitor appreciation of the size of the former Lake Conemaugh and to enable visitors to see the historic spillway that played a critical role in the breaking of the dam.¹⁷⁶

Describing existing development on the western side of the park as at “near maximum,” the *General Management Plan* focused specific development proposals for the recently authorized lands on the eastern side of the park. The plan recommended the reconstruction of the spillway bridge, the construction of an interpretive facility near the reconstructed bridge, the growth of some low-growing native ground cover on the recently cleared lakebed while retaining trees near the railroad right-of-way to provide screening. Recommendations also focused on improving visitor facilities including the addition of a parking lot adjacent to the new interpretive facility and the creation of a trail system to connect visitor use areas. Finally, the recommendations included the construction of a low pedestrian bridge in front of the dam abutments over the South Fork Little Conemaugh River and an at-grade crossing of the railroad tracts to connect the trail system. The study also identified a need for a Historic Structure Report for the Lake View Farm (Lake View Farm) to determine best uses for it.¹⁷⁷

The *General Management Plan* also proposed development of a self-guided auto tour: beginning at the contact station at the south abutment, to the southwestern shoreline and the clubhouse and cottages associated with the South Fork Fishing

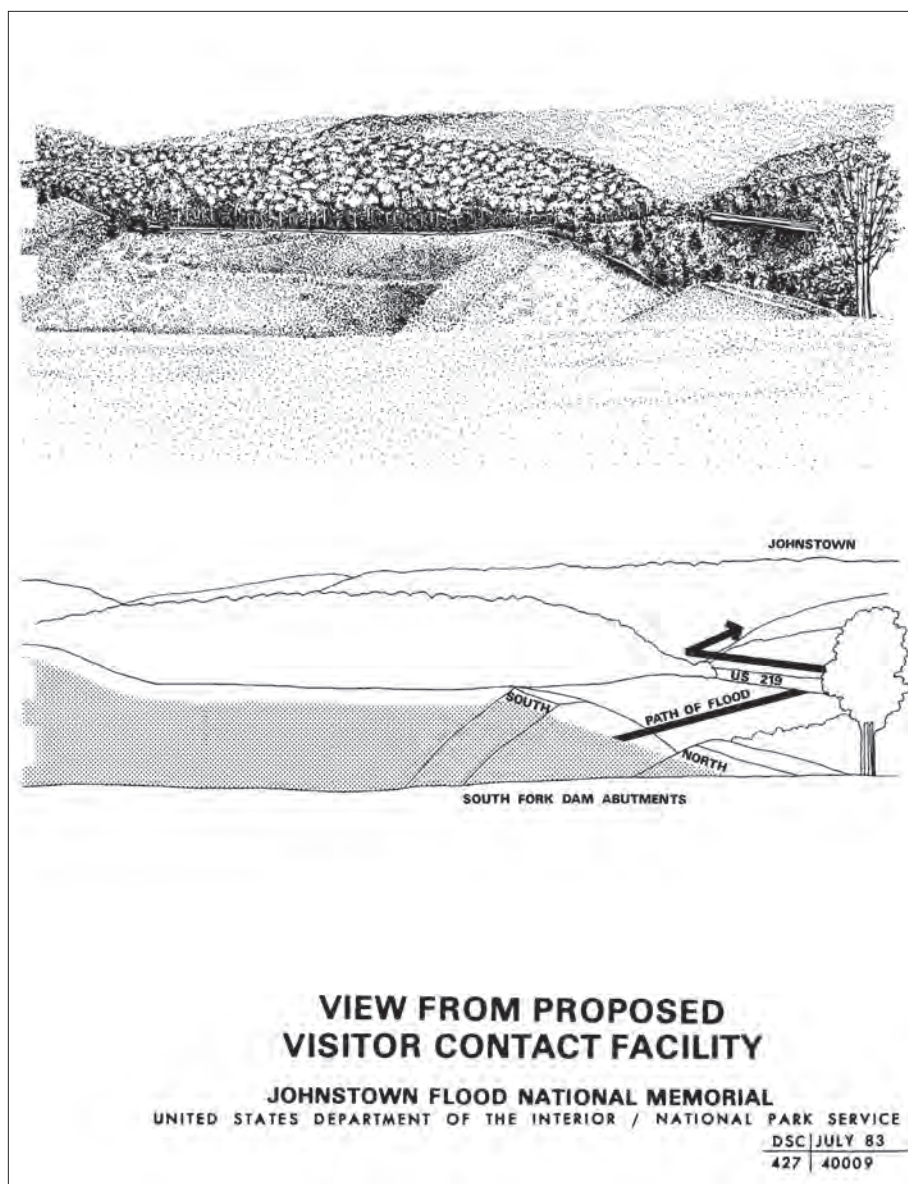
Figure 1.100. The site plan from the 1984 *Interpretative Prospectus and Development Concept Plan*. (Johnstown Flood National Memorial)



and Hunting Club in St. Michael, across the river and tracks to the northeastern shoreline on Township Road 352, and ending at the planned interpretive facility at the north abutment. According to the plan, visitors would “gain an impression of the size of the former reservoir by driving around its edges.” The plan also proposed realigning Township Road 352 from the west and north sides of the Lake View Farm to the south and east sides.¹⁷⁸

Later building on the guidance of the *Statement for Management* and the *General Management Plan*, the park completed an *Interpretive Prospectus and Development Concept Plan* in 1984 updating the details for the visitor program, interpretive techniques and media, and facilities to foster an understanding of the Johnstown flood (Figure 1.100). The report proposed a new facility on the hillside above the north abutment, in the general vicinity of the Lake View Farm buildings, from which visitors could view the dam remains, former lakebed, and distant clubhouse and cottages. The concept plan also proposed configuring

Figure 1.101. Analysis from 1984 *Interpretative Prospectus and Development Concept Plan*, illustrating the importance of the view of the cleared lakebed from the proposed visitor contact station. (Johnstown Flood National Memorial)



and orienting this facility to direct the visitor's view to these resources and to screen unwanted views of Highway 219 (Figure 1.101). Noting that the Lake View House served as a landmark visible from other areas of the park, the report recommended that the location and exterior form of the visitor facility should complement the house and the hillside location, and that its character should be subdued.¹⁷⁹

In the 1980s and 1990s the park implemented improvements to visitor facilities at the picnic grounds. Up until this time, portable toilets accounted for the only visitor amenity. Although a plan from 1980 proposed a combination comfort station/maintenance shop just north of the Picnic Grounds Road loop, the comfort station part of the structure was not built. Thus, portable toilets were used until about 1981 when the park built a permanent comfort station on the west side of the Picnic Grounds Road loop. By 1993, the park constructed an open-

Figure 1.102. This 1993 aerial photograph reveals the trails through the newly cleared lakebed, as well as the picnic pavilion. (Johnstown Flood National Memorial).



sided picnic pavilion on the east of the loop amongst the picnic tables and grills. By this time there was also a horseshoe pit in the median of the loop (Figure 1.102).¹⁸⁰

The park's maintenance facility was initially a collection of shacks set in a work yard north of the Picnic Grounds Road loop. In the early 1980s the park constructed the one-story frame maintenance shop as well as a work yard, located off a gravel road extending north from the north end of the loop. By 1993, additional workspaces and structures had been added in the work yard, including a modular trailer office, three frame sheds, and storage tanks. In 1996 a two-story maintenance office/two-bay garage was constructed at the north end of the work yard, and in 2011 the first maintenance shop was enlarged with a three-bay addition to the north.¹⁸¹

LAKE VIEW FARM

The National Park Service purchased the 30.4-acre Lake View Farm property from Robert E. and Lois M. Furlong in August 1981, by which time the Lake View House had been unoccupied for more than ten years. By 1969 the house was in such poor condition that the Furlongs had purchased a mobile home, locating it in the large garden area between the house and spring house. The abandoned house consequently deteriorated at an accelerated pace and the west porch was removed (Figure 1.103). The Furlongs had begun scaling back farming operations by the late 1960s, and in the 1970s the unused silo collapsed, the original barn and carriage shed were in ruins, and the chicken coop structures, and the smokehouse were removed.¹⁸²



Figure 1.103. Lake View House, circa 1980, prior to its restoration by the National Park Service. (Johnstown Flood National Memorial).

Access into the farm property at the time of federal acquisition was from a gravel driveway heading south from Township Road 352, which forked at the ruins of the barn, carriage/wagon/machine shed, and silo. The lower fork continued south to the Furlong garage, Lake View House, spring house, and well house. Scattered trees and shrubs occupied spaces around the buildings, but the area was mostly open and surrounded by cultivated and abandoned fields.¹⁸³

The park initially intended to adaptively reuse the interior of the Lake View House for park offices with an addition at the basement level to accommodate a visitor center. However, by 1986 the park had developed plans to construct a new visitor center building at the site of the ruined barn and carriage shed (Figure 1.104). Completed in 1989 in time for the 100th Anniversary of the Johnstown Flood, the two-story L-shaped structure included exhibit spaces, a film theatre, offices, and restrooms (Figure 1.105). The new building's form, representing that of the former barn, and its hillside location fulfilled the recommendations set forth in the 1984 *Interpretive Prospectus and Development Concept Plan*. By 1987 the final design of the proposed facilities was nearing completion. The springhouse would be reconstructed to house utilities and other maintenance facilities so additional archeological investigation was required.¹⁸⁴

Figure 1.104. View of the north abutment, prior to the construction of the visitor center, with the ruined barn in distance. (Johnstown Flood National Memorial)



Figure 1.105. The new Johnstown Flood National Memorial Visitor Center, circa 1989. (Johnstown Flood National Memorial)



The 1987 excavations at the springhouse revealed that the building had originally been about forty-five feet long and that it had been cut into the slope and bedrock. Part of the foundation had been obscured by trash which suggested that this area had been used as dump throughout the twentieth century. With the opening of the new facility, the temporary visitor center and park office at the south abutment were removed.¹⁸⁵

The park also addressed the extant buildings at the Lake View Farm, beginning with the restoration of the exterior of the house to its historic 1889 condition for the one hundredth anniversary of the Johnstown Flood. The covered two-story southwest porch with its center stair and the northeast porch (and an accessible ramp) were reconstructed, while the house was painted white with red trim. Interior spaces were upgraded and readapted into park offices, library, workrooms, and storage areas in between 1992 and 1993. The park rehabilitated

Figure 1.106. The rehabilitated Lake View Farmhouse (right) and Spring house (left), circa 1989. (Johnstown Flood National Memorial)



the collapsing foundation of the spring house between 1988 and 1989 and built a new but smaller structure like the style of the original on top of the northwest end of the original foundation (Figure 1.106). Based on recommendations in a 1986 Historic Structure Report, the park removed the Furlong garage (but not the fill) and the well house in the late 1980s.¹⁸⁶

Uphill and to the southeast of the visitor center, the park constructed a sixty-five-space asphalt parking lot accessed by a new two-lane asphalt road (now Visitor Center Road) uphill from the farm lane. Like the parking lot at the picnic grounds, this parking lot was designed as a one-way loop. Concrete sidewalks extended throughout the parking lot and connected to a concrete and stone-paver patio with bench seating at the visitor center entrance. The original farm lane was paved with concrete for use as a service road, which also provided access to a two-space handicap parking area across from the Lake View House where the Furlongs excavated fill for the garage. This drive has since been repaved in concrete permeable pavers. The driveway was extended around the edge of the yard on the southwest side of the house and terminated at the steps on the southwest porch, near two new wayside signs. A curving woodchip trail with timber steps traversed the slope between the parking lot and spring house, and another woodchip trail headed south and west down the hill to Township Road 352. Park plans proposed an extensive program of new plantings around the visitor center and within the parking lot. Many of the trees were installed but the large number of shrubs was limited to areas along the walks and otherwise placed to screen utilities.¹⁸⁷

MANAGEMENT OF THE FORMER LAKEBED

Since the acquisition of lakebed parcels in the 1970s, the National Park Service has managed vegetation within the lakebed of the former Lake Conemaugh so that the contours of the former lakebed are revealed to park visitors. Clearing in

the lakebed has been pursued as resources allow. In the 1930s, the lakebed was mostly open, though successional vegetation was appearing on the slopes and in the western portion of the land. By the 1950s, tree cover was dense and when the National Park Service acquired the property in the 1960s, plans were made to clear the lakebed vegetation. The first evidence of lakebed vegetation clearing is seen in the 1970s (see Figure 1.96). As the 1977 Draft General Management and Development Plan stated,

The National Park Service has cleared trees above the dam abutments to graphically define the historic reservoir waterline. Some low growing ground cover will be encouraged on the recently cleared land and small trees will remain along the railroad tracks to provide screening.¹⁸⁸

To prepare for the one hundredth commemoration of the Johnstown Flood in 1989, the park completed several proposals recommended in the *General Management Plan*. After acquiring the Recreational Authority lands in 1984, the park renewed their active vegetation management in the former lakebed. In preparation for the one hundredth anniversary of the flood, the park clear cut and burned approximately fifty acres of vegetation in the lakebed so that visitors could visualize the extent of the former lake (Figure 1.107). The viewshed was especially important from the new visitor center at the Lake View Farm. Much of the lakebed was then seeded to promote grassland development. The park also cleared stands of timber around the dam remnants to give visitors a better appreciation for the size of the impoundment, remaining consistent with the management goal from the 1980 *General Management Plan*, “To preserve and maintain the cultural resources and the setting of the South Fork Dam to approximate conditions in 1889.”¹⁸⁹

The park also constructed a pedestrian bridge across the top of the spillway. The eight-foot wide wood bridge measured one-hundred-and-forty-six feet in length



Figure 1.107. The lakebed and south abutment following clearing in 1989, evidence of scouring from flooding is visible along the river’s edge. (Johnstown Flood National Memorial).

Figure 1.108. This photograph reveals the boardwalk and overlook on the north abutment (foreground), circa 1990, showing the proximity of the overlook to Highway 219 (background). (Johnstown Flood National Memorial)



with support posts spaced around sixteen feet apart, like the timber trestle bridge present in 1889, although the railing design was different and there were no fish screens. The south end of the bridge was accessed by a new accessible asphalt path that connected to a five-space asphalt parking lot constructed on the west side of Township Road 352, across from the trail leading from the Lake View Farm. The roadside parking lot was built at the approximate point where the trace of the former alignment of Township Road 352 headed north into the lakebed and toward the spillway. The new paved trail was built upslope from the trace, which was scarified and restored with herbaceous vegetation.

Another trail surfaced with woodchips was planned to pass under the pedestrian bridge and traverse through the spillway, and then turn and run parallel to the downstream toe of the north abutment to the railroad tracks. Except for the spillway portion, this trail was built in the late 1980s and began at the north end of the pedestrian bridge. However, it was not actively maintained and soon became overgrown. The park also constructed an eight-foot wide boardwalk along the length of the north abutment around this time to improve accessibility (Figure 1.108). Other improvements included new paving, drainage structures, retaining walls, and timber-faced guardrails along Township Road 352, a wood and stone veneer entrance sign at the beginning of Visitor Center Road, and other directional signs within the park and along adjacent roads.¹⁹⁰

PARTNERSHIP TO PRESERVE THE CLUBHOUSE AND COTTAGES

In July 1986, the former clubhouse and seven extant cottages associated with South Fork Fishing and Hunting Club in St. Michael were identified in the National Register of Historic Places as contributing resources of the South Fork Fishing and Hunting Club Historic District (Figure 1.109). The recognition

Figure 1.109. 1993 Aerial Photograph, St. Michael. (Johnstown Flood National Memorial)



coincided with the preparation of a *Preservation and Interpretation Plan for the South Fork Fishing and Hunting Club Historic District*, a joint effort completed in 1988 between the residents of St. Michael and the National Park Service. The plan resulted in a partnership to protect, maintain, and manage the district's buildings. It also established the 1889 South Fork Fishing and Hunting Club Historical Preservation Society as the principal community body working with the National Park Service (the society was renamed Friends of the Johnstown Flood National Memorial in 2006, disbanded in 2015 and reestablished in 2019).¹⁹¹

The *Preservation and Interpretative Plan* provided concepts and specific guidance for basic visitor services, interpretive directions, and cultural resource preservation and maintenance activities, and suggested ways to promote future economic growth in St. Michael. Phased improvements included the construction of a ten to fifteen space parking lot near the clubhouse so visitors could park at a central facility and not disturb local property owners, as well as the addition of waysides to interpret the story. The plan proposed the restoration of the clubhouse and one or two cottages based on historic documentation. Visitor amenities would include access to the clubhouse and cottages, as well as an interpretive trail route linking the story of the flood events between Johnstown and St. Michael and walking tours of the historic district and adjacent lakebed.¹⁹²

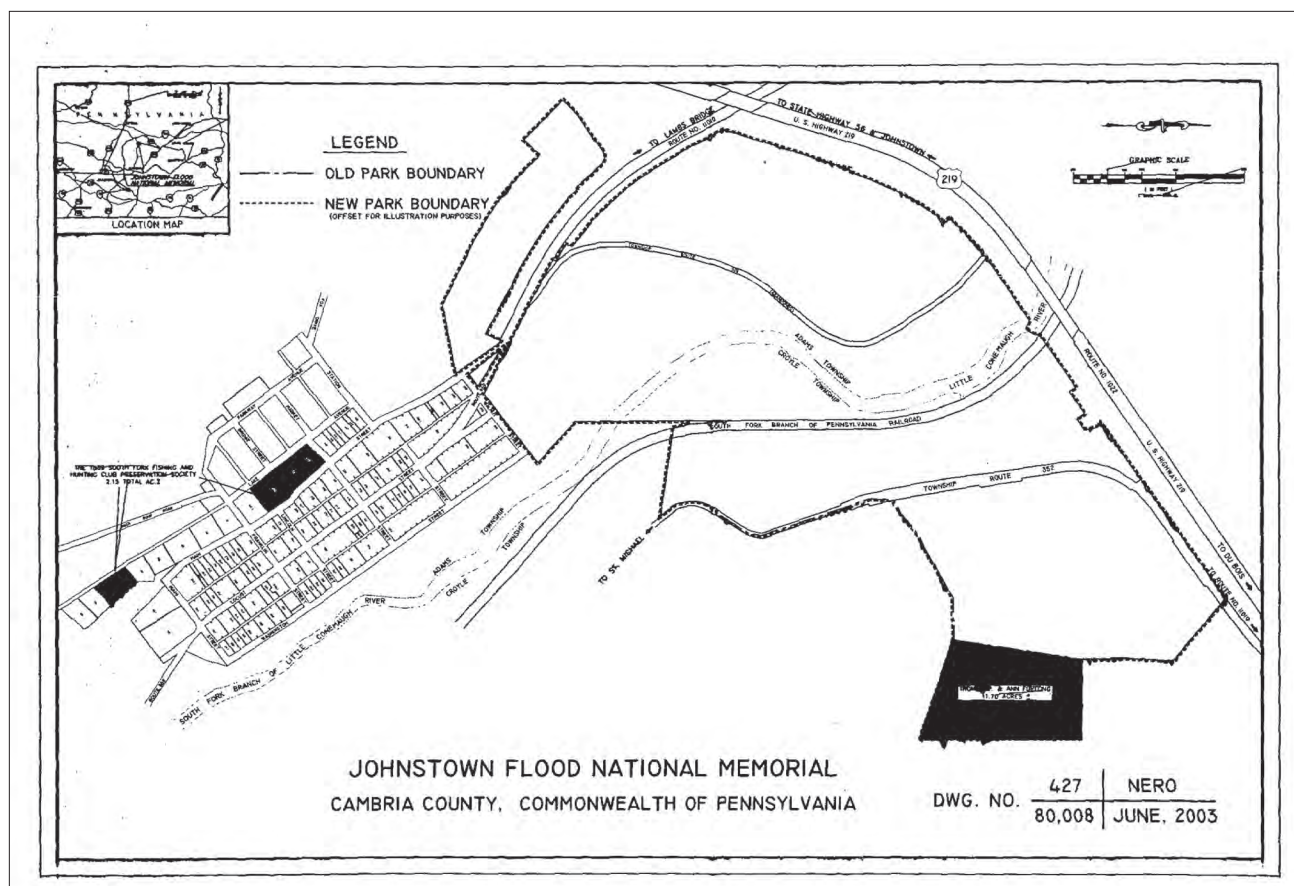


Figure 1.110. Boundary Adjustment Map showing the acquisition of the Cottages and Clubhouse Acquisition, 2006. (Johnstown Flood National Memorial).

The Society obtained ownership of four club buildings in the late 1980s and early 1990s: the clubhouse, double cottage, Brown Cottage, and Lippincott (Moorhead) Cottages (Figure 1.110). One of the first projects completed was reconstruction of the clubhouse porch between 1991 and 1992. At this time, the clubhouse was still used as a restaurant/bar, the double cottage was under renovation as four rental apartment units, and the cottages were vacant. In 1993 John Milner and Associates completed archeological investigations at the four sites to locate subsurface resources and identify landscape features possibly linked to the former club. Milner reported that the artifacts, discrete yard deposits, and landscape features that were found were deposited or created after the club had been disbanded. The investigations also indicated that evidence for the boardwalk that fronted the buildings had not survived.¹⁹³

In 1993 and 1994, the National Park Service and the Preservation Society prepared a Historic Structures Report and an Interpretive Plan/Schematic Design to update and expand on the earlier recommendations. The updated interpretive plan proposed detailed public functions of the restored clubhouse including a visitors/orientation center, exhibit space, a restaurant, and an inn. The exterior of the double cottage (clubhouse annex) was to be restored, including the reconstruction of the two-story porch. The exterior of the Brown Cottage was to be restored on the exterior and renovated on the interior, in keeping with its current duplex configuration, to house two rental units.

The plan recommended that the Lippincott (Moorhead) Cottage should be restored on the exterior and the first floor of the interior to house exhibits and a library and to accommodate special events and receptions. Upstairs, it will be renovated into two apartment units, one intended for a caretaker to administer the overall project. Finally, the plan recommended that the historic boardwalk and the access road behind the cottages should be replicated to provide some sense of the original context of the buildings.¹⁹⁴

ADDITION OF THE SOUTH FORK FISHING AND HUNTING CLUB COTTAGES

The four buildings associated with the South Fork Fishing and Hunting Club were not initially considered for inclusion into Johnstown Flood National Memorial because it was understood that a local entity, such as the 1889 South Fork Fishing and Hunting Club Historical Preservation Society, could adequately provide for their protection and interpretation.

However, by the late 1990s the society was struggling to maintain the buildings and simultaneously make mortgage payments. In 2000 the society began working with a non-profit historic property development company to explore private sector interest in purchasing the parcels. The search was unsuccessful, and on October 5, 2004 federal acquisition of the club properties was authorized as part of the park's third boundary increase (P.L. 108-313), which added approximately fourteen acres of land through purchases. This area included the three parcels in St. Michael associated with the South Fork Fishing and Hunting Club: clubhouse, double cottage, Lippincott (Moorhead) Cottage, and Brown Cottage. These building were acquired in 2006. It also included additional land east of the Lake View Farm.¹⁹⁵

The most recent planning document at Johnstown Flood National Memorial is the Foundation Document, completed in 2013. Foundation documents provide basic guidance for all planning and management decisions. The core components of a foundation document include a brief description of the park as well as the park's purpose, significance, fundamental resources and values, other important resources and values, and interpretative themes.

Fundamental resources and values are those features, systems, processes, experiences, stories, scenes, sounds, smells, or other attributes determined to warrant primary consideration during planning and management processes because they are essential to achieving the purpose of the park and maintaining its significance. They are closely related to a park's legislative purpose and are more specific than significance statements. Fundamental resources and values help focus planning and management efforts on what is truly significant about the park; if they deteriorate, the park purpose and/or significance could be jeopardized.

The Foundation Document for the Johnstown Flood National Memorial identified cultural landscape related resources as fundamental to the significance of the park. These included the South Fork Dam abutments, spillway and remnants of the valve control tower foundation, as well as the trace of the historic carriage road that traversed the abutment and continued up the hillside south of the dam. The Foundation Document also highlighted the dry bed of Lake Conemaugh, defining the lakebed boundaries as all land below the 1,600-foot contour of the lake, including the South Fork Little Conemaugh River, wetlands, and vegetated slopes. The Lake View house, visitor center, spring house, and the fields and orchard on the hillside above the South Fork Dam of Lake View Farm were also considered foundational to the significance of the Johnstown Flood National Memorial. Finally, within the South Fork Fishing and Hunting Club Historic District, the clubhouse and cottages were identified as foundational resources.¹⁹⁶

END OF PERIOD SUMMARY, 1965 – PRESENT

Since Johnstown Flood National Memorial was established in 1969, the landscape has been managed by the National Park Service to convey the dramatic impact of the 1889 flood and the profound loss of life and property in its wake. While the original boundaries of the memorial were shaped by the construction of US Highway 219 and the realignment of local roads, since its establishment, the focus of land acquisition and management has been to empower visitors to imagine the devastation of the flood. By the mid-1970s simple visitor facilities just west of the dam abutments overlooked the former lakebed. Within the portion of the lakebed owned by the National Park Service, vegetation was kept low to help visitors envision the former Lake Conemaugh. In 1981, the National Park Service acquired the property Lake View Farm overlooking the dam abutments, so that the life and perspective of Unger, who witnessed the first stages of the dam's failure on May 31, 1889, could be shared with visitors. Management and interpretation plans focused on the moment South Fork Dam broke, and the National Park Service managed the landscape to enable visitors to understand the magnitude of the flood's destruction. In preparation for the one hundredth commemoration of the Johnstown Flood, the National Park Service restored Lake View Farmhouse and spring house and cleared the lakebed vegetation again and established a meadow community to preserve views into the lakebed. They built trails to viewsheds on crests of the dam abutments and constructed a visitor center to suggest the former barn at Lake View Farm. In 2006, the National Park Service acquired the South Fork Fishing and Hunting Club clubhouse and cottages to expand the ability of the National Park Service to convey the significance of the Johnstown Flood and better tell the story of the South Fork Fishing and Hunting Club. Since the establishment of the Johnstown Flood National Memorial, its cultural landscape has been managed as an interpretive tool to convey the past,

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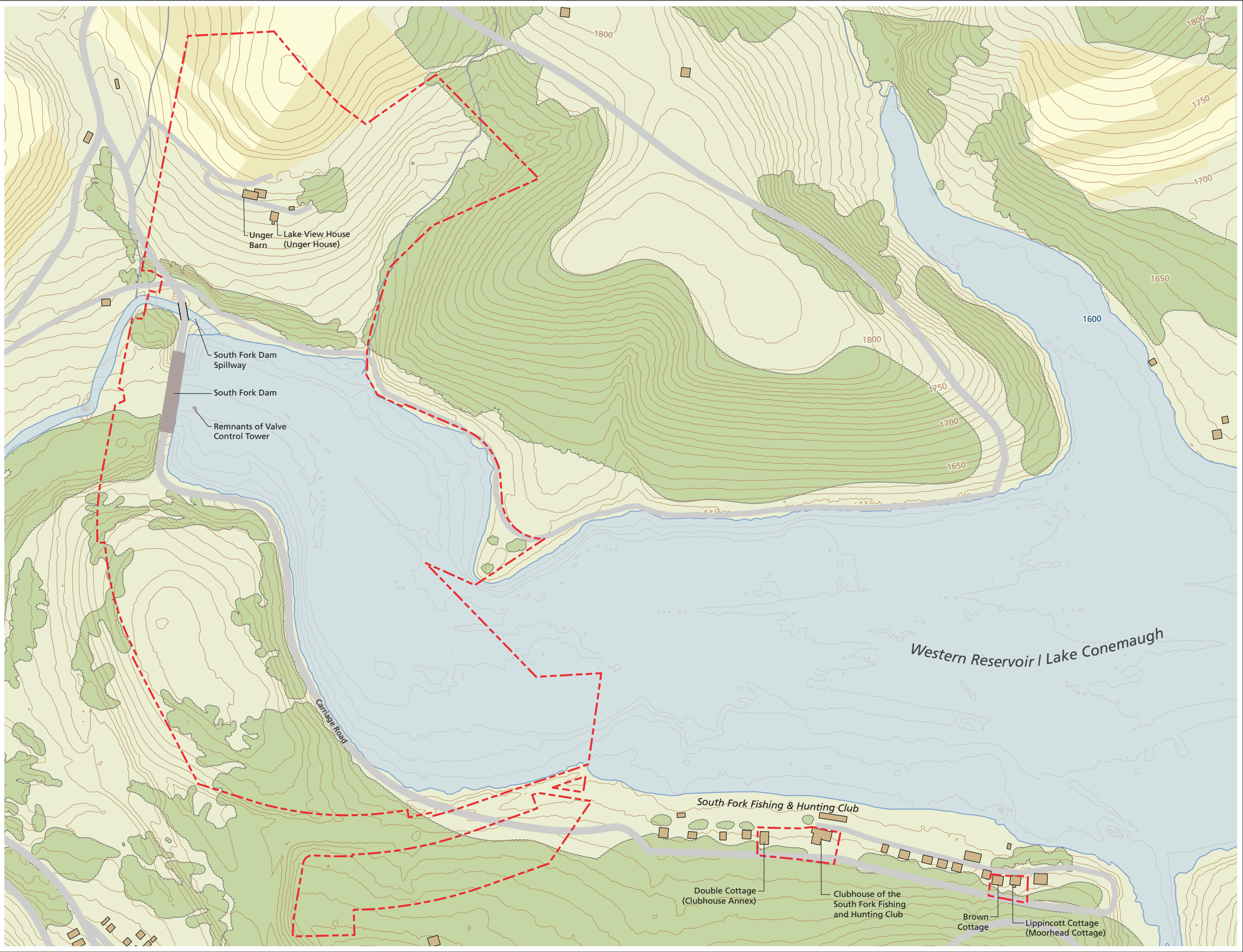
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Cultural Landscape Report

Johnstown Flood National Memorial St. Michael, Pennsylvania

1888 Period Plan



National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

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6. 1888 Period Plan, ESRI ArcMap, AutoCAD, and Adobe Illustrator CS6 Map, Emelyn Najera, 2019

DRAWN BY

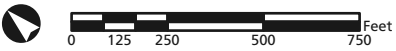
Kelsey Little, ArcGIS Pro 2.5, 2020

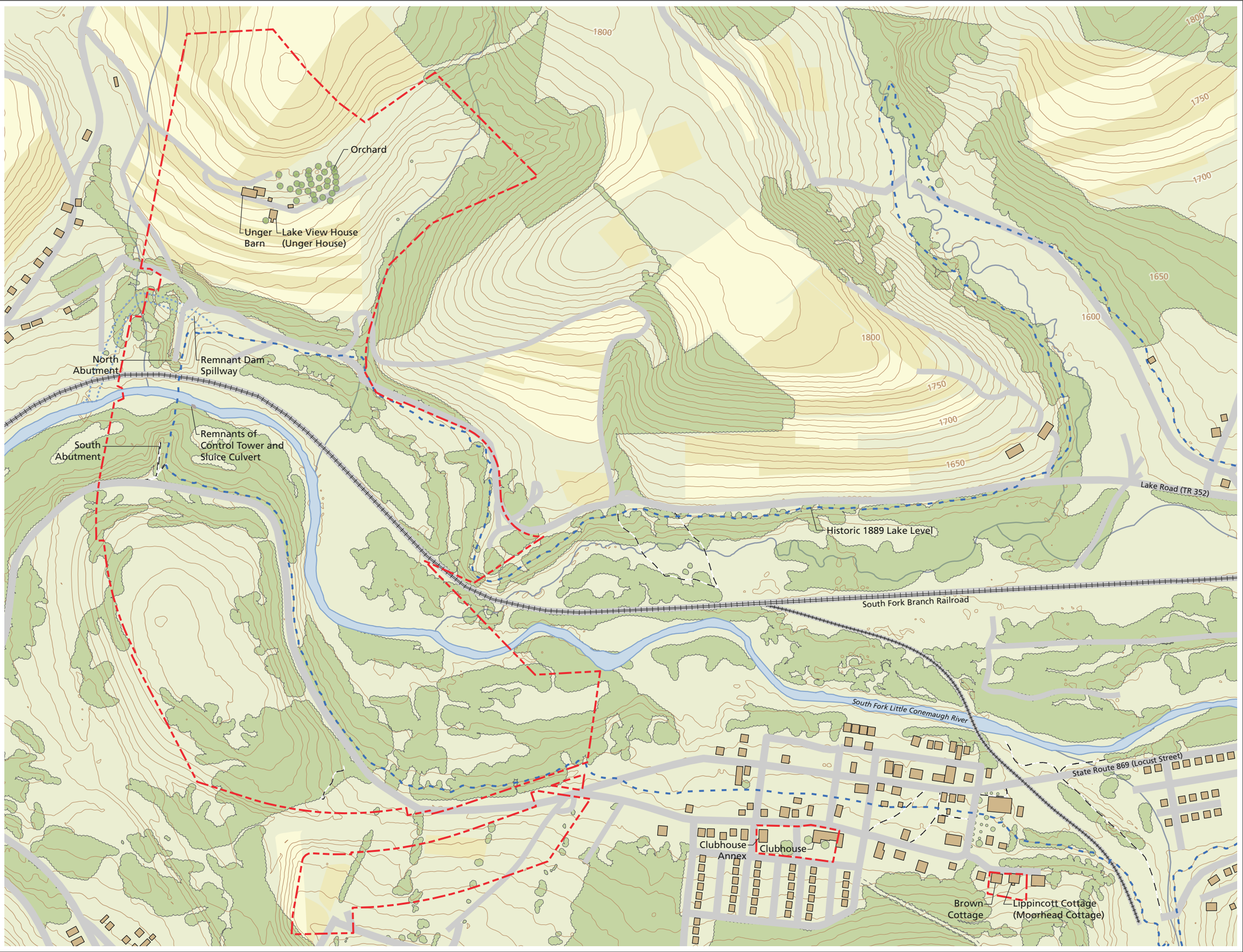
LEGEND

- Park Unit Boundary
- South Fork Little Conemaugh River
- Building
- Road
- Vegetation Canopy
- Agricultural Field
- Meadow

NOTES

1. Projection: NAD 1983 UTM Zone 18N
2. Contour Interval = X' - 10"
3. All features shown in approximate scale and location





Cultural Landscape Report

Johnstown Flood
National Memorial
St. Michael, Pennsylvania

1939 Period Plan



National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

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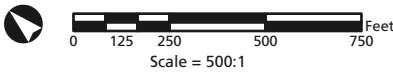
Kelsey Little, ArcGIS Pro 2.5, 2020

LEGEND

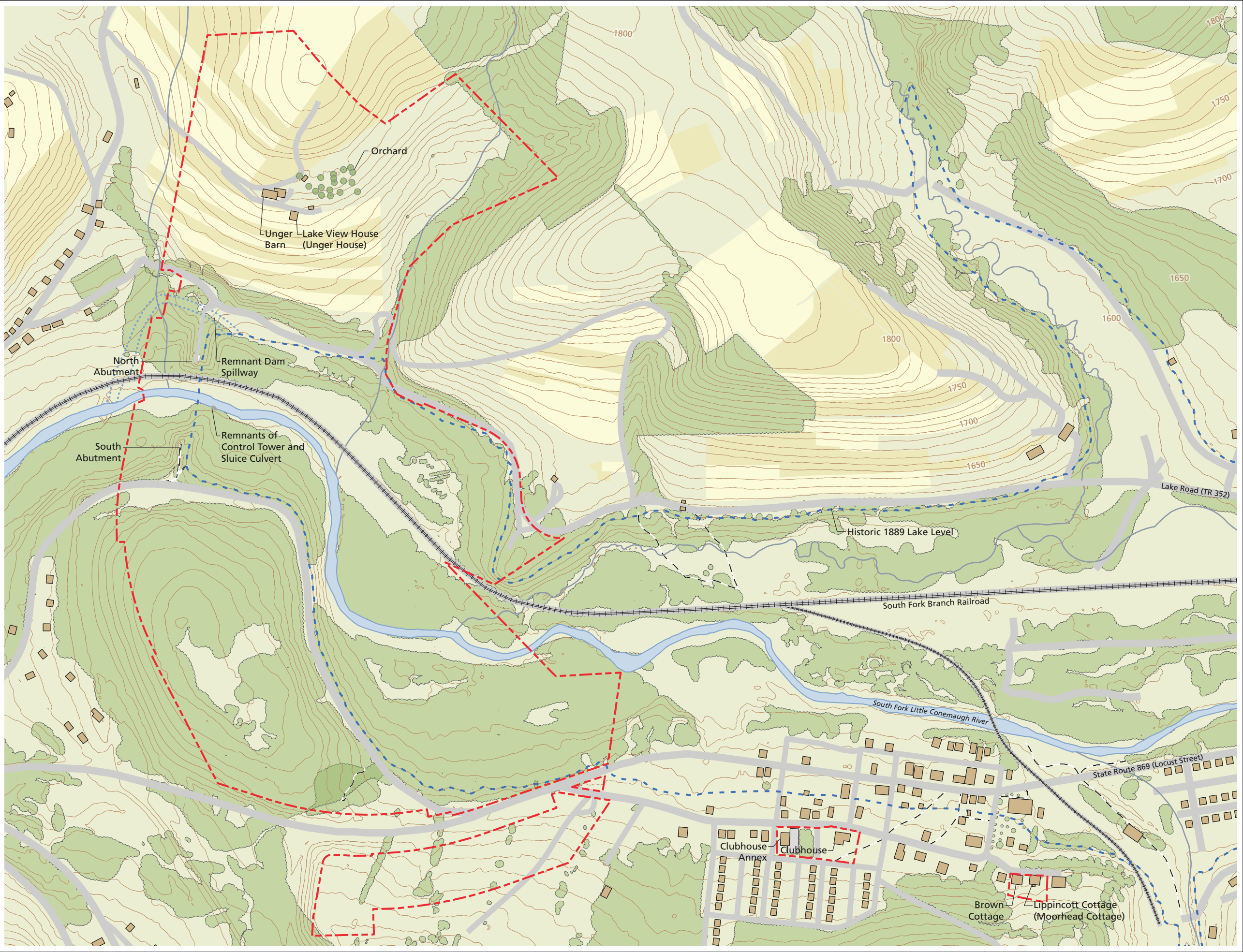
- Park Unit Boundary
- Historic Lake Level
- South Fork Little Conemaugh River
- Building
- Road
- Vegetation Canopy
- Agricultural Field
- Meadow
- Railroad
- Pedestrian Path

NOTES

1. Projection: NAD 1983 UTM Zone 18N
2. Contour Interval = X' - 10"
3. All features shown in approximate scale and location



Drawing 1.2



Cultural Landscape Report

Johnstown Flood National Memorial St. Michael, Pennsylvania

1964 Period Plan



National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

SOURCES

1. United States Geological Survey
2. Aerial Orthoimagery, Flown May 26, 1958, Penn Pilot Aerials
3. 1939 Period Plan, ESRI ArcMap, AutoCAD, and Adobe Illustrator CS6 Map, Emelyn Najera, 2019

DRAWN BY

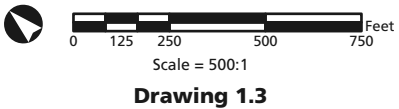
Kelsey Little, ArcGIS Pro 2.5, 2020

LEGEND

- Park Unit Boundary
- Historic Lake Level
- South Fork Little Conemaugh River
- Building
- Road
- Vegetation Canopy
- Agricultural Field
- Meadow
- Railroad
- Pedestrian Path

NOTES

1. Projection: NAD 1983 UTM Zone 18N
2. Contour Interval = X' - 10"
3. All features shown in approximate scale and location





Olmsted Center for Landscape Preservation, 2019

EXISTING CONDITIONS

LANDSCAPE CONTEXT

NATIONAL PARK SERVICE OPERATIONS

LANDSCAPE CHARACTERISTICS AND FEATURES

This chapter describes the existing condition of the landscape of the Johnstown Flood National Memorial in 2019. It begins with a description of the park's regional context, followed by park operations and management. This context is followed by a description of the landscape, documenting each of the landscape characteristics which define the Johnstown Flood National Memorial. These include natural systems, spatial organization, land use, circulation, topography, vegetation, buildings and structures, views and vistas, and small-scale features. Drawings depicting existing conditions in 2019 (Drawings 2.1, 2.2, and 2.3) follow the narrative and are based on field notes (2018 and 2019), US Geological Survey orthophotographs and maps, *Vegetation Classification and Mapping at Johnstown Flood National Memorial. Technical Report* (Perles, 2006), and *Johnstown Flood National Memorial Natural Resource Condition Assessment, Natural Resource Report* (Yetter, 2014), and GIS data from Cumbria County and the National Park Service.

Detailed descriptions of contributing and noncontributing landscape features are presented in the following chapter, Analysis and Evaluation. Additional information about the buildings and structures can be found in the following historic structure reports: *The South Fork Dam HSR, Johnstown Flood National Memorial* (Unrau, 1979), *Elias J. Unger House HSR* (Rayburn and Unrau, 1986), and the *Historic Structures Report, South Fork Fishing & Hunting Club: Clubhouse, Brown Cottage, Moorhead Cottage, and Clubhouse Annex* (Balicki, 1993). More detailed information about archeological features is provided in archeological overview and assessment reports for the park, including *The Archaeology of the Johnstown Flood* (Zitter, 2001), and the *Archeological Survey Report, Archeological Investigations of the Unger House and Vicinity, Johnstown Flood National Memorial* (1989).

Since 2019, Johnstown Flood National Memorial has undertaken major landscape treatment efforts to modify the character of vegetation within the site's historic lakebed. Although the publication of this report follows the implementation of the lakebed treatment project, the landscape description provided in this chapter reflects the park's 2019 pre-treatment character. A detailed account of the lakebed vegetation clearing project can be found in the fifth chapter of this report, Record of Treatment: Lakebed Clearing.

LANDSCAPE CONTEXT

PHYSIOGRAPHIC

Johnstown Flood National Memorial is in the Allegheny Mountains section of the Appalachian Plateaus physiographic province, characterized by rolling hills and

Figure 2.1. A distant view over the lakebed from Lake View Farm at Johnstown Flood National Memorial in winter capturing the rolling hills of the Appalachian Plateaus physiographic province, 2014. (Olmsted Center for Landscape Preservation)



steep ridges comprised of hard, resistant Paleozoic sandstone (Figure 2.1). Narrow valleys, which are underlain softer carbonates and shales, catch water from large watersheds making the area prone to flooding. The steep gorge carved by the South Fork Little Conemaugh River provided an excellent location for Western Reservoir, for it held rainwater collected from a large watershed. Indeed, land in the area was warranted by speculators in canal development, including the first Supreme Court Justice of the United States, in the late eighteenth century. After canal technology became obsolete, the reservoir and its surrounding picturesque hills and valleys were reborn as a bucolic retreat for Pittsburgh's elite families until the dam failed. A decade later, the site's physiographic characteristics again determined land use when bituminous coal was discovered and extracted through underground mines within the once isolated valleys of this region.

CULTURAL

Cambria County has a long history of human use beginning with indigenous people who farmed and managed vegetation with fire. By the mid-nineteenth century, this region was primarily forested, though small land tracks in valleys were cleared and used for agriculture. In the mid-nineteenth century, the railroad industry, and the increasing propensity in the upper classes to engage in outdoor leisure pursuits, supported the growth of resorts, including Cresson Springs and the South Fork Fishing and Hunting Club. The coal industry gained a foothold and expanded in the early twentieth century, and small company towns, including St. Michael, were established. Though mining declined in the mid-twentieth century, both the coal industry and tourism influence the area's culture.

The Johnstown Flood National Memorial is a unit in the National Parks of Western Pennsylvania, which includes the Flight 93 National Memorial in Shanksville, the Allegheny Portage Railroad National Historic Site twenty miles to

the southwest, as well as Fort Necessity National Battlefield and Friendship Hill National Historic Site. The Johnstown Flood Museum, housed in the Cambria Public Library in Johnstown, interprets the Johnstown Flood of 1889, focusing on the devastation caused by the flood and the national recovery efforts.

POLITICAL

Johnstown Flood National Memorial is in southwestern Cambria County, situated in south-central Pennsylvania, approximately ninety minutes east of Greater Pittsburgh and two-and-one-half hours west of the state capital of Harrisburg. The county covers 688 square miles and has a population of 130,192 (2019). The county seat is Ebensburg, which is in Cambria Township, but the county's largest metropolitan city is Johnstown, located ten miles to the southwest (population 19,447 in 2018). The park's core straddles the Adams and Croyle townships and is bordered by U.S. Route 219 and State Route 869. Two non-contiguous park parcels are located a mile south in the village of Saint Michael (population 408 in 2010), which lies within Adams Township and was partially built in the former lakebed of Lake Conemaugh. The village is situated along State Route 869 which leads to the nearby villages of Sidman and Creslo (population together 404 in 2010), which were also partly built in the former lakebed.

NATIONAL PARK SERVICE OPERATIONS

Johnstown Flood National Memorial is open year-round and is comprised of two discontinuous sites. The remnants of the South Fork Dam, the former lakebed of Lake Conemaugh and Visitor Center at the site of the former Lake View Farm, are accessed via Lake Road in South Fork. The cottages and clubhouse are located about a mile south on Main Street in the village of Saint Michael. The grounds are open to the public daily from sunrise to sunset. There is no entry fee to Johnstown Flood National Memorial.

VISITOR SERVICES

From 1969 to 2012, the park welcomed 4,282,029 recreational visitors. Yearly visitation was lowest in 1969 with 19,700 visitors and highest in 1989 during the centennial anniversary of the flood when 333,283 visitors came to the park. Consistent with annual average visitation of approximately 150,000 people per year, in 2019 the park had 183,143 visitors.¹ Visitation occurs primarily during warmer months (April through October) and drops off in winter. Interior access to the South Fork Fishing and Hunting Clubhouse is allowed only during special events or through a prearranged group tour. Interior access to the cottages by the public is not permitted.

ADMINISTRATION

Johnstown Flood National Memorial is within the National Park Service management unit, the National Parks of Western Pennsylvania. The National Parks of Western Pennsylvania also includes the Allegheny Portage Railroad National Historic Site in Gallitzin about twenty-two miles northeast of the Johnstown Flood National Memorial, Flight 93 National Memorial in Shanksville about thirty miles to the south, Fort Necessity National Battlefield, about seventy-five miles to the southwest of Johnstown Flood, and Friendship Hill National Historic Site, about twenty-five miles west of Fort Necessity. Park staff working in conjunction with contractors and volunteers maintain the landscape at Johnstown Flood National Memorial.

FACILITY MANAGEMENT SOFTWARE SYSTEM

For the past two decades, the National Park Service has implemented the use of computer-aided facility management software to manage park infrastructure and track costs associated with its care. Accurate organization and timely updates to the Facility Management Software System enable parks to prioritize projects and create funding requests that accurately reflect asset value and condition. The cultural landscape is tracked through several Asset Types, including roads, parking areas, trails, maintained landscapes, buildings, and interpretive media. However, most assets associated with the cultural landscape are typically tracked under the “Maintained Landscape” Asset Type. A maintained landscape typically includes exterior park areas developed and improved to support operations, which includes the preservation and interpretation of cultural landscapes. To be classified as a maintained landscape, a landscape must require regular, recurring maintenance and include built features. The organization of FMSS data varies by park to reflect the specific resources for which the park needs to track costs.

At present, the FMSS data for Johnstown Flood National Memorial’s Maintained Landscape (3100) encompasses, Maintenance Grounds (16361), Unger House & Visitor Center Grounds (16312), Cottage and House Grounds (16335), and Picnic Grounds (16334) and Lakebed Grounds (16325). The vegetation growing within the former lakebed is found nested under location Lakebed Grounds (16325). For facility management purposes, this managed vegetation is asset 1690321 (Land Surface, Surface, Earth, Lakebed Grounds). Landscape condition assessment indicates the current condition of the inventory unit. Good indicates no clear evidence of major negative disturbance and deterioration by natural and/or human forces. The inventory unit’s cultural and natural values are well preserved as expected under the given environmental conditions. No immediate corrective action is required to maintain its current condition. Fair indicates clear evidence of minor disturbance, with some corrective action required within three to five years. Poor indicates clear evidence of major disturbance and rapid deterioration.

Immediate corrective action is required to protect and preserve the remaining historical and natural values.

Facility condition index (FCI) is a measure of a facility's condition at a point in time relative to other similar facilities. The FCI rating is a ratio of the cost of repair of the asset's deficiencies (deferred maintenance, recurring maintenance that has been deferred, component renewal that has been deferred, and immediate personal hazard life safety repairs) divided by the current replacement value of the asset. FCI only considers existing work orders in FMSS, so indices can be misleading if outstanding maintenance needs are undocumented. The closer the FCI value is to 1, the greater the documented maintenance needs (Good: ≤ 0.100 , Fair: $0.101-0.500$, Poor: $0.151-0.500$, Serious: ≥ 0.500).² In 2018 the FCI evaluation of the lakebed surface was .033 or good.

Asset priority index (API) is an asset evaluation process that quantifies the value of an asset in relation to the park's mission. API utilizes a numeric rating system, considering resource preservation, visitor services, and operational values, along with substitutability of the resource. The closer the value is to 100, the higher the priority.³ The API for the lakebed at Johnstown Flood National Memorial is 87. The FMSS numbers, where available, are included in the Analysis and Evaluation Features table.

LANDSCAPE CHARACTERISTICS AND FEATURES

The following section documents the general landscape characteristics and features of the landscape of Johnstown Flood National Memorial in 2018. Detailed descriptions of the evolution of each landscape characteristic and feature, as well as illustrations, are presented in the following chapter, Analysis and Evaluation.

NATURAL SYSTEMS

Natural systems and features are the natural aspects that have influenced the development and physical form of a landscape.⁴

The natural systems that have most influenced the development of Johnstown Flood include geology, hydrology, soils, and the resulting wetland ecology. When the land that became the Johnstown Flood National Memorial was chosen as the site of the Western Reservoir and South Fork Dam, it was the natural systems of the area that dictated the location. The existing geology of ridge tops of resistant Paleozoic sandstones and valleys underlain by less resistant carbonates and shales creates a landscape where steep hillsides drain into deep valleys. The lakebed of Lake Conemaugh, though shrouded in vegetation, is cut through by the South

Fork Little Conemaugh River (Figure 2.2). The large watersheds of the area make the land still prone to flooding. The area's bedrock contains significant amounts of coal, including the commercially valuable Freeport, Kittanning, and Brookeville-Clarion coal seams. The geology is typified by Glenshaw Formation, while the Casselman Formation is present in the higher elevations. Both are Pennsylvania and Mississippian age, marine-derived sediments composed of abundant sandstone and siltstone, some conglomerate layers, shale, and limestone. These geologic units are fossiliferous, containing remains of vast marshy peat swamps and wetlands. Abandoned mine lands occur throughout the watershed, mostly to the south and east of the Johnstown Flood National Memorial.

Both hydrology and soil type influence the revegetated lakebed. When a railroad was constructed in the late nineteenth century, a berm was built on the river's east side. This berm directs drainage from the tributaries on the east side of the lakebed into culverts positioned along the berms. This alteration impacts the area's hydrology by concentrating water in discrete areas (Figure 2.3). The South Fork Little Conemaugh River and its small tributaries in the park have been designated "cold water fisheries," but none are considered "high quality" waters. The South Fork Little Conemaugh River's entire length running through the park is listed as impaired by pH and metals from abandoned mine drainage by Pennsylvania's Section 303(d) list. The Section 303(d) list is of impaired and threatened waters that states submit to the Environmental Protection Agency.

The land surrounding the South Fork Little Conemaugh River includes moderately well-drained floodplain soils (Atkins silt loam and Philo silt loam). The lakebed also contains a combination of well-drained soil (Laidig loam) and poorly drained soil (Brinkerton silt loam). The park's higher elevations feature poorly drained to well-drained soils (Wharton silt loam, Cathode silt loam, Blairton silt loam, and Cookport-Ernest sandy loam) associated with upland fields

Figure 2.2. The South Fork of the Little Conemaugh River flows through the bottom of the lakebed, shrouded in vegetation in 2019. The stones of the remnant base of the control tower are visible in the center of the photograph. (Olmsted Center for Landscape Preservation)

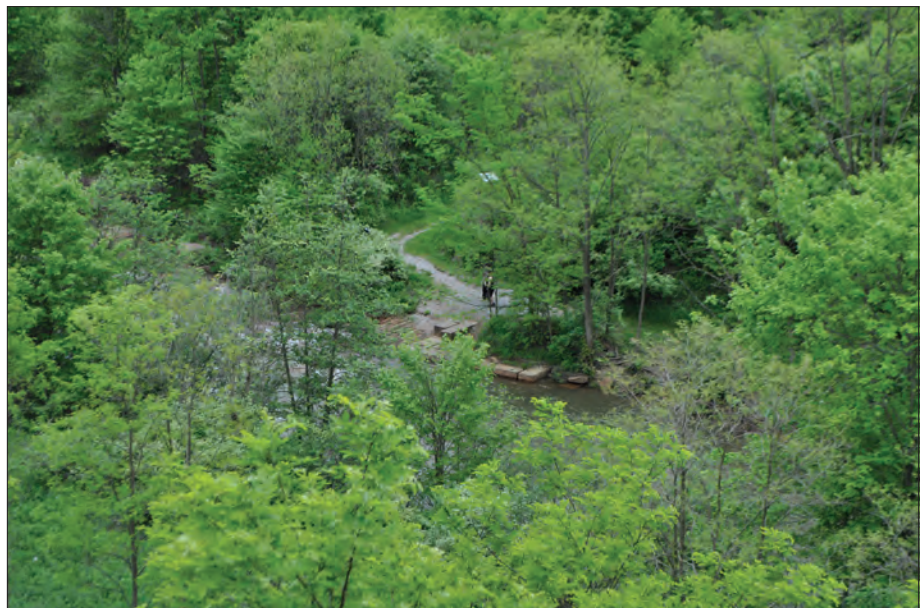


Figure 2.3. The culverts and berm from the late nineteenth century rail line concentrate water runoff in discrete areas of the lakebed supporting the growth of wetlands, 2019. (Olmsted Center for Landscape Preservation)



and forest. The soils of cottage and clubhouse properties are mapped as urban soil (Udorthents).

Throughout the lakebed's lower elevations is a mosaic of designated wetlands created by the lakebed's hydrology, soils, and environmental conditions. The wetlands were inventoried between 2007 and 2009 by Keller Engineers Inc., following the U.S. Army Corps of Engineers methods. In 2016, this inventory was updated to comply with Directors Order 77.1, which required a refined methodology defined by Cowardin et al. (1979) and to field verify the riverine and riparian buffer features. A total of twenty-three unique wetland features were delineated in the autumn of 2016, totaling 11.10 acres of palustrine wetland habitat, four acres of riverine wetland habitat, and 2.74 acres of scrub-shrub riparian buffer for a total of 17.84 acres of designated wetland habitat.

SPATIAL ORGANIZATION

Spatial organization is the three-dimensional organization of physical forms and visual associations in a landscape, including the articulation of ground, vertical, and overhead planes that define and create spaces.

Spatial organization at Johnstown Flood National Memorial is defined by the relationship between circulation routes, views and vistas, and the topography of the landscape, specifically the dam abutments and the lakebed of the former Lake Conemaugh. Though the views and vistas, the carriage road trace, and the lakebed remain in their original locations, vegetation growth is screening the topography of the former lakebed and abutments, limiting the visitor's understanding of the magnitude of the impoundment. In addition, two building clusters help define the area's spatial organization, the Lake View Farm building cluster and the South Fork Fishing and Hunting building cluster (Figure 2.4).

Figure 2.4. View of the Lake View Farm building cluster on the hillside overlooking the lakebed, 2019. (Olmsted Center for Landscape Preservation)



LAND USE

Land use describes the principal activities in a landscape that form, shape, and organize the landscape as a result of human interaction.

The two primary uses at Johnstown Flood National Memorial are interpretation and outdoor recreation. Visitors may engage in interpretative programs and exhibits at the visitor center. They may view waysides on the trails on and around the dam abutments, including a nature trail near the picnic grounds that uses part of the carriage road trace. Additional visitor and park management uses include parking in the four parking lots, administration, and management at the park offices at the Lake View House and maintenance in facilities adjacent to the picnic grounds. The South Fork Fishing and Hunting Club clubhouse is used for interpretative programming, and the cottages owned by the National Park Service are used for rental housing. The railroad running through the middle of the lakebed is still active and is operated by Norfolk-Southern. Though the meadow on the hillside south of Lake View House is not currently used for grazing, it strongly suggests the land's historic use for agriculture.

CIRCULATION

Circulation includes the spaces, features, and applied material finishes that constitute the systems of movement in a landscape.

Circulation at Johnstown Flood National Memorial includes only one contributing circulation route, the historic carriage road trace. All other existing pedestrian and vehicular circulation routes identified in the memorial landscape postdate the period of significance.

Carriage Road Trace

The longest and most intact segment of the Carriage Road Trace extends from the intersection with the Picnic Grounds Road to the parking lot at the south abutment (Figure 2.5). The earthen and grass-surfaced road travels through woodlands and is now used as a pedestrian trail. It connects to the Arbor Nature Trail, a contemporary pedestrian route that leads to the picnic grounds at the top of the hill and includes a small set of stairs at the parking lot. The crests of the dam abutments are also part of the carriage road route, and both provide access to overlooks where visitors can view the breach, river, and former lakebed. The top of the south abutment is mostly surfaced in grass except at the overlook, where the surface is gravel. The top of the north abutment is a boardwalk constructed with plastic lumber installed in 2008 to provide accessible pedestrian access to the dam. Both overlooks were rebuilt in 2009 by the park and the Youth Conservation Corps. The carriage road segment that once descended the dam's downstream face alongside the spillway is overgrown with vegetation and barely discernable. This segment was part of a now-abandoned interpretive trail that the park built alongside the downstream toe of the north abutment and down to the river.

South Abutment Road and Parking Lot

This twenty-foot-wide two-way asphalt-paved road with narrow grass shoulders and several paved gutters leads to a one-way asphalt-paved parking lot. Adjacent to the south abutment, at the site of an old cinder pit and possible location of the dam operator's house, the road divides into a one-way parking lot loop that is designed in two levels to conform to the topography. The lot is striped for twenty-six spaces and includes a wood staircase with wood rails that connects the two levels. The South Abutment Road, formerly State Route 869 and then Township Road 308, served as the primary entrance road in the park's early years. The



Figure 2.5 View of the Carriage Road Trace, just south of the South Abutment Drive, through the winter landscape, 2016. (Olmsted Center for Landscape Preservation)

existing steel guardrails and culverts were installed along the road in 1972-73 when the intersection with State Route 869 was reconfigured to improve safety.

Picnic Grounds Access Road and Parking Lot

The Picnic Grounds Access Road provides access from the South Abutment Road to the picnic grounds on the hilltop southwest of the South Abutment. The twenty-foot wide asphalt road has grass shoulders, several paved gutters, and a culvert with a stone headwall. The road, built in 1972, ends as a one-way parking lot loop with a single bay of perpendicular parking striped for twenty-two spaces adjacent to the eastern side of the road.

Lake Road Parking Lot and Trail to North Abutment

This asphalt-paved parking bay, striped for seven vehicles, is located where the alignment of Township Road 352 was shifted from its circa 1904 alignment, heading toward the spillway, to its 1960s era alignment heading up and around the Lake View Farm hillside. The six-foot-wide asphalt paved accessible trail leading between the parking lot and the North Abutment was built in the late 1980s. The trail's alignment approximates the route of the carriage road that led from the dam to the Lake View Farm when the property was owned by the South Fork Fishing and Hunting Club (Figure 2.6).



Figure 2.6. View north from the Lake Road Parking area, of the accessible trail to the north abutment. The trail alignment approximates the location of the former carriage road, 2018. (Olmsted Center for Landscape Preservation)

Figure 2.7. The entrance to the barn-like Visitor Center includes stone retaining walls, concrete sidewalks and plantings of herbaceous perennials and shrubs, 2018. (Olmsted Center for Landscape Preservation)



Visitor Center Road, Parking Lot, and Sidewalks

The Visitor Center Road, parking lot, and sidewalks were added in the late 1980s in conjunction with the construction of the visitor center at the site of the former Unger family barn. The two-way asphalt road begins north of the farm buildings at Township Road 352 and heads south, briefly paralleling the farm lane before dividing into a one-way parking lot loop, including a return loop at the north end. The parking lot is designed in two levels, striped for fifty-nine vehicles and two buses, to conform to the hillside terrain. Both the road and parking lot included culverts and drop inlet drains. Concrete sidewalks, steps with steel railings, and an accessible ramp with steel railings extend throughout the parking lot and connect to a concrete sidewalk and stone-paver patio at the visitor center entrance (Figure 2.7). The concrete sidewalks range in width from six to ten feet, while the stone pavers vary in dimensions.

Service Road and Parking Area

The service road extends east from a junction with Lake Road just south of the entrance to the Visitor Center parking lot to a small parking area east of the Lake View House. The northern section is paved in concrete. The section from the visitor center to the Lake View House features an earthen and gravel surface with inlaid precast road stabilizer units to minimize erosion. The small concrete paved staff parking area is built into the hillside and on three sides by mortared stone retaining walls. The park converted this earthen and gravel lane, which was once the entrance into the core of the farm, in the late 1980s into a service road after completing the Visitor Center Road and parking lot.

South Abutment Loop Trail

The National Park Service constructed a loop trail at the south abutment in the late 1970s to enable visitors to access the river and the ruins of the sluice. The South Abutment Loop Trail, constructed in the late 1970s, is an earthen-grassed pedestrian trail that begins near the southern edge of the south abutment and descends the upstream dam face to the South Fork Little Conemaugh River and the Sluice ruins before passing through the dam break. The trail then leads around the downstream dam face before ascending the South Abutment downstream face back to the South Abutment Parking Lot. Both ends of the trail traverse steep terrain and thus include numerous wood staircases, some of which include wood railings. The widths of the various surfaces range between four and eight feet.

Arbor Nature Trail

The Arbor Nature Trail, an earthen and gravel pedestrian trail approximately eight feet wide, currently extends from the north end of the Picnic Grounds to link with the Carriage Road Trace. The park likely constructed this trail soon after developing the picnic grounds between 1972 and 1973 to provide a connection between the picnic grounds and the south abutment.

Maintenance Yard and Vehicle Parking

The rectangular-shaped maintenance yard, surfaced in gravel, is located at the end of a short service drive just north of the picnic area and provides workspace and storage for materials and vehicles. The first permanent building, a maintenance shop, was constructed in 1985 at the south end of the yard, and in 1996 the yard was extended to the north for construction of the maintenance office.

Parking Area at Clubhouse

The South Fork Fishing and Hunting Club clubhouse's parking area, an earthen and graveled area to the northwest of the building, is accessed from Main Street. During the many decades that the clubhouse functioned variously as a hotel, rooming house, and restaurant, the area northwest of the building was presumably used for parking, although the layout of the parking is not known.

TOPOGRAPHY

Topography is the three-dimensional configuration of a landscape surface characterized by features (such as slope and articulation) and orientation (such as elevation and solar aspect).

Engineer Sylvester Welch first selected the forested site for the South Fork Dam and Western Reservoir in response to its natural topographic features, including

the deep, relatively narrow ravine cut by the South Fork Little Conemaugh at the point where several mountain streams converged with the river. The approximately seventy-two-foot-high earthen dam was constructed between 1839 and 1853, altering the natural topography dramatically and flooding the now cleared forest land with water. When the South Fork Fishing and Hunting Club converted the unmaintained reservoir and broken dam into a recreational lake and resort, they again responded to the landscape's topography and altered it. They constructed the carriage road by lowering the crest of the dam ten feet to widen it to allow two carriages to pass. Lake View Farm was sited to the north of the dam on a south-facing hillside to allow for views overlooking Lake Conemaugh and passive solar heat and light. A large barn was banked into the south-facing slope. In St. Michael, construction of the clubhouse, cottages, boardwalk fronting the lake, and the carriage road behind the cottages resulted in changes to the topography, especially in the steep terrain southeast of the clubhouse. The dam's collapse formed the site's current topography of remnant abutments separated by a two-hundred-and-fifty-foot gap (Figure 2.8). Late nineteenth century and twentieth-century transportation routes and land use also mold the memorial's topography.

A train track, constructed in 1891 on a raised berm to minimize river washouts, runs along the east side of the river and through the lakebed and the gap in the dam. A banked and flattened Route 869, created from an upgraded road in the 1930s, follows the southwestern shoreline. National Park Service-era parking lots, access roads, trails, and the visitor center have also impacted the topography, smoothing curves, and flattening hilltops to allow for these new land uses.



Figure 2.8. In this view of the north from the south abutment the enormous landforms are lost under the vegetation, 2019. (Olmsted Center for Landscape Preservation)

CONSTRUCTED WATER FEATURES

Constructed water features are built features and elements that utilize water for aesthetic or utilitarian functions.

As water is no longer held within the lakebed of the former Lake Conemaugh, nor does it course through the spillway, there are no existing constructed water features at Johnstown Flood National Memorial.

VEGETATION

Vegetation includes the deciduous and evergreen trees, shrubs, vines, ground covers and herbaceous plants, and plant communities, whether indigenous or introduced in a landscape.

There are four existing vegetative communities that remain on land owned by the National Park Service that were present during the period of significance and thus contribute to the historic integrity of the property. They are the forested downstream face of the Dam Abutments (1), the open meadows and fields on hillside south of Visitor Center (2), forest vegetation on hill southwest of South Dam Abutment (3) and the Old Field Vegetation growing within the historic lakebed (4).

Forested Downstream Face of the Dam Abutments

On the downstream sides of the dam abutments, mature hemlocks and maples dominate the south abutment face while red maple, black locust, and cherry grow on the south face of the north abutment. Many of these trees help screen visual intrusion and noise from Highway 219, the four-lane highway that passes northwest of the dam abutments. Historic images from the period of significance suggest that trees grew on the downstream face of the dam, though they were smaller than existing trees.

Open Meadows and Fields on Hillside South of Visitor Center

The open meadows on the hillside south of the visitor center currently contains a mix of low growing graminoid and herbaceous plants of both native and non-native species. Vegetation includes little bluestem (*Andropogon scoparius*), nodding fescue (*Glyceria Striata*), eastern bottlebrush grass (*Elymus hystrix*), sideoats grama (*Bouteloua curtipendula*), prairie dropseed (*Sporobolus heterolepis*), *Rudbeckia hirta*, *Chamaecrista fasciculata*, *Heliopsis helianthoides*, *Coreopsis tinctoria*, *Desmodium canadense*, *Monarda fistulosa*, among others. Invasive vegetation, including teasel and crown vetch (*Coronilla varia*), Multiflora rose (*Rosa multiflora*), and teasel (*Dipsacus sp.*) is also present.

Forest Vegetation on Hill Southwest of South Dam Abutment

The sloping hillside southwest of the south dam abutment retains its deciduous forest including mature sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), red maple (*Acer rubrum*), black cherry (*Prunus Serotina*), and other species. Please see Perles et. al. *Condition of Vegetation Communities in Allegheny Portage Railroad National Historic Site and Johnstown Flood National Memorial: Eastern Rivers and Mountains Network* summary report 2007–2009 for more information about the vegetative composition of the site.

Old Field Vegetation Growing within the Historic Lakebed

Most of the existing “Old Field” vegetation is comprised of two vegetative communities. The first is dominated by successional vegetation including red maple and black cherry, with an understory made up of primarily nonnative Morrow’s honeysuckle (*Lonicera morrowii*), multiflora rose (*Rosa multiflora*), and Japanese barberry (*Berberis thunbergii*). The second vegetative community, from which the zone gets its name, is dominated by an herbaceous subtype identified as “Old Field” by the Pennsylvania Natural Heritage Program. The “Old Field” vegetative community currently contains graminoid and herbaceous plants of both native and non-native species. The Old Field vegetative community is also prevalent on the gentle to steeply sloping fields above the former lakebed and surrounding the park’s visitor’s center (Figure 2.9).

Contemporary vegetation includes the trees and woody successional vegetation within the lakebed that screens significant views of the lakebed from the visitor center and abutments, as well as the grouping of trees between the Clubhouse and Double Cottage in Saint Michael and the forest behind the buildings. Contemporary vegetation also includes the ornamental near the Lake View



Figure 2.9. View west of the open meadow downhill from the Visitor Center is dominated by “old field” vegetation, 2018. (Olmsted Center for Landscape Preservation)

Farm visitor center and Lake View House. For detailed information about the current vegetative composition of the lakebed please see Perles et. al. *Vegetation Classification and Mapping at Johnstown Flood National Memorial Technical Report* (2006).

Successional Lakebed Vegetation

The lakebed is managed primarily as a mosaic of wetlands, grasslands, and shrubland and successional trees that comprises approximately forty-three percent of the park. In addition, a fifty-foot wide forested riparian buffer is located on either side of the South Fork Little Conemaugh River to facilitate floodplain management, wetland growth, erosion reduction, and pollution control. A few patches of conifer plantations have been allowed to remain in the south end of the park-owned portion of the lakebed, along with several acres of hardwood forest along Lake Road and upslope of wetlands. On the downstream sides of the dam abutments, mature hemlocks and maples dominate the south abutment while red maple, black locust, and cherry grow on the face of the north abutment. Shrubs cover the upstream sides of both abutments except for a few solitary mature trees along the crests of the abutments (Figure 2.10). For more detailed information about the current vegetative composition of the Johnstown Flood National Memorial please see, Perles et. al. *Vegetation Classification and Mapping at Johnstown Flood National Memorial Technical Report* (2006).



Figure 2.10. Woody vegetation covers the upstream sides of both abutments and mature trees, visible on the left side of the photograph, grow along its crest, 2019. (Olmsted Center for Landscape Preservation)

Vegetation near Lake View Farm and the South Fork Fishing and Hunting Club Clubhouse and Cottages

Existing deciduous and coniferous vegetation growing on the lots of the South Fork Fishing and Hunting Club and the cottages does not date to the period of significance, nor does the vegetation growing in the vicinity of Lake View Farm. However, the existing trees, shrubs, and turf, except where they negatively impact the preservation of structures, reinforce the domesticated character of the properties.

BUILDINGS AND STRUCTURES

Buildings are elements constructed primarily for sheltering and form of human activity in a landscape. Structures are elements constructed for functional purposes other than sheltering human activity in a landscape. Engineering systems are also structures.

Johnstown Flood National Memorial includes buildings and structures that reflect the property's use by the South Fork Fishing and Hunting Club in the 1880s. Accordingly, the buildings and structures are arranged for both functional and aesthetic considerations. Visual relationships between contributing buildings and the structures associated with the former Lake Conemaugh, including the lakebed itself and the South Fork Dam Abutments, are a character defining feature of the cultural landscape. Engineered structures, including the remnant dam abutments, spillway, and sluice ruins, are constructed of earthen and stone construction primarily, while the buildings are wood frame on stone foundations.

South Fork Dam Abutments

The earthen South Fork Dam Abutments are partially overgrown with grasses, brush, and trees. The west or downstream faces are covered with stone riprap pierced through by mid-sized deciduous and coniferous trees. The North Abutment measures twenty feet wide by 390 feet in length by seventy-two feet in height. The South Abutment measures twenty feet wide by 230 ft in length by seventy-two feet in height. The gap between the north and south abutments, marking the section of the dam that collapsed on May 31, 1889, is approximately two-hundred-and-fifty to three-hundred feet wide. Though now cloaked in vegetation, the dam abutments reveal the magnitude of the size of the former dam and contribute to visitor understanding of the tragedy.

South Fork Dam Spillway

The spillway is cut through the stone embankment just north of the dam to an approximate depth of ten feet below the crest of the former dam. The opening is two-hundred-eighty feet long and measures between sixty and one-hundred

Figure 2.11. A National Park Service-era foot bridge spans the overflow spillway which is overgrown by shrubby growth, 2018. (Olmsted Center for Landscape Preservation)



feet in width. The spillway is largely overgrown by grass and shrubs and includes delineated wetlands (Figure 2.11).

South Fork Dam Overflow Sluice Ruins

The ruins of the stone sluice culvert and the adjacent wood protective cushion of the valve control tower are located along the streambed just upstream of the breach. The cut, dressed, and coursed stones (each block is two feet wide by four feet long by one- and one-half feet high) of the sluice control foundation ruins form a rectangle. The exposed section is 15 feet wide by 21 feet long with a tiered section that is 2 feet wide by 9 feet long by 3 feet high. A 4-foot wide square section remains submerged. Several 6-inch square timbers remain from the 11 by 15- foot wood cushion east of the foundation.

Lake View Farm Structures

The Lake View House is a two-story, wood, balloon-frame house that was constructed in the vernacular Gothic Revival style as the home of the Unger family. The building measures thirty-six feet long and thirty feet wide and features a steep, wood-shingled, cross-gable roof with two brick chimneys along the primary roof ridge. The walls, including the exposed south basement wall, are clad in wood shiplap siding trimmed with corner and eave boards, while the foundation and remaining three basement walls are rubble fieldstone. A one-story pedimented porch shelters an entrance on the northeast elevation, and a full-width two-story porch with a low-pitched shed roof spans the southwest elevation. While the spring house's rubblestone foundation remains in its original location to the east of the Lake View House, the spring house's frame portion was built in 1988 in a style similar to the earlier version (Figure 2.12). Designed as a replica of the barn, the two-story Visitor Center's hillside location provides

Figure 2.12. This view looking south from Lake View Farm house and spring house, captures both the rolling hills of Cambria County and the National Park Service vegetation and retaining walls, 2019. (Olmsted Center for Landscape Preservation)



expansive views of the dam abutments and lakebed. The building features two offset rectangular blocks with asphalt-shingled side-gable roofs, vertical board walls, and a poured concrete foundation. A stone-clad entrance vestibule with a flat roof, projects at an angle from the northeast end of the building. The visitor center contains a bookstore, museum exhibits, auditorium, restrooms, and utility areas.

South Fork Fishing and Hunting Club Clubhouse and Cottages

The South Fork Fishing and Hunting Club Clubhouse and Cottages are located on the south side of Main Street in St. Michael and face north, set close to the street. The Clubhouse and Double Cottage occupy most of the block between Market and Franklin streets, with the Double Cottage at the corner of Main and Market and the Clubhouse near the center of the block facing Washington Street. The grass-covered, gently sloping lots are almost entirely open except for a grove of trees between the Double Cottage and the gravel parking area adjacent to the clubhouse. The clubhouse is a large three-story, L-shaped building with a hip roof and a wide one-story front porch. A pent roof wraps around the building between the second and third stories, except on the east side elevation of the main block. The main and pent roofs are clad in asphalt shingles and have exposed rafter tails, and corbelled brick interior chimneys are located at the north end of the east and west roof slopes. The walls are clad in beveled shiplap siding, except the east side wall of the main block, which is clad in coved shiplap siding. The porch, rehabilitated in 1992, runs along the twelve-bay north elevation with a forty-five-degree angled projection near the west end and wraps around the building's northwest corner. The porch roof also features exposed rafter tails and is adorned with slightly arched valances between each square post formed by alternating vertical boards and voids. The Double Cottage, constructed ca. 1887, is

a two-story rectangular building with a raised basement and a two-story full-width front porch (Figure 2.13). It has a truncated end-gable roof with small gables centered on the east and west side elevations, asphalt shingles, and boxed overhanging eaves. The walls are clad in vinyl siding installed ca. 1995 and vertical boards in the gable ends. Three rows of concrete block and brick corner piers inserted between the original coursed stone foundation and the first-floor sill circa 1934 raised the building and front porch two feet. The front porch has a shallow shed roof supported on square wood posts with jigsawn brackets that articulate each of the five facade bays and jigsawn boards form the porch railings (Figure 2.14).



Figure 2.13. A view of northeast facade of the Double Cottage, 2018. (Olmsted Center for Landscape Preservation).

The Brown Cottage, built in 1888 as a summer residence for the James W. Brown family and converted to a duplex in 1921, is a two-story, modest Stick Style building with an asymmetric, steeply pitched, hipped and gabled roof and a one-story wraparound front porch. The Lippincott Cottage is a three-story, Queen



Figure 2.14. In this view of the clubhouse, the gravel parking area is visible in the lower right hand corner of the photograph, 2018. (Olmsted Center for Landscape Preservation).

Anne style building featuring an asymmetric, hipped and gabled roof; a distinctive octagonal tower; and multiple projecting bays and porches. The steeply pitched roofs have asphalt shingles and exposed eaves, while the tower has a polygonal roof with flared eaves. The walls are clad in aluminum siding applied irregularly over the original coved wood shiplap siding. Some original wood shingle cladding remains on two sides of the tower at the third-floor level. The foundation is constructed of a series of masonry piers with masonry block or glass block infill. A two-story, end-gabled wing with an enclosed shed-roof porch on the east side extends south from the rear (south) west elevation. A one-story shed-roof porch spans the eastern half of the facade (north) elevation, and a two-story porch continues across the setback northwest portion of the facade. A non-historic set of wood steps leads up to the two-story porch from the road.

The Double Cottage is currently used as rental housing, the Brown Cottage houses park staff, the Lippincott Cottage is vacant, and the first story of the clubhouse is used for park programming. The upper two stories of the clubhouse are vacant.⁵ Non-contributing buildings and structures are detailed in the Analysis and Evaluation chapter and include the Visitor Center, the Maintenance Office and Maintenance Shop, the picnic pavilion, the spillway bridge, and assorted drainage culverts and retaining walls.

VIEWS AND VISTAS

*Views and vistas are the prospect created by a range of vision in a landscape, conferred by the composition of other landscape characteristics and associated features. Views are the expansive or panoramic prospect of a broad range of vision, which may be naturally occurring or deliberately contrived. Vistas are the controlled prospect of a discrete, linear range of vision, which is deliberately contrived.*⁶

Four main nodes of visitor engagement support the most important interpretative views of the lakebed and surrounding landscape. The view sheds are formed by topography and vegetation and include views from the Johnstown Flood Visitor Center/Lake View Farm, the North Abutment Overlook, the South Abutment Overlook, and the Lake Road Parking Lot. All these views are negatively impacted by the unchecked growth of woody vegetation within the lakebed and on the downstream face of the north and south dam abutments (Figures (2.15 – 2.18).

SMALL-SCALE FEATURES

*Small-scale features are the elements providing detail and diversity for both functional needs and aesthetic concerns in a landscape.*⁷

There are no existing small-scale features that date to the period of significance at Johnstown Flood National Memorial. Contemporary small-scale features

Figure 2.15. View east from the Visitor Center, to the Lakebed, 2018. (Olmsted Center for Landscape Preservation)



Figure 2.16. View from the south abutment, across the lakebed toward Lake View Farm and the Visitor Center, 2018. (Olmsted Center for Landscape Preservation)



Figure 2.17. View of the lakebed from the north abutment overlook, 2018. (Olmsted Center for Landscape Preservation)



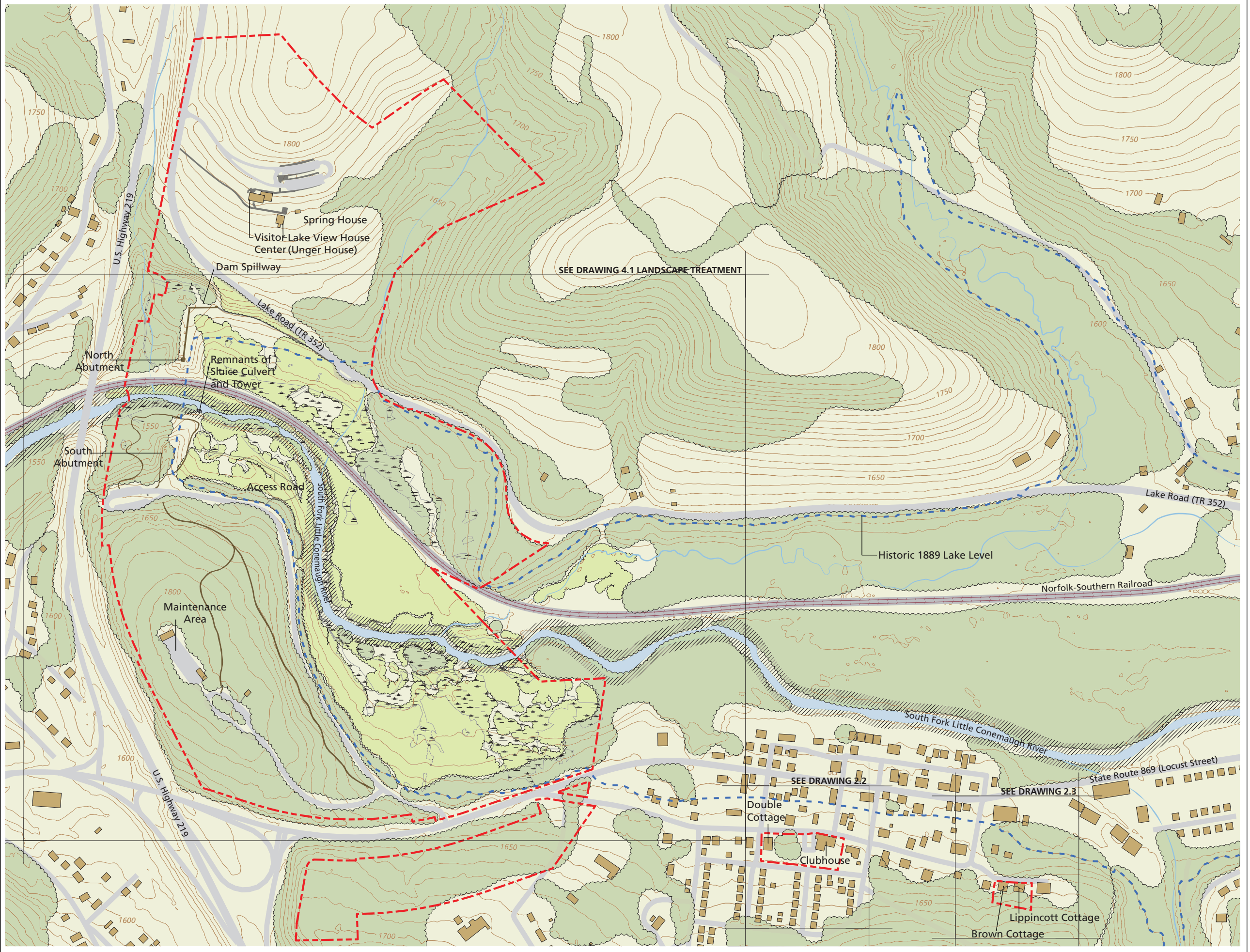
Figure 2.18. View of the lakebed from the Lake Road Parking Lot, 2018. (Olmsted Center for Landscape Preservation)



designed to support park operations include benches, fences, gates, guardrails, directional and interpretive signage, and light standards. These features are appropriate in scale and design and are compatible with the historic landscape. They are detailed in the Analysis and Evaluation Feature Table.

ENDNOTES, EXISTING CONDITIONS

- 1 Email from Doug Bosley, Johnstown Flood National Memorial Site Manager, February 2, 2021.
- 2 NPS FMSS Desk Reference Glossary (August 2015), Director's Order 80: Real Property Asset Management.
- 3 NPS FMSS Desk Reference Glossary (August 2015), Director's Order 80: Real Property Asset Management.
- 4 U.S. Department of the Interior, National Park Service, Cultural Resources, Park Historic Structures & Cultural Landscapes, Landscape Lines 3: Landscape Characteristics (Washington, DC: Government Printing Office, n.d.), 7, 9.
- 5 Laura Kline, Gretchen Pineo and, Kristen Heitert, National Register of Historic Places Nomination Form for Johnstown Flood National Memorial, (Washington, D.C.: United States Department of the Interior, National Park Service, Draft 2016). Sec. 8: 22.
- 6 U.S. Department of the Interior, National Park Service, Cultural Resources, Park Historic Structures & Cultural Landscapes, Landscape Lines 3: Landscape Characteristics (Washington, DC: Government Printing Office, n.d.), 9.
- 7 U.S. Department of the Interior, National Park Service, Cultural Resources, Park Historic Structures & Cultural Landscapes, Landscape Lines 3: Landscape Characteristics (Washington, DC: Government Printing Office, n.d.), 10.



Cultural Landscape Report

Johnstown Flood
National Memorial
St. Michael, Pennsylvania

Existing Conditions



National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

SOURCES

1. United States Geological Survey
2. 2006 Veg. Inventory, 2010 Veg. Study
3. 2014 Nat. Resource Inventory
4. Johnstown Flood National Memorial GIS

DRAWN BY

Emelyn Nájera
ESRI ArcMap, AutoCAD Map 2019,
Adobe Illustrator CS6, 2019

LEGEND

- Park Unit Boundary
- Historic Lake Level
- Wetlands
- Riverine Vegetation, 50 foot Buffer
- South Fork Little Conemaugh River
- Lidar-Derived Contours, ten-foot intervals
- Buildings and Structures
- Pedestrian Paths
- Mature Tree Canopy
- Successional Scrub Growth
- Meadow



Drawing 2.1



DRAWN BY
Emelyn Nájera, 2019
AutoCAD Map 3D, Adobe Photoshop and Illustrator CS6

NOTES
1. All features shown in approximate scale and location.

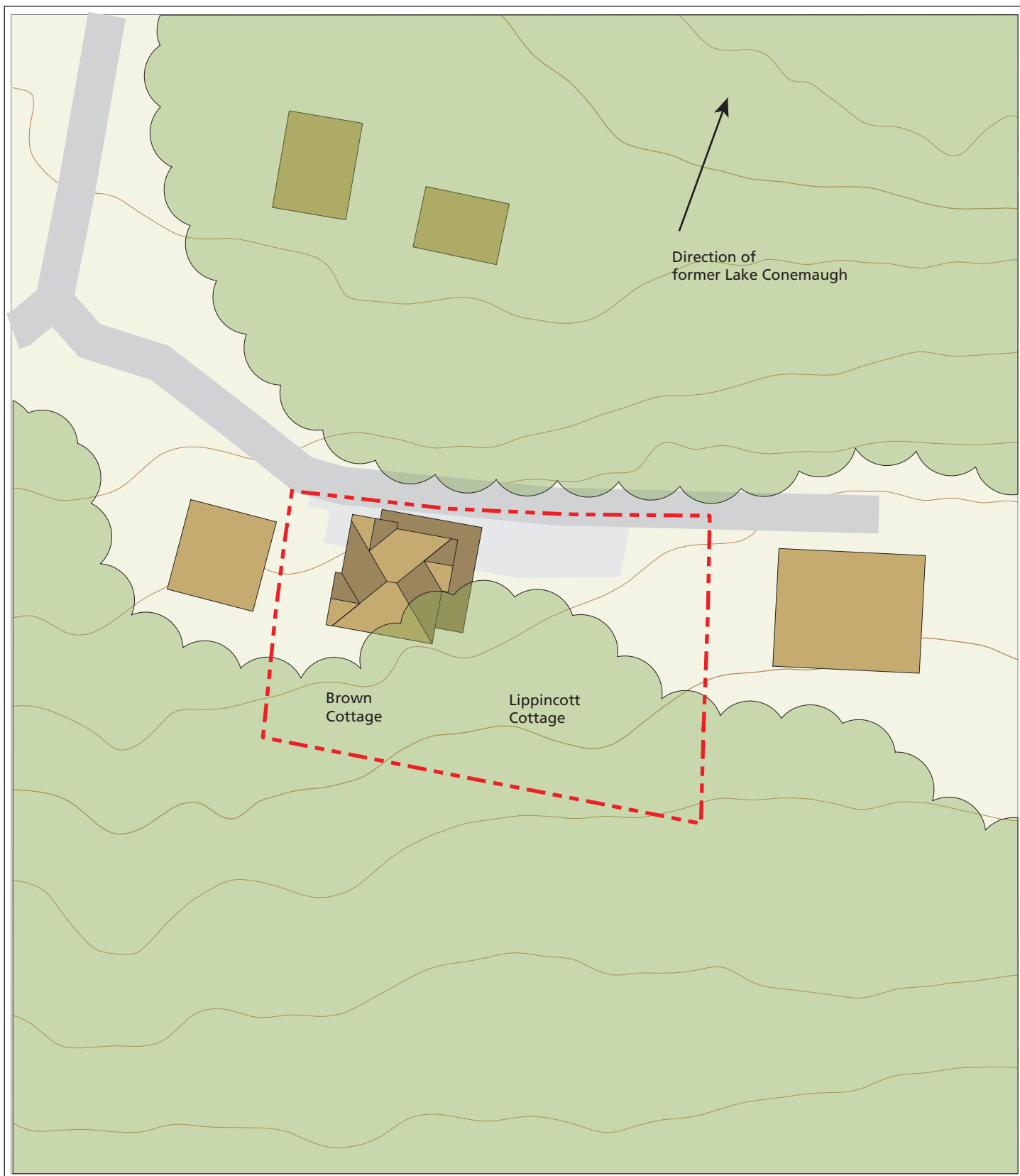
SOURCES
1. Johnstown Flood National Memorial GIS
2. 2014 National Resource Inventory
3. United States Geological Survey

LEGEND

	Gravel Parking Area		Mown lawn
	Walk		Buildings and Structures
	Streets		Historic Lake Level
	Trees and shrubs		Park Unit Boundary

Cultural Landscape Report
Clubhouse and Double Cottage
Johnstown Flood National Memorial

2019 Existing Conditions
Club House and Cottage Detail



DRAWN BY
Emelyn Nájera, 2019
AutoCAD Map 3D, Adobe Photoshop and Illustrator CS6

NOTES
1. All features shown in approximate scale and location.

SOURCES
1. Johnstown Flood National Memorial GIS
2. 2014 National Resource Inventory
3. United States Geological Survey

LEGEND

	Gravel Parking Area		Mown lawn
	Streets		Buildings and Structures
	Trees and shrubs		Park Unit Boundary

Cultural Landscape Report Brown and Lippincott Cottages Johnstown Flood National Memorial

2019 Existing Conditions Cottages Detail

0' 5' 10' **Drawing 2.3**



Olmsted Center for Landscape Preservation, 2019

ANALYSIS AND EVALUATION

NATIONAL REGISTER STATUS

EVALUATION OF LANDSCAPE INTEGRITY

ANALYSIS OF LANDSCAPE CHARACTERISTICS AND FEATURES

LANDSCAPE CHARACTERISTICS AND FEATURES SUMMARY (TABLE 3.1)

Johnstown Flood National Memorial is significant for its association with the South Fork Fishing and Hunting Club and the organization's role in one of the deadliest disasters in American history. The Johnstown Flood was caused by the failure of the South Fork Dam, which impounded Lake Conemaugh, the recreational centerpiece of a resort developed in the 1880s by members of the exclusive club. All contributing resources within the Johnstown Flood National Memorial, including the remnant earthen dam abutments, sluice ruins, the spillway, the former lakebed, and the clubhouse and cottages, are associated with the failure of the dam in May 1889 and retain integrity to the tenure of the South Fork Fishing and Hunting Club.

This chapter provides an analysis of the historical significance of the landscape of Johnstown Flood National Memorial and an evaluation of the historic character based on the findings of the site history and existing conditions chapters. This analysis and evaluation chapter has been developed according to the *National Register Criteria for the Evaluation of Historic Properties* and the National Park Service's *Guide to Cultural Landscape Reports: Contents, Process, and Techniques*.¹

The first section of this chapter reviews the landscape's significance in the existing National Register documentation and evaluates the landscape's historic integrity. The second section evaluates the historic character of the landscapes associated with the historic dam abutments, lakebed, and Lake View Farm, as well as the landscape of the South Fork Fishing and Hunting Club cottages in the town of St. Michael. This analysis is based on the National Park Service cultural landscape methodology, which organizes the landscape into characteristics and features. Each feature is then evaluated to determine whether it contributes to the landscape's historic significance and integrity. The analysis and evaluation contained within this chapter relate to the 2019 existing conditions of the Johnstown Flood National Memorial landscape and do not reflect changes that have resulted from recent treatment efforts at the park. These changes are described in chapter five, Record of Treatment: Lakebed Clearing.

NATIONAL REGISTER STATUS

The National Park Service evaluates the historical significance of properties through a process of identification and evaluation defined by the National Register of Historic Places program. According to the National Register, historic significance may be present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association. A property can be found to have significance on a national, state, or local level, and must meet one or more of the following criteria in order to be considered eligible for the National Register: (A) Association with events that have made a significant contribution to the broad patterns of our history;

(B) Association with the lives of persons significant in our past; (C) Embody the distinctive characteristics of a type, period, or method of construction, or that represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction; or (D) Has yielded, or may yield, information important in pre-contact history or history.²

As a national memorial within the National Park System, the Johnstown Flood National Memorial was administratively listed on the National Register of Historic Places on October 15, 1966, with passage of the National Historic Preservation Act. The South Fork Fishing and Hunting Clubhouse, Double Cottage, Brown Cottage, and Lippincott Cottage were included in the South Fork Fishing and Hunting Club Historic District, listed in the National Register on July 31, 1986.³ The National Register of Historic Places nomination for the Johnstown Flood National Memorial District, which only addresses resources within the national memorial's authorized boundaries, was written in 2016 and remains in draft.

According to the National Register of Historic Places nomination, Johnstown Flood National Memorial is nationally significant under National Register Criterion A in the areas of Social History and Entertainment/Recreation and locally significant under Criterion C in the area of Architecture. The period of significance for the park begins with the organization of the South Fork Fishing and Hunting Club in 1879 and ends with the Johnstown Flood of 1889 and recovery efforts in the tragedy's immediate aftermath. This approximately ten-year time period encompasses the construction or alteration of all the existing contributing resources, including the remnants of the South Fork Dam, which the club altered to create Lake Conemaugh.⁴

The Johnstown Flood National Memorial contains just over 164 acres within four discontinuous parcels and eleven contributing resources consisting of one site, four structures, and six buildings. According to the National Register of Historic Places documentation the contributing site includes the remains of the South Fork Dam and the portion of the lakebed of former Lake Conemaugh owned by the National Park Service. The five contributing structures include: the North and South Abutments of the South Fork Dam (1), the South Fork Dam Spillway (2), the South Fork Dam Sluice Ruins (3), and the Carriage Road Trace (4). The six contributing buildings include the nineteenth-century Lake View House (1) perched on the hillside north of the dam abutments and owned by South Fork Fishing and Hunting Club president Elias J. Unger, as well as the nearby rubble stone foundation of the Unger family's springhouse (2). The remaining four contributing buildings are in the village of St. Michael approximately one mile south of Lake View Farm. These include the South Fork Fishing and Hunting Club Clubhouse (3) and the Double Cottage (4) along with two residences once owned by members of the club, the Brown Cottage (5) and the Lippincott Cottage

(6). The four non-contributing resources within the Johnstown Flood National Register District are modern buildings and structures built by the National Park Service and include the park's visitor center, two maintenance buildings, and a picnic shelter.⁵

CRITERION A: SOCIAL HISTORY AND ENTERTAINMENT/RECREATION

According to the National Register documentation for Johnstown Flood National Memorial (draft 2016), the park is nationally significant under Criterion A in the areas of Social History and Entertainment/Recreation for its associations with the South Fork Fishing and Hunting Club and the Johnstown Flood of 1889 and the recovery efforts in the wake of the tragedy. The Johnstown Flood, which ranks among the worst disasters in American history for loss of life, was caused by the failure of the South Fork Dam, which impounded Lake Conemaugh, the recreational centerpiece of a resort developed in the 1880s by members of the exclusive South Fork Fishing and Hunting Club. The park's contributing resources are directly associated with the history of the club, which was established in 1879 and included among its members, some of the wealthiest families in America. Following the flood, the massive news coverage that tragedy received prompted a national disaster relief effort. The American Red Cross, founded by Clara Barton eight years before, led an effective response to the national disaster, which helped secure the organization's reputation. The media coverage also fueled class tensions that pitted the club members against flood victims who sought compensation for their losses. Though the club never accepted legal responsibility for the disaster, and none of the many civil suits brought against its members were successful, the event ultimately contributed to a significant shift in American tort law toward holding property owners liable for damages incurred as a result of their negligence.⁶

This history's significance is represented in the integrity of the two remaining earthen abutments of the South Fork Dam, the stone ruins of the overflow sluice and spillway, and the drained earthen lakebed. Other remaining historic resources include the home of the club's president, which was built as part of Lake View Farm. In addition, historic resources include the trace of a carriage road that once led over the South Fork Dam and connected Lake View Farm with the clubhouse and cottages of the South Fork Fishing and Hunting Club on the opposite shore of the former Lake Conemaugh. Several wooded areas and open meadows also contribute to the historic setting of Lake View Farm. In contrast, much of the once open lakebed has reverted to a mix of forest and shrubs. This woody vegetation screens views of the lakebed from visitors preventing them from understanding the devastating impact that the destruction of Lake Conemaugh and the South Fork Dam had on the communities downriver.

CRITERION C: ARCHITECTURE

As stated in the 1986 National Register documentation for the South Fork Fishing and Hunting Club, the buildings associated with the former club are locally significant in the area of Architecture for their unique design reflecting the rustic recreational pursuits of prominent wealthy Pittsburgh families. The four buildings owned by the National Park Service were erected along the shoreline to maximize views of the lake. Constructed in a vernacular Queen Anne-style, the houses were typically three-stories with high ceilings, elongated windows, and covered porches to maximize views of the lake. Although called “cottages,” many of the houses were substantial in size.

The National Register documentation noted that the Queen Anne-style architecture of the Lippincott Cottage was the best example of its kind in Adams Township and neighboring Croyle and Summerhill Townships. “Its large mass, intricate detailing, and juxtaposition of porches, gables, and turret are far more sophisticated than the plan and rudimentary designs of the few other Queen Anne style houses located in these townships.”⁷

EVALUATION OF LANDSCAPE INTEGRITY

According to the National Register of Historic Places, integrity is the ability of a property to convey its significance through physical resources. The National Register program identifies seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association. Retention of these qualities is necessary for a property to convey its significance; however, not all seven aspects must be present for a property to retain integrity. A basic test of integrity is to judge whether a participant in the historic period would recognize the property and its features as they exist today. That is to say, if Elias Unger and other members of the South Fork Fishing and Hunting Club were to return today, would they quickly recognize the dam, lakebed, Lake View Farm, and the grounds of the cottages and club? By preserving its contributing historic characteristics and features, the park retains integrity and conveys its historical significance through its location, setting, design, materials, workmanship, feeling, and association.

LOCATION

The National Register defines location as the place where the historic property was constructed or the place where the historic event occurred. Johnstown Flood National Memorial encompasses the abutments of the South Fork Dam, spillway, remnants of the sluice culvert and valve control tower, and a portion of the former lakebed (Figure 3.1). It also includes Lake View Farm, once owned by club president Elias Unger on the hillside overlooking the dam and lakebed, and

Figure 3.1. View west toward the cluster of buildings comprising Lake View Farm on the hillside overlooking the dam remnants, 2018. (Olmsted Center for Landscape Preservation)



four former buildings associated with the South Fork Fishing and Hunting Club in the town of St. Michael. In St. Michael, though the relationship between the buildings and the former shoreline of Lake Conemaugh is difficult to discern due to subsequent development, the buildings remain in their original locations.

DESIGN

Design is the combination of elements that create the form, plan, space, structure, and style of a property. The trapezoidal-shaped earthen and masonry dam's original length and width are apparent in the remnant dam abutments, though covered in shrubs and small trees on the upstream face and mid-sized woody vegetation on the downstream face. The cut for the spillway is visible, although it is overgrown with small trees, while the functions of the sluice culvert and valve control tower can be understood in their stone and wooden remnants at the base of the dam. The park has returned the Lake View House and spring house to their approximate 1880s appearances, and the design of the visitor center gestures to the character of the former Unger family barn. Despite the loss of the original block of the clubhouse and alterations by post-club period owners, the former club buildings retain many exterior design characteristics, including their front porches that once overlooked Lake Conemaugh.

SETTING

Setting is the physical environment of a property and the general character of the place. The South Fork dam's failure and subsequent draining of Lake Conemaugh dramatically changed the setting from a quiet and scenic lake resort to a muddy swath of land one mile wide stretched between the untouched farm and cottages of the South Fork Fishing and Hunting Club. Fourteen miles away, the water released by the dam destroyed much of the city of Johnstown. Years later, the dam's remnants and the farm and cottages would be preserved as a

national memorial commemorating the tragedy of May 31, 1889. Therefore, the remnants of the dam and its associated structures, as well as the contours of the lake basin of the former Lake Conemaugh, contribute to the authenticity of the setting of the Johnstown Flood and are consistent with the park's purpose. The rural setting of the Lake View Farm overlooking the dam and lakebed is also appropriate. However, there have been significant alterations to the setting outside the memorial boundaries, including the construction of the U.S. Highway 219 overpass bridge to the north and west of the dam abutments and development on adjacent lands. In addition, in St. Michael, the setting of the cottages and clubhouse has undergone dramatic change, with the construction of residential and commercial buildings to the immediate north of the cottages, where once the waves of Lake Conemaugh lapped against the shore.

MATERIALS

Materials are the physical features, combined or deposited during the period of significance in a particular pattern or configuration, give form to the property. This aspect of integrity is apparent at the South Fork Dam. Visitors can appreciate the structure's original construction, visible in the stone riprap on the downstream face and the masonry stone and log cribbing in the remnants of the sluice culvert and valve control tower. Original architectural materials are also extant in the farmhouse at Lake View Farm and in the clubhouse and cottages in St. Michael.

WORKMANSHIP

Workmanship is the physical evidence of the crafts and construction methods used during the specified historic period of significance. Visitors to Johnstown Flood National Memorial can still understand the workmanship of the original portions of the dam represented in the extant abutments. For example, the extant boulders on the dam abutments' downstream faces were placed in steep terrain by the original builders of the dam. In contrast, the gap in the dam represents the club's poorly reconstructed section.

FEELING

Feeling is the expression of the aesthetic or historic sense of a particular time resulting from the presence of physical features that, taken together, convey a property's historic character. The feeling of seclusion and rustic character of the former private resort is experienced on the wooded carriage road trace that tracks along the hillside southwest of the south abutment and provides glimpses of the lakebed. The feeling of profound tragedy is evoked by the large gap of the South Fork Dam and by the contours of the drained lakebed. Both experiences are hindered by the continued growth of trees obscuring the former lake's size

and thus the magnitude of its destruction. Beyond the boundary of the memorial, the sight and sound of Highway 219, passing northwest of the dam abutments, intrudes on the feeling of solemnity. Traffic on Lake Road and the active Norfolk-Southern railroad tracks through the lakebed also encroach on the property's overall feeling of seclusion.

ASSOCIATION

Association is the direct link between an important event or person and the property. The memorial's contributing features represent its significant history associated with the South Fork Fishing and Hunting Club, including the remnants of the South Fork Dam and sluice, the spillway and lakebed, as well as Lake View Farm and the club's clubhouse and cottages in St. Michael.

ANALYSIS OF LANDSCAPE CHARACTERISTICS AND FEATURES

This evaluation documents the extent to which the cultural landscapes of Johnstown Flood National Memorial reflect the landscape character they had during the historic period of significance. The cultural landscape evaluation process consists of comparing historic conditions with existing conditions according to the findings of the site history and existing conditions chapters. While the cultural landscape evaluation is similar to the National Register evaluation, it is organized by landscape characteristics and features, rather than by resources, and assesses character rather than integrity. Features specifically described and evaluated in the National Register of Historic Places documentation are marked with an asterisk (*) following the cultural landscape evaluation.

Landscape characteristics and features are tangible aspects that define a landscape's overall appearance and aid in understanding its cultural value. These characteristics include spatial organization, topography, views and vistas, circulation, vegetation, buildings and structures, small-scale features, and archeological features for the landscapes associated with the Johnstown Flood National Memorial. Findings of the following cultural landscape evaluation are defined as follows:

- **Contributing features** are features that were present during the period of significance, retain their historic character, and are associated with the historic significance of the cultural landscape. Those that add prominently to the historical associations and qualities for which the landscape is significant are described as character defining.

- **Non-contributing features** are features that were not present during the period of significance and are not associated with the landscape's historic significance. Non-contributing features that are incompatible with the historic character of the landscape, particularly in relation to historic materials, size, scale, proportion, and massing, are described as detracting. Features distinguishable from the historic character of the landscape but relate to historic materials, size, scale, proportion, and massing, are described as compatible.
- **Unevaluated features** are those features for which physical or historical documentation is insufficient or inconclusive. Further research may provide an evaluation of either contributing or non-contributing.

NATURAL SYSTEMS

Natural systems are the natural aspects that influence the development and physical form of the landscape. Though natural systems, including the site's geology, soils, and hydrology, helped precipitate the Johnstown Flood of 1889, for this analysis, only one natural feature was present during the period of significance and remains within the Johnstown Flood National Memorial. The natural feature that contributes to the memorial's historic significance and integrity is the South Fork Little Conemaugh River. Designated wetlands, while compatible with the cultural landscape, do not contribute to its significance and integrity.

South Fork Little Conemaugh River

Historic Condition: The South Fork Little Conemaugh River's natural course was significantly altered by the construction of the South Fork Dam between 1839 and 1853 and its reconstruction between 1879 and 1881. As initially designed, the South Fork Dam impounded water from the river, which was then released into five sluice pipes when the lake level rose too high. The 1889 breach in the dam left behind the muddy lakebed of the former Lake Conemaugh with the South Fork Little Conemaugh River flowing through the bottom of the basin.

Post-historic and Existing Conditions: Following the sale of the former lakebed by the South Fork Fishing and Hunting Club, in the 1890s, a railroad line raised on an earthen berm to combat flooding was constructed to the east of the river. Though the river's course has been slightly altered since the period of significance and the water quality has been severely impacted by subsurface mine drainage, the river retains its defining characteristics, including its location in relation to the dam abutments and the lake basin.

Two small unnamed tributaries feed the South Fork Little Conemaugh River flowing through the park. Near the town of South Fork, the South Fork Little

Conemaugh River then flows into the Little Conemaugh River before joining with the Stonycreek River to form the Conemaugh River at Johnstown. The Conemaugh River then flows to the Kiskiminetas, the Allegheny, and the Ohio Rivers before emptying into the Mississippi River.

Evaluation: Contributing

Designated Wetlands

Historic Condition: The existing wetlands were not present during the historic period of significance.

Post-historic and Existing Condition: Within the lakebed of the former Lake Conemaugh, a total of twenty-three unique wetland features (17.84 acres) have been delineated including 11.10 acres of palustrine wetland habitat, four acres of riverine wetland habitat, and 2.74 acres of scrub-shrub riparian buffer. Of the palustrine wetlands, 7.96 acres were considered emergent wetland where vegetation tends to be low growing and where systems appear to be seasonally saturated or flooded. Palustrine scrub-shrub wetlands comprise another 2.88 acres of the palustrine wetlands (Figure 3.2). Within these areas, vegetation is dominated by tall shrubs including willow (*Salix sericea*) and alder (*Alnus incada sub. Rugose*).⁸

Evaluation: Non-Contributing, compatible

SPATIAL ORGANIZATION

At Johnstown Flood National Memorial, the historic spatial organization, or the three-dimensional organization of physical forms and visual associations, is relatively intact since the end of the period of significance. The three areas

Figure 3.2. View from the north abutment of designated wetlands east of the South Fork Little Conemaugh River and the rail road, 2018. (Olmsted Center for Landscape Preservation)



that contribute to the memorial landscape's significance and integrity are the lakebed of the former Lake Conemaugh, the South Fork Fishing and Hunting Club Cottage Cluster, and the Lakeview Farm cluster. These spatial organization areas are defined by the landscape's circulation, vegetation, and buildings and structures. All these aspects are addressed in detail below.

Lakebed

Historic Condition: Constructed 1838–53; altered 1862, 1880, and 1889. The reservoir, which was limited to a fifty-foot depth at the dam in 1853, covered an area of 424.85 acres, stretched upstream for about two miles, and was nearly a mile wide in some places. In May 1889 the high-water level of Lake Conemaugh reached the 1604 contour elevation approximately just before the dam's failure. Following the breach in the dam, the water drained out of the basin revealing the muddy contours of the lakebed.

Post-historic and Existing Condition: Following the failure of the dam, areas of the lakebed were used for cultivating crops and grazing. An area in the southern section of the lakebed owned by the National Park Service was planted out in a pine plantation, while successional shrubs and trees grew on fallow land. Beginning in the late 1970s, after the acquisition of the property by the National Park Service, occasional campaigns of tree clearing in the former lakebed began. This cycle of tree removal and growth continued through 2008, when tree removals from the lakebed ended. Today the lakebed consists of fifty acres of the original four hundred to five-hundred-acre bed of Lake Conemaugh, lying between Lake Road on the north and the South Abutment Road on the south. Though the contours of the lakebed are shrouded in woody vegetation the lakebed retains its character defining basin shape and location (Figure 3.3).

Evaluation: Contributing

South Fork Fishing and Hunting Club Cottage Cluster

Historic Condition: The core of the South Fork Fishing and Hunting Club was on the southwestern shore of Lake Conemaugh, about one mile upstream from the South Fork Dam. The first building constructed was the clubhouse in 1881, which was built on the lakeshore and oriented northwest-southeast so that its front façade and covered porch would face the lake. In addition to functioning as the center of club activities, the siting of the clubhouse influenced the location of the private cottages that were built in subsequent years.

By 1888, four single cottages and a double cottage were located northwest of the clubhouse and ten cottages were situated southeast. Like the clubhouse, the cottages were oriented toward the lake in a row with front porches to capture lake breezes and views. Boathouses and docks extended out into the lake and were

connected to the boardwalk with dirt paths. Privies, ice houses, carriage houses and barns were located behind the cottages on the carriage road so as not to block the panoramic lake views.⁹

Post-Historic and Existing Conditions: The club house and cottages owned by the National Park Service remain in their original locations and retain their original orientation toward the north, though Lake Conemaugh no longer exists.

Evaluation: Contributing

Lake View Farm Cluster

Historic Condition: At Lake View Farm, on the hillside overlooking the South Fork Dam and Lake Conemaugh, the main house was perched on the slope to allow views south and west toward the Lake Conemaugh. Auxiliary farm buildings, the barn carriage house and springhouse, were intentionally located behind the house so the view from the house and its two-story porch would not be hindered. Fences around the house and outbuildings, and along some of the property lines, further defined spaces, though the exact location of fencing is not known.

Post-historic and Existing Condition: The Lake View Farm was active and productive for decades after the period of significance. Although a few new structures were added, the overall spatial organization of the farm remained consistent. The most significant changes began when farm production declined and several old or unneeded outbuildings were removed, or in the case of the barn and carriage and wagon shed, collapsed from neglect of maintenance. In the late 1980s, the park constructed a new visitor center at the site of the old barn, which

Figure 3.3. View of the lakebed, shrouded in woody vegetation, from the South Abutment, 2018. (Olmsted Center for Landscape Preservation)



offered excellent views of the dam, lakebed, and clubhouse/cottages. Mindful of the important spatial relationship between the Lake View House and the dam and former lakebed, the park located the visitor parking lot and access road uphill from the visitor center so as not to block the historic views down the hill. Today the structures associated with Lake View Farm retain their approximate locations relative to each other and the lakebed preserving the Lake View Farm Cluster.

Evaluation: Contributing

LAND USE

Land use describes the principal activities in a landscape that form, shape, and organize the landscape as a result of human interaction. During the period of significance, the land that comprised the Johnstown Flood National Memorial was used for both farming and private recreation (including sailing, boating, fishing, and hunting). Only farming, as represented in the meadows south of Lake View Farm, remains as a contributing land use today.

Historic Condition: In 1853 the South Fork Dam and Western Reservoir were completed by the Commonwealth of Pennsylvania to provide a reliable supply of water to the canal in Johnstown. In 1857 the Pennsylvania Railroad Company purchased the entire Main Line works, leaving the dam and reservoir virtually unattended. Following a breach in the dam, vegetation grew up within the partially drained lakebed. In the years that followed, farmers cultivated fields and grazed livestock in the lakebed, while locals fished in pools that remained near the broken dam.

In 1879 the South Fork Fishing and Hunting Club purchased the dam and former reservoir, now a mostly empty lakebed, for use as a private resort where wealthy families from Pittsburgh could hunt, fish, and enjoy the outdoors. The dam was rebuilt in 1880-81, and the refilled impoundment was named Lake Conemaugh. A clubhouse and private cottages with docks and boathouses were built on the lake's southwestern shoreline. Elias Unger purchased what would become Lake View Farm on the northern border of the lake. Unger cultivated field crops and meadows for grazing on the hillsides around the farmhouse and barn, allowing for views of Lake Conemaugh and the dam below. Use of the land as an idyllic resort ended with the dam break and flood on May 31, 1889, after which the club disbanded.

Post-historic and Existing Condition: New land uses were introduced in and around the former Lake Conemaugh soon after the tragic events of May 1889. In 1891, the South Fork Branch Railroad, a subsidiary of the mainline of the Pennsylvania Railroad, built a rail line through the bottom of the empty lakebed and the breach in the dam. By 1904, they had added a second track and a multi-

track railyard in the southeastern portion of the former lakebed. On the lake's southwestern shore just southeast of the club cottages, the Maryland Coal Company opened a mine in 1907 and established the company town of St. Michael. The company purchased the former cottages for employee housing and built additional houses nearby. Another developer purchased the clubhouse and possibly the double cottage for use as a hotel and restaurant. On the lake's northeastern shore, the Lake View Farm was sold to a series of owners who worked the fields and raised livestock. Local roads were also built in portions of the lakebed and along the shorelines. Some of the roads were eventually improved as part of the state highway system. During this time, areas of the lakebed that were not developed reverted to woodlands, including one area set out as a conifer plantation (outside the national memorial's boundaries).

Land uses in the area changed again in the 1950s and 1960s, beginning with the mine's closure around 1958 and the construction of U.S. Route 219 northwest of the dam in the mid-1960s. In 1964 Congress authorized Johnstown Flood National Memorial as a unit of the national park system to commemorate the Johnstown flood and to preserve the remains of the dam and portions of the lakebed. The park's initial land acquisitions included the dam abutments, a small portion of the lakebed, and a hill to the southwest where the park developed a picnic area, parking lot, and later a maintenance facility. Two boundary increases in the 1970s allowed the park to acquire additional lands in the lakebed, the former Lake View Farm, and other lands for use as a scenic buffer. Another boundary increased again in 2006 when the National Park Service gained ownership of the former South Fork Fishing and Hunting Club clubhouse and cottages.

Today at Johnstown Flood National Memorial, visitors may engage in interpretative programs and exhibits at the visitor center. They may view waysides on the trails on and around the dam abutments, including a nature trail near the picnic grounds that uses part of the carriage road trace. Additional visitor and park management uses include four parking lots, park offices at the Lake View House, and maintenance facilities adjacent to the picnic grounds. The clubhouse is used for interpretative programming, and cottages owned by the National Park Service are used for rental housing. The railroad running through the middle of the lakebed is still active and is operated by Norfolk-Southern.

Agricultural Use

Historic Condition: During the period of significance the property surrounding Lake View Farm was used for agriculture, growing field crops and providing meadow for livestock foraging. The low growing vegetation on the hillside above the dam abutments allowed views from Lake View Farm to the lake and distant lakeshore to the southeast.

Post-historic and Existing Condition: The property to the east Lake View House is managed as a meadow, which suggests the earlier agricultural use, contributing to the historic setting of Lake View Farm and allowing views to the lake basin and South Fork Dam abutments (Figure 3.4).

Evaluation: Contributing

CIRCULATION

Circulation comprises the spaces, features, and materials that make up the network of pedestrian and vehicular movement. Circulation during the dam's original construction between 1839 and 1853 likely consisted of cart and wagon roads at the dam site and through the proposed lakebed to allow crews to remove vegetation. Drawings of the dam indicate the crest of the dam was wide enough to allow passage of a single wagon, but part of this road was destroyed when the dam failed in 1862. The existence of other circulation features is not known.

The Carriage Road Trace is the only existing circulation feature that was present during the period of significance. Circulation features that post-date the period of significance, including local State Routes and National Park Service-era access roads, are inventoried at the end of this section.

Figure 3.4. View south across of the meadows south of Lake View Farm, to the wooded lakebed, 2019. (Olmsted Center for Landscape Preservation)



Carriage Road Trace

Historic Condition: The South Fork Fishing and Hunting Club's reconstruction of the dam in 1880 and 1881 restored the carriage road across the top of the dam and lowered the dam's crest so that the road would be wide enough to allow two carriages to pass. The road on the dam was part of a longer carriage route that transported club members between the train station in South Fork and the club grounds on the lake's southwestern shoreline. From South Fork, the carriage road approached the north end of the dam, crossed the creek and lower end of the spillway on a bridge, and continued up the face of the dam to the upper end of the spillway. At this point the road split, with one fork crossing the upper end of the spillway on a bridge toward the Lake View Farm and the other fork continuing across the dam. At the south upstream end of the dam, the carriage road tracked southwesterly along the hillside, generally parallel to the lake's southwestern shoreline to the club grounds in what is now St. Michael. The carriage road then likely extended behind the clubhouse and cottages as a boardwalk occupied the narrow space between the front of the buildings and the shoreline. The boardwalk itself was constructed with wide transversely set boards. In steep areas, steps and bridges were built along the boardwalk and featured rustic railings inset with randomly sized and spaced crisscrossed branches. Paths and wooden walkways connected the houses, boathouses, and numerous wooden docks to the boardwalk.¹⁰

Post-historic and Existing Conditions: Following the destruction of the dam the carriage road leading from Lake View Farm to the dam and on to the cottages on the southwestern shore of the former Lake Conemaugh was most likely not maintained. Following National Park Service acquisition, however, the trace of the carriage drive was incorporated into interpretation and circulation plans. Presently the longest and most intact segment of the Carriage Road Trace extends from the intersection with the Picnic Grounds access road to the parking lot at the south abutment. The carriage road trace follows the alignment of the existing pedestrian trails along the crests of the dam abutments to overlooks of the breach, river, and former lakebed. The trail along the crest of the south abutment is grassed except at the overlook where the surface is gravel. The trail along the crest of the north abutment is a universally accessible PVC lumber boardwalk (Figure 3.5). The segment of the trace descending the downstream face of the dam alongside the spillway is overgrown with vegetation and barely discernable. This segment was once part of a now-abandoned interpretive trail that the park built alongside the downstream toe of the north abutment to the river.

Evaluation: Contributing

Figure 3.5. A view east along the north abutment PVC lumber boardwalk which approximates the location of the carriage drive over the dam, 2019. (Olmsted Center for Landscape Preservation)



South Abutment Road and Parking Lot

Historic Condition: The South Abutment Road and Parking Lot did not exist during the period of significance.

Post Historic and Existing Conditions: The South Abutment Road leading to the dam's south abutment was built around the hill southwest of the dam just downhill from the carriage road trace in the early twentieth century. In the 1930s, the road was improved with culverts and a retaining wall and designated as State Route 869. By 1958, the portion of State Route 869 around the hill was relocated to the southwest side of the hill, and the abandoned portion of the former State Route 869 was renamed Township Road 308.

This road, formerly State Route 869 and then Township Road 308, served in the park's early years as the primary entrance road. Between 1972 and 1973, the road's connection to State Route 869 was reconfigured as a T-intersection to improve safety, while steel guardrails and several new culverts were installed along the road's length. Adjacent to the south abutment, at the site of an old cinder pit and possible location of the dam operator's house, the road divided into a one-way parking lot loop laid out in two levels to conform to the site's topography. Today, the two-way asphalt-paved road is twenty feet wide with narrow grass shoulders and several paved gutters. The one-way asphalt-paved parking lot at the northern end of the road is striped for twenty-six spaces and includes a wood staircase with wood rails that connects the two levels of the parking lot.

Evaluation: Non-Contributing, compatible

Picnic Grounds Road and Parking Lot

Historic Condition: The Picnic Grounds Road and Parking Lot did not exist during the period of significance.

Post-historic and Existing Condition: The park built this access road and parking lot between 1972 and 1973 to provide access from the South Abutment Road to the picnic grounds on the hilltop southwest of the south abutment. The road includes a culvert with a stone headwall and ends as a one-way parking lot loop with a parking bay, although only the eastern bay was built. Today the asphalt-paved road is twenty feet wide with grass shoulders and several paved gutters. The asphalt-paved parking lot is striped for twenty-two spaces. Both non-historic features are compatible with the historic scene.

Evaluation: Non-Contributing

Lake Road Parking Lot and Trail to the North Abutment

Historic Condition: The Lake Road Parking Lot and Trail to the North Abutment were not present during the historic period of significance.

Post-historic and Existing Condition: The park constructed this parking lot in the late 1980s, at the point where the alignment of Township Road 352 was shifted from its c.1904 alignment heading toward the spillway to its new 1960s alignment heading around the Lake View Farm hillside. Aerial photographs suggest the old roadbed was retained for use as a trail to the north abutment and spillway until the late 1980s, when it was removed and reseeded. At that time, the park constructed a new trail between the old and new road alignments. The trail also connected to the footbridge over the spillway and a trail to the Lake View Farm. Today, the asphalt-paved parking is striped for seven vehicles, while the asphalt-paved trail is around six feet wide. Both non-historic features are compatible with the historic scene. However, an analysis of topographic maps and the 1889 shoreline suggests the asphalt trail may approximate the route of the carriage road that presumably led to the Lake View Farm during the historic period.

Evaluation: Non-contributing, compatible

Visitor Center Road, Parking Lot, and Sidewalks

Historic Condition: The Visitor Center Road, Parking Lot and Sidewalks were not present during the historic period of significance.

Post-historic and Existing Condition: The park completed the road, parking lot, and sidewalks in the late 1980s in conjunction with the construction of the visitor center at the site of the former Unger barn. The two-way road began north of the farm buildings at Township Road 352 and headed south, briefly paralleling the

farm lane before dividing into a one-way parking lot loop, which also included a return loop at the north end. The parking lot was laid out in two levels to conform to the hillside terrain, and plans show the lot was designed to be extended to the southeast if needed. Both the road and parking lot included culverts and drop inlet drains.

Today, the asphalt-paved road is 20 feet wide, and the asphalt-paved parking lot is striped for fifty-nine vehicles and two buses. Concrete sidewalks, steps with steel railings, and an accessible ramp with steel railings extend throughout the parking lot and connect to a concrete sidewalk and stone-paver patio at the visitor center entrance. The concrete sidewalks range from six to ten feet wide, while the stone pavers vary in dimensions.

Evaluation: Non-contributing

Service Road and Parking Area

Historic Condition: Though portions of the Service Road fall within the alignment of the former entrance to Lake View Farm, the Service Road and Parking Area were not present during the period of significance.

Post-Historic and Existing Condition: The park converted this earthen and gravel lane, which was once the entrance into the core of the farm, in the late 1980s into a service road after completing the Visitor Center Road and parking lot. Simultaneously, a small parking area was built into the hillside just east of the Lake View House for staff parking. Today, the northern half of the road is paved in concrete, while the southern half (from the visitor center to the Lake View House) features an earthen and gravel surface with inlaid precast road stabilizer units to minimize erosion. The parking area is surfaced in concrete and supported on three sides by mortared stone retaining walls.

Evaluation: Non-contributing, compatible

South Abutment Loop Trail

Historic Condition: The South Abutment Loop Trail was not present during the period of significance.

Post Historic and Existing Condition: The park constructed a loop trail at the south abutment in the late 1970s for visitors to access the river and the ruins of the sluice. Today, the earthen-grass trail begins near the end of the south abutment, descends the upstream dam face to the river and ruins, passes through the dam break and around the downstream dam face, and then ascends the downstream face to the south abutment parking lot. Both ends of the trail traverse steep terrain and thus include numerous wood staircases, some of which include wood railings. The widths of the various trail surfaces range from four to eight feet.

Evaluation: Non-contributing, compatible

Arbor Nature Trail

Historic Condition: The Arbor Nature Trail was not present during the period of significance.

Post-historic and Existing Condition: The National Park Service likely constructed this trail soon after developing the picnic grounds in 1972 and 1973 to provide a connection between the picnic grounds and the south abutment. The earthen and gravel trail currently extends from the north end of the picnic grounds to the carriage road trace. The trail crosses moderately steep terrain and is around eight feet wide.

Evaluation: Non-contributing, compatible

Maintenance Yard and Service Drive

Historic Condition: The Maintenance Yard and Service Drive were not present during the period of significance.

Post-historic and Existing Condition: In the early years of the park, the park's maintenance facility was a collection of shacks set in a work yard north of the picnic access road loop. The first permanent building, a maintenance shop, was constructed in 1985 at the south end of the yard. In 1996 the yard was extended to the north for construction of the maintenance office. Today, the rectangular-shaped maintenance yard and entrance drive is surfaced in gravel and provides workspace and storage for materials and vehicles.

Evaluation: Non-contributing, compatible

Parking Area at Clubhouse

Historic Condition: The Parking Area at the Clubhouse did not exist during the period of significance.

Post-historic and Existing Condition: During the many decades that the clubhouse functioned as a hotel, rooming house, and restaurant, the area northwest of the building was presumably used for parking, although the layout is unknown. Today, this earthen and graveled area serves as an informal parking lot accessed from Main Street.

Evaluation: Non-contributing, compatible

TOPOGRAPHY

Topography is the three-dimensional configuration of the landscape surface characterized by slope and orientation. While topographic characteristics shaped the evolution of the property that would become the Johnstown Flood National Memorial there are no contributing or non-contributing topographic features that are not classified under other cultural landscape characteristics.

Historic Condition: The topography of the landscape that would become Johnstown Flood National Memorial was dramatically altered in 1839 when the state began construction on the South Fork Dam and Western Reservoir (Figure 3.6). After the South Fork Fishing and Hunting Club and the Unger family acquired the property in the 1880s, road and building construction resulted in grade changes. At the Lake View Farm, the house, barn, and other buildings were built into the hillside, which required walls and steps to address the grade changes. Topographic changes were also made in the early 1880s by the South Fork Fishing and Hunting Club to build the carriage road that approached the dam's north abutment, crossed the dam, and continued along the hillside southwest of the dam to the club grounds. In St. Michael, additional topographic changes were made with the construction of the clubhouse, cottages, boardwalk, and carriage road behind the cottages, especially southeast of the clubhouse where the terrain was relatively steep.

Post-Historic and Existing Condition: Changing land uses, including the introduction of new roads and rail lines, following the destruction of the dam resulted in topographic changes to the lakebed and surrounding hillsides. One of the first occurred in 1891 when the South Fork Branch Railroad constructed a rail line on a raised berm on the east side of the river through the lakebed and the gap in the dam. By 1905 roads were built along and below the lake's northeastern



Figure 3.6. The winter landscape helps to reveal the topography of the earthworks of the south face showing the trapezoidal shape of the landform, 2014 (Olmsted Center for Landscape Preservation).

shoreline and through the spillway and just above the southwestern shoreline. In the 1930s, the road on the southwestern shoreline was improved with retaining walls and culverts as part of its designation as State Route 869. In the 1960s, the road on the northeastern shoreline was relocated uphill from the spillway as part of the construction of U.S. Route 219. The topography of the former lakebed, to the north of the cottages in St. Michael, was also altered to allow for residential and commercial development. Since the park was established, landforms have been altered to construct visitor parking lots, an access road to the picnic grounds and maintenance yard, trails, and a new visitor center at the former barn site on the Lake View Farm.

VEGETATION

Vegetation includes managed individual specimens and masses of deciduous and evergreen trees, shrubs, vines, groundcovers, and herbaceous material, both indigenous and introduced. There are four existing vegetative communities that remain within the monument that were present during the period of significance and thus contribute to the property's historic integrity. They are the forested downstream face of the Dam Abutments (1), the open meadows and fields on the hillside south of Visitor Center (2), forest vegetation on the hill southwest of South Dam Abutment (3), and the Old Field Vegetation growing within the historic lakebed (4).

Historic Condition: Before the development of the South Fork Dam and Western Reservoir, the land that became Johnstown Flood National Memorial was forested with species including sugar maple (*Acer saccharum*), black cherry (*Prunus serotina*), butternut (*Juglans cinerea*), hickory (*Carya sp.*), chestnut (*Castanea dentata*), ash (*Fraxinus sp.*), oak (*Quercus sp.*), hemlock (*Tsuga sp.*), and spruce (*Picea sp.*). Beginning in 1840, contracts were let to clear and burn over four hundred acres of land to construct the South Fork Dam and the Western Reservoir. After the dam's first break in 1862, grasses and other vegetation returned in the lakebed but were underwater again by 1881 when the dam was rebuilt to form Lake Conemaugh. Additional trees were likely removed along the shoreline as the lake's capacity was increased to around five hundred acres. Historic photographs reveal that in 1889, only a few young trees were growing on the upstream side of the dam's crest but were more thickly growing on the rocky downstream sides of the dam. There were no trees in the center portion of the dam, which was rebuilt by 1881.

At the South Fork Fishing and Hunting Club, tree clearing presumably occurred to construct the clubhouse and cottages, boardwalk, and carriage road. However, historic photographs indicate some mature trees and shrubs were retained in front of and between the buildings, and that dense woodlands stood behind the buildings. Some cottages also featured small gardens. At the Lake View Farm,

Figure 3.7. Highway 219 is visible in the center of the photograph, passing adjacent to the dam abutments. Trees between the dam abutment overlooks and the highway help to screen noise and visual pollution, 2018. (Olmsted Center for Landscape Preservation)



historic photographs show open fields surrounding the farm buildings. There were a few trees and shrubs around the Lake View House, and groups of trees between the barn and spring house and north of the barn.

Post Historic and Existing Conditions: Vegetation within the park boundaries today reflects the use of the land over time and current management policies and practices. The evolution of these vegetative communities, both contributing and non-contributing, are addressed below.

Forested Areas on Downstream Face of Dam Abutments

Historic Condition: Historic photographs reveal that in 1889 trees were growing on the rocky downstream sides of the dam, though not within the portion of the dam that was repaired by the South Fork Fishing and Hunting Club.

Post Historic and Existing Condition: Both large and small trees remain on the downstream sides of the North and South Dam Abutments. These trees suggest the tree growth present during the period of significance, as well as screen visual and noise pollution from the adjacent freeway (Figure 3.7).

Evaluation: Contributing

Meadow Vegetation on Hillside South of Visitor Center

Historic Condition: During the period of significance the hillside south of Lake View Farm was covered in field crops and/or meadow which allowed for views from Lake View House south southeast to Lake Conemaugh.

Post-historic and existing conditions: A meadow stretches from the Visitor Center down the hillside southward to Lake Road which allows for views of the lake

basin, helping visitors to envision the former Lake Conemaugh and magnitude of the dam's destruction.

Evaluation: Contributing

Forest Vegetation on Hill Southwest of South Dam Abutment

Historic Condition: Historic photographs reveal that during the period of significance the hillside southwest of the south abutment was forested in deciduous vegetation.

Post-historic and existing conditions: The hill situated southwest of the south abutment remained wooded after 1889. However, some trees were removed by 1904-05 for construction of a local road just downhill from the carriage road, and a small clearing was made for mining activities near the dam. Additional trees were taken down along the road in the 1930s when the road was improved and designated State Route 869. By 1958, a corridor of trees was removed on the southwest side of the hill for the new alignment of State Route 869. In the 1960s, a much larger area was removed on the northwest side of the hill to construct U.S. Route 219 and its associated engineering features. Under park ownership, trees were removed at the top of the hill in 1972-73 for construction of the Picnic Grounds Road and parking lot, but mature trees were retained in the picnic area itself. Additional trees were cleared to construct a maintenance facility in the early 1980s and its expansion in the mid-1990s. Today, the hill retains its deciduous forest, including mature sugar maple, American beech, red maple, black cherry, and other species..

Evaluation: Contributing

Old Field Vegetation Growing within the Historic Lakebed

Historic Condition: After the dam break the water drained from Lake Conemaugh leaving a muddy basin. Over time grasses and forbs and eventually successional woody vegetation grew to cover the contours of the basin of the former lake.

Post-historic and existing conditions: The low growing grasses and meadow forbs that make up the Old Field vegetation within the lakebed allow the magnitude of the former Lake Conemaugh to be revealed to visitors through the basin's contours. An herbaceous subtype identified as "Old Field" by the Pennsylvania Natural Heritage Program dominates this vegetative community. The "Old Field" vegetative community currently contains graminoid and herbaceous plants of both native and non-native species. Old Field vegetation is currently limited within the lake basin due to the growth of successional woody species (Figure 3.8).

Evaluation: Contributing

Figure 3.8. Typical grasses and forbs of “Old Field” vegetation in the foreground of this photograph, grow in areas of the lakebed, including here at the toe of the south abutment, 2019. (Olmsted Center for Landscape Preservation)



Mature Red Maple, Black Locust, and Hemlock that line the lakebed side of the South Abutment Road

Historic Condition: During the period of significance the thin band of trees between the lake and the carriage drive (South Abutment Road did not exist) was not present.

Post-historic and existing condition: The mature red maple, black locust, and hemlock that line the lakebed side of the South Abutment Road were retained by the National Park Service with the South Abutment Road was constructed (Figure 3.9).

Evaluation: Non-contributing, compatible

Figure 3.9. Mature trees along the lakebed side of South Abutment Road looking north, 2018 (Olmsted Center for Landscape Preservation).

Mature Hardwood Forest growing south Visitor Center and South of Lake Road

Historic Condition: Historic photographs dating to the period of significance show that the land south of the present-day Visitor Center and Lake Road was cleared of forest, a portion of which was under the water of Lake Conemaugh.

Post-historic and existing condition: Following the destruction of the South Fork Dam, this area was



Figure 3.10. Woody vegetation growing within the lakebed, looking west from Lake Road parking area, 2018. (Olmsted Center for Landscape Preservation)



drained of water and grew up in hardwoods. Though this vegetative community does not contribute to the historic significance of the property it is compatible with the historic setting.

Evaluation: Non-contributing, compatible

Woody Vegetation on Upstream Side of Dam Abutments and within Lakebed

Historic Condition: Historic photographs dating to the period of significance show there was no woody vegetation growing on the upstream side of the Dam Abutments or within the lakebed.

Post-historic and existing condition: Following the destruction of the South Fork Dam, this area was drained of water and grew up in hardwoods. Moreover, the vegetation screens the lake basin's contours and the dam abutments, preventing visitors from visualizing the extents of the former lake and the magnitude of the disaster and threatens the stability of the dam abutments. The woody vegetation on the upstream side of the dam abutments and within the lakebed does not contribute to the historic significance of the property and is incompatible with the historic setting (Figure 3.10).

Evaluation: Non-contributing, incompatible

Woodlot/Orchard southeast of Lake View House

Historic Condition: The Woodlot/Orchard growing southeast of the Lake View House postdates the period of significance.

Post-historic and existing condition: To the southeast of the spring house, a woodlot or orchard comprised of hawthorns and apples was established by 1939 but was

Figure 3.11. In this photograph of the spring house looking south from the Unger farm house, the flowering orchard is visible in the background, 2018. (Olmsted Center for Landscape Preservation)



reduced in size in the late 1980s by construction of the visitor parking lot (Figure 3.11).¹¹

Evaluation: Non-contributing, compatible

Plantings and Lawns around Lake View House and Visitor Center

Historic Condition: The Plantings and lawns growing around the Lake View House and Visitor Center postdate the period of significance.

Post-historic and existing conditions: With the rehabilitation of the Lake View House and construction of the visitor center in the late 1980s, the park installed trees around the buildings and parking lot, including tulip tree, red oak, red maple, sugar maple, American beech, hawthorn, and dogwood. Substantial masses of shrubs and grasses were proposed on the hill between the visitor center and spring house, but not all were installed. The park installed lawns throughout this area. Today a garden of native plants grows near the entrance to the visitor center, and specimen shrubs are interspersed throughout the lawn near Lake View House and the spring house (Figure 3.12).

Evaluation: Non-contributing, compatible

Trees and shrubs near South Fork Fishing and Hunting Club Clubhouse and Cottages

Historic Condition: The Plantings and lawns growing around the Lake View House and Visitor Center postdate the period of significance.

Post-historic and existing condition: After the historic period, scattered trees continued to mature around the former clubhouse and cottages, while the former lakebed that fronted the cottages was transformed into housing lots. A 1939 aerial

Figure 3.12. National Park Service era plantings near the Lake View House and spring house, 2018. (Olmsted Center for Landscape Preservation)



photograph indicates lawns with scattered trees around the club buildings, like the character of the surrounding residential neighborhoods of St. Michael. There was also a small woodlot between the clubhouse and double cottage by this time, some of which may have been present during the historic period. By the late 1950s, most trees at the clubhouse had been removed, while the woodlot between the clubhouse and annex had matured and expanded.

Today, there is small area of red maple-black cherry forest/woodland at the rear of the Brown and Lippincott (Moorhead) Cottages, which is part of a larger wooded area to the south and west. The clubhouse and double cottage are maintained as lawns except for the small woodlot between the two buildings, which has become smaller due to the loss of trees from old age and disease.

Evaluation: Non-contributing, compatible

Maple Tree Growing on the Crest of the North Dam Abutment near the end of the Pedestrian Bridge

Historic Condition: The Plantings and lawns growing around the Lake View House and Visitor Center postdate the period of significance.

Post-historic and existing condition: The large maple tree, *Acer sp.*, located at the western end of the Pedestrian bridge on the crest of the Northern Dam Abutment, may date to the period of significance. Dendrological research is necessary to determine the age of the tree (Figure 3.13).

Evaluation: Unevaluated

BUILDINGS AND STRUCTURES

Buildings are elements constructed primarily for sheltering any form of human activity in the landscape, while structures are constructed for functional purposes other than sheltering human activity. There are nine buildings and structures located within the Johnstown Flood National Memorial that were present during the period of significance and retain integrity. They are inventoried at the end of this section. They include the South Fork Dam Abutments (north and south), the South Fork Dam Spillway, the South Fork Dam



Figure 3.13. The maple tree at the northern end of the north abutment may be a witness tree, but further research is necessary, 2018 Olmsted Center for Landscape Preservation).

Overflow Sluice Ruins, Lake View House, the Unger Spring House Rubblestone Foundation (portions of it are rebuilt), the South Fork Fishing and Hunting Clubhouse, the Double Cottage, the Brown Cottage, and the Lippincott Cottage. There are additional buildings on the landscape of Johnstown Flood National Memorial that are compatible with the historic setting but do not contribute to the property's historic integrity. These, too, are inventoried at the end of this section.

Historic Condition: Construction on the South Fork Dam and Western Reservoir was begun in 1840 by the Commonwealth of Pennsylvania for the Main Line of Public Works, a system of canals and rail lines linking Philadelphia and Pittsburgh. Civil engineer William E. Morris designed the dam and reservoir, and when completed in 1853, they were hailed as an engineering masterpiece. The dam was 931 feet long, seventy-two feet high, more than five hundred feet wide at the bottom, and approximately ten feet wide at the top, wide enough for a wagon to pass. The top of the dam was ten feet higher than the water level of the reservoir. Although preliminary estimates had indicated a central core of masonry, it was instead composed of successive layers of clay earth that was found in the vicinity, each layer having been well rammed or packed down (puddled) by allowing it to sit under a skim of water for a period of time so as to be watertight. This puddled clay core was supported on both sides by stone and gravel layers. The dam's downstream face was riprapped with heavy loose rocks, while the upstream face was riprapped with a layer of smaller stones about two and a half feet thick. Between the outer riprap and central core was a layer of native slate broken down into four-inch size pieces. The downstream face slope was constructed with a sixty-six percent slope while that of the upstream face was slightly less steep at a fifty percent slope.¹²

The dam's control mechanism consisted of a sluice gate whose five twenty-four-inch diameter cast iron pipes were secured within a cut stone arch culvert (twenty-five feet wide at the base) that extended through the entire width of the dam at its base. Water was discharged from the reservoir through these pipes into the river. The water then flowed twelve to fourteen miles downriver to the canal at Johnstown. A wood-frame valve control tower with a log and stone foundation at the bottom of the reservoir extended about fifteen feet above the top of the water surface and regulated water discharge. A rowboat served as the only access from the dam to the control tower.¹³ The south end of the dam was anchored to the hillside by a stone wall twenty feet high and buttressed every twenty feet through the base. At the north end of the dam, a spillway was cut through the solid rock to prevent the water behind the dam from rising to the top and flowing over its crest. At its narrowest width, the spillway was seventy feet wide. The floor of the upper end of the spillway was approximately ten feet below the crest of the dam.¹⁴ Two timber bridges crossed the spillway and featured a trestle design. The bridge at the upper end of the spillway was one-hundred-and-twenty-three feet long and supported by seven supports spaced fifteen feet apart and anchored into the spillway floor. The ends of the bridge sat on stone abutments or ledge. The wood bridge railings were supported by wood posts with diagonal crossbars. The design and dimensions of the bridge at the lower end of the spillway are not known. Concurrent with the dam's construction, a brick and stone house and a stable were built at the reservoir site, possibly just northwest of the south abutment. The building housed the dam's construction supervisor and then the person who maintained and operated the dam and reservoir, but its use by the South Fork Fishing and Hunting Club is unknown. Following the Club's acquisition of the property, club president Elias Unger built a house and farm outbuildings on the lake's northeastern shoreline.

Several buildings and structures that were present at the Lake View Farm in 1889 are no longer extant. During the Holsopple family period of ownership in 1912-49, they painted the farm's L-shaped barn, and carriage or machine shed red with white trim and replaced the cupolas with dormers. During the Furlong family ownership from 1950-81, the two buildings deteriorated, and by 1975 both had collapsed. After 1981 the park removed the ruins and used them to build the new visitor center and museum. The smokehouse, chicken coop, and pig pen present during the historic period, and the Holsopple's ownership were removed by the Furlongs.¹⁵ The Holsopples and Furlongs also added buildings and structures that have since been removed. The Holsopples constructed a well near the spring house, and when the park took ownership of the property, it was marked by a well house made of cinder blocks and topped with a low wooden shed with vertical board siding. The park removed the well in the late 1980s.

The Holsopples also constructed a silo in the heel of the L-shaped barn and shed. The silo stood slightly taller than the barn and featured vertical wood boards with

steel staves set on a concrete foundation. It collapsed in the early 1970s, and the foundation was removed in the late 1980s. The Holsopples also constructed a privy, which stood to the north of the house and was connected to it by a short walk. The privy was removed by the Furlongs when they constructed a new garage on the west side of the driveway between the house and barn. The Furlongs built the three-bay garage because the barn and shed were in such poor condition and used material excavated from the hillside near the house to create a level site. The park removed the garage in the 1980s.¹⁶

While the Unger family was constructing Lake View Farm, club members built the clubhouse and cottages on Lake Conemaugh's southwestern shore. The large clubhouse served as the center of the community of cottages, which spread out in a line along the shore of the lake. All the frame cottages were constructed in the Queen Anne, Stick/Eastlake, or Gothic architectural styles characteristic of the 1880s. They were typically three-stories tall with high ceilings, long windows, and covered porches to maximize the lake views. At least two, if not all, cottages had privies in the back yards, but none had kitchens because members dined in the clubhouse. Historic photographs show loose stone walls supported some of the steeper slopes around the houses and steps and bridges along the boardwalk. Other structures at the club complex included floating or moored docks and boathouses, including a large multi-slip structure with gable roofs anchored in front of the clubhouse. There was likely a barn or stable somewhere on club property to house the horses and carriages that transported club members to and from the club grounds.

Post-Historic and Existing Conditions: The existing dam structures and historic buildings associated with the tenancy of the South Fork Fishing and Hunting Club are described in more detail below. Buildings that post-date the period of significance and therefore do not contribute to the park's historic integrity are inventoried at the end of the section.

South Fork Dam Abutments (North and South)

Historic Condition: The South Fork Dam was constructed between 1838 and 1853 and altered in 1862 and 1880, and partially destroyed in 1889. When it was built, the South Fork Dam was nine hundred and thirty-one feet long, seventy-two feet high, more than five hundred feet wide at the bottom, and approximately ten feet wide at the top. The top of the dam was ten feet higher than the water level of the reservoir. This puddled clay core was supported on both sides by stone and gravel layers.

In 1880, the South Fork Fishing and Hunting Club acquired the dam and made repairs caused by a dam failure in 1862. The club did not reinstall sluice pipes, which eliminated the ability to remove excess water from the reservoir. In

addition, the crest of the center portion of the dam was lowered by two feet to create a place where two carriages could pass each other. This height reduction reduced the spillway's maximum flow capacity from ten feet to eight feet before water would begin to flow over the top of the dam. The flow capacity of the spillway was reduced further by a timber trestle bridge built across the upper end of the spillway to carry the carriage road to the lake's northeastern shoreline. In between the bridge supports were twenty-inch high heavy fish screen grids to prevent the loss of stocked fish. In addition, a V-shaped log boom projected into the lake to keep brush and debris from piling against the screens. On May 31, 1889, despite valiant efforts to save the dam, its center section pushed downstream at around 3:15 pm, creating an opening more than three hundred feet wide the full depth of the dam. The water drained out of Lake Conemaugh, leaving the muddy cliffs of the dam abutments.

Post Historic and Existing Condition: After May 1889, the remaining portions of the earthen and stone dam eventually became overgrown with grasses, shrubs, and trees. Remnants of the stone sluice culvert and timber support cushion of the valve control tower remained visible near the streambed that passed through the gap. It is possible that the construction of the first railroad track in 1891 through the breach, and/or the second track by 1904, may have required the removal of some of the dam ruins in the breach area. The earthen South Fork Dam Abutments are partially overgrown with grasses, brush, and trees. The west or downstream faces are covered with stone riprap pierced through by mid-sized deciduous and coniferous trees. The North Abutment measures twenty feet wide by 390 feet in length by seventy-two feet in height. The South Abutment measures twenty feet wide by 230 ft in length by seventy-two feet in height. The gap between the north and south abutments, marking the section of the dam that collapsed on May 31, 1889, is approximately two-hundred-and-fifty to three-hundred feet wide. Though now cloaked in vegetation, the dam abutments reveal the magnitude of the size of the former dam and contribute to visitor understanding of the tragedy (Figure 3.14).¹⁷

Evaluation: Contributing

South Fork Dam Spillway

Historic Condition: At the north end of the dam, a spillway was cut through the solid rock to prevent the water behind the dam from rising to the top and flowing over its crest. At its narrowest width, the spillway was seventy feet wide. The floor of the upper end of the spillway was approximately ten feet below the crest of the dam. The spillway was cleared of vegetation.

Post-historic and Existing Conditions: The spillway is cut through the stone embankment just north of the dam to an approximate depth of ten feet below

Figure 3.14. The dam abutments are visible here, circa 2000, when vegetation on the abutments was managed to control woody growth, circa 2000. (Johnstown Flood National Memorial)



the crest of the former dam. The opening is two hundred and eighty feet long and measures between sixty and one hundred feet in width. The spillway is overgrown by grass and shrubs and includes delineated wetlands (Figure 3.15).

Evaluation: Contributing

South Fork Dam Overflow Sluice Ruins

Historic Condition: The South Fork Dam Overflow Sluice was constructed between 1839 and 1853 and was altered in 1862 when the dam failed. It was again altered between 1875–79 when the iron sluice pipes were removed. Finally, it was altered in 1889 with the dam failure. Originally, the control mechanism for the dam consisted of a sluice gate whose five twenty-four-inch diameter cast iron pipes were secured within a cut stone arch culvert (twenty-five feet wide at the base) that extended entirely through the base width of the dam. Water was discharged from the reservoir through these pipes, however, by 1879 these pipes had been removed. A wood frame valve control tower, with a log and stone foundation at the bottom of the reservoir, extended about fifteen feet above the top of the water surface and was used to regulate the discharge of water.



Figure 3.15. Woody vegetation grows from the embankments surrounding the former spillway, 2018, (Olmsted Center for Landscape Preservation).

Post-historic and Existing Conditions: The South Fork Dam Overflow Sluice Ruins consist of the masonry sluice control foundation ruins and the adjacent wood protective cushion ruins, located in the streambed immediately upriver (east) of the south abutment. In the winter the structure is submerged by ice and water. The cut, dressed, and coursed stones (each block is two feet wide by four feet long by one-and-one-half feet high) of the sluice control foundation ruins form a rectangle. The exposed section is fifteen feet wide by twenty-one feet long with a tiered section that is two-foot-wide by nine feet long by three feet high. A four-foot square section remains consistently submerged. Several six-inch square timbers remain from the eleven feet by fifteen ft wood cushion east of the foundation. Wood and culvert foundation stones near the river and at the bottom and center of the original dam mark the only remains of the original stone arch culvert that housed the sluice discharge pipes (Figure 3.16).¹⁸

Evaluation: Contributing

Lake View House (Elias J. Unger House)

Historic Condition: The two-story, wood, balloon-frame house was constructed in the vernacular Gothic Revival style as the home of the Unger family. Club member Elias Unger constructed his house on a hillside above the lake's northeastern shoreline sometime between June 1883 and September 1888. The two-story frame house was built into the slope of the hill and was painted white with red trim. The building featured a cross-gable roof with two chimneys, a small covered porch on the northeast side, and a larger two-story covered porch on the southwest elevation overlooking the lake and dam. A wide wood staircase descended from the southwest porch to the surrounding lawn.

Figure 3.16. The remnants of the wood and culvert foundation stones are near the toe of the dam along the South Fork of the Little Conemaugh River, 2014. (Olmsted Center for Landscape Preservation)



On the hillside above the house, Unger built a spring house, barn, and carriage/wagon/machine shed. The two-story frame and stone spring house had a gable roof, central chimney, and was painted a light color, possibly the same white with red trim as the main house. The 2.5-story barn and 1.5-story shed formed an L shape, leaving the “heel” of the L open. The barn and shed featured gabled roofs with cupolas and heavy timber construction on stone foundations. A photograph taken in 1889 shows both to have been painted a dark color with light trim. The same photograph shows small structures southeast of the shed, possibly a smokehouse, chicken coop, or pig pen. There was presumably a privy on the grounds as well.¹⁹

Post-historic and existing conditions: The building measures thirty-six feet long and thirty feet wide and features a steep, wood-shingled, cross-gable roof with two brick chimneys along the primary roof ridge. The walls, including the exposed south basement wall, are clad in wood shiplap siding trimmed with corner and eave boards, while the foundation and remaining three basement walls are rubble fieldstone. A one-story pedimented porch shelters an entrance on the northeast elevation and a full-width two-story porch with a low-pitched shed roof spans the southwest elevation. The house was restored between 1987–90 and again between 1993 and 1994. The administrative offices for the Johnstown Flood National Memorial are in the building (Figure 3.17).

Evaluation: Contributing

Unger Spring House Rubblestone Foundation

Historic Condition: The spring house was constructed between 1883 and 1888 with a rubblestone foundation and frame second story which was slightly smaller than that of the existing spring house.

Figure 3.17. The Visitor Center, reminiscent of a barn is in the foreground while Lake View House, or Unger House, and spring house are in the background, 2014. (Olmsted Center for Landscape Preservation)



Post-historic and Existing Conditions: The spring house remains in its original location on a mostly reconstructed foundation. In 1988 the National Park Service removed the deteriorated upper frame portion of the spring house and replaced it with one similar in style to the earlier structure but smaller in size. At the same time the open west end of the remaining stone foundation was also stabilized. Though the upper story of the structure is slightly smaller than the original, the design of the wood frame building is similar. The spring house is currently used for storage.

Evaluation: Contributing

South Fork Fishing and Hunting Clubhouse

Historic Condition: The original residential scale two-and-a-half story frame building was completed in 1881, and then enlarged with a larger three-story frame L-shaped addition in 1886. The clubhouse featured forty-seven furnished bedrooms, a dining room for one-hundred-and-fifty, an office, billiard room, parlor, kitchen, bakery, and a long covered front porch overlooking Lake Conemaugh.

Post-Historic and Existing Conditions: The three-story, L-shaped building features a hip roof and a wide one-story front porch. The main and pent roofs are clad in asphalt shingles and have exposed rafter tails, and corbelled brick interior chimneys are located at the north end of the east and west roof slopes. The walls are clad in beveled shiplap siding, except the east sidewall that is clad in coved shiplap siding installed when the older portion of the building was removed. The frame building rests on a stone foundation and piers. The covered porch runs along the north elevation and wraps around the northwest corner of the building. Wide wood steps are located at the porch's east end and at the center of its west side, and a modern wood ramp is attached to the rear of the wraparound portion.

Between the end of the significance period and today, the Clubhouse underwent extensive alteration. From 1958 into the 1990s, the building was used as a rooming house, restaurant, and lounge. Near the end of this period, the building was purchased by the 1889 South Fork Fishing and Hunting Club Historical Preservation Society (Friends of the Johnstown Flood National Memorial), who reconstructed the covered front porch. The National Park Service purchased the building in 2006 and removed two non-historic additions. The building's ground floor is used for National Park Service programming, and the upper two floors are vacant and not used.

Evaluation: Contributing

Double Cottage (Clubhouse Annex)

Historic Condition: Circa 1887 a two-story frame building was constructed northwest of the clubhouse providing accommodations for four families. The building included a two-story covered front porch facing the lake. A two-story icehouse was purportedly located behind the clubhouse, and two-story privy may have been located behind the clubhouse, possibly connected to it by elevated walkway or a rope bridge or located behind the double cottage. Archeological investigations have been unable to verify their locations.²⁰

Post-Historic and Existing Conditions: The Double Cottage is a two-story rectangular building with a raised basement and a two-story full-width front porch with walls clad in vinyl siding installed circa 1995 and vertical boards in the gable ends. Though, circa 1934 the building and front porch were raised two feet, the building retains its original location, orientation, and design, and thus contributes to the historic integrity of the property. The rehabilitated interior of the building contains four identical apartments leased to tenants by the National Park Service.

Evaluation: Contributing

Brown Cottage

Historic Condition: The Brown Cottage was constructed in 1888 as a summer residence for the James W. Brown family as a modest two-story building with an asymmetric, steeply pitched, hipped and gabled roof and a one-story wraparound front porch oriented toward Lake Conemaugh.

Post-Historic and Existing Conditions: The Brown Cottage became the property of the Maryland Coal Company in 1907 to house company employees and was converted to a duplex by the company in 1921. Vinyl siding and asphalt roof shingles, and a one-story addition to the back facade were added in the 1990s. The building is in its original location and retains its wraparound porch and asymmetrical massing. Today, the building's rehabilitated interior contains two apartments leased to tenants by the National Park Service.

Evaluation: Contributing

Lippincott Cottage (Morehead Cottage)

Historic Condition: The Lippincott Cottage was constructed possibly in 1887 as a summer residence for the Jesse Lippincott family as a Queen Anne-style building with asymmetric, hipped and gabled roof; a distinctive octagonal tower; and multiple projecting bays and porches. Like all the cottages within the South Fork Fishing and Hunting Club, the building was oriented toward Lake Conemaugh.

Post-Historic and Existing Conditions: The Maryland Coal Company acquired the Lippincott Cottage in 1907 for company housing, converting it into a side by side duplex in the 1930s. The company shortened the tower roof and removed a substantial portion of the front porch. The company sold the house in 1955, and when the Preservation Society acquired the property in the late 1980s or early 1990s, the building was vacant. The park stabilized the house in 2005 and officially purchased it the following year. The three-story, Queen Anne style building features an asymmetric, hipped and gabled roof; a distinctive octagonal tower; and multiple projecting bays and porches. The steeply pitched roofs have asphalt shingles and exposed eaves, while the tower has a polygonal roof with flared eaves. The walls are clad in aluminum siding applied irregularly over the original coved wood shiplap siding. Some original wood shingle cladding remains on two sides of the tower at the third-floor level. The foundation is constructed of a series of masonry piers with masonry block or glass block infill. A two-story, end-gabled wing with an enclosed shed-roof porch on the east side extends south from the rear (south) west elevation. A one-story shed-roof porch spans the eastern half of the facade (north) elevation, and a two-story porch continues across the setback northwest portion of the facade. A non-historic set of wood steps leads up to the two-story porch from the road.²¹ The Lippincott Cottage is currently vacant and undergoing stabilization.

Evaluation: Contributing

National Park Service Visitor Center

Historic Condition: The National Park Service Visitor Center did not exist during the historic period.

Existing Condition: The visitor center was completed in 1989, the year of the 100th Anniversary of the Johnstown Flood. Designed as a replica of the barn, the two-story building's hillside location provided expansive views to the dam abutments and former lakebed. Today, the building contains a bookstore, museum exhibits, auditorium, restrooms, and utility areas. It features two offset rectangular blocks with asphalt-shingled side-gable roofs, vertical board walls, and a poured concrete foundation. A stone-clad entrance vestibule with a flat roof projects at an angle from the northeast end, where a small concrete patio and native plant garden are partially enclosed by a low stone retaining wall. Doors centered in the southwest wall of the west block provides access from the building's lower level to the farm lane at the rear that leads to the Lake View House and the spring house. Overall, the size, materials, and character of the building evoke the design of the original barn at the site (Figure 3.18).²²

Evaluation: Non-Contributing

Figure 3.18. Shrubs, herbaceous vegetation and retaining walls, at Lake View House and the Visitor Center entrance, 2019. (Olmsted Center for Landscape Preservation).



Maintenance Office

Historic Condition: The Maintenance Office did not exist during the historic period.

Existing Condition: The park's maintenance facility was initially a collection of shacks set in a work yard north of the picnic access road loop. In 1985 the park constructed a shop and parking area at the south end of the yard. By 1993, additional workspaces and structures had been added to the north, including a modular trailer office, three frame sheds, and storage tanks. In 1996 a maintenance office and garage were constructed at the north end of the yard, and in 2011 the maintenance shop was enlarged with an addition to the north. The maintenance office is a two-story shed-roof building with vertical board walls and a concrete slab foundation and includes two double-height metal overhead garage doors.

Evaluation: Non-contributing

Maintenance Shop

Historic Condition: The Maintenance Shop did not exist during the historic period.

Existing Condition: Located at the park's maintenance facility, the Maintenance Shop is a one-story, side-gable building with a metal roof, vertical board walls, and a concrete slab foundation. Four metal overhead garage doors line the west elevation; the southernmost door is smaller and set back under a slight roof overhang.

Evaluation: Non-contributing

Picnic Pavilion

Historic Condition: The Picnic Pavilion did not exist during the historic period.

Existing Condition: Located at the picnic grounds, this structure was constructed in 1989 east of the parking lot loop. The open-sided pavilion has a shallow-pitched end-gable roof with asphalt sheathing supported by eight square metal posts set in a concrete slab.

Evaluation: Non-contributing

Stone Culverts and Retaining Wall, at the South Abutment Road and Parking Lot

Historic Condition: The Stone Culverts and Retaining Wall, at the South Abutment Road and Parking Lot did not exist during the historic period.

Existing Condition: The culverts and retaining walls along the South Abutment Road were built in the 1930s when the local unimproved road was upgraded and paved as part of its designation as State Route 869. The culvert inlets are typically drop-inlets with metal grates and/or metal or concrete curbs, while seven culvert outlets feature headwalls with coursed rough-cut stone. The largest structure measures thirteen feet long by eighteen inches wide by six feet high, and the smallest measures five feet long by eighteen inches wide by three feet high. The retaining wall of coursed, rough-cut fieldstone is located on the east side of the road and measures seventy-nine feet long by two feet wide by five feet high. The park constructed the parking lot at the south abutment in the 1970s and connected some of the parking lot's drainage system into the existing road culverts.

Evaluation: Non-contributing

Stone Culvert at Picnic Grounds Road and Parking Lot

Historic Condition: The Stone Culvert at Picnic Grounds Road and Parking Lot did not exist during the historic period of significance.

Existing Condition: A single modern culvert structure, likely constructed with the picnic area, is situated at the junction of the Picnic Grounds Road and the parking lot. It features a drop-inlet with metal grates and an outlet set in a mortared stone headwall.

Evaluation: Non-contributing

Retaining Walls at Visitor Center

Historic Condition: The Retaining Walls at Visitor Center did not exist during the historic period of significance.

Existing Condition: Constructed in the late 1980s as part of the new visitor center, three cut stone façade retaining walls line the walkway from the parking lot to the building. Two walls situated on the south side of the walkway are around two feet in height to serve as seat walls. The wall closest to the parking lot is around forty-five feet long, while the wall at the entrance is around forty feet long. Another wall, between four and five feet high and two hundred feet long, stands along the north side of the walk and then makes a series of turns to support the entrance patio as a shorter seat wall.

Evaluation: Non-contributing

Retaining Wall at Lake View House Parking Area

Historic Condition: The retaining Wall at the Lake View House Parking Area did not exist during the historic period of significance.

Existing Condition: A U-shaped reinforced concrete and stone-faced wall dating to the late 1980s defines three sides of the parking area east of the Lake View House (see Figure 2.18). The total length of the wall is around 65 feet. The height of the wall tapers upwards to conform to the hillside topography, and ranges in height from 4-8 feet. The stone wall is similar in character to the adjacent stone foundations of the Lake View House and spring house.

Evaluation: Non-contributing

Spillway Footbridge

Historic Condition: The Spillway Footbridge did not exist during the historic period of significance.

Existing Condition: The club's original timber trestle bridges across the lower and upper ends of the spillway were removed by 1904 when a local road (Township Road 352) was built along the former lake's northeastern shoreline and through the spillway. The park constructed the wood bridge across the upper end of the spillway between 1988 and 1989 to complete the trail from the visitor center to the north abutment. Today the bridge is twelve feet wide by one-hundred-and-forty-three feet long and sits approximately fourteen feet above the spillway floor. It is constructed with pine timbers supported by eight pairs of wood columns set in concrete. Wood handrails stretch along the entire length of the bridge. Although the architectural details of the bridge differ from the historic timber trestle bridge, the structure blends in with the surrounding landscape.

Evaluation: Non-contributing

VIEWS AND VISTAS

Views are the panoramic or expansive prospect of a broad range of vision, which may be naturally occurring or deliberately contrived. Vistas are controlled aspects of a discrete, linear range of vision, which is deliberately contrived. Available views and vistas were not considered by engineers when they designed and built the South Fork Dam and Western Reservoir to supply water to the canal in Johnstown. However, the ability to create beautiful views and vistas was a significant factor when the South Fork Fishing and Hunting Club chose the property for their lakeside resort and developed the cottage community and Lake View Farm. Today, four main nodes of visitor engagement support the most important interpretative views of the lakebed and surrounding landscape. The view sheds are formed by topography and vegetation and include views from the Johnstown Flood Visitor Center/Lake View Farm (1), the North Abutment Overlook (2), the South Abutment Overlook (3), and the Lake Road Parking Lot (4) (See: Viewshed Analysis Map).

Views from the Johnstown Flood National Memorial Visitor Center/Lake View Farm

Historic Condition: Club president Elias Unger built his farmstead on the lake's northeastern shoreline and sited the house in a hillside field so the Unger family would have a panoramic view of the South Fork Dam, Lake Conemaugh and toward the South Fork Fishing and Hunting Club cottages on the distant shoreline (Figures 3.19 and 3.20).

Existing Condition: Though a meadow grows on the hillside just east of the Unger House, the basin of the former lakebed and abutments are cloaked in woody vegetation preventing visitors from viewing the contours of the lakebed and thereby understanding the enormity of the former lake and the destructive capacity of the dam breach.

Evaluation: Contributing

Views from the North Abutment Overlook

Historic Condition: Historic photographs from the period of significance suggest that trees and woody vegetation grew on the downstream or west side of the South Fork Dam, while views to the east encompassed Lake Conemaugh. Post breach, views from the top of the North Abutment revealed the muddy basin of the lakebed.

Existing Conditions: Currently woody vegetation hides the contours of the lakebed from this important viewpoint, limiting visitors' ability to visualize the enormity of the former Lake Conemaugh and therefore the significance of the dam's failure.

Figure 3.19. View from the Visitor Center when the lakebed was cleared of woody vegetation, revealing some scouring of the river's edge, circa 1990. (Johnstown Flood National Memorial)



Evaluation: Contributing

Views from the South Abutment Overlook

Historic Condition: Historic photographs from the period of significance suggest that trees and woody vegetation grew on the downstream or west side of the South Fork Dam, while views to the east encompassed Lake Conemaugh. Post breach, views from the top of the South Abutment revealed the muddy basin of the lakebed.

Existing Conditions: Currently woody vegetation hides the contours of the lakebed from this important viewpoint, limiting visitors' ability to visualize the enormity of the former Lake Conemaugh and therefore the significance of the dam's failure.

Evaluation: Contributing

Views from the Lake Road Parking Lot

Historic Condition: Historic photographs from the period of significance suggest that this point, which was near the path of the carriage road, provided views across Lake Conemaugh and of the east face of the South Fork Dam. Post breach, views from the top of the South Abutment revealed the muddy basin of the lakebed in this location.

Existing Conditions: Currently woody vegetation hides the contours of the lakebed from this important viewpoint, limiting visitors' ability to visualize the enormity of the former Lake Conemaugh and therefore the significance of the dam's failure.

Evaluation: Contributing

Figure 3.20. View from the Visitor Center, circa 2000, when the lakebed was cleared of woody vegetation. (Doug Bosley, Johnstown Flood National Memorial)



SMALL-SCALE FEATURES

Small-scale features include minor built elements that provide detail and function, such as utilities, signs, fences, benches, and other outdoor furnishings. Historic photographs provide some information on small-scale features associated with the South Fork Fishing and Hunting Club, such as a flagpole attached to the top of one of the boathouses, but knowledge about historic small-scale features at the site is limited. Today, there are no existing small-scale features that were present during the period of significance. Non-contributing small-scale features are inventoried at the end of this section.

Historic Condition: Historic photographs reveal that the South Fork Fishing and Hunting club installed a telephone line attached to poles across the crest of the dam. The line presumably connected to the club grounds and the railroad station in South Fork, and possibly the Lake View Farm. The telephone line across the dam was destroyed in the 1889 flood. The club also began installation of a cast iron sewer line in 1889 along the lakeshore, extending from the clubhouse and cottages to the dam. Work crews on the sewer line aided in the May 31 efforts to save the dam, after which the project was abandoned.²³

At the Lake View Farm, several historic photographs show a fence around the house and post and board fencing near the dam and northeastern shoreline. The latter fence was apparently the result of an agreement between Elias Unger and the club to erect and maintain a fence between the Unger property and the club's dam property. Part of this fence ran along the edge of the hill above the spillway. Other portions of club property were reportedly fenced, gated, or signed to prohibit public access, but locations of such features are not known.²⁴

Post-Historic and Existing Conditions: After the flood, the club sold their property and the Unger family sold Lake View Farm. By the late 1910s, during

the Holsopple ownership of the farm, a picket fence with gates surrounded the house. The fence was replaced by a barbed wire fence later. As the Holsopple and Furlong families actively farmed the land and raised animals, there were likely fenced barnyards and pastures.²⁵

The small-scale features present in the park today are primarily related to visitor interpretation and safety and are not historic. The most visible features are the wayside signs located at the Lake View Farm, at the dam abutments and spillway, along the loop trail to the river, and at the picnic grounds. Most of these signs are constructed with angled framed laminate panels attached to fence railings or supported by two black metal posts anchored into the ground or into the top of retaining walls. The native plant garden at the visitor center's entrance features smaller interpretive signs attached to single posts set into the ground. Vertical framed laminate information panels with a small gable roof attached to two black metal posts are located at the south abutment parking lot and the picnic grounds parking lot. Four combination wayside/information signs with vertical framed panels and two support posts are in front of the Clubhouse, Double Cottage, and Brown and Lippincott Cottages in St. Michael. Numbered wood signposts line the Arbor Nature Trail and a small section of the carriage road trace and correspond to a brochure describing trees in the park. The park's main entrance sign, comprised of a wood sign and redwood arrowhead emblem mounted to a stone veneer concrete structure, is located on the west side of Lake Road between the parking lot and the Visitor Center Road. No fences remain at the Lake View Farm except for a split rail fence installed by the National Park Service along the west side of Lake Road. The split rail fence is in the approximate location of the fence installed by the South Fork Fishing and Hunting Club along the Unger property line above the spillway. There are also U-shaped sections of board fencing with angled top boards at the end of each dam abutment overlook to protect visitors from the steep slope formed by the dam's breach. A chain-link fence enclosure with plastic inserts surrounds part of the maintenance shop at the picnic grounds, and a black metal swing gate marks the entrance to the maintenance yard. A steel-backed wood guardrail lines a portion of Lake Road, and a brown steel guardrail stretches along the western edge of the South Abutment Road.

Wood benches with backs and metal supports are located along the trail to the north abutment, along the south abutment loop trail, and at the south abutment parking lot next to the loop trail. A wood bench with a back and concrete supports can be found along the carriage road trace. At the picnic grounds, a water fountain, metal barbecue grills, stationary wood picnic tables, and movable metal picnic tables are scattered under the trees between the picnic pavilion and parking lot. A horseshoe pit can be found in the parking lot median. Other miscellaneous features include a wood clothesline behind the Double Cottage, five black-painted bollard lights alongside the sidewalk to the visitor center and around the

entrance patio, a row of four pole-mounted solar-powered lights in the median of the visitor center parking lot, and a black-painted flagpole just southeast of the visitor center, adjacent to the parking lot. The noncontributing small-scale features, including park signage, split rail fencing, metal gates, road guardrails, contemporary benches, grills, and lighting, are inventoried in the Landscape Characteristics and Features table at the end of this section.

ARCHEOLOGY

The history of archeological research at Johnstown Flood National Memorial comprises nearly a dozen archeological investigations conducted between 1977 and 2015. Work was undertaken to meet compliance obligations under Section 106 and Section 110 of the National Historic Preservation Act (NHPA) and ranged from identification surveys to data recovery/mitigation excavations. Ten resources are inventoried in the Archeological Sites Management and Information System (ASMIS) for the park, all of which have corresponding LCS identification numbers and are currently listed in the National Register as contributing buildings or structures. Broadly speaking, these ASMIS-inventoried resources consist of park-owned residential properties associated with the South Fork Fishing and Hunting Club – the Clubhouse, Double Cottage, Brown and Lippincott cottages, the Lake View House, and the South Fork Dam and associated infrastructure.²⁶

LANDSCAPE CHARACTERISTICS AND FEATURES SUMMARY

The following table (Table 3.2) summarizes landscape characteristics and features based on date of construction and modification(s), as well as an evaluation of whether the feature contributes to the historic character of the landscape. Features that are specifically described and evaluated in the National Register of Historic Places documentation are marked with asterisk (*) under “Evaluation.”

List of Classified Structures (LCS) numbers and Facility Management Software System (FMSS) Location and Asset records are based directly on system data, as of 2018. All landscape features are associated with a FMSS Location record, while only some are associated with a more specific FMSS Asset record. In FMSS, work orders must be associated with a Location; association with an Asset record is optional, dependent upon specific resource and project circumstances.

ENDNOTES, ANALYSIS AND EVALUATION

1 *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation*, (Washington, D.C.: National Park Service, National Register of Historic Places, 1990, rev. 2002).

2 *National Register Bulletin 16A: How to Complete the National Register Nomination Form*, (Washington, DC: Government Printing Office, 1991).

3, Richard F. Truscello, Fred Denk, and William Sisson, Cambria County Planning Commission, *National Register of Historic Places Nomination Form for South Fork Fishing and Hunting Club Historic District*, (Washington, D.C., United States Department of the Interior, National Park Service 1986), NRIS#86002091 Additional historic resources outside of the boundaries of the Johnstown Flood National Memorial were also included in the nomination.

4 Laura Kline, Gretchen Pineo and, Kristen Heitert, *National Register of Historic Places Nomination Form for Johnstown Flood National Memorial*, (Washington, D.C.: United States Department of the Interior, National Park Service, Draft 2016), Sec. 8: 22.

5 Laura Kline, Gretchen Pineo, and Kristen Heitert, *National Register of Historic Places Nomination Form for Johnstown Flood National Memorial*, (Washington, D.C.: United States Department of the Interior, National Park Service, Draft 2016), Sec. 8: 22.

6 Laura Kline, Gretchen Pineo, and Kristen Heitert, *National Register of Historic Places Nomination Form for Johnstown Flood National Memorial*, (Washington, D.C.: United States Department of the Interior, National Park Service, Draft 2016). Sec. 8: 22.

7 Richard F., Truscello, Fred Denk, and William Sisson, Cambria County Planning Commission, *National Register of Historic Places Nomination Form for South Fork Fishing and Hunting Club Historic District*, (Washington, D.C., United States Department of the Interior, National Park Service 1986), Sec.8: 3.

8 Memorandum, June 2017, Peter Sharpe and Eric Kelley, Northeast and National Capital Regions, Report for Travel to Johnstown Flood National Memorial, September 19 – 23, 2016.

9 Landmarks Design Associates, Architects (LDA) and Wallace, Roberts & Todd et.al. *Historic Structures Report, South Fork Fishing & Hunting Club: Clubhouse, Brown Cottage, Moorhead Cottage, and Clubhouse Annex*, (Washington, DC: US Department of the Interior, National Park Service, 1993), 47.

10 Landmarks Design Associates, Architects (LDA) and Wallace, Roberts & Todd et.al. *Historic Structures Report, South Fork Fishing & Hunting Club: Clubhouse, Brown Cottage, Moorhead Cottage, and Clubhouse Annex*, (Washington, DC: US Department of the Interior, National Park Service, 1993), 21-22,47.

11 Yetter et.al. *Johnstown Flood National Memorial Natural Resource Condition Assessment, Natural Resource Report 2014* (Fort Collins: Department of the Interior, National Park Service, 2014),175.

12 Harlan Unrau, *Historic Structure Report: The South Fork Dam, Johnstown Flood National Memorial, Pennsylvania, Package No. 124*, (Denver, CO: US Department of the Interior, National Park Service, Denver Service, 1979), 46-47.

13 Harlan Unrau, *Historic Structure Report: The South Fork Dam, Johnstown Flood National Memorial, Pennsylvania, Package No. 124*, (Denver, CO: US Department of the Interior, National Park Service, Denver Service, 1979), 47,54.

14 Harlan Unrau, *Historic Structure Report: The South Fork Dam, Johnstown Flood National Memorial, Pennsylvania, Package No. 124*, (Denver, CO: US Department of the Interior, National Park Service, Denver Service, 1979), 47.

15 Ella Sue Rayburn, author, Harlan Unrau Editor, *Historic Structure Report: Elias J. Unger House, Johnstown Flood National Memorial, Pennsylvania, Package No. 124*, (Denver, CO: US Department of the Interior, National Park Service, Denver Service 1986) 50-51,145-149,154.; Laura Kline, et. al., *National Register of Historic Places Nomination Form for Johnstown Flood National Memorial*, (Washington, D.C.: United States Department of the Interior, National Park Service, Draft 2016), Sec.7: 10.

16 Ella Sue Rayburn, author, Harlan Unrau Editor, *Historic Structure Report: Elias J. Unger House, Johnstown Flood National Memorial, Pennsylvania, Package No. 124*, (Denver, CO: US Department of the Interior, National Park Service, Denver Service 1986): 51,149,152,154.

17 Laura Kline, et. al., *National Register of Historic Places Nomination Form for Johnstown Flood National Memorial*, (Washington, D.C.: United States Department of the Interior, National Park Service, Draft 2016), Sec.7: 7.

18 Laura Kline, et. al., *National Register of Historic Places Nomination Form for Johnstown Flood National Memorial*, (Washington, D.C.: United States Department of the Interior, National Park Service, Draft 2016).

- 19 Mary Sue Rayburn and Harlan Unrau, *Historic Structure Report: Elias J. Unger House, Johnstown Flood National Memorial, Pennsylvania, Package No. 124.*, (Denver, CO: US Department of the Interior, National Park Service, Denver Service 1986), 50-51,143,145-149,154.
- 20 Johnstown Flood National Memorial, *Environmental Assessment: Adaptive Re-Use of the South Fork Fishing and Hunting Club Clubhouse, Clubhouse Annex, Brown Cottage and Moorhead Cottage* (Washington D.C.: US Department of the Interior, National Park Service, 2007), 37-39,44-45; Joseph Balicki and J. Sanderson Stevens, *Historic Structures Report, Archeological Data Section: Clubhouse, Brown Cottage, Moorhead Cottage, and Clubhouse Annex. South Fork Fishing and Hunting Club, Saint Michael Pennsylvania.* (Alexandria, VA: John Milner and Associates 1993), 2,5.; Landmarks Design Associates, Architects (LDA) and Wallace, Roberts & Todd et.al. *Historic Structures Report, South Fork Fishing & Hunting Club: Clubhouse, Brown Cottage, Moorhead Cottage, and Clubhouse Annex*, (Washington, DC: US Department of the Interior, National Park Service, 1993), 42.
- 21 Laura Kline, Gretchen Pineo and, Kristen Heitert, *National Register of Historic Places Nomination Form for Johnstown Flood National Memorial*, (Washington, D.C.: United States Department of the Interior, National Park Service, Draft 2016), Sec. 8: 22, 14-15.
- 22 Laura Kline, Gretchen Pineo and, Kristen Heitert, *National Register of Historic Places Nomination Form for Johnstown Flood National Memorial*, (Washington, D.C.: United States Department of the Interior, National Park Service, Draft 2016), Sec.7: 10.
- 23 Landmarks Design Associates, Architects and Wallace, Roberts & Todd et.al. *Historic Structures Report, South Fork Fishing & Hunting Club: Clubhouse, Brown Cottage, Moorhead Cottage, and Clubhouse Annex*, (Washington, DC: US Department of the Interior, National Park Service, 1993), 21-22; Unrau 1979: 54.
- 24 Landmarks Design Associates, Architects and Wallace, Roberts & Todd et.al. *Historic Structures Report, South Fork Fishing & Hunting Club: Clubhouse, Brown Cottage, Moorhead Cottage, and Clubhouse Annex*, (Washington, DC: US Department of the Interior, National Park Service, 1993), 22; Ella Sue Rayburn, author, Harlan Unrau Editor, *Historic Structure Report: Elias J. Unger House, Johnstown Flood National Memorial, Pennsylvania, Package No. 124.*, (Denver, CO: US Department of the Interior, National Park Service, Denver Service 1986), 35.
- 25 Ella Sue Rayburn, author, Harlan Unrau Editor, *Historic Structure Report: Elias J. Unger House, Johnstown Flood National Memorial, Pennsylvania, Package No. 124.*, (Denver, CO: US Department of the Interior, National Park Service, Denver Service 1986), 35,152.
- 26 Laura Kline, Gretchen Pineo, and Kristen Heitert, *National Register of Historic Places Nomination Form for Johnstown Flood National Memorial*, (Washington, D.C.: United States Department of the Interior, National Park Service, Draft 2016), Sec.8: 71-72.

**TABLE 3.1. LANDSCAPE FEATURE INVENTORY:
JOHNSTOWN FLOOD NATIONAL MEMORIAL**

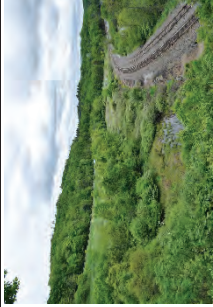
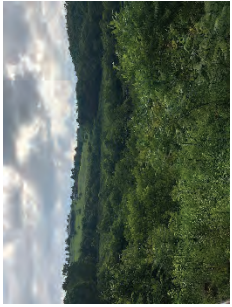
Feature Name	Other Resource Inventory	FMSS Data (Location / Asset records)	Evaluation Status	Evaluation Narrative Period of Significance (1879 – 1889)	Graphic Reference
Natural Systems Features					
NS-1 South Fork Little Conemaugh River and its unnamed tributaries		N/A	Contributing	Historic Condition (1879 - 1889): The natural course of the South Fork Little Conemaugh River was significantly altered by the construction of the South Fork Dam in 1853 and its reconstruction in 1879-81. As originally designed, the South Fork Dam impounded water from the river which was then released into five sluice pipes when the lake rose too high. The 1889 breach in the dam left behind the muddy basin of the former Lake Conemaugh with the South Branch Little Conemaugh River flowing through the bottom of the basin. Evaluation: Today, the South Fork Little Conemaugh River flows through the lakebed bisecting the park. The course of the river has been altered since the period of significance by the presence of the railroad berm constructed in the 1890s on the east side of the river. This berm directs drainage from the unnamed tributaries on the east side of the lakebed into culverts positioned along the berm. Though the river's course has been slightly altered since the period of significance and the water quality has been severely impacted by subsurface mine drainage, the river retains its defining characteristics including its location in relation to the dam abutments and the lake basin.	
NS-2 Wetlands		N/A	Non-contributing	Historic Condition (1879 - 1889): N/A Evaluation: The wetlands were not present during the period of significance (1879 – 1889) but their low growing vegetation is compatible with the historic setting of the dam abutments and the lake basin of the former Lake Conemaugh.	
Spatial Organization Features					
SO-1 Lakebed	NR: Contributing Site	Location: 16312 & 16325 Asset: 1269038 & 1690321	Contributing * (* = listed on the National Register of Historic Places)	Historic Condition (1879 – 1889): Constructed 1838–53; altered 1862, 1880, 1889. In May 1889 the high-water level of Lake Conemaugh, which was about one mile across and two miles long, reached the 1604 contour elevation just before the dam's failure. Following the breach in the dam, the water drained out of the basin revealing the muddy contours of the lakebed. Evaluation: Today the lakebed consists of fifty acres of the original 400- to 500-acre bed of Lake Conemaugh that lie between Lake Road on the north side and the South Abutment Road on the south. Though the	

TABLE 3.1. LANDSCAPE FEATURE INVENTORY:
JOHNSTOWN FLOOD NATIONAL MEMORIAL

Feature Name	Other Resource Inventory	FMSS Data (Location / Asset records)	Evaluation Status	Evaluation Narrative Period of Significance (1879 – 1889)	Graphic Reference
SO-3 South Fork Fishing and Hunting Club Clubhouse and Cottages Cluster	N/A	N/A	Contributing	contours of the lakebed are shrouded in woody vegetation the lakebed retains its character defining basin shape, contours, and location. Historic Condition: The core of the South Fork Fishing and Hunting Club was on the southwestern shore of Lake Conemaugh, about one mile upstream from the South Fork Dam. The clubhouse was built on the lakeshore and oriented northwest-southeast so that its front façade and covered porch would face the lake. In addition to functioning as the center of club activities, the siting of the building also influenced the location of the private cottages that were built in the years that followed. By 1888, four single cottages and double cottage were located northwest of the clubhouse and ten cottages were situated southeast, and like the clubhouse, all were oriented to the lake. Collectively, the buildings formed a row that faced the shoreline. Boathouse structures and numerous docks extended out into the lake and were connected to the boardwalk with paths. Other utilitarian structures, such as privies, ice houses, and barns, were located on the carriage road behind the row of buildings so as not to block the panoramic lake views. Evaluation: The cottages and clubhouse remain in their original locations and retain their original orientation to the north, though Lake Conemaugh no longer exists.	
SO-2 Lake View Farm Cluster	N/A	N/A	Contributing	Historic Condition (1879 – 1889): A similar orientation of buildings and spaces characterized the Lake View Farm, where the house was built on a hillside overlooking the dam and lake. Farm buildings were intentionally located uphill and behind the house so the view from the house and its two-story porch would not be blocked. Fences around the house and outbuildings, and along some of the property lines, further defined spaces. Evaluation: The Lake View Farm was active and productive for decades after the historic period, and although a few new structures were added, the overall spatial organization of the farm remained the same. The most significant changes began when farm production declined and several old or unneeded outbuildings were removed, or in the case of the barn and carriage/wagon/machine shed, collapsed. In the late 1980s, the park constructed a new visitor center at the site of the old barn, which offered excellent views of the dam, lakebed, and clubhouse/cottages. Mindful of the important spatial relationship between the Lake View House and the dam and former lakebed, the park located the visitor parking lot and access road uphill from the visitor center so as not to block the historic views down the hill.	

TABLE 3.1. LANDSCAPE FEATURE INVENTORY:
JOHNSTOWN FLOOD NATIONAL MEMORIAL

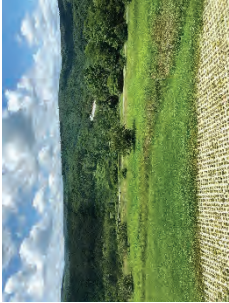
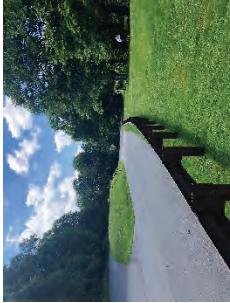
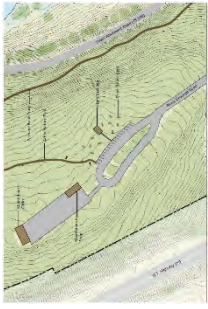
Feature Name	Other Resource Inventory	FMSS Data (Location / Asset records)	Evaluation Status	Evaluation Narrative Period of Significance (1879 – 1889)	Graphic Reference
Land Use Features					
LU-1 Agricultural Land Use	N/A	Unger House & Visitor Center Grounds Location: 16312 Assets: 1269044, 1269047, 1269043, 1269034	Contributing	Historic Condition (1879 – 1889): During the period of significance the property surrounding Lake View Farm was used for agriculture, growing field crops and providing meadow for livestock foraging. The low growing vegetation on the hillside above the dam abutments allowed views from Lake View Farm to the lake and distant lakeshore to the southeast. Evaluation: The property to the east Lake View House remains in agriculture contributing to the historic setting of Lake View Farm and allows views to the lake basin and South Fork Dam abutments.	
Circulation Features					
C-1 Carriage Road Trace	CLI No. 176750 LCS No. 081980 (JTCARRRD) ASMIS No. JOFL00001.000, NR contributing structure	Location: 21661 Asset: 210171	Contributing *	Historic Condition (1879 – 1889): ca. 1880; altered 1889, 1903–04. Historically the earthen carriage road led from South Fork, past Lake View Farm over the South Fork Dam to the South Fork Fishing and Hunting Club. Evaluation: A remnant of the carriage road parallels and is part of the right-of-way for the South Abutment Road. In addition, an earthen trace of the carriage road, approximately 20 ft wide by 3,720 ft long, begins southeast of the park access road. It runs along a portion of the west side of the road as a pedestrian trail that cuts northwest through the woods to the south abutment parking area. The trace continues as a trail on the north side of the parking area across the top of the south dam abutment to an overlook of the breach and former lakebed. A handicap accessible trail follows the carriage road trace across the top of the north abutment to the spillway footbridge, where the unmaintained trace veers to the west through the woods along the downstream (west) side of the abutment.	
C-2 South Abutment Road and Parking Lot	CLI No. 176752	Location: 42679	Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park South Abutment Road and Parking Lot was not present during the period of significance (1879 – 1889) but it is compatible with the historic setting.	

TABLE 3.1. LANDSCAPE FEATURE INVENTORY: JOHNSTOWN FLOOD NATIONAL MEMORIAL					
Feature Name	Other Resource Inventory	FMSS Data (Location / Asset records)	Evaluation Status	Evaluation Narrative Period of Significance (1879 – 1889)	Graphic Reference
C-3 Picnic Grounds Road and Parking Lot	CLI No. 176754	Location: 45906 Asset: 397086	Non-Contributing	Evaluation: The National Park Service Picnic Grounds Road and Parking Lot were not present during the period of significance (1879 – 1889) but they are compatible with the historic setting.	
C-4 Lake Road Parking Lot and Trail to and on top of North Abutment	CLI No. 176756	Location: 236371	Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service Lake Road Parking Lot and Trail to and on top of the North Abutment were not present during the period of significance (1879 – 1889) but they are compatible with the historic setting.	
C-5 Visitor Center Road, Parking Lot, and Sidewalks	CLI No. 176758	Grounds Location: 16312 Asset: 1269034	Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service Visitor Center Road, Parking Lot, and Sidewalks were not present during the period of significance (1879 - 1889) but they are compatible with the historic setting.	
C-6 Service Road and Parking Area	CLI No. 176760	Grounds Location: 16312	Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service-era Service Road and Parking Area was not present during the period of significance (1879 – 1889) but they are compatible with the historic setting.	

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JOHNSTOWN FLOOD NATIONAL MEMORIAL**

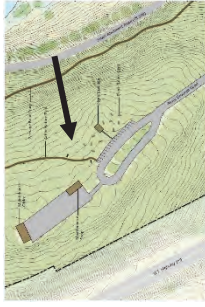
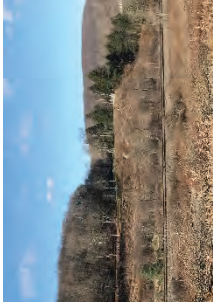
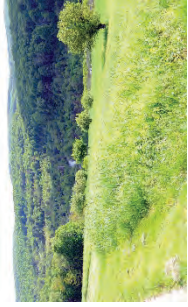
Feature Name	Other Resource Inventory	FMSS Data (Location / Asset records)	Evaluation Status	Evaluation Narrative Period of Significance (1879 – 1889)	Graphic Reference
C-7 South Abutment Loop Trail	CLI No. 176762	Location: 16321	Non- Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service South Abutment Loop Trail was not present during the period of significance (1879 – 1889) but it is compatible with the historic setting.	
C-8 Arbor Nature Trail	CLI No. 176764	Location: 16348	Non- Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service Arbor Nature Trail was not present during the period of significance (1879 – 1889) but it is compatible with the historic setting.	
C-9 Maintenance Yard	CLI No. 176766	Grounds Location: 16361	Non- Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service Maintenance Yard (built 1996) was not present during the period of significance (1879 – 1889) but it is compatible with the historic setting.	
C-10 Parking Area at Clubhouse	CLI No. 176768	Location: 16325 Asset: 1269041	Non- Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service Parking area at the Club House was not present during the period of significance (1879 – 1889) but it is compatible with the historic setting.	
Topography Features					
N/A					

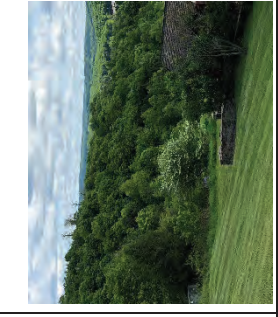
TABLE 3.1. LANDSCAPE FEATURE INVENTORY:
JOHNSTOWN FLOOD NATIONAL MEMORIAL

Feature Name	Other Resource Inventory	FMSS Data (Location / Asset records)	Evaluation Status	Evaluation Narrative Period of Significance (1879 – 1889)	Graphic Reference
Vegetation Features					
V-1 Forested Areas on Downstream Face of Dam Abutments	CLI No. 176718		Contributing	Historic Condition (1879 – 1889): Historic photographs reveal that in 1889 trees were growing on the rocky downstream sides of the dam, though not within the portion of the dam that was repaired by the South Fork Fishing and Hunting Club. Evaluation: Both large and small trees remain on the downstream sides of the North and South Dam Abutments. These trees suggest the tree growth present during the period of significance, as well as screen visual and noise pollution from the adjacent freeway.	
V-2 Open meadows and fields on hillside south of Visitor Center	CLI No. 176724	Location: 16312. Asset: 1269038	Contributing	Historic Condition (1879 – 1889): During the period of significance the hillside south of Lake View Farm was covered in field crops and/or meadow which allowed for views from Lake View House south southeast to Lake Conemaugh. Evaluation: A meadow stretches from the Visitor Center down the hillside southward to Lake Road which allows for views of the lake basin, allowing the visitor to envision the former Lake Conemaugh and magnitude of the dam's destruction.	
V-3 Forest Vegetation on Hill southwest of South Dam Abutment	CLI No. 176722		Contributing	Historic Condition (1879 – 1889): Historic photographs reveal that during the period of significance the hillside southwest of the south abutment was forested in deciduous vegetation. Evaluation: The hill situated southwest of the south abutment remained wooded after 1889, although some trees were removed by 1904-05 for construction of a local road just downhill from the carriage road, as well as a small clearing for mining activities near the dam. Additional trees were taken down along the road in the 1930s when the road was improved and designated State Route 869. By 1958, a corridor of trees was removed on the southwest side of the hill for the new alignment of State Route 869, and in the 1960s a much larger area was removed on the northwest side of the hill for the construction of U.S. Route 219 and its associated engineering features. Under park ownership, trees were removed at the top of the hill in 1972-73 for construction of the Picnic Grounds Road and parking lot, but mature trees were retained in the picnic area itself. Additional trees were cleared for construction of a maintenance facility in the early 1980s and its expansion in the mid-1990s. Today, the hill retains its deciduous forest	

**TABLE 3.1. LANDSCAPE FEATURE INVENTORY:
JOHNSTOWN FLOOD NATIONAL MEMORIAL**

Feature Name	Other Resource Inventory	FMSS Data (Location / Asset records)	Evaluation Status	Evaluation Narrative Period of Significance (1879 – 1889)	Graphic Reference
				including mature sugar maple, American beech, red maple, black cherry, and other species	
V-4 Old Field Vegetation growing within the historic lakebed	N/A	Location: 16325 Asset: 1690321	Contributing	Historic Condition (1879 – 1889): After the dam break the water drained from Lake Conemaugh leaving a muddy basin. Over time grasses and forbs and eventually successional woody vegetation grew to cover the contours of the basin of the former lake. Evaluation: The low growing grasses and meadow forbs that make up the Old Field vegetation within the lakebed allow the magnitude of the former Lake Conemaugh to be revealed to visitors through the basin's contours. This vegetation community is dominated by an herbaceous subtype identified as "Old Field" by the Pennsylvania Natural Heritage Program. The "Old Field" vegetative community currently contains graminoid and herbaceous plants of both native and non-native species. Due to the growth of successional woody species, Old Field vegetation is currently limited within the lake basin.	
V-5 Mature red maple, black locust, and hemlock that line the lakebed side of the South Abutment Road	N/A		Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: Though the mature red maple, black locust, and hemlock that line the lakebed side of the South Abutment Road post-date the period of significance (1879 – 1889), they are compatible with the historic setting.	
V-6 Mature hardwood forest growing south Visitor Center and South of Lake Road	N/A		Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: Though the mature hardwood forest growing south of the Visitor Center and South of Lake Road post-date the period of significance (1879 – 1889), they are compatible with the historic setting.	

TABLE 3.1. LANDSCAPE FEATURE INVENTORY:
JOHNSTOWN FLOOD NATIONAL MEMORIAL

Feature Name	Other Resource Inventory	FMSS Data (Location / Asset records)	Evaluation Status	Evaluation Narrative Period of Significance (1879 – 1889)	Graphic Reference
V-8 Woody vegetation on Dam Abutments and within Lakebed	CLI No. 176716	Location: 16325 Asset: 1690321	Non- Contributing/ Non- Compatible	Historic Condition (1879 - 1889): N/A Evaluation: The woody vegetation growing on the historic dam abutments and within the boundaries of the historic former Lake Conemaugh lake basin was not present during the period of significance. Moreover, the vegetation screens the contours of the lake basin and abutments, preventing visitors from visualizing the extents of the former lake and the magnitude of the disaster.	
V-9 Woodlot/Orchard southeast of Lake View House	CLI No. 176726	Location: 16312 Asset: 1269043	Non- Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The woodlot and orchard post-date the period of significance (1879 – 1889) but they are compatible with the historic setting.	
V-10 Plantings and Lawns around Lake View House and Visitor Center	CLI No. 176728	Location: 16312 Assets: 1269044, 1269047 1269043	Non- Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service-era plantings of trees, shrubs, lawn and perennials near the Lake View House and Visitor Center were not present during the period of significance (1879 – 1889) but they are compatible with the historic setting.	

**TABLE 3.1. LANDSCAPE FEATURE INVENTORY:
JOHNSTOWN FLOOD NATIONAL MEMORIAL**

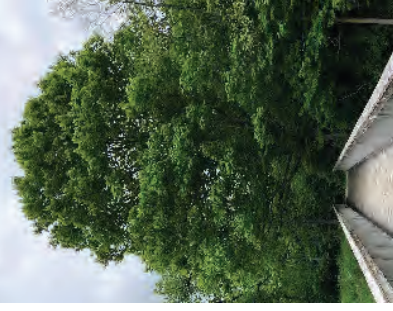
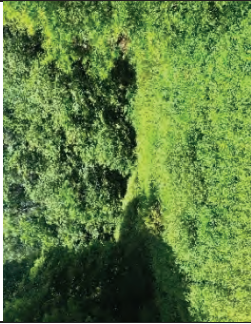
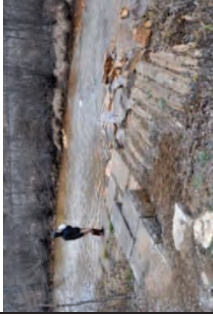
Feature Name	Other Resource Inventory	FMSS Data (Location / Asset records)	Evaluation Status	Evaluation Narrative Period of Significance (1879 – 1889)	Graphic Reference
V-11 Trees and shrubs near South Fork Fishing and Hunting Club Clubhouse and Cottages	N/A	Location: 16335 Asset: 1269041	Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service-era plantings of trees, shrubs, and lawn planted near the Clubhouse and cottages were not present during the period of significance (1879 – 1889) but they are compatible with the historic setting.	
V-12 Maple Tree growing on the crest of the North Dam Abutment near the end of the Pedestrian Bridge	N/A		Undetermined	Historic Condition (1879 - 1889): Unknown Evaluation: The large maple tree located at the western end of the Pedestrian bridge on the crest of the Northern Dam Abutment, may date to the period of significance. Further research is necessary.	

TABLE 3.1. LANDSCAPE FEATURE INVENTORY:
JOHNSTOWN FLOOD NATIONAL MEMORIAL

Feature Name	Other Resource Inventory	FMSS Data (Location / Asset records)	Evaluation Status	Evaluation Narrative Period of Significance (1879 – 1889)	Graphic Reference
Buildings and Structures Features					
BS-1 South Fork Dam Abutments	LCS No. 000747, ASMIS No. JOFL00003.000, NR: Contributing structure	Location: 16325 Asset: 1690321	Contributing *	Historic Condition (1879 - 1889): Constructed 1838-53; altered 1862, 1880, 1889. Historically the South Fork Dam was 931 feet long, 72 feet high, more than 500 feet wide at the bottom, and approximately ten feet wide at the top, which was wide enough for a wagon to pass. The top of the dam was ten feet higher than the water level of the reservoir. This puddled clay core was supported on both sides by stone and gravel layers. The downstream face of the dam was ripped with heavy loose rocks, while the upstream face was ripped with a layer of smaller stones 2.5 feet thick. Evaluation: The earthen South Fork Dam Abutments are built in steep slope revetments with large stone riprap along the lower level to minimize erosion. They are partially overgrown with grasses, brush, and trees. The west or downstream faces are covered with stone riprap pierced through by mid-sized deciduous and coniferous trees. The North Abutment measures 20 feet wide by 390 feet in length by 72 feet in height. The South Abutment measures twenty feet wide by 230 ft in length by 72 feet in height. The gap between the north and south abutments, marking the section of the dam that collapsed on May 31, 1889, is approximately 250 to 300 ft wide. Though now cloaked in vegetation, the dam abutments reveal the magnitude of the size of the former dam and contribute to visitor understanding of the tragedy.	
BS-2 South Fork Dam Spillway	LCS No. 081988, ASMIS No. JOFL00005.000, NR: contributing structure	Location: 16325 Asset: 1690321	Contributing *	Historic Condition (1879-1889): Constructed 1838-53; altered 1879-81, 1889, 1903-04, 1960-70. Historically, the cut stone on the sides and bottom of the spillway would have been visible, not cloaked in vegetation and occasionally the spillway would have held water from the sluice-pipes to prevent overflow of the dam. Evaluation: The South Fork Dam Spillway is cut through the stone embankment north of the dam to an approximate depth of ten feet. The 280 ft long opening varies between sixty and one hundred feet wide. A cliff rises up toward Lake Road and forms the north and east edges of the spillway cut. Woody vegetation, grass and brush has grown up within the spillway. A wood footbridge constructed by the National Park Service in 1994 crosses over the east end of the spillway to provide access to the north abutment.	

**TABLE 3.1. LANDSCAPE FEATURE INVENTORY:
JOHNSTOWN FLOOD NATIONAL MEMORIAL**

Feature Name	Other Resource Inventory	FMSS Data (Location / Asset records)	Evaluation Status	Evaluation Narrative Period of Significance (1879 – 1889)	Graphic Reference
BS-3 South Fork Dam Overflow Sluice Ruins	LCS No. 081981, ASMIS No. JOFL00004.000, NR contributing structure	Location: 16325 Asset: 1690321	Contributing *	Historic Condition (1879-1889): Constructed 1839-53; altered 1862, 1875-79, 1889. During the period of significance the control mechanism for the dam consisted of a sluice gate whose five 24-inch diameter cast iron pipes were secured within a cut stone arch culvert (25 feet wide at the base) that extended entirely through the base width of the dam. Water was discharged from the reservoir through these pipes, though by the period of significance these pipes had been removed. A wood frame valve control tower, with a log and stone foundation at the bottom of the reservoir, extended about fifteen feet above the top of the water surface and was used to regulate the discharge of water. Evaluation: The South Fork Dam Overflow Sluice Ruins consist of the masonry sluice control foundation ruins and the adjacent wood protective cushion ruins, located in the streambed immediately upriver (east) of the south abutment. In the winter the structure is submerged by ice and water. The cut, dressed, and coursed stones (each block 2 ft wide by 4 ft long by 1.5 ft high) of the sluice control foundation ruins form a rectangle. The exposed section is fifteen feet wide by twenty-one feet long with a tiered section that is two-foot-wide by nine feet long by three feet high. A four-foot square section remains consistently submerged. Several six-inch square timbers remain from the eleven feet by fifteen ft wood cushion east of the foundation. Wood and culvert foundation stones near the river and at the bottom and center of the original dam mark the only remains of the original stone arch culvert that housed the sluice discharge pipes.	
BS-4 Lake View House (Elias J. Unger House)	CLI No. 176778 LCS No. 080057 (JBUNGER) ASMIS No. JOFL00002.000, NR contributing building	Location Grounds: 16312 Location Building: 16309	Contributing *	Historic Condition (1879 – 1889): Constructed 1883-88; restored 1987-90, 1993-94. The two-story, wood, balloon-frame building measured thirty 36 feet long and 30 feet wide and features a steep, wood-shingled, cross-gable roof with two brick chimneys along the primary roof ridge. The walls, including the exposed south basement wall, are clad in wood shiplap siding trimmed with corner and eave boards, while the foundation and remaining three basement walls are rubble fieldstone. A one-story pedimented porch shelters an entrance on the northeast elevation and a full-width two-story porch with a low-pitched shed roof spans the southwest elevation. Evaluation: Though in the years after the period of significance, Lake View House was altered, in 1981 the National Park Service purchased the Unger property, and in 1987-90 restored the vernacular Gothic Revival exterior to its c.1885 appearance. The park reconstructed the missing porches and chimneys, removed a non-historic west chimney, and painted the house white with red trim. These changes have restored the character defining features of the Unger family property. Park administrative offices are located in the building.	

**TABLE 3.1. LANDSCAPE FEATURE INVENTORY:
JOHNSTOWN FLOOD NATIONAL MEMORIAL**

Feature Name	Other Resource Inventory	FMSS Data (Location / Asset records)	Evaluation Status	Evaluation Narrative Period of Significance (1879 – 1889)	Graphic Reference
BS-5 Unger Spring House Rubblestone Foundation	CLI No. 176782 LCS No. 080058 (JBSPRING) ASMIS No. JOFL00006.000,	Grounds Location: 16312 Building Location: 16311	Contributing *	Historic Condition (1879 – 1889): Constructed 1883-88; partially rebuilt 1888-89. The Spring House was constructed between 1883 and 1888 on a rubblestone foundation. Evaluation: The spring house remains in its original location on its original foundation. Though the upper story of the structure is slightly smaller than the original, the design of the wood frame building is similar. The spring house was partially rebuilt 1888-89 on the original rubblestone foundation. In 1988 the National Park Service removed the deteriorated upper frame portion of the spring house replaced it with one similar in style to the earlier structure but smaller in size. The open west end of the remaining stone foundation was also stabilized. The spring house contributes to the integrity of the property through its integrity of location, materials, and design. Today, the spring house is used for storage.	
BS-6 South Fork Fishing and Hunting Clubhouse	CLI No. 176770 LCS No. 757628 (112) ASMIS No. JOFL00007.000, NR contributing building	Grounds Location: 16335 Building Location: 16334	Contributing *	Historic Condition (1879 – 1889): Constructed 1881-86; altered ca. 1930. The original residential scale two-and-a-half story frame building was completed in 1881, and then enlarged with a larger three-story frame L-shaped addition in 1886. The clubhouse featured forty-seven furnished bedrooms, a dining room for one-hundred-and-fifty, an office, billiard room, parlor, kitchen, bakery, and a long covered front porch overlooking Lake Conemaugh. Evaluation: Between the end of the significance period and today, the Clubhouse underwent extensive alteration. In the 1990s the front porch was rebuilt by the South Fork Fishing and Hunting Club Historical Preservation Society and two non-historic additions were removed by the National Park Service in the 2000s. The Clubhouse remains in its original location and retains many of the character defining features it had during its use by the South Fork Fishing and Hunting Club. The ground floor of the building is used for NPS programming, and the upper two floors are not used.	

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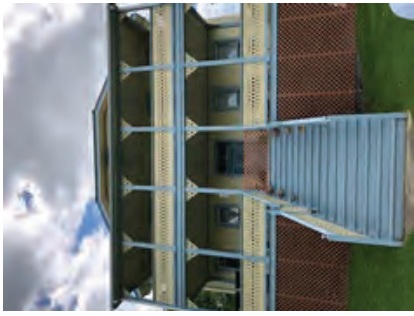
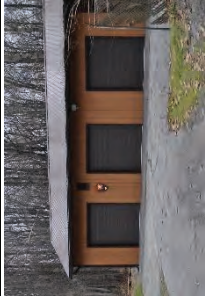
Feature Name	Other Resource Inventory	FMSS Data (Location / Asset records)	Evaluation Status	Evaluation Narrative Period of Significance (1879 – 1889)	Graphic Reference
BS-7 Double Cottage (Clubhouse Annex)	CLI No. 176772 LCS No. 764672 (113) ASMIS No. JOFL00008.000, NR contributing building	Grounds Location: 16335 Building Location: 86518	Contributing *	Historic Condition (1879 – 1889): Constructed ca. 1887; altered ca. 1950. In c.1887 a two-story frame building was constructed northwest of the clubhouse providing accommodations for four families. The building included a two-story covered front porch facing the lake. Evaluation: The Double Cottage is a two-story rectangular building with a raised basement and a two-story full-width front porch with walls clad vinyl siding installed ca. 1995 and vertical boards in the gable ends. Though, circa 1934 the building and front porch were raised two feet, the building retains its original location, orientation and design, and thus contributes to the historic integrity of the property. The rehabilitated interior of the building contains four identical apartments leased to tenants by the National Park Service.	
BS-8 Brown Cottage	CLI No. 176774 LCS No. 764704 (106) ASMIS No. JOFL00010.000, NR contributing building	Grounds Location: 16335 Building Location: 86516	Contributing *	Historic Condition (1879 - 1889): Constructed 1888; altered 1921. The Brown Cottage was constructed in 1888 as a summer residence for the James W. Brown family as a modest two-story building with an asymmetric, steeply pitched, hipped and gabled roof and a one-story wraparound front porch oriented toward Lake Conemaugh. Evaluation: Though the cottage was converted to a duplex in 1921 and vinyl siding and asphalt roof shingles, and a one-story addition to the back facade were added in the 1990s, the building is in its original location and retains many of its character defining features including its wraparound porch and asymmetrical massing. Today, the rehabilitated interior of the building contains two apartments leased to tenants by the National Park Service.	

TABLE 3.1. LANDSCAPE FEATURE INVENTORY: JOHNSTOWN FLOOD NATIONAL MEMORIAL					
Feature Name	Other Resource Inventory	FMSS Data (Location / Asset records)	Evaluation Status	Evaluation Narrative Period of Significance (1879 – 1889)	Graphic Reference
BS-9 Lippincott Cottage (Moorhead Cottage)	CLI No. 176776 LCS No. 748636 (105) ASMIS No. JOFL00009.000, NR contributing building	Location Grounds: 16335 Location Building: 16341	Contributing*	Historic Condition (1879-1889): Constructed 1887; altered ca. 1930. The Lippincott Cottage was constructed possibly in 1887 as a summer residence for the Jesse Lippincott family as a Queen Anne-style building with asymmetric, hipped and gabled roof; a distinctive octagonal tower; and multiple projecting bays and porches. Like all the cottages within the South Fork Fishing and Hunting Club, the building was oriented toward Lake Conemaugh. Evaluation: Though in poor condition, the Lippincott Cottage is in its original location and retains many of the defining characteristics including its building fabric, massing, and design and thus contributes to the integrity of the property.	
BS-10 National Park Service Visitor Center	CLI No. 176782	Location: 16310	Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service Visitor Center (built 1989) was not present during the period of significance (1879 – 1889) but the structure, which suggests the massing and materials of the former Lake View Farm barn, is compatible with the historic setting of the memorial.	
BS-11 Maintenance Office	CLI No. 176788	Grounds Location: 16361 Building Location: 16355	Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service Maintenance Office (built 1996) was not present during the period of significance (1879 – 1889) but as the modest one-story, brown building is screened from visitors, it is compatible with the historic setting.	
BS-12 Maintenance Shop	CLI No. 176786	Grounds Location: 16361 Building Location: 16356	Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service Maintenance Shop (built 1985) was not present during the period of significance (1879 – 1889) but, as a modest one-store brown building screened from visitors, it is compatible with the historic setting.	

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JOHNSTOWN FLOOD NATIONAL MEMORIAL**

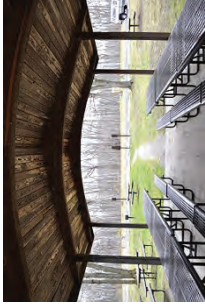
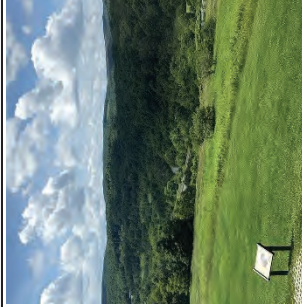
Feature Name	Other Resource Inventory	FMSS Data (Location / Asset records)	Evaluation Status	Evaluation Narrative Period of Significance (1879 – 1889)	Graphic Reference
BS-13 Picnic Pavilion	CLI No. 176784	Location: 16344 Asset: 1253617	Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service Picnic Pavilion (built 1989) was not present during the period of significance (1879 – 1889) but the rustic wooden architecture it is compatible with the historic setting.	
BS-14 Stone Culverts and Retaining Wall at South Abutment Road and Parking Lot	CLI No. 176792		Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service era culverts and Retaining Wall near the South Abutment Road and Parking Lot were not present during the period of significance, but their subtle design using local stone renders them compatible with the historic setting.	
BS-15 Culvert at Picnic Grounds Road and Parking Lot	CLI No. 176794		Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service era culverts near the picnic ground and parking lot were not present during the period of significance, but their subtle design using local stone renders them compatible with the historic setting.	
BS-16 Retaining Walls at Visitor Center	CLI No. 176798	Location: 16312 Asset: 1686543 (south) 1686544 (north)	Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service era retaining walls near the Visitor Center were not present during the period of significance, but they are compatible with the historic setting using simple vernacular construction techniques and local stone.	
BS-16 Retaining Wall at Lake View House Parking Area	CLI No. 176800	Location: 16312	Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service era retaining walls near the Lake View House Parking Area were not present during the period of significance, but they are compatible with the historic setting through the use of simple vernacular construction techniques and local stone.	

TABLE 3.1. LANDSCAPE FEATURE INVENTORY: JOHNSTOWN FLOOD NATIONAL MEMORIAL					
Feature Name	Other Resource Inventory	FMSS Data (Location / Asset records)	Evaluation Status	Evaluation Narrative Period of Significance (1879 – 1889)	Graphic Reference
BS-17 Spillway Footbridge	CLI No. 176802		Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service-era Spillway Footbridge was not present during the period of significance, but it is a recreation of a bridge present during the period of significance and it is compatible with the historic setting as the appearance of the existing bridge suggests the original footbridge through its materials and location, though its architectural details are different.	
Constructed Water Features					
N/A					
Views and Vistas Features					
VV-1 Views from the Johnstown Flood Visitor Center/Lake View Farm	CLI No. 176806	Location: 16325 Asset: 1690321	Contributing	Historic Condition: Club president Elias Unger built his farmstead on the lake's northeastern shoreline and sited the house in a hillside field so the Unger family would have a panoramic view of the South Fork Dam, Lake Conemaugh and toward the South Fork Fishing and Hunting Club cottages on the distant shoreline. Evaluation: Though a meadow grows on the hillside just east of the Unger House, the basin of the former lakebed and abutments are cloaked in woody vegetation preventing visitors from viewing the contours of the lakebed and thereby understanding the enormity of the former lake and the destructive capacity of the dam breach.	
VV-2 Views from the North Abutment Overlook	CLI No. 176804	Location: 16325 Asset: 1690321	Contributing	Historic Condition (1879-1889): Historic photographs from the period of significance suggest that trees and woody vegetation grew on the downstream or west side of the South Fork Dam, while views to the east encompassed Lake Conemaugh. Post breach, views from the top of the North Abutment revealed the muddy basin of the lakebed. Evaluation: Currently woody vegetation hides the contours of the lakebed from this important viewpoint, limiting visitors' ability to visualize the enormity of the former Lake Conemaugh and therefore the significance of the dam's failure.	

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JOHNSTOWN FLOOD NATIONAL MEMORIAL**

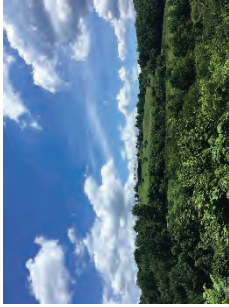
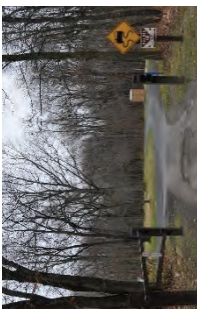
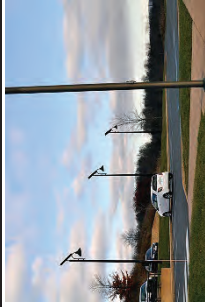
Feature Name	Other Resource Inventory	FMSS Data (Location / Asset records)	Evaluation Status	Evaluation Narrative Period of Significance (1879 – 1889)	Graphic Reference
VV-3 Views from the South Abutment Overlook	CLI No. 176804	Location: 16325 Asset: 1690321	Contributing	Historic Condition (1879-1889): Historic photographs from the period of significance suggest that trees and woody vegetation grew on the downstream or west side of the South Fork Dam, while views to the east encompassed Lake Conemaugh. Post breach, views from the top of the South Abutment revealed the muddy basin of the lakebed. Evaluation: Currently woody vegetation hides the contours of the lakebed from this important viewpoint, limiting visitors' ability to visualize the enormity of the former Lake Conemaugh and therefore the significance of the dam's failure.	
VV-4 Views from the Lake Road Parking Lot	N/A	Location: 16325 Asset: 1690321	Contributing	Historic Condition (1879-1889): Historic photographs from the period of significance suggest that this point, which was near the path of the carriage road, provided views across Lake Conemaugh and of the east face of the South Fork Dam. Post breach, views from the top of the South Abutment revealed the muddy basin of the lakebed in this location. Evaluation: Currently woody vegetation hides the contours of the lakebed from this important viewpoint, limiting visitors' ability to visualize the enormity of the former Lake Conemaugh and therefore the significance of the dam's failure.	
Small-Scale Features (Drawing Key: SSF)					
SSF-1 Wayside Signs, and Information Signs, and Numbered Signposts	CLI No. 176808		Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service era wayside signs, informational signs and numbered signposts were not present during the period of significance, but as interpretive guides in a national park, they are compatible with the historic setting.	
SSF-2 Park Entrance Sign	CLI No. 176810	Location: 1269022 Asset: 1269022	Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service era park entrance sign on Lake Road was not present during the period of significance, but as a national park service property, this sign is compatible with the historic setting.	

TABLE 3.1. LANDSCAPE FEATURE INVENTORY: JOHNSTOWN FLOOD NATIONAL MEMORIAL						
Feature Name	Other Resource Inventory	FMSS Data (Location / Asset records)	Evaluation Status	Evaluation Narrative Period of Significance (1879 – 1889)	Graphic Reference	
SSF-3 Split-Rail Fence along Lake Road	CLI No. 176812		Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service era split rail fence along Lake Road was not present during the period of significance, but as split rail fences were used during the period of significance in agricultural settings, the fencing is compatible with the historic setting.		
SSF-4 Rail Fences at Dam Abutments	CLI No. 176814		Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service era wood rail fences at the Dam Abutments were not present during the period of significance, but as subtle utilitarian protective barriers using local materials, they are compatible with the historic setting.		
SSF-5 Fence and Metal Gate at Maintenance Area	CLI No. 176816	Location: 16261 Asset: 1269013	Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service era fence and metal gate at the maintenance area was not present during the period of significance, but as this is a non-visitor area and used for protection of park resources, the gates are compatible with the historic setting.		

**TABLE 3.1. LANDSCAPE FEATURE INVENTORY:
JOHNSTOWN FLOOD NATIONAL MEMORIAL**

Feature Name	Other Resource Inventory	FMSS Data (Location / Asset records)	Evaluation Status	Evaluation Narrative Period of Significance (1879 – 1889)	Graphic Reference
SSF-6 Guardrails	CLI No. 176818		Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service era metal and wooden guardrails were not present during the period of significance, but they are compatible with the historic setting.	
SSF-7 Benches	CLI No. 176820		Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service benches were not present during the period of significance, but as the subtle design can clearly be understood to be modern, they are compatible with the historic setting.	
SSF-8 Picnic Tables	CLI No. 176826		Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service era stationary picnic tables were not present during the period of significance, but are compatible with the historic setting.	
SSF-9 Grills	CLI No. 176824	Location: 16344 Asset: 1269018	Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service era grills were not present during the period of significance, but they are clearly modern yet of a subtle design they are compatible with the historic setting.	

**TABLE 3.1. LANDSCAPE FEATURE INVENTORY:
JOHNSTOWN FLOOD NATIONAL MEMORIAL**

Feature Name	Other Resource Inventory	FMSS Data (Location / Asset records)	Evaluation Status	Evaluation Narrative Period of Significance (1879 – 1889)	Graphic Reference
SSF -10 Bollard Lights at Visitor Center	CLI No. 176832		Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service-era Bollard Lights at the Visitor Center were not present during the period of significance, but they are compatible with the historic setting.	
SSF-11 Visitor Center Parking Lot Lights	CLI No. 176834		Non-Contributing	Historic Condition (1879 - 1889): N/A Evaluation: The National Park Service-era Parking Lot Lights were not present during the period of significance, but they are compatible with the historic setting.	
Archeological Sites Features					
AS-1 Ten ASMIS sites			Contributing	Historic Condition (1879 – 1889): N/A Evaluation: The history of archeological research at Johnstown Flood National Memorial comprises nearly a dozen archeological investigations conducted between 1977 and 2015. Ten resources are inventoried in the Archeological Sites Management and Information System (ASMIS) for the park and are currently listed in the National Register as contributing buildings or structures.	

GENERAL NOTES

1. Features are numbered consecutively by characteristic for the Johnstown Flood National Memorial
2. All documentation is from the Site History (CLR chapter 1), the National Register Nomination for Johnstown Flood National Memorial (draft 2016), and the Cultural Landscape Inventory for Johnstown Flood National Memorial
3. All photographs are by the Olmsted Center for Landscape Preservation and date to between 2014 and 2019.



Olmsted Center for Landscape Preservation, 2019

TREATMENT

TREATMENT OVERVIEW

TREATMENT FRAMEWORK

LANDSCAPE TREATMENT ALTERNATIVES

Nestled amidst the rolling topography and lush woodlands of western Pennsylvania's south-central Cambria County, the picturesque setting of the Johnstown Flood National Memorial, and the South Fork of the Little Conemaugh River remain indifferent to the will of humankind. This landscape, through which drains a vast expanse between two ridges of the Allegheny Mountains, bends only to the movement of water, the freeze and thaw of ice crystals, and the inexorable growth and decay of plant life. Experience has demonstrated that human designs for this place must be carefully and thoughtfully considered.

The Treatment Plan for Johnstown Flood National Memorial therefore is based upon careful consideration of the natural and cultural resources within the park, and through close collaboration with park and regional staff. According to the *General Management Plan for the Johnstown Flood National Memorial*, the purpose of the memorial is to commemorate the tragic Johnstown Flood of May 31, 1889 by interpreting the causes and significance of the Johnstown Flood in the national economic, social and technological history, and to foster an awareness of its relationship to contemporary American society. To meet this multifaceted goal, the park's cultural landscape must enable visitors to understand the vast size of the historic lake and dam and the enormous impact of its failure. To facilitate this understanding, vegetation growing in the lakebed and spillway, and on the remnants of the historic earthen dam, must be managed to allow visitors to visualize the extents of the former lake (Figure 4.1).

Figure 4.1. In this view of the lakebed from the meadow south of Lake View House, morning fog glides over the contours of the lakebed, suggesting the long vanished Lake Conemaugh. (Johnstown Flood National Memorial).



The Johnstown Flood National Memorial was authorized as a unit of the National Park Service in 1964 and is in south-central Pennsylvania approximately eighty miles east of Pittsburgh. The park straddles the South Fork of the Little Conemaugh River, which was dammed in 1853, impounding a large reservoir critical to the successful operation of a trans-Allegheny canal system. At the time of its construction, the dam formed one of the largest human-made lakes in the nation, nearly two miles long and up to a mile wide. Obsolete by the late 1870s, the dam was purchased and repaired by the South Fork Fishing and Hunting Club, a social club comprised of wealthy, prominent families from Pittsburgh. The dam's impoundment, named Lake Conemaugh, served as the club's exclusive resort until the dam failed.

After the 1889 disaster, trees and shrubs sprang forth to clothe the denuded landscape. Coal was discovered in profitable quantities in the rock strata below the former lakebed and elsewhere throughout the area. New communities developed in response to the presence of the mines, and freight trains rumbled across tracks laid parallel to the South Fork of the Little Conemaugh River, transporting coal to an eager market.

The 178-acre national monument currently preserves the remains of the South Fork Dam, which consists of two trapezoidal-shaped earthen and rock abutments separated by a breach approximately four hundred feet wide. The basin of the former lake stretches eastward from the base of the dam. These features, so critical to public understanding and commemoration of the tragedy, are hidden from view by the unchecked growth of shrubs and trees, making it difficult for visitors to visualize the former geometry of the earthen dam; to comprehend the boundaries of the former lake; or otherwise to imagine the tremendous destructive energy stored in such a vast impoundment of water. The dam's spillway, a large trough cut into the rock to the north of the north abutment, is traversed by a modern pedestrian bridge, with additional trails leading visitors to the bottom of the dam breach. Along the bottom of the lakebed, the river and an active railroad line move past the stone and timber ruins of the dam's original control structure and through approximately seventeen acres of federally designated wetlands. Lake View Farm and Lake View House, accompanied by the modern park visitor center, occupy the former property of Elias Unger, the club's former president. These properties are found to the north and perched on a grassy hillside. From this elevated vantage point, visitors engage with exhibits and attempt to take in once panoramic views of the lakebed and dam. Surviving historic residences associated with the South Fork Fishing and Hunting Club are barely visible from this vantage point, laying about one mile to the south in St. Michael (Figure 4.2). The National Park Service owns and manages four of these historic buildings, the central club house, a double cottage and two single cottages.

TREATMENT OVERVIEW

The primary objective of this landscape treatment plan is to reveal the contours of the former lakebed and dam abutments through economically and environmentally sustainable methods. The treatment recommendations and tasks included in this chapter were developed in collaboration with park and regional staff beginning with a treatment workshop held in St. Michael, Pennsylvania on June 24, 2019.

The National Park Service defines *landscape treatment* as “historic preservation efforts focused on the goal of enhancing the historic character of a cultural landscape within the context of its contemporary function.”¹ In addition to preserving the historic integrity of significant landscape characteristics and features, a landscape treatment plan supports other park management objectives, including economic and environmental sustainability, and public access. The proposed landscape treatment for Johnstown Flood National Memorial conforms to policies, goals, and objectives detailed in the federal enabling legislation for the park, as well as National Park Service standards and guidelines, and current park planning documents. At Johnstown Flood National Memorial a primary function of the cultural landscape is to provide visitors with a visual impression of the enormity of former Lake Conemaugh and the South Fork Dam, so that visitors may understand the magnitude of the devastation caused by the dam’s failure.

Landscape treatment for Johnstown Flood National Memorial will be presented in the following six sections. The first section provides the Treatment Framework, including legal and regulatory basis for acting. This is followed by the Treatment Philosophy, an articulation of the preservation values for the 178-acre site, providing context for the treatment recommendations included in this report. The Treatment Philosophy summarizes the preservation issues specific to Johnstown Flood National Memorial and emphasizes rehabilitation of the former lakebed



Figure 4.2. The view southwest in the winter, towards the former South Fork Fishing and Hunting Club Cottages from Lake View Farm, 2016. (Olmsted Center for Landscape Preservation)

though careful removal of vegetation to reveal the former lake's topographic contours to visitors.

The second section begins with an overview of three Treatment Alternatives for the rehabilitation of the lakebed, presented to the leadership of Johnstown Flood National Memorial and the National Parks of Western Pennsylvania by historical landscape architects from the Olmsted Center for Landscape Preservation in June 2019. The Preferred Alternative, chosen by leadership of the Johnstown Flood National Memorial following the 2019 landscape treatment presentation, is then detailed in the third section. The preferred alternative is presented through the development of four Treatment Zones based on existing conditions and regulatory requirements. This section provides a vision for each Treatment Zone, describing how each zone contributes to achieving the clearing of the lakebed. This section also enumerates the treatment tasks required to achieve the preferred treatment alternative. Completion of these treatment tasks, through staff and contracted services, enhances historic landscape character while accommodating present-day management and legal regulations. The fourth section defines an implementation strategy based on existing conditions, regulatory requirements, and best practices and methodologies. The fifth section outlines a plan for yearly and cyclical maintenance, including a multi-year seasonal maintenance calendar. The sixth and final section provides a brief *Record of Treatment* for the clearing of the lakebed in 2019 and 2020. This *Record of Treatment* describes the planning process and regulatory compliance path, as well as lessons learned in the implementation of the project.

TREATMENT FRAMEWORK

This section describes the regulatory and philosophical framework as context for the treatment recommendations that follow. This includes descriptions of the applicable National Park Service policies and regulations, enabling legislation for Johnstown Flood National Memorial and park planning documents. Building upon this framework, a landscape treatment philosophy articulates a vision for the Johnstown Flood National Memorial landscape, including a primary treatment approach.

RELATIONSHIP TO NATIONAL PARK SERVICE REGULATIONS AND POLICIES

The treatment framework for the Johnstown Flood landscape is grounded in the mission of the National Park Service, defined in the Organic Act of 1916, “to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.”² The

application of this mission to cultural landscapes is articulated in The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes, which in turn is interpreted within the context of National Park Service management regulations and policies.

Management of the Johnstown Flood National Memorial is defined by 36 Code of Federal Regulations: Parks Forests and Public Property, Part 2: Resource Protection, Public Use and Recreation (preservation of natural, cultural, and archeological resources). The application guidance to these regulations is contained within National Park Service Management Policies (2006), Director's Order 28: Cultural Resource Management, and NPS-28: Cultural Resource Management Guideline. Several management standards outlined in NPS-28 provide a broad philosophical base for the proposed landscape treatment and are further detailed in The Secretary of the Interior's Standards for Rehabilitation. Those most pertinent to the landscape treatment at Johnstown Flood National Memorial are highlighted below.

- All treatment decisions reflect consideration of effects on both the natural and built features of a cultural landscape and the dynamics inherent in natural processes and continued use.
- Land use activities, whether historic or introduced, will not impair archeological resources.
- Use is monitored and regulated to minimize both immediate and long-term damage.
- Contemporary structures to facilitate access and interpretation are designed and located to minimize adverse impacts on the character and features of a cultural landscape.

In addition, the landscape treatment of Johnstown Flood National Memorial is in part governed by *Directors Order 77-1: Wetland Protection* which requires the identification, classification, and mapping of designated wetlands, and NPS-77, *Natural Resource Management Guidelines* which regulates the management of resources and values including, ecosystems and their component plants, animals, water, air, soils, topographic features, geologic features, and palaeontologic resources, and aesthetic features such as scenic vistas. Therefore, the recommended landscape treatment balances the needs of natural resources while meeting park cultural resource protection, maintenance, and interpretive goals.

PARK ENABLING LEGISLATION

Johnstown Flood National Memorial was authorized on August 31, 1964 and established on June 30, 1969, to commemorate the tragic Johnstown Flood of May

31, 1889, and to “interpret the events leading up to the Johnstown flood, the flood itself, and of its effects on Johnstown and the nation.” Boundary adjustments allowing additional acreage surrounding the South Fork Dam and Unger property were made in 1972 (52.76 acres) and 1978 (56.89 acres).

On October 5, 2004, Congress passed Public Law 108-313 approving for the modification of the existing boundaries of the memorial to include an additional approximately fourteen acres of land. This boundary revision incorporated several resources associated with the South Fork Fishing and Hunting Club into the park boundary, including the Clubhouse and Clubhouse Annex (now Double Cottage) and the Brown Cottage and Moorhead (now Lippincott) Cottage. These discontinuous properties are included within the 178-acre cultural landscape of the Johnstown Flood National Memorial.

NATIONAL REGISTER OF HISTORIC PLACES DOCUMENTATION

As a national memorial within the National Park System, the Johnstown Flood National Memorial was administratively listed on the National Register of Historic Places on October 15, 1966 with passage of the National Historic Preservation Act. On July 31, 1983, documentation for the 5.6-acre South Fork Fishing and Hunting Club Historic District in the town of St. Michael, including the Club House and cottages now incorporated into the Johnstown Flood National Memorial, was accepted by the Keeper of the National Register. The National Register of Historic Places documentation for the National Memorial was last updated in 2016 (pending).

Johnstown Flood National Memorial is nationally significant under National Register Criterion A in the areas of Social History and Entertainment/Recreation and locally significant under Criterion C in the area of Architecture. The period of significance for the park begins with the organization of the South Fork Fishing and Hunting Club in 1879 and ends with the Johnstown Flood of May 31, 1889 and the immediate recovery activities that followed. This time period encompasses the construction of all the resources associated with the club, including the repair and modification of the South Fork Dam for recreational purposes.³

Resources contributing to the significance of the property include the Lakebed (contributing site); Overflow Sluice Ruins (contributing structure); South Fork Dam Abutments (contributing structure); South Fork Dam Spillway, Carriage Road Trace (contributing structure); Lake View Farm, including Lake View House (contributing building) and Lake View Spring House (contributing structure); SFFHC Clubhouse (contributing building); Double Cottage (contributing building); Brown Cottage (contributing building); and Lippincott Cottage (contributing building).

Currently, woody vegetation growing on the contributing structures of the overflow sluice ruins, the South Fork Dam Abutments, and the South Fork Dam Spillway threaten their condition and integrity. In addition, the contributing site of the lakebed of historic Lake Conemaugh is hidden from visitors through the growth of non-contributing vegetation.

RELATIONSHIP TO EXISTING PARK PLANNING

Since its designation, management of Johnstown Flood National Memorial has been supported by planning initiatives consistent with National Park Service policy. Park management is guided by the *General Management Plan for Allegheny Portage Railroad National Historic Site and Johnstown Flood National Memorial* (1980), which was updated in 1992. In addition, management objectives related to the visitor experience and the cultural landscape are guided by the *Johnstown Flood Interpretive Prospectus and Development Concept Plan* (1984). The *Foundation Document for the Johnstown Flood National Memorial* was published in 2013 to document park's foundational resources, values, and history and provides a basis for planning and management. Management of park infrastructure, including facilities associated with the cultural landscape, is accomplished with computer-aided facility management software, called the National Park Service Facility Management Software System (FMSS). These planning initiatives, and how they inform treatment of the Johnstown Flood National Memorial cultural landscape, are described below.

General Management Plan (1980 and 1993)

The General Management Plan for Johnstown Flood National Memorial was published in 1980 as a joint publication, *General Management Plan for Allegheny Portage Railroad and Johnstown Flood National Memorial* to provide a definitive guide for management to follow in implementing authorizing legislation, including specifying development and management actions required to realize the purpose of the park. According to the General Management Plan, the purpose of the Johnstown Flood National Memorial is to commemorate the tragic Johnstown Flood of May 31, 1889 by interpreting the causes and significance of the Johnstown Flood in the national economic, social and technological history, and to foster an awareness of its relationship to contemporary American society. This included the “preservation and maintenance of the cultural resources and the setting of the South Fork Dam to approximate conditions in 1889.” In addition, the General Management plan detailed the perpetuation of the natural ecological communities in the park's designated natural zone and highlighted the value of these lands as aesthetic buffers around significant cultural resources. In 1993 the General Management Plan was updated through the publication of a *Statement for Management for Johnstown Flood National Memorial*. The then 163-acre park

(the fourteen-acre cottage property was acquired in 2004) was divided into four primary management zones (See Figure. 1.95), based on the natural, cultural and development zones first proposed in the 1980 GMP. Definitions of the four zones are excerpted below from the 1993 document:

- **Historic Zone:** Lands that will be managed for the preservation, protection, and interpretation of cultural resources and their settings, and to provide for their use and enjoyment by the public. The historic zone consists of the historic lakebed, dam abutments, spillway, culvert stones, as well as the Unger House.
- **Natural Zone:** Lands and waters that will be managed to conserve natural resources and ecological processes and to provide for their use and enjoyment by the public. The natural zone consists of a variety of open fields, brush, and forest bordering the historical and developed areas. In this park, the natural zone offers a buffer to historic resources from intrusive adjacent land uses or activities.
- **Park Development Zone:** Lands that will be managed to provide and maintain facilities serving park visitors and management. The development zone includes the maintenance area, picnic area, the visitor center, the spring house, and associated access roads and parking areas.
- **Special Use Zone:** Lands and waters that will continue to be used for activities not appropriate in other zones, such as non-federal lands within the boundary used for transportation and utility corridors [i.e. the railroad corridor cutting through the lakebed]

In addition, the 1993 *Statement for Management* detailed management objectives describing “desired futures of the park” including,

- To encourage preservation of the Lake Conemaugh area and the path of the flood (from key visitor access points) in a way that maintains a visual impression of these areas as they were at the time of the flood (1889) and enhances understanding of the significance of the flood, in cooperation with the Commission and other agencies and organizations
- To enable visitors to see the historic spillway that played a critical role in the failure of the dam
- To create an atmosphere of quiet contemplation at the Memorial such that visitors may understand and appreciate the tragic consequences of the 1889 flood
- To encourage preservation of the Lake Conemaugh Area and the path of the flood (from key visitor access points) in a way that maintains a visual impression of these areas as they were at the time of the flood

- To maintain the character of the Unger House, spring house, barn-form of the visitor center, and the surrounding landscape on the north abutment area at about 1889, to convey to visitors the events at the dam on the fateful day of the flood
- To protect and maintain the natural diversity of plants and animals outside of areas managed for primarily cultural resources or developed areas, providing a buffer to historic resources from intrusive adjacent land uses
- To provide visitors a range of recreational opportunities which will enhance their appreciation of the story of the flood, the significance of geography and the relationship of natural resources, without impairing natural or cultural resource values or the atmosphere of quiet contemplation
- In St. Michael, to encourage a representation of the setting at the South Fork Fishing and Hunting Club, 1878-1889

Interpretive Prospectus and Development Concept Plan (1984)

The National Park Service published an *Interpretive Prospectus and Development Concept Plan* in March 1984 to further refine ideas conveyed in the long-range *General Management Plan* (1980). The Interpretive Prospectus portion of the plan identified themes and story elements, while the Development Concept Plan provided a conceptual plan for a visitor services including a contact building, an access road, parking, trails, and landscaping. Together the overarching goal was to “describe a total visitor experience that will dramatically interpret the causes and significance of the Johnstown Flood.”⁴ In detailing the history and significance of the Johnstown Flood National Memorial, the Interpretive Prospectus highlighted the importance of the former Lake Conemaugh, stating “if there is one thing a visitor should gain from contemplation of the present-day view of the former Lake Conemaugh, it should be a reaction to man’s manipulation of the environment and the possible consequences.”⁵ Supporting the *General Management’s Plan* recommendation to “preserve and maintain the cultural resources and the setting of the South Fork Dam to approximate conditions existing during the 1889 period, the *Development Concept Plan* recommended that the fifty acre lakebed, which had been partially cleared and seeded in native grasses, be fully cleared of weedy vegetation.

Wildland Fire Management Plan for Allegheny Portage Railroad National Historic Site and Johnstown Flood National Memorial (2005)

A Wildland Fire Management Plan was approved by park and regional leadership in 2005 in compliance with National Park Service Director’s Order 18 requiring that all parks with vegetation capable of sustaining fire develop a Fire Management Plan. In compliance with the National Environmental Policy Act (NEPA), an

Environmental Assessment (EA) and a Finding of No Significant Impact (FONSI) were prepared concurrently with the Fire Management Plan. A primary objective outlined in the Wildland Fire Management Plan allowed park management to use prescribed fire to “efficiently accomplish resource management objectives, including the ability to maintain an overall park environment that compliments the park’s historic theme and interpretability.”⁶

Foundation Document (2013)

The National Park Service published a Foundation Document for Johnstown Flood National Memorial in 2013, detailing a formal mission statement to provide basic guidance for all planning and management decisions, and identifying fundamental resources and values within the park. Fundamental resources and values are those features, systems, processes, experiences, stories, scenes, sounds, smells, or other attributes determined to merit primary consideration during planning and management processes because they are essential to achieving the purpose of the park and maintaining its significance. The following fundamental resources and values have been identified for Johnstown Flood National Memorial landscape:

- South Fork Dam ruins. The abutments and sluiceways that are the remaining ruins of the South Fork Dam, the control tower foundation ruins, and the historic carriage road that traversed the abutment and continued upslope
- The dry bed of Lake Conemaugh. The land below the 1,600-foot contour of the lake, including the South Fork Little Conemaugh River, wetlands, and vegetated slopes
- South Fork Fishing and Hunting Club Historic District. The South Fork Fishing and Hunting Club Clubhouse, Double Cottage, and cottages
- Unger Farm. The Unger House, the visitor center, the springhouse ruins, and the fields and the orchard on the hillside above the South Fork Dam
- Sense of loss. Visitors should have the opportunity to feel and understand the magnitude of the loss of life and the scope of the disaster.⁷

Facility Management Software System Work Planning

The National Park Service Facility Management Software System (FMSS) is designed to manage park infrastructure and track costs associated with its care. Accurate FMSS organization and timely updates enable parks to prioritize projects and create funding requests that accurately reflect asset value and condition. FMSS hierarchy consists of Sites (e.g. Johnstown Flood National Memorial), Asset Types (e.g. Maintained Landscape), Locations (geographic areas, e.g. Lakebed), and assets (features, e.g. turf).

Johnstown Flood National Memorial's cultural landscape is tracked through several Asset Types, including Roads, Parking Areas, Trails, Maintained Landscapes, and Buildings. Most of the assets located with the cultural landscape at Johnstown Flood National Memorial are tracked under the Maintained Landscape Asset Type. A Maintained Landscape typically includes exterior park areas that have been developed and improved to support operations or visitor activities. To be classified as a Maintained Landscape, a landscape must require regular, recurring maintenance and include built features. Thus, the Lake Conemaugh Lakebed conforms to the definition of a "Maintained Landscape."

Organization of the Maintained Landscape Asset Type is intended to reflect specific areas for which the park wishes to accurately track costs. At present, the FMSS data for Johnstown Flood National Memorial's Maintained Landscape (3100) encompasses, Maintenance Grounds (16361), Unger House & Visitor Center Grounds (16312), Cottage and House Grounds (16335), and Picnic Grounds (16334) and Lakebed Grounds (16325). The vegetation growing within the former lakebed is found nested under location Lakebed Grounds (16325). For facility management purposes, this managed vegetation is Asset number 1690321 (Land Surface, Surface, Earth, Lakebed Grounds).

LANDSCAPE TREATMENT PHILOSOPHY

An effective landscape treatment philosophy briefly articulates the essential landscape qualities that convey significance, affirming fundamental principles for perpetuating and enhancing landscape character. Intending to address both undertakings under consideration, as well as unforeseen undertakings belonging to the future, the apt expression of treatment philosophy is consistent with principles derived from National Park Service legislation, policy, and planning.

Johnstown Flood National Memorial exists to commemorate the tragic flood of May 31, 1889, through its surviving cultural resources, including the dry Lakebed, the ruined dam, and the park-owned period buildings. Careful management of woody vegetation, long blocking views of the river valley, will give to park visitors a visual reference for understanding the magnitude of the former lake and dam. Treatment of the National Memorial landscape aspires to impart an emotional response, including a "Sense of Loss" that followed the catastrophe, providing a tranquil setting in which to reflect upon its causes and aftermath. To this end, the landscape will be treated to reveal the contours of the historic lakebed and will preserve the earthen dam structure and spillway by managing the growth of woody vegetation. Existing woodland will be converted over time to ground cover vegetation, resetting the process of ecological succession. Vegetation will be managed to both recover historic views from key vantage points, as well as to screen off-site contemporary development, supporting a positive visitor experience and effective historical interpretation. Treatment will preserve natural

resource values, including the integrity of local wetlands. Treatment will also avoid erosion by limiting ground disturbance in proximity to waterways and will support the integrity of existing low growing, native plant communities.

PRIMARY LANDSCAPE TREATMENT APPROACH

To implement this treatment philosophy, the recommended treatment approach is rehabilitation. Rehabilitation accommodates repair and replacement for deteriorated and missing historic features, while simultaneously accommodating compatible alterations and new additions to facilitate the Memorial's continued use as a national park.

Rehabilitation is defined as, "the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values."⁸ The Secretary of the Interior defines the following ten standards under rehabilitation:

- A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.
- The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize the property will be avoided.
- Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.
- Changes to a property that have acquired historic significance in their own right shall be retained and preserved.
- Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.
- Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration required replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.
- Chemical or physical treatment, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

- Archaeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.⁹

Rehabilitation emphasizes protection and preservation of extant historic features, repair of deteriorated historic features, and provides flexibility to address contemporary management considerations, such as vegetation maintenance and invasive species control.

LANDSCAPE TREATMENT ALTERNATIVES

This section begins with an overview of the three Treatment Alternatives for the rehabilitation of the lakebed, presented to the leadership of Johnstown Flood National Memorial and the Western Parks of Pennsylvania by historical landscape architects from the Olmsted Center for Landscape Preservation in June 2019. All proposed landscape treatment alternatives met the regulatory requirements and conformed to policy directives as presented within the Treatment Framework. In all alternatives, essential elements of the rehabilitation effort focus on the perpetuation of views across the empty lakebed to suggest the location of the former Lake Conemaugh. All treatment alternatives minimize disturbance to cultural and natural resources and are economically and environmentally sustainable given current management conditions at Johnstown Flood National Memorial. The treatment alternatives, however, differ in the level of resources required to implement and most importantly, to maintain, clearing in the lakebed.

TREATMENT ALTERNATIVE 1: THE BASIN

“The Basin” Landscape Treatment, Alternative 1, is designed to suggest the enormous magnitude of the lakebed following the dam breach (Drawing 4.1). This alternative is the most resource intensive, for it removes the greatest amount of vegetation from the lakebed and requires the most maintenance to maintain (Figure 4.3). Within the entire lakebed, meadows of forbs and warm season grasses grow low to the sloping topography and surround a matrix of designated wetlands (Figure 4.4 and 4.5). Wetlands retain their shrubs and woody vegetation, except for trees above ten feet in height. The South Fork of the Little Conemaugh River snakes through the bottom of the basin, which is lined with native riparian vegetation, kept low through selective removal of tall trees.

In “The Basin” Treatment Alternative, all trees and shrubs above ten feet in height are removed to reveal the contours of the former lakebed. The edge of the former lakebed is defined as the 1600-foot contour, or the elevation of the water level in the lake in the moments before the destruction of the South Fork Dam in 1889. Therefore, all vegetation taller than ten feet growing below this contour is removed (Figures 4.6 and 4.7). On the dam abutments and historic sluiceway, all

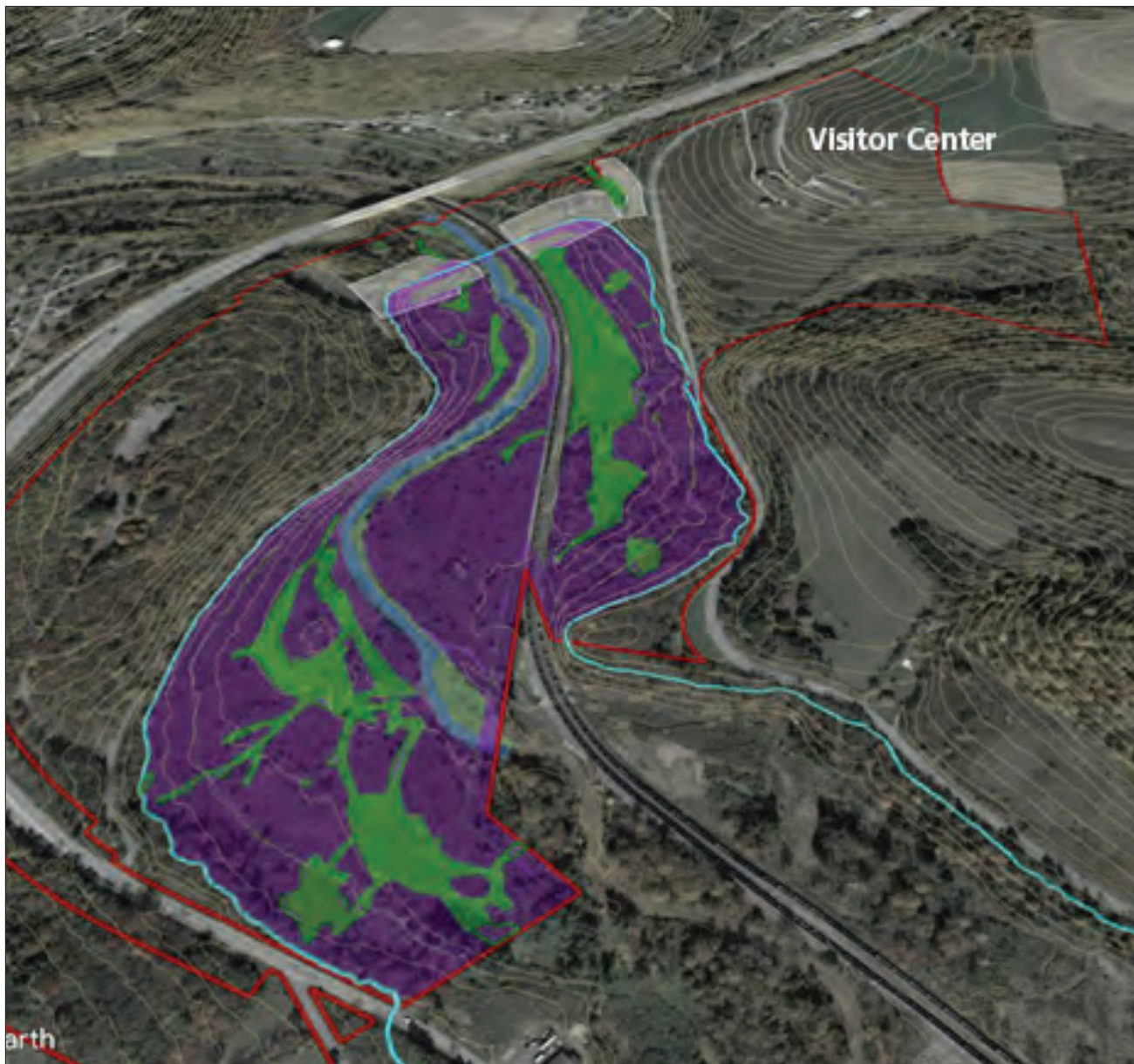


Figure 4.3. In this diagram of Landscape Treatment Alternative 1, green shaded areas are designated wetlands, purple is the area to be cleared of woody vegetation, and white represents the steep slopes of the eastern dam abutments. The blue line identifies the former extents of Lake Conemaugh, or the 1604 foot elevation. (Olmsted Center for Landscape Preservation)

trees negatively impacting the integrity and condition of the historic sluiceway and the dam abutments are removed, though some large trees on the western slope of the dam abutments are retained to screen auditory and visual intrusion from the adjacent highway. Identified wetlands that fall within the historic lakebed boundaries are managed in a way that supports the integrity of the wetland, with no cutting or thinning of vegetation under ten feet high.

In consultation with natural resource specialists, areas cleared of trees are replanted with native, low-growing native perennial forbs and low growing warm season grasses according to 2007 and 2014 natural resource inventory lists. Increased invasive plant growth, caused by tree removals, will be monitored, and controlled through regional specialist teams.

TREATMENT ALTERNATIVE 2: THE BASIN RING

The Basin Ring Treatment, Alternative 2, is designed to impress upon the visitor the enormous magnitude of the lakebed just prior to the dam breach, without requiring the level of resource investment required by Alternative 1, “The Basin” (Drawing 4.2). In Alternative 2, the perimeter of the former lake will be evoked through a twenty-foot vertical band of low native vegetation growing between the 1600 foot and the 1580-foot elevations (Figure 4.8). This band of low vegetation will contrast with the rest of the lakebed which will retain all native non-invasive vegetation that does not pierce through the base of the band when viewed from afar.

Figure 4.4. A view east from the parking area on Lake Road, toward the lakebed, prior to the clearing woody vegetation, 2019. (Olmsted Center for Landscape Preservation)



Figure 4.5. A photographic simulation of the cleared lakebed from the same vantage point. Note woody vegetation remains within the river buffer, 2019. (Olmsted Center for Landscape Preservation)



Figure 4.6. A view south from the northern abutment including the wetlands along the railline through the lakebed, prior to woody vegetation clearing, 2019. (Olmsted Center for Landscape Preservation).



Figure 4.7. A photographic simulation illustrating the of same view along the railline south of the north dam abutment, with the woody vegetation removed, 2019. (Olmsted Center for Landscape Preservation)



The Basin Ring is created by removing all trees and shrubs taller than ten feet, or lower where they block important view sheds, focusing vegetation management within the band between the 1580-foot contour and the 1600-foot contour. Within this area remaining vegetation is managed to encourage native, low growing woody shrubs. Within the lakebed beyond the ring boundaries, all vegetation whose tops grow higher than the 1580 elevation is removed. In all areas of the lakebed, native low growing warm seasonal grasses and forbs are encouraged.

Identified wetlands that fall within The Basin Ring are managed in a way that supports the integrity of the designated wetland and riparian areas, however vegetation that that grows higher than ten feet is removed. Low growing native vegetation is planted to replace the trees that are felled.

Large woody vegetation on the sluiceway and the dam abutments is removed, with consideration of views to and from the adjacent highway. In addition, all trees and shrubs taller than ten feet, or lower if they block important views, are removed from the hillside/cliff between the lakebed and Lake Road. Increased invasive plant growth, caused by tree removals, will be monitored, and controlled through regional specialist teams.

ALTERNATIVE 3: THE SHADOW DAM

In this alternative, a visual representation of the former dam is placed in the gap between the two dam abutment remnants. The height of the former lake is suggested in the height of the visual pilings or sculptural element. In combination with the ring, the shadow dam concept visually reinforces the 1600-foot contour as the water level of Lake Conemaugh prior to the dam's failure in May 1889 (Figure 4.9).

Figure 4.8. In this diagram of Landscape Treatment Alternative 2, the green is the basin ring, elevations between 1580 and 1600, the white references the designated wetlands and riparian buffer, while in the purple zone only trees that pierce the 1580 foot contour or above will be removed. The orange lines on the right hand side of the image refer to the shadow dam, 2019. (OCLP)

LANDSCAPE TREATMENT PREFERRED ALTERNATIVE

All alternatives were presented to the park and regional staff at the June 2019 Treatment Workshop (Drawing 4.3). Following a discussion of the merits of the landscape treatment alternatives in the context of environmental conditions, and park management goals and capacity, leadership from the Western Parks of Pennsylvania selected “The Basin” or Alternative 1 as the Preferred Alternative. Park leadership chose the “The Basin” Landscape Treatment as the Preferred

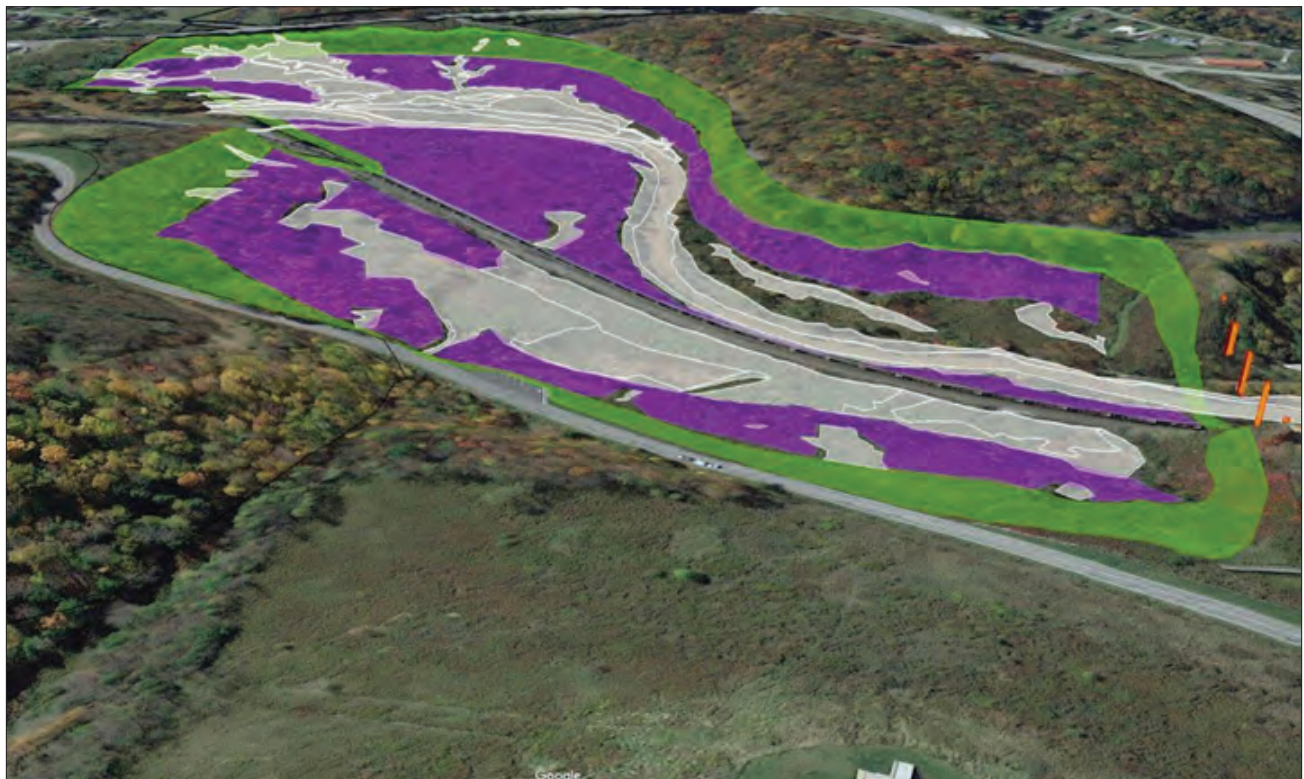




Figure 4.9. A photographic simulation of the shadow dam from the south abutment, 2019. (Olmsted Center for Landscape Preservation)

Alternative for two main reasons. Following the presentation by Olmsted Center staff, park and regional representatives reiterated that successful interpretation of the Johnstown Flood Memorial's significance required visitors to envision the magnitude of the former lakebed. They believed that clearing *all* vegetation greater than ten feet in height from the lakebed would facilitate visitor understanding of the impact of the flood. Secondly, Regional Fire Management specialists explained that using prescribed burning as a vegetation management tool in the lakebed would require a holistic approach, and require that they implement a burn plan for the whole unit, as opposed to limiting the burn area to the "basin ring." Consequently, the "Basin Ring Landscape Treatment, Alternative 2 would be as hard, if not harder, to maintain than The Basin, Alternative 1.

Meeting participants also briefly reviewed Alternative 3, The Shadow Dam. Although they agreed the concept was interesting, the regional and park representatives concluded that the investment of resources into the dam was not prudent at this time. They also briefly addressed a "no-action" alternative through a discussion of virtual reality visualization tools. The ability to engage authentically with the lakebed landscape was determined to be critical to the experience of the Johnstown Flood National Memorial. Therefore Alternative 2, The Basin Ring, and a "no-action" alternative, were rejected in favor of the Basin Landscape Treatment.

The perpetuation of views across the empty lakebed to maintain a visual impression of the area as it was at the time of the flood, is of primary importance in the interpretation of the significance of the entire site and the implementation of the preferred alternative. Therefore the essential elements of this treatment effort will focus on the rehabilitation of the lakebed through the removal of all woody vegetation that diminishes the visitor's comprehension of the scale and location of the former lakebed, the remnants of the dam abutments, the sluiceway, and the historic remnant structures related to the operation of the dam.

To facilitate the management, implementation, and maintenance of the views across the lakebed the Project Area for the Treatment Plan includes the portion of the former lakebed of historic Lake Conemaugh owned by the National Park Service, as well as the historic earthen dam abutments, the remnant sluiceway, and an area north of the lakebed between the Visitor Center and Lake Road. This Lakebed Project Area has been divided into three treatment zones, the Engineered Earthworks and Historic Dam Structures Treatment Zone, the Old Field Restoration Zone, and the Designated Wetlands and Riparian Treatment Zone (Drawing 4.4). A fourth Treatment Zone includes the grounds of the South Fork Fishing and Hunting Club Cottages and Clubhouse.

In addition, four main nodes of visitor engagement support the most important interpretative views of the lakebed and surrounding landscape, and therefore shape the landscape treatment. The view sheds are formed by topography and vegetation and include views from the Johnstown Flood Visitor Center, the North Abutment Overlook, the South Abutment Overlook, and the Lake Road Parking Lot (Drawing 4.5). The portion of the lakebed owned by the National Park Service is not visible from the former South Fork Fishing and Hunting Club cottages and clubhouse.

OLD FIELD RESTORATION TREATMENT ZONE

Existing Conditions: The Old Field Restoration Treatment Zone includes the portion the historic lakebed of Lake Conemaugh owned by the National Park Service (approximately twenty percent of the original lakebed extents), and is defined by the approximate high water elevation of Lake Conemaugh at the 1604 foot contour prior to the dam's failure. Today, the former lakebed is a mosaic of wetlands, grasslands, shrubs, and trees comprising approximately forty-three percent of the park acreage. Much of the former lakebed falls within the Old Field Restoration Zone, which also includes a small area to the north of the lakebed near Lake Road. A line of mature red maple, black locust, and hemlock that line the lakebed side of the South Abutment Road (Route 308) and a mature hardwood forest growing south of Lake Road are excluded from the Old Field Restoration Zone. Approximately seventeen acres of designated wetlands meander through lakebed and a fifty-foot riparian buffer is maintained on either side of the Little

Conemaugh River. These wetlands and riparian buffer are excluded from the Old Field Restoration Zone and together form the Riparian and Designated Wetland Zone. The Historic Engineered Earthworks Zone forms the northern boundary of the Old Field Restoration Zone. Though much of the historic earthworks will also be clad in an “old field” cover, as it is a historic engineered earthwork, its treatment and regulatory framework differs from that of the Old Field Restoration Zone.

Most of the existing vegetation within the Old Field Restoration Zone is comprised of two vegetative communities. The first is dominated by successional vegetation including red maple and black cherry, with an understory made up of primarily nonnative Morrow’s honeysuckle (*Lonicera morrowii*), multiflora rose (*Rosa multiflora*), and Japanese barberry (*Berberis thunbergii*). The second vegetative community, from which the zone gets its name, is dominated by an herbaceous subtype identified as “Old Field” by the Pennsylvania Natural Heritage Program.¹⁰ The “Old Field” vegetative community currently contains graminoid and herbaceous plants of both native and non-native species. The Old Field vegetative community is also prevalent on the gentle to steeply sloping fields above the former lakebed and surrounding the park’s visitor’s center (Figure 4.10).

Proposed Conditions: Treatment within the “Old Field Restoration Zone” is designed to suggest the enormity of the former lakebed through removal of woody vegetation and encouragement of stable low-growing native plant communities. Growth of invasive plant communities will be suppressed through physical removal and chemical means.

Proposed Treatment: Within the Old Field Restoration Zone, treatment is intended to keep the landscape free of woody vegetation and to be economically and

Figure 4.10. In the foreground of the image, Existing vegetation near the north abutment, includes typical “Old Field” vegetation, which will be encouraged following the removal of woody vegetation from the lakebed, 2019. (Olmsted Center for Landscape Preservation)



environmentally sustainable. All woody vegetation will be removed through mechanical means, primarily mastication, in order to reset the process of ecological succession. Low growing native shrubs and small-statured trees such as hawthorns (*Crataegus spp.*), musclewood (*Carpinus caroliniana*), serviceberries (*Amelanchier spp.*), and apples (*Malus spp.*) will be retained where preservation is possible and desirable. Tree species that will be removed include maples (*Acer spp.*), birches (*Betula spp.*), oaks (*Quercus spp.*), pines (*Pinus spp.*), cherries (*Prunus spp.*), black locust (*Robinia pseudoacacia*), ash (*Fraxinus spp.*), and poplars (*Populus spp.*). Where species proliferation occurs following cutting, such as with *Robinia* species, chemical application in addition to mechanical removal will be utilized. In disturbed areas appropriate seed mixes perpetuating the “Old Field” plant community will be planted to discourage invasive growth and soil erosion (see appendices for composition of seed mixes).

Relationship to National Park Service Guidance and Park Planning Documents:

In the General Management Plan (1980 & 1993) lands within the Old Field Restoration Zone are contained within a broader Historic Management Zone, where resource are to be managed for the preservation, protection, and interpretation of cultural resources and their settings, providing for their public use and enjoyment.

ENGINEERED EARTHWORKS AND HISTORIC DAM STRUCTURES TREATMENT ZONE

Existing Conditions: The Engineered Earthworks and Historic Dam Structures Zone encompasses the historic engineered abutments, the historic sluiceway, and the remnants of the valve control tower located at the base of the north dam abutment. The two massive trapezoidal earthworks are separated by an approximately four hundred foot-wide opening where the dam failed in 1889. The remnant abutments and spillway reveal the dam’s original design and construction while the breach in the dam and the ruins of the sluice culvert and valve control tower are reminders of poor decisions made during the dam’s reconstruction. Trails provide access to the top of the dam abutments and passage through the breach on the south side of the river, and a footbridge crosses the upper end of the spillway on the north abutment near where a historic carriage road bridge once stood. On the downstream sides of the dam abutments, mature hemlocks and maples dominate the south abutment face while red maple, black locust, and cherry grow on the south face of the north abutment. Many of these trees help screen visual intrusion and noise from Highway 219, the four-lane highway that passes northwest of the dam abutments.

Grasses, large shrubs, and small trees cover the upstream sides of both abutments except for a few solitary mature trees along the crest of the abutments. A large maple tree, growing at the end of the reconstructed spillway bridge leading to the

north abutment is possibly a witness tree to the 1889 flood (a small sapling appears in the interpretive photo currently at the south abutment viewing platform). Further research is necessary to determine whether this tree is a witness tree.

Proposed Conditions: Low growing native and non-native grasses and forbs will continue the “Old Field” cover type from the lakebed to the upstream sides of both abutments. The stone sluiceway/spillway will be cleared of all woody vegetation, as will the rocky embankment to the north of the sluiceway. To help preserve the quiet contemplative nature of the memorial, the downstream sides of the abutments, some evergreen and deciduous trees will be preserved within the abutments’ rocky faces to screen the adjacent highway.

Treatment Description: Large trees and shrubs threaten the integrity of the historic earthen dam and dam structures and will be managed. The north side of the dam abutments are heavily treed, hiding the rubble face of the dam, the spillway, and remnants of the dam breach. A strategy of selective removal of trees on the downstream sides of the north and south abutment, allowing for the interpretation and preservation of the engineered landforms while retaining a visual and sonic barrier to the freeway will be implemented. On the upstream side of the abutments, all woody vegetation will be removed and an “Old Field” plant palette, see appendices for suggested seed mixes, will be supported to cover the contours of the historic dam abutment.

Relationship to National Park Service Guidance and Park Planning Documents: The need to balance the preservation of the historic earthworks with the desire for a contemplative setting are reflected in management documents for Johnstown Flood National Memorial. The General Management Plan, the National Register of Historic Places Documentation, and the Foundation Document for Johnstown Flood National Memorial all identify the historic engineered earthworks of the South Fork Dam abutments and the remains of the historic structures associated with the dam, as important contributing cultural resources and as foundational resources conveying the significance of the Johnstown Flood National Memorial. In addition, the General Management Plan and the Foundation Document recognize the importance of preserving the quiet, contemplative nature of the site as an appropriate setting for a memorial to a national tragedy.

DESIGNATED WETLANDS AND RIPARIAN TREATMENT ZONE

Existing Conditions: While presenting a visual reference to the former Lake Conemaugh is critical to the successful interpretation of the site, the conservation of the riparian corridor of South Fork of the Little Conemaugh River and protection of the designated wetlands within the historic lakebed are necessary to protect natural resource values. The Designated Wetlands and Riparian Zone encompasses a mosaic of designated wetlands spread throughout the lower

elevations of the lakebed as well as a fifty-foot-wide strip on both banks of the South Fork of the Little Conemaugh River. According to a 2006 assessment, the biology and water quality of this waterway is severely impaired.¹¹

Within the riparian buffer, species composition is highly variable due to the frequent erosive scour exposing new substrate and allowing new plants from a variety of sources to become established. The existing vegetation is characterized both by scour zone species and species typical of successional habitats. Much of the riparian buffer includes a moderately dense short-shrub layer of native and non-native species, less than ten feet in height including steplebush (*Spiraea tomentosa*), Tatarian honeysuckle (*Lonicera tatarica*), Allegheny blackberry (*Rubus allegheniensis*), and black raspberry (*Rubus occidentalis*). Native and non-native trees and large shrubs growing within the riparian buffer include river birch (*Betula nigra*), Scotch pine (*Pinus sylvestris*), autumn olive (*Elaeagnus umbellata*), black locust (*Robinia pseudoacacia*), red maple (*Acer rubrum*), and black cherry (*Prunus serotina*). The herbaceous layer includes spotted joepey weed (*Eupatorium maculatum*), goldenrods (*Solidago canadensis*, *S. gigantea*, *S. speciosa*, *S. rugosa*), narrowleaf plantain (*Plantago lanceolata*), ox eye daisy (*Leucanthemum vulgare*), deertongue (*Dichanthelium clandestinum*), sweet vernalgrass (*Anthoxanthum odoratum*), common boneset (*Eupatorium perfoliatum*), jewelweed (*Impatiens capensis*), and common wood sorrel (*Oxalis stricta*).¹² Because of frequent scouring, patches of non-native invasive species, including reed canary grass (*Phalaris arundinacea*), giant knotweed (*Polygonum sachalinense*) and Japanese knotweed (*Polygonum cuspidatum*) and Morrow's honeysuckle (*Lonicera morrowii*), also grow along the banks of the South Fork of the Little Conemaugh River. All invasive vegetation, and non-native woody vegetation will be removed from the Riparian Buffer.

The Designated Wetland and Riparian Zone also includes a mosaic of designated wetlands spread through the lower elevations of the lakebed. The wetlands were inventoried between 2007 and 2009 by Keller Engineers Inc. following to the U.S. Army Corps of Engineers methods. In 2016, this inventory was updated to comply with Directors Order 77.1 which required a refined methodology defined by Cowardin et. al (1979) and to field verify the riverine and riparian buffer features. A total of twenty-three unique wetland features were delineated in the autumn of 2016 totaling 11.10 acres of palustrine wetland habitat, four acres of riverine wetland habitat, and 2.74 acres of scrub-shrub riparian buffer for a total of 17.84 acres of designated wetland habitat. Of the palustrine wetlands, 7.96 acres were considered emergent wetland where vegetation tends to be low growing and where systems appear to be seasonally saturated or flooded. Paulstrine scrub-shrub wetlands comprise another 2.88 acres of the paulstrine wetlands. Within these areas, vegetation is dominated by tall shrubs including willow *Salix sericea* and alder *Alnus incada sub. rugose*.

Proposed Conditions: Vegetation within the Designated Wetland and Riparian Zone will be managed to encourage communities of low growing native vegetation. Invasive species will be actively monitored and managed.

Proposed Treatment: Within the Riparian and Designated Wetland Zone, low growing native shrubs and native small-statured trees such as hawthorns (*Crataegus spp.*), musclewood (*Carpinus caroliniana*), serviceberries (*Amelanchier spp.*), and apples (*Malus spp.*) will be retained, where preservation is possible and desirable. Only invasive and non-native woody plants will be removed through invasive management and selective clearing.

Relationship to National Park Service Guidance and Park Planning Documents: The proposed treatment within the Riparian and Designated Wetland Treatment Zone is consistent with NPS-77, *Natural Resources Management, Executive Order 11990 Protection of Wetlands*, and the policies and procedures of *Director's Order 77-1, Wetland Protection*. In 2016 wetlands within the former lakebed were delineated and designated, consistent with Executive Order 11990, *Protection of Wetlands*, and the policies and procedures of *Director's Order 77-1 Wetland Protection*. In alignment with these regulatory requirements, the proposed landscape treatment for the Designated Wetland and Riparian Zone, avoids impacting integrity of the designated wetlands, limits removal of vegetation within the wetlands to invasive and non-native woody species.

CLUBHOUSE AND COTTAGES TREATMENT ZONE

Existing Conditions: As discussed in the Analysis and Evaluation Chapter, the vegetation growing near the cottages and clubhouse does not date to the period of significance and therefore does not contribute to the property's National Register eligibility. The turf, shrubs, trees on the grounds of the Clubhouse and Double Cottage, and near the base of the Brown Cottage do not detract from the historic setting and reinforce the domestic character of the properties (Figure 4.11). As the Lippincott Cottage is undergoing stabilization, existing vegetation may hinder preservation efforts, and no new vegetation is proposed.



Figure 4.11. Existing vegetation growing between the Double Cottage and the Clubhouse post-dates the period of significance for the site, however, it does not detract from the residential setting of the property. Additional street trees are proposed for the perimeter of the clubhouse lot, 2019. (Olmsted Center for Landscape Preservation)

Proposed Conditions: The grounds of the Clubhouse and Double Cottage should suggest the residential scale and use of the period of significance. Where the grounds are not used for parking or group gathering for interpretation, small street trees will soften the boundary along Lake Avenue and the boundaries of the National Park property in St. Michael. Seasonal interest in the tree species should reflect the significant dates in the history of the Johnstown Flood tragedy, with spring bloom times that correspond to the month of the dam breach. Woodland behind the Brown and Lippincott Cottage will be maintained, where it does not impact the integrity or condition of the historic structures, to suggest the former siting of the cottages at the edge of the woods.

Treatment Description: A row of evenly spaced street trees is proposed along Lake Avenue and the southern boundary of the clubhouse grounds. In addition, understory trees should be planted along main street, between the clubhouse and the double cottage. Native species to consider include Eastern Redbud, (*Cercis Canadensis*), American Fringe Tree, (*Chioncanthus virginicus*), Flowering Dogwood, *Cornus Florida*, American Hornbeam, (*Carpinus caroliniana*), and River Birch, (*Betula nigra*), among others. (Drawings 4.5 and 4.6).

Relationship to National Park Service Guidance and Park Planning Documents: As the vegetation on the grounds of the South Fork Fishing and Hunting Club cottages and clubhouse does not contribute to the National Register status of the property, no vegetation requires historic preservation. Nevertheless, existing vegetation does not detract from the residential and historic character of the cottages and clubhouse, and therefore this treatment is consistent with guidance set forth in the Foundation Document for Johnstown Flood National Memorial, which highlights the cottages and clubhouse as fundamental resources.

TREATMENT TASKS

The primary goal of the Treatment Plan for Johnstown Flood National Memorial is to support low growing plant communities that enable the use of the lakebed for interpretation of the 1889 flood, while meeting the requirements of natural and cultural resource protection sustainably. To fulfill this goal, the treatment tasks outlined below must be completed by park management.

VG-1 Remove woody vegetation in support of “Old Field” plant communities

Issue: Since the destruction of the dam, the former lakebed has gone through episodic clearing followed by successional growth. Successional forest growth in the lakebed hides the contours of the earthen dam abutments and the lakebed until they are undistinguishable from the surrounding forested hillsides. Within much of the former lakebed, as well as a small area to the north of the lakebed

near Lake Road, these tall trees block visitors' views, preventing them from understanding the impact of the South Fork Dam's failure in 1889.

Recommendation: Remove all vegetation taller than ten feet within the "Old field" zone, outside the boundaries of the designated wetlands and riparian zone, through the use of mastication and selective clearing.

Considerations: Mastication operations may occur only during winter months while the ground is frozen in order to reduce rutting and increase the safety of operations. Areas in which to use mastication should be small enough and spaced so that the resulting chip layer will allow for seeding where necessary. Following mastication, at least fifty percent of the surface area should be visible soil. Mastication should only be used on gentle slopes, and outside of the boundaries of Designated Wetlands or Riparian areas. Woody vegetation that cannot be removed through mastication should be selectively removed via chainsaws.

VG-2 Support stability of native low-growing vegetation populations

Issue: Removing trees and shrubs from the lakebed will require ongoing maintenance to prevent woody succession as well as the appearance of other undesirable vegetation. Additionally, in some areas, the removals will create gaps in the vegetative cover that will require seeding with specified native vegetation to prevent unwanted species of vegetation.

Recommendation: To prevent the growth of unwanted vegetation, especially invasive species, regular maintenance will be required. This includes annual mowing and prescribed burning of lakebed vegetation, outside the boundaries of the designated wetlands. Seeding with specified native vegetation will be necessary in bare areas. To nurture the seedlings, subsequent mowing of these areas will be required to help prevent weedy species from out competing the seedling natives.

Considerations: The composition of seeding mixtures, as well as the process for seeding is detailed in the Implementation chapter. Archaeological resources should be considered if soil is cultivated prior to seeding. The schedule of prescribed burning should be established in consultation with natural resource professionals to avoid potential impact to nesting bird populations. Further information about prescribed burning within the lakebed is contained in the Implementation section.

VG-3 Control and monitor invasive growth

Issue: Without control and monitoring invasive vegetation will threaten the preservation of the newly established and existing "Old Field" vegetative meadow in the lakebed.

Recommendations: To maintain the “ Old Field” vegetative meadow in the lakebed, invasive vegetation growth must be monitored by the National Park Service as part of a multiprong landscape management approach. The meadow management program must continually be evaluated to determine whether excessive growth from woody and invasive grasses and forbs is outcompeting native grasses and forbs. Changes in maintenance practices, including more frequent mowing, hand-pulling of invasive species, herbicide treatments, and/or additional seeding may be required to address issues raised through monitoring.

Considerations: This monitoring program may be accomplished through partnerships with other organizations.

VG-4 Stabilize disturbed areas to prevent erosion and colonization by invasive plants

Issue: When trees and shrubs are removed from the lakebed exposing bare earth and disturbed ground, soil erosion and the colonization of undesirable and invasive species in these areas will occur without effective erosion control.

Recommendations: On areas of steep slopes, including the dam abutments and the sides of the sluiceway, effective erosion control strategies, including mulches, blankets, haybales, and quick establishing vegetation should be implemented. Mulch types include straw, wood chips, and cellulose hydromulch (hydroseed). Erosion control blankets (ECBs) are typically biodegradable, open-weave blankets that provide temporary cover and support for establishing vegetation on bare soil areas. Haybales can be used as check dams by installing them in the path of gathering water to slow the water’s flow or alter its path. Quickly establishing vegetation, such as annual rye, can also be planted if needed, but over time such vegetation can also grow to compete with the more desirable native vegetation.

Considerations: If quickly establishing vegetation is seeded, those areas should be carefully monitored to ensure that the vegetation is not outcompeting more desirable native vegetation.

VG-5 Remove all woody vegetation from the upstream side of the dam abutments and within the spillway to preserve the integrity and condition of the historic engineered earthworks

Issue: Large trees growing on the steep slopes of the upstream side of the dam abutments are susceptible to blowing over and uprooting, which can damage historic earthworks. Following woody vegetation removal, to protect the structural integrity of the earthworks, and to reveal their contours so that park visitors might better understand the purpose and scale of the dam and spillway, grass should be grown on the earthworks’ slopes.

Recommendation: All woody vegetation should be removed from the upstream side of the dam abutments and historic spillway through selective clearing using chainsaws. Once the vegetation is removed, goats will be needed to manage this grassy growth and young woody vegetation on the abutments, where mowers cannot be used because of steep slopes. At a minimum, the south sides of the abutments and the spillway will need to be mowed annually to allow the native grasses to become established.

Considerations: Clearing vegetation by goats through contracted services, requires some management by park staff to ensure that the goats have adequate water, shelter, predator protection, and containment. In removing trees via chainsaw, care should be taken to prevent damage to the historic earthworks.

VG-6 Implement a strategy of selective removal of trees on the downstream sides of the north and south abutment to retain a visual and sonic barrier between the historic earthworks and Highway 219.

Issue: Highway 219, which passes just north of the historic dam abutments, creates noise pollution challenging the memorial's peaceful environment. Currently, the area between the dam abutments and Highway 219 is forested which provides a visual and sonic buffer. However, the trees also block visitor's views of the historic rock face of the dam on the south abutment as well as the historic spillway, limiting their understanding of these historic resources.

Recommendation: A strategy of limited tree removal should be implemented to expose the spillway so that visitors may understand this important element, without affecting the trees that shield the north abutment from traffic noise. On the south abutment, trees will be removed to expose the rock face while retaining trees that buffer highway noise.

Considerations: How each tree growing on the downstream side of the north abutment screens Highway 219 from visitors must be considered prior to the tree's removal.

VG-7 Retain stability of riverbanks and prevent erosion where possible along the riparian buffer and within designated wetlands

Issue: Currently trees growing in the riparian buffer of the South Fork of the Little Conemaugh River screen the contours of the historic lakebed from visitors.

Recommendations: To restore sightlines to the historic lake basin, trees that are taller than ten feet should be removed from the riparian buffer and designated wetlands through selective removals via chainsaw.

Considerations: So that the tree removals do not compromise the riverbank's stability, stumps should be left in situ, and undergrowth left undisturbed to leave root systems intact.

VG-8 Maintain the integrity of the existing wetlands

Issue: Approximately seventeen acres of designated wetlands are scattered throughout the lower elevations of the lakebed. Most contain low growing vegetation that does not block views of the lakebed from visitors. There are some trees, however, that block visitor views. Without appropriate accommodations, tree removal can damage wetland integrity.

Recommendations: In the few instances where trees screen the lakebed from visitors, they will be removed through non-invasive means. Trees should be cut and left where they fall, and the stump left in situ.

Considerations: Tree removal in designated wetlands should be achieved without driving machinery within the limits of the designated wetlands.

CLUBHOUSE AND COTTAGES TREATMENT ZONE

VG-9 Implement planting of flowering deciduous street trees to reinforce domestic scale of the landscape setting of the South Fork Fishing and Hunting Club cottage

Issue: Historically, the South Fork Fishing and Hunting clubhouse was oriented toward Lake Conemaugh with the wooded hillside as a backdrop to the building. Cottages were lined up along the shoreline to the east and west of the clubhouse and connected through a boardwalk. Due to subsequent changes in the surrounding landscape, some of the residential scale of the clubhouse site has been lost.

Recommendation: To reinforce the historic residential scale of the clubhouse and form an aesthetically pleasing connection to the surrounding suburban blocks, understory street trees should be planted at approximately fifty feet apart along Main Street, Franklin Street and Lake Street as shown on the plan.

Consideration: In specifying the species of understory tree to be planted along the clubhouse block, the seasonal interest of the tree should be considered, as well as the environmental conditions of the site, and projected maintenance needs. Species that flower during the spring, when the activities commemorating the anniversary of the Johnstown Flood occur, should warrant special consideration. Such species include Eastern Redbud, (*Cercis Canadensis*), American Fringe Tree, (*Chioncanthus virginicus*), American Hornbeam, (*Carpinus caroliniana*), or River Birch, (*Betula nigra*), among others, may be considered.

VG-10. Maintain the woodland south of the Brown and Lippincott Cottages, unless the vegetation impacts the preservation of the historic structures, to suggest the 1880s siting of the cottages at the edge of the woods.

Issue: Woodland is located to the rear, or south and west, of the Lippincott and Brown Cottages, as it was during the period of significance. This woodland remains and should be preserved where the vegetation does not negatively impact the condition of the historic buildings.

Recommendation: Large trees and non-invasive undergrowth should be preserved to the south and west of the Brown and Lippincott Cottages.

Considerations: Where vegetation impacts the condition of the cottages, and prevents the stabilization of the Lippincott cottage, the vegetation should be removed.

Please note the following Treatment Task Summary Chart for Facilities Management Software System information.

ENDNOTES, TREATMENT

- 1 Robert R. Page, Cathy A. Gilbert, and Susan A. Dolan, *A Guide to Cultural Landscape Reports: Contents, Process, and Techniques* (Washington, D.C.: National Park Service, 1998, second printing 2005), 134.
- 2 An Act to Establish a National Park Service, and for other purposes (National Park Service Organic Act, August 25, 1916), 39 Stat. 535.
- 3 National Register Johnstown Flood National Memorial, draft 2016, Sec.8: 22.
- 4 Interpretive Prospectus Development Concept Plan for Johnstown Flood National Memorial, (Denver Service Center: National Park Service, 1981), 8.
- 5 Interpretive Prospectus Development Concept Plan for Johnstown Flood National Memorial, (Denver Service Center: National Park Service, 1981), 8.
- 6 ALPO-JOFL Fire Management Plan
- 7 Foundation Document, Johnstown Flood National Memorial, Pennsylvania (National Park Service, Department of the Interior 2013), 6.
- 8 Charles A. Birnbaum and Christine Capella Peters, eds., *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* (Washington, D.C.: U.S. Department of the Interior, 1996), 48.
- 9 Charles A. Birnbaum and Christine Capella Peters, eds., *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* (Washington, D.C.: U.S. Department of the Interior, 1996), 49.
- 10 The Pennsylvania Natural Heritage Program (PNHP) is a member of NatureServe, an international network of natural heritage programs that gather and provide information on the location and status of important ecological resources (plants, vertebrates, invertebrates, natural communities, and geologic features). <http://www.naturalheritage.state.pa.us> accessed 10/31/2019.
- 11 Stephanie J. Perles, Gregory S. Podniesinski, Ephraim A. Zimmerman, Wiliam A. Milinor, and Lesley A. Sneddon, *Vegetation Classification and Mapping at Johnstown Flood National Memorial*, Technical Report, NPS/NER/NRTR-2006/034, Northeast Region, Philadelphia: National Park Service, 2006.
- 12 Perles, et. al, 77.

**TABLE 4.1. TREATMENT TASK SUMMARY:
JOHNSTOWN FLOOD NATIONAL MEMORIAL**

CLR Treatment Task (FMSS Work Order)	CLR Treatment Action (FMSS Task)	Related Tasks, Issues	FMSS Asset Type/Location	FMSS Work Type/Subtype/Maintenance Needed ¹
VG-1. Remove woody vegetation in support of "Old Field" plant communities (See Work Order: 712548- Remove trees and shrubs and treat stumps; See Also, 23802457, 23802471 & 23802473- Cyclic Maintenance of Lakebed Grounds)	Remove all vegetation taller than ten feet within the "Old field" zone, outside the boundaries of the designated wetlands and riparian zone, and the steep slopes of the dam's earthworks, through the use of mastication and selective clearing.	Mastication operations, whether through contracted services or collaboration with regional fire management teams, may occur only during winter months while the ground is frozen in order to reduce rutting and increase the safety of operations. Areas in which to use mastication should be small enough and spaced so that the resulting chip layer will allow for seeding where necessary. Following mastication, at least fifty percent of the surface area should be visible soil. Mastication should only be used on gentle slopes. Woody vegetation that cannot be removed through mastication should be selectively removed via chainsaws by contract.	Lakebed Location: 16312 & 16325 Asset: 1269038 & 1690321	FM-RMDM or FM-CR
VG-2 Support stability of native low-growing vegetation populations (See Work Order: 7143791 – Control Exotic Vegetation and Plant Native Species)	Seeding with specified native vegetation will be necessary to fill in bare soil exposed through the removal of the lakebed's trees and to prevent unwanted species of vegetation.	Periodic mowing, either through operational maintenance staff or contract, will be necessary to prevent weedy species from out competing the native seedlings. A regular schedule of prescribed burning of the lakebed, outside the boundaries of designated wetlands, should be established in consultation with fire and natural resource management professionals.	Lakebed Location: 16312 & 16325 Asset: 1269038 & 1690321	FM-RM
VG-3 Control and monitor invasive growth (See Work Orders: 23802457, 23802469, 23802470, - Monitoring and Treatment of Lakebed	The growth of invasive grasses and forbs must be monitored. Changes in mowing frequency, the use of herbicides, additional seeding, and/or hand-pulling of invasive species will be implemented based on identified issues.	The invasive monitoring program may be accomplished through partnerships with other organizations. Additional maintenance procedures will be based on seasonal monitoring of invasive vegetation.	Lakebed Location: 16312 & 16325 Asset: 1269038 & 1690321	FM-PM

**TABLE 4.1. TREATMENT TASK SUMMARY:
JOHNSTOWN FLOOD NATIONAL MEMORIAL**

CLR Treatment Task (FMSS Work Order)	CLR Treatment Action (FMSS Task)	Related Tasks, Issues	FMSS Asset Type/Location	FMSS Work Type/Subtype/Maintenance Needed ¹
Grounds, FY22, FY25 & FY27)				
<i>VG-4 Stabilize disturbed areas to prevent erosion and colonization by invasive plants</i> <i>(See Work Orders: 23802457, 23802469, 23802470, - Monitoring and Treatment of Lakebed Grounds – FY22, FY25 & FY27)</i>	Erosion control strategies should be implemented on the dam abutments, sides of the sluiceway, and steep areas of the lakebed. Possible strategies include mulches, blankets, haybales, and additional seeding. The selected erosion control method will be based on existing environmental conditions.	If quickly establishing vegetation is seeded, those areas should be highlighted in the monitoring scope of work, and carefully monitored to ensure that the seeded vegetation is not outcompeting more desirable native vegetation.	Location: 16325 Asset: 1690321	FM-PM
<i>VG-5 Remove all woody vegetation from the upstream side of the dam abutments and within the spillway to preserve the integrity and condition of the historic engineered earthworks</i> <i>(See Work Orders: 23802457, 23802469, 23802470, - Monitoring and Treatment of Lakebed Grounds – FY22, FY25 & FY27)</i>	All woody vegetation should be removed from the upstream side of the dam abutments and historic spillway through selective clearing using chainsaws via contracted services. Goats should be used to manage the grassy growth and young woody vegetation.	Clearing vegetation by goats through contracted services, requires some management by park staff to ensure that the goats have adequate water, shelter, and containment. In removing trees via contracted services, care should be taken in the scope to prevent damage to the historic earthworks.	Location: 16325 Asset: 1690321	FM-RM

**TABLE 4.1. TREATMENT TASK SUMMARY:
JOHNSTOWN FLOOD NATIONAL MEMORIAL**

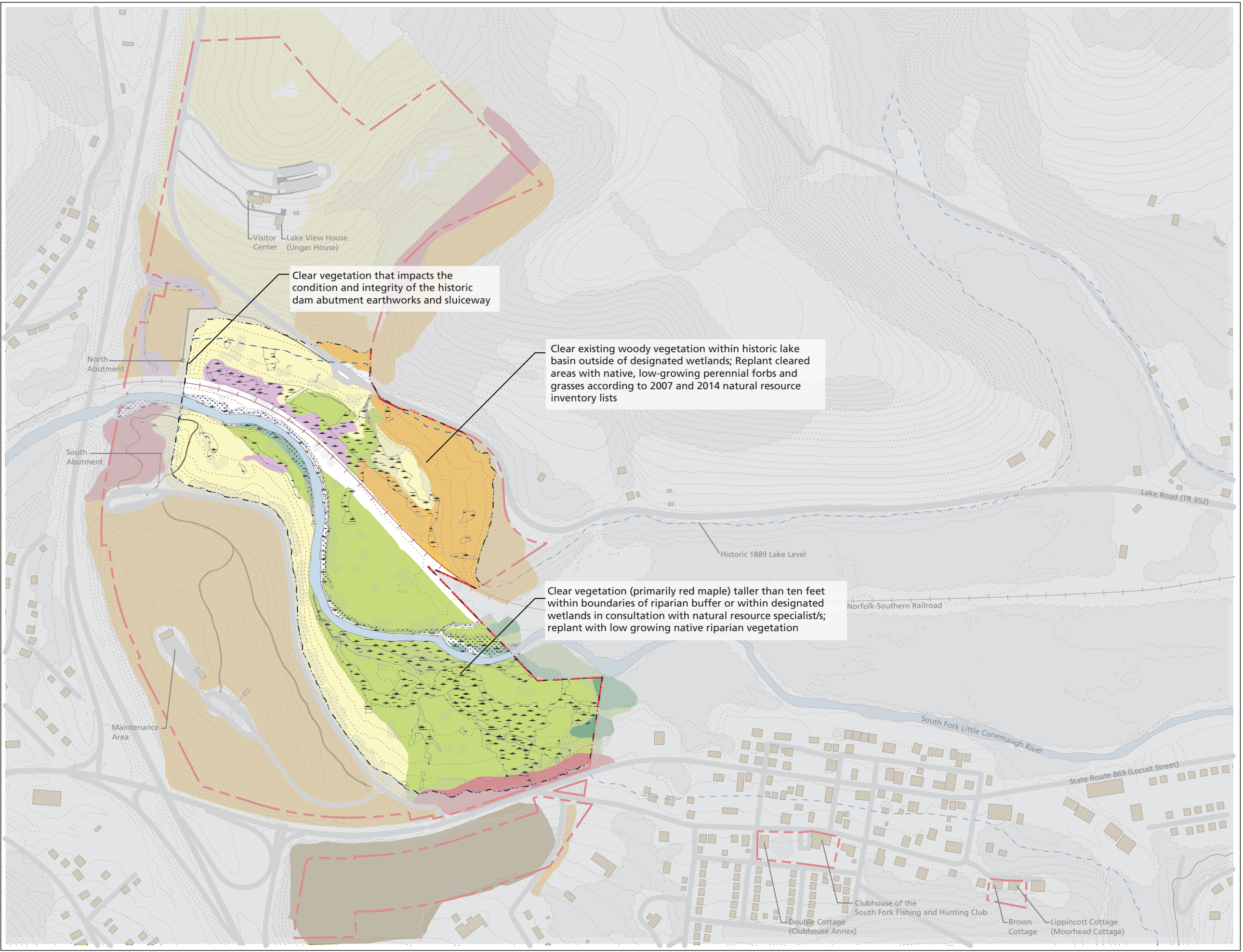
CLR Treatment Task (FMSS Work Order)	CLR Treatment Action (FMSS Task)	Related Tasks, Issues	FMSS Asset Type/Location	FMSS Work Type/Subtype/Maintenance Needed ¹
<i>VG-6 Implement a strategy of selective removal of trees on the downstream sides of the north and south abutment to retain a visual and sonic barrier between the historic earthworks and Highway 219.</i> <i>(See Work Orders: (See Work Orders: 23802457, 23802469, 23802470, - Monitoring and Treatment of Lakebed Grounds, FY22, FY25 & FY27)</i>	A strategy of limited tree removal should be implemented to expose the spillway so that visitors may understand this important element, without affecting the trees that shield the north abutment from highway impact. On the south abutment, trees will be removed to expose the rock face while retaining trees that buffer highway noise.	Trees to be removed must be identified and tagged by park staff after considering how each tree growing on the downstream side of the north abutment screens Highway 219 from visitors. This selective tree removal will be accomplished through contracting.	Location: 16325 Asset: 1690321	FM-RM
<i>VG-7 Retain stability of riverbanks and prevent erosion where possible along the riparian buffer and within designated wetlands</i> <i>(See Work Orders: (See Work Orders: 23802457, 23802469, 23802470, - Monitoring and Treatment of Lakebed Grounds, FY22, FY25 & FY27)</i>	To restore sightlines to the historic lake basin, trees that are taller than ten feet should be removed from the riparian buffer and designated wetlands through selective removals via chainsaw.	Trees to be removed via contract should be identified and tagged by NPS staff prior to removal by chainsaw. So that the tree removals do not compromise the riverbank's stability, stumps should be left in situ, and undergrowth left undisturbed to leave root systems intact. Care should be taken near the ASMS and CRIS-HS sites associated with the historic sluice gates and valve control tower to prevent impact from removals.	Lakebed Location: 16312 & 16325 Asset: 1269038 & 1690321	FM-RMDM or FM-CR

**TABLE 4.1. TREATMENT TASK SUMMARY:
JOHNSTOWN FLOOD NATIONAL MEMORIAL**

CLR Treatment Task (FMSS Work Order)	CLR Treatment Action (FMSS Task)	Related Tasks, Issues	FMSS Asset Type/Location	FMSS Work Type/Subtype/Maintenance Needed ¹
<i>VG-8 Maintain the integrity of the existing wetlands</i>	In the few instances where trees in designated wetlands screen the lakebed from visitors, they should be identified, tagged and removed through non-invasive means. Trees should be cut and left where they fall, and the stump left in situ to prevent erosion.	All actions taken within Designated Wetland must meet the requirements of Executive Order 11990, Protection of Wetlands, and the policies and procedures of Directors Order 77-1 Wetland Protection. As such, all tree removal in designated wetlands should be achieved without driving machinery, prescribed burns or mowing, within the limits of the designated wetlands.	Lakebed Location: 16312 & 16325 Asset: 1269038 & 1690321	FM-RMDM or FM-CR
<i>VG-9 Implement planting of flowering deciduous street trees to reinforce domestic scale of the landscape setting of the South Fork Fishing and Hunting Club cottage</i>	Five, 1 to 2 inch caliper understory trees should be planted approximately fifty feet on center along Main Street, Franklin Street, and Lake Street as shown on treatment plan to reinforce the historic residential scale of the clubhouse and form an aesthetically pleasing connection to the surrounding suburban blocks.	Native understory trees with multi-season interest that do well in urban environments (primarily winter salt application from adjacent roads)	Maintained Landscape South Fork Fishing and Hunting Club Location: 16335 Asset: 1269041	CI-AL
<i>VG-10 Maintain the woodland south of the Brown and Lippincott Cottages, unless the vegetation impacts the preservation of the historic structures, to suggest the 1880s siting of the cottages at the edge of the woods.</i>	Retain woodland south/behind the Brown and Lippincott cottages, unless the vegetation impacts the preservation of the historic structures. Vegetation that negatively impacts the stabilization and preservation of the historic Lippincott Cottage should be removed.		Maintained Landscape South Fork Fishing and Hunting Club Location: 16335 Asset: 1269041	FM-RM

NOTES

1. Maintenance includes work needed to sustain the historic character of treated landscape features and to inform creation of Facility Operations, Preventative Maintenance, and Recurring Maintenance work orders in FMSS. Cycles of maintenance of the lakebed are addressed in the Lakebed Vegetation Management Chapter of this Cultural Landscape Report.



Cultural Landscape Report

Johnstown Flood
National Memorial
St. Michael, Pennsylvania

Treatment Alternative 1
The Basin



National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

SOURCES

1. United States Geological Survey
2. 2006 Veg. Inventory, 2010 Veg. Study
3. 2014 Nat. Resource Inventory
4. Johnstown Flood National Monument GIS

DRAWN BY

ESRI ArcMap, AutoCAD Map 2019,
Adobe Illustrator CS6, 2019

LEGEND

- Park Unit Boundary
- Lowland Cold-deciduous Forest
- Medium Tall Sod or Sub-poplar Grassland
- Saturated Deciduous Perennial Forbs/ Old Field
- Red Maple-Black Cherry Successional Forest
- Temperate Evergreen Forest/ Conifer Plantation
- Seasonally Flooded/ Black Cherry/ Red Maple
- Mixed Evergreen Deciduous Forest
- Silky Willow Shrub Swamp
- Riverine Scour Vegetation
- South Fork Little Conemaugh River
- Wetlands



Drawing 4.1

Johnstown Flood
National Memorial
St. Michael, Pennsylvania

Treatment Alternative 2
The Basin Ring



National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

SOURCES

- 1. United States Geological Survey
- 2. 2006 Veg. Inventory, 2010 Veg. Sudy
- 3. 2014 Nat. Resource Inventory
- 4. Johnstown Flood National Monument GIS

DRAWN BY

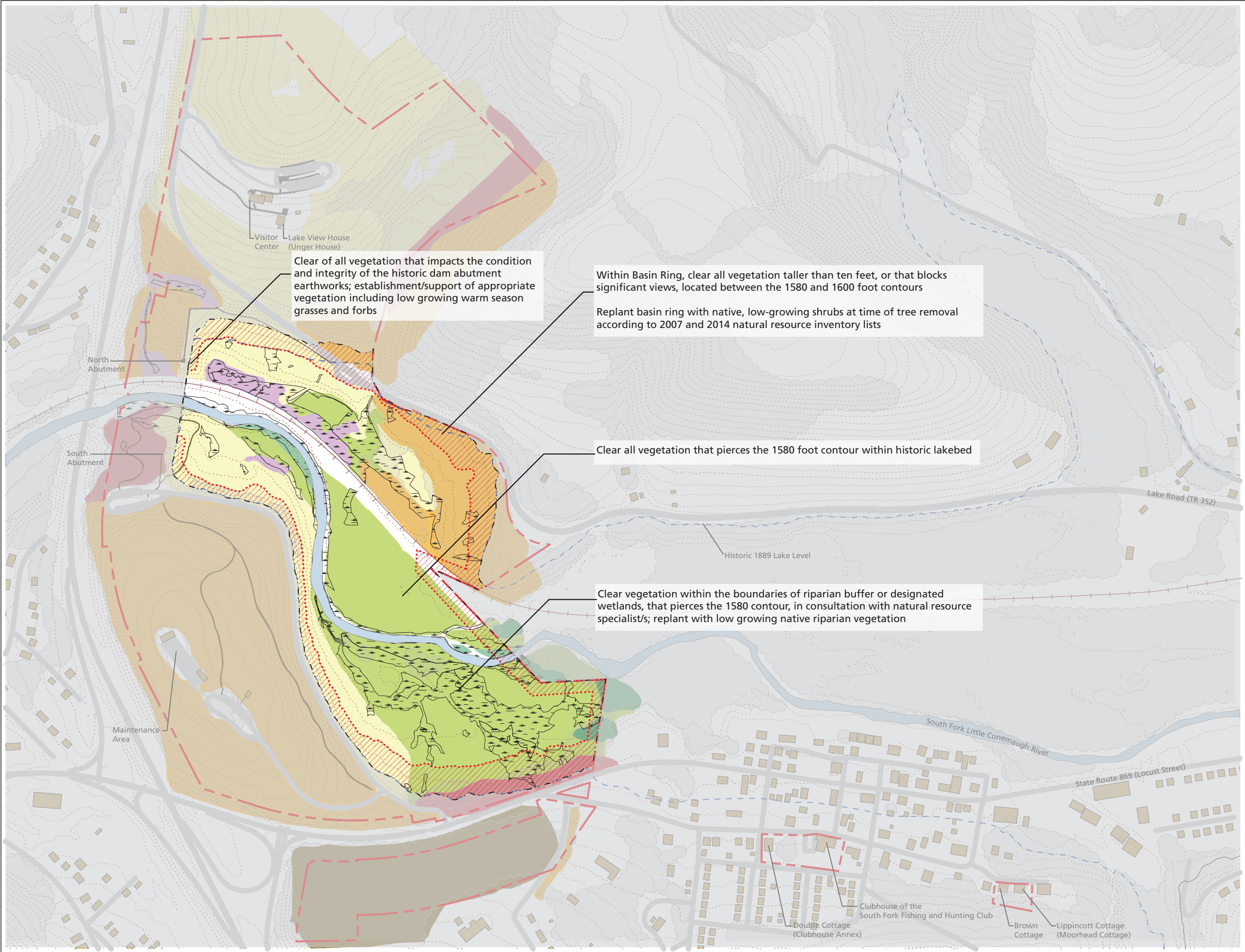
ESRI ArcMap, AutoCAD Map 2019,
Adobe Illustrator CS6, 2019

LEGEND

- Basin Boundary Boundary
- Ring Basin within 1580 to 1600 Foot Contour
- Lowland Cold-deciduous Forest
- Medium Tall Sod or Sub-poplar Grassland
- Saturated Deciduous Perennial Forbs/ Old Field
- Red Maple-Black Cherry Successional Forest
- Temperate Evergreen Forest/ Conifer Plantation
- Seasonally Flooded/ Black Cherry/ Red Maple
- Mixed Evergreen Deciduous Forest
- Silky Willow Shrub Swamp
- Riverine Scour Vegetation
- Wetlands



Drawing 4.2



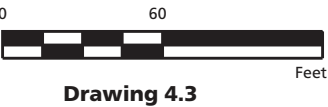
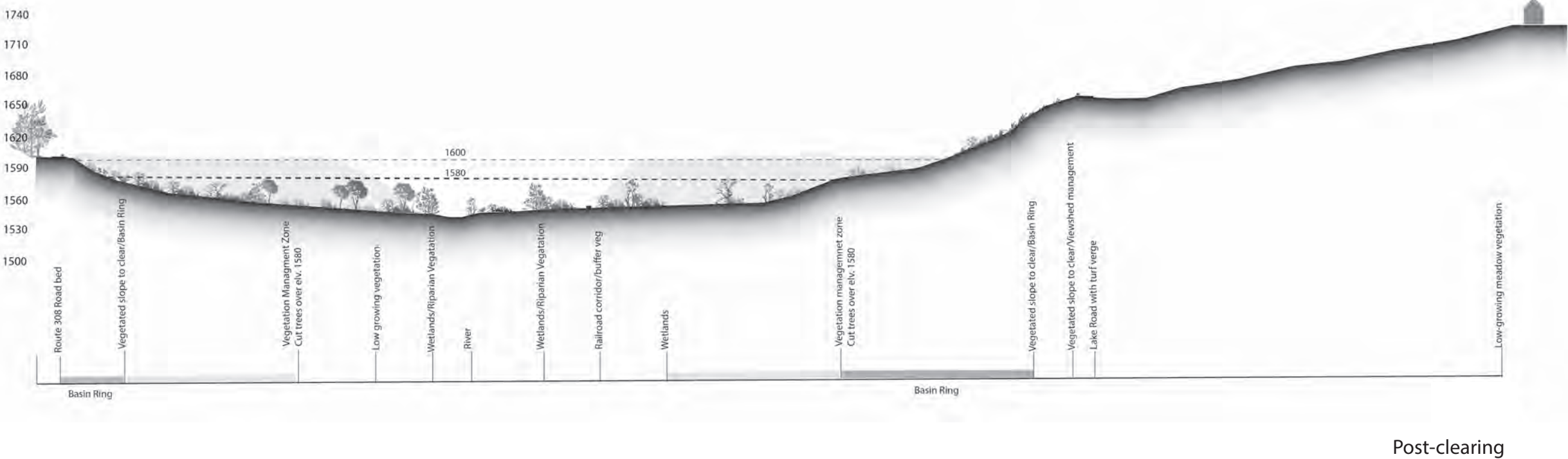
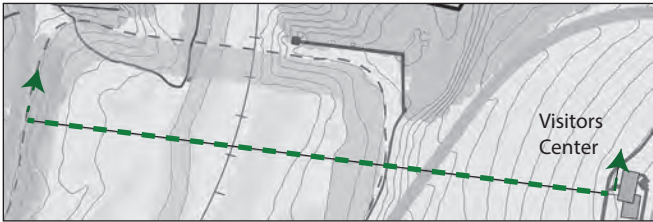
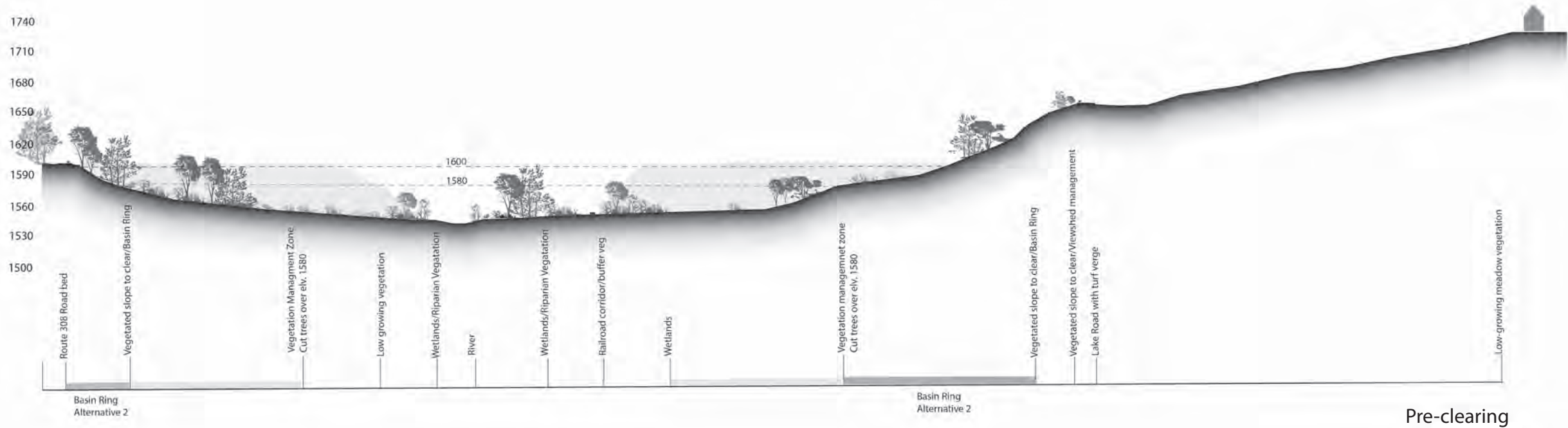
Lakebed Section

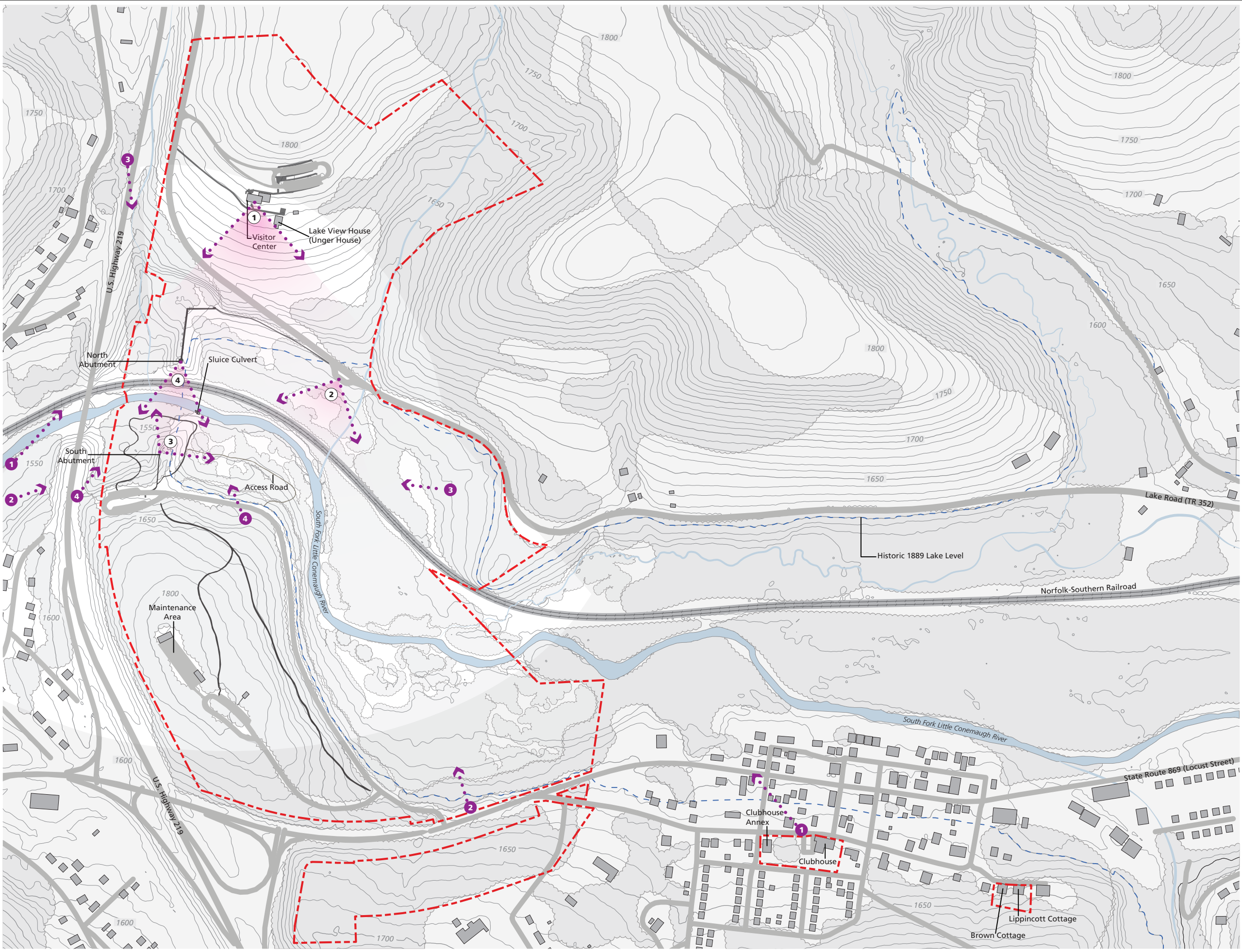


National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

- SOURCES
- 1. United States Geological Survey
 - 2. 2006 Veg. Inventory, 2010 Veg. Study
 - 3. 2014 Nat. Resource Inventory
 - 4. Johnstown Flood National Monument GIS

DRAWN BY
Jennifer Hanna, OCLP
AutoCAD Map 2019, Adobe Illustrator CS6, 2019





Cultural Landscape Report

Johnstown Flood
National Memorial
St. Michael, Pennsylvania

Key Viewsheds



National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

SOURCES

1. United States Geological Survey
2. 2006 Veg. Inventory, 2010 Veg. Study
3. 2014 Nat. Resource Inventory
4. Johnstown Flood National Monument GIS

DRAWN BY

Emelyn Nájera
ESRI ArcMap, AutoCAD Map 2019,
Adobe Illustrator CS6, 2019

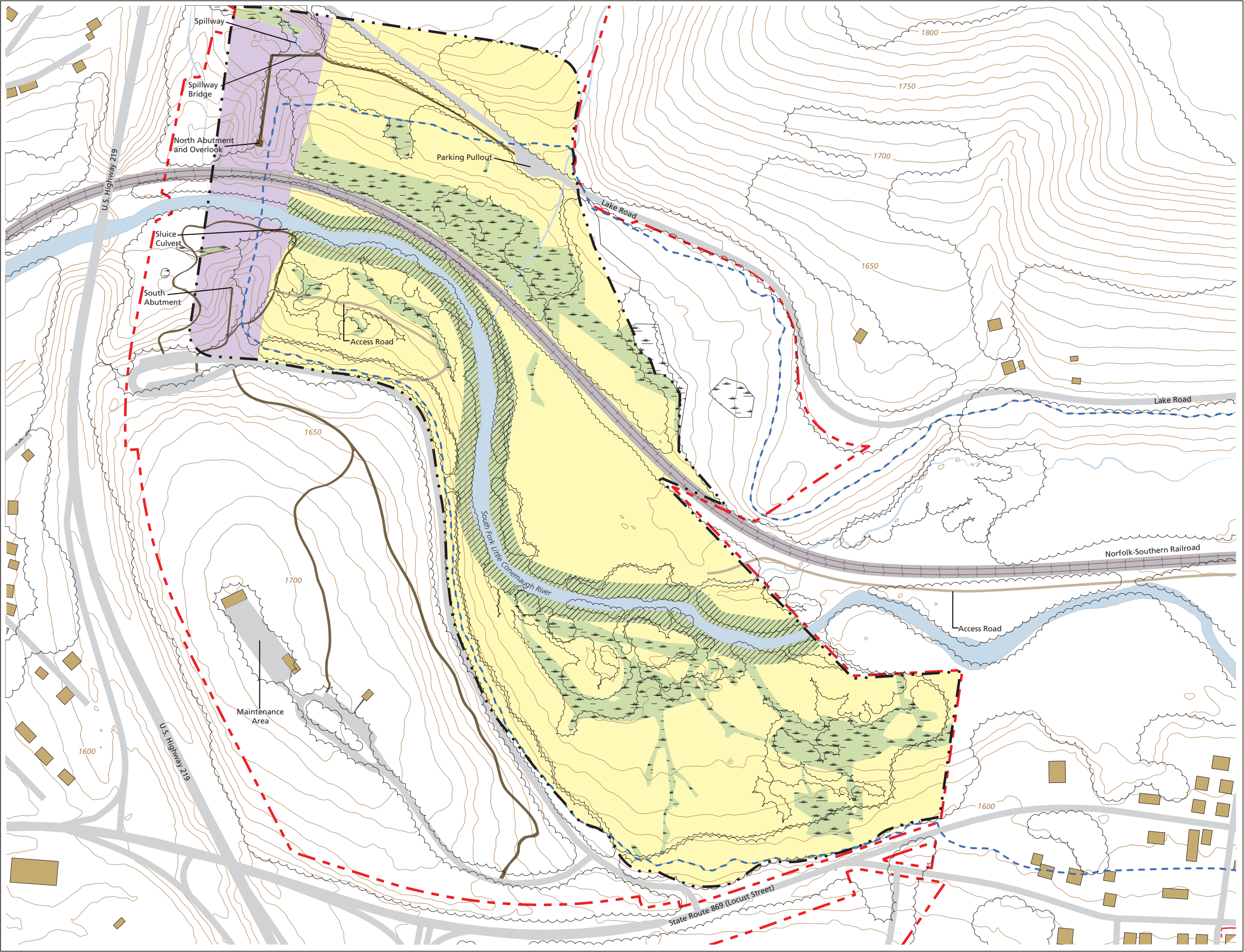
LEGEND

- Park Unit Boundary
- Historic Lake Level
- South Fork Little Conemaugh River
- Lidar-Derived Contours, ten-foot intervals
- Buildings and Structures
- Extent of Tree Canopy
- Viewsheds
- Extent of Viewshed

NOTES

Feet

Drawing 4.4



Cultural Landscape Report

Johnstown Flood
National Memorial
St. Michael, Pennsylvania

Landscape Treatment



National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

SOURCES

1. United States Geological Survey
2. 2006 Veg. Inventory, 2010 Veg. Study
3. 2014 Nat. Resource Inventory
4. Johnstown Flood National Monument GIS

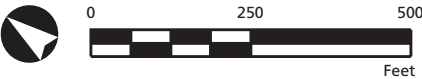
DRAWN BY

Emelyn Nájera and Clelie Fielding
ESRI ArcMap, AutoCAD Map 2019,
Adobe Illustrator CS6, 2019

LEGEND

- Park Unit Boundary
- Proposed Treatment Boundary
- Historic Lake Level
- South Fork Little Conemaugh River
- Old Field Restoration Zone
- Riparian and Wetland Treatment Zone
- Engineered Earthworks Treatment Zone
- Riparian Buffer
- Designated Wetland
- Mature Tree Canopy

NOTES



Drawing 4.5



DRAWN BY

Emelyn Najera, 2019
AutoCAD Map 3D, Adobe Photoshop and Illustrator CS6

NOTES

1. All features shown in approximate scale and location.

SOURCES

1. Johnstown Flood National Memorial GIS
2. 2014 National Resource Inventory
3. United States Geological Survey

LEGEND

	Gravel Parking Area		Mown lawn
	Walk		Buildings and Structures
	Streets		Historic Lake Level
	Trees and shrubs		Proposed Understory Street Tree
	Park Unit Boundary		

Cultural Landscape Report Clubhouse and Double Cottage Johnstown Flood National Memorial

Landscape Treatment Club House and Double Cottage Detail

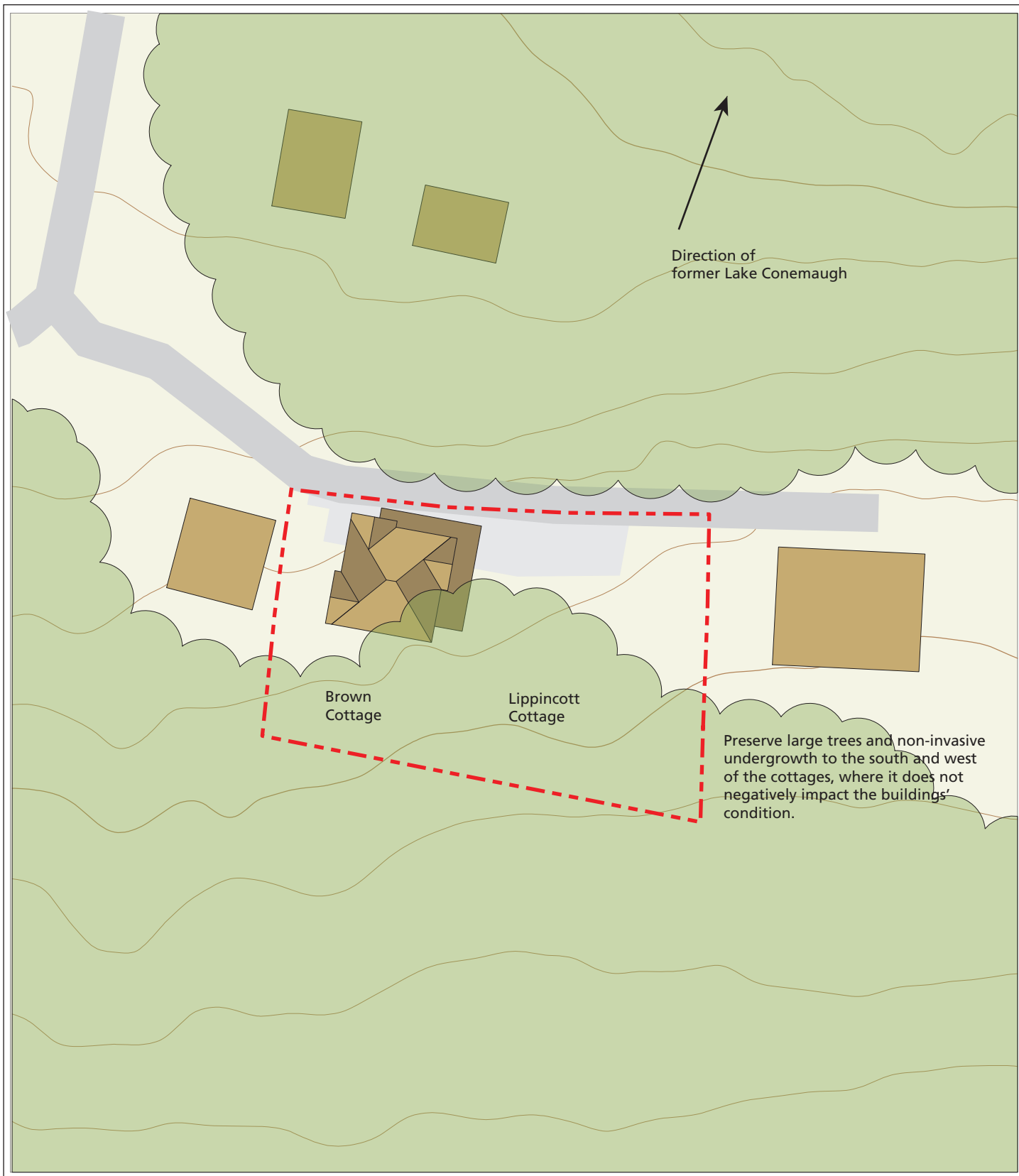


0' 5' 10'

Drawing 4.6



National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/olcp



DRAWN BY

Emelyn Najera, 2019
AutoCAD Map 3D, Adobe Photoshop and Illustrator CS6

NOTES

1. All features shown in approximate scale and location.

SOURCES

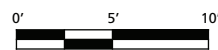
1. Johnstown Flood National Memorial GIS
2. 2014 National Resource Inventory
3. United States Geological Survey

LEGEND

	Gravel Parking Area		Mown lawn
	Streets		Buildings and Structures
	Trees and shrubs		Park Unit Boundary

Cultural Landscape Report Brown and Lippincott Cottages Johnstown Flood National Memorial

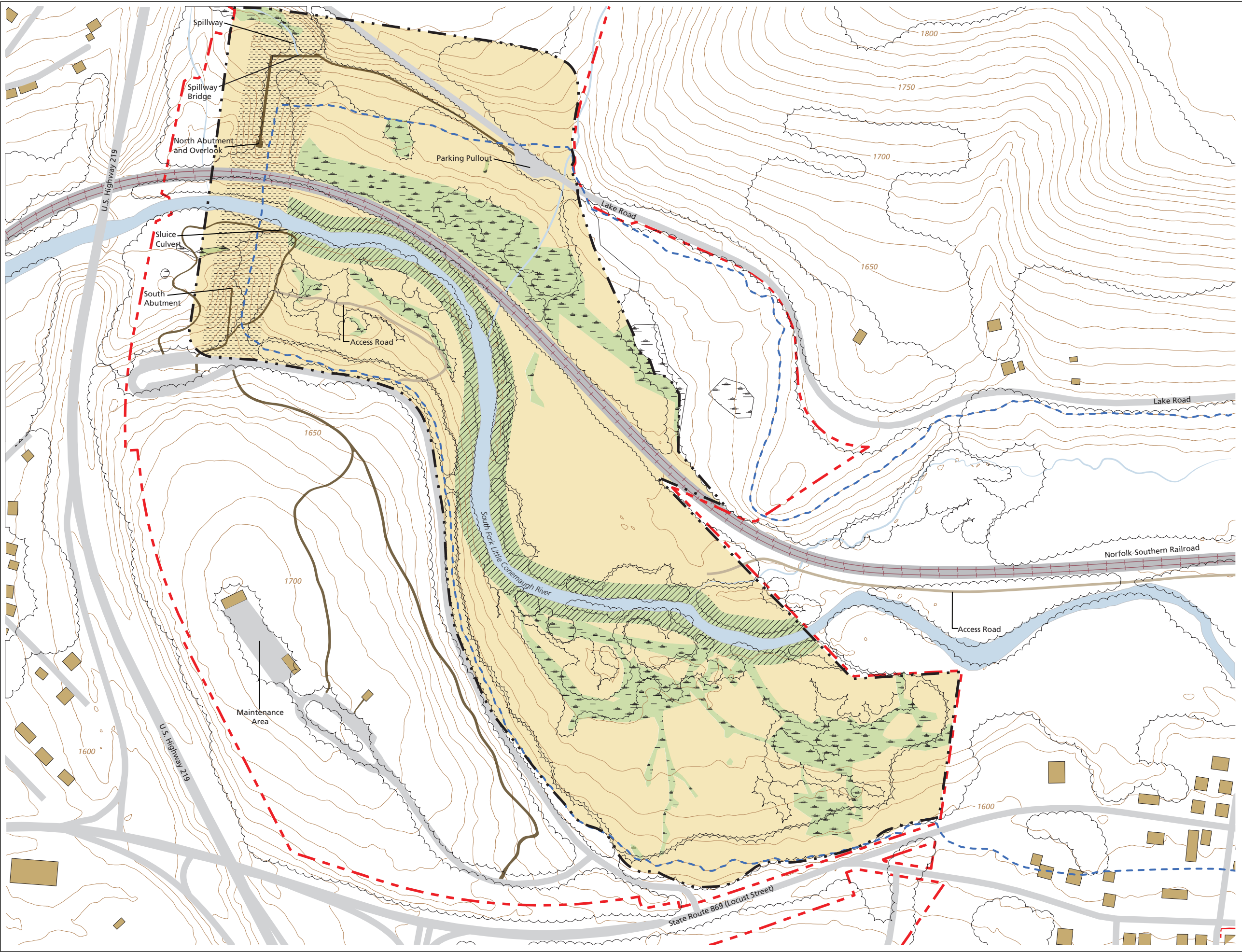
Landscape Treatment Cottage Detail



Drawing 4.7



National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/odlp



Cultural Landscape Report

Johnstown Flood
National Memorial
St. Michael, Pennsylvania

Implementation Strategy



National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

- SOURCES**
1. United States Geological Survey
 2. 2006 Veg. Inventory, 2010 Veg. Sudy
 3. 2014 Nat. Resource Inventory
 4. Johnstown Flood National Monument GIS

DRAWN BY
Emelyn Nájera and Clelie Fielding
ESRI ArcMap, AutoCAD Map 2019,
Adobe Illustrator CS6, 2019

- LEGEND**
- Park Unit Boundary
 - Proposed Treatment Boundary
 - Historic Lake Level
 - South Fork Little Conemaugh River
 - Mechanical Clearing
 - Selective Removal
 - Engineered Earthworks Treatment
 - Riparian Buffer
 - Designated Wetland
 - Mature Tree Canopy

NOTES

Drawing 4.8



Johnstown Flood National Memorial, 2020

RECORD OF TREATMENT: LAKEBED CLEARING

RECORD OF TREATMENT, IMPLEMENTATION

RECORD OF TREATMENT, PLANNING AND COMPLIANCE

ISSUES AND RESOLUTIONS

SUMMARY

This chapter provides an implementation strategy for moving forward with the treatment tasks based on the recommendations contained in the treatment framework and an analysis of conditions in the field (See Drawing 4.7). Though the lakebed clearing cyclical project (PMIS 171804) was undertaken prior to the completion of the *Cultural Landscape Report for Johnstown Flood National Memorial*, this study provides the research and treatment recommendations to support the methods and scope of the lakebed clearing project. As the first phases of the lakebed clearing project were completed in 2020, this chapter also describes the process and results of this portion of the lakebed clearing cyclical project through the Record of Treatment section in this chapter.

RECORD OF TREATMENT, IMPLEMENTATION

Implementation of vegetation clearing in the landscape must consider existing vegetative communities, topography, wetlands, riparian areas, and physical access, as well as the human and financial resources necessary to accomplish the work. In addition, the maintenance of the cleared landscape must be operationally sustainable. Based on the existing conditions and park resources, the following strategies are recommended: mechanical clearing, chemical application, seeding, burning through prescribed fire, monitoring, and mowing. After implementation, these same strategies will be used for long term maintenance of the lakebed. There are two main strategies for clearing the lakebed, mechanical clearing using large scale machinery and selective clearing through chainsaws.

MECHANICAL CLEAR CUTTING THROUGH MASTICATION

The entire lakebed, except for within the Designated Wetland and Riparian Zone, will be cleared of woody vegetation through mechanical means. Most of the former lakebed, which contains trees and large shrubs blocking significant views, will be cleared with a masticator because of its efficiency. Masticating fuels, or mulching the forest, involves the reduction of vegetation into small chunks and is one of the many ways overstocked forest stands are thinned. A masticator is an excavator type tractor which moves through a wooded landscape grinding and chipping trees and brush. The chips are then left on the ground for mulch or fuel for prescribed burning. In conjunction with the mechanical clearing, chemical applications to stumps may be needed to prevent regrowth.

Mastication is a fuel reduction treatment method used in forestry management to reduce wildfire risk, to reduce fuel loadings by returning the forest to natural conditions. Project areas where mastication will be used have the following characteristics:

- Mastication operations will occur only during winter months while the ground is frozen in order to reduce rutting and increase the safety of operations.
- Trees are small enough and spaced so that the resulting chip layer will allow for seeding where necessary, at least fifty percent of the surface area should be visible soil.
- Gentle slopes that will not put machinery and operators in danger.
- Areas are located outside of the boundaries of Designated Wetlands or Riparian Treatment Zones.

Most of the area to be cleared through mastication is characterized by successional growth dominated by red maple and black cherry (Figures 5.1 and 5.2). Where this successional woody vegetation dominates, few grasses or forbs are present. Much of the woody understory is comprised of non-native, invasive shrubs, primarily Morrow's honeysuckle (*Lonicera morrowii*), multiflora rose (*Rosa multiflora*), and Japanese barberry (*Berberis thunbergii*). Therefore, treatment of invasive vegetation and the application of herbicide will be necessary.

SELECTIVE TREE REMOVAL

Chainsaws and/or brush saws can be used as an alternative to mastication where conditions do not allow for mastication. Areas identified for selective removals include the Designated Wetlands and Riparian Zones (for invasive species and non-native woody removal), portions of the Engineered Earthworks Zone where the slope is too steep to support a masticator, and areas where existing trees are too large for removal through mastication. Trees must be identified and marked prior to removal through this process. Where possible cut stumps and woody stems should be treated to prevent regrowth. As available surface water affects species composition, the number of trees marked for removal will vary by area. Areas where manual removal techniques will be used will have the following characteristics:

- The terrain is too steep or uneven for the masticator machinery to operate safely.
- Removal of the trees by mastication would threaten designated wetlands, historic earthworks, or remnant historic structures.

Once felled, trees and brush shall be removed by:

- Craning or winching, and trucked off site
- Piled and burned in a strategically placed location in the lakebed, identified on site at the time of removal

- Cut into smaller pieces and left for habitat, at the discretion of the resource advisors onsite during operations. Onsite resource specialists should consider the placement of these pieces carefully as the habitat piles can hinder maintenance operations.

Figure 5.1. The view east to the Visitor Center from the bottom of the lakebed prior to clearing woody vegetation, 2020. (Johnstown Flood National Memorial)



Figure 5.2. Looking north up the spillway just prior to clearing, 2020. (Johnstown Flood National Memorial)



RECORD OF TREATMENT, PLANNING AND COMPLIANCE

This section documents the planning, compliance, and implementation of the first two phases of the cyclical maintenance project “Restoration of the Lakebed” entered into PMIS in 2019 (171804) and funded in 2020 (Figures 5.3–5.7). The scope of this cyclical maintenance project, which is based on funded project “Remove Trees and Shrubs and Treat Stumps from Lakebed” (PMIS 171804), aligns with the treatment recommendations proposed in the *Cultural Landscape Report for Johnstown Flood National Memorial*.

Figure 5.3. Looking south towards southwestern section of the lakebed following the use of the masticator, 2020. (Johnstown Flood National Memorial)



Figure 5.4. Here along the earthen embankment of the south abutment, removals included some large trees, that blocked views and also threatened to damage the historic earthworks, 2020. (Johnstown Flood National Memorial)



PROJECT PLANNING

In the 1970s and late 1980s, Johnstown Flood National Memorial leadership authorized clearance of woody vegetation from the lakebed to meet a primary goal of the park's General Management Plan: "To preserve and maintain the cultural resources and the setting of the South Fork Dam to approximate conditions in 1889."¹ Following clearing, the lakebed contours clad in meadow allowed the visitors to envision the enormity of Lake Conemaugh and the tremendous impact of destruction of the South Fork Dam breach. Yet, in subsequent years maintenance of the cleared lakebed proved difficult to achieve due to lack of

Figure 5.5. The Masticator at work near the rail line in the Lakebed, 2020. (Johnstown Flood National Memorial)



Figure 5.6. The cut trunks of trees lay on the ground in front of the rail line, post mastication, 2020. (Johnstown Flood National Memorial)



Figure 5.7. The lakebed from the Visitor Center during the mastication phase, 2020. (Johnstown Flood National Memorial)



resources and ambiguity regarding wetland protection. In time, large portions of the lakebed reforested.

Current park leadership decided to return the lakebed and dam abutments to a condition that would meet the goal of park’s General Management Plan objective of returning the lakebed to its “approximate conditions in 1889” and thus improve interpretation of the site.² Project planning for the *Cultural Landscape Report for Johnstown Flood National Memorial, Treatment*, and the cyclical maintenance project, “Restoration of the Lakebed,” began concurrently in the spring of 2019.

Regional specialists in hydrology, natural resources, cultural resources, fire management, and interpretation were brought together by the Olmsted Center for Landscape Preservation to review planning requirements and provide input into the development of Landscape Treatment Alternatives for the lakebed rehabilitation in the spring of 2019. In addition, the Landscape Treatment Alternatives would help guide the implementation of the formulated cyclical maintenance project “Restoration of the Lakebed.” After input from Regional and Park specialists, the Olmsted Center for Landscape Preservation presented three Landscape Treatment Alternatives at a Cultural Landscape Report treatment workshop at Johnstown Flood National Memorial in July 2019. These alternatives were placed in the context of a Treatment Framework and Philosophy, ensuring that all alternatives met National Park Service regulatory requirements and park policy. After park and regional specialists considered the opportunities and challenges posed by the three Alternatives, park leadership chose Alternative 1, the Basin, as the Preferred Alternative.

In this treatment approach, all woody vegetation in the lakebed above ten feet in height and growing outside of the boundaries of the riparian buffer and

designated wetlands, would be removed. In consultation with regional specialists, the Olmsted Center for Landscape Preservation further refined the preferred alternative to address concerns about vegetation removal within the riparian buffer and designated wetlands, ensuring that treatment recommendations met the regulatory requirements under Directors Order 77-1 Wetland Protection. Simultaneously, site field work was conducted to refine recommend seed mixes based on existing vegetative composition. In December 2019, once the refined treatment was approved, an Implementation and Maintenance Strategy was developed in coordination with park and regional staff to further define future maintenance required to keep the lakebed cleared of woody vegetation (Figures 5.8 and 5.9).

Figure 5.8. Field notes for the crew undertaking selective clearing, highlighting the trees to be kept in the riparian zone, 2020. (Johnstown Flood National Memorial)



Figure 5.9. The slope east of the north abutment, selective clearing, post mastication, 2020. (Johnstown Flood National Memorial)



CYCLICAL MAINTENANCE PROJECT

Concurrently, the National Parks of Western Pennsylvania was planning implementation of the first phase of the “Restoration of the Lakebed” cyclical maintenance project in partnership with the NPS Regional Fire Management team (Figures 5.10 and 5.11). In December 2019, public comments were solicited by the National Parks of Western Pennsylvania in preparation for the initial phase of lakebed clearing. No public comments were received, and project NEPA and NHPA compliance was completed in December 2019. In late January 2020, the Region 1 Fire Management Team, led by Matthew Boss began the first phase of the cyclical project, “Restoration of the Lakebed” using a skid steer masticator on the frozen ground of the lakebed. Mastication was concentrated on an approximately nineteen-acre area, southwest of the South Fork of the Little Conemaugh River. The use of the masticator was limited to this area because steep slopes and wet

Figure 5.10. The lakebed along the accessible walk to the north abutment, Old Field vegetation is in the foreground, and the preserved evergreen trees are visible on the downstream side of the south abutment to provide a screen from the adjacent highway, Selective removals are still in process, 2020. (Johnstown Flood National Memorial)



Figure 5.11. The north and south dam abutments are visible again, with tree clearing still in process, 2020. (Johnstown Flood National Memorial)



Figure 5.12. Tire rutting caused from using machinery on soil that is too soft and wet, 2020. (Johnstown Flood National Memorial)



ground resulted in unacceptable levels of ground rutting (Figure 5.12, Drawing 5.1).

In late August, Johnstown Flood National Memorial staff also contracted with Allegheny Goatscape to employ goats to clear vegetation on the slope and adjacent areas of the south dam abutment. Moving forward, the park will employ twelve goats and one donkey annually to address vegetation control in areas that are difficult to access with machinery, including the entirety of the Engineered Earthworks and Dam Abutment Zone.

In April 2020, a contract was solicited to remove the remaining trees from the lakebed and was awarded in June to Russell Tree Experts for a start date in November. From November 10th to 25th 2020, Russell Tree Experts began working under the tree removal contract. Equipment used was determined by the lakebed terrain and included forestry clearing machines, masticators and hydraulic shearers, chainsaws, flail mowers, chippers, and feller bunchers (Figure 5.13). Finding the ground too soft and saturated to prevent compaction and wheel rutting, work was halted in late November. The contractor returned on January 26, 2021 and the contract to remove the woody vegetation was substantially complete as of February 1, 2021 (Figure 5.14).



Figure 5.13. In the selective removals process on the downstream side of the south abutment, some trees were retained to screen noise and visual pollution from the adjacent highway, 2020. (Johnstown Flood National Memorial)

Figure 5.14. The cleared lakebed looking north toward the pedestrian bridge over the spillway, 2020. (Johnstown Flood National Memorial)



For 2022, in partnership with the Region 1 fire management and preservation maintenance specialists, the park is planning the second phase of the “Restoration of the Lakebed” cyclical maintenance project, which is a prescribed burn in spring. For areas missed by goats and the burn, the park has acquired specialized mowing equipment. This specialized equipment includes a remote-control slope mower and a boom mounted mulcher head.

REGULATORY COMPLIANCE

Compliance with the National Environmental Policy Act and the National Historic Preservation Act for the cyclical maintenance project, “Restoration of the Lakebed” (PEPC Project 9147) was predicated on the Finding Of No Significant Impact (FONSI) of the Environmental Assessment for the Wildland Fire Management Plan for Allegheny Portage Railroad National Historic Site and Johnstown Flood National Memorial, approved on October 27, 2005.

The Wildland Fire Management Plan for Johnstown Flood outlined an approach for woody vegetation management within the lakebed utilizing prescribed burning and mechanical clearing to reduce fire load and to reveal the contours of the lakebed for interpretative purposes. As the “Restoration of the Lakebed” project retained the same location, alternatives, resource conditions, and impacts, the project’s regulatory compliance was addressed under the 2005 Environmental Assessment for the Fire Management Plan.

The wetlands within the lakebed were designated and delineated by National Park Service Northeast Regional Hydrologist, Peter Sharpe, in 2016 consistent with Executive Order 11990, Protection of Wetlands, and the policies and procedures

of Directors Order 77-1 Wetland Protection (PEPC 11389). In alignment with these regulatory requirements, the project “Restoration of the Lakebed” avoided impacting the integrity of the designated wetlands by limiting removal of vegetation within the wetlands to invasive and non-native woody species. Consultation with the United States Fish and Wildlife Service confirmed that the 2016 delineation of the wetlands within the lakebed remained accurate, and that their comments on the 2005 Fire Management Plan Environmental Assessment were still valid (November 12, 2019). Therefore, as the project scope aligned with the scope of the Fire Management Plan Environmental Assessment/FONSI, the “Restoration of the Lakebed” project met NEPA compliance.

Project compliance with the National Historic Preservation Act followed the Standard 36 CFR Part 800 Consultation process through submittal of the Assessment of Actions having an Effect on Historic Properties evaluation to the Pennsylvania State Historic Preservation office. Three historic properties were identified within project Area of Potential Impact (APE), including the National Park Service owned area of the former Lake Conemaugh lakebed, the remnants of the South Fork Dam and South Fork Dam Spillway, and the South Fork Dam Overflow Sluice Ruins. As the ruins of the South Fork Dam Spillway and Overflow Sluice Ruins were determined to fall within the Riparian Buffer Zone, they were determined not to be affected by the project. As the State Historic Preservation Officer (SHPO) had approved the findings of the 2005 FONSI for the Fire Management Plan on July 19, 2005, the SHPO determined that unless the scope of the project had changed from the 2005 Fire Management Plan, no further SHPO consultation was needed. As the project fell within the scope of the 2005 Fire Management Plan, the project met NHPA compliance.

While no ethnographic resources have been documented in the lakebed, four tribes with ancestral connections to the land were contacted about the “Restoration of the Lakebed” project. The Delaware Nation of OK and the Delaware Tribe of Indians approved the project, stating that there should be archaeological monitoring in the event of ground disturbance. The other two tribes, the Eastern Shawnee Tribe of OK and the Seneca-Cayuga Nation, did not respond within thirty days.

In compliance with the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), the United States Fish and Wildlife Service was contacted about the project. As no impacts from the project to federally listed, or proposed to be listed, species were anticipated, no further consultation or coordination was required under the Act.

As the Pennsylvania Department of Conservation and Natural Resources identified state protected species, the Appalachian blue violet, (*Viola appalachiensis*) was documented near the project site along a paved road leading to the South Abutment parking lot, further review of the project was necessary.

After review, the Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry, determined that no impact would be anticipated from proposed actions within the APE . Following consultation, the Pennsylvania Fish and Boat Commission stated that no impact is anticipated to threatened and endangered species and or special concern species or resources. The Pennsylvania Game Commission also responded that no impact is anticipated to threatened or endangered species or special concern species or resources. Compliance for the cyclical project was begun by WEPA staff on October 25, 2019 and closed on January 13, 2020.

CHRONOLOGICAL TIMELINE OF TREATMENT WORK

January 2018	Johnstown Flood NM enters a Cyclical Maintenance Project “Remove Trees and Shrubs and treat stumps from Lakebed” into PMIS based on FMSS Parent Work Order (7125585) FY 2013
February 2019	Johnstown Flood CLR Treatment Kick-off Meeting
June 2019	Johnstown Flood CLR Treatment Workshop
June 2019 – Oct. 2019	OCLP: CLR Treatment Preferred Alternative refined through consultation with Regional and Park Staff; Implementation Plan developed WEPA: Planning for project implementation w/ Regional Fire Management team
October 2019	Environmental Compliance for cyclical maintenance project initiated by Park
November 2019	Project compliance meeting with Regional and Park Staff
December 2019	Public Comment Period on cyclical project
January 13, 2020	Project NEPA and NHPA compliance completed
January 19-24, 2020	Park and Reginal Fire Management initiate first phase of clearing project through use of a masticator
April, 2020	Contract SOW written to clear remaining woody vegetation from the lakebeJune 2020 Contract awarded
August 2020	Goats hired to clear vegetation from steep abutments

November 2020	Contractor begins clearing remaining woody lakebed vegetation after mastication; halts work because too much wheel rutting due to wet soils
January 26, 2021	Contractor returns and substantially completes contract to remove remaining woody vegetation from lakebed.
April 2021	Mowing Contract to complete clearing

ISSUES AND RESOLUTIONS

While planning, compliance, and implementation of the project was successful, there were a few issues that arose.

MASTICATION

To accomplish as much of the lakebed clearing using internal National Park Service resources, Johnstown Flood National Memorial staff partnered with the Region 1 Fire Management team to use their masticating equipment to clear the lakebed. Region 1 Fire Management uses a masticator to reduce burn load in parks throughout the region. The park borrowed a small-scale masticator mounted on a skid steer, as well as the expertise of the Regional Fire Management Team in the use of masticators.

Though successful in clearing some areas of the lakebed, mastication presented some issues. The use of the masticator was limited to flat, dry areas of the lakebed, west and south of the South Fork of the Conemaugh River. Wood chips generated from the mastication of the trees were large resulting in a shredding of trees as opposed to a chipping of the trunks. The initial concern, that the layer of chips left behind from mastication would be too thick and inhibit seed germination was proved unfounded given the sparse population of large trees.

GOATS

In the summer of 2020, Johnstown Flood National Memorial management employed goats to clear vegetation on the south abutment slope. While the initiative was successful and vegetation was cleared, park management believes that the goats were deployed too late in the year, as vegetation was starting to die back. In the future, goats will be contracted earlier in the season to address vegetation within the engineered earthworks and historic dam structures zone.

CONTRACTING

Given the limited number of staff at the National Parks of Western Pennsylvania and Johnstown Flood National Memorial, leadership determined that the trees remaining after mastication would need to be removed with contracted labor.

The contract was fulfilled over a period of approximately twenty days by 3 to 8 employees of the contractor.

Under this Scope of Work the contractor was to remove all woody plants within the lakebed by cutting trees flush to the ground and removing them from the site. Stumps were treated with an approved herbicide to prevent regrowth. Clippings and chips were dispersed in a manner that it would not smother underlying vegetation or hinder seedbed preparation. Where this standard was not attainable, excess vegetative debris was removed and disposed of offsite in a legal manner.

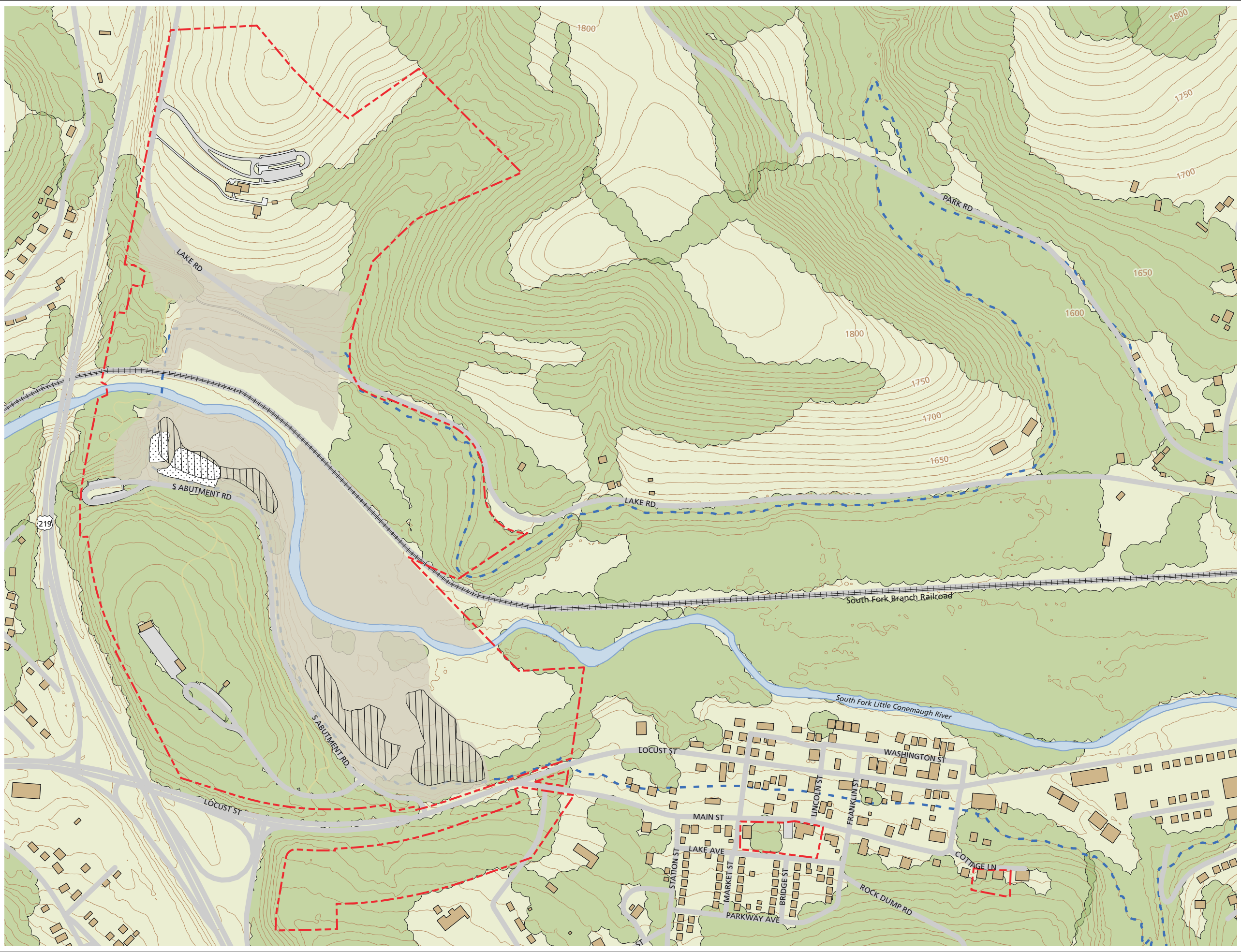
Complications in the contract arose when the ground of the lakebed proved softer than anticipated resulting in tire rutting. While the contract required the contractor to repair all damage at their cost, a clause requiring a work stoppage due to unsuitable conditions should have been included in the contract.

SUMMARY

The implementation of the initial phases of the cyclical maintenance project, “Restoration of the Lakebed” in coordination with the production of the Landscape Treatment chapter associated with this Cultural Landscape Report, was successfully accomplished between February 2019 and February 2021. Through these dual processes, research was conducted, alternative Landscape Treatments developed, and a Preferred Alternative was chosen by management of Johnstown Flood National Memorial. Project compliance was met, and the first two phases of the cyclical maintenance project, “Restoration of the Lakebed” were achieved. Moving forward, an integrated vegetation management strategy, as outlined in the final chapter of this document, will be necessary to maintain the cleared lakebed. Though prescribed fire could not be used in the initial clearing of the lakebed because of combustible loads, prescribed fire in coordination with a robust mowing plan will be critical to maintaining the landscape. In addition, because not all areas of the lakebed can be mowed due to rough terrain and to preserve wetlands, manual clearing of new woody growth on a cyclical basis will be necessary. Successful management of the cleared lakebed over time will require continued collaboration between regional and park staff, and a commitment to careful monitoring of woody vegetative growth.

ENDNOTES, RECORD OF TREATMENT

- 1 General Management Plan for Allegheny Portage Railroad National Historic Site and Johnstown Flood National Memorial, Draft Statement 1977 and Plan 1980 (Washington, D.C.: Department of Interior, National Park Service).
- 2 Memo to File, PEPC Project 91417, (Department of the Interior, National Park Service), 2019.



Cultural Landscape Report

Johnstown Flood National Memorial St. Michael, Pennsylvania

2021 Record of Treatment



National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

SOURCES

1. United States Geological Survey
2. 2019 Existing Conditions, ESRI ArcMap, AutoCAD, and Adobe Illustrator CS6 Map, Emelyn Najera, 2019

DRAWN BY

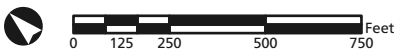
Kelsey Little, ArcGIS Pro 2.5, 2021

LEGEND

- NPS, Region 1, Fire Management Division, Tree Mastication Clearing
- Contracting, Private Sector, Clear Cutting & Selective Tree Removals
- Goat Grazing Area
- Park Unit Boundary
- Historic Lake Level
- South Fork Little Conemaugh River
- Building
- Road
- Vegetation Canopy
- Open Field
- Railroad

NOTES

1. Projection: NAD 1983 UTM Zone 18N
2. Contour Interval = X' - 10"
3. All features shown in approximate scale and location





Johnstown Flood National Memorial, 2021

LAKEBED VEGETATION MANAGEMENT

LANDSCAPE MAINTENANCE STRATEGIES

FIVE YEAR CYCLICAL MAINTENANCE CALENDAR

Preservation maintenance of the cleared lakebed requires the integration of many strategies. Annual mowing of the lakebed will be an effective way to manage many undesirable plants, including invasive herbaceous vegetation and young trees. However, because the lakebed includes areas of steep slopes over twenty-five degrees, rocky outcroppings, and uneven ground conditions, alternatives to mowing and additional tools will be needed. These tools and methods include chemical applications, seeding of tree cleared areas, prescribed fire, the monitoring of invasive vegetation, and even the use of goats on steep slopes of the Engineered Earthworks and Dam Abutment Zone. Goats, usually contracted out through a service provider, need park support and infrastructure to succeed, including fencing, water, and temporary shelter (Figure 6.1).

In addition, the Riparian and Designated Wetland Zone of the lakebed contains desirable vegetation that should not be mowed, burned, or cleared using goats. Therefore, a five-year rotation of manual removal of trees growing in this area will be necessary. Finally, consistent monitoring of vegetation will indicate whether maintenance actions like mowing are frequent enough or the timing of prescribed burns is correct. These preservation maintenance strategies, detailed below, will require flexibility to maintain this large and complex landscape.

Figure 6.1. Goats on the slope of the southern dam abutment require fencing, water and temporary shelter, but they do an adequate job of removing woody vegetation on steep slopes. Goats, in addition to mowing of flatter areas, and future selective clearing efforts will help to maintain the meadows of the Johnstown Flood National Memorial, 2020. (Johnstown Flood National Memorial)



LANDSCAPE MAINTENANCE STRATEGIES

MOWING

Mowing the lakebed in the late fall or early spring annually will keep woody successional plants under control and promote the native grassland desired as part of the implementation of the “Old Field” treatment zone. With trees removed and stumps cut flush to the ground, mowing will be able to be performed on most of the lakebed.

A variety of mowers will be needed due to the varied topography. Overall, a flail mower should be used as this is more resilient to variations in topography and more evenly distributes clippings. A flail mower on a hydraulic arm will allow the steeper areas to be mowed completely reaching from above and down from below. There are remote control mowers designed for steep slopes that may assist greatly in the efficiency and safety of the mowing effort. While a flail mower will be able to handle a variety of ground conditions, the slope mowers need a relatively smooth and debris free ground surface, this means that other tree removal equipment on hydraulic arms will be needed. These efforts will minimize the need for manual removal which will improve efficiency and work safety.

CHEMICAL APPLICATION

Targeted chemical applications are a critical part of the lakebed management program. It is anticipated that regular mowing and tree removal will control most undesirable vegetation, but mowing will not adequately address many of the invasive plants or the aggressive regrowth of cut down woody plants. Strategies for chemical use evolve as technology and research advance, therefore it is important to engage with land grant universities and extension agents to stay current.

The National Park Service has a Pesticide Use Proposal System (PUPS) for the approval of pesticide applications. Chemical applications need to be coordinated with JOFL’s IPM Coordinator who will use PUPS to get the necessary approval or suggest alternatives. The primary components of the current lakebed vegetation can be broken down into several categories: grasses, native shrubs and brush, non-native shrubs and brush, and woody trees.

Herbicide on Trees and Stumps

Cut stumps, whether removed by mastication or selective removal, may be treated with a labeled herbicide to prevent resprouting of deciduous trees. This is unnecessary with coniferous trees since they generally do not sprout from the stump. Herbicides must be approved by management from Johnstown Flood National Memorial and the Regional Integrated Pest Management Coordinator

using the Pesticide Use Proposal System (PUPS). Trees can be effectively managed by foliar applications of the herbicide, triclopyr, during the growing season. If allowed to grow to a height where foliar treatment is not practical, trees can be cut, and their stumps treated with triclopyr. Woody trees that have resprouted from the stump, may be cut back and the stump treated or may be foliar treated to slow regrowth.¹ If herbicide use is not desirable, cutting should be done from May through July. During these months tree root reserves are lowest and subsequent sprouting is reduced, though not eliminated. Maximum sprouting occurs when cutting is done during the dormant season. One species poses particular challenges and requires herbicidal application to control.

Black locust: This tree may be native to the Johnstown region, however, if repeatedly cut, it will root, sprout, and spread far beyond its current footprint. It also grows more quickly than many native trees, and so may become too large to easily cut before native trees need to be mowed. Therefore, the recommendation is to aggressively manage this species. It is currently growing in one patch near the parking lot below the Visitor Center. After the initial mowing, monitor these areas and treat as soon as full leaves appear. This will require several repeat treatments over a few years. A mix of the herbicides triclopyr and aminopyralid is especially effective.

Native Shrubs and Brush

Large native shrubs may be managed by herbicide application, or they may be simply managed by regular mowing regime targeting invasive/woody growth. Non-native shrubs should be chemically managed as they are likely to out compete native vegetation after mechanical removal of the vegetation cover.

Native and non-native shrubs can generally be effectively managed by foliar applications of a broadleaf specific herbicide such as triclopyr, or a mixture of triclopyr and glyphosate. Many other herbicides can be incorporated depending on the species to be managed. Generally, a broadleaf specific herbicide would be preferable, in order to limit damage to grasses. Foliar application should be done during the growing season.

Grasses

Native grasses will not require any active chemical management, as they are the desired vegetation type. For management of non-native grasses several post-emergent herbicides are available, including sethoxydim, quizalofop, fenoxaprop, among others. These are grass specific, and generally will not damage sedges or broadleaf plants. Pre-emergent herbicides, such as indaziflam or pendimethalin, are very effective on annual grasses

Herbaceous Vegetation

It is anticipated that Canada thistle and crown vetch will be challenging invasive plants and will require management.

Canada thistle: This forms a large component of the ‘understory’ near the lower parking lot, below an ‘overstory’ of a native goldenrod. If these areas are actively mowed, the Canada thistle may quickly spread due to lack of competition. The growth of the Canada thistle should be monitored frequently. If it seems to be expanding, or if management action is otherwise desired, aminopyralid or aminocyclopyrachlor, are effective. Note, these two herbicides should not be used near desirable trees and shrubs.

Crown vetch: Crown vetch is growing in the same areas as the Canada thistle. Triclopyr alone or in combination with aminopyralid is effective, as are several other herbicides.

SEEDING

Seeding with desirable native forbs and grasses will be necessary to establish the “Old Field” meadows once the woody vegetation is removed. Ground conditions after woody plant removal will dictate the seeding strategy. Additional steps for ground preparation may need to be taken if the chip layer is too thick or coarse for planting.

- Ground preparation should be such that seed can contact soil. If there are chips, thatch, or forest litter, the area will need to have these obstacles removed.
- Seed Mix: Seed will be low growing mix (8” to 36”) of warm and cool season grasses and native pollinator plants. Recommended plants for the seed mix include: Little bluestem (*Andropogon scoparius*), Nodding Fescue (*Glyceria striata*), Eastern Bottlebrush grass (*Elymus hystrix*), Sideoats Grama (*Bouteloua curtipendula*), Prairie Dropseed (*Sporobolus heterolepis*), *Rudbeckia hirta*, Coastal Plain NC Ecotype, Black-eyed Susan, Coastal Plain NC Ecotype), *Chamaecrista fasciculata*, PA Ecotype (Partridge Pea, PA Ecotype), *Heliopsis helianthoides*, PA Ecotype (Oxeye Sunflower, PA Ecotype), *Coreopsis tinctoria* (Plains Coreopsis), *Desmodium canadense*, PA Ecotype (Showy Ticktrefoil, PA Ecotype), *Monarda fistulosa*, Fort Indiantown Gap-PA Ecotype (Wild Bergamot, Fort Indiantown Gap-PA Ecotype)
- Seed Quality: All seed purchased should be accompanied by seed tags along with a current seed analysis per species (not older than 9 months) noting analysis for purity (specifically stating weed seed and other crop seed by genus) and germination.

- **Timing:** The most ideal timing for seed installation is after the soil temperatures of the site are consistently below 40 degrees Fahrenheit, this should be around November 15th to approximately March 15th. The site should be dry with minimal wind speed (less than 8 mph).
- **Seeding Methods:**

To ensure seed success, seed needs to be in direct contact with mineral soil. Seed should be broadcast. This may be accomplished with an ATV pull behind broadcast seeder or by hand. If the seed is too light to be spread, it may be mixed with sand to facilitate broadcasting. mix sand with seed at a ratio of 4/1 sand to seed to ensure even broadcast application. Other inert material such as rice hulls or vermiculite is ideal to mix with the seed in order to make spreading easier.

Traverse the site twice when broadcast seeding, the second coverage should be at a 180-degree angle to the first coverage resulting in a crisscross application of the seed. Seed should be tapped into the ground by raking across the slope of the site. This may be accomplished by hand-raking or dragging a harrow or chain behind an ATV. Seed should not be buried greater than ¼ inch. To verify seed is not buried too deep, after raking a few seeds per square foot (about 5) should be visible on the ground indicated seed has not been buried too deep.

To ensure seed to soil contact is critical for seeding success. An ATV-pull behind type harrow may be needed to work seed into the ground, dimpling the seed into the ground with the knobby tires of the ATV, or hand raking.

Other seeding approaches based on ground conditions and equipment availability include hydroseeding, broadcast and cultipact/dimple, native seed drill.

PRESCRIBED FIRE

Prescribed fire is an important tool for managing the growth of woody vegetation in the “Old Field Restoration Zone.” In coordination with Regional Fire Management, park staff should implement a prescribed burn in the former lakebed within the “Old Field Restoration Zone” and in portions of the Engineered Earthworks Zone”, as appropriate, on a three-year rotation cycle. These prescribed burns should be timed to minimize impacts to wildlife, especially nesting species of birds. Note, the most abundant species during the breeding season (June and July) include the red-eyed vireo, ovenbird, American redstart, scarlet tanager, indigo bunting, wood thrush, black-throated green

warbler, chipping sparrow, brown-headed cowbird, blue-headed vireo, black-capped chickadee, and the song sparrow.

Once impacts to wildlife are minimized, scheduling of the fire should be based on desired vegetative species, invasive pressure, and fuel load., According to the *Fuels and Fire Management Plan for Allegheny Portage Railroad National Historic Site and Johnstown Flood National Memorial (2005)*, the Johnstown Flood management unit has two fire seasons, or periods of the year where prescribed burns are best managed. The Spring Prescribed Burn Fire Season is from March 1 until June 1, and the fall season is from September 1 until November 15. These are general dates only and are affected by drought, and abnormal weather. Precipitation and green-up are the controlling factors for the beginning and the end of the spring fire season. The end of the fall fire season is dependent on frosts and snow fall. Prescribed fire should not be conducted within three months of a chemical treatment to avoid any possible danger of exposure from chemical carrying smoke.

VEGETATION MONITORING

A monitoring program should be implemented to assess the success or failures of the efforts of vegetation management. This monitoring plan will have three components: 1) assess cover of woody species; 2) survey for invasive plant species, and 3) determine species composition of the grassland / Old Field vegetation community in the lakebed to direct future planting or seeding efforts. Monitoring data will guide adjustments in the maintenance program to address desired plants and invasive vegetation. Opportunities to establish a relationship with the Pennsylvania Natural Heritage Program through the CESU program should be explored by park staff.

FIVE YEAR CYCLICAL MAINTENANCE CALENDAR

Long term preservation maintenance of the cleared lakebed will require the integration of many strategies. While most of the program to maintain the lakebed will be fulfilled by annual mowing, the lakebed's steep terrain and uneven ground conditions will require alternative maintenance approaches including goats, trimming, selective removal through chainsaws, remote control mowers, hand removal, and prescribed burns. These methods and tools are integrated into the following five-year cyclical calendar.

Year 1 of 5 Year Cycle (2020)

- Masticate areas of the lakebed that are accessible for mastication operation (only in 2020). Limit ground disturbance and avoid the deposit of excessive chips that would complicate seeding or regrowth.
- Selectively remove trees and other woody growth using land clearing techniques and manual labor. Treat stumps to prevent sprouts and seed areas with bare soil or ground disturbance.
- Mow or trim renovated areas in the Lakebed Management Zone during growing season at a high height (6") to limit weed competition through shading and limiting seed production, in a rotation sustainable by park staffing resources. Rotate areas to be mowed to reduce impacts to wildlife and pollinators.
- Revise maintenance program in response to invasive monitoring program observations as needed. Note, invasive non-native shrubs, including multiflora rose and shrub honeysuckle and as it may leaf out before native species, may be available to be treated the same year as the initial mechanical removal. Black locust, though a native, due to its regrowth, is also early to leaf out and may be treated early the same year after mastication. Most of the native vegetation can likely wait until a full year after cutting before first chemical treatment. Generally, treatment should be during the active growing season, roughly June through early September. Mechanical treatments should not be performed within 2 weeks after a chemical treatment.

Year 2 of 5 Year Cycle (2021)

- Implement a springtime prescribed burn in the lakebed on a 3-year rotation in coordination with natural resource staff to minimize impacts to wildlife, especially nesting species of birds. This initial burn in the spring is designed to address the fuel load expected to be present. The timing of future burns will vary based on monitoring and ground conditions.
- Mow renovated areas Lakebed Management Zone at a 6 to 12-inch height during the season as needed if weeds present a problem such as outcompeting seeded areas or desirable species.
- Using information generated from the monitoring program, address invasive or successional plant issues.

Year 3 of 5 Year Cycle (2022)

- Mow within Lakebed Management Zone once during the period, January 15 to March 15 . Time mowing for when frost is in the ground and frozen conditions provide a stable surface for machinery. Mow from inside of the field out to give wildlife a chance to avoid mowing equipment.
- Using information generated from the monitoring program, address invasive or successional plant issues.

Year 4 of 5 Year Cycle (2023)

- Mow within Lakebed Treatment Zone once during the period, January 15 to March 15. Time mowing for when frost is in the ground and frozen conditions provide a stable surface for machinery. Mow from inside of the field out to give wildlife a chance to avoid mowing equipment. Do not mow late in the season unless there is a weed that needs control.
- Use information generated from the monitoring program to address invasive or successional plant issues.

Year 5 of 5 Year Cycle (2024)

- Skip winter/spring mowing this year to help generate fuel for a fall burn. Using information generated from the monitoring program to address invasive or successional plant issues.
- Implement a prescribed burn this season. Base the specific timing on best available research, existing plant populations, invasive plant pressure, wildlife considerations, and desired plant populations.
- Use information generated from the monitoring program to address invasive or successional plant issues.

ENDNOTES, LAKEBED VEGETATION MANAGEMENT

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