

Berlin Lake 2021 Master Plan



Executive Summary

A Master Plan is required for each Civil Works Project and all fee-owned lands for which the U.S. Army Corps of Engineers (Corps) has administrative responsibility. It serves as a strategic land-use management document that guides the comprehensive management and development of all recreational, natural, and cultural resources throughout the life of the Project, anticipating what could and should happen at the Corps Project while remaining flexible enough to address changing conditions.

The primary goals of this 2021 revision of the Berlin Lake (Project) Master Plan, are to prescribe an overall strategic land use management plan, resource objectives, and associated design and management concepts, which: 1) use sound environmental principles to protect and enhance public lands; 2) cultivate volunteers, public-private partnerships, and apply for grants; 3) provide safe and memorable connections as part of multiple destination points; and 4) leverage emerging technology to tell the Corps' story and enhance visitor experiences.

Upon completion of this Master Plan, Operational Management Plans (OMPs) will be executed yearly. OMPs implement the resource objectives and development needs identified in the Master Plan. The table below reflects the years in which key resource objectives should be implemented.

Resource Objectives for Berlin Lake

Five Year	Ten Year	Conditions Based Actions**
Regular dam tours are established	Security features are enhanced	Oil, gas, and coal mining are leveraged and mitigated
All fee, flowage, and shoreline boundaries are surveyed and marked	Forest, Fish, and Wildlife Management Plan is updated	Endangered species conservation methods are identified and implemented
Volunteers are working at the Project in multiple capacities	Cultural Resource Management Plan is updated	Invasive species control methods are identified and implemented
Biological and cultural resources are inventoried and documented	Degraded facilities are identified and divestment options are considered*	Climate change impacts are considered

*This will require external support (i.e. budgeting decisions through executive assistance).

**Condition Based Actions will be evaluated as new requests or as information becomes available.

This Master Plan lays out future recommendations for the management of both recreation and natural resources at the Project with an emphasis on conserving our resources and responding to community needs.

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1. Project Authorization

The construction of the Project was authorized by the Flood Control Act of 1938. Authorizations subsequent to construction (Table 1-1, full list in Appendix A) provided incidental benefits, including fish and wildlife management and recreational uses of the impoundments and Project lands.

Table 1-1. Project Purposes and Authorities

Operating Purpose	Authority	Citation
Flood Control	Flood Control Act of 1938	PL 75-761
Fish and Wildlife	Fish and Wildlife Coordination Act	PL 85-624
Recreation	Flood Control Act of 1944 River and Harbor Act of 1962	PL 78-534 PL 87-874
Water Supply	Flood Control Act of 1938	PL 75-761
Water Quality	Flood Control Act of 1938 Clean Water Act	PL 75-761 PL 92-500
Low Flow Augmentation	Flood Control Act of 1938	PL 75-761

1.1 Project Purpose

The Project is authorized for flood control, low flow augmentation, and water quality control along the Mahoning, Beaver, and upper Ohio Rivers. See Appendix B, Plate 1 for the Watershed map. Additional uses of the reservoir area include fish and wildlife management and recreation. These additional uses shall not conflict with the primary function of flood control.

1.2 Watershed and Project Description

The Project is situated in Ohio approximately 25 miles from Youngstown, OH and 80 miles from Pittsburgh, PA. See Appendix B, Plate 2 for Project Overview and Transportation Corridors map. Refer to Table 1-2 below for Reservoir Information.

Table 1-2. Reservoir Information

Pool	Elevation (ft. NAVD88)	Storage (ac.-ft.)
Minimum	979.31	1,259
Summer Conservation	1,024.01	55,097
Full	1,031.31	86,314

The Project covers a total of 8,061.4 acres. That acreage includes land held in fee and flowage easements. The Corps maintains the Resource Manager's Office, Ranger Station/Information Center, maintenance compound, a dwelling, campground, two boat launches (one paved and one

unimproved), playgrounds, picnic areas, a dog park, disc golf course, and reservable picnic shelters.

The Corps leases 6,553.9 acres of Project lands and waters to the Ohio Department of Natural Resources (ODNR), 9.4 acres of lands and waters to Dutch Harbor Marina, 2.2 acres of lands and waters to Berlin Yacht Club, 17.1 acres of lands and waters to Les’s Bait and Marcko Landing, LLC, and 2.2 acres of lands and waters to Stark County Parks (Table 1-3, below). Appendix B, Plate 3 shows the Boundary map for the Project.

Table 1-3. Outgrant Areas

Grantee	Type	Acres
Ohio Department of Natural Resources	Recreation/ Wildlife	6,553.9
Dutch Harbor Marina	Recreation	9.4
Berlin Yacht Club	Recreation	2.2
Les’s Bait and Marcko Landing, LLC	Recreation	17.1
Stark County Parks	Recreation	2.2

1.3 Listing of Pertinent Project Information

While the Master Plan is focused on management of land and water surface area related to Project purposes, the following information is provided to aid in understanding Project information regarding water storage levels and Project construction (Table 1-4, below).

Table 1-4. Project Information

Project Attribute	Description
Average Annual Rainfall	38 in.
Drainage Area above Dam	249 sq. miles
Construction Began	1941
Construction Completed	1943
Dam Type	Concrete gravity flanked by earth embankments
Dam Length	5,750 ft. including embankments
Dam Height	1,045 ft.
Base Width	73 ft. at controlled spillway section
Outlet Works	Two ring jets, three ball valves, four crest gates measuring 30 ft. wide by 18 ft. high, and an uncontrolled concrete ogee spillway.
Spillway	Crest elevation 1,014 ft. for controlled spillway, 1,032 ft. for uncontrolled spillway. 30 ft. by 18 ft. tainter gates, total width of 120 ft.

	Uncontrolled portion consists of twelve 30 ft. sections with a total width of 360 ft.
Highest Inflow Recorded	25,200 c.f.s. (January 1959)
Highest Outflow Recorded	4,500 c.f.s. (December 1950)
Highest Elevation (NAVD88)	1,032 ft. (May 12, 1996)

1.4 Purpose and Scope of the Master Plan

This Master Plan presents updated land use categories, management objectives, resource plans, and recommendations for the management of Project lands and waters to meet current and future needs. It is a vital tool for the responsible stewardship of Project resources for the benefit of present and future generations, guiding the comprehensive management and development of the natural, cultural, and man-made resources at the Project.

This Master Plan takes into consideration regional and local needs, resource capabilities, suitability, and expressed public interests consistent with authorized Project purposes, pertinent legislation, applicable regulations, national objectives, and other state and regional goals and programs. The Master Plan is distinct from the Operational Management Plan (OMP). Specifically, policies in the Master Plan are guidelines implemented through provisions of the OMP and the Annual Work Plan. A Master Plan is the strategic land use management document that guides the comprehensive management and development of all Project recreational, natural, and cultural resources throughout the life of the Project. OMPs implement the resource objectives and development needs identified in the Master Plan. Annual Work Plans are a description of management tasks and initiatives, complete with labor, material, and cost requirements to be completed for use in the current fiscal year. The Annual Work Plan is synonymous with the current fiscal year plan in the OMP.

1.5 Management Goals

This section sets forth goals and objectives necessary to achieve the vision for the future of the Project. In the context of this Master Plan, goals express the overall desired end state of the cumulative land and recreation management programs, whereas resource objectives specify task-oriented actions necessary to achieve the Master Plan goals. The following goals are the priorities for consideration when determining resource objectives and development activities.

1. Use sound environmental principles to protect and enhance public lands.
2. Cultivate volunteers, public-private partnerships, and apply for grants.
3. Provide safe and memorable connections as part of multiple destination points.
4. Leverage emerging technology to tell the Corps' story and enhance visitor experiences.

Implementation of these goals is dependent upon time, manpower, and budget. These goals will be pursued using a variety of mechanisms such as: volunteer efforts, hired labor, contract labor, permit conditions, remediation, and special lease conditions.

The Corps management activities are guided by Corps-wide Environmental Operating Principles (EOPs) in accordance with Engineer Regulation (ER) 200-1-5. The EOPs are as follows:

1. Strive to achieve environmental sustainability. An environment maintained in a healthy, diverse, and sustainable condition is necessary to support life.
2. Recognize the interdependence of life and the physical environment.
3. Proactively consider environmental consequences of Corps programs and act accordingly in all appropriate circumstances.
4. Seek balance and synergy among human development activities and natural systems by designing economic and environmental solutions that support and reinforce one another.
5. Continue to accept corporate responsibility and accountability under the law for activities and decisions under our control that impact human health and welfare and the continued viability of natural systems.
6. Seek ways and means to assess and mitigate cumulative impacts to the environment; bring system approaches to the full life cycle of our processes and work.
7. Build and share an integrated scientific, economic, and social knowledge base that supports a greater understanding of the environment and impacts of our work.
8. Respect the views of individuals and groups interested in Corps activities; listen to them actively and learn from their perspective in the search to find innovative win-win solutions to the nation's problems that also protect and enhance the environment.

1.6 Resource Objectives

Resource Objectives are defined as clearly written statements that both respond to identified issues and specify measurable and attainable activities for resource development and/or management of the lands and waters under Corps jurisdiction. Resource Objectives provided in this section are established to provide high levels of stewardship to managed lands and resources, while simultaneously providing a high level of public service.

Each of the following Resource Objectives has a current and future component (see below, Table 1-5 through Table 1-8). The current component is the near-term focus of the current Master Plan and is the impetus of efforts of this review cycle (i.e. five years). The future component is the long-term focus to be addressed in subsequent reviews (i.e. ten years).

Table 1-5: Goal 1: Use sound environmental principles to protect and enhance public lands¹

Management and Development Activity	Five-year	Ten-year	Desired State
Inventory natural and cultural resources	Inventory and document biological and cultural resources (E)	Develop operational geospatial database for natural and cultural resources (E)	Completed and maintained biological/cultural resource inventory and associated management plans
		Identify eligible cultural resource artifacts that can be registered with the State Historic Preservation Office (SHPO) (E)	
		Update Cultural Resource Management Plan	
Identify threats (i.e. erosion, terrestrial & aquatic invasive species)	Implement erosion and pollution (soil, air, water) control methods (E)	Develop an Invasive Species Management Plan (E)	Conservation and enhancement of Project land
	Identify and implement procedures to reduce HABS (E)		
Achieve and maintain desired natural and cultural resource conditions	Engage specific conservation organizations (federal and state agencies, academia, non-profits) (S&E)	Formalize relationship with federal, state, academia, and NGOs to achieve desired environmental conditions (S&E)	Increased stakeholder buy-in and protection of the resources in and surrounding the Project
	Add fish habitat structures (E)		
	Conduct timber harvest so that proceeds go back to the Project (E)		
	Send project staff to applicable trainings to enhance knowledge of natural and cultural resource management (S&E)		
	Leverage available skill sets and equipment across Projects (S&E)		
	Hold annual working meetings with partners (ODNR) (S&E)	Update Forest, Fish, and Wildlife Management Plan to include items such as: best management practices for timber; controlled burns; protection of shoreline buffers for wildlife and water	

¹ S – Sustain
E – Establish

	Establish on site and roving educational programs on topics such as water quality, Harmful Algal Blooms (HABs) and erosion control (E)	quality; protection of Corps owned and managed riparian habitat; protection of contiguous habitat corridors; protection of viewsheds (S&E)	
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Table 1-6: Goal 2: Cultivate volunteers, public-private partnerships, and apply for grants¹

Management and Development Activity	Five-year	Ten-year	Desired State
Partnering for a shared public land management ethic	Initiate opportunities with community action groups, local recreational clubs, and other Corps resources (such as Friends of Berlin, Mahoning County Bee Keeping Association, Backcountry Hunters and Anglers, Martig Farm, Ohio State University, Youngstown State University, local Boy Scout troops, local 4H groups, etc.) (S&E)	Establish appropriate Partnership Agreements (i.e. Memorandum of Understanding /Memorandum of Agreement) with natural resource management partners (E)	Engaged with appropriate resource management partners to manage according to Pittsburgh District’s vision; partners are helping to share the Corps vision for the Project
	Initiate relationships with Whitetail Unlimited, Audubon Society, Ducks Unlimited, Ruffed Grouse Society, and Safe Kids Coalition to establish educational, safety, and wildlife improvement projects (E)		Partners, volunteers, and interns are augmenting Project staff responsibilities to further protect and enhance natural and cultural resources
	Partner with universities to utilize Project facilities for biological stations (E)		
	Obtain assistance with environmental management from seasonal natural resource crews such as the Student Conservation Association (SCA) (S&E)		
	Enhance, expand, and diversify the Friends of Berlin Lake group (S&E)		

	Assist and notify non-profit organizations of grant opportunities available (E)		
	Establish Citizen Science Groups (eBird, iNaturalist) to promote environmental stewardship and best management practices at the Project (S&E)		

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Table 1-7: Goal 3: Provide safe, memorable connections as part of multiple destination points¹

Management and Development Activity	Five-year	Ten-year	Desired State
Ranger safety	Issue government cell phones to permanent Park Rangers (E)	Install enhanced security features, such as, but not limited to, video surveillance systems and emergency exits throughout the Project (E)	Project staff are working in a safe environment
	Hold additional training opportunities such as self-defense, narcotics, and verbal judo at the Project and throughout the District (E)		
Visitor safety	Assure consistent visitor assistance experience (playground inspections, life jacket loaner inspections, water sampling, and regular sanitation and cleaning protocols) (S)	Identify Project Site Areas (PSAs) with low use and degraded facilities and consider divestment options if appropriate. Establish regular maintenance program and plan for facilities and recreation areas (S&E)	Low chances of incidents and quick response times for emergency personnel
	Establish weather alert systems in recreational areas (E)	Develop Project/Public Safety Plan for accidents/incidents/severe weather (E)	
	Partner with ODNR and/or Coast Guard to conduct boating safety courses and vessel inspections (E)		
	Establish a local partnership for paddlecraft safety courses (E)		
	Provide educational water safety and hypothermia programs at the Project (S&E)		
	Emergency responders practice emergency safety and rescue relief at the Project on a regular basis (S)		
	Identify possible areas around Project for placement of dry hydrants (E)		
	Evaluate road widths for emergency vehicles (E)		
	Place low water markers throughout the Project (E)		
	Utilize Federal Highway Transportation Programs to assist with road repairs, and establish a road maintenance plan (E)		
	Conduct regular Recreation Operational Condition Assessments (OCAs) at the Project to inventory road and facility conditions		

	Establish annual interagency meetings with local first responders and partners (E)		
Connect with other District reservoirs and locks	Explore and promote joint ventures and recreational activities with other reservoirs and locks at the Project (i.e. ATV trails at Shenango River Lake, Summerfest, National Public Lands Day) (S&E)	Project staff is knowledgeable on operational/general information at other reservoirs and locks and dams; cooperation is improved (S&E)	Public is aware of the Corps recreational facilities at multiple Projects
	Cross-train Project staff at other reservoirs, locks and dams, and District departments (S&E)		
	Promote team building exercises and more hands on natural resource management trainings (E)		
Serve as part of multiple destination points	Serve as leaders in local Convention and Visitor Bureaus (E)	Provide and promote access points to regional trails (e.g. Mahoning Valley Trail, Berlin Lake Trail) (S&E)	User groups from regional area are coming to the Project
	Engage local and regional outdoor recreation organizations (e.g. paddlcraft, birding, Mahoning Valley Disc Golf Association) (S&E)	Integrate the Project into the Heritage Tourism Program and establish interpretative signs and programs (E)	
		Increase winter recreational opportunities (e.g. hunting opportunities, viewing platform for migratory bird watching, snow shoeing) (E)	
		Expand access areas to accommodate increased off-season recreational opportunities (E)	
Promote all that the Project has to offer, bringing in an increased number of visitors with varying interests and of varying ages	Reach out to schools to initiate Every Kid Outdoors opportunities (S&E)	Bring in multiple and diverse vendors throughout the Project and increase visitation (S&E)	Visitors are aware and utilizing all of the available resources at the Project and are recreating year-round
	Display signage regarding different activity areas around the Project (e.g. Information Center, pollinator plot, campground, historic sites, wildlife viewing areas, access points) (S&E)		
	Update Operational Management Plan to include A/E study, load capacity study and market analysis (S&E)		
	Project staff participate in multiple outreach events (e.g. Canfield County Fair, Canfield 4 th of July Parade, Oh Wow! Silly Science) (S&E)		
	Establish regular dam tours (E)		
	Add Wi-Fi to Mill Creek Campground (E)		

Keep Mill Creek Recreation Area open past the recreation season (E)		
Add additional picnic shelters to Mill Creek Recreation Area (E)		
Modernize facilities to ensure Americans with Disabilities Act (ADA) accessibility (E)		
Demolish unused dwelling (E)		
Establish a viewing/fishing platform at the Dam Site Picnic Area (E)		
Offer paddlecraft rentals in Mill Creek Campground (E)		
Work with ODNR to make Route 224 Access Area ADA accessible (E)		
Create a nature/interpretive trail in Mill Creek Campground (E)		
Establish a signature event (Mill Creek Campground Decorating Contest, Fall Festival, Safety Day, Outdoor Photography Event, Outdoor Art Festival, Christmas in July, etc.) (E)		
Add in full hookup/pull-through campsites and additional electric campsites to Mill Creek Campground (E)		
Add in cabins at Mill Creek Campground (E)		

Table 1-8: Goal 4: Leverage emerging technology to tell the Corps’ story and enhance visitor experiences¹

Management and Development Activity	Five-year	Ten-year	Desired State
Assess and embrace emerging technology in interpretive services capabilities	Obtain tablets and other wireless devices to assist in patrols, campground reservations, shoreline, and data collection (E)	Utilize Boundary Line/Environmental Stewardship OCA Tool for collection and inventory (E)	Public interaction with the Project is occurring through technology; Project staff are utilizing technology to better monitor and communicate about the Project and provide data to the public and Project staff
	Survey and mark all fee, flowage, and shoreline boundaries (E)	Conduct Project boundary inventory and monitoring wirelessly (i.e. on smartphones or tablets) (E)	
Enhance public outreach	Include interpretive curriculum in every OMP update (E)	Increase signage leading to the Project and within Project boundaries on highways and state roads, indicating the presence of the Project (S&E)	Visitation is increasing due to greater public awareness of events and opportunities at the Project
	Develop Project app to act as a real time comment card for Corps’ facilities and to include trail and park maps (E)		
	Update and modernize Project Information Center (E)	Establish an Interpretive Plan at the Project to grow and adapt to changing conditions (S&E)	
	Promote Corps water safety messages and public service announcements throughout the region (E)		
	Promote regional outdoor recreation activities on social media (S)		
	Share success stories with local news outlets in coordination with the Public Affairs Office and internally throughout the District (S&E)		
	Utilize emerging social media technologies for promotion and public outreach (Project App/District Instagram Page) (E)		

2. Project Setting and Factors Influencing Management and Development

2.1 Resource Analysis

2.1.1 Fish and Wildlife Resources

The Project's forested habitat, scrub-shrub uplands, wetlands, streams, and river/reservoir support a variety of wildlife species common to Ohio. A few of the more common avian species likely to occur at the Project include osprey (*Pandion haliaetus*), turkey (*Meleagris gallopavo*), red-winged blackbirds (*Agelaius phoeniceus*), robins (*Turdus migratorius*), song sparrows (*Melospiza melodia*), common mergansers (*Mergus merganser*), and mallards (*Anas platyrhynchos*) (ODNR, 2015).

Mammal species of the region commonly include white-tailed deer (*Odocoileus virginianus*), red fox (*Vulpes vulpes*), opossum, (*Didelphis virginiana*), raccoon (*Procyon lotor*), and gray squirrel (*Sciurus carolinensis*). In addition, the Project supports a variety of amphibians and reptiles, including multiple frog, turtle, salamander, and snake species (ODNR, 2015).

The Project also provides habitat for a diverse assemblage of fish species including smallmouth/largemouth bass (*Micropterus sp.*), walleye (*Sander vitreus*), yellow perch (*Perca flavescens*), black crappie (*Pomoxis nigromaculatus*), muskellunge (*Esox masquinongy*) catfish (i.e., *Ictalurus punctatus*, *Ameiurus catus*, etc.), common carp (*Cyprinus carpio*), white sucker (*Catostomus commersonii*), golden redhorse (*Moxostoma erythrurum*), green sunfish (*Lepomis cyanellus*), pumpkinseed (*Lepomis gibbosus*), bluegill (*Lepomis macrochirus*), bluntnose minnow (*Pimephales notatus*), and white crappie (*Pomoxis annularis*) (ODNR, 2015).

2.1.2 Vegetative and Timber Resources

A large proportion of the Project was historically timber harvested for the purpose of pasturage, cultivation, and gas well development. Virtually all the lands at the Project were cleared of forest cover following European settlement. Consequently, forest cover on the Project has been extensively altered. It is currently comprised of second and third growth stands, which dominate the Project land cover. The remaining land is a combination of field and pasture, shrubland, wetlands/riparian, with minor areas of maintained lawn. The Project supports the overarching goal of forest sustainability detailed in the ODNR Forest Management Plan. Forest sustainability requires the continued existence and use of forested lands to: 1) meet human physical, economic, and social needs; 2) preserve the health of forest ecosystems in perpetuity; and 3) preserve options for future generations, while meeting current needs. The ODNR Forest Management Plan for the Project contains further details, including resource inventories and harvesting procedures (see Appendix B, Plate 4 for Vegetative Classification map).

The Project supports the overarching goal of forest sustainability with a focus on the following priorities:

- Conserve and manage working forest landscapes for multiple values and uses;
- Protect forests from threats; and
- Enhance public benefits from trees and forests.

2.1.3 Threatened and Endangered Species

Lists of threatened and endangered species are maintained by the U.S. Fish and Wildlife Service. Threatened and endangered species that may exist in the region are listed in Table 2-1 below. No federally threatened and endangered species are known to use the Project. However, potentially occupied habitat may be present (See Table 2-1, below). Periodic surveys should be conducted through coordination with local conservation groups and academia. Any proposed development would include protective measures and consultations as needed to ensure no listed species are present.

Table 2-1. Threatened and Endangered Species (USFWS, 2021)

Species	Scientific Name	Class	Status	Habitat
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Mammal	Threatened	Cavities or crevices in both live trees and snags (dead trees) during the summer. In the winter these bats hibernate in caves and mines.
Indiana Bat	<i>Myotis sodalis</i>	Mammal	Endangered	Roost under the peeling bark of dead and dying trees during the summer. In the winter these bats hibernate in caves or, occasionally, in abandoned mines.
Northern Wild Monkshood	<i>Aconitum noveboracense</i>	Plant	Threatened	Shaded to partially shaded cliffs, algific talus slopes, or on cool streamside sites.
Mitchell’s Satyr Butterfly	<i>Neonympha mitchellii</i>	Insect	Endangered	Restricted to rare wetlands called fens, which are low nutrient systems that receive carbonate-rich ground water from seeps and springs.
Eastern Massasauga	<i>Sistrurus catenatus</i>	Reptile	Threatened	Wet areas including wet prairies, marshes, and low areas along rivers and lakes and adjacent uplands during part of the year. May hibernate in crayfish burrows but may also be found under logs and tree roots, or in small mammal burrows.

2.1.4 Invasive Species

Under Executive Order (EO) 13112, Invasive Species (FR: 03 Feb 1999), as amended by EO 13751, Safeguarding the Nation From the Impacts of Invasive Species (FR: 08 Dec 2016), an invasive species is defined as a non-native species whose introduction does, or is likely to cause, economic or environmental harm or harm to human health. Invasive species can be microbes, plants, or animals that are non-native to an ecosystem. Invasive species can outcompete native species by consuming their food, occupying their territory, and altering the ecosystem in ways that harm native species. Invasive species can be accidentally transported, or they can be deliberately introduced because they are thought to be helpful in some way. Invasive species cost local, state, and federal agencies billions of dollars annually. The most common invasive

terrestrial plant species occurring at the Project are: Japanese honeysuckle (*Lonicera japonica*), Japanese knotweed (*Polygonum cuspidatum*), autumn-olive (*Elaeagnus umbellata*), buckthorns (*Rhamnus frangula*, *R. cathartica*), purple loosestrife (*Lythrum salicaria*), common reed or phragmites (*Phragmites australis*), reed canary grass (*Phalaris arundinacea*), garlic mustard (*Alliaria petiolata*), multiflora rose (*Rosa multiflora*), giant hogweed (*Heracleum mantegazzianum*), and bush honeysuckles (*Lonicera maackii*, *L. tatarica*, *L. morrowii*). The most common invasive insects are: Asian long-horned beetle (ALB) (*Anoplophora glabripennis*) emerald ash borer (EAB) (*Agrilus planipennis*), gypsy moth (*Lymantria dispar*), and the hemlock woolly adelgid (HWA) (*Adelges tsugae*). The most common aquatic invasive species are the hydrilla (*Hydrilla verticillata*) and the zebra mussel (*Dreissena polymorpha*) (Ohio Invasive Plants Council, 2018).

Climate change will likely benefit many of the aforementioned non-native species, potentially enhancing their ability to outcompete native organisms. Left unchecked, invasive species have the potential to undermine ecosystem structure and function, resulting in a degraded resource that fails to meet many of the key objectives of the Project.

2.1.5 Ecological Setting

The purpose of ecological land classification is to provide information for research, assessment, monitoring, and management of ecosystem components. The Natural Resource Management mission statement (ER 1130-2-550; Change 5, 30 Jan 2013) directly supports this paradigm.

According to the U.S. Environmental Protection Agency's designation of ecoregions, the Project is located within the Erie Drift Plain Ecoregion. This region consists of closed, mixed wood forests composed of red spruce, balsam fir, red maple, hemlock, and eastern white pine. Lowlands are underlain by flat to gently dipping sandstones, shales, and conglomerates. The climate here is marked by warm summers and mild, snowy winters (USEPA, 2021).

2.1.6 Wetlands

According to the National Wetland Inventory (NWI), accessed on July 21, 2021, the Project includes approximately 4,074.9 acres of wetlands. There are 58.9 acres of riverine wetlands, 3,190.9 acres of lake wetlands, 764.5 acres of freshwater forested/shrub wetlands, 54.5 acres of freshwater emergent wetlands, and 6.1 acres of freshwater pond wetlands. Wetlands serve important water quality and wildlife habitat functions. Particular conservation interest should be given to these features. See Appendix B, Plate 5 for Wetlands map.

2.1.7 Water Quality

The Pittsburgh District water quality program has collected water quality measurements at the Project since 1969. Data collected include chemical, physical, and biological constituents at numerous sampling locations on tributaries, bays, the reservoir, and outflow. Routine water quality monitoring includes:

- Biweekly sample collection by Project staff from the inflow at Alliance, OH, and outflow;
- Yearly limnology surveys of the reservoir by water quality staff; and
- Monthly intensive limnology surveys once every ten years from the months of March through October to understand decadal/spatial changes in limnological dynamics.

Water quality typically improves as water moves through the Project. Settling, dilution, and biological processes remove or store sediments, metals, contaminants, and nutrients. Many of the primary water quality concerns within the Mahoning River watershed, and therefore the Project, are associated with adjacent land use (e.g. agriculture) and municipal wastewater discharges from nearby cities. The Mahoning River is listed as impaired on the Ohio 303(d) list for habitat alterations, flow alteration, nutrients, polychlorinated biphenyls (PCBs), pathogens and sediment. Federal and state agencies are working with water-quality partners and landowners to focus watershed conservation efforts on priority or target areas in the watershed to meet water quality standards in the Mahoning River watershed.

The Project can be classified as a moderately deep, eutrophic, mid-latitude, dimictic reservoir. Strong stratification in the summer can lead to hypoxic areas by the dam, resulting in hydrogen sulfide releases in the outflow, reduced fish habitat in the deeper depths of the reservoir, and increased dissolved metal concentrations at certain times. The Project is not equipped with gates at varied elevations (selective withdrawal), but with the use of ring jets, it is possible to release good quality waters that satisfy the congressionally authorized operating purposes of water quality and low flow augmentation in the Mahoning River. The Project has a water supply intake tower near the dam, which can supply Meander Creek Reservoir with water for drinking water treatment through a pump house and conduit. Farther upstream, Deer Creek Dam and Reservoir flows into the reservoir and provides drinking water for nearby municipalities. The Project hosts numerous opportunities for aquatic recreation, and the Pittsburgh District works with the ODNR to support a steady pool elevation for the spawning of walleye in the reservoir each spring.

When contrasted with other District reservoirs in the Mahoning River basin, Berlin Lake has challenges, such as pollution point sources, nutrient enrichment, and eutrophic conditions. Although the Project has frequent algae blooms, these have largely been dominated by algae groups other than blue-green algae, which are known to produce toxins and can be a human health concern. Abundant algal growth in the reservoir can be attributed to the substantial nutrient inputs from wastewater treatment plants, aging sewer infrastructure that can leach through groundwater, and agricultural fertilizer that flow into the Project. Sedimentation and turbidity within the reservoir basin can be attributed to development, removal of vegetation, and impervious surface runoff. Zebra mussel populations are periodically documented near the dam, but their presence and populations vary from year to year. Water-quality monitoring will

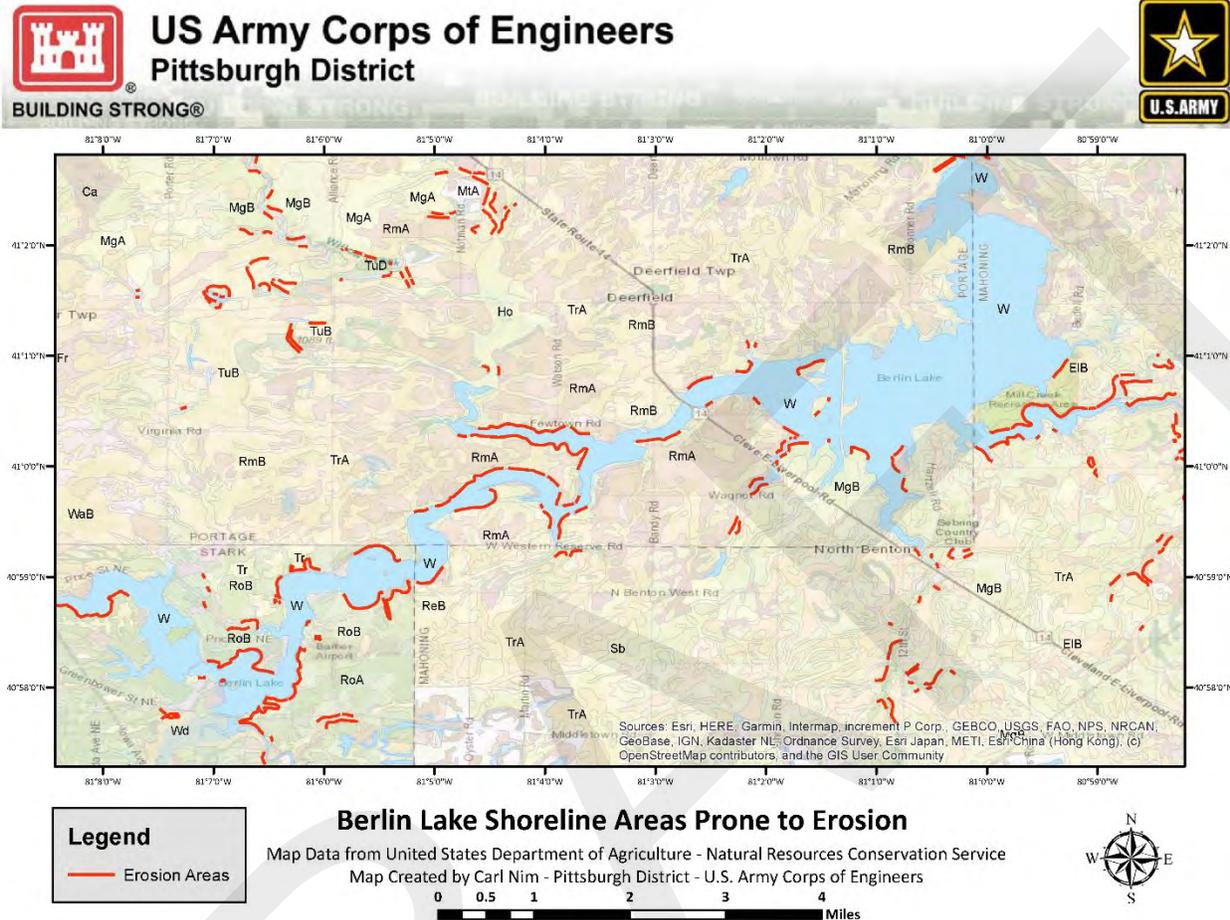
continue as a critical part of a holistic, environmentally sound water-quality management strategy for the Project to continue to meet applicable federal and state environmental laws, criteria, and standards. For further information regarding water quality, the Project Water Control Manual can be found here: <https://water.usace.army.mil/a2w/f?p=100:1:0:::>

2.1.8 Sedimentation

Sedimentation surveys for the Project were completed in 1943, 1951, 1983 and 1999. The 1943 survey was a topographical (contour map) survey while the rest of the surveys were range line/cross section surveys. The 1999 survey found a total storage capacity reduction of 5.36% and a total surface area reduction of 6.04% at elevation 1031.31 feet (NAVD 88). Both staff and visitors report increasing amounts of sedimentation that are impacting the surface water use by reducing the total useable area for boating as well as constricting reservoir channels. Although boating demand stays constant, loss of boating area is creating recreational concerns. Loss of reservoir storage capacity is a water management concern, which impacts the flood risk management mission of the reservoir. Water quality concerns include the deposition of nutrients, polycyclic aromatic hydrocarbons (PAHs), oil and gas well byproducts (e.g. chloride and petroleum hydrocarbons) and polychlorinated biphenyls (PCBs) in reservoir sediments. Pollutants listed in the Ohio Environmental Protection Agency's list of impairments (see water quality section), as well as contaminants listed in other studies in the basin (Darner, 2001) can persist in these sediments and affect a variety of reservoir processes and organisms. Although sedimentation surveys are in need, there is currently no sedimentation survey scheduled for the near future.

Shoreline erosion at the Project is also a concern. Many riparian areas of the reservoir are prone to erosion (see map below) due to their steep slopes and soil composition. When coupled with erosional forces, sedimentation of the reservoir occurs. While several no-wake zones are implemented throughout the reservoir, many areas are prone to erosion from a variety of natural and anthropogenic forces. Development around the reservoir also contributes to erosion through the removal of riparian vegetation for property viewsheds of the lake. While there is a lake association for the Project, much of the emphasis of the organization is focused on promoting the recreational and real estate values of the reservoir rather than ecological sustainability. If this organization endorsed environmental policies that prohibit the removal of riparian vegetation, it could aid in reducing the shoreline erosion that is occurring at the Project and improve water quality, recreational opportunities, and property values.

Figure 2-1. Berlin Lake Shoreline Areas Prone to Erosion



Sediment buildup from shoreline erosion, agricultural runoff, development, and other sources can adversely impact the storage capacity of the dam, the water recreational experience, and the ecological quality of aquatic habitat. One possible way the Project could address this issue is through the implementation of sustainable reservoir sediment-management plans, as recommended by the Advisory Committee on Water Information. The Advisory Committee on Water Information, Subcommittee on Sedimentation, approved a resolution in August 2014 that encourages all federal agencies to develop long-term reservoir sediment-management plans for the reservoirs that they own or manage by 2030. These management plans should include either the implementation of sustainable sediment-management practices or eventual retirement of the reservoir. Sustainable reservoir sediment-management practices are practices that enable continued reservoir function by reducing reservoir sedimentation and/or removing sediments through mechanisms that are functionally, environmentally, and economically feasible. The costs for implementing either sustainable sediment management practices or retirement plans are likely to be substantial, and sustainable methods to pay for these activities should also be identified. Federal agencies are encouraged to start developing sustainable reservoir sediment-

management plans now for one or two reservoirs per year on a pilot basis. From this experience, interagency technical guidelines will be developed for preparing sustainable reservoir-sedimentation plans. For further information regarding sediment quality, the Project Water Control Manual can be found here: <https://water.usace.army.mil/a2w/f?p=100:1:0::::>

2.2 Cultural Resources

2.2.1 General Background

Cultural resources include archaeological or historical sites and objects, buildings, structures, and landscapes that are related to the history of past human land use. These activities include but are not limited to activities of Native American peoples as well as early historic European and American settlers, early industrial sites, like gristmills, and more modern engineering structures.

Cultural resources are protected under several federal laws and regulations including: Antiquities Act, National Historic Preservation Act (NHPA), Archaeological Resources Protection Act (ARPA), Federal Curation Regulations 36 CFR Part 79, Native American Graves Protection and Repatriation Act, and Executive Order 13007 - Indian Sacred Sites among others. Furthermore, the Corps has established policies regarding the management of cultural resources under the Corps' jurisdiction. These policies can be found in ER 1130-2-540 (15 Nov 1996) Environmental Stewardship Operations and Maintenance Policies; and Engineer Pamphlet (EP) 1130-2-540 (15 Nov 1996) Environmental Stewardship and Maintenance Guidance and Procedures. The Corps must comply with all these laws, regulations, and policies when performing any works either funded, regulated, or within Corps fee-land or easements. These laws and regulations provide the Corps with processes for understanding how Corps projects affect cultural resources and how the Corps can avoid, minimize, or mitigate potential effects on these resources.

2.2.2 Previous Investigations

The Project is one of rich cultural history. Project lands had been inhabited for thousands of years prior to the European settlement. This is evidenced in the archaeological record encountered during previous investigations. Eight different cultural resource surveys have been completed within the Project; therefore, 40% of the Project has been surveyed. The intent of some these surveys was to identify cultural resources for the future management, while others were associated with specific projects and undertakings. Furthermore, regional universities have performed excavations within known archaeological sites at the Project with the purpose of obtaining additional information and training students on how to perform archaeological fieldwork and cultural resources investigations. Additional research is still necessary in order to fully understand and manage cultural resources within the Project.

Archaeological research indicates that the area has been inhabited from Archaic times (4,850 BP. – 11,700 BP.) to the 20th century. A total of 58 cultural resources have been identified within

Project lands. These include archaeological sites, historic buildings, and structures. One of the most visible cultural resource within the Project is the Berlin Dam. This structure has determined eligible for inclusion in the National Register. The National Register is the official list of the nation's historic places worthy of preservation. However, most of the Project's cultural resources are archaeological sites. Many of these sites have the potential to produce important information about prehistoric and historic activities within the Project's lands.

2.2.3 Cultural Resources Management

According to ER 1130-2-540, the District Commander shall ensure that a Cultural Resources Management Plan (CRMP), where appropriate, is developed for all Corps projects. Currently, Berlin Lake does not have a CRMP. However, the Corps will be preparing a CRMP for the Project in 2021. In the meantime, the Corps continues to follow all cultural resource management laws, regulations, and policies prior to conducting work or allowing others to conduct work at the Project site. ER 1130-2-540 directs that the District Commander shall implement a program, upon availability of funds, to accomplish an inventory of historic properties and site evaluation at each civil works water resource project under his/her jurisdiction and administration to comply with Section 110(a)(2) of the NHPA.

EP 1130-2-540 states that on lands held in fee by the federal government under the administration and jurisdiction of the Corps of Engineers, District Commanders shall ensure that historic properties are given full consideration in all management and construction activities. The District Commander has full responsibility within existing statutes, administrative guidelines, and policy to protect, preserve, manage, and/or mitigate damage to historic properties on Project lands. These responsibilities include but are not limited to the following actions: real estate grants and land disposals, recreational development, wildlife management, construction, and operation and maintenance. Based on these responsibilities the Corps would be required to identify and address impacts on cultural resources for all types of Corps undertakings.

2.3 Socio-Economics

2.3.1 Market Area

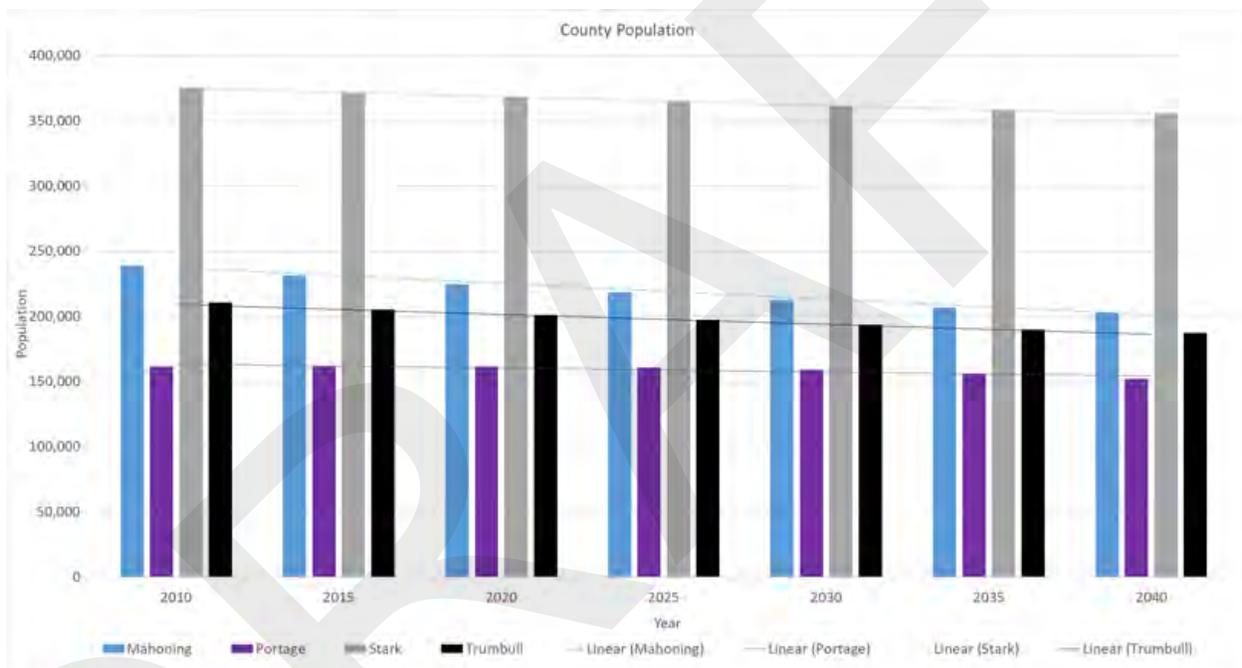
The Project was constructed on the Mahoning River and is located in Deerfield Township in Portage, Stark, and Mahoning Counties and near Trumbull County. Based on feedback from prior visitor surveys, the Project receives visitors primarily from these counties and this trend is expected to continue into the future.

2.3.2 Population

Census data and population projections for the relevant counties through 2040 were gathered to inform potential future visitation at the Project. Portage County loses approximately 2,400 residents every five years. Mahoning County loses approximately 5,500 residents every five years. Stark County loses approximately 3,200 residents every five years. Trumbull County

loses approximately 3,400 residents every five years. The total population of these four counties is expected to shrink by approximately 14,500 residents every five years through 2040 (Ohio Department Services Agency, 2018). According to the 2010 census, Portage County and Stark County belong to the Cleveland-Akron-Canton, Ohio Combined Statistical Area, which had a total combined population of 2,077,240, and Mahoning County and Trumbull County belong to the Youngstown-Warren, Ohio and Pennsylvania Combined Statistical Area, which had a total combined population of 565,773. Section 2.4.1 (Zones of Influence) goes into more detail about statistical areas. Based on these population projections it can be assumed that with other variable factors held constant, recreation at the Project will likely decrease. Graph 2-1 below shows the historic and projected populations for the counties in the market area.

Graph 2-1. Population of Counties in the Market Area



(United States Census Bureau, 2019a; United States Census Bureau, 2019b)

2.3.3 Income and Poverty Status

The median household income and poverty rate of each county in the market area were considered for the purpose of determining what choices the public might make when seeking recreation. The 2019 census data for the four counties in the market area and the State of Ohio was gathered for this update. Table 2-2 below shows the median household income and poverty rate (percentage of population that fall below the poverty line) for each county in the market area as well as the State of Ohio (United States Census Bureau, 2019a; United States Census Bureau, 2019b).

Table 2-2. Median Household Income and Poverty Rate by County in the Market Area

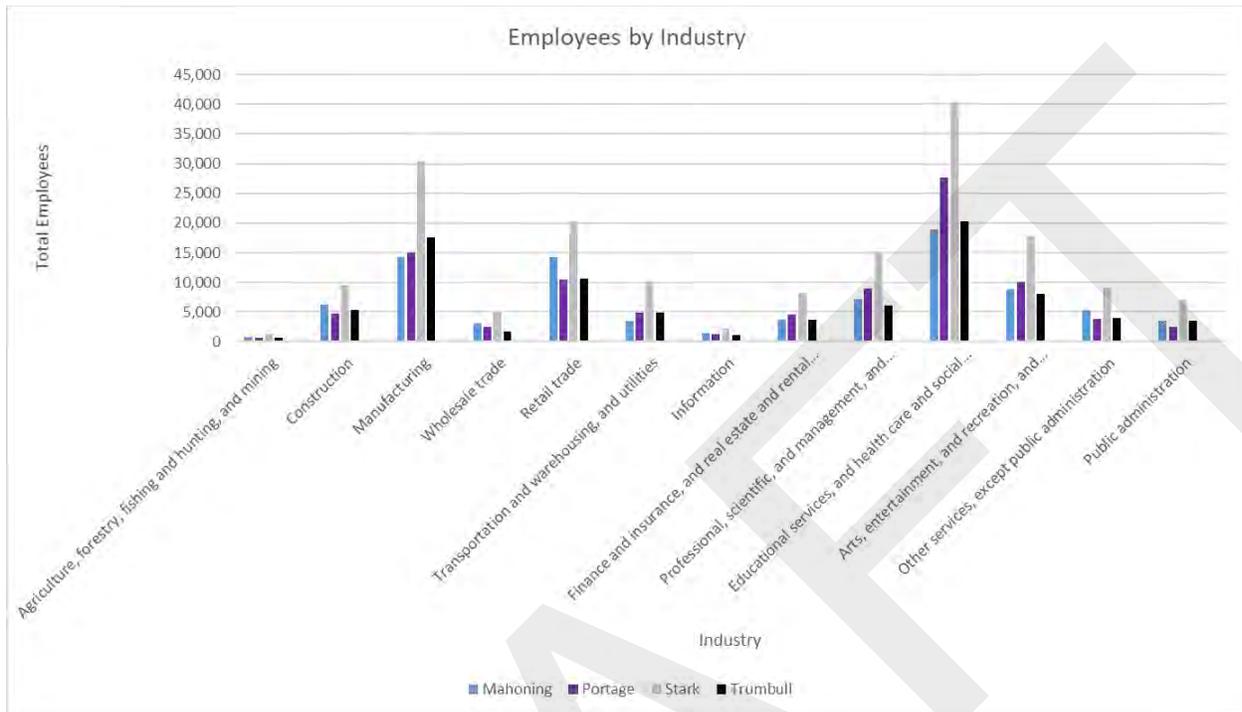
County	Portage	Mahoning	Stark	Trumbull	OH
Median Household Income	\$56,679	\$47,170	\$55,499	\$47,087	\$58,642
Poverty Rate	12.5%	18.4%	13.2%	15.7%	13.1%

All of the counties in the market area fall below the State of Ohio’s median household income of \$58,642, although Portage County and Stark County are fairly close. Only Portage County has a lower percentage of population below the poverty line than Ohio’s 13.1% (United States Census Bureau, 2019a; United States Census Bureau, 2019b). This data is discussed in greater detail in section 2.3.4 below.

2.3.4 Area Industries

Mahoning, Stark, and Trumbull Counties are very similar with regards to primary industries of employment with Portage County having only slightly different primary industries. The three highest paying industries in Portage County are Management of Companies & Enterprises (\$108,571); Utilities (\$74,653); and Public Administration (\$53,426). In Mahoning County, the three highest paying industries are Utilities (\$70,000); Mining, Quarrying, & Oil & Gas Extraction (\$55,859); and Transportation & Warehousing (\$52,597). In Stark County, the three highest paying industries are Utilities (\$95,118); Mining, Quarrying, & Oil & Gas Extraction (\$50,283); and Public Administration (\$48,914). In Trumbull County, the three highest paying industries are Utilities (\$58,475); Mining, Quarrying, & Oil & Gas Extraction (\$57,067); and Public Administration (\$45,922) (United States Census Bureau, 2019a). Graph 2-2 below shows the number of employees in each industry for each of these four counties in the market area.

Graph 2-2. Employment by Industry of Counties in the Market Area



(United States Census Bureau, 2019a; United States Census Bureau, 2019b)

2.3.5 Economic Impact of Recreation Related Spending

The Corps provides water-based recreation opportunities throughout the country, which provide economic benefits to the local and regional communities in which Corps projects exist. To estimate the economic impact from the recreation-related spending at the Project, the Corps Institute for Water Resources, in collaboration with the Louis Berger Group and Michigan State University, have developed a regional economic impact modeling tool called Regional ECONomic System (RECONS). This modeling tool automates calculations and generates estimates of jobs and other economic measures, such as income and sales associated with the Corps American Recovery and Reinvestment Act (ARRA) and Civil Works program spending and secondary affects for Ports, Inland Water Way, Formerly Utilized Sites Remedial Action Program (FUSRAP), and Recreation. This is done by extracting multipliers and other economic measures from more than 1,500 regional economic models that were built specifically for Corps project locations (Chang, W.H., et al., 2019). For 2019, RECONS shows an estimated 610,985 visits (person-trips) at the Project, which resulted in direct benefits to the region of \$45,086,320 in sales, \$13,915,003 in labor income, \$24,937,176 in economic value added, and 427 jobs supported in the region (USACE-IWR, 2019). Based on the population, income, and poverty factors presented in the sections above, a sizable portion of the local population will likely use the Project as a vacation destination based on proximity and the relatively lower costs associated

with recreating closer to home as opposed to incurring additional costs by choosing a site further away. By choosing to go to the Project for recreational needs, the populace will also contribute to the local economy of the area. There are other reservoirs with recreation facilities similar to those of the Project, such as, Deer Creek Reservoir in Stark County, Lake Milton in Mahoning County, and Michael J. Kirwan Reservoir in Portage County. The presence of these alternative recreation facilities means that the Project may see fewer economic benefits from surrounding counties that have populations closer to these alternative sites.

2.4 Recreation Facilities, Activities, and Needs

2.4.1 Zones of Influence

The zones of influence help to show how the concentration and distribution of populations surrounding the Project are major influencers on land classification and recreational development. The primary zone of influence encompasses portions of the Cleveland-Akron-Canton, Ohio Combined Statistical Area and the Youngstown-Warren, Ohio and Pennsylvania Combined Statistical Area as the basis in summarizing the population associated with the Project. The Cleveland-Akron-Canton, Ohio Combined Statistical Area is comprised of fourteen counties, two of which are in the market area for the Project (Portage County and Stark County). Those two counties had a total combined population of 537,005 according to the 2010 census. The Youngstown-Warren, Ohio and Pennsylvania Combined Statistical Area is comprised of four counties, two of which are in the market area for the Project (Mahoning County and Trumbull County). Those two counties had a total combined population of 449,135 according to the 2010 census. The Project is located in Deerfield Township, Ohio, which is located in the southeastern corner of Portage County, Ohio. Portage County's population as of the 2010 census was 161,419, a 6.15% increase from the 2000 census (Ohio Department Services Agency, 2018).

2.4.2 Visitation Profile

Visitation is common at the campground and day-use areas as the Project is in close proximity to major interstates; Youngstown, OH; Akron, OH; and Cleveland, OH. Peak recreation season is from May through September. Visitation is concentrated during the weekends and holidays in both peak and non-peak seasons. Popular recreational activities at the Project include angling, paddlecraft (e.g. canoes, kayaks), boating, camping, swimming, picnicking, hunting, bird watching, biking, and hiking.

2.4.3 Recreation Analysis

Description of Facilities

The Project had an average yearly visitation of approximately 624,077 from 2019 to 2020. The Project is a popular local attraction with a campground, boat launches, picnic areas, reservable picnic shelters, disc golf course, and plenty of hunting and fishing opportunities. Mill Creek Campground, managed by the Corps, consists of 305 campsites, 106 with electric and 199 that

are non-electric. Visitor use and the increase in popularity of paddlecraft such as kayaks, canoes, and paddleboards indicate that additional small-craft launches would be desirable at the Project. Other recreation opportunities include hunting and fishing access areas managed by ODNR. Recreation facilities managed by the Corps include a Ranger Station/Information Center, campground, reservable picnic shelters, picnic areas, boat launches, playgrounds, disc golf course, and trail systems.

Customer Satisfaction and Considerations

Through the Master Plan scoping meetings, customer satisfaction surveys, and routine communication between staff and visitors, it has been identified that the areas that need the most improvement include modernizing the bathrooms/shower houses, more pull-through campsites, and adding in cabins/shelters to Mill Creek Recreation Area. There is also interest in having Wi-Fi availability and additional full hookup campsites. Visitor demand also indicates adding more paddlecraft launches around the Project.

2.4.4 Recreational Carrying Capacity

Carrying capacity, which includes both environmental (how much use the resource can support without being compromised) and social (how much use can occur before the quality of visitor experience is diminished) dimensions, is currently balanced at the Project. The Project experiences few fatalities or boating accidents, and Mill Creek Campground is occupied throughout the recreation season, especially on weekends and holidays. Picnic shelters are rented 90% of the time during the recreation season. Future recreational developments will require plans and studies to account for water quality, erosion, and sedimentation changes, balancing recreational diversity, and accommodating new demands within a developed footprint in a manner that is environmentally and economically sustainable.

2.5 Related Recreational, Historical, and Cultural Areas

The Project is located within the Ohio Northeast tourism region. The Project is adjacent to the Lake Milton and West Branch Ohio State Parks and the Dale Walborn Reservoir. These areas provide outdoor recreation opportunities like hiking trails and campgrounds. Several Ohio Historical Markers have been erected in the vicinity of the Project, including historical marker 11-76 Lexington Quaker Cemetery which is located on the southern shore of the reservoir. Other historical and cultural areas nearby include the Newtown covered bridge, Lisbon Historical District, and Mill Creek Furnace.

2.6 Real Estate and Acquisition Policy

The total real estate at the Project encompasses 8,061.4 acres, of which 6,899.9 acres are fee land and water and 1,161.5 acres flowage easement. There are approximately 343 active outgrants, with the majority of the land being outgranted to ODNR. There are no mineral tracts at the Project.

3. Land Allocation, Land Classification, Water Surface, and Project Easement Lands

This Master Plan is intended to guide the comprehensive management and development of recreation, natural, and cultural resources at the Project and define the Corps' responsibilities pursuant to federal laws to preserve, conserve, restore, maintain, manage, and develop lands, waters, and resources. An important aspect in managing these goals is properly defining the appropriate use for lands and waters consistent with their congressionally authorized purpose.

3.1 Land Allocation

In accordance with EP 1130-2-550 (Change 5, 30 Jan 13), land allocations are the congressionally authorized purposes for which Corps lands were acquired. There are four categories of allocation:

3.1.1 Operations

Lands acquired for the congressionally authorized purpose of constructing and operating the Project. All of the Project has a land allocation of Operations, which means that all Project lands were originally acquired to provide safe, efficient operation of the Project and its authorized purposes. No specific parcels were acquired for or assigned to individual purposes of recreation, fish and wildlife management, or mitigation.

3.1.2 Recreation

Lands acquired specifically for the congressionally authorized purpose of recreation. Lands in this allocation can only be given a land classification of "Recreation". No specific parcels at the Project were acquired for or assigned to the purpose of recreation.

3.1.3 Fish and Wildlife

Lands acquired specifically for the congressionally authorized purpose of fish and wildlife management. Lands in this allocation can only be given a land classification of "Wildlife Management". No specific parcels at the Project were acquired for or assigned to the purpose of fish and wildlife.

3.1.4 Mitigation

Lands acquired specifically for the congressionally authorized purpose of offsetting losses associated with development of the Project. Lands in this allocation can only be given a land classification of "Mitigation". No specific parcels at the Project were acquired for or assigned to the purpose of mitigation.

3.2 Land Classification

Land classifications are the primary use for which Project lands are managed. The previous Master Plan dated 1984, used a now obsolete classification scheme that has been updated in this

document to meet current standards. Current standards identify the below classification categories:

- Project Operations
- High Density Recreation
- Mitigation
- Environmentally Sensitive Areas
- Multiple Resource Managed Lands
- Water Surface

The classification process refines the land allocations to fully utilize Project lands and considers public desires, legislative authority, regional and Project specific resource requirements, and suitability. Land classification indicates the primary use for which Project lands are managed. The Project manages lands according to five of the above six classifications (sans Mitigation). The system for classification has been realigned to meet current standards (see Appendix B, Plate 6 for the Land Classification map).

3.2.1 Project Operations

This classification includes lands required for the dam and associated structures, administrative offices, maintenance compound, and other areas that are used to operate and maintain the Project. Where compatible with operational requirements, Project Operations land may be used for wildlife habitat management and recreational use, as long as the proposed activities do not negatively impact Project operations. Likewise, licenses, permits, easements, or other outgrants are issued only for uses that do not conflict with operational requirements. Public access to these areas is often restricted. For example, mooring private vessels or modification of land and vegetation are prohibited without explicit permission. Requests for a permit for a compatible use within an area designated for Project operations will be evaluated on a case-by-case basis and a decision will be made as to whether or not the proposed activity will be permitted, based on the potential impact to operations.

3.2.2 High Density Recreation

These lands are designated for intensive levels of recreational use to accommodate and support the recreational needs and desires of visitors. They include lands on which existing or planned major recreational facilities are located and allow for developed public recreation facilities, concession development, and high-density or high-impact recreational use. In general, any uses of these lands that interfere with public enjoyment of recreational opportunities are prohibited. Low density recreation and wildlife management activities compatible with intensive recreation use are acceptable, most usually on an interim basis. No agricultural uses are permitted on these lands, except on an interim basis for maintenance of scenic or open space values. Permits, licenses, and easements are not issued for non-compatible manmade intrusions such as pipelines,

overhead transmission lines, and non-Project roads, except where warranted by the public interest and no viable alternative area or route is available.

The facilities in these areas will accommodate the recreation needs of visitors in concentrated numbers, while also offering open space lands for the purpose of providing more complete and attractive recreation areas. The modernization of campsites and recreation facilities is anticipated to occur on a funds-available basis.

Requests for permits to conduct concessions, rentals, or any other business in these areas will be reviewed on a case-by-case basis and will involve real estate instruments and fee payment to the Corps.

Given the difficulty of maintaining current facilities, the development of more modern facilities demanded by recreational visitors will likely include partnering with stakeholders to share in the cost, operation, and maintenance of any such asset.

3.2.3 Environmentally Sensitive Areas

This classification consists of areas where scientific, ecological, cultural, or aesthetic features have been identified. Designation of these lands is not limited to just lands that are otherwise protected by laws such as the Endangered Species Act, the National Historic Preservation Act, or applicable state statutes. These areas must be identified and protected by management to ensure they are not adversely impacted. Typically, limited or no development of public use is allowed on these lands. No agricultural or grazing uses are permitted on these lands, unless necessary to implement a specific resource management benefit. These areas are typically distinct parcels located within another, larger land classification area.

Defining Environmentally Sensitive Areas as part of the Master Plan process assists in the protection of valuable resources. These sites are mapped and managed by the Corps. Environmentally Sensitive Areas include locations of threatened and endangered species and cultural sites. Many factors contribute in identifying Environmentally Sensitive Areas. The degree of sensitivity varies by location and other contributing factors. An area may be available to construct a properly designed hiking trail or may be actively managed by forest practices such as timber stand improvement that do not negatively impact the site's sensitivity. Other sites can be very sensitive to human disturbance and need adequate protection from development. Examples of this degree of sensitivity would involve eagle nests, osprey nests, and heron rookeries. These animals are threatened by human activities especially during active breeding seasons.

Areas designated as environmentally sensitive can change over time, and continuous monitoring through programs like Multiple Species Inventory and Monitoring (MSIM) provide valuable information to keep identified sensitive areas current. Using Geographic Information System

(GIS) databases maintained with separated layers, the dynamic nature of sensitivity can be managed in an up-to-date program. Some areas may be highly sensitive to change, while other areas may need prescribed management to remain viable. The goal of managing these areas is to protect and preserve known areas that contribute to the diversity and health of the Project.

3.2.4 Multiple Resource Management Lands

These lands can be divided into the following four sub-classifications: Low Density Recreation, Wildlife Management, Vegetative Management, and Future/Inactive Recreation Areas. In the future, some of these areas may be converted to High Density Recreation. Conversion to High Density Recreation may occur based on future recreation needs within the Project. The Corps must continue to carefully evaluate land use requests in these areas to include road and utility easements, rights of way for pipelines, resource mining activities, and other potential ground disturbing activities and to ensure that these actions do not negatively impact the environment in a significant manner.

3.2.4.1 Low Density Recreation

These lands are designated for dispersed and/or low impact recreation use. Development of facilities on these lands is limited. Emphasis is on providing opportunities for non-motorized activities such as walking, fishing, hunting, or nature study. Site-specific, low-impact activities such as primitive camping and picnicking are allowed. Facilities may include boat ramps, boat docks, trails, parking areas and vehicle controls, vault toilets, picnic tables, and fire rings.

In these areas, natural conditions preclude intensive public use development because extensive alteration of natural systems would be required. Difficult access is also a factor indicating low density use as most appropriate for these lands.

Private or long-term exclusive group use of these lands will not be permitted. Management practices leading to habitat improvements for the benefit of wildlife are encouraged. No licenses, permits, or easements will be issued for non-compatible manmade intrusions, such as underground or exposed pipelines, cables, overhead transmission lines, or non-Project roads. Exceptions to this restriction may be made where necessary to serve a demonstrated public need only in those instances where no reasonable alternative is available. Agricultural uses are permitted on this land. The focus for areas under the Low Density Recreation classification is on a balance of low-impact recreational activities along with conservation of natural areas and native species. Management of invasive species is also a priority for these areas to prevent their spread throughout the Project. Hunting is permitted in most areas under this classification to promote healthy populations of game species.

Low density recreation areas have the potential to be converted to High Density Recreation through the development of new trail systems, campgrounds, boat launches, or other recreational features. These areas also have the potential to be used for utility lines, timber sales, or mining

activities if a third-party makes a request for such an activity. However, these actions would require additional study and would be approved on a case-by-case basis based on the anticipated impacts associated.

3.2.4.2 Wildlife Management

Proper management techniques will be applied wherever the opportunity exists to improve conditions for scenic value, timber stand improvement, wildfire prevention, pest control, and watershed protection. While all Project lands are managed for fish and wildlife habitat in conjunction with other land uses, Wildlife Management Area lands are designated specifically for wildlife management. They contain valuable wildlife habitat components that are managed, using guidance that includes the State Wildlife Action Plan (SWAP) yield habitat suitable for designated game and non-game species. This plan can be found by contacting the Ohio Department of Natural Resources. Licenses, permits, and easements for such man-made intrusions such as pumping plants, pipelines, cables, transmission lines, and non-Project roads are usually not allowed on these lands; however, exceptions to this policy are allowable, if properly mitigated.

3.2.4.3 Vegetative Management

Vegetative management, including agricultural activities that do not greatly alter the natural character of the environment, are permitted for a variety of purposes, including erosion control, retention and improvement of scenic qualities, and wildlife management. Management activities focus on the protection and enhancement of forest resources and vegetative cover. Forests are managed as a multi-purpose resource for sustained yield when consistent with recreation and wildlife management objectives and approved land uses. Hunting and fishing are allowed pursuant to tribal or state fish and wildlife management regulations where these activities are not in conflict with the safety of visitors and Project personnel. Other activities are conducted under the guidance of the Project's forest management and wildlife management plans.

3.2.4.4 Future or Inactive Recreation Areas

These areas have site characteristics compatible either with future recreational development or recreation areas that are closed. Until there is an opportunity to develop or reopen these areas, they will be managed for multiple resources.

3.2.5 Water Surface

There are four possible sub-classifications.

3.2.5.1 Restricted

Water areas restricted for Project operations, safety, and security purposes.

3.2.5.2 Designated No-Wake

To protect environmentally sensitive shoreline and recreational water access areas from disturbance, and/or to protect public safety.

3.2.5.3 Fish and Wildlife Sanctuary

Annual or seasonal restrictions on areas to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning.

3.2.5.4 Open Recreation

Those waters available for year-round or seasonal water-based recreational use.

3.3 Easement Lands

Project Easement lands are those properties where the Corps has obtained an easement interest, but no fee title. Planned use and management of easement lands will be in strict accordance with the terms and conditions of the easement estate acquired for the Project. Easements were acquired for specific purposes and the Corps does not have the same rights or ownership as it does with its fee owned land. There are three different types of easements – operations, flowage, and conservation.

3.3.1 Operations Easement

Operations easements are easements utilized for the purpose of conducting Project operations.

3.3.2 Flowage Easement

Flowage easements are easements utilized for the purpose of temporarily overflowing, flooding, and submerging private land. Generally, the purpose of these easements is to provide adequate storage for flood waters.

3.3.3 Conservation Easement

Conservation easements are easements utilized for the purpose of protecting wildlife, fisheries, recreation, cultural resources, environmental resources, or endangered species.

4. Resource Plan

The resource plan describes, in broad terms, how Project lands will be managed according to the established land classifications. Each classification is discussed in terms of anticipated public use and resource stewardship needs.

4.1 Classification and Justification

The land classifications are:

4.1.1 Project Operations

This classification includes lands required for the dam and outflow structures, Resource Manager's Office, a dwelling, and other areas used to operate and maintain the Project. There are 70.7 acres classified as Project Operations. The management plan (stated as "resource objectives") for these areas is to continue providing physical security necessary to ensure continued operations of the dam and related facilities.

4.1.2 High Density Recreation

Lands developed for intensive recreational activities for the public are considered as high density recreation including day-use areas, campgrounds, and commercial concessions (marinas, restaurants, resorts, etc.). Future possibilities for development of these areas include expansion of trail systems utilizing emerging technologies such as Quick Reference (QR) codes and other electronic media outreach, addition of electric to campsites at the campground, and expansion of additional park recreation features. There is a total of 319.2 acres classified as High Density Recreation (see Appendix B, Plate 7 for the Recreation map).

Mill Creek Recreation Area

Mill Creek Recreation Area is a multi-use area that consists of a campground with 305 campsites, 106 with electric and 199 that are non-electric. There are two shower houses and nine restrooms (one by the boat launch) in the campground along with two dump stations. The campground is open from May through Labor Day weekend. This area also offers a boat launch and courtesy dock that stay open until the end of September. In addition to the campground there are four playgrounds and two picnic shelters that are available to rent and a dog park. There are approximately 43 picnic tables near the picnic shelter and at the boat launch and 221 car parking spaces and 151 trailer spaces.

Dam Site Picnic Area

The Dam Site Picnic Area is a day-use area that contains a picnic shelter, fishing area, picnic area, pit toilet, and a disc golf course. This area is open year-round.

German Church Boat Launch

German Church Boat Launch is leased out to ODNR. The boat launch includes a two lane concrete ramp, floating docks, and paved parking lot with 78 trailer spaces and 17 car only spaces. This launch is open year-round.

Les's Bait and Marcko Landing, LLC

Les's Bait and Marcko Landing, LLC, consists of four paved launch lanes, boat storage, 126 boat slips that are available to rent, a picnic area, and 70 parking spaces. The area is open from April through September depending on reservoir levels.

Berlin Yacht Club

Berlin Yacht Club consists of a club house, concrete boat launch, and dry boat storage. This area also offers sailing lessons and occasional regattas. Club grounds are open to members year-round and the club house is open from May through October.

Bonner Road Boat Launch

Bonner Road Boat Launch is leased out to ODNR. This area consists of four paved launch lanes, five handicap launch spaces, 12 car only spaces and 90 trailer spaces. This launch is open year-round.

Dutch Harbor Marina

Dutch Harbor Marina consists of a boat launch, boat storage, approximately 177 boat slips available for rent, and a convenience store that consists of marine supplies, food, and bait, towing service, and gas. This area is open year-round.

Deer Creek Boat Launch

Deer Creek Boat Launch is managed by Stark County. This area consists of a one lane boat ramp and a fishing pier.

Best Management Practices for High-Density Recreation Lands:

- Provide access for and use by the elderly and people with disabilities
- No ground-disturbing activities in high density recreation areas, unless authorized by the Corps
- Interpret cultural resources to benefit visitors
- Protect the viewshed (geographical area that is visible from a location) in order to maintain current aesthetic values
- Prescribed fire should be considered as a management method for this land classification in appropriate locations

4.1.3 Environmentally Sensitive Areas

This classification consists of areas where scientific, ecological, cultural, or aesthetic features have been identified. Designation of these lands is not limited to just lands that are otherwise protected by laws such as the Endangered Species Act, the National Historic Preservation Act, or applicable state statutes. These areas must be identified and protected by management to ensure they are not adversely impacted. Typically, limited or no development of public use is allowed on these lands.

Environmentally Sensitive Areas include locations of threatened and endangered species and cultural sites. Some areas may be highly sensitive to change, while other areas may need prescribed management to remain viable. The goal of managing these areas is to protect and preserve known areas that contribute to the diversity and health of the Project. There is a total of 895.8 acres classified as Environmentally Sensitive Areas.

The following types of landscape may be classified as an Environmentally Sensitive Area:

- Known or discovered cultural sites/archaeological sites
- Large tract woodlands
- Mature woodlands
- Reforestations
- Wetlands identified in the National Wetlands Inventory
- Lands possessing unique wildlife value by diversity or conservative species
- Steep slopes, often with outcrops or talus slopes
- Areas of aesthetic quality or having aesthetic “scenic” views
- Corridors between habitats that protect connectivity (e.g. riverine woodlands)

Archaeological Sites

Approximately 9.6 acres are classified as lands containing archaeological resources. These include prehistoric and historic sites. These sites will be managed to protect these resources in accordance with the provisions of applicable laws, including the Archaeological Resources Protection Act, National Historic Preservation Act, and Native American Graves Protection and Repatriation Act. These areas, along with any other possible archaeological sites, will continue to be surveyed for the presence of archeological resources when development activities are proposed to ensure that utilities placement, mining, installation of recreation features, and other actions do not impact unknown resources. If additional resources are discovered, these parcels would be converted to this management category and additional protections would be afforded to ensure compliance with applicable laws. Some identified archaeological sites are already disturbed and are therefore not classified as Environmentally Sensitive Areas.

Wetlands

There are 58.9 acres of riverine wetlands, 3,190.9 acres of lake wetlands, 764.5 acres of freshwater forested/shrub wetlands, 54.5 acres of freshwater emergent wetlands, and 6.1 acres of freshwater pond wetlands.

Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For the purposes of this classification, wetlands must have one or more of the following three attributes: 1) at least periodically, the land supports predominantly hydrophytes; 2) the substrate is predominantly undrained hydric soil; and 3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year. Wetlands provide many benefits such as habitat for fish and wildlife, natural water quality improvement, flood storage, and shoreline erosion protection. There are multiple acres of wetlands that are not classified as Environmentally Sensitive Areas but rather under the Water Surface classification.

Best Management Practices for Environmentally Sensitive Areas:

- Control noxious weeds and other pests in a manner that avoids damage to existing desirable vegetation and sensitive areas (wetlands and streams)
- Preserve and protect existing wetland and other sensitive or unique habitats that support threatened and endangered species along with other wildlife
- Proponents of surface disturbing activities shall identify important, sensitive, or unique habitats in the vicinity of the Project and design the proposed project to avoid, minimize, or mitigate impacts to these resources
- Riparian areas are maintained and improved for the protection and enhancement of fisheries
- As a standard practice, ephemeral, perennial, and intermittent drainages and wetland/riparian areas will be avoided as locations for oil and gas related facilities, including drilling locations, production facilities, roads, and pipelines. Whenever possible, facilities will be confined to existing alignments or locations, minimizing width requirements and maximizing multiple occupancy
- Surface disturbance will not be allowed within 660 feet of the source of a spring or seep, or within downstream riparian areas created by flows from the source or resulting from riparian area management
- Proponents of surface disturbing activities shall conduct surveys for federally and state-protected species and other species of concern within action areas and design the project to avoid, minimize, or mitigate impacts to these resources
- The Corps will prohibit the disturbance of any population of federally listed and special status plant species
- No motorized use, unless previously authorized, will be allowed within Environmentally Sensitive Area boundaries; other trails (i.e., foot trails, mountain bike trails, cross country skiing trails, etc.) will be analyzed on a case by case basis. Trail design, construction, and maintenance will ensure all criteria in which the Environmentally Sensitive Area was established will remain protected
- Prescribed fire should be considered as a management method for this land classification

4.1.4 Multiple Resource Managed Lands

This classification includes areas where the predominant use is for game and wildlife management or dispersed recreation. However, there are other compatible uses that may occur on these lands without impacting the predominant use.

4.1.4.1 Low Density Recreation

Low density refers to lands with minimal development or infrastructure that support passive public recreational use (e.g. primitive camping, fishing, hunting, trails, wildlife viewing). There

are 632.1 acres at the Project that fall under this category. Many of these lands are undeveloped and used for wildlife purposes.

Route 224 Access Area

This area is leased out to ODNR. It consists of a parking area with access to the reservoir and hunting lands.

Dog Training Area/Archery Range

This area is leased out to ODNR. This area is open year-round from sunrise to sunset, no permits are required. Located here is a tree stand simulator and targets set at multiple distances.

Price Boat Launch

This area is leased out to ODNR and contains an unimproved water access for paddlecraft. This area is open year-round.

Bedell Road Boat Access Area

This area contains an unimproved water access for paddlecraft and access to hunting lands. This area is open year-round.

Trails

The Berlin Lake Trail is a two-mile, non-motorized, multi-purpose trail. The Mahoning Valley Trail is 4.46-mile multi-purpose trail managed by Stark County Parks.

Best Management Practices for Low Density Recreation Lands:

- Provide access for and use by the elderly and people with disabilities
- No ground disturbing activities in low density recreation areas unless authorized by the Corps
- Interpret cultural resources to benefit visitors
- Protect the viewshed in order to maintain current aesthetic values
- Prescribed fire should be considered as a management method for this land classification in appropriate locations

The Non-Recreation Outgrant Policy (ER 1130-2-550, Chapter 17), which reflects nationwide guidance developed in 2009, will be used to evaluate requests for use of Corps lands and waters. Future non-recreation outgrant requests may be granted if one of the following two conditions are met and as long as Project purposes are not compromised:

- There is no viable alternative to the activity or structure being placed on Corps lands

- There is a direct benefit to the Project and their respective authorized mission

4.1.4.2 Wildlife Management Areas

Wildlife lands are available for sightseeing, wildlife viewing, nature study, hunting, and hiking. There are 1,529.8 acres classified as Wildlife Management Areas. Taking of wildlife, including hunting, fishing, and trapping, may be allowed when compatible with the wildlife objectives for a given area and within federal and state fish and wildlife management regulations as established with ER 1130-2-540.

Wildlife management activities include upland small game and deer management through natural succession control, brush pile construction, and orchard improvement. Waterfowl, small game, and large game hunting is also permitted around the Project.

Wildlife Management Areas (WMAs) include Willow Creek. This area is managed by ODNR and allows for hunting, fishing, and wildlife viewing. The Project also manages small pollinator plots of native species.

Best Management Practices for Wildlife Management Areas:

- Surface disturbance will not be allowed within 660 feet (or if there are any more stringent state species-specific buffers) of active raptor nests on natural habitat features, such as trees, large brush, and cliff faces
- The Master Memorandum of Agreement (MOA) between the Corps and the U.S. Department of Agriculture will guide nuisance species damage control. For more information, the referenced MOA can be found here:
<https://corpslakes.erd.c.dren.mil/employees/cecwon/mou-archive.cfm>
- Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 45 decibels measured at 30 feet from the source of the noise
- Manage forest resources and other vegetation for balanced uses of recreation, wildlife, and fisheries
- Monitor forest conditions to document health and identify pests
- A habitat restoration plan shall be developed to avoid, minimize, or mitigate negative impacts on vulnerable wildlife while maintaining or enhancing habitat values for other species. The plan shall identify revegetation, soil stabilization, and erosion reduction measures that shall be implemented to ensure that all temporary use areas are restored. The plan shall require that restoration occur as soon as possible after completion of activities to reduce the amount of habitat converted at any one time and to shorten the length of recovery time to natural habitats
- Recovery plans for species federally-listed as threatened or endangered will be implemented under the authority of the Endangered Species Act, including the

reintroduction or relocation of native special status species in areas on public land in coordination and cooperation with local governments

- Increased intensity of research and monitoring will be needed to evaluate changes in habitat condition, land use threats to the species, species use and distribution, reclamation efforts, propagation, and other projects that may help in enlarging the knowledge base of these species
- All land use management prescriptions will be maintained as currently established to ensure aesthetics, habitat quality, and overland water flow. All existing utilities and their operations and maintenance will not be impacted by this designation
- No motorized use, unless previously authorized, will be allowed within Wildlife Management Area boundaries; other trails (i.e., foot trails, mountain bike trails, cross country skiing trails, etc.) will be analyzed on a case by case basis
- Prescribed fire should be considered as a management method for this land classification

4.1.4.3 Future or Inactive Recreation Areas

There are no acres of lands classified as Future Recreation Areas.

4.1.5 Water Surface

There are four Water Surface categories within the boundaries of the Project: Restricted, Open Recreation, Fish and Wildlife Sanctuary, and Designated No-Wake. These areas make up 3,816.7 acres that are within the reservoir's conservation pool. See Appendix B, Plate 7 for Recreation map which shows the Water Surface categories.

4.1.5.1.1 Restricted

Restricted areas include those portions of the reservoir pool where public access is prohibited due to Project operations, security concerns, or to promote public safety. This includes the areas between the outlet structure and the upstream portion of the dam and the area immediately downstream of the dam. There are 14.6 acres at the Project that fall under this category.

4.1.5.1.2 Designated No-Wake

Designated no-wake zones are marked with buoys to protect environmentally sensitive shoreline areas, recreational areas (such as boat ramps and docks), and for public safety. Boats are required to slow down in these areas to prevent waves from impacting the shoreline. There are 1,565.2 acres at the Project that fall under this category.

4.1.5.1.3 Open Recreation

Open recreation areas are waters that are available year-round or seasonally for water-based recreational use. There are 2,234.8 acres at the Project that fall under this category.

4.1.5.1.4 Fish and Wildlife Sanctuary

Fish and wildlife sanctuary zones have annual or seasonal restrictions on areas to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning. There

are 2.1 acres at the Project that fall under this category, and are marked as an Osprey nesting area restricted from 1 March through 30 September.

Best Management Practices for Water Surface Areas:

- Maintain and, if possible, improve water quality and fisheries habitat structure to support a productive sport fishery and maintain healthy populations of native fish species
- Water quality monitoring at established stations should continue throughout the Project property and watershed, as the data gathered aids in conservation of the Projects aquatic resources
- Fish and macroinvertebrate surveys at established stations should continue throughout the Project property and watershed, as the data gathered aids in conservation of the Projects aquatic resources
- Continue coordinating monitoring activities at the Project with state and federal resource agencies

4.2 Easement Lands

There are 1,161.5 total acres of easement lands at the Project.

4.2.1 Operations Easement

The Corps has no acres of operations easement lands at the Project.

4.2.2 Flowage Easement

The Corps has 1,161.5 acres of flowage easement lands at the Project.

4.2.3 Conservation Easement

The Corps has no acres of conservation easement lands at the Project.

Best Management Practices for Easement Lands:

- Monitor any activities occurring on easement lands to ensure that Corps rights, according to terms and conditions of the legal easement, remain unimpeded
- Promote an understanding of Corps boundary and mission by both the public and the owners of underlying private property
- Restrict development on easement lands and discharges of treated wastewater and other pollutants into the reservoir

5. Special Considerations Affecting Natural Resources

During the development of this Master Plan, several issues were identified that could affect or are affecting the stewardship and management potential of the lands and waters at the Project.

5.1 Coal Mines

Currently, there are no active or abandoned coal mines on Project property. However, there are adjacent abandoned mines which could impact water quality. Mineral rights underlying the Project may be owned outright by the federal government, owned by a third party, or a combination thereof. There may be subordination agreements or surface restrictions in place. It is also possible for the Bureau of Land Management (BLM) to lease federally-owned mineral interests beneath the surface of Project land. It is necessary to review and consider the specific ownership documentation of each tract in order to determine the rights and controls that the Corps has on said tracts.

Historical coal mining activities in the area may result in negative environmental impacts such as abandoned mine drainage. Abandoned mine drainage is water that is polluted from contact with mining activity, and normally associated with coal mining. It is a common form of water pollution in areas where mining took place in the past. There are several issues with abandoned mines that impact water quality:

- Acid mine drainage (the most prevalent; see below)
- Alkaline mine drainage (this typically occurs when calcite or dolomite is present)
- Metal mine drainage (high levels of lead or other metals that drain from these abandoned mines)

Acid mine drainage is the formation and movement of highly acidic water rich in heavy metals. This acidic water forms through the chemical reaction of surface water (rainwater, snowmelt, pond water) and shallow subsurface water with rocks that contain sulfur-bearing minerals, resulting in sulfuric acid. Heavy metals can be leached from rocks that come in contact with the acid, a process that may be substantially enhanced by bacterial action. The resulting fluids may be highly toxic and, when mixed with groundwater, surface water, and soil, may have harmful effects on humans, animals, and plants (USEPA, 2018). Coal mine locations will be managed for water quality concerns, overland water flow, erosion control, and environmental impacts. Surface occupancy will be avoided for coal mines.

5.2 Oil and Gas Development

Currently, there are no proposals for new oil and gas related activities on Project lands. There are seven inactive wells and 41 active wells on Corps fee owned property. Mineral rights underlying the Project may be owned outright by the federal government, owned by a third party, or a combination thereof. There may be subordination agreements or surface restrictions in place. It is also possible for the BLM to lease federally-owned mineral interests beneath the surface of Project land. It is necessary to review and consider the specific ownership documentation of each tract in order to determine the rights and controls that the Corps has on said tracts. Oil and gas well locations will be managed for surface disturbance such as invasive

species, water quality, overland water flow, and erosion control. Potential impacts of mineral extraction activities include the footprint of the extraction site and construction and operation of access roads. Mineral extraction within the Project boundary could infringe on general recreational areas or fish and wildlife related recreation, either directly or from pollutants that are a result of extraction operations. Surface occupancy will be avoided for oil and gas development.

5.3 Federally-Owned Minerals

Under the multiple-use principle, federal minerals beneath the surface of Corps lands may be made available for mineral exploration and extraction, consistent with Project activities. The General Mining Act of 1872 (30 U.S.C. 22-42) authorizes and governs prospecting and mining for economic minerals. The Mineral Leasing Act of 1920 (30 U.S.C. 181 et. seq.), authorizes and governs leasing of public lands for developing deposits of coal, petroleum, natural gas, and other hydrocarbons. The Materials Act of 1947 (30 U.S.C. 601-604) authorizes BLM to dispose of mineral materials on federal lands provided that the disposal is not otherwise expressly authorized or prohibited by law, and is not detrimental to the public interest. While the Mineral Leasing Act authorizes the BLM to issue oil and gas and coal leases, it does not require that leases be issued (Darin & Stills, 2002). The BLM must obtain the Army's approval and the Army, through the Engineering District, can place limitations in the lease regarding the extractions of these minerals (See AR 405-30; *see, e.g.*, 43 CFR § 3503.20). If a developer approaches the BLM for access to a certain parcel or mineral interest, the BLM notifies the Corps and requests title information for the parcel and any use stipulations the Corps might require. The Real Estate Office for the Corps provides the BLM with title information and any stipulations (AR 405-30). The BLM would, in turn, inform the party interested in leasing the federal minerals of all associated stipulations. If the developer is still interested, the BLM follows its procedures to make the minerals available. The Corps has the final say in whether minerals will be made available, and the Assistant Secretary of the Army (ASA) has final approval on any non-availability determination.

5.4 Owners of Private and State Minerals

Owners of private and state oil, gas, and coal rights have a property right to develop their interests, which generally includes reasonable use of the surface to the extent necessary to accomplish such development. However, this does not mean their operations are free from limitation or reasonable regulation that might originate under state and/or federal law, whether pursuant to property law concepts or other legal authorities. Under applicable state and federal laws and regulations, the mineral owner, whether it is private or state, and/or the lessee must coordinate with the Project to use the federally-controlled surface. For all types of mineral leases where surface occupancy is approved under a lease, the lessees must obtain prior approval for any surface activities on Corps-managed lands (Title 43 – Public Lands: Interior Code of Federal Regulations [CFR] Part 3160). It is the Project's responsibility to protect Project purposes when

allowing surface use. Moreover, while owners of oil, gas, and coal interests generally have the right to reasonable use of the surface to the extent necessary for private oil, gas, and coal exploration and development, they are not exempt from possible liability to the surface owner for damages stemming from such exploration and development.

5.5 State or Privately-Owned Minerals Accessed from State or Privately-Owned Land

When the Corps does not own the necessary estates in real property to control development within close proximity of dams and other Project structures, effective control of mineral extraction activities requires close coordination among the Project staff and the District Office, especially Operations, Real Estate, Engineering-Construction, and Office of Counsel. Operations personnel are often the first Corps employees to become aware of new or proposed mineral extraction activities near the Project. Mineral extraction activities may include exploration operations, mining operations, drilling operations, production operations, reworking operations (including hydraulic fracturing), and high pressure pipeline operations. Real Estate personnel must investigate the location of activities and determine the federal real property interests in the location. Engineering-Construction personnel must evaluate any new or proposed activities in order to decide whether the proposed activity is compatible with the structural integrity of the dam and other major structures. The Corps' ability to regulate and dictate private mineral extraction on adjacent private lands is minimal; however, federal agencies have a duty to protect federal resources for authorized purposes. EC 1165-2-220 provides policy and procedural guidance for processing requests by private, public, tribal, or other federal entities to make alterations to, or temporarily or permanently occupy or use, any Corps Project under Section 408. Proposed alterations must not be injurious to the public interest or impair the usefulness of the Project.

5.6 Indiana Bat and Northern Long-Eared Bat

Currently listed as federally endangered, the Indiana bat (*Myotis sodalis*) is a small, dark brown to black colored bat that hibernates in caves and abandoned mines during winter months (starting mid-September into November) and roosts under peeling tree bark, under bridges, and sometimes in buildings during warmer months (starting mid-April into May). The total body length of an adult Indiana bat averages between 2-3 inches, with a wingspan of 9-11 inches. Populations have been declining since the 1960's, largely due to disturbance of winter cave hibernacula (USFWS, 2019). The northern long-eared bat (*Myotis septentrionalis*), currently listed as federally threatened, is a medium-sized bat with a total body length of 3.0-3.7 inches, and a wingspan of 9-10 inches. Their fur color can be medium to dark brown on the back and pale-brown on the underside, primarily distinguishable by its long ears (USFWS, 2020). The northern long-eared bat and Indiana bat are similar with respect to their behavior, habitat use, and range, as well as the anthropogenic activities threatening existing populations.

There is considerable suitable summer roosting habitat present in and amongst the forested components of the Project. At present, there is no current Corps management or survey plan in effect; however, the U.S. Fish and Wildlife Service (USFWS) has adopted regional, seasonal cutting/disturbance restrictions. Generally, tree-cutting activities should be carried out from mid-November through the end of March during which time bats are hibernating in non-forest habitats. If any tree-cutting is necessary from the beginning of April to mid-November, trees greater than or equal to three inches in diameter at breast height should not be cut or physically disturbed in order to avoid potentially killing or injuring roosting bats. Special considerations should be given to trees with the following characteristics indicative of suitable roosting habitat: 1) dead or dying trees and snags (with exfoliating bark); 2) live trees with exfoliating or defoliating bark in the trunk or branches (e.g., shagbark and shellbark hickory); and 3) trees or snags that have characteristics typical of roost sites for bats (i.e., have exfoliating or defoliating bark, or contain cracks, crevices, or holes).

Currently, no known occurrence of these bats has been confirmed at the Project. Regardless, Project staff adhere to the aforementioned cutting/disturbance restrictions. Corps staff at the Project will continue to work with USFWS and partner with other state and federal resource agencies to ensure that potential detrimental effects to managed resources are minimized on public lands entrusted to the Corps.

5.7 Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*), is protected by the Bald and Golden Eagle Protection Act (Eagle Act) and the Migratory Bird Treaty Act (MBTA). The MBTA and the Eagle Act protect bald eagles from a variety of harmful actions and impacts. The USFWS established the National Bald Eagle Management Guidelines to advise landowners, land managers, and others who share public and private lands with bald eagles of protective provisions that apply to human activities. A variety of human activities can potentially interfere with bald eagles, affecting their ability to forage, nest, roost, breed, or raise young. The guidelines are intended to help minimize impacts to bald eagles, particularly where they may constitute disturbance, which is prohibited by the Eagle Act (USFWS, 2007).

5.8 Invasive Aquatic and Terrestrial Species

The most common invasive terrestrial plant species occurring at the Project are: Japanese honeysuckle, Japanese knotweed, autumn-olive, buckthorns, purple loosestrife, common reed or phragmites, reed canary grass, garlic mustard, multiflora rose, giant hogweed, and bush honeysuckles. The most common invasive insects are: Asian long-horned beetle (ALB), emerald ash borer, gypsy moth, and the hemlock woolly adelgid (HWA). The most common aquatic invasive species are the hydrilla and the zebra mussel. While no management plan is currently in effect for invasive species, terrestrial or aquatic, on Corps managed property, considerations are taken when performing tasks on the Project to prevent the spread or introduction of invasive

species. Efforts to educate the public on preventing the spread and introduction of invasive species is made through signage (e.g. Don't Move Firewood! signs), ranger led interpretive programs, and information on displays and pamphlets around the Project. The ODNR takes similar precautions on leased lands, as well as practicing forest and wildlife management initiatives.

5.9 Unmanned Aircraft

Title 36, Parks, Forest and Public Property, Chapter 111, Part 327.4 states “The operation of “aircraft” on Project lands at locations other than those designated by the District Commander is prohibited. This provision shall not be applicable to aircraft engaged in official business of federal, state, or local governments or law enforcement agencies, aircraft used in emergency rescue in accordance with the direction of the District Commander or aircraft forced to land due to circumstances beyond the control of the operator.” The use of unmanned aircrafts for recreational purposes is currently prohibited under this regulation. It is possible in the future that the Project can designate a specific area for the operation of unmanned aircrafts.

5.10 Climate Change

Long-term changes in climate (i.e., altered air temperature and/or precipitation rates) will affect habitats and species. Intolerant flora and fauna, as well as species currently existing on the edge of their range, are at greatest risk of local extirpation as a result of altered environmental conditions under climate change. Climate change was predicted using models and climate data. Given predictions, it may result in water management and water quality difficulties such as not being able to make summer pool in time for the recreation season or not having enough water in the late summer to meet downstream flow targets. Increased storm runoff due to climate change also has the potential to result in greater inputs of pollution which in turn can affect water quality of the reservoir and downstream of the Project. Similarly, increased runoff may alter rates of sedimentation within the reservoir. Ecosystems and associated species impacted by pre-existing anthropogenic stressors are also at greater risk. Thus, preserving and promoting healthy and connected habitats will be critical to ensuring long-term persistence of all species under climate change (NOAA, 2021).

5.11 Important Bird and Biodiversity Area

The Project is designated as an Important Bird and Biodiversity Area (IBA). An IBA is identified using an internationally agreed set of criteria that is globally important for the conservation of bird populations. Currently, there are 13,000 IBAs worldwide. In the United States, this program is administered by the National Audubon Society. To be listed as an IBA, a site must satisfy one of the following criteria: 1) Globally Threatened Species – this site that is known or thought to regularly hold a significant number of globally threatened species; 2) Restricted-range Species – this site is known or thought to hold a significant population of at least two range-restricted species; 3) Biome-restricted Species – this site is known or thought to

hold a significant component of the group of species whose distributions are largely or wholly confined to one biome-realm; or 4) Congregations – this site is known or thought to hold congregations of equal to or greater than one percent of the global population of one or more species on a regular or predictable basis (Bird Life International, 2021).

When the pool is drawn down in mid-summer, extensive areas of mudflats are exposed attracting diverse shorebirds. Exposed mudflats have demonstrated an attraction for a number of diverse shorebirds. Mudflats tend to be productive, offering a wide diversity and high abundance of potential food (Bird Life International, 2021).

6. Agency and Public Coordination

Throughout the Master Plan update process, the Corps involved the public, engaged with partners and stakeholders representing interests at the local, regional, state, and federal levels, and coordinated with sovereign (recognized) tribal nations.

Comments from the scoping period were received on a variety of topics, including but not limited to:

1. Preferred qualities, characteristics, and components of the Project:

- A recognized, consistent source of water-based recreation from Memorial Day to Labor Day that is utilized by users throughout the state
- Provider of high-quality camping and fishing opportunities by recognizing the value of clean waters and managed habitats
- Balance of private and public access to Project amenities
- Coordinating partner with other regional water resources to provide flood risk reduction benefits as well as recreational opportunities

2. Potential Threats and Concerns:

- Increase in trash and debris collecting near recreation areas, particularly near the boat ramp on German Church Road
- Lack of communication on the rationale of both the designation and the value of the management prescriptions associated with land designations in the Shoreline Management Plan
- Crowding of docks in areas around the reservoir
- Inability of emergency vehicles to gain access to people in need of assistance at a dock or in the water due to easement requirements that limit paths to four feet in width
- Negative effects to the economy when the reservoir levels drop below a preferred level before Labor Day

- Threats to safety when shallow portions of the reservoir are left unmarked
- Lack of maintenance in the designated dog training area is causing safety concerns
- Decline in size of fish populations
- Sedimentation in the reservoir creating unnavigable waters and harming reservoir vegetation; as well as the shoreline erosion contributing to the sedimentation and loss of shoreline

3. Regional Needs/Opportunities:

Below are the identified regional needs/opportunities it was thought that the Project could undertake:

- Updating facilities, such as campground restrooms and boat ramps
- Creating opportunities for recreation starting before Memorial Day and lasting until after Labor Day by changing the dates of operation for campgrounds and managing reservoir levels to enable these opportunities
- Using timber management as a source of income and a way to manage reservoir aesthetics
- Identifying additional areas around the Project that can be utilized for recreational purposes such as picnic areas, public docks, disc golf, etc. and/or improving access to existing amenities
- Revisiting the designation of property classifications around the Project
- Forming an advisory committee, representative of reservoir users, to provide the Pittsburgh District with feedback about future opportunities and threats related to the management of the reservoir and the surrounding lands
- Changing permitting requirements to allow for All Terrain Vehicles and Snowmobiles
- Improving Corps coordination with law enforcement and emergency management services
- Providing better ADA access to the amenities at the Project

See Appendix C for the compilation of the comments collected during the Scoping and Public Comment Period meetings. All comments made during these meetings, as well as those submitted online, were considered during the development of the current Master Plan.

6.1 Draft Release Meetings

A public comment period will be held in September 2021, with the purpose of unveiling the proposed recommendations and land use classifications and eliciting feedback on the proposed updates to the Master Plan and accompanying Environmental Assessment.

6.2 Outreach Efforts

The following outreach efforts were conducted to notify the public, stakeholders, and partners of the opportunities for involvement and to solicit input into the Master Plan update process:

- **Fact Sheet:** A Master Plan update fact sheet was developed to inform partners, stakeholders, and the public about the purpose and scope of the Master Plan update. This fact sheet was sent in email invitations and handed out at the meetings.
- **Agency, Partner, and Stakeholder Email Invitations:** Email invitations for the public scoping meeting were sent out via email to all partners and stakeholders with available contact information, inviting them to attend the meeting, and providing information for how to submit comments.
- **Public Facebook Posts:** Facebook posts were made on the Berlin Lake Facebook page advertising the Master Plan update, promoting the meetings themselves, and inviting comments.
- **Press Release:** Sent to local media before the public meeting in an effort to notify the public of the upcoming meetings and opportunities to comment:
<https://www.lrp.usace.army.mil/Media/News-Releases/Article/1628884/pittsburgh-district-to-host-berlin-lake-master-plan-public-meeting/>
- **Indian Nation Coordination Letters:** Letters were sent directly to Indian Nations in recognition of the Corps' Federal Tribal Trust responsibilities. Letters sent during the scoping phase inquired as to whether the Indian Nations had any information relevant to the Project and invited them to contact the Pittsburgh District either via mail, email, or phone in order to submit any comments or concerns, and requested comments on the upcoming revision of the Master Plan. Letters were also sent during the public comment phase for the proposed update asking for comments on the proposed revisions.
- **Notice of Availability:** Pittsburgh District sent a Notice of Availability (NOA), required for the National Environmental Policy Act compliance, to partners and stakeholders indicating the 30-day comment period for the Master Plan and Environmental Assessment, along with the web address to access the documents.

6.3 Scoping Meetings

Scoping efforts formally began on September 20, 2018, with a public open house-format meeting. The objectives of this scoping meeting were to 1) communicate the Pittsburgh District's intent and need to revise the Master Plan and 2) learn about the needs, opportunities,

and concerns of partners, stakeholders, and the public. For anyone unable to attend the scheduled meetings or not located close to the Project site, Pittsburgh District piloted the use of a public comment tool which allowed interested parties to leave a comment with respect to the type of activities they would like to see at the reservoir. Interested parties could also mail or email the Pittsburgh District with their comments. See Appendix C for a summary of the meetings and the public notice.

Other previous and on-going stakeholder engagement efforts were also used to inform the decisions made within the Master Plan. Two examples of those engagement efforts include the July 2017 Berlin Lake Vision Meeting and comment period for proposed planned deviation to the Water Control Plan for 2018 at Berlin Lake.

7. Summary of Recommendations

This Master Plan conceptually establishes and guides the orderly development, administration, maintenance, conservation, enhancement, and management of all natural, cultural, and recreational resources at the Project. This section summarizes the proposed changes that can be found within this Master Plan and provides specific recommendations to be considered that will help guide the direction of Project management into the future.

Derived through correspondences, comments, scoping meetings (described in further detail below) by local citizens, stakeholders, and current and potential Project partners, along with Corps staff knowledge of the Project, the recommendations below address the regional needs, threats, and opportunities identified throughout the planning process.

These management recommendations are non-regulatory and available for use by any citizen, group, or agency. They have been analyzed in the Environmental Assessment associated with this Master Plan in order to identify potential impacts and any additional analysis and coordination that may be necessary.

7.1 Coordination and Partnerships

The modest size of the staff at the Project creates a prime opportunity for partners and volunteers to augment and advance the operations and management of the Project.

Therefore, an overarching recommendation for the Project is to create partnerships to leverage fiscal resources and continue to involve local communities and stakeholders in achieving the resource objectives set forth in Section 1.6. This recommendation includes working with federal and state agencies to leverage resources for complimentary natural resources management, with recreation service providers to improve user experiences, with environmental groups to improve

habitat, and with educational and community groups to encourage volunteer activities that are mutually beneficial.

In order to keep in accordance with other plans regarding resources and opportunities within Stark, Portage, and Mahoning Counties, it is recommended that the Corps keep abreast of content within the existing plans reviewed during the update of this Master Plan as well as any future plans that are developed for the area.

To encourage coordination and partnership, it is recommended that the Project staff engage with external partners including but not limited to:

- Berlin Lake Association
- Berlin Yacht Club
- Dutch Harbor Marina
- Lake Milton Association
- Les's Bait and Marcko Landing, LLC
- Ohio Department of Natural Resources
- McDermott's Lakefront Campground
- Stark County Parks

Opportunities ripe for partnerships include: the creation of a Berlin Advisory Committee and firm establishment of a Friends of Berlin group, timber management, erosion control, development of a comprehensive public safety plan, and the establishment of a Berlin Lake signature event and volunteer events.

7.2 Facility Modernization

The Corps will continue to modernize current facilities at the Project. Modernization activities will occur within existing footprints of recreation areas and prioritize actions that improve visitor safety and experience where funding is available and in accordance with Engineer Manual (EM) 1110-1-400, Engineering and Design – Recreation Facility and Customer Service Standards, 1 Nov 2004. Potential improvements are described in detail in Section 1.6 of this Master Plan and were developed using information gathered during the public input process and expert knowledge of the Project staff. Examples of potential improvement projects are provided below.

Specific potential improvements for safety if resourcing and/or a successful partnership becomes available at the Project should include:

- Installment of informational and directional signs around the Project and trails;
- Demarcation of property lines (fee, flowage, and shoreline);
- Improvements to roads leading to, and surrounding, the Project; and

- Modernize facilities to ensure ADA accessibility.

Specific potential improvements for improved visitor experience if resourcing and/or a successful partnership becomes available at the Project should include:

- Identification of Project Site Areas (PSAs) with low use and degraded facilities; divest when appropriate;
- Establishment of different ways for visitors to explore the Project, including development of a Project app that enables visitors to access park maps, learn about the Project, check-in, and log information from their experience;
- Add additional picnic shelters to Mill Creek Recreation Area;
- Demolish unused dwelling;
- Create a nature/interpretive trail in Mill Creek Campground;
- Add in full hookup/pull-through campsites and additional electric campsites to Mill Creek Campground;
- Add in cabins at Mill Creek Campground; and
- Establish a viewing/fishing platform at the Dam Site Picnic Area.

7.3 Land Classification Changes

The land use classification changes discussed in this document and evaluated in the accompanying Environmental Assessment represent the changes in land use, management strategies, and guidance concerning naming conventions that have occurred since the original Master Plan for this Project was developed. Specifically, the previous Land Classifications (Limited Use Area, Non-Intensive Recreation) are now consolidated under the Multiple Resource Management Land Classification (Low Density Recreation; Wildlife Management; Vegetative Management; and Future or Inactive Recreation Areas) in this revised Master Plan. Additionally, Intensive Recreation is now considered High Density Recreation in this revised Master Plan.

Other updates to this Master Plan include renaming of lands previously identified as archeological and historical sites as to reflect the new land classification of Environmentally Sensitive Areas (see Tables 7-1 and 7-2, below). Updating and highlighting naming conventions and/or classifications as part of the Master Plan will ensure the conservation of valuable resources continues uninhibited.

Table 7-1. Conversion of Land and Water Classifications

Original	Proposed
Limited Use Area Protection Area	Wildlife Management Environmentally Sensitive Areas

	Vegetative Management
Intensive Recreation	High Density Recreation
Non-Intensive Recreation	Low Density Recreation
n/a	Future or Inactive Recreation
n/a	Project Operations
Power Boating Zone	Open Recreation
No-Wake Zone	Designated No-Wake
n/a	Restricted
n/a	Fish and Wildlife Sanctuary

This table reflects a change in terminology classifications of land and water.

Table 7-2. Summary of Land Class Changes

Existing Land Use Class	Existing Land Use Acres	Proposed Land Use Class	Proposed Land Use Acres
Limited Use Area	901.4	Wildlife Management	1,529.8
Protection Area	2,019.6	Environmentally Sensitive Areas	895.8
		Vegetative Management	0.0
Intensive Recreation	370.7	High Density Recreation	319.2
Non-Intensive Recreation	155.2	Low Density Recreation	632.1
		Future or Inactive Recreation	0.0
		Project Operations	70.7
Power Boating Zone	1,163.2	Open Recreation	2,234.8
No-Wake Zone	2,651	Designated No-Wake	1,565.2
		Restricted	14.6
		Fish and Wildlife Sanctuary	2.1

Acreeage numbers for historical land use classifications were calculated in GIS software by scanning, georeferencing, and digitizing the 1984 Land Use Classification map. Due to the scale and other limitations of the original hand-drawn map, acreages should be considered very approximate.

While these land use classifications may be updated in the future, those described in this document, dated 2021, represent the most current and relevant uses of various Project lands. Additional details of the uses and management goals for individual Project site areas will be provided in a forthcoming OMP for the Project.

7.4 Development Requests

Some development requests identified at Mill Creek Recreation Area include adding additional picnic shelters, creating a nature/interpretive trail, adding in full hookup/pull-through campsites, and additional electric campsites, and adding in cabins.

There is also interest in establishing a viewing/fishing platform at the Dam Site Picnic Area in the future.

7.5 Wildlife Management and Environmentally Sensitive Areas

The Corps land at the Project represents a significantly-sized riparian corridor consisting of valuable wildlife lands. These lands are vulnerable to change by human disturbance. Therefore, large portions of these lands are outgranted to other agencies with the primary focus being wildlife management. At the Project there are large portions of land acreage remaining in an undeveloped natural state (i.e., heavily forested and rich in riverine habitat and wetlands). The Corps will continue to coordinate with resource agency partners to successfully manage these lands for the use and enjoyment of our visitors and the conservation of our valuable natural resources. In the future, the Corps should develop survey methods to identify sensitive habitats, possibly using MSIM, and use the results to designate additional Environmentally Sensitive Areas, which would be converted from multiple resource managed lands. It is recommended that these lands be protected from human disturbance and development activities to the extent possible in compliance with all applicable laws and regulations. If development activities are proposed for these areas, the Corps will work with partners to minimize the disturbance or mitigate the impacts. The Corps will also consider proactive steps to enhance natural areas for sensitive species and to restore sensitive habitats through native vegetation plantings, removal of invasive species, and/or other efforts targeted at non-game species habitat. In addition, the Corps will continue to protect cultural resources in existing Environmentally Sensitive Areas and promote education related to these resources.

7.6 Threatened and Endangered Species

Federally listed threatened and endangered plant and animal species will be managed according to USFWS Recovery Plans. State listed species will be protected through partnerships and agreements with state agencies. Best Management Practices, which are to be used to manage threatened and endangered species at the Project, have been outlined in Sections 4 and 5.

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