

ALUM CREEK LAKE OHIO

MASTER PLAN UPDATE



August 2011 Final



US Army Corps
of Engineers
Huntington District
Huntington, West Virginia

Table of Contents

1.0	Introduction and Background	1-1
1.1	Authorization	1-1
1.2	Authorized Project Purposes	1-2
1.2.1	Flood Risk Management	1-2
1.2.2	Recreation	1-2
1.2.3	Water Supply	1-3
1.2.4	Fish and Wildlife Management	1-4
1.3	Prior Master Plans	1-4
1.4	Application of Public Laws	1-4
1.4.1	Recreation	1-4
1.4.2	Water Resource Protection and Flood Risk Management	1-6
1.4.3	Fish and Wildlife Resources	1-7
1.4.4	Forest Resources	1-8
1.4.5	Leases, Easements, and Rights-of-Way	1-8
1.4.6	Cultural Resources	1-9
1.4.7	Executive Orders	1-10
1.5	Purpose of the Master Plan	1-12
1.6	Scope of the Master Plan	1-13
1.7	Project Description	1-13
1.7.1	Location	1-13
1.7.2	History of the Project	1-14
1.7.3	Land Acquisition History	1-17
1.7.4	Federal Areas and Recreational Facilities	1-17
1.7.5	Outgrants	1-17
1.7.6	Project Data/Lake Operations	1-23
1.7.7	Lake Regulation	1-24
1.7.8	Visitation Data	1-25
2.0	Public Involvement, Coordination, and Partnerships	2-1
2.1	Public Meeting	2-1
2.2	Identified Key Issues	2-1
2.3	Consistency with Other Agencies	2-3
2.4	Coordination and Partnerships	2-4
3.0	Resource Analysis	3-1
3.1	Physical Environment	3-1
3.1.1	Surface Water	3-1
3.1.1.1	Existing Conditions	3-1
3.1.1.2	Implications of Surface Water Resources for Project Development	3-11
3.1.2	Wetlands	3-12
3.1.2.1	Existing Conditions	3-15
3.1.2.2	Implications of Wetland Resources for Project Development	3-15
3.1.3	Groundwater	3-16
3.1.3.1	Existing Conditions	3-16
3.1.3.2	Implications of Groundwater Resources for Project Development	3-16

3.1.4	Physiology / Topography	3-19
3.1.4.1	Existing Conditions	3-19
3.1.4.2	Implications of Physiography/Topography for Project Development	3-20
3.1.5	Geology, Soils, and Minerals	3-23
3.1.5.1	Existing Geology and Soil Conditions	3-23
3.1.5.2	Existing Minerals Resources	3-25
3.1.5.3	Implications of Geology, Soils, and Mineral Resources for Project Development	3-26
3.1.6	Prehistoric and Historic Resources	3-31
3.1.6.1	Existing Conditions	3-31
3.1.6.2	Implications of Prehistoric and Historic Resources for Project Development	3-32
3.1.7	Scenic Qualities	3-33
3.1.7.1	Existing Conditions	3-33
3.1.7.2	Implications of Scenic Qualities for Project Development	3-34
3.2	Biological Environment	3-34
3.2.1	Vegetation	3-34
3.2.1.1	Existing Conditions	3-34
3.2.1.2	Implications of Vegetative Resources for Project Development	3-39
3.2.2	Terrestrial Wildlife	3-40
3.2.2.1	Existing Conditions	3-40
3.2.2.2	Implications of Terrestrial Wildlife for Project Development	3-41
3.2.3	Aquatic Resources	3-42
3.2.3.1	Existing Conditions	3-42
3.2.3.2	Implications of Aquatic Resources for Project Development	3-43
3.2.4	Threatened, Endangered, and Species of Special Concern	3-44
3.2.4.1	Existing Conditions	3-44
3.2.4.2	Implications of Threatened and Endangered Species on Project Development	3-45
3.2.5	Critical Habitat	3-46
3.2.5.1	Existing Conditions	3-46
3.2.5.2	Implications of Critical Habitat for Project Development	3-46
3.2.6	Environmentally Sensitive Areas	3-46
3.2.6.1	Existing Conditions	3-46
3.2.6.2	Implications of Environmentally Sensitive Areas for Project Development	3-47
4.0	Recreation Program Analysis	4-1
4.1	Overview of the Project Areas	4-1
4.1.1	Visitor Center	4-5
4.1.2	Below Dam Recreation Area	4-5
4.1.2.1	Westerville Model Aeronautics Association- Dinneen Field	4-7
4.1.3	Alum Creek State Park	4-8
4.1.4	Alum Creek State Park Campground	4-18
4.1.5	Alum Creek Lake	4-21
4.2	Current Recreational Activities and Visitation	4-23

4.2.1	Outdoor Recreational Activities	4-23
4.2.2	Visitation by Recreation Area.....	4-25
4.2.3	Activity Distribution	4-25
4.3	Area of Influence	4-26
4.3.1	Identifying the Area of Influence.....	4-26
4.3.2	Demographic Characteristics of the Area of Influence.....	4-26
4.3.2.1	Primary Area of Influence	4-29
4.3.2.2	Secondary Area of Influence	4-30
4.4	Outdoor Recreational Opportunities at Comparable Facilities.....	4-30
4.5	Trends in Outdoor Recreational Activities	4-37
4.5.1	Age.....	4-37
4.5.2	Fishing and Hunting.....	4-38
4.5.3	Summer Activities	4-38
4.5.4	Winter Activities.....	4-40
4.6	Identifying Potential Recreational Opportunities	4-40
4.7	Recreational Demand Analysis.....	4-43
4.7.1	Impact of Comparable Facilities.....	4-43
4.7.2	Impact of Trends in Participation Rates in Recreational Activities.....	4-43
4.7.3	Impact of Demographic Changes.....	4-44
4.7.4	Projected Number of Visits by Activity.....	4-44
4.7.5	Lake Carrying Capacity	4-47
4.8	Implications of Projected Future Demand on Recreational Activities	4-50
4.8.1	Boating.....	4-50
4.8.2	Camping.....	4-52
4.8.3	Fishing.....	4-53
4.8.4	Hunting	4-53
4.8.5	Other Activities.....	4-54
4.8.6	Picnicking	4-55
4.8.7	Sightseeing.....	4-55
4.8.8	Swimming.....	4-55
4.8.9	Waterskiing.....	4-56
5.0	Resource Use Objectives.....	5-1
5.1	Resource Use Objective 1	5-1
5.1.1	Project Measures to Achieve Objective.....	5-1
5.1.2	Justification.....	5-1
5.2	Resource Use Objective 2.....	5-2
5.2.1	Project Measures to Achieve Objective.....	5-2
5.2.2	Justification.....	5-2
5.3	Resource Use Objective 3.....	5-3
5.3.1	Project Measures to Achieve Objective.....	5-3
5.3.2	Justification.....	5-3
5.4	Resource Use Objective 4.....	5-4
5.4.1	Project Measures to Achieve Objective.....	5-4
5.4.2	Justification.....	5-4
5.5	Resource Use Objective 5.....	5-5
5.5.1	Project Measures to Achieve Objective.....	5-5

5.5.2	Justification	5-5
6.0	Land Allocation and Classification	6-1
6.1	Land Allocation	6-1
6.2	Land Classification	6-1
6.2.1	Project Operations.....	6-3
6.2.2	Recreation – Intensive Use	6-3
6.2.3	Mitigation.....	6-3
6.2.4	Environmental Sensitive Areas.....	6-4
6.2.5	Multiple Resource Management.....	6-4
6.2.5.1	Recreation Low-Density	6-4
6.2.5.2	Wildlife Management General.....	6-5
6.2.5.3	Vegetative Management	6-5
6.2.5.4	Inactive and/or Future Recreation Areas	6-5
6.2.6	Easement Lands	6-5
7.0	Resource Plan.....	7-1
8.0	Special Considerations.....	8-1
8.1	Major Utility Corridor Consideration at the Alum Creek Lake Project	8-1
8.1.1	Land Use Compatibility and Site Suitability Considerations	8-1
8.1.2	Considerations for a Systems Approach for Recreational Use of Alum Creek Lake and Delaware Lake Projects.....	8-4

List of Tables

Table 1-1:	Federal Recreation Areas and Outgrant Areas	1-17
Table 1-2:	Project Structures	1-24
Table 1-3:	Alum Creek Lake Surface Water Elevations	1-24
Table 1-4:	Visitation Data, FY 2000-2009	1-25
Table 2-1:	Shared Recreation and Environmental Conservation Goals	2-4
Table 3-1:	Drainage Areas of the Alum Creek and Principal Tributaries	3-2
Table 3-2:	2011 Bacteriological Data for Alum Creek Lake.....	3-7
Table 3-3:	Project Impacts Based on Lake Elevation.....	3-12
Table 3-4:	Wetlands Present in Project Area.....	3-15
Table 3-5:	Soils in Order of Predominance	3-24
Table 3-6:	Land Cover in the Alum Creek Lake Project.....	3-37
Table 3-7:	Terrestrial Animals Common to the Project Area.....	3-40
Table 3-8:	Native and Stocked Fish Species in Alum Creek Lake.....	3-42
Table 3-9:	Listed Threatened and Endangered Species at Alum Creek Lake	3-44
Table 4-1:	Primary Areas of the Project and the Managing Entities	4-1
Table 4-2:	Recreational Activities at the Project.....	4-23
Table 4-3:	Distribution of Visits by Primary Recreation Area 2006-2010 Average.....	4-25
Table 4-4:	Number of Participants for Each Recreational Activity.....	4-25
Table 4-5:	Population in Areas of Influence.....	4-29
Table 4-6:	Age Distribution of Population by Area of Influence	4-29
Table 4-7:	Median Household Income in Areas of Influence.....	4-30

Table 4-8: Comparable Recreational Facilities.....	4-33
Table 4-9: Recreational Activities and Amenities at Alum Creek Lake and Comparable Recreational Facilities.....	4-35
Table 4-10: Potential Recreation Activities at the Project.....	4-41
Table 4-11: Baseline and Projected Users by Activity and Subarea of Influence	4-46
Table 4-12: Space Assumptions for Safe and Enjoyable Boating	4-48
Table 4-13: Alum Creek Lake Carrying Capacity	4-48
Table 4-14: Alum Creek Lake 2020 Boat Usage.....	4-49
Table 4-15: Variables used to Calculate Boat Ramp Facility Requirements.....	4-51
Table 6-1: Land Classification and Designated Project Areas	6-2
Table 7-1: Resource Plan for the Lake Project	7-3

List of Figures

Figure 1-1: Location of the Alum Creek Lake Project	1-15
Figure 1-2: Recreational Areas and Outgrants in the Alum Creek Lake Project.....	1-21
Figure 3-1: Alum Creek Lake Project Watershed.....	3-3
Figure 3-2: Surface Waters Within the Alum Creek Lake Project	3-9
Figure 3-3: Inundation Areas between Summer Pool Elevation and Flood Control Pool Elevation	3-13
Figure 3-4: NWI-Delineated Wetlands.....	3-17
Figure 3-5: Topography Suitability for Project Development.....	3-21
Figure 3-6: Soils Suitability for Project Development	3-27
Figure 3-7: Gas Well Locations.....	3-29
Figure 3-8: Vegetation and Land Cover	3-35
Figure 3-9: Environmental Sensitive Resources.....	3-49
Figure 4-1: Existing Recreational Areas and Major Facilities.....	4-3
Figure 4-2: Area of Influence	4-27
Figure 4-3: Comparable Recreation Facilities	4-31
Figure 6-1: Land Classification Map	6-7
Figure 7-1: Alum Creek Below Dam Recreation Area Improvements.....	7-7
Figure 7-2: Alum Creek Lake New Galena Boat Ramp and Picnic Area, Existing Conditions	7-9
Figure 7-2a: Alum Creek Lake New Galena Boat Ramp and Parking Improvements, Site Plan	7-11
Figure 7-3: Alum Creek Lake Hollenback Marina and Boat Ramp, Existing Conditions	7-13
Figure 7-3a: Alum Creek Lake Hollenback Boat Ramp and Parking Improvements, Site Plan.....	7-15
Figure 8-1: Potential Utility Corridor Considerations	8-7

List of Photos

Photograph 1-1	Alum Creek State Park	1-18
Photograph 1-2	Alum Creek State Park.....	1-18
Photograph 1-3	Model Airplane Field	1-18
Photograph 1-4	Model Airplane Field	1-18
Photograph 1-5	City of Columbus Pump Station	1-19
Photograph 1-6	Alum Creek Lake Dam	1-23
Photograph 1-7	Alum Creek Lake Dam from Below Dam Recreation Area	1-23
Photograph 3-1	Alum Creek Lake and Dam.....	3-2
Photograph 3-2	Typical Project Topography.....	3-19
Photograph 3-3	View from Scenic Overlook at Hogback Road Access Area.....	3-33
Photograph 4-1	USACE Alum Creek Visitor Center	4-5
Photograph 4-2	Below Dam Recreation Area Facilities.....	4-6
Photograph 4-3	Below Dam Fishing Area.....	4-6
Photograph 4-4	Model Airplane Work Tables and Picnic Shelter	4-7
Photograph 4-5	Sailing Marina.....	4-8
Photograph 4-6	Sailing Marina Activity Center	4-8
Photograph 4-7	Alum Creek Beach	4-9
Photograph 4-8	Beach Comfort Station.....	4-9
Photograph 4-9	Beach Concession Stand Terrace.....	4-9
Photograph 4-10	Beach Bathhouse.....	4-9
Photograph 4-11	Dog Park Beach.....	4-10
Photograph 4-12	Parking Conditions at Dog Park.....	4-10
Photograph 4-13	Hogback Osprey Platform.....	4-11
Photograph 4-14	Hogback Scenic Vista	4-11
Photograph 4-15	Hogback Parking Area	4-11
Photograph 4-16	Equestrian Campground.....	4-12
Photograph 4-17	Entrance to Bridle Trail.....	4-12
Photograph 4-18	Howard Boat Ramp.....	4-12
Photograph 4-19	Howard Parking Area.....	4-12
Photograph 4-20	Kilbourne Fishing Access	4-13
Photograph 4-21	Kilbourne Shoreline Fishing	4-13
Photograph 4-22	COMBO Trails.....	4-14
Photograph 4-23	COMBO Kiosk Display of Trail Map.....	4-14

Photograph 4-24	New Galena Boat Ramp.....	4-15
Photograph 4-25	New Galena Multipurpose Trail.....	4-15
Photograph 4-26	New Galena Disc Golf.....	4-16
Photograph 4-27	New Galena Picnic Area and Shoreline Fishing.....	4-16
Photograph 4-28	Hollenback Marina.....	4-17
Photograph 4-29	Hollenback Marina.....	4-17
Photograph 4-30	Hollenback Boat Ramp.....	4-17
Photograph 4-31	Hollenback Boat Prep Prior to Launch in Parking Lot.....	4-17
Photograph 4-32	Hollenback Marina Breakwater Erosion.....	4-17
Photograph 4-33	ODNR Park Office.....	4-18
Photograph 4-34	Amphitheater.....	4-19
Photograph 4-35	Nature Center.....	4-19
Photograph 4-36	Typical Campsite.....	4-20
Photograph 4-37	Cedar Cabin.....	4-20
Photograph 4-38	Cedar Cabin with Access Ramp.....	4-20
Photograph 4-39	Camper Cabin.....	4-20
Photograph 4-40	Shoreline Fishing.....	4-22
Photograph 4-41	Shoreline Fishing.....	4-22
Photograph 4-42	Boat Fishing on the Lake.....	4-22
Photograph 4-43	Boat Swimming/Camping.....	4-22

List of Appendices

Appendix A: Acronyms and Abbreviations

Appendix B: Bibliography

Appendix C: Public Comments

List of Project Design Memoranda

Number	Title	Date
	Hydrology	October 1966
2	General Design Memorandum	December 1966
3A	Preliminary Master Plan	March 1967
3B	Master Plan, Recreation Site Plan	January 1968
3C	Master Plan, As Constructed	December 1970
4	Real Estate, Reservoir Lands	March 1967
4A	Real Estate, Reservoir, P-II	December 1967
4B	Real Estate, Reservoir, P-III	June 1968
5	Geology & Soils	August 1967

6	Dam, Spillway and Outlet Works	August 1967
7	Concrete Aggregates	October 1967
8	Relocations, Highways and Roads	December 1968
9	Recreation Plan	March 1972
10	Relocations, Power and Telephone	April 1971
11	Relocation, Pipelines	June 1971
12	Sediment Range	January 1978
13	Master Plan Update	April 1984
	Relocations Portion of General Design Memorandum	December 1966

This page intentionally left blank.

1.0 Introduction and Background

This updated Master Plan provides guidance for the use and development of natural and manmade resources at the Alum Creek Lake Project located in Delaware County, Ohio (OH). Alum Creek Lake was impounded by the United States Army Corps of Engineers (USACE) in 1975. The USACE purchased approximately 8,443 acres including the lake, and the area is used for recreation and fish and wildlife enhancement. The Alum Creek Lake Project, which includes Project operation and recreation areas, is referred to as the Project for the purposes of this document.

This Master Plan is intended to guide the USACE in achieving their goal of managing, conserving, and enhancing natural resources while providing quality opportunities for outdoor recreation to the public. This Master Plan was developed in response to regional and local needs, resource capabilities and suitability, and expressed public interests consistent with authorized Project purposes and relevant legislation and regulations.

The Master Plan provides a summary of the purposes and history of the Project; the applicable Federal laws and directives that govern its use; resource objectives; and a detailed analysis of existing natural resources, recreational resources, and land uses. The Master Plan includes projections of future demands for recreational use of the area and a resource use plan so that the Project will continue to meet USACE goals of promoting awareness of the natural environment, adhering to sound environmental stewardship principles, and providing outdoor recreation opportunities for current and future generations in an efficient and effective manner. The Master Plan proposes actions for modifying recreational facilities and wildlife management approaches that are consistent with the USACE's established purposes. A Programmatic Environmental Assessment (PEA) has been prepared to address the potential impacts of the proposed actions.

To facilitate reading this document, a list of acronyms is included as Appendix A, Appendix B contains a bibliography of references used during the planning process, and Appendix C contains the results of the Scoping Meetings.

1.1 Authorization

The Alum Creek Lake Project was authorized for construction by the Flood Control Act of 1962, H.R. 13273, Public Law (PL) 87-874, which was passed by the 87th Congress on October 23, 1962.

1.2 Authorized Project Purposes

The Alum Creek Lake dam was constructed on Alum Creek, a tributary to the Scioto River, to serve several purposes. Authorized purposes are flood risk management, recreation, water supply, and fish and wildlife management.

1.2.1 Flood Risk Management

The Flood Control Act of 1936 recognized that flood risk management was “a proper activity for the Federal Government in cooperation with states, their political subdivisions, and localities thereof.” Congress gave responsibility for Federal flood projects to the USACE. One year later, in 1937, one of the most damaging floods along the Ohio River occurred resulting in part of Cincinnati remaining under water for more than 2 weeks and damage costs exceeded \$20 million (Ohio Historical Society, 2010).

In the years following passage of the law, the USACE built, pursuant to congressional authorization and appropriation, close to 400 reservoirs whose primary benefit was flood risk management. The series of flood risk management reservoirs subsequently constructed by the USACE is estimated to have prevented over \$19 billion in flood damages in the Ohio River Basin since the 1930s (USACE, 2009b). Flood risk management was cited in subsequent Acts including the Flood Control Act of 1962 (PL 87-874) which authorized a number of additional reservoirs including Alum Creek Lake Project.

1.2.2 Recreation

Section 4 of the Flood Control Act of 1944 authorized the Chief of Engineers "...to construct, maintain, and operate public parks and recreational facilities in reservoir areas under the control of (the Secretary of the Army), and to permit the construction, maintenance, and operation of such facilities." The Flood Control Act of 1962 broadened the 1944 authority to include all water resources projects. The Corps has since recognized long-term recreational development as a full-scale project purpose on an equal basis with other established purposes of water resources development

The traditional policy of the USACE has been to encourage non-Federal participation in the administration of recreation opportunities provided at USACE projects. Since 1944, the USACE has entered into leases which permit state and local development and administration of recreation areas at Civil Works projects. The policies were reaffirmed by Congress through the passage of the Federal Water Project Recreation Act of 1965 (PL 89-72). This Act directs "... that ... in investigating and planning any Federal navigation, flood control, reclamation, hydroelectric, or

multipurpose water resource project, full consideration shall be given to the opportunities, if any, which the project affords for outdoor recreation." The Act further defined the basis for sharing the financial responsibilities in joint Federal-non-Federal development, enhancement, and management of recreation and fish and wildlife resources of Federal water projects. However, there are a substantial number of recreation areas which were developed prior to implementing the cost sharing principles of PL 89-72 that continue to be operated directly by the USACE.

Non-consumptive recreation opportunities offered at the Project through leases with the state, county, and other entities include camping, boating, hiking, disc golf, mountain biking, and horseback riding. The Project also provides opportunities for consumptive recreation including fishing and hunting. Recreation areas vary from undeveloped forested land to well developed and extensively used campgrounds.

1.2.3 Water Supply

National policy regarding water supply states that the primary responsibility for water supply rests with states and local entities. The USACE is authorized under the Water Supply Act of 1958 (PL 85-500) to provide storage in multipurpose reservoirs for municipal and industrial water supply and for agricultural irrigation. Some facilities for releasing or withdrawing the stored water can be included in the project structure. The cost of storage and associated facilities must be repaid by the non-Federal sponsor. The Secretary of the Army is authorized to make agreements with states, municipalities and non-Federal entities for the right to storage in USACE reservoirs. Existing USACE projects may be modified to add storage for municipal and industrial water supply. Storage may also be reallocated from other purposes to municipal and industrial uses. Permanent reallocations for irrigation water supply may also be considered in existing projects through the submittal of a Section 216 report (Review of Completed Projects) to Congress. Surplus water can be used to respond to droughts and other emergencies affecting municipal and industrial water supplies.

Water supply for the City of Columbus is drawn from Alum Creek Lake. The water is piped to Hoover Reservoir from a pump station below the dam structure. Del-Co Water Company, which supplies water for many areas of Delaware County, also draws water from the lake at the same intake. There is a separate intake downstream of the lake that is used by the City of Westerville. The total lake allocation for water supply is for up to 40 million gallons per day.

1.2.4 Fish and Wildlife Management

The Fish and Wildlife Coordination Act of 1958, PL 85-624, provides authority to the USACE to modify projects to conserve fish and wildlife resources. The Endangered Species Act of 1973, PL 93-205, provides additional authority for operating projects to protect threatened or endangered fish and wildlife. PL 89-72, The Federal Water Project Recreation Act-Uniform Policies, requires consideration of opportunities for fish and wildlife enhancement in planning water resources projects. Non-Federal bodies are encouraged to operate and maintain the project fish and wildlife enhancement facilities. If non-Federal bodies agree in writing to administer the facilities at their expense, the fish and wildlife benefits are included in the project benefits and project costs are allocated to fish and wildlife. Fees may be charged by the non-Federal interests to repay their costs. If non-Federal bodies do not so agree, no facilities for fish and wildlife may be provided. Fish and wildlife management at Alum Creek Lake is provided by Ohio Department of Natural Resources (ODNR), although there is no designated wildlife area.

1.3 Prior Master Plans

The original Alum Creek Lake Preliminary Master Plan was approved in March 1967 as Design Memorandum (DM) No.3A. The Master Plan was subsequently updated in 1968 and 1970 in DM No. 3B and No.3C respectively. The last update was approved in April 1984 as DM No.13 and this document updates that master plan.

1.4 Application of Public Laws

Development and management of Federal reservoirs are regulated by several laws covering recreation; water resource protection and flood risk management; fish and wildlife resources; forest resources; leases, easements, and rights-of-way; and cultural resources. Decisions about development within USACE controlled areas must abide by the relevant regulations, be consistent with Executive Orders (EOs), and be guided by USACE documents. The following sections provide a summary of relevant laws.

1.4.1 Recreation

Each PL and policy discussed below addresses development and management of recreation facilities on public lands and is pertinent to USACE project lands in central Ohio:

- PL-78-53, *Flood Control Act of 1936* (22 June 1936), authorizes the construction of civil engineering projects such as dams, levees, dikes, and other flood risk management measures through the USACE.

- PL 78-534, *Flood Control Act of 1944* (22 December 1944), authorizes the Chief of Engineers to provide facilities in reservoir areas for public use, including recreation and conservation of fish and wildlife.
- PL 79-526, *Flood Control Act of 1946* (24 July 1946), amends PL 78-534 to include authority to grant leases to non-profit organizations at recreation facilities in reservoir areas at reduced or nominal charges.
- PL 83-780, *Flood Control Act of 1954* (3 September 1954), further amends PL 78-534 and authorizes the Secretary of the Army to grant leases to Federal, State, or governmental agencies without monetary considerations for use and occupation of land and water areas under the jurisdiction of the Department of the Army for park and recreation purposes when in the public interest.
- *Joint Land Acquisition Policy for Reservoir Projects* (Federal Register, [Volume 27, 22 February 1962]), allows the Department of the Army to acquire additional lands necessary for the realization of potential outdoor recreational resources of a reservoir.
- PL 88-578, *Land and Water Conservation Fund Act of 1965* (1 September 1964), prescribes conditions under which the USACE may charge for admission and use of its recreation areas.
- PL 89-72, *Federal Water Project Recreation Act* (9 July 1965), requires sharing of financial responsibilities in joint Federal and non-Federal recreation and fish and wildlife resources with no more than half of the first cost being borne by the Federal government.
- PL 90-480, *Architectural Barriers Act of 1968* (12 August 1968), requires access for persons with disabilities to facilities designed, built, altered, or leased with Federal funds.
- PL 101-336, *Americans with Disabilities Act (ADA)* (26 July 1990) as amended by the *ADA Amendments Act of 2008* (PL 110-325), prohibits discrimination based on disabilities in, among others, the area of public accommodations and requires “reasonable accommodation” to persons with disabilities.
- PL 102-580, *Water Resources Development Act of 1992* (31 October 1992), authorizes the USACE to accept contributions of funds, materials, and services from non-Federal public and private entities to be used in managing recreation facilities and natural resources.
- PL 103-66, *Omnibus Budget Reconciliation Act—Day Use Fees* (10 August 1993), contains provisions by which USACE may collect fees for the use of developed recreation sites and facilities, including campsites, swimming beaches, and boat launching ramps.
- PL 104-333, *Omnibus Parks and Public Lands Management Act of 1996* (12 Nov 96), creates a nine-member advisory Commission to review the current and anticipated demand for

recreational opportunities at lakes and reservoirs managed by the Federal government, and to develop alternatives to enhance the opportunities for such use by the public.

1.4.2 Water Resource Protection and Flood Risk Management

A number of PLs address water resources protection and flood risk management and the integration of these goals with other Project purposes such as recreation. The following are pertinent to USACE project lands in central Ohio:

- PL 74-738, *Flood Control Act of 1936* (22 June 1936), declares flood risk management to be a proper Federal activity.
- PL 78-534, *Flood Control Act of 1944* (22 December 1944), specifies the rights and interests of the States in water resource development and requires cooperation and consultation with State agencies in planning for flood risk management.
- PL 85-500, *Water Supply Act of 1958* (3 July 1958), authorizes the USACE to include municipal and industrial water supply storage in multiple-purpose reservoir projects.
- PL 87-88, *Federal Water Pollution Control Act Amendments of 1961* (20 July 1961), requires Federal agencies to address the potential for pollution of interstate or navigable waters when planning a reservoir project.
- PL 87-874, *Flood Control Act of 1962* (23 October 1962), authorizes the construction of civil engineering projects such as dams, levees, dikes, and other flood risk management measures through the USACE.
- PL 89-80, *Water Resources Planning Act of 1965* (22 July 1965), provides for the optimum development of the Nation's natural resources through coordinated planning of water and related land resources.
- PL 89-298, *Flood Control Act of 1965* (27 October 1965), authorizes the Secretary of the Army to design and construct navigation, flood risk management, and shore protection projects if the cost of any single project does not exceed \$10 million.
- PL 95-217, *Clean Water Act of 1977* (15 December 1977), amends PL 87-88 and requires the United States Environmental Protection Agency (USEPA) to enter into written agreements with the Secretaries of Agriculture, the Army, and the Interior to provide maximum utilization of the laws and programs to maintain water quality.
- PL 99-662, *Water Resource Development Act of 1986* (17 November 1986), establishes cost sharing formulas for the construction of harbors, inland waterway transportation, and flood risk management projects.

1.4.3 Fish and Wildlife Resources

A number of PLs address protection and maintenance of fish and wildlife resources. The following are pertinent to USACE project lands in central Ohio:

- PL 79-732, *Fish and Wildlife Coordination Act* (10 March 1934), provides authority for making project lands available for management by interested State agencies for wildlife purposes.
- United States Code (U.S.C.) 668-668d, 54 Statute 250, *Bald and Golden Eagle Protection Act of 1940* (8 June 1940) as amended, prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald eagles, including their nests or eggs.
- PL 85-624, *Fish and Wildlife Coordination Act* (August 12, 1958), states that fish and wildlife conservation will receive equal consideration with other project purposes and be coordinated with other features of water resources development programs.
- PL 91-190, *National Environmental Policy Act of 1969* (NEPA) (1 January 1970), establishes a broad Federal policy on environmental quality stating that the Federal government will “...assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings...preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety...”
- PL 93-205, *Conservation, Protection, and Propagation of Endangered Species* (28 December 1973), requires that Federal agencies will, in consultation with the U.S. Fish and Wildlife Service, further conservation of endangered and threatened species and ensure that their actions are not likely to jeopardize such species or destroy or modify their critical habitat.
- PL 95-632, *Endangered Species Act Amendments of 1978* (10 November 1978), specifies a consultation process between Federal agencies and the Secretaries of the Interior, Commerce, or Agriculture for carrying out programs for the conservation of endangered and threatened species.
- PL 101-233, *North American Wetland Conservation Act* (13 December 1989), directs the conservation of North America wetland ecosystems and requires agencies to manage their lands for wetland/waterfowl purposes to the extent consistent with missions.
- PL 106-147, *Neo-tropical Migratory Bird Conservation Act* (20 July 2000), promotes the conservation of habitat for neo-tropical migratory birds.

1.4.4 Forest Resources

The following PL pertains to management of forested lands and is pertinent to USACE project lands in central Ohio:

- PL 86-717, *Protection and Improvement of Natural Resources* (6 September 1960), provides for the protection of forest cover in reservoir areas and specifies that reservoir areas of projects developed for flood risk management or other purposes that are owned in fee and under the jurisdiction of the Secretary of the Army and the Chief of Engineers will be developed and maintained so as to encourage, promote, and ensure fully adequate and dependable future resources of readily available timber. Timber production can be implemented through sustained yield programs, reforestation, and accepted conservation practices.

1.4.5 Leases, Easements, and Rights-of-Way

A number of PLs and regulations govern the granting of leases, easements, and rights-of-way on Federal lands. The following are pertinent to USACE project lands in central Ohio:

- U.S.C. Title 10, § 2667, authorizes the lease of land at water resource projects for any commercial or private purpose not inconsistent with other authorized project purposes.
- U.S.C. Titles 10, 16, 30, 32, and 43, address easements and licenses for project lands.
- U.S.C. Title 16, § 460d, authorizes use of public lands for any public purpose, including fish and wildlife, if it is in the public interest.
- U.S.C. Title 16, § 470h-3, *National Historic Preservation Act*, for historic property.
- U.S.C. Title 16, § 663, *Impoundment or Diversion of Waters* (10 March 1934), for wildlife resources management in accordance with the approved general plan.
- U.S.C. Title 16, § 2601-13, supports Project Partnership Agreements or other cost share agreements.
- U.S.C. Title 30, §§ 181-263, *Mineral Leasing Act of 1920* (25 February 1920), promotes the mining of coal, oil, and gas on the public domain and specifies conditions of leasing agreements.
- U.S.C. Title 30, § 351-359, *Mineral Leasing Act for Acquired Lands* (7 August 1947), provides that minerals subject to the *Mineral Leasing Act of 1920* that are located on acquired Federal lands are subject to the Federal mineral leasing system.

- PL 91-631, *Mining and Minerals Policy Act* (28 April 1971), specifies the Federal policy for economically sound development of domestic mining.
- PL 91-646, *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970* (2 January 1971), establishes a uniform policy for fair and equitable treatment of persons displaced as a result of Federal or federally assisted programs.
- PL 94-579, *Federal Land Policy and Management Act of 1976* (FLPMA) (21 October 1976) establishes a policy that the Federal government receive fair market value for the use of the public lands and their resources unless otherwise provided for by statute. It provides for the inventory of public land and land use planning and establishes the extent to which the Executive Branch may withdraw lands without legislative action.
- PL 95-87, *Surface Mining Control and Reclamation Act* (SMCRA) (3 August 1977), regulates surface mining and requires permits and inspections.

1.4.6 Cultural Resources

A number of PLs mandate the protection of cultural resources on public lands. The following are pertinent to USACE project lands in central Ohio:

- PL 59-209, *Antiquities Act of 1906* (8 June 1906), applies to the appropriation or destruction of antiquities on federally owned or controlled lands and has served as the precedent for subsequent legislation.
- PL 74-292, *Historic Sites Act of 1935* (21 August 1935), declares that it is a national policy to preserve for public use historic sites, buildings, and objects of national significance for the inspiration and benefit of the people of the U.S.
- PL 86-523, *Reservoir Salvage Act of 1960* (27 June 1960), provides for the preservation of historical and archaeological data which might otherwise be lost as the result of the construction of a dam and attendant facilities and activities.
- PL 89-665, *National Historic Preservation Act of 1966* (NHPA) (15 October 1966), establishes a national policy of preserving, restoring, and maintaining cultural resources. It requires Federal agencies to take into account the effect an action may have on sites that may be eligible for inclusion on the National Register of Historic Places.
- PL 93-291, *Archaeological and Historic Preservation Act of 1974* (24 May 1974), amends PL 86-523 and provides for the Secretary of Interior to coordinate all Federal survey and recovery activities authorized under this expansion of the *Reservoir Salvage Act of 1960*.

The Federal construction agency may expend up to 1 percent of project funds on cultural resource surveys.

- PL 96-95, *Archaeological Resources Protection Act of 1979* (31 October 1979), updates PL 59-209 and protects archaeological resources and sites on public lands and fosters increased cooperation and exchange of information among governmental authorities, the professional archaeological community, and private individuals.
- PL 101-601, *Native American Graves Protection and Repatriation Act* (16 November 1990), requires Federal agencies to return Native American human remains and cultural items, including funerary objects and sacred objects, to their respective peoples.

1.4.7 Executive Orders

Executive Orders are issued by the President of the United States and do not require Congressional approval. The following are pertinent to USACE project lands in central Ohio:

- EO 11514, *Protection and Enhancement of Environmental Quality* (5 March 1970), outlines the responsibilities of Federal agencies in consonance with NEPA. EO 11514 was amended by EO 11991 in 1977.
- EO 11593, *Protection and Enhancement of Cultural Environment* (13 May 1971), outlines the responsibilities of Federal agencies in consonance with NHPA, NEPA, the Historic Sites Act, and the Antiquities Act.
- EO 11644, *Use of Off-Road Vehicles on Public Lands* (8 February 1972), establishes a uniform Federal policy regarding the use of vehicles such as trail bikes, snowmobiles, dune buggies, and others on public lands.
- EO 11988, *Flood Plain Management* (24 May 1977), requires Federal agencies to take actions to reduce the risk of flood loss and to restore and preserve the natural and beneficial functions of floodplains.
- EO 11989, *Off-Road Vehicles on Public Lands* (24 May 1977), amends EO 11644 and authorizes Federal agencies to close areas or trails to off-road vehicles that cause adverse effects to soil, vegetation, wildlife, wildlife habitat, and cultural or historical resources.
- EO 11990, *Protection of Wetlands* (24 May 1977), restricts Federal agencies from taking actions that would destroy or modify wetlands when there is a practicable alternative.
- EO 11991, *Relating to Protection and Enhancement of Environmental Quality* (24 May 1977), amends EO 11514 by directing the Council of Environmental Quality to issue guidance to Federal agencies for implementing procedural provisions of NEPA.

- EO 12088, *Federal Compliance with Pollution Control Standards* (12 Oct 1978), requires all Federal agencies to be in compliance with environmental laws and fully cooperate with USEPA, State, interstate, and local agencies to prevent, control, and abate environmental pollution. EO 12088 was amended by EO 12580 in 1987. EO 12088 was amended by EO 12777 in 1991, EO 13016 in 1996, and EOs 13286 and 13308 in 2003.
- EO 12962, *Recreational Fisheries* (7 June 1995), directs Federal agencies to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities. EO 12962 was amended by EO 13373 in 2008 and EO 13474 in 2008
- EO 13112, *Invasive Species* (3 February 1999), directs each Federal agency to prevent the introduction of invasive species, to detect and respond rapidly to and control populations of invasive species in a cost-effective and environmentally sound manner, to monitor invasive species populations accurately and reliably, and to provide for restoration of native species and habitat conditions in ecosystems that have been invaded.
- EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds* (10 January 2001), directs Federal agencies, pursuant to its Memorandum of Understanding with the US Fish and Wildlife Service, to support the conservation intent of migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the greatest extent practicable, adverse impacts on migratory bird resources.
- EO 13327, *Federal Real Property Asset Management* (4 Feb 2004), promotes the efficient and economical use of Federal real property resources in accordance with their value as national assets and in the best interest of the nation. EO 13327 was amended by EO 13423 in 2007.
- EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management* (24 Jan 2007), instructs Federal agencies to conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically, and fiscally sound, integrated, continuously improving, efficient, and sustainable manner.
- EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance* (5 Oct 2009), expands on the energy reduction and environmental performance requirements for Federal agencies identified in EO 13423 and requires Federal agencies to make reductions in greenhouse gas emissions (GHG).

1.5 Purpose of the Master Plan

The purpose of this Master Plan is to provide guidance for the preservation, conservation, restoration, maintenance, management, and development of Project lands, waters, and associated resources. The Master Plan is intended to aid responsible stewardship of Project resources for the benefit of present and future generations. The Master Plan evaluates the present use and future potential of those resources and recommends strategies for the future management and development of those resources. Because this Master Plan is conceptual in nature, it identifies conceptual types and levels of activities, not designs and exact locations.

The Master Plan is based on responses to regional and local needs, resource capabilities and suitability, and expressed public interests that are consistent with authorized Project purposes and pertinent legislation and regulations. The Master Plan provides a USACE District-level policy consistent with national objectives and other State and regional goals and programs. Future actions by the USACE and by the agencies and individuals granted leases or licenses for use of Project lands must be consistent with the Master Plan. The Master Plan is distinct from the project-level implementation emphasis of the Operational Management Plan (OMP). Policies in the Master Plan are guidelines that will be implemented through provisions of the OMP, specific DM, and other planning mechanisms.

The broad intent of this Master Plan is to:

- Determine appropriate uses and levels of development for Project resources;
- Provide a framework within which the OMP and other planning mechanisms can be developed and implemented; and
- Establish a basis on which outgrants and recreational development proposals can be evaluated.

1.6 Scope of the Master Plan

This Master Plan includes guidance for appropriate uses, development, enhancement, protection, and conservation of the natural, cultural, and built resources of the Project. The Master Plan has eight sections and three appendices:

- Section 1 – Introduction and Background
- Section 2 – Public Involvement, Coordination and Partnerships
- Section 3 – Resource Analysis
- Section 4 – Recreation Program Analysis
- Section 5 – Resource Use Objectives
- Section 6 – Land Allocation and Classification
- Section 7 – Resource Plan
- Section 8 – Special Programs
- Appendix A: Acronyms and Abbreviations
- Appendix B: References
- Appendix C: Public Comments

1.7 Project Description

1.7.1 Location

The Alum Creek Lake dam is located on Alum Creek in Delaware County, Ohio, approximately 3.5 miles north of the city limits of Columbus, Ohio and about 26 miles upstream from the confluence of Alum Creek with Big Walnut Creek. It is 157 miles from the mouth of the Scioto River.

Interstate 71 (I-71) borders the southeast portion of the Project area and also provides access to Columbus, Ohio. State Route (SR) 36 bisects the Project into north and south sections. Figure 1-1 shows the location of the Project in the State of Ohio as well as major highways and urban areas within the Project area.

Lewis Center Road and S. Old State Road provide access to the Project on the southwestern side of the lake and Africa Road provides access to the various recreation areas throughout the Project on the southeastern side of the lake. N. Old State Road provides access to the Project on the northwestern side of the lake and a combination of Howard Road, Hogback Road, and SR 521 provide access to the Project on the northeast side of the lake.

1.7.2 History of the Project

Following the disastrous January 1959 flood, Congress passed the Flood Control Act of 1962. The Act increased the number of authorized Scioto River Basin projects to include Alum Creek, Mill Creek, and Salt Creek Reservoirs. Deer Creek and Paint Creek Lakes were built many years later under authority of the Flood Control Act of 1938. Big Darby and Rocky Fork Lakes were authorized by the same act, although the State of Ohio funded the construction of Rocky Fork Lake. Eventually, Alum Creek Lake was completed in 1975 by the USACE, and several years later the Big Darby, Salt Creek, and Mill Creek Lake projects were deactivated.

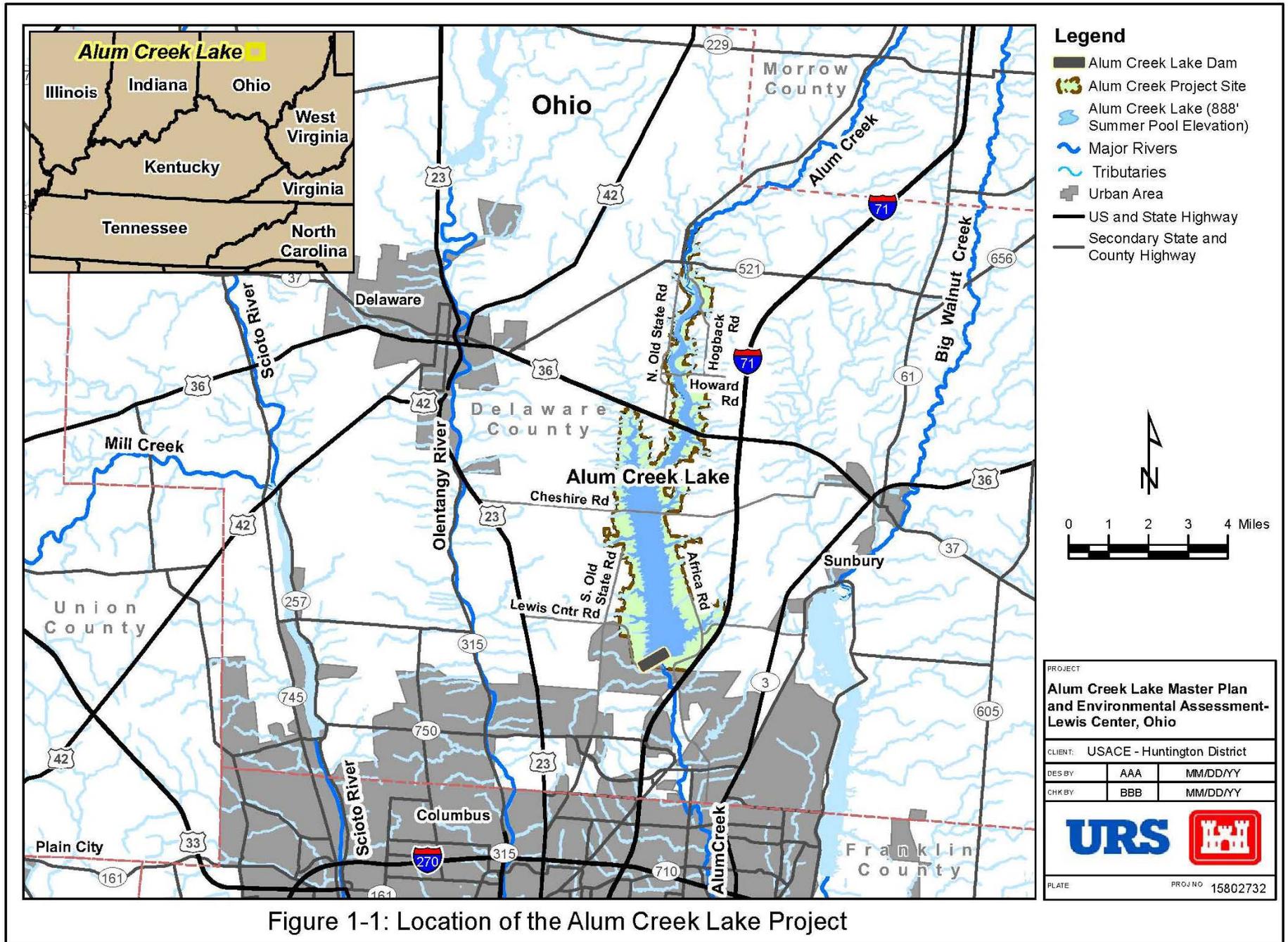


Figure 1-1: Location of the Alum Creek Lake Project

This page intentionally left blank.

1.7.3 Land Acquisition History

The Federal government purchased the land and fully funded the construction and operation of the Project. The acquisition criteria for Alum Creek Lake were based on the minimum requirements as prescribed by the 1962 Joint Land Acquisition Policy. The DM No.2, the General Design Memorandum, included 2,400 acres of additional real estate for recreational purposes, which was also confirmed by the needs identified in the DM No. 3A, Preliminary Master Plan. The acquisition criteria were based upon fee acquisition of 300 feet of land along the shore at maximum flood elevation of 901 feet National Geodetic Vertical Datum (NGVD). Lake surface water elevations are measured in feet above mean sea level using the NGVD, which is a standard that was developed in 1929 for measuring vertical distances. Minor deviations from the full 300-foot acquisition limit were proposed where highways or property lines intervened with the outer limits of the margin. It was deemed unnecessary to increase the 5-foot vertical freeboard allowance. DM No. 4, 4A, and 4B provide details to the real estate acquisition. DM No. 6 recommended development of the dam site and construction area.

1.7.4 Federal Areas and Recreational Facilities

There are three areas managed by the USACE: the Below Dam Recreation Area, the Dam Site, and the Visitor Center/Office Area.

Table 1-1: Federal Recreation Areas and Outgrant Areas

Name of Area	Acreage	Managing Agency	Major Facility/Activities
Visitor Center/Office Area	7	USACE	Hiking, exhibits, interpretive area
Dam Site	36.94	USACE	Operational structures, physical fitness activities
Below Dam Recreation Area	35	USACE	Picnicking, fishing
Alum Creek State Park	8,017	ODNR	Boating, picnicking, fishing, hunting, camping, horseback riding, hiking, biking
Model Airplane Field	9.5	Westerville Model Aeronautics Association (WMAA)	Model airplane flying, picnicking
Del-Co Water Company	4.5	Del-Co Water Company	Water treatment plant
City of Columbus	0.6	City of Columbus	Pump station

1.7.5 Outgrants

An outgrant is the written interest granted to an entity or individual that allows that entity or individual to make use of government property through lease, license, easement, or permit. Outgrants typically establish a timeframe, conditions, and restrictions on the use of the property.

Some outgrants are issued through lease agreements, which are contracts between the USACE and another party. One outgrant for the recreation areas has been established at the Project through a lease agreement.

Ohio Department of Natural Resources: A lease (DACW69-1-76-121 [1 June 1975]) was granted to the ODNR that began in 1975 for 50 years for public park, recreational, fish and wildlife, and forest management purposes (see Photographs 1-1 and 1-2). The lease provides for the management of 8,017 acres of land and water. Additionally, ODNR has agreements with various entities for development of recreation areas throughout the Project which are discussed in Section 4.



Photographs 1-1 and 1-2: Alum Creek State Park

Other outgrants are established by licenses that grant authority to an agency to enter or use land for a specific purpose without having ownership in it.

Westerville Model Aeronautics Association: (WMAA): A license (DACW69-3-09-1051) was issued to the WMAA for 9.5 acres of land for the purposes of developing and maintaining a model airplane field (see Photographs 1-3 and 1-4).



Photographs 1-3 and 1-4: Model Airplane Field

Outgrants are also issued for easements that grant the right to use property for a specific purpose. The easement is itself a real property interest, but legal title to the underlying land is retained by the USACE.

Del- Co Water Company: An easement (DACW69-2-82-0152) was issued for a 4.5 acre site for the water treatment plant.

City of Columbus: An easement for the location of a pump station was issued to the City of Columbus, OH (see Photograph 1-5).



Photograph 1-5: City of Columbus Pump Station

The federal recreation and outgrant areas at the Project are listed previously in Table 1-1 and the location of each of the federal recreation areas and outgrant areas are shown on Figure 1-2.

This page intentionally left blank.

This page intentionally left blank.

1.7.6 Project Data/Lake Operations

The Alum Creek Dam (see Photograph 1-6) is a rolled earth-filled dam with a concrete gravity channel section. The top width of the dam is 20 feet and crest length is 10,200 feet. The stream bed elevation at the dam is 820 feet NGVD. The top elevation of the dam is 913 feet NGVD.



Photograph 1-6: Alum Creek Lake Dam

The Alum Creek Dam structures include a conduit type outlet works and a controlled spillway, a short access road, an operations building with a parking area, and a gauging station.

- The spillway is a gated concrete spillway located in the channel section of the dam. The crest elevation is 878 feet NGVD and an overall length of 118 feet. The spillway consists of three tainter gates that are 34 feet wide by 25 feet high, supported by 8 foot piers (see Photograph 1-7). A 60-inch diameter low-flow conduit discharges into the stilling basin and a 60-inch diameter water supply pipe extends to the downstream pumping and treatment facilities. The spillway is designed for a peak outflow of 61,500 cubic feet per second.



Photograph 1-7: Alum Creek Lake Dam from Below Dam Recreation Area

Table 1-2 presents information regarding Project structures.

Table 1-2: Project Structures

Dam	
Type	Rolled, earth-fill with a concrete gravity channel section
Top length	10,020 feet
Top width	20 feet
Stream bed elevation	820 feet NGVD
Top elevation	913 feet NGVD
Spillway	
Type	Gated, concrete, in channel section of dam
Crest elevation	878 feet NGVD
Length	118 feet
Outlet Works	
Type/size	Conduit/60" diameter
Tainter Gates	3 tainter gates, 34 feet wide by 25 feet high

1.7.7 Lake Regulation

During the months of April through November (summer pool), the target surface elevation of the lake is 888 feet NGVD. At this elevation, the surface area of the lake is 3,387 acres. Actual lake levels fluctuate constantly. During the winter, when the target surface elevation of the lake is 885 feet NGVD, the surface area is slightly smaller. During periods of flooding, the elevation of the lake may be as high as 901 feet NGVD. Table 1-3 shows how the surface area and shoreline (perimeter) of the lake change as elevations change.

Table 1-3: Alum Creek Lake Surface Water Elevations

Lake Level Description	Elevation(feet NGVD)	Surface Area(acres)	Shoreline (miles)
Minimum	841.5	348	
Winter Pool (December – March)	885.0	3,105	
Summer (April – November)	888.0	3,387	45.6
Maximum Flood Control Pool	901.0	4,852	80

1.7.8 Visitation Data

USACE uses the Visitor Estimation Reporting System (VERS) to report the annual number of visits to recreation areas in the Project area. In 1991, magnetic loop counters were installed at the Project for counting visitor vehicles. These counters are located at the Visitor Center/Office Area, Below Dam Recreation Area, Model Airplane Field, and all major Alum Creek State Park Areas.

Table 1-4 presents visitation data estimates to the Project area from 2000 to 2009. A visit represents the entry of one person into a recreation area. As shown in Table 1-4, visitation during this period was highest in Fiscal Year (FY) 2001, when there were an estimated 3.6 million visitors to the Project area. The number of visitors subsequently decreased until FY 2003 and then spiked in FY 2004. Since FY 2005, the estimated number of visitors has remained fairly consistent. Approximately 2.9 million visits were made during FY 2009 to the Project area.

Table 1-4: Visitation Data, FY 2000 – 2009

Fiscal Year	Project Visitation
FY 2000	2,933,200
FY 2001	3,598,775
FY 2002	3,235,133
FY 2003	3,043,985
FY 2004	3,465,120
FY 2005	3,138,997
FY 2006	2,892,215
FY 2007	2,888,187
FY 2008	2,936,890
FY 2009	2,874,282

This page intentionally left blank.

2.0 PUBLIC INVOLVEMENT, COORDINATION AND PARTNERSHIPS

Public involvement is critically important to the success of the overall master planning effort. The public involvement effort related to developing this Master Plan occurred in August 2009, providing the public, stakeholders, and public agencies opportunities to participate in defining the Project needs and study objectives.

2.1 Public Meeting

A public meeting and three stakeholder meetings were held on 11 August 2009 during the scoping phase of the Master Plan. The White House Council on Environmental Quality defines scoping as "... an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action" (Title 40 Code of Federal Regulations [CFR] 1501.7). The scoping process is used to invite public participation, identify issues, and obtain public comments in the Master Plan formulation process. The public meeting conducted at the USACE Visitor Center at Alum Creek Lake contributed to the understanding of key project issues and to formulating the resource use objectives presented in Section 5. Three stakeholder meetings were also held on 11 August 2009 at the USACE Visitor Center at Alum Creek Lake. A more detailed summary of comments provided by the public and invited stakeholders is included within Appendix C.

2.2 Identified Key Issues

The following summarizes the key issues identified for consideration in the master planning process based on the scoping process, including the public meeting and three stakeholder meetings. Based on comments received during the meetings, there is public interest in the following topics related to recreational use of the Project:

- Improve quality and increase quantity of boat launches.
- Provide more boat docks; slips at the marina, including sailboat slips; restrooms at marina facilities; and mooring fields.
- Provide better launch access for canoes and kayaks.
- Develop additional mountain bike trails to meet the growing demand.
- Improve connectivity of walking, jogging, and biking trails to existing community facilities.
- Evaluate the carrying capacity of the lake and conflict of usage between different user groups.

- Concerns about shoreline erosion issues.
- Need for additional group picnic shelters.
- Significant urbanization and population growth in the region is exerting significant pressure on Alum Creek resources, specifically recreational needs.
- Increase ADA accessibility throughout the Project.
- Provide additional parking at boat launches, bank fishing access points, and Visitor Center.
- Provide additional area for boat anchorage and swimming while enforcing no-wake zones.
- Provide picnic areas in the northern portion of the Project.
- Develop a shelter at the overnight camping area for the bridal trailhead.
- Increase patrols to improve water safety.
- Develop population control plans for geese and deer.
- Provide better erosion control at the marina and at the tailwaters.
- Ensure an adequate water supply for existing and future communities, while maintaining long-term water quality.
- Concerns about funding, manpower, and facility maintenance needs for infrastructure rehabilitation.
- There is a proposed new power boat marina on the southeast side of the lake that would create 100 new boat slips and provide fuel.
- A winter recreation area has been proposed adjacent to the existing Monarch butterfly visitation area.
- There is a desire by the USACE for the ODNR to develop a timber management plans to be used on their outgrant.
- There is a community desire to develop an interpretive structure or exhibit for the Africa Community in the Dam Site Recreational Area.

Comments also included discussion of the following topics related to the Project:

- Concern was raised over the need for additional water supply to meet the needs of growing communities and population increases around Columbus, Ohio. Participating agencies are considering new reservoirs, additional water treatment plants, and other engineering projects to meet the future demand. Drought contingency plans should be developed for severe drought conditions to potentially utilize water from Alum Creek Lake.
- There is concern over the security of the water supply in the Columbus region.
- Regional watershed planning is being initiated to address a projected regional increase in water demand.

- There has been strong public interest in the dog park and the mountain biking trails, which are both volunteer maintained and operated.

2.3 Consistency with Other Agencies

The goals and objectives of the USACE for recreation at the Alum Creek Lake Project are consistent with those of other agencies that provide or plan for recreation in the area based on a review of existing planning documents prepared by the State of Ohio and those applicable Federal agencies, including:

- ODNR *Ohio Statewide Comprehensive Outdoor Recreation Plan (SCORP)* (ODNR, 2008);
- ODNR, Division of Wildlife *Ohio Comprehensive Wildlife Conservation Strategy (OWCS) “Action Plan 2001-2010,”*(ODNR, Division of Wildlife, 2005);
- ODNR, Division of Real Estate and Land Management *Trails for Ohioans: A Plan for the Future* (ODNR, Division of Real Estate and Land Management, 2005);
- USEPA *Recreational Fishery Resources Conservation Plan Agency Action Plan* (USEPA, 1996);
- U.S. Department of Agriculture (USDA) *Conservation Education Strategic Plan to Advance Environmental Literacy* (USDA, Forest Service, 2007);
- USDA Forest Service *2000 Renewable Resources Planning Act (RPA) Assessment of Forest and Range Lands* (USDA, Forest Service, 2000); and
- National Park Service (NPS) *Rivers, Trails and Conservation Assistance Program Strategic Plan* (NPS, 2005).

Shared goals among these plans and agencies include:

- Provision of high quality opportunities for recreation such as a system of hiking trails as encouraged by *Trails for Ohioans: A Plan for the Future*;
- Good stewardship of the land;
- Restoration of ecological corridors and natural habitats for conservation of wildlife; and
- Preservation of cultural, natural, and historical resources.

Shared goals also provide approaches for achieving desired ends, including: monitoring outcomes, encouraging public involvement, coordination among government entities, and developing partnerships with public, private, and non-profit entities to develop, manage, and maintain resources. Given the commonalities in goals established by State and Federal agencies, the USACE will continue to work in concert with these State and Federal agencies, stakeholders,

local government, the public, and other interested parties to enhance recreational opportunities and to support wildlife management and protection goals.

Additionally, the Mid-Ohio Regional Planning Commission (MORPC) is facilitating the balanced growth planning process, by bringing communities in a watershed together to plan for land uses that protect areas while encouraging cost-effective development to accommodate future growth with emphasis on conserving natural and agricultural areas. The Upper Scioto Watershed has developed their planning partnership and the MORPC is working with individual partnerships to determine the unique role it will play in the watershed's balanced growth planning process. Each partnership will develop its balanced growth plan with guidance provided by the MORPC.

Table 2-1 lists some of the goals stated in plans developed by other agencies that are consistent with the Project's purposes.

Table 2-1: Shared Recreation and Environmental Conservation Goals

PLAN	GOAL				
	Recreational Opportunity Enhancement	Stewardship of the Land	Restoration of Ecological Corridors	Restoration of Habitats	Preservation of Natural, Historical, and Cultural Resources
Ohio Statewide Comprehensive Outdoor Recreation Plan	✓				✓
Ohio Comprehensive Wildlife Action Plan			✓	✓	
Trails for Ohioans: A Plan for the Future	✓	✓			✓
EPA – Recreational Fishery Resources Conservation Plan Agency Action Plan		✓		✓	✓
USDA – Conservation Education Strategic Plan to Advance Environmental Literacy	✓				✓
USDA – Forest Service 2000 Renewable Resources Planning Act		✓			✓
NPS – Rivers, Trails and Conservation Assistance Program Strategic Plan					✓

2.4 Coordination and Partnerships

As the objectives of the ODNR and Delaware County overlap with objectives of the USACE, these organizations work in partnership with the USACE at the Project. The ODNR Division of

Geological Survey and the Division of Watercraft have offices located within the boundaries of the Project. The ODNR Division of Parks oversees the activities at the Hollenback Boat Ramp and Marina, Alum Creek Lake State Park campground, the beach area, the boat ramps, and additional recreation sites throughout the Project to ensure that quality recreational facilities are maintained at the Project. The other entities that partner with the USACE at the Project include the Westerville Model Aeronautics Association.

Additional partnerships exist between the State of Ohio and various organizations for recreation areas located throughout the Project. The partnerships with the state include the Ohio Horseman's Council, Inc., Central Ohio Mountain Bike Organization (COMBO), Friends of Alum Creek Dog Park, and the Alum Creek Sailing Association (ACSA).

The lake and authorized hunting areas are patrolled by the ODNR Natural Resources Officers who enforce Chapter 1501 laws and regulations.

Public safety is a goal shared by Federal, State, and local government agencies. The OMP for the Project states that, depending upon the situation that threatens public safety, Project staff should contact the Delaware County Sheriff's Department or the Ohio State Police.

This page intentionally left blank.

3.0 RESOURCE ANALYSIS

This section of the Master Plan presents an analysis of existing conditions of physical and natural resources at the Project. The information in this section is intended to facilitate a better understanding of the natural resource capabilities, suitability, and constraints relative to future Project development and natural resource-related management activities and to support development of the resource objectives and subsequent land classification decisions.

3.1 Physical Environment

The discussion of the physical environment of the Project area includes the following natural resources:

- Surface water;
- Wetlands;
- Groundwater;
- Physiography and topography;
- Geology, soils and minerals;
- Historic and pre-historic resources; and
- Scenic elements.

Existing conditions of each of these natural resources are described in the subsections below, followed by a brief analysis of the suitability of that resource for Project development.

3.1.1 Surface Water

Surface water includes water sources that are present at the ground surface. For the Project area, surface waters include Alum Creek Lake (see Photograph 3-1), associated tributary streams, and the tailwater area downstream of the dam.

3.1.1.1 Existing Conditions

Streams

The approximately 8,400-acre Alum Creek Lake Project is located in Delaware County, Ohio on Alum Creek, which is a tributary of Big Walnut Creek. Alum Creek is approximately 56 miles long and flows north to south through Morrow and Delaware Counties, merging into Big Walnut Creek in Franklin County. Big Walnut Creek flows into the Scioto River and eventually into the Ohio River (Friends of Alum Creek & Tributaries [FACT]) 2005). The Project area is

approximately 27 miles upstream from the confluence of Alum Creek and Big Walnut Creek (see Figure 3-1).



Photograph 3-1: Alum Creek Lake and Dam

The Alum Creek Dam is the only USACE dam on Alum Creek, providing flood risk management and controlling the downstream flow to maintain a sufficient water supply (see Photograph 3-1). The dam is located at river mile 26.7. The dam as well as all of the lake lies within Delaware County (see Figure 3-1). The lake receives runoff from a 123 square mile drainage basin and the lake’s watershed represents only a small portion of the total Scioto River Basin regional watershed, which drains approximately 3,196 square miles of land. The drainage areas of Alum Creek and its principal tributaries are presented in Table 3-1.

Table 3-1: Drainage Areas of the Alum Creek and Principal Tributaries

Stream	Location	River Mile	Area (square miles)
Alum Creek	Above mouth of Indigo Creek	42.7	28.4
Indigo Creek	Mouth	42.7	4.5
Alum Creek	Below mouth of Indigo Creek	42.7	32.9
Alum Creek	Above mouth of West Branch	41.5	35.8
West Branch	Mouth	41.5	29.1
Alum Creek	Below mouth of West Branch	41.5	64.9
Alum Creek	Above mouth of Big Run	31.3	89.5
Big Run	Mouth	31.3	11.5
Alum Creek	Below mouth of Big Run	31.3	101.0
Alum Creek	Alum Creek Dam	26.0	123.0

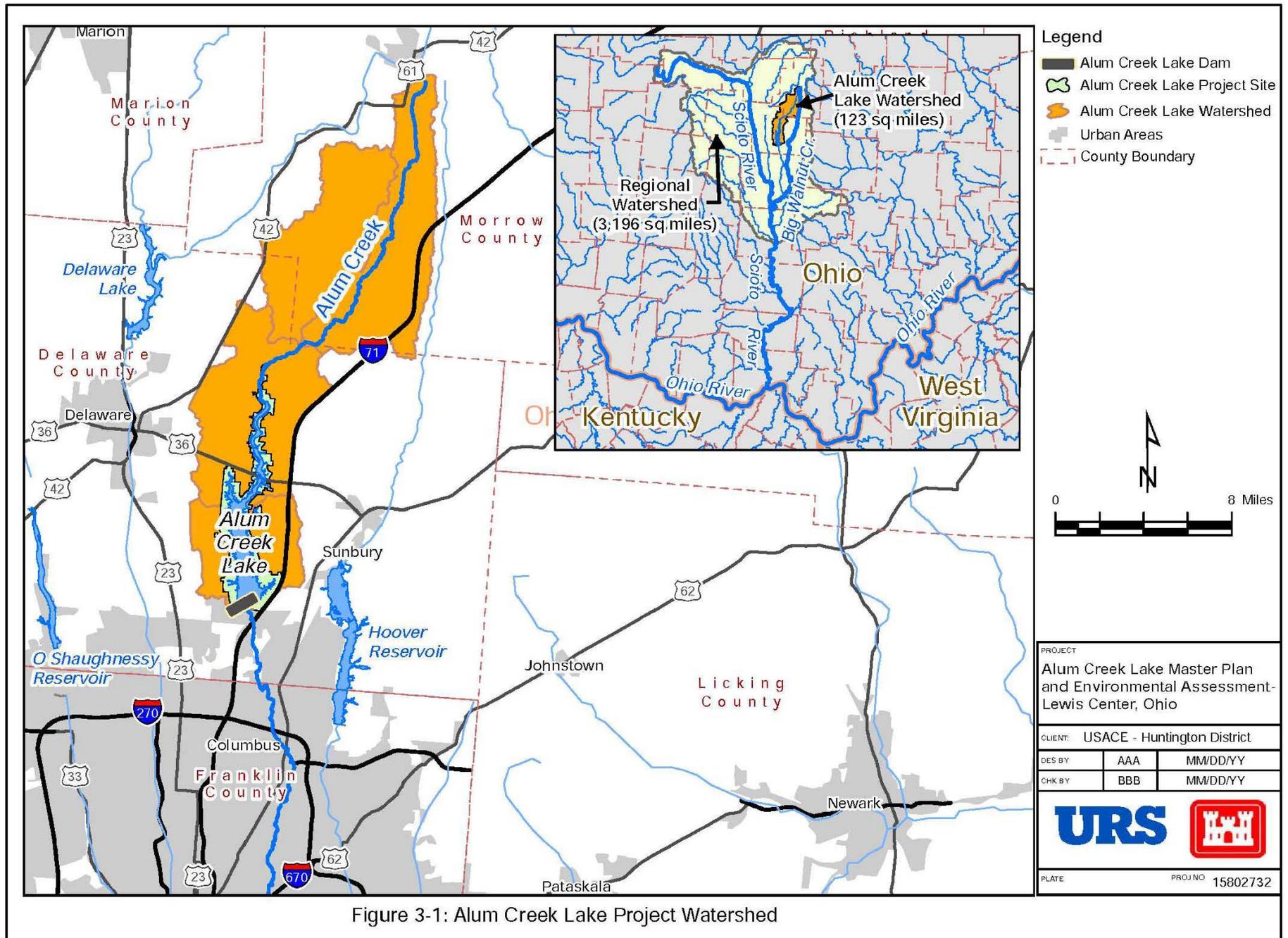


Figure 3-1: Alum Creek Lake Project Watershed

This page intentionally left blank.

Alum Creek Lake

Alum Creek Lake is formed by the dam, the topographical features of the area, and the tributaries, creeks, and streams that discharge into Alum Creek above the dam and within the Project boundary. The surface of Alum Creek Lake measures approximately 3,390 acres and is approximately 10.5 miles long with a mean breadth of 2,700 feet in the main portion of the lake during the normal summer pool elevation of 888 feet NGVD. Water depths in the lake vary from 5 to 60 feet with an average depth of 25 to 35 feet.

Approximately 2,920 acres of the lake are designated for unrestricted boat speeds, except within 200 feet of the shoreline where no-wake zones are delineated, and approximately 470 acres are restricted to idle speed. The lake extends along Alum Creek with a short arm extending up Big Run on the west side of the lake. Especially during summer pool elevation, the lake shoreline has numerous small ravines and channels that create many coves along the 46 miles of shoreline, some of which are utilized as boater's swim areas. Figure 3-2 shows the locations of the no wake zones and also identifies the coves that are designated as boater's swim areas.

Water supplies for both Delaware County and Franklin County are obtained from the O'Shaughnessy Reservoir on the Scioto River, Alum Creek Lake on Alum Creek, and the Hoover Reservoir on Big Walnut Creek. The Delaware County Water Company, Inc. (Del-Co) utilizes the Project to provide water to a portion of Delaware County. Alum Creek Lake supplies 1.8 million gallons of water per day to a population of approximately 10,560. The capacity at the water treatment plant is approximately 3.4 million gallons per day (Ohio State University Extension, Fact Sheet, 2010). The City of Columbus also utilizes water from Alum Creek Lake. The water is pumped to the Hoover Reservoir from a pump station that is part of the Alum Creek dam. Water is only pumped from Alum Creek Lake for augmentation purposes when the Hoover Reservoir falls below a certain level.

Tailwater Area

The tailwater area is located immediately downstream of the dam where the outflow from the lake is discharged. Water is released from the lake through an intake structure and passes through a tunnel to emerge as outflow. This system allows withdrawal from various water depths and offers a considerable range of choices for outflow rates and other water parameters, including temperature. A minimum flow can be maintained in times of drought in order to enhance water quality of the downstream reach of Alum Creek.

Water Quality

The area above Alum Creek Lake is largely used for agricultural purposes and water quality conditions generally reflect agricultural pollution from fertilizers, insecticides, and herbicides.

The Ohio EPA uses two broad designations for water quality criteria when evaluating waterways: aquatic life and non-aquatic life uses. Non-aquatic life uses include recreation, human health, and water supply. The Ohio EPA utilizes biological, chemical, and physical criteria to create measurable properties that can be compared to goals specified by each designation.

The Ohio 2010 Integrated Water Quality Monitoring and Assessment Report (IR) identifies and rates four beneficial uses for each watershed assessment unit in the state of Ohio. The Alum Creek Dam-Alum Creek and the Big Run-Alum Creek watershed units were noted as impaired for aquatic life and recreation in 2008 and 2010. Causes for impairment related to aquatic life for the watershed units are direct habitat and flow alterations and nutrients associated with the following sources: channelization of agriculture, non-irrigated crop production, and removal of riparian vegetation. Overall, the watershed assessment units in the Project area have a low priority (0 or 1 point) on the 2010 Section 303(d) List of Prioritized Impaired Waters (Ohio EPA, 2010).

Water quality conditions in Alum Creek Lake for human contact are monitored under the Bathing Beach Monitoring Program of the Ohio Department of Health (ODH). For 2011, the U.S. Geological Survey (USGS) Ohio Water Science Center is performing monitoring on behalf of ODH at Alum Creek Lake. The USGS collects bi-weekly lake water samples at two locations that are transmitted to the ODH for analysis for *E. coli* bacteria levels. If levels are determined to exceed state standards, a second sample may be taken and analyzed to confirm the exceedance. If sampling indicates that bacteria levels present a potential health risk to persons coming into contact with the water, including for recreational purposes such as swimming, the ODH director recommends to the ODNR Division of Parks and Recreation that signs advising the public against swimming due to the bacteriological conditions should be posted. These signs are advisory only and do not mandate beach or lake closure.

Sampling is normally performed during the bathing season extending from approximately Memorial Day to Labor Day. Testing results for 2011 at the two Alum Creek Lake sampling locations (identified by ODH as "Alum Creek--Main" and "Alum Creek--Camp") are presented in Table 3-2.

Table 3-2: 2011 Bacteriological Data for Alum Creek Lake

Sampling Date	Number of Colony Forming Units per 100 ml Lake Water ¹	
	Main Sampling Location	Camp Sampling Location
7/3/11	150	1
7/2/11	4	5
7/1/11	93	8
6/27/11	--	3
6/26/11	14	--
6/25/11	12, 10, 21	3, 6
6/24/11	6	16
6/20/11	28	15
6/19/11	201, 71	26
6/18/11	57.3	51.2
6/17/11	3.1	20.1
6/13/11	19.9	13.5
6/12/11	38.8	13.5
6/11/11	160	170
6/10/11	184.2	24.1
6/4/11	16.1	--
6/3/11	7.1	13.5
5/28/11	42	190.4
5/27/11	129.1	261.3

¹Advisories are posted when the number of colony forming units per 100 ml exceeds 235.
Source: Ohio Department of Health

Based on the sampling data for 2011, it can be seen that there is high variability in the bacteria levels found in the lake, but that levels have met state standards on all sampling occasions except one. Consequently, it can be concluded that water quality conditions in Alum Creek Lake generally support recreational activities that involve contact with lake waters. No water quality parameters that affect the taking or consumption of fish from the lake are monitored by any governmental agencies.

The Friends of Alum Creek & Tributaries (FACT) is the active watershed group in the Project area. The group commissioned the Lower Alum Creek Watershed Action Plan in 2005, which focuses on actions to generally improve the water quality of the portion of Alum Creek south of the Alum Creek reservoir, a total distance of 27 miles. The group has active projects to remove low head dams from the waterway, as well as programs to monitor water quality and trash removal.

This page intentionally left blank.

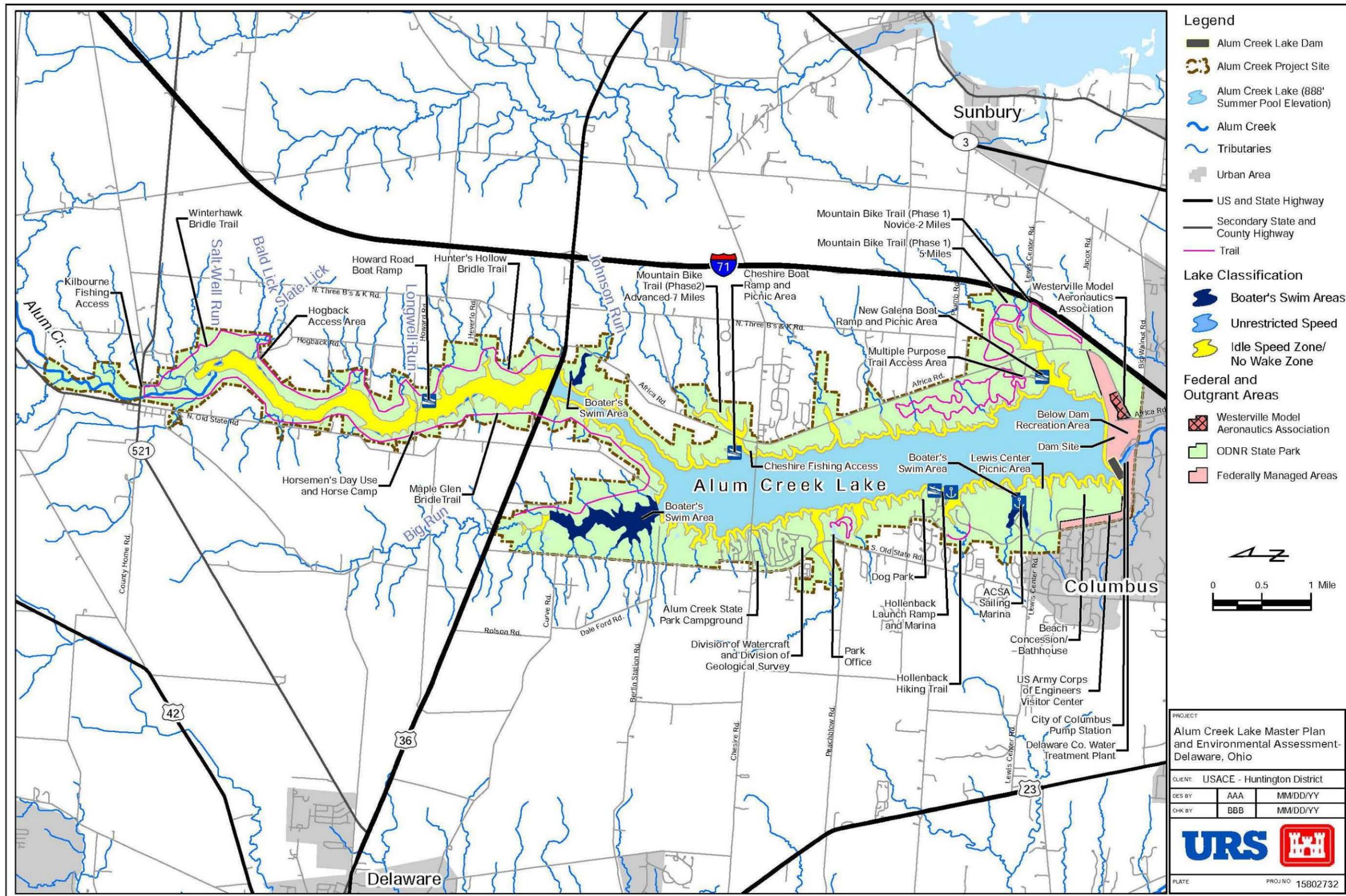


Figure 3-2: Surface Waters Within the Alum Creek Lake Project

This page intentionally left blank.

3.1.1.2 Implications of Surface Water Resources for Project Development

While there are variations in lake level throughout the year, the USACE is generally able to maintain a relatively constant summer pool elevation that is suitable and conducive to recreational boating. Summer flooding of the land above the recreational summer pool elevation of 888 feet NGVD is possible, but the majority of flooding instances occur during the winter and spring months. Due to the relatively large surface area of the lake and the small watershed, fluctuations of the lake surface elevation are relatively minor, making the lake conducive to water related recreational use.

The size and depth of the lake, along with the quality of the water, make the lake well suited for motorized and non-motorized boating (e.g. canoes and kayaks) and associated water recreation activities, such as waterskiing. Larger, wider expanses of the lake are more suitable for motorized boats and sailboats, while coves and narrower reaches of the lake lend themselves to non-motorized boating activities. The size and accessibility of the lake also supports the need for marina and boat launch facilities such as those provided at the Hollenback Boat Ramp and Marina, New Galena Boat Ramp, Cheshire Boat Ramp, Howard Road Boat Ramp, the Sailboat Marina, and the boat ramps at the Alum Creek State Park Campground.

The lake water quality is suitable for swimming, which is permitted along the shoreline at the beach. The coves along the lake provide additional opportunities for swimming from boats and overnight boating activities. The designated boater's swim areas are located in the coves that extend up Big Run, Johnson Run, and in the cove near the Sailboat Marina (see Figure 3-2).

Fishing is a popular recreational activity at the lake. The lake and tailwater area support a diverse population of fish and aquatic life due to good water quality, large surface area, and adequate depth. A shoreline that exceeds 46 miles during summer pool elevation offers extensive opportunities for anglers.

One of the primary authorized purposes of the Alum Creek Lake Project is flood risk management. The Project area around the lake is designed to store floodwaters to reduce flood risk downstream. Figure 3-3 shows inundation areas between the summer pool elevation of 888 feet NGVD and the maximum flood control pool elevation of 901 feet NGVD. Based on Figure 3-3, the northernmost portions of the lake, including Alum Creek Lake near SR 521 and the Big Run branch, experience the most significant inundation due to flooding. The areas immediately surrounding the lake are susceptible to moderate inundation due to flooding which limits future Project development in close proximity to the lake in some locations.

Table 3-3 presents the impacts of various lake elevations on recreation areas within the Project boundary. As indicated in the table, impacts become apparent three feet above the summer pool elevation of 888 feet NGVD. As mentioned above, the lake reaches its flood control pool at elevation 901 feet NGVD.

Table 3-3: Project Impacts Based on Lake Elevation

Elevation (feet NGVD)	Project Impacts
865 (below)	Cheshire, Marina, and New Galena Boat Ramps closed
873 (below)	Campground boat ramp closed
878 (below)	Beach closed (water 300' from guard towers)
882 (below)	Howard Boat Ramp closed
883 (below)	Campground beach closed
885	Winter Pool Elevation
888	Summer Pool Elevation
891 (above)	Beach closed
895 (above)	North Camp Road closed
895.5 (above)	Hogback Road closed
896 (above)	Marina unusable
896.5 (above)	New Galena, Cheshire, and Hollenback Boat Ramps closed
898 (above)	Marina building begins flooding

Source: USACE Water Control

According to Section 2.2.1 of the USACE Engineering Manual (EM) 1110-1-400 (2004), a good general guideline for planning purposes is to construct lakeside development above the five-year flood frequency level where possible. This criterion may limit project development opportunities in some locations, but there are numerous lands within the project in relative close proximity to the lake that will not be impacted by the five year flood frequency level.

3.1.2 Wetlands

The USACE and USEPA jointly define wetlands as areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. In general terms, wetlands can be described as the transition zone between upland and aquatic ecosystems. Regulations require that a site must have suitable hydrology and must contain hydric soils and predominantly hydrophytic vegetation to be classified as a wetland. Functionally, wetlands are important

This page intentionally left blank.

landscape features because they hold and slowly release floodwater and snow melt. Another function of wetlands is to act as filters to cleanse surface water of impurities, recycle nutrients, and trap sediment. Because these areas tend to be wet, have exposure to sunlight, and are highly fertile, wetlands support a diverse composition of flora and fauna.

3.1.2.1 Existing Conditions

According to U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps, approximately 125 acres of wetlands exist within the Project area. The NWI maps are a generalized series of maps that give approximate locations of wetland areas using existing sources of information such as soil surveys, previous wetland recordings, and site observations. NWI mapping shows that wetlands mapped in the Project area tend to occur mainly in the southeast and northern portion of the Project, are primarily isolated and scattered, and consist of relatively small areas typically averaging less than three acres in size. However, at the northern end of the Alum Creek branch near SR 521, the wetland areas are fairly broad, covering approximately 105 acres of the floodplain of Alum Creek. The locations of the approximately 125 acres of potential jurisdictional wetlands in the Project area are shown in Figure 3-4. Table 3-4 provides information about the different types of wetlands.

Table 3-4: Wetlands Present in Project Area

Wetland Type	Abbreviation	Number of Sites	Approximate Total Acreage
Palustrine, emergent, temporary or seasonally flooded wetland	PEM	15	17.29
Palustrine, forested, broad-leaved deciduous, temporarily or seasonally flooded wetland	PFO	33	99.72
Palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded wetland	PSS	7	8.33

3.1.2.2 Implications of Wetland Resources for Project Development

Under EO 11990, Federal agencies, including the USACE, are tasked with the responsibility to preserve and enhance wetland resources. Wetlands can represent both a constraint and an opportunity in regard to project development. Wetlands are a constraint because they are a sensitive environmental resource which should be preserved, and this requirement limits development opportunities for high intensity/density recreational activities. In the case of this Project area, the large intact wetland areas located along Alum Creek at the north end near SR 521 are within the Alum Creek floodplain and will limit development potential in this area. The remaining wetland areas are scattered throughout the Project, and due to the scattered and

isolated nature of these wetlands, as well as their small size, they should be easily avoided and should pose minimal constraints to project development opportunities.

However, as an opportunity, the wetlands found in the Project provide specialized habitat for select flora and fauna that would not otherwise thrive in this locale. Wetlands can provide potential recreational opportunities such as wildlife viewing, bird watching, and interpretive and educational activities due to the diverse wildlife associated with them. Wetlands can also support target game species and waterfowl, thereby supporting consumptive recreational uses.

Prior to the implementation of any proposed Project development recommendations that could affect wetlands, wetland delineations would need to be conducted, potential wetland impacts evaluated, including mitigation for unavoidable impacts, and water quality certification obtained from the OEPA, as necessary.

3.1.3 Groundwater

Groundwater is subsurface water situated in geologic units called aquifers, which are recharged by precipitation and infiltration of surface waters. Groundwater is used for potable water supply and other domestic and industrial uses through public and private wells in areas not serviced by a surface water distribution system.

3.1.3.1 Existing Conditions

Alum Creek Lake Project lies in the central portion of Delaware County where an aquifer comprised of the Devonian and lower Mississippi Systems formations typically provides poor water yields of less than five gallons per minute (gpm). This is largely due to heavy clays which overlay the impermeable shale bedrock. Water under the shale is generally not tapped because it may be high in sulfur, hydrogen sulfide, and iron (ODNR, 2005a). There are no known groundwater wells within the Project boundary.

3.1.3.2 Implications of Groundwater Resources for Project Development

Due to low water yields and the potential for dissolved minerals and odors, groundwater is not a viable resource to provide potable water for development at the Project. Any future development will require connection to the existing water distribution system.

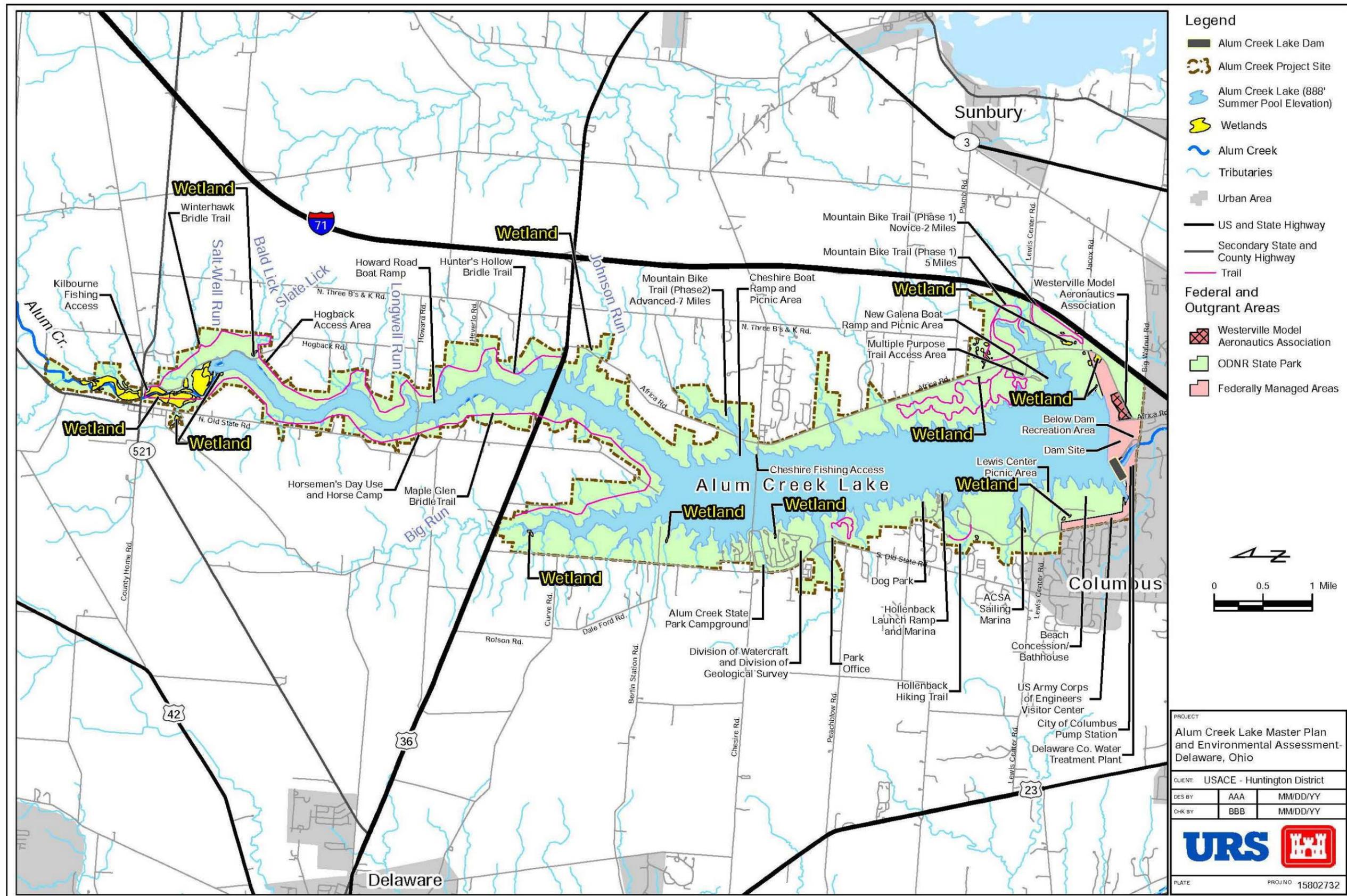


Figure 3-4: NWI-Delineated Wetlands

This page intentionally left blank.

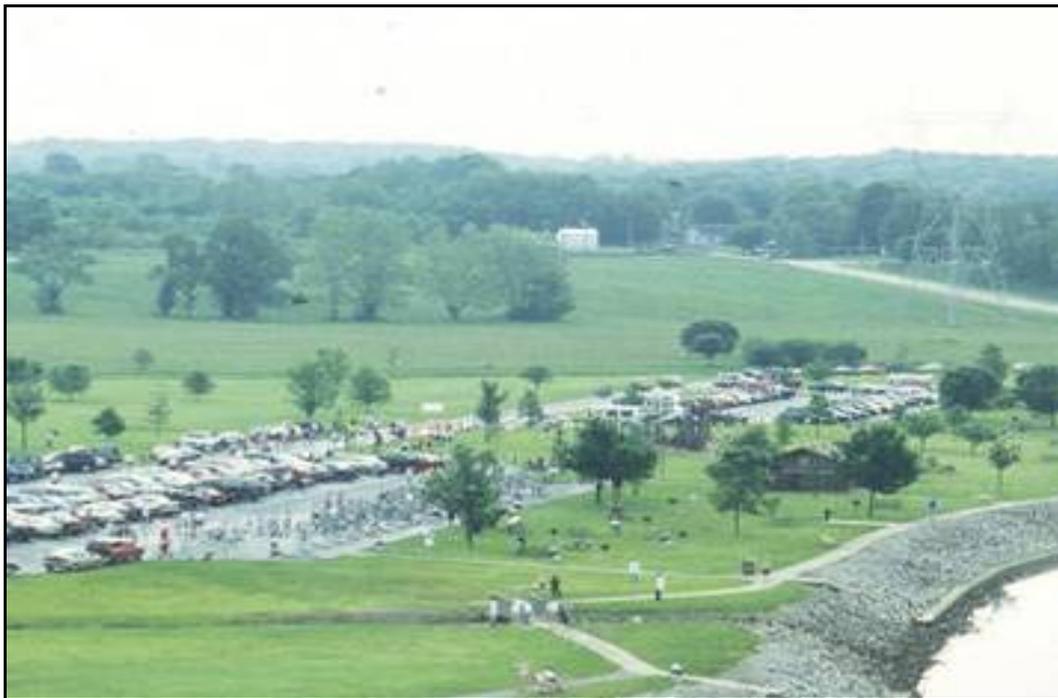
3.1.4 Physiography/Topography

The physical features of the earth's surface are described in terms of physiography (landforms) and topography (elevation, slope, and orientation).

3.1.4.1 Existing Conditions

The Project is located in the Till Plains Section of the Central Lowlands Province of the Scioto River Basin. The topography of Alum Creek Lake is characterized by level plains transitioning to gently rolling terrain with glacial drift mantling the bedrock and filling the preglacial valleys (ODNR, 2005b). Elevations in the Project range from approximately 850 feet NGVD directly below the dam to 920 feet NGVD on the higher slopes at the northern end of the Project area.

Locations along some of the larger coves and in the northern portion of the Project area above US 36/SR 37 have limited development potential per USACE Publication EM 1110-1-400 (2004), which recommends avoiding development in areas with greater than 15 percent slope. Approximately 75 percent of the Project area below US 36/SR 37 consists of slopes that are less than 15 percent (see Photograph 3-2).



Photograph 3-2: Typical Project Topography

3.1.4.2 Implications of Physiography/Topography for Project Development

The Project topography is generally flat and suited for recreational development. Steeper slopes greater than 15 percent are typically associated with incised ravines and the lake shoreline above US 36/SR 37.

Areas with slopes less than 15 percent have the highest development potential relative to topography and provide opportunities for higher intensity recreational development. Slopes between 15 percent and 30 percent have more limited project development potential, but can provide interesting and challenging opportunities for hiking, mountain biking, hunting, and wildlife or scenic viewing, as well as other opportunities if properly integrated with site topography. Areas with slopes in excess of 30 percent typically have very limited Project development potential, but do provide wildlife habitat and visual buffers, and add scenic quality to the overall Project.

Because construction costs typically increase as grade increases, development of higher intensity recreational facilities are usually planned for sites with minimal slope if such sites are available. Based on information presented in Figure 3-5, the area of the Project with the highest development potential based solely on topographic considerations is situated south of US 36/SR 37. This is supported by the fact that most of the Project's existing higher intensity developed recreation areas are located in this reach of the Project. The northern portion of the Project, to the north of US 36/SR 37, has numerous sites with slopes exceeding 30 percent, although there are a few large tracts of land that have more moderate slopes. Due to these slope limitations, the northern portion of the Project appears least suitable for higher intensity recreation use. The southern portion of the Project appears to have substantial areas that are suitable for development based on topography, but inundation of those gently sloping areas adjacent to Alum Creek Lake and tributaries may be a limiting factor (refer to Figure 3-3). Flooding and wet soils are potentially significant constraints in locations with no or minimal slopes, as discussed in greater detail in Section 3.1.5, Geology, Soils, and Minerals.

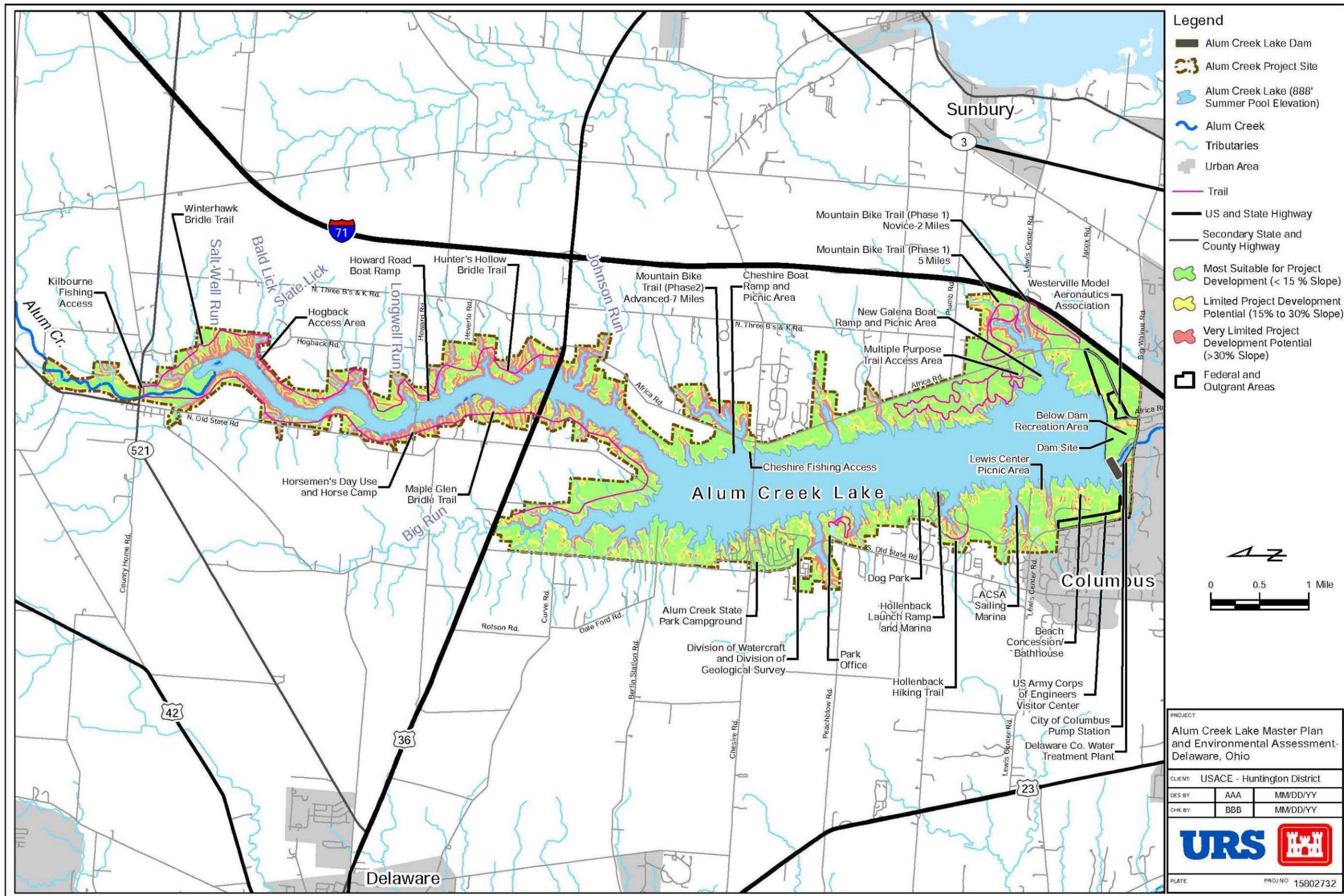


Figure 3-5: Topography Suitability for Project Development

This page intentionally left blank.

3.1.5 Geology, Soils, and Minerals

This section describes the geologic setting, soil characteristics, and mineral resources in the Project area.

3.1.5.1 Existing Geology and Soil Conditions

Delaware County, part of the Upper Scioto River Basin, is underlain by sedimentary rocks such as limestone, shale, and sandstone. The oldest exposed rocks are from the Silurian age, created about 400 million years ago. The youngest rocks are about 350 million years old. Continental glaciers that spread over much of the Project area during the Pleistocene transported huge loads of debris consisting of boulders, cobbles, pebbles, sand, silt, and clay that were deposited as the ice melted. These deposits are generally called glacial drift. Materials in the drift were derived from the bedrock and soils over which the glaciers passed. There are three primary soil deposits found in the Project area which include till, ground moraines, and lacustrine deposits. Till is a particular type of drift made of a compact and heterogeneous mass of unsorted sand, silt, clay, pebbles, cobbles, and a few boulders. Ground moraines are a till-mantled land surface that is relatively smooth and has little topographic relief. Most of Delaware County consists of ground moraines. Silts and clays that settled out of glacial melt water are classified as lacustrine deposits and these only occur in a few low terraces along Alum Creek. The land surface in this region is poorly drained and has a dendritic drainage pattern.

According to the 2006 Soil Survey of Delaware County, Ohio (USDA and National Resources Conservation Service [NRCS], 2006), 15 different groupings of soils occur at the Project. These soil groupings are listed in Table 3-5, along with the suitability and limitations of these soil types and slopes for recreational development. Figure 3-6 categorizes the soil types identified in Table 3-4 into three groups: (1) most suitable for project development; (2) limited project development potential; and (3) least suitable for project development.

Based on the information from Table 3-5, the Cardington, Gallman, Glynwood, and Lobdell soils provide the best opportunity for development because they are the only units classified as “most suitable” or “limited suitability.” These soil units occur in broad areas between the ravines associated with small creeks that flow into Alum Creek Lake. The Farmland Protection Policy Act of 1981 (7 U.S.C. §§ 4201-4209) established the policies that are intended to minimize conversion of valuable farmland to non-agricultural uses. The National Resources Conservation Service (NRCS) has classified specific soil types as prime or unique agricultural soils. The prime farmland soils, which include Cardington, Gallman, Glynwood, and Lobdell, are located along Alum Creek and the lake.

Table 3-5: Soils in Order of Predominance

Symbol	Soil Type	Typical Slopes (%)	Suitability Based on Slope and Soil Type
CaB, CaC2	Cardington silt loam	2-12	Limited Project Development Potential. Unsuitable (too wet) for lawn or landscaping; camping or playground areas; small buildings; or septic tank absorption field. Somewhat suitable for picnicking, trails, and golf fairways. Poorly suited for roads due to low strength and frost action.
GwB, GwC2	Glynwood silt loam	2-12	Limited Project Development Potential. Unsuitable (too wet) for lawn or landscaping; camping or playground areas; small buildings; or septic tank absorption field. Somewhat suitable for picnicking, trails, and golf fairways. Poorly suited for roads due to low strength and frost action.
BeA, BeB	Bennington silt loam	0-4	Least Suitable for Project Development. Unsuitable (too wet) for lawn or landscaping; trails or golf fairways; camping, picnicking, or playground areas; small buildings; or septic tank absorption field. Poorly suited for roads due to low strength, wetness, and frost action.
LbF	Latham-Brecksville complex	25-70	Least Suitable for Project Development. Unsuitable (slope) for lawn or landscaping; trails or golf fairways; camping, picnicking, or playground areas; small buildings; or septic tank absorption field. Poorly suited for roads due to low strength, wetness, and frost action.
AmD2, AmE, AmF	Amanda silt loam	12-50	Least Suitable for Project Development. Unsuitable (slope) for lawn or landscaping; trails or golf fairways; camping, picnicking, or playground areas; small buildings; or septic tank absorption field. Poorly suited for roads due to low strength and slope.
LyD2, LyE2	Lybrand silt loam	12-25	Least Suitable for Project Development. Unsuitable (too steep) for lawn or landscaping; for trails or golf fairways; for camping, picnicking, or playground areas; small buildings; or septic tank absorption field. Poorly suited for roads due to low strength, slope, and frost action.
SkA, SnA, SoA	Sloan silt loam	0-2	Least Suitable for Project Development. Unsuitable (due to ponding) for lawn or landscaping; trails or golf fairways; camping, picnicking, or playground areas; small buildings; or septic tank absorption field. Poorly suited for roads due to ponding, flooding, and frost action.
LoA, LsA	Lobdell silt loam	0-2	Limited Project Development Potential. Unsuitable (too wet) for lawn or landscaping; camping, picnicking, or playground areas; small buildings; or septic tank absorption field. Somewhat suited for trails or golf fairways. Poorly suited for roads due to flooding and frost action.
BoA, BoB	Blount silt loam	0-4	Least Suitable for Project Development. Unsuitable (too wet) for lawn or landscaping; for trails or golf fairways; camping, picnicking, or playground areas; small buildings; or septic tank absorption field. Poorly suited for roads due to low strength, wetness, and frost action.

Table 3-5: Soils in Order of Predominance

Symbol	Soil Type	Typical Slopes (%)	Suitability Based on Slope and Soil Type
GaC2, GbA, GbB	Gallman loam, loamy substratum	0-12	Most Suitable for Project Development. Suitable for lawn or landscaping; trails or golf fairways; camping and picnicking; small buildings; or septic tank absorption field. Very limited for playground development. Suitable for roads, although there is moderate slope and frost action.
PwA	Pewamo silty clay loam	0-1	Least Suitable for Project Development. Unsuitable (ponding) for lawn or landscaping; trails or golf fairways; camping, picnicking, or playground areas; small buildings; or septic tank absorption field. Poorly suited for roads due to low strength, ponding, and frost action.
CnA	Condit silt loam	0-1	Least Suitable for Project Development. Unsuitable (ponding) for lawn or landscaping; trails or golf fairways; camping, picnicking, or playground areas; small buildings; or septic tank absorption field. Poorly suited for roads due to low strength, ponding, and frost action.
JmA	Jimtown silt loam	0-2	Least Suitable for Project Development. Unsuitable (too wet) for lawn or landscaping; trails or golf fairways; camping, picnicking, or playground areas; small buildings; or septic tank absorption field. Poorly suited for roads due to frost action and wetness.
HeF	Heverlo silt loam	25-70	Least Suitable for Project Development. Unsuitable (slope) for lawn or landscaping; trails or golf fairways; camping, picnicking, or playground areas; small buildings; or septic tank absorption field. Poorly suited for roads due to low strength and slope.
MfA	Millgrove silt loam	0-2	Least Suitable for Project Development. Unsuitable (ponding) for lawn or landscaping; or golf fairways; camping, picnicking, or playground areas; small buildings; or septic tank absorption field. Poorly suited for roads due to ponding and frost action.

Source: USDA and NRCS, 2006

3.1.5.2 Existing Mineral Resources

There is no record of any extraction of sand and gravel deposits along Alum Creek. Surveys have indicated that there are no coal deposits on or near the Project. A review of oil and natural gas wells at the Project recorded several abandoned and/or plugged wells within the Project boundary. However, there are no active oil or natural gas wells currently operating within the Project boundary. Figure 3-7 shows the locations of both active and abandoned oil and natural gas wells located in the Project vicinity.

The Federal government owns all mineral rights within the Project boundary.

3.1.5.3 Implications of Geology, Soils, and Mineral Resources for Project Development

Geology and Soils

The landform of the Project area, particularly south of US 36/SR 37, is essentially flat to gently rolling with slopes suitable for development. Throughout the Project area, the two major factors that could limit project development are slope and wetness or ponding. While the majority of the soils south of US 36/SR 37 are suitable for development in terms of slope, there are large areas that are classified as “least suitable” for project development due to severe wetness and ponding. Larger expanses of these areas are located near the Below Dam Area, to the east near the Westerville Model Airfield area, and just northeast of the New Galena boat ramp. The remaining soils in the area south of US 36/SR 37 are identified by NRCS as “limited” for project development. These soils can support construction of roadways, trails, or small buildings or for development of camping, picnicking, playground areas, or lawns. These soils may be suitable for lower and/or higher intensity recreation use such as hiking trails, picnicking, camping, and playgrounds. Based on the soil data, the locations identified as "limited" for project development possess soil types GaC2/GbA/GbB, CaB/CaC2, GwB/GwC2, or LoA/LsA. Based on Figure 3-6, these soil associations become more scattered and sparse in the northern portion of the Project area, but are fairly prevalent south of US 36/SR 37.

To more thoroughly evaluate Project development potential, soil suitability, topography (steepness of slope), inundation frequency, and access should all be considered together with environmental factors. It should also be noted that the soils classified as most suited or limited for project development are also those classified as prime or unique agricultural soils. The potential utilization of these areas for open field or meadow habitat could be considered for habitat and wildlife enhancement, thereby providing the capability to support recreation activities such as hunting and wildlife viewing.

Minerals

Because the demand for oil and/or natural gas is increasing, there is potential for new extraction operations for minerals in the Project area. Oil and/or natural gas are leasable minerals governed by the Mineral Leasing Act of 1920 (30 U.S.C. §§ 181-263) and the Mineral Materials Act of 1947 (30 U.S.C. §§ 351 et seq.).

Since the Federal government owns all subsurface mineral rights on Project lands, any future resource extraction would proceed through the Bureau of Land Management (BLM). The BLM would coordinate any new leases with the USACE to avoid or minimize impacts to recreational, natural, or sensitive resources associated with access road and extraction site development.

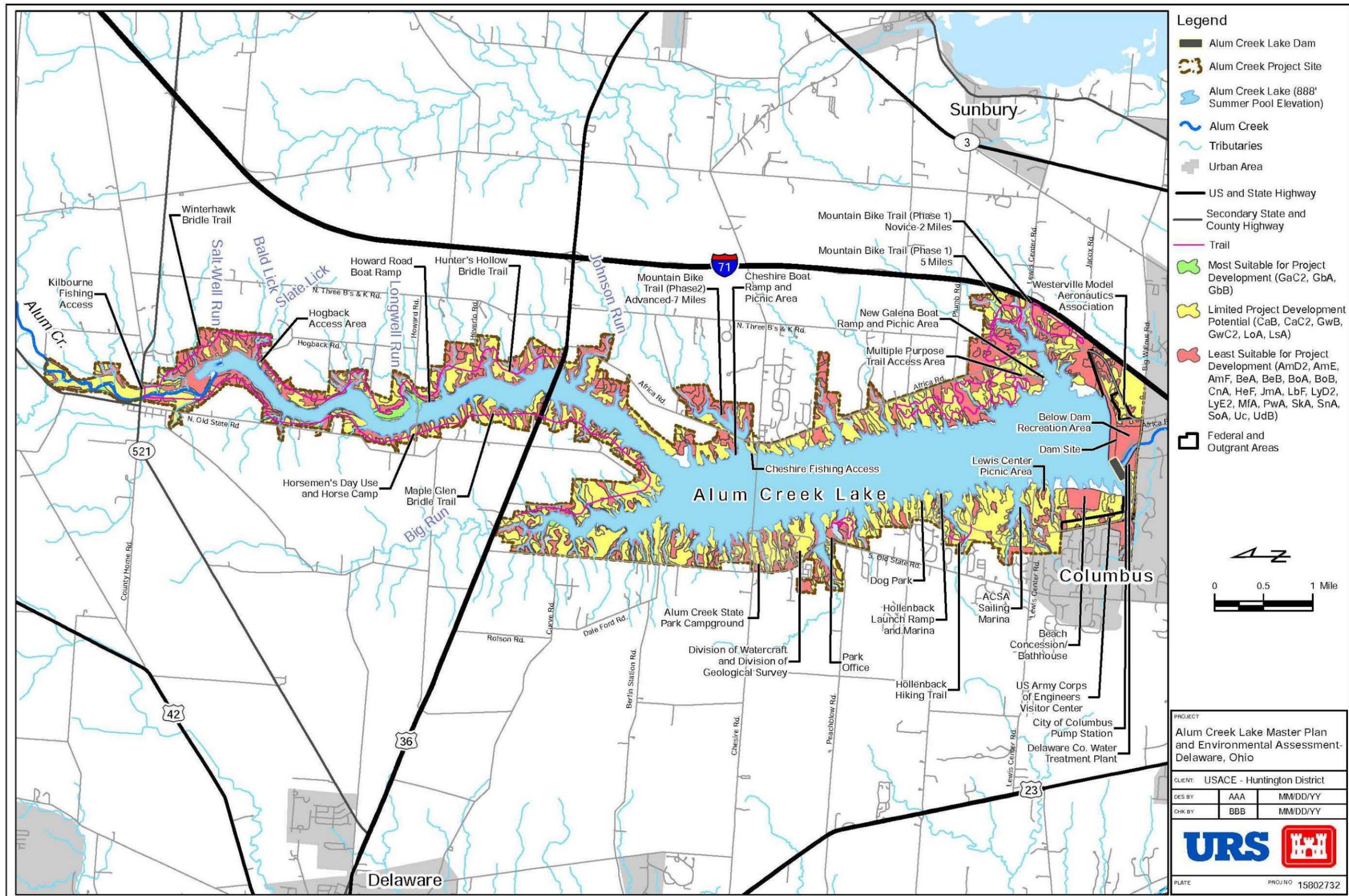


Figure 3-6: Soils Suitability for Project Development

This page intentionally left blank.

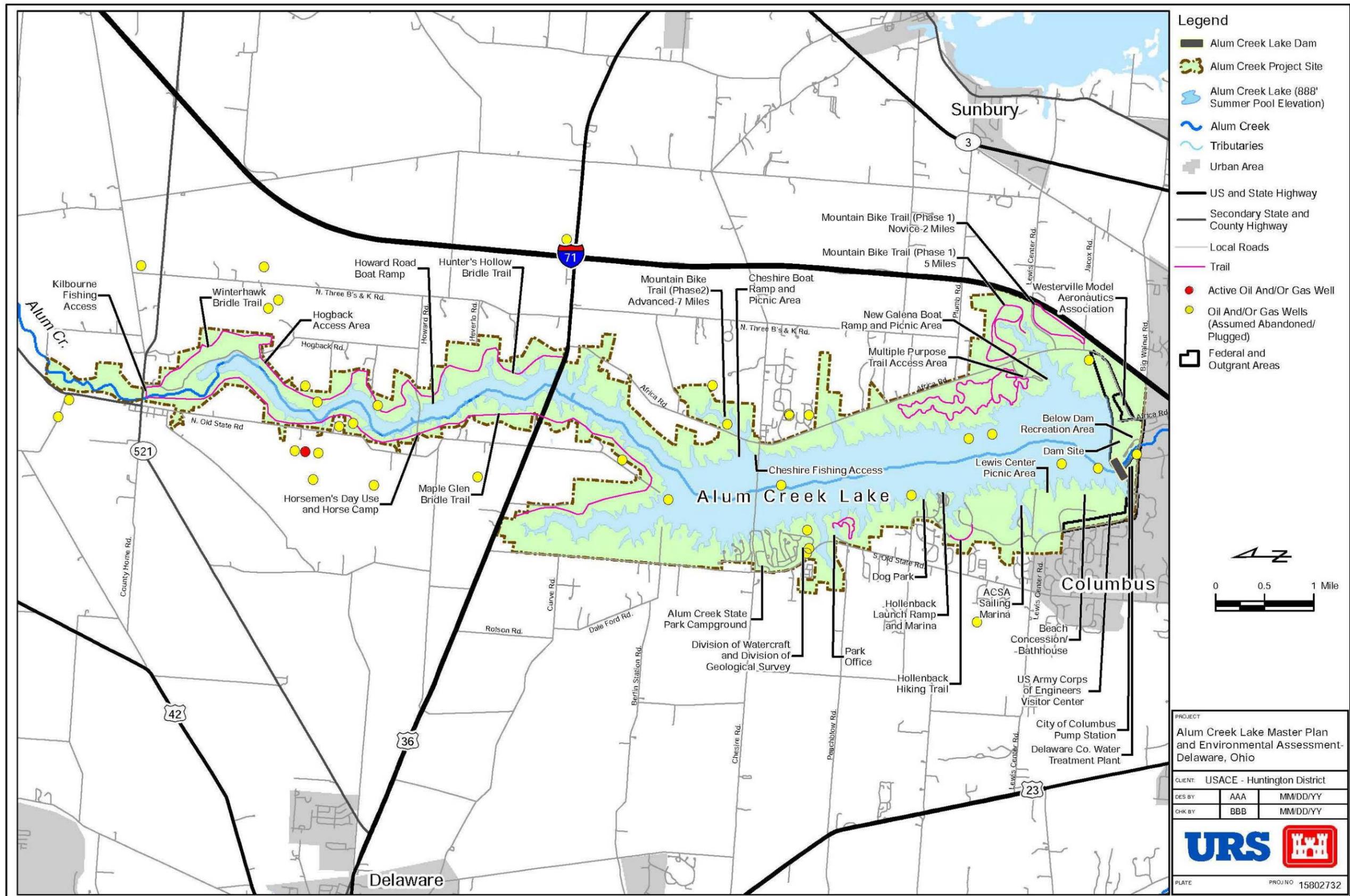


Figure 3-7: Gas Well Locations

This page intentionally left blank.

Potential impacts of mineral extraction activities include the footprint of the extraction site and access road construction and operation. Mineral extraction within Project boundaries could infringe on fish and wildlife related recreation, either directly or from pollutants that result from extraction operations.

3.1.6 Prehistoric and Historic Resources

A historic property, as defined by the Advisory Council on Historic Preservation, is a prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places (NRHP). A historic property includes artifacts, records, and remains that are related to and located within these National Register properties.

3.1.6.1 Existing Conditions

A Historic Properties Management Plan (HPMP) was completed for the Project area in the fall of 1993. The HPMP provides a summary of the Lust Mound located near the dam site, two cemeteries, and a schoolhouse that were inundated by the reservoir. The HPMP also summarizes 155 recorded archeological sites that have been identified within the reservoir from the early 1960's through 1993. The majority of the sites were identified through surveys completed for the USACE either as initial reservoir studies or as a shoreline survey. Identified archeological sites are almost exclusively prehistoric (150) dating from the Paleoindian (10,500-8000 B.C.) through the Late Prehistoric (900-1600 A.D.) temporal periods. Only two of the sites have a historic Euro-American affiliation. The remaining three sites were not provided a cultural affiliation.

Early work in the Project area was limited to three sites of unknown cultural affiliation (33DI3, 33DI4, and 33DI5) that have been inundated, and salvage archeology for five early woodland mound sites originally thought to be in the inundation zone for the reservoir (33DI14, 33DI16, 33DI17, 33DI20, and 33DI21), as well as salvage archeology for an early woodland structure (33DI25) also originally thought to be in the inundation zone for the reservoir. Early work also recorded four prehistoric open habitation sites (33DI224, 33DI225, 33DI226, and 33DI228) and one historic site (33DI227). Three of the four prehistoric sites date from the woodland period and one is of unknown cultural affiliation. None of the sites identified through these early evaluations were listed on the NRHP. Sites recorded through salvage archeology were fully excavated in the 1960's and 1970's. Not much is known of Sites 33DI224-33DI228. These sites should be subjected to further evaluation.

A pedestrian shoreline survey was conducted of the Project area in 1993. This survey, conducted during winter pool between elevations 870' and 885', recorded 140 prehistoric archeological sites and one historic site. The sites are listed as 33DI702 through 33DI842. The recorded sites are made up of one historic cemetery, nine isolated finds, 26 lithic scatters, and 105 undefined sites. Forty of the sites were determined to have no potential to yield significant information and require no further work. The remaining 101 sites have potential to yield significant information and require further work to determine their NRHP eligibility.

Since the 2004 HPMP, only two known surveys have been completed within the reservoir. A 2010 survey was conducted for a proposed launch ramp. This survey encountered one prehistoric archeological site. Site 33DI2589 is an isolated find and is not considered eligible for the NRHP. No further work is recommended. A 2011 survey was limited to the Dam Site Recreation Area. The survey recorded three prehistoric sites: ACR-05-FS01, which is a lithic scatter, and ACR05-FS02 and ACR05-FS03, which are isolated finds. All three sites were determined to be ineligible for the NRHP and require no further work. Sites encountered in the 2011 survey were not formally recorded on standard site forms and provided to the Ohio State Historic Preservation Office.

The only additional known cultural resource work conducted within the Project area was the 2009 emergency recovery of historic human remains from the old Cheshire Cemetery. The remains were located along the shoreline and were re-interred at the Berlin Township Cemetery.

3.1.6.2 Implications of Prehistoric and Historic Resources for Project Development

Proposed development actions should take into account previously identified sites and their treatment recommendations. Sites eligible, or potentially eligible for the NRHP, should be avoided or subjected to further analysis prior to actions that have the potential to impact those sites. Avoidance measures and/or further analysis must be coordinated with the District archeologist. Actions proposed for areas not previously surveyed will require coordination with the District archeologist to determine if a cultural resource survey is required. The District is currently unsure of the number and boundary limits of previously evaluated real estate actions that have been cleared at the District level (i.e., pipelines, etc.). These smaller projects need to be catalogued and mapped to ensure areas are not subject to repeated surveys. In the absence of mapping, coordination with the District archeologist will ensure that real estate actions are not subject to unnecessary resurveying. Cultural resource research, evaluation, and reporting must comply with all applicable federal laws and regulations.

3.1.7 Scenic Qualities

Scenic qualities refer to the quality of the environment as perceived through visual senses.

3.1.7.1 Existing Conditions

As described previously, the topography of the Project area is characterized as generally flat to gently rolling with a few dissected valleys and bluffs. This terrain, in combination with the lake and forested landscape areas, creates an overall scenic environment with opportunities for scenic vistas and view sheds. View distances range from small coves and glimpses of the lake along park and local roads to panoramic views of the lake and surrounding lands from the dam itself. The forests have a combination of mature growth trees and understory trees (such as hazelnut and serviceberry), creating a visually appealing environment. The vegetation of the Project offers changes in color, texture, and size that vary by topography, vegetation type, and season. Fall foliage forms a colored collage that supports sightseeing.

Forty-six miles of shoreline, numerous picnic areas, and abundant hiking and biking trails offer opportunities to enjoy scenic vistas at Alum Creek Lake Park. These views are typically characterized by panoramic cross-water views. Vistas of the lake are possible at many points from roads and hiking trails. Of particular interest is a scenic overlook located on the northern part of the lake on the eastern shore at the Hogback Road Access Area. Photograph 3-3 illustrates the panoramic view from the overlook. Wildlife pedestals have been installed in the area to facilitate wildlife observation, specifically osprey nesting.



Photograph 3-3: View from Scenic Overlook at Hogback Road Access Area

3.1.7.2 Implications of Scenic Qualities for Project Development

The Project area has unique scenic qualities and provides opportunities for scenic vistas; however, improvements in accessibility, directional signage and supporting facilities, and maintenance could enhance such opportunities. The two main areas for scenic vistas include the dam itself and the bluffs at the north eastern end of the lake between US 36/SR 37 and SR 521 along Hogback Road. Enjoyment of the scenic overlook near Hogback Road can be limited because of poor signage, poor accessibility to the site, and a lack of safe observation areas.

3.2 Biological Environment

This section provides a summary of the biological resources of the Project area and potential planning constraints posed by these resources. The biological environment includes vegetation, terrestrial wildlife, aquatic resources, threatened and endangered species that may inhabit the Project, and critical and sensitive wildlife habitat.

3.2.1 Vegetation

The types of plants and the percentage of coverage in the Project area are discussed.

3.2.1.1 Existing Conditions

Delaware County was heavily forested at the beginning of the nineteenth century. However, as the county became populated, forests were cleared for agriculture. Older growth woodlands are located throughout various areas of the Project between US 36/SR 37 and SR 521. These stands are characterized with oak, maple, and hickory. Younger timber and other land cover types are located in the southern portion of the Project.

About 45 percent of the Project area is forested (NatureServe, 2007) which represents a substantial amount of habitat as compared to the surrounding land. Land cover in the Alum Creek Lake Project area (see Figure 3-8) includes forest, grasslands, herbaceous vegetation, and open water. Table 3-6 identifies land cover types and acreages within the Alum Creek Lake Project site. Variation in topography and soil type also contributes to the diverse forest ecosystems in central Ohio.

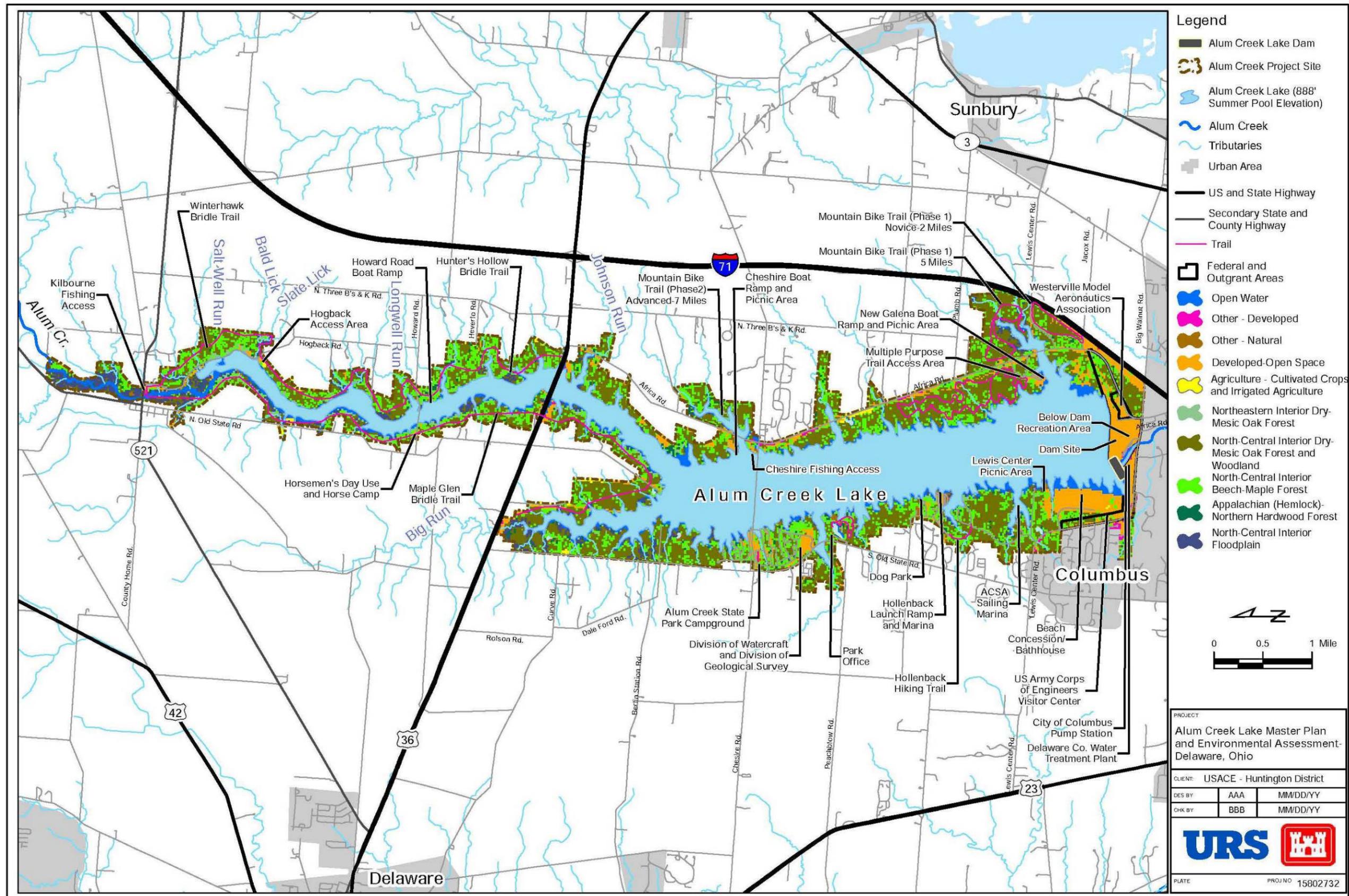


Figure 3-8: Vegetation and Land Cover

This page intentionally left blank

Table 3-6: Land Cover in the Alum Creek Lake Project

Land Cover	Percent of Project Area
Open Water	42%
North-Central Interior Dry-Mesic Oak Forest and Woodland	27%
North-Central Interior Beech-Maple Forest	14%
Developed Open Space	7%
North-Central Interior Floodplain	3%
Northeastern Interior Dry-Mesic Oak Forest	3%
Appalachian (Hemlock)-Northern Hardwood Forest	1%
Other (developed) includes low, medium, and high intensity developed land	1%
Agriculture	1%
Other (natural) includes herbaceous, successional shrub/scrub, and interior small stream/riparian categories	1%

Source: NatureServe, 2007

North-Central Interior Dry-Mesic Oak Forest and Woodlands are found throughout the glaciated regions of the Midwest and can occur on uplands, near floodplains, or on rolling glacial moraines. Forest cover can range from dense to moderately open canopy and there is commonly a dense shrub understory. Fire-resistant oak species, in particular bur oak (*Quercus macrocarpa*), northern red oak (*Quercus rubra*), and/or white oak (*Quercus alba*), dominate the overstory. Hickories including shagbark hickory (*Carya ovata*), bitternut hickory (*Carya cordiformis*), and mockernut hickory (*Carya alba*) are diagnostic in portions of the range of this system. Depending on site location and the overstory canopy density, the understory may include species such as American hazelnut (*Corylus americana*), serviceberry trees (*Amelanchier* spp.), starry false lily of the valley (*Maianthemum stellatum*), blue cohosh (*Caulophyllum thalictroides*), wood nettle (*Laportea canadensis*), white trillium (*Trillium grandiflorum*), wild sarsaparilla (*Aralia nudicaulis*), and stinging nettle (*Urtica dioica*). Occasionally, prairie grasses such as *Andropogon gerardii* and *Panicum virgatum* may be present.

North-Central Interior Beech-Maple Forests are typically found on flat or rolling uplands with rich loam soil over glacial till. These forests are characterized by a dense tree canopy, which creates a thick layer of humus and leaf litter developing a rich, dense herbaceous layer. Sugar maple (*Acer saccharum*) and American beech (*Fagus grandifolia*) comprise up to 80 percent of the canopy. Other species that comprise the canopy can include northern red oak (*Quercus rubra*), American basswood (*Tilia americana*), American hornbeam (*Carpinus caroliniana*), and American hophornbeam (*Ostrya virginiana*). The herbaceous layer is very diverse and typically includes Jack in the Pulpit (*Arisaema triphyllum*), Clayton's sweetroot (*Osmorhiza claytonia*), smooth Solomon's Seal (*Polygonatum biflorum*), and white trillium.

North-Central Interior Floodplain is found along rivers across the glaciated Midwest. This forest is characterized by sugar maple, eastern cottonwood (*Populus deltoids*), and willows, especially black willow (*Salix nigra*), in the wettest areas, and green ash (*Fraxinus pennsylvanica*), American elm (*Ulmus americana*), and bur oak in more well-drained areas.

Northeastern Interior Dry-Mesic Oak Forests are typically closed-canopy forests on flat to gently rolling land. These forests are characterized by various oak species including northern red oak, white oak, black oak (*Quercus velutina*), and scarlet oak (*Quercus coccinea*). Hickories may also dominate mature stands. Red maple (*Acer rubrum*), sweet birch (*Betula lenta*), yellow birch (*Betula alleghaniensis*), and sugar maple may also be present.

Appalachian Hemlock-Hardwood forests are characterized by northern hardwoods; sugar maple, yellow birch (*Betula alleghaniensis*), and American beech are characteristic, either forming a deciduous canopy or mixed with eastern hemlock or eastern white pine. Other common and sometimes dominant trees include oaks (most commonly red oak), yellow-poplar, black cherry (*Prunus serotina*), and sweet birch (*Betula lenta*) (NatureServe, 2007).

No known timber management activities have taken place at the Project site. Although the ODNR State Parks manages the vast majority of the Project, the focus of the management is for recreational uses of the State Park rather than for wildlife management. There is no current definitive plan developed for timber management to support wildlife use or regeneration.

Invasive Plant Species

As with any comprehensive forestry management approach, a primary goal is to manage the forest to yield a healthy sustainable forest. A key issue is controlling invasive species. Invasive species are problematic because they compete with native flora and fauna for the same resources. By definition, invasive species are species that are foreign to a particular region that out-compete native species for the same resources. If these species are not monitored and managed, they may affect the native ecology. Often the undesirable species can be managed chemically, mechanically, and/or physically.

According to ODNR Division of Wildlife, all natural habitats in Ohio are impacted by invasive plants. The most prominent invasive plant species known to occur in the Project area is autumn olive. Autumn olive was introduced to the United States in the 1830's from East Asia and can thrive in a variety of soil types. Autumn olive is considered a threat because it exhibits prolific fruiting and rapid growth which stifles the growth of native plants. Autumn olive can also disrupt the nitrogen cycle of the soil, which may impact native plant species.

3.2.1.2 Implications of Vegetative Resources for Project Development

Vegetative resources have capabilities to enhance and support recreational opportunities and project development at the Project. Forests and vegetated areas enhance the Project's scenic quality, as well as the camping and picnicking experience for visitors, by providing a quality, aesthetically pleasing natural setting and landscape buffer. The forest, as well as open fields provide habitat for a variety of wildlife, affording wildlife viewing, eco-tourism opportunities and also provide suitable habitat for target game species such as deer and wild turkey. Areas of dense, unbroken canopy provide a rapidly diminishing resource that attracts a number of neotropical birds, some of which are in decline. Conserving forest resources also provides water quality benefits that, in turn, impact recreational opportunities. Tree roots slow storm water runoff providing erosion control capabilities, especially on areas with steeper slopes surrounding the lake and tributaries; and this in turn helps to maintain the quality and clarity of the water in the streams and lake. Better water quality provides a more suitable resource for swimming, waterskiing, boating, and fishing.

The Project has significant timber resources for the area with nearly 45 percent of the project area forested. As a management consideration, systematic harvesting and management of timber could yield a more balanced forest in terms of desirable habitat to support target game and non-game species, as well as diversity of wildlife. Given that hunting is used more for population control at the Project area, the main goal of forest management would be the maintenance of a healthy forest stand. Removal of dead and diseased trees as well as stand thinning to promote regeneration of sapling and young trees would help to ensure the continued presence of a healthy forest on the site for recreational use.

As previously discussed, exotic and invasive plant species are a part of the existing ecosystem in the Project area. These plants have the ability to rapidly disrupt and dominate the vegetative landscape if not aggressively managed, dominating the competition with native species for space, water, and sunlight. Through time, the native plant species will be replaced and the ecology altered. Additionally, the interdependence and connectivity between the flora and fauna will be out of balance, and the fauna may relocate to find the native vegetative resource required for preferred food, shelter, or habitat structure. Typically, once the habitat structure and the vegetative composition of an area changes and the fauna seek out alternative niches, it becomes increasingly difficult to reintroduce these species back into previously inhabited areas. The consequences of such changes in habitat structure and floral and faunal composition may result in negative impacts for recreational opportunities.

3.2.2 Terrestrial Wildlife

Terrestrial wildlife is defined as animals that are found on land and in the air and includes amphibians, birds, mammals, and reptiles.

3.2.2.1 Existing Conditions

According to the ODNR Division of Wildlife, the Project area supports a diverse array of bird, amphibian, mammal, and reptile species. The scientific and common names of the species most commonly found at the Project are listed in Table 3-7.

Table 3-7: Terrestrial Animals Common to the Project Area

Taxonomy	Common Name	Scientific Name
Amphibians	Marbled salamander	<i>Ambystoma opacum</i>
	Spotted salamander	<i>Ambystoma maculatum</i>
	Northern spring peeper	<i>Pseudacris crucifer crucifer</i>
	Bullfrog	<i>Rana catesbeiana</i>
	Green frog	<i>Rana clamitans melanota</i>
Birds	Wild turkey	<i>Meleagris gallopavo</i>
	American crow	<i>Corvus brachyrhynchos</i>
	Tufted titmouse	<i>Baeolophus bicolor</i>
	White-breasted nuthatch	<i>Sitta carolinensis</i>
	Wood thrush	<i>Hylocichla mustelina</i>
	Ovenbird	<i>Seiurus aurocapilla</i>
	Scarlet tanager	<i>Piranga olivacea</i>
	Warbler	<i>Dendroica spp.</i>
	Yellow-billed cuckoo	<i>Coccyzus americanus</i>
	Pileated woodpecker	<i>Dryocopus pileatus</i>
	Barred owl	<i>Strix varia</i>
Mammals	White-tailed deer	<i>Odocoileus virginianus</i>
	Raccoon	<i>Procyon lotor</i>
	Squirrel	<i>Sciuridae</i>
	Cottontail rabbit	<i>Sylvilagus sp.</i>
	Woodchuck	<i>Marmota monax</i>
	Muskrat	<i>Ondatra zibethicus</i>
	Mink	<i>Neovison vison</i>
	Opossum	<i>Didelphis virginiana</i>
Reptiles	Common snapping turtle	<i>Chelydra serpentina serpentina</i>
	Musk turtle	<i>Sternotherus odoratus</i>
	Red-eared slider	<i>Trachemys scripta elegans</i>
	Northern copperhead	<i>Agkistrodon contortrix mokeson</i>
	Water snake	<i>Nerodia sp.</i>
	Garter snake	<i>Thamnophis sp.</i>

Source: ODNR Division of Wildlife (2011)

Alum Creek Lake is not listed by ODNR as a Wildlife Area, but hunting and trapping are allowed in designated areas. Common game and fur species include: white-tail deer, cottontail rabbit, squirrel, woodchuck, raccoon, muskrat, mink, and opossum (ODNR, 2010). Additionally, the southern flying squirrel (*Glaucomys volans*) can be found in mature beech-maple forests and the eastern chipmunk (*Tamias striatus*) can be found in deciduous woods. The masked shrew (*Sorex cinereus*), eastern mole (*Scalopus aquaticus*), fox, and mice may also be present in the Project (FACT, 2005).

Alum Creek Lake is a haven for nesting and migratory birds. Red-tailed hawks, American kestrels, and northern harriers (marsh hawks) migrate in the fall and can be seen over open fields. Ring-necked pheasant and mourning dove are popular game birds. Rare birds observed at the Project include: bald eagle (*Haliaeetus leucocephalus*), northern goshawk (*Accipiter gentilis*), osprey (*Pandion haliaetus*), king rail (*Rallus elegans*), snowy owl (*Bubo scandiacus*), long-eared owl (*Asio otus*), great egret (*Ardea alba*), cattle egret (*Bubulvus ibis*), and sandhill crane (*Grus canadensis*). Waterfowl such as Canadian geese (*Branta canadensis*), mallards (*Cairina moschata*), and wood ducks (*Aix sponsa*) are commonly seen (ODNR, 2010).

The emerald ash borer (*Agrilus planipennis fairmaire*), an invasive beetle native to Asia, is highly destructive to ash trees. It has been discovered in the Project vicinity, but its presence has not been confirmed on Project lands. As a result, firewood cannot be transported into the park.

3.2.2.2 Implications of Terrestrial Wildlife for Project Development

Terrestrial wildlife resources support both consumptive and non-consumptive recreational activities at the Project. White-tailed deer and wild turkey are popular game species, but rabbit, squirrel, waterfowl, and other upland game species also provide opportunities for hunting. The deer population is at nuisance levels, due to overpopulation, giving greater emphasis to hunting within the Project boundaries. Issues such as conflicts with vehicles and damage to planted ornamental vegetation add emphasis to deer population control via hunting.

Non-consumptive recreational activities that could be supported by terrestrial wildlife include wildlife viewing and birding (neo-tropicals and year-round species). Terrestrial wildlife also provides potential opportunities for eco-tourism. To maximize Project development potential, resources should be managed with diversity as a key objective.

Wildlife management provides opportunities for stewardship, support for declining species, and preservation of habitat. The USACE's Environmental Stewardship and Maintenance Guidance and Procedures pamphlet (USACE, 1996), is a natural resources management tool that aims to

ensure the conservation, preservation, or protection of resources for present and future generations by focusing on sustaining ecosystems. No significant issues related to terrestrial wildlife were identified that would constrain development activities.

3.2.3 Aquatic Resources

Aquatic resources refer to animal life in surface waters including streams, wetlands, and the lake.

3.2.3.1 Existing Conditions

ODNR’s Division of Parks and Recreation and Division of Wildlife oversee management for Alum Creek State Park. The Division of Parks and Recreation manages the land and the Division of Wildlife oversees the operations on the land in accordance with the State wildlife laws and regulations. Activities by the Division of Wildlife include stocking, fish population monitoring, angler harvest studies, and water quality analysis.

Alum Creek Lake is regarded as one of the best fishing lakes in Ohio and numerous fishing tournaments are held each year. The ODNR Division of Wildlife regularly stocks the lake with saugeye and muskellunge. Alum Creek Lake sustains a diverse composition of aquatic species. Some of the fish species found in the lake are listed in Table 3-8.

Table 3-8: Native and Stocked Fish Species in Alum Creek Lake

Common Name	Scientific Name
Bullhead (Yellow, Black, or Brown)	<i>Ameiurus</i> spp.
White sucker	<i>Catostomus commersoni</i>
Spotfin shiner	<i>Cyprinella spilopterus</i>
Common carp	<i>Cyprinus carpio</i>
Gizzardshad	<i>Dorosoma cepedianum</i>
Muskellunge	<i>Esox masquinongy</i>
Channel catfish	<i>Ictalurus punctatus</i>
Brook silverside	<i>Labidesthes sicculus</i>
Bluegill	<i>Lepomis macrochirus</i>
Smallmouth bass	<i>Micropterus dolomieu</i>
Largemouth bass	<i>Micropterus salmoides</i>
White bass	<i>Morone chrysops</i>
Emerald shiner	<i>Notropis atherinoides</i>
Bluntnose minnow	<i>Pimephales notatus</i>
Fathead minnow	<i>Pimephales promelas</i>
White crappie	<i>Pomoxis annularis</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
Walleye	<i>Stizostedion vitreum</i>
Saugeye	<i>Stizostedion vitreum</i> x <i>S. canadense</i>

The lake provides habitat for many species. In development of the lake, timber was left in many of the cove areas so that it would be below the summer pool elevation to provide underwater habitat to benefit fisheries. The adjacent wetlands and shallow water areas provide additional spawning areas as well as hunting areas for predator birds and other wildlife. The natural physiology also provides for structure that is conducive to a healthy aquatic system. Existing structure like rocky bottoms, sandy bottoms, pooling areas, rock outcrops, and grassy areas combine to provide habitat for aquatic life.

Invasive Aquatic Species

Ohio has an array of diverse aquatic habitats very well suited to support native plants and animals. This habitat is also well suited to many invasive (non-native) species such as damaging non-native plants, animals, and pathogens.

Zebra mussels were discovered in Alum Creek Lake in 1995. The zebra mussel is a small freshwater mussel that was probably introduced to Alum Creek Lake through boats. Zebra mussels compete for many of the same resources as the native mussels and invertebrates, which in turn, reduces native species population, including fish (FACT, 2005).

3.2.3.2 Implications of Aquatic Resources for Project Development

Aquatic resources support recreational fishing at the Project, including both the lake and the tailwater area. These resources are healthy and can support a high level of recreational fishing. Consequently, the aquatic resources can be considered an opportunity rather than a constraint when planning for development activities.

It was noted by Project staff that the zebra mussel population seems to be declining, although no specific measures are being implemented to reduce the population. Detailed guidance for chemical control is provided by the USACE in the January 2000 Zebra Mussel Chemical Control Guide. Care should be taken to control the spread of zebra mussels. Zebra mussels are known to attach to boat hulls and motors. Boaters should be advised to remove any mussels that are attached to the hull, rinse the boat with freshwater, and allow the boat to dry in the sun for five days before launching the boat in a different water body. Additionally, boaters should remove any aquatic plants from the boat, trailer, or other equipment; drain water from motor, livewell, bilge, transom, etc.; and dispose of unused bait in the trash (Wisconsin DNR, 2004).

3.2.4 Threatened, Endangered, and Species of Special Concern

Threatened, endangered, and species of special concern are sensitive and protected biological resources, including plant and animals, that are listed for protection by the USFWS or the State of Ohio. Under the Federal Endangered Species Act of 1973 (16 U.S.C. §§ 1531–1544), an endangered species is defined as any species in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as any species likely to become an endangered species in the foreseeable future.

3.2.4.1 Existing Conditions

USFWS maintains lists of rare plants and wildlife known to occur in each county of the United States. This list is based on historical site records and existing preferred habitats. Threatened or endangered species that may occur in the Alum Creek Lake Project area are shown in Table 3-9, along with their Federal and State status (USFWS, 2010b and ODNR, 2010).

Table 3-9: Listed Threatened and Endangered Species at Alum Creek Lake

Taxonomy	Common Name	Scientific Name	Federal Status	State Status
Freshwater Mussel	Clubshell mussel	<i>Pleurobema clava</i>	E	E
	Rayed bean mussel	<i>Villosa fabalis</i>	PE	E
	Snuffbox	<i>Epioblasma triquetra</i>	PE	E
Mammal	Indiana bat	<i>Myotis sodalis</i>	E	E

Source: USFWS, Threatened and Endangered Species in Ohio, 2010.

E = endangered

PE = proposed endangered

Federally-protected species known to have occurred in Delaware County include one animal species, the endangered Indiana bat (*Myotis sodalis*), and one mussel species, the endangered clubshell mussel (*Pleurobema clava*). The snuffbox (*Epioblasma triquetra*) and rayed bean mussel (*Villosa fabalis*) are both candidate species proposed for listing on the Federal list. All four species are described below (USFWS, 2010).

The Indiana bat is medium-sized and closely resembles the little brown bat, although it differs in color. The Indiana bat uses two distinct habitat types during the course of a year, caves and under tree bark or in cavities of dead trees. In August, the Indiana bat migrates south to limestone caves. In spring, the Indiana bat migrates north, where females establish maternity colonies beneath the loose bark of dead trees. Males tend to use caves during the summer. Occasionally, both males and females have been found beneath the bark of living trees and within the cavities of dead trees. The Project area appears to have some suitable habitat for this species.

The clubshell mussel has a triangular outline, a maximum length of 3.5 inches, and is typically tan or yellow in color (Michigan State University Extension, 2011). This mussel is found buried up to four inches in depth in medium to small rivers and prefers clean, loose sand and gravel substrates. Alum Creek Lake and its tributaries appear to have suitable habitat for this species.

The rayed bean is a small mussel usually less than two inches in length. The rayed bean mussel is typically found in smaller headwater creeks, although it has been recorded in larger rivers. The mussels are usually found in or near shoal or riffle areas and in the shallow, wave-washed areas of glacial lakes. Substrates typically include gravel and sand, and it is often found buried among roots of vegetation (Ohio River Valley Ecosystem Team, 2002). As of this writing, this species has not been reported in the Project area.

The snuffbox mussel has a triangular shell generally two inches in length and yellow or yellowish green in color with green rays or blotches. The snuffbox is typically found in medium to large rivers in clear, gravel riffles. At the time of the writing of this document, this species has not been reported at the Project area.

The bald eagle has been recorded in the Project area. Although bald eagles are no longer a federally-listed threatened species, they are protected under the Golden and Bald Eagle Protection Act of 1940 (16 U.S.C. §§ 668-668d) and the Migratory Bird Treaty Act of 1918 (16 U.S.C. §§ 703-712). Bald eagles occur on Project lands where the conditions are suitable for finding food and nesting opportunities. The eagles prefer larger trees near open bodies of water for hunting fish and generally utilize these same trees for nesting in the spring.

3.2.4.2 Implications of Threatened and Endangered Species on Project Development

Since no federally-listed threatened or endangered species have been identified as living or hibernating within the Project area, threatened or endangered species should not limit development of recreational activities at the Project. Nevertheless, habitat for these species should be included in the development of management plans for the Project and considered during future development. While the USACE is not actively managing for endangered species, surveys are conducted for the Indiana bat when trees are cut in the Project area. One State-listed species, the bald eagle, has been identified in the Project area. Recognition and preservation of sensitive or critical habitat in the Project area for bald eagles may result in constraints, as well as opportunities, when planning for development activities. The National Bald Eagle Management Guidelines (USFWS, 2007) note that, depending on the type of structure and visibility from the nest, new construction should be restricted within 330 to 660 feet from a nest. Timber operations

(e.g., clear cutting and removal of overstory trees) should be avoided within 330 feet of a nest at any time and avoided within 660 feet of the nest during breeding season. For the following activities, no buffer is necessary around nests outside the breeding season and should be avoided with 330 feet of the nest during breeding season: (1) use of off-road vehicles; (2) use of motorized watercraft (including jet skis and personal watercraft); and (3) non-motorized recreation and human entry (e.g., hiking, camping, fishing, and hunting). Loud, intermittent noises such as blasting should be avoided within 0.5 mile of active nests.

3.2.5 Critical Habitat

In Section 7 of the Endangered Species Act (16 U.S.C. § 1536), critical habitat is defined as an area that is essential to the conservation of a species, although the area need not actually be occupied by the species when it is designated.

3.2.5.1 Existing Conditions

The loss of critical habitat is one of the most common problems facing threatened and endangered species. There is no designated critical habitat under Section 7 of the Endangered Species Act present within the Project area. The ODNR Division of Natural Areas and Preserves has not identified any State Nature Preserves or State Natural Areas within the Project area (Division of Natural Areas and Preserves [DNAP], 2011).

3.2.5.2 Implications of Critical Habitat for Project Development

As no critical habitat has been identified at the Project area, project development will not be constrained by this environmental consideration.

3.2.6 Environmentally Sensitive Areas

Environmentally sensitive areas are typically areas that are designated as special status or protected by Federal or State statutes or legislation. Extremely rare or unique natural resource features may also be considered as potential environmentally sensitive areas.

3.2.6.1 Existing Conditions

Examples of environmentally sensitive areas include protected critical habitat, threatened and endangered species, Section 106 cultural resources, and wetlands. Figure 3-9 identifies some of the environmentally sensitive areas discussed in the resource analyses. Locations of archaeological resources are not disclosed to safeguard the integrity of these sites.

Environmentally sensitive resources identified at the Project include wetlands and Section 106 archeological and historic resources (not shown on Figure 3-9).

The forested habitats at Alum Creek Lake represent a unique resource in the Project area. Due to the rapid spread of development in the area as well as the large amount of open agricultural lands, the limited amounts of forested habitat are being further reduced. These unique areas support fairly contiguous mature second growth forested habitat with generally low density recreational development as part of the Project.

The Project area contains other unique species and habitats that could not be clearly located based on available data but that may also be considered as sensitive environmental areas including bottomland hardwood areas. The precise location of these unique habitats should be field identified and delineated and included in this data set in the future.

3.2.6.2 Implications of Environmentally Sensitive Areas for Project Development

Preservation of these areas and significant development restrictions may apply to these resources and restrict development options; however, these sites may provide interpretative, educational, or eco-tourism opportunities.

This page intentionally left blank.

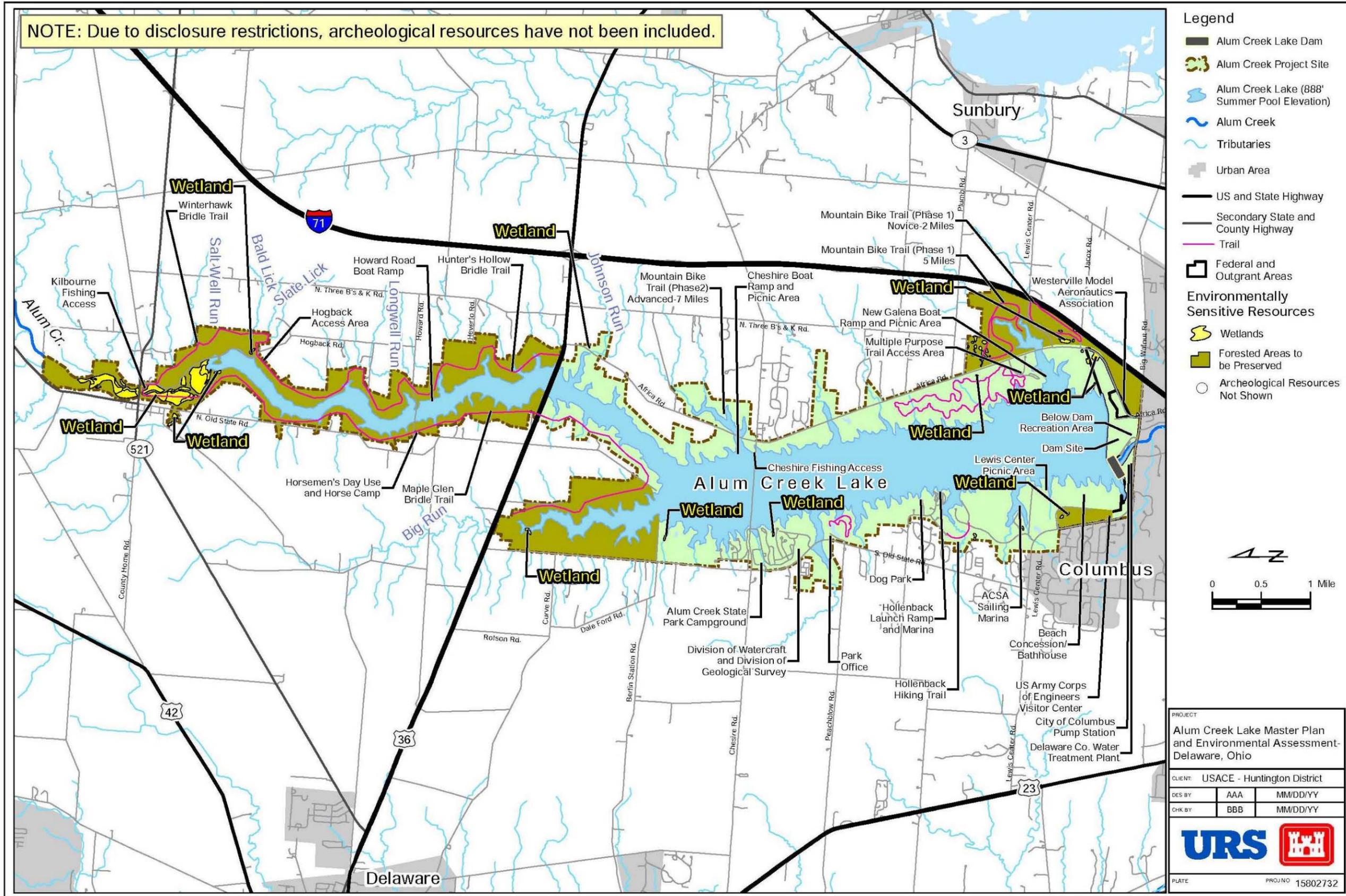


Figure 3-9: Environmental Sensitive Resources

This page intentionally left blank

4.0 RECREATION PROGRAM ANALYSIS

This section contains the results of an analysis of the recreation program at the Project. The intent of the analysis was to identify the current and future recreational demands that may affect the resources at the Project. Changes in population, preferences, and alternative recreational facilities may change the demand for the recreational activities in the region.

This section begins with the information that was used as a baseline for the analysis. Section 4.1 is an overview of the Project areas, Section 4.2 is a summary of the recreational activities currently available to visitors and the number of visitors, Section 4.3 defines the recreational area of influence, and Section 4.4 describes comparable activities that occur in the area of influence.

The results of the analysis are presented in the remainder of Section 4.0. The results consist of recreational trends (Section 4.5), potential recreational activities at the Project (Section 4.6), projected demand for recreational activities at the Project (Section 4.7), and the implications of the projected demand (Section 4.8).

4.1 Overview of the Project Areas

The Project comprises several areas that are managed by Federal and State entities (see Figure 4-1). Within the ODNR managed areas, various parcels have been sublet to local entities. This section describes the primary areas, subareas, and existing amenities. The primary areas that are discussed in the following sections and the managing entities are listed in Table 4-1. Refer to Table 1-1 for a list of the acreages of each area and the major facilities and activities (not including Alum Creek Lake).

Table 4-1: Primary Areas of the Project and the Managing Entities

Primary Area	Managing Entity
Visitor Center	USACE
Below Dam Recreation Area	USACE
Alum Creek State Park	ODNR
Alum Creek State Park Campground	ODNR
Alum Creek Lake	ODNR/USACE

This page intentionally left blank.

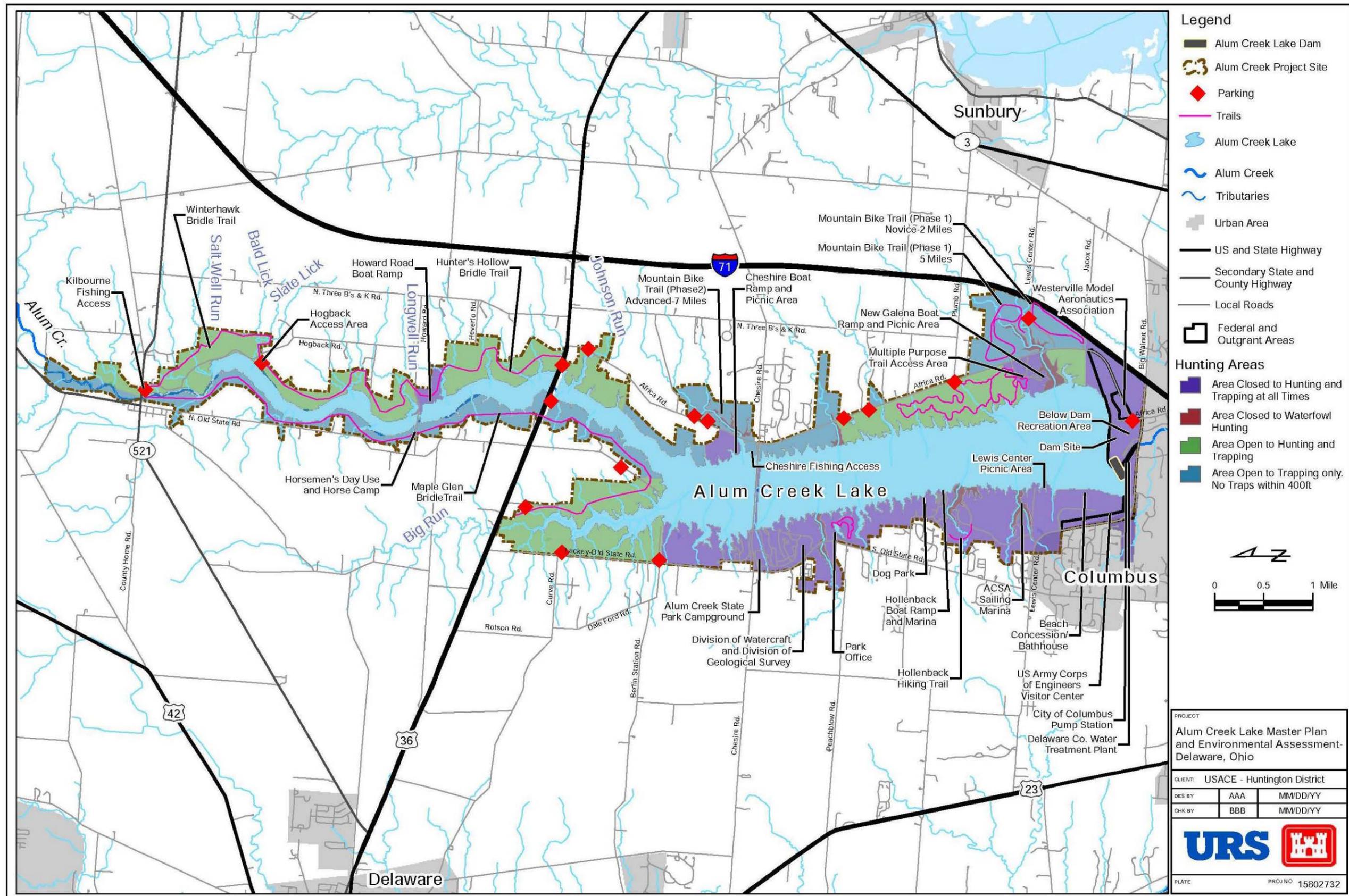


Figure 4-1: Existing Recreational Areas and Major Facilities

This page intentionally left blank.

4.1.1 Visitor Center

The Alum Creek Visitor Center (see Photograph 4-1) is located on Lewis Center Road between the beach and the Alum Creek Dam. It is open year-round and operated by the USACE. The Visitor Center has moderate visitation.



Photograph 4-1: USACE Alum Creek Visitor Center

4.1.2 Below Dam Recreation Area

The Below Dam Recreation Area is managed by the USACE and provides opportunities for various recreation activities. This part of the Alum Creek Lake Project is also known as the Tailwater Area or the Spillway. The open picnic area has 25 six-foot picnic tables, 27 galvanized dome top trash cans with wood enclosure, 16 charcoal grills, one universally accessible water fountain, one standard water fountain, one water spigot, and five wooden benches.

The overall recreation area offers views of the dam and the outlet structure, and also provides a mix of shaded picnic areas, open picnic areas, and recreation opportunities. Additionally, the area has a large playground with two play structures for climbing, one double teeter-totter, one climbing structure, and three benches. Photograph 4-2 shows one of the shelters and climbing structures. One restroom facility serves the entire Below Dam Recreation Area. Although the restrooms are locked during the winter, two portable chemical toilets serve as temporary replacements; one of the portable toilets is accessible.

A kiosk featuring local and regional information is located in the day use area. Beyond the kiosk is a path that leads to a set of stairs used to climb to the top of the dam.



Photograph 4-2: Below Dam Recreation Facilities



Photograph 4-3: Below Dam Fishing Area

Frequent users of this area include joggers, walkers, and hikers. Seasonal activities include kite flying and sledding on a designated sledding ridge in the winter recreation area near the east parking lot. Sledding is not permitted on the dam embankment, although it frequently occurs after hours. The designated sledding ridge was developed in response to this unauthorized activity. Fishing is also popular from the approximately three-foot wide sidewalk which provides easy access to the river for almost the entire length of the outfall as shown in Photograph 4-3

This area features three picnic shelters that can be reserved. The Buckeye Picnic Shelter, Maple Picnic Shelter, and Oak Picnic Shelter all provide picnic tables, grills, and water fountains. The Buckeye Picnic Shelter is new and includes 15 eight-foot long picnic tables, four plastic dome trash cans, four grills, two water fountains, one water spigot, and six duplex electrical outlets. The Maple Picnic Shelter is also new and includes 6 twelve-foot long picnic tables, 2 eight-foot long picnic tables, four plastic dome top trash cans, two plastic dome top recycle bins, three grills, and four duplex electrical outlets. In addition, the Oak Picnic Shelter is new and includes 6 twelve-foot long picnic tables, 2 eight-foot long picnic tables, four grills, four plastic dome top trash cans, two plastic dome top recycle bins, one water fountain, one water spigot, and four duplex electrical outlets. There is also a playground with benches located between the Maple and Oak Picnic Shelters. This area is highly utilized by hikers, walkers, joggers, and general day users. The three picnic shelters are occupied on all weekends and holidays during the recreation season.

A historical marker located in the Below Dam Area commemorates the escaped slaves that were part of the Underground Railroad from North Carolina that settled in the area.

4.1.2.1 Westerville Model Aeronautics Association – Dinneen Field

There is model airplane field, named Dinneen Field by the WMAA, (see Photograph 4-4) east of the picnic area which provides control stations and work tables. Dinneen Field encompasses 10 acres of land and was leased from the USACE in 1987. The field is public and anyone with a valid Academy of Model Aeronautics (AMA) license can fly. The WMAA hosts two events throughout the year including competitions and family fun events. The WMAA has provided the funding for developing the following: a 900-foot long runway, protective fencing, five concrete pad flying stations, nine pilot preparation areas with workbenches, a frequency control board with slots for each channel to hold pilots’ AMA cards, a shelter house with picnic tables, a paved parking lot with 45 parking spaces, storage sheds, a portable toilet, a windsock and flagpole, and landscaping (WMAA, [2010](#)). The picnic shelter has 6 six-foot picnic tables, 2 eight-foot picnic tables, 2 twelve-foot picnic tables, and four benches.



Photograph 4-4: Model Airplane Work Tables and Picnic Shelter

This area is highly utilized, and due to this high utilization, the parking area is not large enough to accommodate the number of visitors at peak use times. The development of a pathway to lead visitors to an additional parking area containing approximately 37 spaces southwest of Dinneen Field is being considered by the WMAA.

4.1.3 Alum Creek State Park

The majority of the land at the Project is leased to the ODNR as a State Park. Within the State Park, various areas provide a range of consumptive and non-consumptive recreational activities. Each area/activity, in alphabetical order, within the State Park is described below.

Alum Creek Sailing Marina

The Alum Creek Sailing Marina (see Photograph 4-5) is accessible via Lewis Center Road just north of the beach and is located on the west side of the lake. The marina is operated by the Alum Creek Sailing Association (ACSA). The Alum Creek Sailing Marina has 135 boat slips, restricted to sailboats, and also has a gravel car and trailer parking lot, restrooms, and related goods and services.

A newly constructed open-air activity center/picnic shelter (see Photograph 4-6) is equipped with 16 eight-foot tables and is utilized for educational events related to sailing.

The Marina is very well utilized, with full boat slip capacity, and has a waiting list for new members.



Photograph 4-5: Sailing Marina



Photograph 4-6: Sailing Marina Activity Center

Beach

Alum Creek Lake also offers opportunities for swimming, with a 3,000-linear foot beach on Lewis Center Road on the west side of the lake (see Photograph 4-7). The area includes three restroom facilities, three picnic areas, vending machines, soccer fields, a playground and four sand volleyball courts, and is open only during daylight hours. Alum Creek Lake State Park is well utilized on peak recreation season weekends. Currently, the beach area and associated parking provide adequate capacity to meet the demand. The first picnic area has 6 six-foot

picnic tables and five grills. The second picnic area adjacent to the concession stand has 24 six-foot long picnic tables and 14 grills. The third picnic area has 11 six-foot picnic tables and four grills. The comfort station (see Photograph 4-8) contains a concession vending area, a concession stand terrace (see Photograph 4-9), and a bathhouse that is in poor condition (see Photograph 4-10). It was noted throughout the planning process and during field observations that the restrooms and bathhouse are in poor condition. The existing facilities are original to the Project, which was developed in the late 1970's. Other amenities include picnic tables, benches, and trash cans. The dam, lake, and beach can all be viewed from the terrace.



Photograph 4-7: Alum Creek Beach



Photograph 4-8: Beach Comfort Station



Photograph 4-9: Beach Concession Stand Terrace



Photograph 4-10: Beach Bathhouse

Cheshire Boat Ramp and Picnic Area

The Cheshire Boat Ramp and Picnic Area is located off of Cheshire Road on the east side of the lake. The area is accessible via Africa Road. The facility consists of a four-lane boat ramp with two courtesy docks, and parking for 90 truck/trailers and 75 cars. This area also has 13 six-foot picnic tables, six charcoal grills, water fountain and spigot, and two restroom facilities. Both restroom facilities have a masonry base up to six-feet high and a wooden frame structure with wood siding above the masonry base.

The Cheshire Boat Ramp is highly utilized and experiences congestion during the peak recreation season weekends. The picnic facilities appear to provide adequate capacity to meet the demand.

Friends of Alum Creek Dog Park

The Friends of Alum Creek Dog Park (see Photograph 4-11) is on a four-acre site on the west shore of the lake near the Hollenback Boat Ramp and Marina. The dog park was built and is currently maintained by volunteers and park staff. It includes a divided fenced area for small and large dogs with beach and water access for dogs by size. Park use rules are posted and visitors must handle their pets within the set guidelines. This area also has multiple trash cans, benches, seven picnic tables, chairs, two water fountains and spigots, a dog walking trail, and one universally accessible restroom. This area is very well utilized, with the parking lot capacity typically being exceeded on weekday evenings and weekends during the recreation season.



Photograph 4-11: Dog Park Beach



Photograph 4-12: Parking Conditions at Dog Park

Hogback Road Access Area

The Hogback Road Access Area, located off of Hogback Road in the northeastern part of the Project, provides opportunities for wildlife viewings (see Photograph 4-13) and scenic vistas (see Photograph 4-14). There is adequate parking (see Photograph 4-15) and the area is also available for hunting during the fall/winter season. The lake is very narrow and shallow at this location and is bordered by low, wooded hills. Osprey can be found from April through September near nesting platforms (see Photograph 4-14) that have been constructed in this portion of the lake. Other bird species often seen include swallows, hawks, vultures, herons, ducks, and shorebirds. (Ohio Ornithological Society, 2010).



Photo 4-13: Hogback Osprey Platform



Photo 4-14: Hogback Scenic Vista



Photo 4-15: Hogback Parking Area

Horsemen's Day Use and Horse Camp Area/Equestrian Campground

Primitive camping is available at the Horsemen's Day Use and Horse Camp Area, with access provided by Howard Road via N. Old State Road on the west side of the lake and by North Three B's & K Road on the east side of the lake. The Horsemen's Day Use and Horse Camp Area (see Photograph 4-16) provides 30 campsites with parking for trailers, tie-up areas, a mounting block, water, and a vault toilet. This area also has 18 picnic tables, 17 fire rings, and a dump station. There is also a kiosk which provides camper registration, rules/regulations, and trail maps.

Horseback riding is permitted at the Project on three bridle trails (see Photograph 3-17), totaling approximately 38 miles, located primarily in the northern part of the park. The Winterhawk Bridle Trail begins at the information kiosk. Hunter's Hollow Bridle Trail begins in the vicinity of US 36/SR 37 and proceeds north, where it becomes the Winterhawk Bridle Trail just south of SR 521. The trail generally follows the contours of the lakeshore and begins to proceed south at the northern-most point of the lake to the Equestrian Camp/Day-Use Area located near Howard Road. The trail continues south across Howard Road, where it becomes the Maple Glen Bridle Trail. It then crosses US 36/SR 37 and proceeds approximately one mile south, where it switches back to a northerly direction and ends near US 36/SR 37.



Photograph 4-16: Equestrian Campground



Photograph 4-17: Entrance to Bridle Trail

Howard Road Boat Ramp

The Howard Road Boat Ramp is located in the northeastern portion of the lake and is accessible via Howard Road. The facility consists of a two-lane boat ramp (see Photograph 4-18) with courtesy docks and parking for 50 truck/trailers and 20 cars (see Photograph 4-19). Fishing access and separate men's and women's restroom facilities (chemical toilets) are also provided.

The Howard Road Boat Ramp has a high utilization and sometimes experiences congestion during the peak recreation season weekends.



Photograph 4-18: Howard Boat Ramp



Photograph 4-19: Howard Parking Area

Hunting and Trapping

Although there is no designated Wildlife Area, hunting, including archery, and trapping are permitted at the Project and are popular activities. These activities are primarily seasonal and waterfowl, deer, and upland game hunting are permitted.

There are various designated hunting and trapping areas throughout Alum Creek State Park. The consumptive recreation areas are presented on Figure 4-1. The wooded portions of the northern part of the lake are well-suited to deer and smaller game, while the southern hunting areas, typically abandoned cropland with small areas of secondary hardwoods, are well-suited to rabbit and upland game. Trapping is allowed in some of the areas that allow hunting.

The ODNR hosts an annual lottery for 20 waterfowl blinds. The annual lottery is held on the third Saturday in August. The blinds that are part of the lottery are generally located on the east side of the Project, mostly south of US 36/SR 37. There are eight day-use blinds that are available on a first come-first served basis. The locations of the blinds are identified on Figure 4-1 (ODNR, 2010b).

Kilbourne Fishing Access

The Kilbourne Fishing Access area is located in the northern portion of the Project, on the east side of the lake. A gated entrance restricts vehicle access to the water (see Photograph 4-20). This area has a parking lot, 3 six-foot picnic tables, two charcoal grills, separate men's and women's restroom facilities (chemical toilets), and shoreline fishing access (see Photograph 4-21).



Photograph 4-20: Kilbourne Fishing Access



Photograph 4-21: Kilbourne Shoreline Fishing

Lewis Center Picnic Area

The Lewis Center Picnic Area is located in the southwest portion of the Project, north of the beach. This area provides opportunities for picnicking and fishing and is associated with the group camp site. This area has nine picnic tables, two charcoal grills, and a parking lot.

Mountain Biking Trails

Mountain biking is another popular activity at Alum Creek Lake (see Photograph 4-22). There are two phases of trails along the eastern boundary of the lake, totaling 14 miles. Phase I consists of two trails accessible from Africa Road at Lewis Center Road: one trail is south of Lewis Center Road and is designated as an easy two-mile trail; the other is located north of Lewis Center Road and is designated as a moderately difficult six-mile trail. Phase II is a six-mile bike trail that is designated as advanced. It is accessible from CR 21 just north of Cheshire Road. The trails at Alum Creek Lake are highly utilized and are displayed on Figure 4-1.

The trails were constructed and are maintained by the Central Ohio Mountain Bike Organization (COMBO). Parking lots are provided near the trailheads along with kiosks that provide trail guide information (see Photograph 4-23). There is one designated gravel parking lot for Phase I and one paved parking lot for Phase II. Three picnic tables are provided at the Phase I lot and 12 picnic tables, 10 grills, and restroom facilities are provided at the Phase 2 parking lot. There is also an annual event in association with the Ohio Mountain Bike Championship (OMBC) Series at Alum Creek State Park with various divisions and age groups for each event.



Photograph 4-22: COMBO Trails



Photograph 4-23: COMBO Kiosk Display of Trail Map

New Galena Boat Ramp and Picnic Area

The New Galena Boat Ramp, the most popular boat ramp at the Project, is accessible via Africa Road and is located on the east side of the lake. During the summer months, this area is very well utilized by tournament fishermen and pleasure boaters.



Photograph 4-24: New Galena Boat Ramp



Photograph 4-25: New Galena Multipurpose Trail

The facility consists of a four-lane boat ramp with courtesy docks (see Photograph 4-24) and parking for 90 trucks/trailers and 50 cars. There are also five picnic tables, four charcoal grills, an additional 60 parking spaces, two restroom facilities (one chemical and one traditional), and a water fountain and water spigot.

The disc golf course is also located in this area, which includes an 18-hole “Players Course” (see Photograph 4-26). The course is maintained by Mood Golf through a partnership with the ODNR.

Additionally, a seven-mile multiple purpose trail is located in this area with parking areas along Cheshire Road and Plum Road (see Photograph 4-25). The trail is designed for hiking in the spring and summer months and snowmobiling and cross country skiing in the winter, depending on snow cover.

The New Galena Boat Ramp has a high utilization and experiences congestion during the peak recreation season weekends. The picnic amenities in the area, as shown in Photograph 4-27, appear to provide adequate capacity to meet the demand.



Photograph 4-26: New Galena Disc Golf



Photograph 4-27: New Galena Picnic Area and Shoreline Fishing

Hollenback Boat Ramp and Marina

The Hollenback Boat Ramp and Marina (see Photographs 4-28 and 4-29) is accessible via CR 10 to Hollenback Road. The launch facilities include a four-lane boat ramp (see Photograph 4-30) with courtesy docks and parking for a 101 trucks/trailers and 25 cars (see Photograph 4-31). There is also a sand launch area for small boats.

The Hollenback Boat Ramp and Marina is publicly owned and privately operated through a concession contract, which provides a watercraft rental service that offers wave runners, ski boats, five different lengths of pontoon boats, bass boats, simple fishing boats, rowboats, canoes, kayaks, pedal boats, and aqua cycles. All rentals are by the hour, day, or in some cases, overnight. The Hollenback Boat Ramp and Marina also offers 224 rental docks, 25 mooring balls, and 172 car parking spaces. The boat docks are available to rent nightly or weekly. The marina operates a concession stand and restaurant, and sells related goods, services, and fuel.

There are two restroom facilities located in the marina parking lot which each have men's and women's facilities. One of the bathhouses is accessible, while the other is not. The one that is not accessible has three chemical toilets on each side. Also around the marina area are 21 six-foot picnic tables and nine grills.

During the winter, this area is used for the Fantasy of Lights event and it is the area that is open for ice skating, ice sailing, and kite skiing.

The Hollenback Boat Ramp and Marina has high utilization and experiences congestion during the peak recreation season weekends. There is currently a waiting list for marina boat slips

which are awarded via an annual lottery. The breakwater that protects the marina has experienced significant erosion (see Photograph 4-32).



Photograph 4-28: Hollenback Marina



Photograph 4-29: Hollenback Marina



Photograph 4-30: Hollenback Boat Ramp



**Photograph 4-31: Hollenback Boat Prep
Prior to Launch in Parking Lot**



**Photograph 4-32: Hollenback Marina
Breakwater Erosion**

State Park Office

The ODNR Division of Parks and Recreation operates a park office, which is located along the western boundary of the lake on CR 10 (see Photograph 4-33). The park office provides information for campers at Alum Creek State Park and Delaware Lake State Park, as well as information on trails, hunting, fishing, and boating. The site has an open field with bird houses, landscaping, a pond, views of wildlife habitat, benches throughout the area, and fishing access. There are two trails that are accessible from the Park Office: the Park Office Hiking Trail and the Hollenback Hiking Trail. The Park Office Hiking Trail (1.5 miles) extends toward the lake and loops to the north, and the Hollenback Hiking Trail runs along the lake to the south and into the campground area. Both of these trails are designated as easy to moderate.



Photograph 4-33: ODNR Park Office

4.1.4 Alum Creek State Park Campground

Overnight visits to Alum Creek Lake are confined to three areas. The main campground is located on the west side of the lake and is divided into two areas by Cheshire Road (CR 72). The campground is accessed via South Old State Road (CR 10) and on the entrance road is the camp welcome center where visitors can check in. In the vicinity of the welcome center is one trash can, a five-foot long bench, a six-foot long picnic table, one galvanized metal bicycle rack, two public phones, and a shelter with two drink vending machines. Adjacent to the check-in office is an asphalt parking lot supporting the check-in office, the amphitheater, and a nature center.



Photograph 4-34: Amphitheater



Photograph 4-35: Nature Center

The amphitheater stage is approximately 30-feet by 15-feet and is accessible (see Photograph 4-34). It has a large white projection screen at the back of the stage, 52 eight-foot long wooden benches, a projector stand in the middle of the aisle, an eight-foot diameter fire ring, and 11 six-foot long wooden picnic tables (one is accessible).

Just beyond the welcome center is the Nature Center, which is a one story building with horizontal wood siding above a stone base (see Photograph 4-35). A wood deck off the back of the building holds three octagonal picnic tables and one trash can. Adjacent to the Nature Center is a playground, tether ball court, a volleyball court, two wooden benches, 7 six-foot picnic tables, two round picnic tables, and one small galvanized metal bike rack. Inside the center there are multiple displays such as books of native plants and animals, slides and viewers, and taxidermy animals of the native fauna. All of these exhibits are displayed in a classroom setting.

The state park campground includes 286 campsites with electrical hookups and three full-service campsites with electric, sewer, and water services. The campsites are in both wooded and sunny locations, and some overlook the lake. Each campsite has a paved parking pad, picnic table, and fire ring. Additionally, all campsites have 20, 30, and 50-ampere electrical service (see Photograph 4-36).

There are also three cedar cabins (one is accessible) (see Photographs 4-37 and 4-38), four camper cabins (two are accessible), and one log cabin. The cedar cabins are located on Road E while the camper cabins are located on Road C. The campsites and cabins are available for reservation for portions of the year on the ODNr state park website. During designated time frames the sites are rented on a first come-first served basis.

The cedar cabins have a kitchenette, bedroom, bathroom, and front porch. Also, each cabin has a six-foot picnic table, fire ring, and charcoal grill. The cedar cabins are approximately 10 feet by

20 feet. The camper cabins (see Photograph 4-39) are approximately 10 feet by 10 feet and have 20, 30, and 50-ampere electrical service, a six-foot long picnic table, one fire ring, and a carport.

The main park campground has a total of six restrooms and four bathhouses, with heated showers, flush toilets, drinking water, and a trailer waste dump station. It was noted throughout the planning process that the restrooms and bathhouses are in need of updating. The existing facilities are original to the Project, which was developed in the late 1970's. Overnight user facilities include a playground, basketball court, shelter house, amphitheater, a nature trail, a horseshoe pit, and a beach. There is a two-lane boat ramp with approximately 25 car parking spaces. There are designated pet-friendly campsites at the main campground.

A historical marker is located at the campground that commemorates the blockhouse that was located in this area, constructed in preparation for the War of 1812.



Photograph 4-36: Typical Campsite



Photograph 4-37: Cedar Cabin



Photograph 4-38: Cedar Cabin with Access Ramp



Photograph 4-39: Camper Cabin

Other camping facilities are located north of the Lewis Center Picnic Area on the west side of the lake, just south of the Hollenback Boat Ramp and Marina. This area is designated for group camping organized events and reservations are accepted. The group campsite is primitive and includes five fire rings, 20 six-foot picnic tables, a water fountain and spigot, and access to the Hollenback Trail. The bathhouse has men's and women's facilities, each with two stalls with chemical toilets. There is also a small boat launch area for canoes and kayaks and two picnic areas. The first picnic area, the Lewis Center Picnic Area, is located across from the sailing marina and has 9 six-foot picnic tables and two grills. The second picnic area is located along the Group Camp access road and has 8 six-foot picnic tables, four charcoal grills, one water fountain and spigot, parking lot, and an open meadow.

The campground has high utilization during peak recreation season. The cabins in particular are in high demand.

4.1.5 Alum Creek Lake

Management responsibilities for Alum Creek Lake are shared by the USACE and the ODNR. The water quality is good and supports a healthy fish population. The lake is highly utilized for boating, fishing, and swimming. Many locations around the Project provide scenic views of the lake. The forested areas and vegetation around the lake are healthy and offer great opportunities for fall leaf and wildlife viewing, as well as winter activities.

The pool of the lake is approximately 3,390 acres during the summer and approximately 3,105 acres during the winter. The relatively large, expansive size of the lake makes it a popular boating destination. The lake is used by motorized and non-motorized boats. Approximately 470 acres of the lake (during the summer) north of US 36/SR 37 are designated as idle speed zones.

Boat access to the lake is provided at five points of access including: Hollenback Boat Ramp and Marina, New Galena Boat Ramp, Cheshire Boat Ramp, Howard Road Boat Ramp, and the boat ramps at the Alum Creek State Park Campground. In addition to the areas around the boat ramps mentioned above, fishing from the shoreline (see Photographs 4-40 and 4-41) is available at various points around the Project including the Lewis Center Picnic Area, Kilbourne Fishing Access, Cheshire Fishing Access, Below Dam Area, and the camping or picnic areas.

The saw-tooth edged lake has various coves that provide excellent fish cover and provide quality fishing opportunities (see Photograph 4-42). These coves are signed as "no-wake zones."

Fishing for bass, bluegill, crappie, walleye, and saugeye is common at Alum Creek Lake. Additional game fish in the lake include sunfish, channel catfish, and muskellunge.

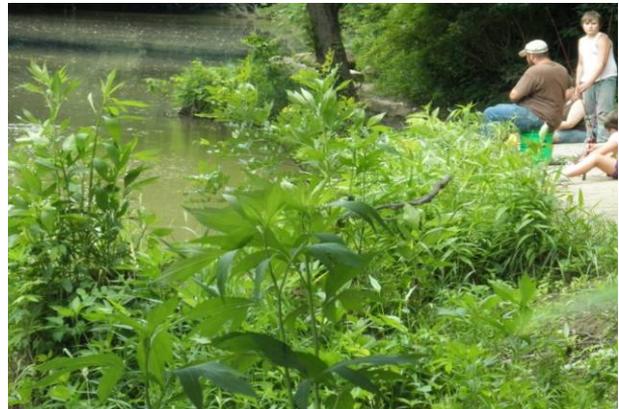
Ice fishing, a popular winter activity, is also permitted at the lake. Ice fishing typically entails anglers fishing for crappies near the New Galena Boat Ramp or for saugeyes near the Cheshire Boat Ramp (Public Land Journal, 2010).

Swimming from boats is permitted at three coves around the lake and overnight boat stays are permitted at two of these coves (see Photograph 4-43).

Various types of water craft utilize the lake and include sailboats, powerboats, kayaks, canoes, hobby catamarans, kite boarders, and wind surfers. A more recent phenomenon is referred to as rafting where several powerboats tie together to create a raft. Typically, the boaters remain in one location throughout the day, engaged in swimming, and often users end up camping on the boats. The rise in popularity of this activity may be attributed to the increasing fuel costs.



Photograph 4-40: Shoreline Fishing



Photograph 4-41: Shoreline Fishing



Photograph 4-42: Boat Fishing on the Lake



Photograph 4-43: Boat Swimming/Camping

4.2 Current Recreational Activities and Visitation

This section identifies the recreational activities that are currently available at the Project and the number of visitors who participate in these activities.

4.2.1 Outdoor Recreational Activities

The Project provides the opportunity to enjoy a wide range of recreational activities. Table 4-2 lists the recreational activities that are available at the Project, including the locations of the opportunity and a brief description of how the designated recreation area supports the activity. The recreational activities are grouped by the major activities available at the Project. Figure 4-1 shows the locations of the recreation areas at the Project.

Table 4-2: Recreational Activities at the Project

Activity	Location	Description
Boating	Alum Creek Sailing Marina	<ul style="list-style-type: none"> • 135 boat slips • Parking area for vehicles and trailers
	Alum Creek Lake	<ul style="list-style-type: none"> • 3,390 acres
	State Park Campground	<ul style="list-style-type: none"> • 2-lane boat ramp • Parking area for vehicles and trailers
	Cheshire Boat Ramp and Picnic Area	<ul style="list-style-type: none"> • 4-lane boat ramp • Parking area for vehicles and trailers
	Howard Road Boat Ramp	<ul style="list-style-type: none"> • 2-lane boat ramp • Parking area for vehicles and trailers
	New Galena Boat Ramp and Picnic Area	<ul style="list-style-type: none"> • 4-lane boat ramp • Parking area for vehicles and trailers
	Hollenback Marina	<ul style="list-style-type: none"> • 4-lane boat ramp • 224 boat slips • Parking area for vehicles and trailers
Camping	Alum Creek Lake	<ul style="list-style-type: none"> • Boat camping permitted at 2 coves on the lake
	State Park Campground	<ul style="list-style-type: none"> • 286 campsites with electrical hookups (20, 30, and 50 amperes) • 3 full-service campsites with electric, sewer, and water hookups • 3 cedar cabins • 4 small camper cabins • 1 large camper (log) cabin • Group camping site and primitive camping
	Horseman's Day Use and Horseman's Camp Area (Equestrian Campground)	<ul style="list-style-type: none"> • 30 primitive campsites
Fishing	Alum Creek Lake	<ul style="list-style-type: none"> • Access from shore, boat ramps, and marina

Activity	Location	Description
	Below Dam Area	<ul style="list-style-type: none"> Fishing access provided with sidewalk to tailwaters
	Cheshire Fishing Access	<ul style="list-style-type: none"> Fishing access provided
	Howard Road Boat Ramp	<ul style="list-style-type: none"> Fishing access provided
	Kilbourne Fishing Access	<ul style="list-style-type: none"> Fishing access provided
	Lewis Center Picnic Area	<ul style="list-style-type: none"> Fishing access provided
Hunting	State Park	<ul style="list-style-type: none"> Designated hunting and trapping areas (approximately 3,500 acres)
Other Activities (e.g. hiking, golf)	Below Dam Area	<ul style="list-style-type: none"> Model airplane field (Dinneen Field) is located in this area Trails are also located here
	Friends of Alum Creek Dog Park	<ul style="list-style-type: none"> 4-acres devoted to dog park
	Mountain Biking	<ul style="list-style-type: none"> 3 trails of varying difficulty located in the southeast portion of the Project
	New Galena Boat Ramp and Picnic Area	<ul style="list-style-type: none"> 18-hole disc golf course Multi-purpose trail (7 miles) which can be used for hiking, snowmobiling, dog sledding, and cross country skiing
	State Park Office	<ul style="list-style-type: none"> Access to Park Office Hiking Trail (1.5 miles) and Hollenback Hiking Trail
	Visitor Center	<ul style="list-style-type: none"> Amphitheater with projection screen and benches
Picnicking	Beach	<ul style="list-style-type: none"> Multiple picnic tables located in the area
	Below Dam Area	<ul style="list-style-type: none"> Three picnic shelters, picnic tables, and grills provided throughout the area
	Cheshire Boat Ramp and Picnic Area	<ul style="list-style-type: none"> Multiple picnic tables located in the area
	Lewis Center Picnic Area	<ul style="list-style-type: none"> Multiple picnic tables located in the area
	New Galena Boat Ramp and Picnic Area	<ul style="list-style-type: none"> Multiple picnic tables located in the area
	Hollenback Marina	<ul style="list-style-type: none"> Multiple picnic tables located in the area
	Hogback Road Access Area	<ul style="list-style-type: none"> Views of the narrowing lake and osprey platforms
	Visitor Center	<ul style="list-style-type: none"> Viewing deck provided at the Visitor Center
Swimming	Alum Creek Lake	<ul style="list-style-type: none"> Boater's swimming activity occurs in designated areas
	Beach	<ul style="list-style-type: none"> 3,000-foot beach for swimming
Waterskiing	Alum Creek Lake	<ul style="list-style-type: none"> Approx. 2,920 acres suitable for waterskiing

4.2.2 Visitation by Recreation Area

The Project reports visitation data through the Visitation Estimating and Reporting System (VERS) program. Visits are a “head count” of visitors to a project based on a count of vehicles and a statistical analysis of the number of people in a vehicle. It represents the entry of one person into a recreation area or site to participate in one or more recreation activities.

Project visitation statistics reflect estimates of the number of visits to each of the major recreation areas. Table 4-3 shows the estimated annual average number of visits made to the recreation areas. The “Dispersed Area” category includes use that occurs outside developed recreation areas.

Table 4-3: Distribution of Visits by Primary Recreation Area, 2006 – 2010 Average

Recreation Area	Visitation Average	Visitation Percentage
Dam Site	391,529	13%
Alum Creek Lake (Park Area)	1,953,617	63%
Alum Creek Lake	76,329	3%
Dispersed Area	656,327	21%
Total	3,077,802	100%

4.2.3 Activity Distribution

Table 4-4 shows the 2007-2010 average estimated annual number of visits by recreational activity. This is the baseline number of participants that will be used in the Recreational Demand Analysis. The category “Other” includes hiking, horseback riding, and other activities. People often engage in more than one activity while in the Project area. In Table 4-4, each activity in which an individual participates is counted as a separate visit. For example, if an individual fishes and picnics, participation in each of these activities is counted separately.

Table 4-4: Number of Participants for Each Recreational Activity

Recreational Activity	Baseline Number of Participants
Camping	76,349
Picnicking	243,182
Boating	195,750
Fishing	697,660
Hunting	53,917
Waterskiing	38,704
Swimming	394,847
Other	286,504
Sightseeing	1,137,286
Total	3,124,197

4.3 Area of Influence

The area of influence is defined as the area where the majority of the people who visit the Project live. Determining the area of influence and evaluating the demographic characteristics of the area is an important part of projecting the future demand for recreational facilities at the Project.

4.3.1 Identifying the Area of Influence

Based on the nature of the recreational activities provided at the Project and competing comparable facilities, the vast majority of the visitors to the Project will reside within a one-hour driving distance (see Figure 4-2). A one-hour drive time was used because the Project is very close to an urban area with numerous indoor and outdoor recreational activities competing for the population's interest. With so many competing facilities, it is unlikely that visitors would drive more than one hour to visit Alum Creek. There are two subareas of interest, described below.

- *Primary* - within a 30-minute drive of the Project. Due to their proximity, residents in the primary area of influence are expected to make the Project a destination for all of the recreational opportunities available at the Project.
- *Secondary* - between a 30- and 60-minute drive of the Project. Residents in the secondary area of influence are expected to visit the Project for specific reasons; however, they are not expected to make the Project a destination solely for general day-use activities, such as picnicking, that are also available in their local area.

4.3.2 Demographic Characteristics of the Area of Influence

Demographic data (population and age) were compiled from data reported by the U.S. Census Bureau and the Ohio Department of Development. These data were analyzed to determine the population within the area of influence and how that population is projected to change by 2020. The 2020 population projections were created by the Ohio Department of Development in 2003 using the 2000 U.S. Census information. The populations of the counties in the area of influence are projected to increase at different rates. The projected percentage change was determined for each area of influence based on the change in the estimated population in each county.

There are two counties that comprise the majority of the primary area of influence and eight counties within the secondary area of influence. All counties are located within Ohio.

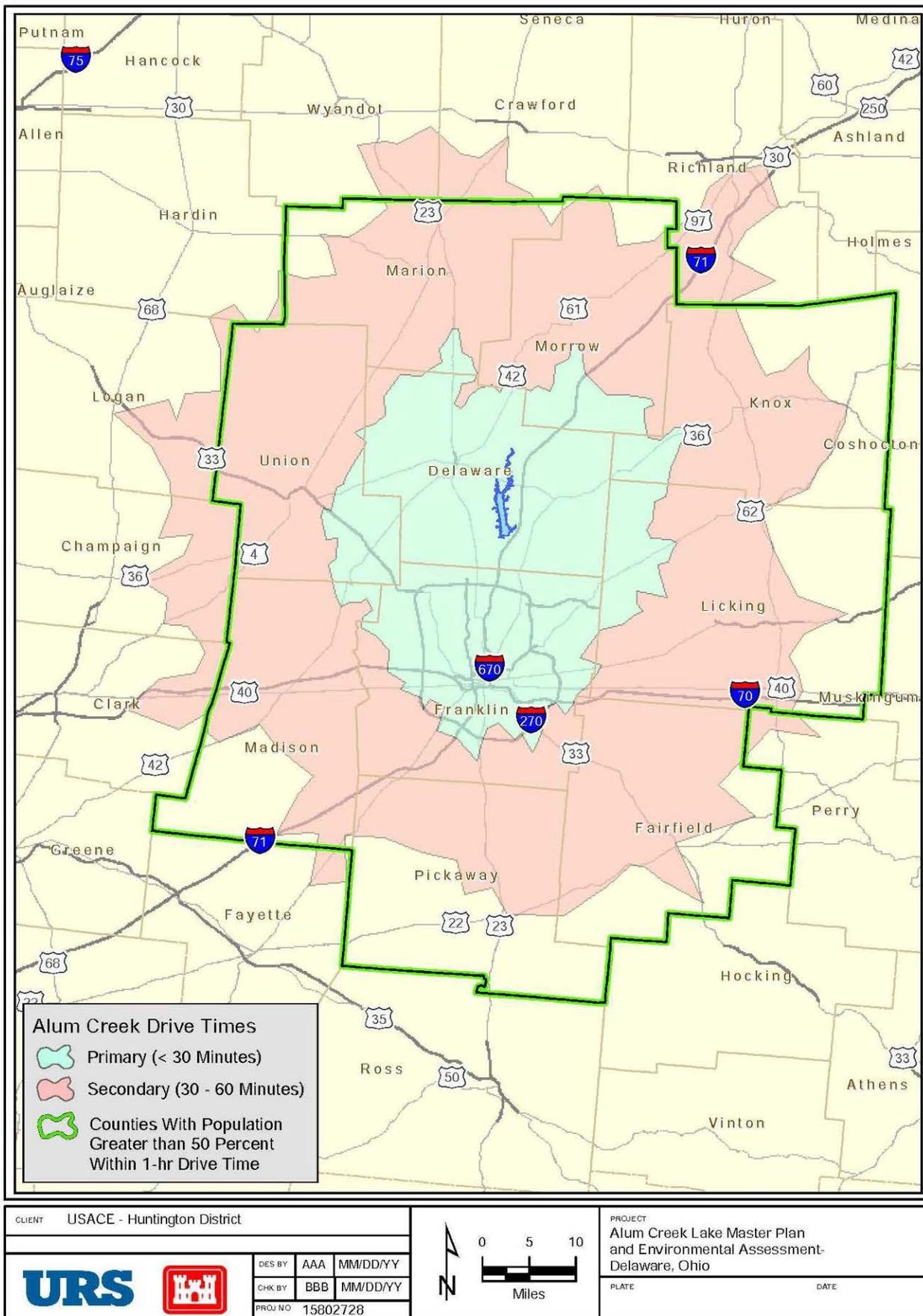


Figure 4-2: Area of Influence

This page intentionally left blank.

4.3.2.1 Primary Area of Influence

The primary area of influence consists of mostly Delaware and Franklin Counties in Ohio. The estimated populations for the primary and secondary areas of influence are displayed in Table 4-5. The population in the primary area of influence is projected to increase by 23.3 percent from 2000 to 2020.

Table 4-5: Population in Area of Influence

Area of Influence	2000 Population	2010 Population	2020 Projection	Projected Growth 2000–2020
Primary	1,178,967	1,337,628	1,453,730	23.3%
Secondary	554,444	626,330	686,570	23.8%

Source: Developed from data from the U.S. Department of Commerce Bureau of Census, 2011 and Ohio Department of Development, 2003

Changes in the percentage of the population in each age group were based on projected changes at the county level from the Ohio Department of Development. The analysis combined the county estimates to estimate the percent change in each age group for each area of influence, as shown in Table 4-6. Within the primary area of influence, the percentage of people 19 and under is projected to decrease from 28.5 percent in 2000 to 27.0 percent by 2020. The percentage of young adults between 20 and 44 is expected to decrease significantly from 41.5 percent of the population to 35.9 percent of the population, while the percentage of older adults between the ages of 45 and 64 is expected to increase significantly from 20.4 percent to 25.0 percent. The percentage of people over 65 is projected to increase from 9.6 percent in 2000 to 12.0 percent by 2020.

Table 4-6: Age Distribution of Population by Area of Influence

Age Group	Primary			Secondary		
	2000	2010	2020	2000	2010	2020
<5	7.3%	7.2%	6.9%	6.6%	6.3%	6.6%
5-19	21.2%	20.4%	20.1%	22.0%	21.3%	20.6%
20-44	41.5%	37.9%	35.9%	36.2%	31.7%	33.1%
45-64	20.4%	24.6%	25.0%	23.4%	27.8%	25.6%
≥65	9.6%	9.9%	12.0%	11.7%	12.9%	14.2%

Source: Developed from data from the U.S. Department of Commerce Bureau of Census, 2011 and Ohio Department of Development, 2003

The median incomes of the households in the areas of influence were estimated using a weighted average of the 2009 median incomes of the counties in the area of influence and are shown in Table 4-7. The median household income in the primary area of influence was \$52,318, compared to the median household income of \$45,467 for Ohio.

Table 4-7: Median Household Income in Area of Influence

Area of Influence	2009
Primary	\$ 52,318
Secondary	\$ 50,152
State of Ohio	\$ 45,467
National	\$ 50,221

Source: Developed from data from the U.S. Department of Commerce Bureau of Census, 2011

4.3.2.2 Secondary Area of Influence

The secondary area of influence includes portions of eight counties in Ohio. These counties are Fairfield, Knox, Licking, Madison, Marion, Morrow, Pickaway, and Union. The population in the secondary area of influence is projected to increase 23.8 percent from 2000 to 2020. Within the secondary area of influence, the percentage of people 19 and under is projected to decrease slightly from 28.6 percent in 2000 to 27.2 percent by 2020. The percentage of younger adults between 20 and 44 is expected to decrease from 36.2 percent of the population to 33.1 percent of the population, while the percentage of older adults between the ages of 45 and 64 is expected to increase from 23.4 percent to 25.6 percent. The percentage of people over 65 is projected to increase significantly from 11.7 percent in 2000 to 14.2 percent by 2020. The median household income in the secondary area of influence was \$50,152 in 2009 (see Tables 4-5, 4-6, and 4-7).

4.4 Outdoor Recreational Opportunities at Comparable Facilities

Recreational opportunities provided at other comparable facilities within a one-hour drive of the Project were identified and reviewed to understand the recreational opportunities available to people living within the area of influence (see Figure 4-3). Table 4-8 lists these facilities, their locations within the areas of influence, the owner of each facility, and the approximate size of each facility. A total of 19 facilities were identified (seven in the primary area of influence and 12 in the secondary area of influence).

There have been some recent improvements to water quality at Hoover Reservoir; also, Delaware Lake Marina recently renovated its boat slips to allow them to accommodate larger vessels and upgraded its restaurant. There are no other significant changes to the recreational activities at comparable facilities within the area of influence anticipated in the near future. The types of changes investigated include the addition or removal of an existing recreational activity or the construction of an entirely new facility.

This page intentionally left blank.

Table 4-8: Comparable Recreational Facilities

Name	Area of Influence	State	Operating Agency	Approximate Size of Facility (acres)
AW Marion State Park	Secondary	OH	ODNR	310
Battell Darby Creek Metro Park	Secondary	OH	Metro Parks	7,060
Blacklick Woods Park	Secondary	OH	Metro Parks	640
Blendon Woods Metro Park	Primary	OH	Metro Parks	650
Big Island Wildlife Area	Secondary	OH	ODNR	5,720
Buckeye Lake State Park	Secondary	OH	ODNR	3,300
Deer Creek State Park	Secondary	OH	ODNR	2,340
Delaware Lake State Park	Primary	OH	USACE/ODNR	7,700
Glacier Ridge Metro Park	Primary	OH	Metro Parks	1,040
Highbanks Metro Park	Primary	OH	Metro Parks	1,160
Hoover Reservoir	Primary	OH	ODNR/City of Columbus	5,030
Knox Lake State Wildlife Area	Secondary	OH	ODNR	500
Kokosing Lake Wildlife Area	Secondary	OH	ODNR	150
Madison Lake State Park	Secondary	OH	ODNR	180
Mount Gilead State Park	Secondary	OH	ODNR	180
Pickerington Ponds Wildlife Refuge	Secondary	OH	Metro Parks	1,630
Sharon Woods Metro Park	Primary	OH	Metro Parks	760
Slate Run Metro Park	Secondary	OH	Metro Parks	1,710
Three Creeks Park	Primary	OH	Metro Parks	1,050

The recreational facilities listed in Table 4-8 support a variety of recreational activities similar to those offered at the Project. Table 4-9 lists recreational activities offered at the Project and the comparable facilities. In addition to these recreational activities, other amenities were reviewed. Amenities are services or features that can increase the enjoyment of visitors. The following amenities were reviewed:

- High-speed internet access;
- Lodge and/or cabins;
- Marina;
- On-site restaurant; and
- Outdoor theater.

This page intentionally left blank.

Table 4-9: Recreational Activities and Amenities at Alum Creek Lake and Comparable Recreational Facilities

Name of Recreational Facility	Recreation Activities																			Amenities						
	Bicycling on Bike Trail	Bird Watching/Wildlife Viewing/Sightseeing	Boating	Camping	Court Activities	Fishing	Golfing	Hiking	Horseback Riding	Hunting	Miniature Golf	Nature Preserve/Trail/Historic Site	Off-Road 4-Wheel Driving	Open Field Events	Picnicking	Playground	Rock Climbing	Summer Camps/Daily Rec Events	Swimming	Target Shooting	Winter Activities	High Speed Internet Access	Lodge and/or Cabins	Marina	On-site Restaurant	Outdoor Theatre
Alum Creek Lake	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓		✓	✓	✓			✓				✓	✓		✓
AW Marion State Park		✓	✓	✓	✓	✓		✓		✓					✓	✓					✓			✓		
Battell Darby Creek Metro Park	✓	✓	✓			✓		✓		✓		✓			✓	✓					✓					
Blacklick Woods Park	✓	✓						✓				✓		✓	✓	✓					✓					
Blendon Woods Metro Park		✓						✓				✓		✓	✓	✓					✓					
Big Island Wildlife Area						✓				✓																
Buckeye Lake State Park		✓	✓			✓					✓				✓	✓			✓		✓			✓		
Deer Creek State Park	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓		✓	✓		✓	✓	✓	✓	✓	✓
Delaware Lake State Park		✓	✓	✓	✓	✓		✓		✓				✓	✓	✓			✓	✓	✓			✓		✓
Glacier Ridge Metro Park	✓	✓					✓	✓				✓			✓	✓										
Highbanks Metro Park		✓						✓				✓			✓			✓			✓					
Hoover Reservoir		✓	✓			✓									✓											
Knox Lake State Wildlife Area		✓				✓		✓		✓					✓									✓		
Kokosing Lake Wildlife Area			✓			✓									✓											
Madison Lake State Park			✓		✓	✓		✓		✓					✓				✓							
Mount Gilead State Park		✓	✓	✓	✓	✓		✓							✓			✓			✓		✓			✓
Pickerington Ponds Wildlife Refuge	✓	✓						✓				✓			✓											
Sharon Woods Metro Park	✓	✓				✓		✓				✓			✓	✓										
Slate Run Metro Park		✓				✓		✓	✓			✓			✓	✓										
Three Creeks Park	✓	✓	✓		✓	✓		✓				✓		✓	✓	✓					✓					

*** NOTES**

Bird Watching/Wildlife Viewing/Sightseeing	Includes those activities that involve observing or photographing wildlife, nature, or historic areas located within a site, whether walking or driving.
Boating	Includes if a site has boat ramps, boating activities, and/or waterskiing.
Camping	Includes backpack camping, camping at a campsite w/o electricity or water, or camping with electricity and water (Recreational Vehicle [RV]).
Court Activities	Includes activities that require a court setup, including (but not limited to): basketball, tennis, or volleyball.
Golfing	Includes golf courses and/or driving ranges.
Hiking	Includes hiking, walking, and/or exercising on a fitness trail.
Horseback Riding	Includes sites that accommodates horseback riding, thru trails or designated areas, regardless if horses are provided .
Lodges and/or Cabins	Includes areas for overnight stay that provide more than basic shelter, such as electricity, plumbing, furnishings, etc.
Nature Preserve/Trail/Historic Site	Includes nature preserves, historic sites, and/or visitor centers with educational tools/presentations. Includes activities that can be performed on an open field, including (but not limited to): softball, soccer, lacrosse, corn-hole/corn toss, football, disc golf, flying a kite, track and field events, and/or horseshoes.
Open Field Events	
Outdoor Theatre	Includes amphitheaters, areas for outdoor festivals/concerts/reenactments, and/or outdoor stages.
Summer Camps/Daily Rec Events	Includes summer camps, horseback riding camps, and/or events/presentations offered on a daily basis.
Swimming	Includes designated swimming area (e.g., beach, pool). Includes activities performed in winter, such as ice skating outdoors, snow sledding/snowshoeing, ice fishing, skiing, snowboarding, and/or snowmobiling.
Winter Activities	

4.5 Trends in Outdoor Recreational Activities

There has been much speculation in recreation literature that participation in all nature-based activities is declining due to a decrease in free time and increase in the level of technology in people's everyday life. However, a study on the trends in outdoor recreation (Cordell, 2008) concluded that while the national interest in nature and outdoor activities has been changing over the last 60 years, overall it is not declining.

The discussion on participation trends in this section focuses on identifying changing preferences for recreational activities. Changing preferences for recreational activities as a whole were identified by reviewing literature on the general trends that are occurring in Ohio, particularly the central region where the Project is located, and across the country. Changing preferences for a specific activity at the Project were identified through discussions with resource managers.

The 2006 Ohio Outdoor Recreation Participation and Satisfaction Survey, conducted for the 2008 Ohio SCORP, found that the three recreation categories with the highest percentage of household participation in Ohio were other outdoor recreation activities, trail activities, and wildlife observation, each with over 60 percent of households participating. The three recreation categories with the highest percentage of household participation in the central region of Ohio were trail activities, other outdoor recreation activities, and picnicking, each with over half of households participating. The category "other outdoor recreation activities" included: "scenic drive on public lands, visiting dog park, skateboard or BMX, rock climbing or outdoor climbing wall, orienteering or geo-caching, horseback riding at outdoor arena, gardening at a community garden, kite flying or remote control, horseshoes, corn toss/hole, and an open ended question for other activities" (Ohio University, 2007).

4.5.1 Age

The Ohio SCORP recognizes that 78 million baby boomers are beginning to reach retirement age, but many will likely have to delay retirement due to insufficient financial planning. At the same time, improved medical care means that baby boomers should remain in good health for more years than previous generations, and thus be more inclined to participate in recreation activities at more advanced ages. The Ohio SCORP also notes that there is research that suggests that this age group is more likely to seek health-enhancing outdoor activities than their parents or grandparents.

Age can influence the preference for recreational activities. For example, as the population ages, there is a greater demand for Recreational Vehicle (RV) camping and lodging and less demand

for tent camping. In addition, older populations transition from active sports to less strenuous activities such as walking (Virginia Department of Conservation and Recreation, 2007).

The Ohio SCORP noted that non-traditional activities, such as snowboarding, kayaking, climbing, and skateboarding, are popular with younger generations. These activities are attractive to a growing section of the population that prefers individual rather than team or group outdoor recreation.

4.5.2 Fishing and Hunting

The 2006 Ohio Outdoor Recreation Participation and Satisfaction Survey found that fishing is a very popular outdoor recreation activity in Ohio, with 27 percent of households in central Ohio and 26.4 percent of households throughout Ohio reporting that they fished in 2006. Hunting is a less popular outdoor recreation activity in Ohio. Only 9.9 percent of Ohio households and 11.5 percent of central Ohio households reported that they participated in hunting activities in 2006. However, the Ohio SCORP noted that participation in hunting, fishing, and trapping has declined significantly in recent years, and the USFWS reported that nationally fishing decreased by about 16 percent and hunting decreased by about 11 percent between 1991 and 2006 (USFWS, 2010d).

The decreasing national trends in fishing and hunting noted by USFWS are supported by a study produced by the USDA Forest Service, *Outdoor Recreation in American Life: An Assessment of Demand and Supply Trends* (Cordell, 1999). A section of the USFWS study looks at projections of outdoor recreation participation through the year 2050 and accounts for increases in participation due to population growth. The study projects fishing visits will increase by 36 percent through 2050, but this is marginally less than the projected population growth of 44 percent; therefore, the participation rate is actually projected to decrease over the next 40 years. Similarly, the study projects national visits for hunting will decrease by 11 percent over this time period.

4.5.3 Summer Activities

The USDA Forest Service projects that participation in both hiking and horseback riding will increase marginally faster than the population (Bowker, 1999). The Ohio SCORP identified trail use as one of the most popular outdoor recreation activities in the central Ohio region, with over 69 percent of households participating an average of 38.4 times in 2006; it also identified horseback riding as an activity with increasing participation.

The USDA Forest Service found that the rates of participation in picnicking, swimming, camping, boating, and waterskiing have been steady (Bowker, 1999). While the participation rate for camping in general is steady, there is an increasing trend for camping in an RV with electricity and water, as opposed to camping in tents. The USDA Forest Service is projecting primitive camping will increase at a slower rate than population growth, and therefore, will experience a decreasing rate of participation. However, developed camping is projected to increase at a greater rate than the population growth (Bowker, 1999). Approximately one-third of Ohio households participated in camping activities in 2006, including camping with and without electricity and/or water, camping in a cabin, group camping, backpack camping, and horse camping. RV camping was not included in the 2006 Ohio Outdoor Recreation Participation and Satisfaction Survey.

The Ohio SCORP identified power boating, canoeing, and kayaking as a very popular activity in the central Ohio region, and noted that non-motorized water vehicles are a fast growing segment of Ohio's boating population. Almost 30 percent of central Ohio households participated in boating activities an average of 2.7 times in 2006 (Ohio University, 2007). Resource managers at Alum Creek indicated that boaters on Alum Creek Lake are increasingly participating in boater's swim activity (swimming from anchored boats often with several boats rafting together) compared to traditional boating activity such as waterskiing.

The Ohio SCORP noted that picnicking is a declining outdoor recreation activity in the central Ohio region, and resource managers at Alum Creek confirmed this trend, although over half of central Ohio households picnicked an average of 3.6 times in 2006.

Observing nature has been increasing and is expected to continue to increase. The USDA Forest Service projects participation to increase in non-consumptive wildlife activities, including bird watching, photography, and other forms of wildlife viewing (Bowker, 1999). The number of participants is anticipated to increase more rapidly than the population for these activities. Wildlife observation or photography in public areas was one of the most popular outdoor recreation activity categories in Ohio in 2006, with over 61 percent of households reporting participation an average of 31.7 times. Birding and nature observation were noted as two of the most popular outdoor recreation activities in central Ohio (Ohio University, 2007). Similar to non-consumptive wildlife activities, sightseeing and visiting historic places are projected to grow.

4.5.4 Winter Activities

Winter activities, such as skiing, skating, sledding, and snowmobiling, are generally individual activities, which the Ohio SCORP notes are increasingly popular with younger generations as opposed to team activities. Nationally, participation in cross-country skiing is expected to increase 95 percent, participation in downhill skiing is expected to increase 93 percent, and participation in snowmobiling is expected to increase 40 percent by 2050 (Bowker, 1999).

The Ohio SCORP noted that 33.1 percent of Ohio households participated in winter sports in 2006, with average participation of 2.5 times per year. Within central Ohio, 33.3 percent of central Ohio households participated in winter sports in 2006, with average participation of 2.0 times per year. Statewide, 22.9 percent of households reported snow sledding, 13.1 percent reported downhill skiing/snowboarding, 8.0 percent reported ice skating outdoors, 6.6 percent reported cross country skiing, and 2.1 percent reported snowmobiling. Only 9 percent of Ohioans indicated that winter sport areas were in their top three most important outdoor recreation facilities; however, the mean time travelled to reach winter sport areas was approximately 40 minutes (Ohio University, 2007). This indicates that those households that participate in winter recreation are willing to travel longer distances than users of other recreation areas, such as fishing, swimming, and picnicking. It could also indicate that there is a lack of convenient facilities, which could be limiting participation.

4.6 Identifying Potential Recreational Opportunities

Identifying recreational opportunities at the Project is important relative to future project development and investment. The following section examines recreational opportunities available at the Project and those opportunities that may be a viable option in the future for the Project.

The rate of participation in a particular activity may not correlate with the value people place on the activity. For example, people may place great value on camping, but it requires a large time commitment and typically people can only participate a few weekends per year. Camping can be considered as having high value, but a low participation rate. Alternatively, people may play tennis more often because it requires much less time per event and can be enjoyed in the local neighborhood. Tennis can be considered as having a lower value, but a high participation rate. Therefore, although ranking the activities by rate of participation provides a general guide to the value people place on certain activities, the activities need to be evaluated carefully when planning for current and future recreational activities at the Project.

The resources available at the Project provide the opportunity for visitors to participate in many of the activities identified in the Ohio SCORP and 2006 Ohio Outdoor Recreation Participation and Satisfaction Survey. However, some of the activities may not be consistent with Project resource capabilities or USACE water and outdoor resource-based recreation policy. Therefore, the activities have been categorized as follows for planning purposes:

Available – resources and supporting facilities for these activities are currently available at the Project.

Potential – facilities for these activities are not currently available at the Project, but they are consistent with planning goals and may be considered as potential future activities. Facilities for these activities may be cost shared by the USACE or constructed wholly by a non-Federal entity.

Inconsistent – facilities for these activities are not currently available at the Project and are inconsistent with future planning goals. These activities are in conflict with USACE policy and environmental conservation goals.

Table 4-10 lists the activities identified in the Ohio SCORP and 2006 Ohio Outdoor Recreation Participation and Satisfaction Survey and identifies if the activity is currently available at the Project, has potential as a future activity, or is inconsistent with planning goals. The activities are listed in order of decreasing participation for residents in central Ohio.

Table 4-10: Potential Recreation Activities at the Project

Activity	Available	Potential	Inconsistent
Hiking/walking/jogging on trail	✓		
Visiting a playground in a park	✓		
Picnicking	✓		
Scenic driving	✓		
Visiting nature preserve	✓		
Swimming at public or club pool		✓	
Other wildlife viewing	✓		
Special event picnicking using a shelter	✓		
Bicycling on bike trail for recreation	✓		
Sailing, powerboating, canoeing, kayaking, jet skiing, etc.	✓		
Golfing at a 9-18 hole course		✓	
Birdwatching	✓		
Fishing from shore or pier	✓		
Swimming in a lake, river, or stream	✓		
Driving/practice range		✓	
Miniature golfing		✓	
Playing football, soccer, lacrosse, and/or field hockey	✓		
Playing corn toss/hole		✓	
Snow sledding	✓		

Table 4-10: Potential Recreation Activities at the Project

Activity	Available	Potential	Inconsistent
Swimming at a wave pool, lazy river, or spray park		✓	
Playing baseball or softball		✓	
Kite flying or remote control	✓		
Playing tennis		✓	
Playing basketball	✓		
Exercising on fitness trail	✓		
Camping without electric or water	✓		
Camping with electric or water	✓		
Camping in cabin	✓		
Visiting dog park	✓		
Downhill skiing/snowboarding	✓		
Hunting with bow, shotgun, etc.	✓		
Playing horseshoes	✓		
Shooting skeet, trap, archery, etc.		✓	
Inline/roller skating		✓	
Ice skating outdoors	✓		
All-Terrain Vehicle (ATV) riding/ off road motorcycling			✓
Mountain biking	✓		
Track and field		✓	
Other outdoor recreation	✓		
Designated group camping	✓		
Playing volleyball	✓		
Playing other field and court sports		✓	
Rock climbing or outdoor climbing wall		✓	
Backpack camping		✓	
Disc golfing	✓		
Gardening at community garden		✓	
Horseback riding on trail	✓		
Skateboarding or BMX biking			✓
Orienteering or geo-caching	✓		
Cross country skiing	✓		
Horseback riding at outdoor arena		✓	
Horse camping	✓		
Snowmobiling	✓		

The Project currently offers all of the top five recreation activities for central Ohioans. The activities listed as potential are consistent with USACE policy and environmental conservation goals and could be provided at the Project. The potential activities could be formally developed by a local sponsor, but a determination on the suitability of the activity would be done on an individual basis.

4.7 Recreational Demand Analysis

The recreation demand analysis reviewed several factors that can change the demand for recreational activities at a particular facility. Changes to the following factors could result in a shift in demand for recreational activities at the Project or affect the number of visitors:

Change in the opportunities available to participants, such as the development of new comparable facilities near the Project;

Change in preferences for activities, such as national participation trends showing a decrease in hunting; and

Change in the demographic characteristic in the area of influence, including a change in overall population and a change in the median age of that population. Such changes can affect the preferred activities (e.g., older visitors may prefer RV camping to tent camping).

4.7.1 Impact of Comparable Facilities

The Project and the comparable facilities in the area of influence have been open and operating for many years. Delaware Lake State Park has recently renovated its marina and boat slips and upgraded its restaurant; however, because Alum Creek Lake is a larger lake with closer proximity to the Columbus population center and superior water quality than Delaware Lake, this is not expected to have a substantial impact on Alum Creek Lake visitation. As noted earlier, no significant planned changes are anticipated at the comparable facilities, and no new comparable facilities are anticipated. None of the comparable facilities are expected to change the existing demand for recreational activities at the Project.

4.7.2 Impact of Trends in Participation Rates in Recreational Activities

Trends in recreation were reviewed to identify potential changes in demand for recreational activities at the Project. In general, the rate of participation in consumptive resource uses, such as hunting and fishing, has been declining and is anticipated to continue declining. However, the rate of participation for non-consumptive resource uses, such as using nature trails and sightseeing, has been increasing. Based on these trends, the following assumptions were used to forecast future activities and participation:

As a population ages, there will be a shift to less physical activities, such as walking;

The participation rate for fishing and hunting will decrease 7 percent between 2010 and 2020;

The participation rate for “other” recreational activities, including hiking and horseback riding, will increase 5 percent between 2010 and 2020;

Although the participation rate for camping is anticipated to remain stable, there will be an increased preference for camping in an RV as opposed to a tent;

The participation rate for waterskiing will decrease 2 percent between 2010 and 2020 as non-motorized boat use increases and boaters decrease traditional boating activity and increase boater's swimming activity;

The participation rate for picnicking will decrease 2 percent between 2010 and 2020; and

The participation rate for sightseeing, including observing nature and visiting historic places, will increase 5 percent between 2010 and 2020.

4.7.3 Impact of Demographic Changes

The population change in the area of influence over the next decade is projected to be a rather large increase in population; the primary area of influence is expected to grow to almost 1.5 million people and the secondary area of influence is expected to grow to almost 700,000 people (see Table 4-5). In addition to population change, the age of the population is projected to increase. Based on the projected population, change in the demographic makeup, and observations at the Project, the following assumptions were used to forecast future activities and participation:

The population in the primary area of influence is projected to increase by 8.7 percent between 2010 and 2020;

The population in the secondary area of influence is projected to increase by 9.6 percent between 2010 and 2020;

The demand for RV accessible campsites will increase because of preferences for RV camping as opposed to tent camping among older campers; and

The shift to an older population will create a demand for shorter walking and hiking trails that are easy to traverse.

4.7.4 Projected Number of Visits by Activity

A multi-step approach was used to project the number of visits for each recreational activity at the Project. The approach accounts for anticipated changes in the rate of participation in specific activities and the estimated change in population in each area of influence. In the first step, the rate of participation for the current visitors engaged in the activities was adjusted to estimate the impacts of preference changes on the current users. In the second step, the estimated number of visitors was adjusted to account for projected population changes within each area of influence.

The rate of participation of the current population was assumed to be representative of the rate of the participation for new people to the area (e.g., if 15 percent of the current population

participates in camping, it is assumed that 15 percent of the new people to the area would also participate in camping). The current population engaged in the activities was divided among the two areas of influence (primary and secondary) based on the assumption that 80 percent of visitors live in the primary area of influence and 20 percent live in the secondary area of influence.¹ The current rate of participation in each activity was applied to the change in the population to estimate the number of visitors that would participate in an activity in 2020.

The estimated number of visitors expected to engage in each activity in 2020 (based on changes in preferences) was added to the estimated new entrants from a change in population. Table 4-11 shows the baseline and projected number of visitors for each of the primary activities, sorted by area of influence.

As indicated in Table 4-11, overall activity participation at the Project is expected to increase by 290,370 visits (approximately 9.3 percent) by 2020. Additionally, the activities undertaken by the visitors are anticipated to change. Hunting and fishing visits are anticipated to increase much more slowly than other activities.

1) Approximately 70% of the population in the area of influence lives in the primary area, but comparable facilities have a greater impact on the recreational destination to those living farther from the Project.

Table 4-11: Baseline and Projected Users by Activity and Subarea of Influence

Activity	Area of Influence	Baseline Visits	Projected Visits for 2020	Change in Visits
Boating	Primary	156,600	170,220	13,620
	Secondary	39,150	42,910	3,760
	Subtotal	195,750	213,130	17,380
Camping	Primary	61,080	66,390	5,310
	Secondary	15,270	16,740	1,470
	Subtotal	76,350	83,130	6,780
Fishing	Primary	558,130	567,620	9,490
	Secondary	139,530	143,160	3,630
	Subtotal	697,660	710,780	13,120
Hunting	Primary	43,140	43,870	730
	Secondary	10,780	11,060	280
	Subtotal	53,920	54,930	1,010
Other	Primary	229,200	260,600	31,400
	Secondary	57,300	65,670	8,370
	Subtotal	286,500	326,270	39,770
Picnicking	Primary	194,540	207,570	13,030
	Secondary	48,640	52,340	3,700
	Subtotal	243,180	259,910	16,730
Sightseeing	Primary	909,830	1,034,480	124,650
	Secondary	227,460	260,670	33,210
	Subtotal	1,137,290	1,295,150	157,860
Swimming	Primary	315,880	343,360	27,480
	Secondary	78,970	86,550	7,580
	Subtotal	394,850	429,910	35,060
Water Skiing	Primary	30,960	33,030	2,070
	Secondary	7,740	8,330	590
	Subtotal	38,700	41,360	2,660
	Total	3,124,200	3,414,570	290,370

4.7.5 Lake Carrying Capacity

It is projected that the number of people participating in fishing could increase by 1.9 percent and boating could increase by 8.9 percent by year 2020. The increase in boating could lead to an overall increase in the number of boats using Alum Creek Lake.

Based on observations by Project resource managers, it is estimated that the distribution of boats on the lake at any one time is 10 percent non-motorized boats and 90 percent motorboats, including sailboats. Non-motorized boats (e.g., canoes and rowboats) are a growing segment of the Ohio boating population and are forecast to increase to 13 percent of the Alum Creek Lake boat distribution by 2020. These boats require less lake space than motorboats for safety and boating enjoyment, and do not need to use a traditional boat launch ramp. The size of motorboats has increased in recent years, and boats as large as 32 feet long now use Alum Creek Lake.

Based on traditional boating practices, this increase in the number of boaters and the size of boats could cause congestion issues if the increase reaches or exceeds the lake carrying capacity. The carrying capacity of Alum Creek Lake was analyzed to determine whether the lake capacity is adequate for current and future demand. Carrying capacity refers to the number of boats that might use the lake at one time. If the number of boats exceeded the carrying capacity of the lake, boaters would not experience a reasonable level of satisfaction in the boating experience or a reasonable level of safety.

The summer pool lake is about 3,390 acres; approximately 470 acres of the lake (during the summer) are designated as “no-wake zones.” Because of shallow water, narrow portions of the lake, docks, and other constraints, approximately 10 percent of Alum Creek Lake is estimated to be unsuitable for boating. Although some of the unsuitable area can be used safely by non-motorized boats or motorboats fishing close to shore, the area was removed from the lake carrying capacity analysis. The estimated number of acres available for boating in the summer months is:

$$\text{Acres available for boating during summer} = 3,390 - (0.1 * 3,390) = 3,051 \text{ acres}$$

The carrying capacity of Alum Creek Lake was estimated for three scenarios: high, medium, and low density of boats (see Table 4-12), which is consistent with the carrying capacity analysis conducted for the Lucky Peak Master Plan in Walla Walla, Washington (USACE, 2006).

Table 4-12 Space Assumptions for Safe and Enjoyable Boating

Type of Boat	Low Density Scenario Acres	Medium Density Scenario Acres	High Density Scenario Acres
Low Power Boats	2.5 acres	1.3 acres	0.5 acres
High Power Boats	20 acres	10 acres	5 acres

Source: USACE, 2006

In the Lucky Peak Master Plan, low power boats were defined as those boats without power (non-motorized) and boats with power but operating at slow speeds (e.g. trollers). In this analysis, low power boats are assumed to be non-motorized. Based on these assumptions, the number of boats of each type that might comfortably fit on the lake at any one time for each scenario can be calculated. For each scenario:

$$L + M = T$$

Where:

T = Total number of boats

L = Number of Non-Motorized Boats

M = Number of Motorized Boats

*Low Density Scenario: $L * 2.5 \text{ acres/boat} + M * 20 \text{ acres/boat} = 3,051 \text{ acres}$*

*Medium Density Scenario: $L * 1.3 \text{ acres/boat} + M * 10 \text{ acres/boat} = 3,051 \text{ acres}$*

*High Density Scenario: $L * 0.5 \text{ acres/boat} + M * 5 \text{ acres/boat} = 3,051 \text{ acres}$*

Table 4-13 displays the results for the number of low power and high power boats that fit on the lake for each scenario using the 2010 boat distribution of 90 percent motorboats and 10 percent non-motorized boats as well as the 2020 boat distribution of 87 percent motorboats and 13 percent non-motorized boats.

Table 4-13: Alum Creek Lake Carrying Capacity

Type of Boat	2010 Boat Distribution			2020 Boat Distribution		
	Low Density	Medium Density	High Density	Low Density	Medium Density	High Density
Non-Motorized Boats	17	33	67	22	45	90
Motorized Boats	150	301	603	150	299	601
Total Boats	167	334	671	172	344	691

The numbers of boats that could fit comfortably on the lake in the low, medium, and high density scenarios were compared to the estimated number of boats (based on the estimated number of boaters) that use the lake on a weekend day during peak season. Weekend days during peak

season were targeted in order to estimate the number of boaters on Alum Creek Lake during periods of highest volume.

An analysis was performed to evaluate the effect of the number of boats on the lake’s carrying capacity. The number of boats was derived based on the following assumptions:

- Peak boating season is from Memorial Day to Labor Day;
- 60 percent of total annual boaters use the lake during peak season;
- 75 percent of boating activity takes place on a weekend;
- There are 30 weekend days during peak season;
- 3 boaters per boat; and
- The duration of each trip is 6 hours, or half a summer day.

Table 4-14 shows the projected number of boats on the lake at any one time on a summer weekend day based on these assumptions for the baseline number of annual boaters (2007 to 2010 average) and for the 2020 projection (refer to Table 4-11).

Table 4-14: Alum Creek Lake 2020 Boat Usage

Year	Boating Visits per Weekend Day	Boats on Lake per weekend day	Boats at any one time
Baseline	2,936	979	489
2020	3,197	1,066	533

As shown in Table 4-14, a total of 533 boats are projected to use the lake at any one time on a summer weekend day in 2020, which reflects medium-to-high density usage. This is consistent with observations from resource managers who indicated that usage of Alum Creek Lake is relatively high on weekends during the recreational season.

Additionally, according to the Project resource managers, the boating culture has changed over the past 20 years. Whereas in the past boaters participated in high-speed activities like racing or waterskiing that require as much as 20 acres per boat for safety and enjoyment (refer to Table 4-12), a growing segment of current boaters gather together to raft for the day, socialize, and swim from their boats. Project resource managers estimate that approximately 25 percent of boaters visit the lake for this reason, and this percentage can be as high as 40 to 50 percent on weekend days. This rafting activity requires much less space than traditional boating. Because of this trend, Alum Creek Lake carrying capacity is not expected to cause safety or satisfaction issues for boat users.

4.8 Implications of Projected Future Demand on Recreational Activities

Based on previously discussed trends and changing demographics, demand for recreational activities at the Project are expected to change over the next 10 years. The following section describes the implications of the trend and demand analysis on recreational activities at the Project.

4.8.1 Boating

Boating is a popular activity at the Project and visits are expected to increase by 8.9 percent, or 17,380 visits, by 2020. Although the overall capacity of the lake is expected to be able to accommodate the current and future boaters, the number of boat ramps was reviewed to determine if they were sufficient for the number of boaters. Alum Creek Lake currently has five boat ramps with a total of 16 lanes and two marinas with 359 boat slips. An additional marina near the existing Hollenback Marina is being considered and could add another 140 boat slips. Boat slips at the marinas are in very high demand.

An analysis was performed to evaluate the effect of the number of boats that need to use a boat ramp during the lake's busiest season. The number of boats using a ramp was derived based on the number of boats using the lake on a weekend day calculated in Table 4-14 and the following assumptions, which are based on observations from resource managers:

- Non-motorized boats (not including sailboats) do not need to use a traditional boat ramp;
- Approximately 200 boats leave from a marina and do not need to use a boat ramp.

Based on 2007 through 2010 average visitation data, an estimated 681 boats use a boat ramp on a weekend day. The number of boats is projected to increase to 727 boats per weekend day in 2020.

In order to determine the demand for boat lanes, formulas based on the USACE Institute for Water Resources (IWR), Estimating Recreational Facility Requirements, Volume IV (IWR Research Report 74-R1) (USACE, 1974) were used. To compute the necessary number of boat lanes, the number of daily boats was divided by the boat lane turnover rate. The IWR Research Report 74-R1 indicates that an average boat turnover rate is approximately 40 boats per day, based upon nine minutes to launch or retrieve a boat, meaning that one ramp will allow a maximum of 40 boats per day to access the lake. However, observations at the Alum Creek Lake boat ramps indicate that it only takes boaters four to six minutes to launch or retrieve a boat. If it takes boaters six minutes to launch or retrieve, the boat lane turnover rate is 60 boats

per day. Table 4-15 displays the formula and variables used to derive boat ramp requirements, using turnover rates of both 40 and 60 boats per day.

Table 4-15: Variables used to Calculate Boat Ramp Facility Requirements

Boat Lanes for deriving facility requirements= Db/Rb			
Variable	Symbol	9-minute launch/retrieve	6-minute launch/retrieve
Number of daily boats	Db	681	681
Turnover rate per boat lane	Rb	40	60
Boat Lanes		17	11

Source: USACE, 1974

The required number of boat ramp lanes for the projected amount of daily boat visits is calculated to be between 11 and 17 in 2010 and between 12 and 18 in 2020. There are currently 16 boat lanes at Alum Creek Lake open during the summer season. However, due to the increasing size of boats using Alum Creek Lake, several of the four-lane boat ramps are functioning as two-lane boat ramps, reducing the number of effective lanes. Based on nine minutes to launch or retrieve a boat, 17 lanes would be required to meet current demand. This is consistent with the summer weekend crowding that has been noted at the existing boat launches; however, the lower number of boat lanes needed with a boat turnover rate of 60 per day indicates that if improvements can be made that increase boater efficiency in launching and retrieving their boats, the 16 current boat lanes could be sufficient through 2020. Examples of improvements that could increase boater efficiency include wider boat ramp lanes consistent with current boat usage and size, turnaround area redesign, procedural signage, and the addition of courtesy docks.

The Alum Creek Sailing Marina Association has a wait list of about 50 individuals. The Hollenback Marina is currently at capacity and a lottery is used to award rental boat slips due to the significant demand for boat slips. An additional power boat marina is in the planning stages. Any additional marina capacity could effectively decrease demand at existing boat ramps as potential users of any new boat slips currently likely trailer their boats to the lake and utilize boat ramps to launch and retrieve their boats.

As previously noted, the lake carrying capacity analysis performed as part of the master plan indicates the potential ability of the Project to accommodate some limited additional capacity while maintaining a safe quality recreational experience. The capacity study was conducted based upon available data, without surveys. The data indicates medium to high use in peak periods. Before any new marina facility is developed a more detailed lake carrying capacity analysis should be conducted.

It should also be noted that the evolving urban/suburban character of the region surrounding the Project may result in boater's ability to accept higher boating density levels and still enjoy a quality recreational boating experience.

Improvements should also be considered at the breakwater at Hollenback Marina and Boat Ramps. The current breakwater has experienced severe erosion and is in poor condition. If not rehabilitated it could result in damage to the Hollenback Marina. Current damage to the breakwater can be partially attributed to the wakes of larger boats using Alum Creek Lake. All improvements to the boat ramp areas and the breakwaters should take into consideration the fact that boats as large as 32-feet long are now using Alum Creek Lake on a regular basis.

Additionally, non-motorized boats are expected to increase from 10 percent of the total boats on Alum Creek Lake in 2010 to 13 percent in 2020. Designating an area of Alum Creek Lake as a paddle sport area for canoes and kayaks should be considered to accommodate this growing demand.

4.8.2 Camping

Currently, Alum Creek State Park Campground has a total of 320 campsites including 286 campsites with electrical hookups, 3 full service campsites, 30 primitive campsites at the horseman's campground, and a primitive group campsite. All campsites with electrical hookups are RV accessible, but do not have pull-through access. Up to six people are allowed to stay overnight on a campsite. Eight cabins are also available for overnight rental. Three cabins each accommodate five visitors, one cabin accommodates six visitors, and four cabins each accommodate two visitors. At six visitors per campsite, the maximum allowed visitors per cabin, and 50 visitors at the group campsite, the current camping facilities can accommodate approximately 2,000 visitors per night.

Alum Creek State Park has a high number of overnight stays for camping. Camping facilities at the Project operate at capacity during peak season weekends and during the Fall Camp Out event held annually the first weekend of October. The cabins have particularly high demand and reservations fill up quickly. With the strong existing demand expected to increase by 8.9 percent, or 6,780 visits over the next 10 years, an expansion of camping facilities, particularly cabins and developed RV campsites, may be warranted. Improvements should also be considered at the existing facilities because the trend in camping is expected to shift away from tent camping towards developed RV accessible campsites with electricity, water, sanitary sewer, and internet services. Currently restrooms and bathhouse facilities are old and outdated, and in

need of upgrade or replacement. If water and sewer utilities are also upgraded, consideration should be given to adding water and sewer connections along with camp-wide internet access.

4.8.3 Fishing

Fishing is a popular activity at the Project, and fishing visits at Alum Creek Lake are expected to increase by 1.9 percent by 2020 despite declining interest nationally, due to large increases in population in the surrounding areas. Fishing at Alum Creek Lake occurs both from boats and from the shore. Shoreline fishing is available from several of the recreational areas and boat ramps as well as dedicated fishing access areas including the Kilbourne Fishing Access, the Cheshire Fishing Access, and the Below Dam Area. Accessible shoreline fishing is available at Cheshire Fishing Access.

Alum Creek Lake has good water quality and supports a healthy fish population. The numerous coves provide excellent fish cover and are designated as “no-wake zones.” There are numerous fishing tournaments held throughout the recreation season at Alum Creek Lake. Ice fishing is a popular winter activity at Alum Creek Lake, and is available near the New Galena Boat Ramp and the Cheshire Boat Ramp.

Increased fishing activity from boats and fishing tournaments will put additional pressure on already congested boat ramps. Boat ramp improvements to increase operating efficiency should be considered. There will also be increased demand for shoreline fishing. Access points and associated parking may need to be improved. Implementing aquatic habitat improvements to increase fish catch rates for shore anglers could also enhance the fishing experience.

4.8.4 Hunting

Seasonal hunting and trapping are allowed at Alum Creek State Park in designated areas, which include approximately 3,500 acres at both the northern and southern areas of the Park. Hunting visits are expected to increase slightly, by 1,010 visits annually, by 2020. Targeted species include deer, waterfowl, squirrel, rabbit, and other upland game. Eliminating hunting at the Park has been considered due to the urbanization of the surrounding areas, but there is a need to control the deer population to decrease the number of deer-car collisions and reduce nuisance feeding on nearby gardens and ornamental shrubs.

Designated hunting areas are limited to the areas of the Project with the least amount of recreational activity, primarily on the eastern side of the lake. Key areas with high recreational use are closed to hunting and trapping activities. During deer season, walking trails are closed

except for Sundays, with the appropriate signage to notify the public. The two bridle trails, Hunter's Hollow and Winterhawk Bridle Trails, which are located in designated hunting areas, are closed during hunting season. One bridle trail, the Maple Glen Bridle Trail, is not located in a hunting area and is open during deer hunting season. This bridle trail is characterized by relatively steep ravines that must be crossed when starting at the existing trail head. Providing additional access points for this trail would allow users to avoid the steep ravines and better access the only available horse trail during the hunting season.

4.8.5 Other Activities

The projected use for other activities such as walking, hiking, and horseback riding is forecast to increase significantly with both higher participation rates and a growing population. The projected increase for other activities by 2020 is 13.9 percent, or 39,770 visits. The Project has two unimproved hiking trails, three mountain biking trails, three bridle trails for horseback riding, and a multi-purpose trail that can be used for hiking, snowmobiling, and cross country skiing, totaling over 60 miles of trails. Current usage of these trails vary from low usage on the unimproved hiking trails to moderate usage of the bridle trails to high usage of the mountain biking trails. Increased usage of the mountain biking trails will further necessitate the need for improved connectivity between Phases I and II. Additional supporting facilities such as parking and restrooms may also be needed. Additionally, local communities have expressed an interest in connecting their bike and pedestrian paths to the Alum Creek trail system.

Improving access from these adjacent neighborhoods could decrease the demand for parking spaces throughout the Project and increase usage of the trail system at the Project. The improved connectivity and linkage to adjacent community bike and pedestrian trails may necessitate improving the existing Project trail systems in some areas and/or constructing new bike and pedestrian trails at the Project to accommodate cyclist and walkers. Additional demand for bridle trails may result in the need for additional or improved trail heads and better connectivity between bridle trails on the eastern and western sides of the lake.

Other activities at the Project include a popular and highly-used four-acre dog park, a model airplane field, and two disc golf courses. Parking facilities reach or exceed capacity at both the dog park and the model airplane field and projected increased visitation will further exacerbate the situation. Adding new parking capacity or creating walking paths from existing less utilized parking lots could decrease parking congestion at these locations.

4.8.6 Picnicking

Existing picnicking facilities include picnic tables at multiple locations throughout the Project, including the swimming beach, Below Dam Area, Cheshire Boat Ramp and Picnic Area, New Galena Boat Ramps and Picnic Area, Lewis Center Picnic Area, Hollenback Marina and Boat Ramps, Visitor Center, and all campsites. This includes over 200 picnic tables, plus tables at each campsite and cabin, 20 tables at the group campsite, and 18 tables at the Horseman's Day Use and Horse Camp Area. Not counting the tables at the campsites, the current number of picnic tables can accommodate over 1,300 picnickers at a time. According to Project resource managers, participation in picnicking is a declining activity and the current supply of picnic tables at Alum Creek Lake sufficiently meets the current demand, with the exception of the group picnic shelters in the Below Dam Area. Contrary to the reported declining participation rate, the large projected population growth indicates picnicking visits at Alum Creek are expected to increase 6.9 percent, or 16,730 visits, by 2020. However, the existing number of individual picnic sites should remain adequate to meet 2020 demand. The three picnic shelters in the Below Dam Area are consistently reserved and used to capacity during peak recreation season. Additional group picnic shelters and supporting facilities are needed to meet future demand.

4.8.7 Sightseeing

The highest percentage of visits to Alum Creek Lake is for sightseeing, and sightseeing activity is projected to increase significantly in the future. The projected increase in sightseeing visits is 13.9 percent, or 157,860 visits, by 2020. This increase should result in additional visits to the Hogback Road Access Area for viewing of the lake and osprey nests, as well as visits to the Visitor Center viewing decks and the top of the dam. Additional facilities to support the scenic vista and wildlife viewing opportunities at the Hogback Road Access Area may be warranted. New viewing decks should be accessible. This additional demand should also increase the need for directional and interpretive signage at vista points along with short walking paths with interpretive signage at key locations for wildlife observation.

4.8.8 Swimming

Swimming at Alum Creek Lake is expected to increase by 8.9 percent, or 35,060 visits, by 2020. There is currently a 3,000 linear foot beach at Alum Creek Lake, with moderate to high summer weekend usage. Turnover at the beach is as high as three times a day, which allows many users to take advantage of the area. Because of the diversity of users and high turnover, the beach area

has adequate capacity to meet demand. Beach parking is also adequate to meet demand. The central bathhouse, pavilion, and restroom facilities are outdated and should be improved based on current and projected user needs.

Many Project visitors also engage in boat swim activity. This is allowed at three designated coves in Alum Creek Lake, with Big Run Cove being a popular destination. As many as 25 to 40 percent of boaters utilize the lake to anchor and swim from boats. This activity requires much less lake area than traditional boating activities, but these users need to have designated areas that avoid high use, unlimited speed areas. The current designated boaters swim areas appear to be sufficient for current users, but may need to be expanded as this activity increases in popularity and participation.

4.8.9 Waterskiing

Waterskiing takes place on Alum Creek Lake during the summer months. The participation rate is declining, but with the large expected increase in population, the number of visits is expected to increase by 6.9 percent, or 2,660 visits. According to Project resource managers, the percentage of boaters who waterski has been decreasing recently with the high price of gas and the increasing popularity of boater's swimming or rafting activity. With over 2,500 acres of Alum Creek Lake suitable for waterskiing, this should be sufficient for current and future demand.

5.0 RESOURCE USE OBJECTIVES

The objectives for the use of Project resources, both manmade and natural, are presented in this section. The objectives are used to guide development in the Project area and also guide resource management to obtain the greatest possible benefit through meeting the needs of the public and protecting and enhancing the environment. In the development of the objectives, the following were considered: authorized Project purposes, applicable Federal laws and directives, regional needs, resource capabilities, and expressed public desires. The information in Sections 2, 3, and 4 form much of the basis for the resource use objectives.

While implementing the following objectives, opportunities to increase efficiencies, cost effectiveness, and innovation at the Project should be considered. Consistent with EO 13514, specific measures to pursue include energy efficiencies, reduction of water consumption, reduction of carbon emissions, and reduction of operations and maintenance costs.

5.1 Resource Use Objective 1

Enhance recreational boating and fishing opportunities.

5.1.1 Measures to Achieve Objective

1. Conduct detailed lake carrying capacity study.
2. Improve boat ramp facilities through efficiencies that support larger size and use of boats.
3. Provide additional boat slips and mooring opportunities.
4. Provide an enhanced non-motorized boat launch to accommodate paddle sports.
5. Enhance existing shoreline fishing opportunities.
6. Provide additional boater's swim areas and overnight boating opportunities to address growing demand.

5.1.2 Justification

Demand for boating has historically been strong at the Project and is projected to increase in the future. Results from the public scoping meeting indicate a desire for improved paddle sport access, improved boat ramp facilities, and additional wet and dry storage for watercraft. There currently is a waiting list for boat slips at the Hollenback Marina and the Alum Creek Sailing Association Marina.

Boat ramp facilities are congested on weekends and holidays during the recreation season and are outdated relative to the current boat usage and size. The existing Hollenback Marina boat slips are also outdated relative to the current boat usage and size.

Due to the documented waiting list for boat slips, developing additional marina capacity, including boat slips and mooring opportunities, should relieve some congestion at boat ramps. Based on the lake carrying capacity analysis performed as part of this master plan, it appears that the lake can accommodate some limited marina capacity expansion and resultant increased boating activity. Any marina capacity improvement project should be supported by a detailed carrying capacity analysis.

There also is a growing demand for boater's swim areas (boat swim) and overnight boating (boat camp) opportunities at the lake. Currently there are coves designated to support these activities which are well used.

Paddle sports have been identified as the fastest growing component of boating. This is supported by the number of titles issued for this type of boat.

Fishing is the second most popular activity at the Project, with a significant portion of fishing activity associated with shoreline fishing.

5.2 Resource Use Objective 2

Provide additional overnight accommodation and enhance quality of existing accommodations.

5.2.1 Measures to Achieve Objective

1. Provide additional RV campsites and cabins.
2. Provide overnight boating opportunities.
3. Upgrade campground infrastructure services to include water, sewer and internet.
4. Enhance the camping experience through the addition of recreational facilities and services at the campground.

5.2.2 Justification

The campground is typically at capacity on weekends during the recreation season and the recreation program analysis indicates a near 10 percent projected increase in camping visits. The demand for cabins is high and there are frequent requests for additional cabins. Along with an increase in demand for campsites, there will be an increase in demand for recreational activities provided at the campgrounds such as disc golf and multipurpose court games. The recreation

program analysis indicates a shift away from tent camping toward more developed camping such as RV camping or cabins. It also indicates a shift in the area of influence to an aging population who desire an amenity oriented RV camping or cabin experience with internet capability and upgraded facilities. Adding popular recreational facilities such as a disc golf course and multi-purpose courts will enhance the recreational experiences at the campground. The restrooms and bathhouses at the campgrounds are old and outdated and need to be updated or replaced. There is a growing demand for boat camp opportunities for boaters at the lake and addressing this demand will provide an alternative overnight visitation opportunity.

5.3 Resource Use Objective 3

Enhance recreational day use activities.

5.3.1 Measures to Achieve Objective

1. Provide additional group picnic shelters.
2. Enhance walking, hiking, and biking opportunities through improved connectivity to surrounding neighborhoods.
3. Improve access and connectivity of horseback riding trails through the addition of access points and improved connectivity along SR 521.
4. Enhance facilities to support sightseeing and wildlife viewing through improved signage and observation platforms.
5. Provide additional parking for dog park and model airplane field users.
6. Enhance the winter recreation area by adding additional opportunities such as an ice skating area.

5.3.2 Justification

Demand for picnic shelters is high, with shelters typically reserved every weekend during the recreation season. An increase in visits is projected for picnicking. The swim beach is a popular day use recreation area with projected growth in usage. Some facilities at the swim beach are outdated and do not function effectively. Substantial increases in user visits are projected in other day use activities such as walking, hiking, and biking. The demand for pedestrian and bicycle trails with connectivity to surrounding communities is also high, as noted at the public scoping meeting.

Stakeholders have noted that during the hunting season, only one bridle trail is open and developing additional access points could increase utilization of this trail during the winter by allowing users to bypass more geographically challenging portions of the trail. The trail open

during hunting season is located in an area separate from designated hunting areas. There is also poor connectivity between horse trails near SR 521.

Osprey nesting platforms are provided in the northern portion of Alum Creek Lake. Birding is identified in the Ohio SCORP as one of the most popular activities in the central Ohio region and wildlife viewing is a popular activity at the Project. Wildlife watching was also cited in the Ohio SCORP as the fastest growing type of recreation associated with wildlife. The need for additional wildlife viewing/nature observation areas was identified at the public scoping meeting.

Various stakeholders have noted the need for additional infrastructure, such as additional parking capacity and additional or upgraded restroom facilities, at popular day use recreation areas throughout the Project.

It was noted in the Ohio SCORP that approximately one-third of Ohio households participate in winter activities and nationally participation in winter activities is expected to increase.

5.4 Resource Use Objective 4

Support unique, environmentally and culturally sensitive areas.

5.4.1 Measures to Achieve Objective

1. Identify and delineate the location, size, and type of wetlands.
2. Enhance existing wetlands and/or create new wetlands.
3. Protect and interpret environmentally unique ecosystems, including the osprey nests and bottomland hardwood ecosystems.
4. Prevent introduction of invasive species and, where present, control and monitor invasive species.
5. Restore native species and habitat conditions in ecosystems that have been invaded.
6. Identify forested areas for preservation.

5.4.2 Justification

In addition to supporting the laws and EOs described in Section 1.0 that require the conservation of wildlife and plant species and prohibit the destruction of wetlands, there are opportunities at the Project to provide support for environmentally sensitive areas. A number of unique ecosystems at the Project, such as wetlands and bottomland hardwoods, are in decline throughout the region and require support to avoid further decline. Conservation of the natural habitat within the Project would maintain the rich ecological diversity of the area, provide interpretive opportunities, and also attract visitors to the Project.

5.5 Resource Use Objective 5

Improve pedestrian, bicycle, and vehicular connectivity between the Project and surrounding neighborhoods.

5.5.1 Measures to Achieve Objective

1. Improve bicycle and pedestrian linkage between the Project and surrounding communities.
2. Improve safety and vehicular access to the Below Dam Area.

5.5.2 Justification

There is significant biking and hiking activities both at the Project and in the surrounding communities. There is expressed interest and public desire to better connect and link existing and planned pedestrian and bicycle facilities between the Orange Township neighborhoods and the Project. This could result in reduced vehicular congestion, reduced demand for parking, and reductions in energy and greenhouse gas (GHG) emissions.

There are expressed desires to improve access into the Below Dam Recreation Area due to safety concerns and traffic congestion on Lewis Center Road.

This page intentionally left blank.

6.0 LAND ALLOCATION AND CLASSIFICATION

The land allocation and land classification information presented in this section provides for the development, use, and management of Project lands and waters. Land allocation and classification categories are established for USACE Projects based on Engineering Regulation (ER) 1130-2-550, Recreation Operations and Maintenance Policies (USACE, 1996a).

6.1 Land Allocation

Land allocations identify the authorized purposes for which project lands were acquired. The entire Project has a land allocation of Operations. Operations lands are those lands acquired to provide safe, efficient operation of the project for its authorized purposes. The Project purposes include flood risk management, recreation, water supply, and fish and wildlife management. No separable lands for recreation, fish and wildlife, or mitigation were acquired for the Project.

6.2 Land Classification

Allocated Project lands are further classified to provide for development and resource management consistent with the authorized Project purposes and the provisions of NEPA and other Federal laws. The classification process refines the land allocation to fully utilize Project lands and considers public desires, legislative authority, regional and Project-specific resource requirements, and suitability. General land classification categories as defined in ER 1130-2-550 (USACE, 1996a) include:

1. Project Operations;
2. Recreation;
3. Mitigation;
4. Environmental Sensitive Areas;
5. Multiple Resource Management:
 - a) Recreation – Low Density;
 - b) Wildlife Management General;
 - c) Vegetative Management;
 - d) Inactive and/or Future Recreation Areas; and
6. Easement Lands.

Table 6-1 identifies land classifications per ER 1130-2-550 and the Project areas included in the classifications with the associated acreage. The acreage does not include the lake area of 3,387

acres at summer pool. The land classifications are discussed below, and the land classifications in the Project area are shown in Figure 6-1.

1. Table 6-1: Land Classification and Designated Project Areas

	Land Classification	Project Areas Included	Acreage
1	Project Operations	Visitor Center	7
		Dam site	369.4
		Below Dam Recreation Area	35
		Model Airplane Field (Dinneen Field)	9.5
		Del-Co Water Treatment Plant	4.5
		City of Columbus Water Pump Station	0.6
		Total Acreage	426
2	Recreation (Intensive Use)	Alum Creek State Park Campground	270
		Alum Creek Sailing Marina	12
		Beach	70
		Friends of Alum Creek Dog Park	5
		Group Campground	4
		Hollenback Marina and Boat Ramps	92
		Lewis Center Picnic Area	30
		COMBO Mountain Biking Trails Phase 1&2	14
		New Galena Boat Ramps and Picnic Area	63
		Adjacent and Supporting lands	1,260
	Total Acreage	1,820	
3	Mitigation	No applicable lands	0
4	Environmental Sensitive Areas	No applicable lands	0
5	Multiple Resource Management		
	a) Recreation – (Low Density)	Cheshire Boat Ramp and Picnic Area	42
		Cheshire Fishing Access	16
		Howard Road Boat Ramp	10
		Hogback Road Access Area	2
		Horseman’s Day Use and Horse Camp Area	4
		Kilbourne Fishing Access	5
		Adjacent and Supporting lands	2,731
	b) Wildlife Management General	No applicable lands	0
	c) Vegetative Management	No applicable lands	0
d) Inactive and/or Future Recreation Areas	No applicable lands	0	
	Total Acreage	2,810	
6	Easement Lands	Total Acreage	229

6.2.1 Project Operations

The Project Operations classification includes lands required for the dam and associated structures, operations center, administrative offices, maintenance compounds, and other areas that are used to operate and maintain the Project. Where compatible with operational requirements, Project Operations lands may be used for wildlife habitat management, recreational use, or agricultural activities. Licenses, permits, easements, or other outgrants are issued only for uses that do not conflict with operational requirements.

Lands classified for Project Operations are concentrated at the Dam Site and the Below Dam Area.

6.2.2 Recreation – Intensive Use

The Recreation – Intensive Use classification includes lands that are designated for intensive levels of recreational use to accommodate and support the recreational needs and desires of visitors. These 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, no uses of these lands are allowed which would interfere with public enjoyment of recreation opportunities. Low-density recreation and wildlife management activities compatible with intensive recreation use are acceptable, especially on an interim basis. No agricultural uses are permitted on those 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.

Lands classified for Recreation – Intensive Use are located in the State Park and concentrated along the southwest and southeast quadrants of the lake including recreation areas such as the campground, marinas, the swimming beach, and day use areas.

6.2.3 Mitigation

This classification only includes land acquired or designated specifically for mitigation. No mitigation lands exist at the Project.

6.2.4 Environmental Sensitive Areas

The Environmentally Sensitive Area classification includes areas where scientific, ecological, cultural, or aesthetic features have been identified. Public use is normally limited or prohibited to ensure that the sensitive areas are not adversely impacted. Agricultural or grazing uses are not permitted. Environmentally sensitive resources are intermittently located throughout the Project within other land classification areas. There are no specific environmental sensitive areas designated under this classification at the Project.

6.2.5 Multiple Resource Management

The Multiple Resource Management classification includes lands that are managed for one or more of the following sub-classifications: (a) low density recreation, (b) wildlife management, (c) vegetative management, and (d) inactive and/or future recreation. However, management is not limited to these activities to the extent that they are compatible with the primary allocation(s).

6.2.5.1 Recreation - Low Density

The Recreation – Low Density sub-classification includes lands that are designated for dispersed and/or low-density 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.

Manmade intrusions, including powerlines, non-project roads, and water and sewer pipelines, may be permitted under conditions that minimize adverse effects on the natural environment. Vegetation 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. Where not in conflict with the safety of visitors and project personnel, hunting and fishing are allowed pursuant to tribal or State fish and wildlife management regulations.

Land classified in this sub-classification are State Park lands primarily concentrated in the eastern and northern reaches of the lake and include hunting and trapping areas, boat ramps and fishing access areas, bridle trails and equestrian camp area, and the Hogback Road Access Area.

6.2.5.2 Wildlife Management General

The Wildlife Management General sub-classification includes lands that are designated for wildlife management. These lands contain valuable wildlife habitat components that are maintained to yield habitat suitable for a designated wildlife species or group of species. These lands may be administered by other public agencies under a lease, license, permit, or other formal agreement. No lands within the Project are classified in this sub-classification.

Private use of wildlife lands is prohibited except for agricultural activities undertaken to improve wildlife habitat. Licenses, permits, and easements are not allowed for such manmade intrusions as pumping plants, pipelines, cables, transmission lines, or non-project roads. Exceptions are allowed when necessary for the public interest. Wildlife lands are available for sightseeing, wildlife viewing, nature study, and hiking. Consumptive uses of wildlife, including hunting, fishing, and trapping, are allowed when compatible with the wildlife objectives for a given area and with Federal and State fish and wildlife management regulations. No lands within the Project are classified in this sub-classification.

6.2.5.3 Vegetative Management

The Vegetative Management sub-classification includes lands that are designated for vegetative management. Management activities focus on the protection and development of forest resources and vegetative cover. The Alum Creek Lake Project has no project lands with this sub-classification, but all project lands are managed to protect and develop vegetative cover in conjunction with other land. No lands within the Project are classified in this sub-classification.

6.2.5.4 Inactive and/or Future Recreation Areas

The Inactive and/or Future Recreational Areas sub-classification includes lands that are designated recreational areas that are planned or contain existing recreation areas that have been closed temporarily. No lands within the Project are classified in this sub-classification.

6.2.6 Easement Lands

The Easement Lands classification includes all lands for which the USACE holds 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. Significant flowage easements have been acquired beyond the Project area and are shown in Figure 6-1.

This page intentionally left blank.

This page intentionally left blank.

7.0 Resource Plan

This section presents the plan for resource use and development at the Alum Creek Lake Project. The plan includes identified issues and the recommended actions or strategies to address each issue. The issues and recommended actions are presented in Table 7-1. Table 7-1 contains the following information for each Project area:

- **Land Classification** – Land use classification. See Section 6.0 for more information on land classifications.
- **Management Agency** – Agency or agencies directly responsible for managing a Project area.
- **Issues** – Identified issues which are based on input from the public and interested agencies. Each issue relates to the resource use objective (RUO) listed in Section 5.0.
- **Recommendations** – Proposed actions or strategies to address the identified key issues. Recommendations are conceptual in nature and will be translated into operational terms in the Operational Management Plans. Prior to the implementation of any development activity, additional environmental studies and economic analyses may be conducted if necessary. The recommendations relate to the Project-specific measures that are intended to achieve the RUO listed in Section 5.0.

This page intentionally left blank.

Table 7-1: Resource Plan for the Lake Project

Project Area	Land Classification	Management Agency	Issue	Recommendations
Visitor Center	Project Operations	USACE	No issues were identified for this area.	<ul style="list-style-type: none"> Periodically update exhibits.
Below Dam Recreation Area	Project Operations	USACE	Neighboring townships are developing multi-use bikeway/pedestrian path plans with the expressed interest of providing direct connectivity to the Project and the Below Dam Recreation Area. Bike and pedestrian access to the Project could help reduce the demand for vehicular parking, as parking is at capacity at several locations throughout the Project (RUO 3 and RUO 5)	<ul style="list-style-type: none"> Provide bikeway/pedestrian path connections in the Below Dam Recreation Area to improve connectivity to neighboring communities. Potential access locations include Bale Kenyon Road and Africa Road. Develop a pedestrian/ bicycle bridge over the spillway to provide connectivity between the east and west sides of the spillway eliminating the need to use Lewis Center Road. Incorporate pedestrian/bikeway trail with pedestrian bridge between Bale Kenyon Road and Jaycox Road. Add parking near east end of the dam near Africa Road to access pedestrian/bikeway trail. Refer to Figure 7-1.
			Recreational facilities do not fully meet the needs and demands of visitors. Group picnic shelters are reserved throughout the recreation season and additional demand is forecasted. (RUO 3)	<ul style="list-style-type: none"> Provide an additional group picnic shelter and associated parking in the Below Dam Recreation Area. Provide an additional restroom facility and multi-purpose courts. Refer to Figure 7-1.
			The Below Dam Recreation Area has high intensity use and strong demand for fishing during the peak season but does not provide universally accessible fishing access. (RUO 1)	<ul style="list-style-type: none"> Integrate a universally accessible fishing pier with the pedestrian/bicycle bridge over the spillway. Refer to Figure 7-1.
			The parking lot on the west side of the spillway is unimproved and at capacity. (RUO 1 and RUO 3)	<ul style="list-style-type: none"> Improve the parking lot on the west side of the spillway area. Refer to Figure 7-1.
			The vehicular entrance to the Below Dam Recreation Area from Lewis Center Road has been noted as a safety concern because of the high traffic volumes on Lewis Center Road. (RUO 5)	<ul style="list-style-type: none"> Improve the Below Dam Recreation Area entrance at Lewis Center Road to enhance safety and traffic flow.
			The Winter Recreation Area includes a sledding hill but does not have an ice skating area. (RUO 3) One-third of Ohio households participate in winter activities and nationally participation in winter activities is expected to increase.	<ul style="list-style-type: none"> Provide ice skating area near the Winter Recreation Area. Refer to Figure 7-1.
Dinneen Field	Project Operations	Westerville Model Aeronautics Association	Parking facilities at Dinneen field are over capacity during annual events and on weekends during the peak recreation season. (RUO 3)	<ul style="list-style-type: none"> Provide a path from the existing public parking lot located southwest of Dinneen Field, near the Winter Sledding Area, for pedestrian access to the model airplane field. Refer to Figure 7-1.
Alum Creek State Park Campground	Recreation (Intensive Use)	ODNR	The campsites are typically reserved throughout the recreation season and are at capacity and there are frequent requests for additional cabins. (RUO 2)	<ul style="list-style-type: none"> Develop additional RV campsites and construct additional cabins to support current and future demand. Additional RV campsites and cabins could be located adjacent to and north of the existing campground.
			There is an increasing demand and desire for upgraded RV camping facilities and amenities. (RUO 2)	<ul style="list-style-type: none"> Provide wireless internet service throughout the campground. Wireless internet is an amenity that has been growing in popularity and would be used by a wide variety of visitors.
New Galena Boat Ramps and Picnic Area	Recreation (Intensive Use)	ODNR	There is substantial congestion at the boat ramp during the summer season including weekends, holidays, and fishing tournaments. The site accommodates a high volume of boat launch activity as well as substantial day use activity which results in some conflict of use. (RUO 1)	<ul style="list-style-type: none"> Segregate day use from boat ramp traffic.
			Ramp lane widths are obsolete relative to current watercraft usage and size; this effectively reduces launch capacity. The larger vessels using the lake require longer truck/trailer combinations for which current truck/trailer parking spaces are not adequate. (RUO 1) Turn-a-round areas are inefficient for boat prep prior to launch and securing boats after retrieval. This adds to congestion at boat ramps and blocks access to ramps and parking areas. (RUO 1)	<ul style="list-style-type: none"> Plans are currently in place to improve the boat ramp area and associated parking area. Refer to Figure 7-2 showing existing conditions and Figure 7-2a showing the approved site design.
Lewis Center Picnic Area	Recreation (Intensive Use)	ODNR	No issues were identified within the Lewis Center Picnic Area.	<ul style="list-style-type: none"> Maintain existing facilities at this location.

Table 7-1: Resource Plan for the Lake Project

Project Area	Land Classification	Management Agency	Issue	Recommendations
Cheshire Boat Ramp and Picnic Area	Multiple Resource Management Recreation – Low Density	ODNR	There is substantial congestion at the boat ramp during the summer season including weekends, holidays, and fishing tournaments. Also, the site accommodates high volume boat launch activity as well as substantial day use activity which results in some conflict of use. (RUO 1)	<ul style="list-style-type: none"> Segregate day use from boat ramp traffic.
			The boat ramps face directly west toward open lake waters and are exposed to wave action and boat wakes, creating difficulty launching and retrieving boats and causing erosion. Also, ramp lane widths are obsolete relative to current watercraft usage and size; this effectively reduces launch capacity. (RUO 1)	<ul style="list-style-type: none"> Re-orient the boat ramp so that boats are launched into the cove. Develop a breakwater to the west of the ramp to protect the boat ramp from wave action and boat wakes. Reconfigured ramps should be designed to accommodate wider boats, consistent with current boat usage and size.
			The larger vessels using the lake (currently up to 32' in length) require longer truck/trailer combinations for which current truck/trailer parking spaces are not adequate. (RUO 1)	<ul style="list-style-type: none"> Develop truck/trailer parking bays adequate to accommodate longer trailers comparable to current boat usage and size.
			Turn-a-round areas are inefficient for boat prep prior to launch and securing boats after retrieval. This adds to congestion at boat ramps and blocks parking areas. (RUO 1)	<ul style="list-style-type: none"> Improve the turn-a-round area near the boat ramp to more efficiently accommodate boat prep prior to launch and securing boats after retrieval.
Beach	Recreation (Intensive Use)	ODNR	The existing central beach facility including, restrooms, showers, pavilion, and concession area are outdated and do not function effectively. Restroom facilities on the north and south sides of the beach are outdated. (RUO 3) Due to uncertainty associated with weather conditions, food concession operations have not been successful. (RUO 3)	<ul style="list-style-type: none"> Replace central beach facilities, incorporating updated restrooms, appropriate sized shower facilities, pavilion, and concession vending machine area. Restroom facilities on both the north and south side of the Beach Area should be updated.
			The pedestrian path along the beach front dead-ends on the south side of the beach. (RUO 3)	<ul style="list-style-type: none"> Provide connectivity from the pedestrian path along the beach front to the Visitor Center Trail.
Cheshire Fishing Access	Multiple Resource Management Recreation – Low Density	ODNR	No issues were identified at the Cheshire Fishing Access.	<ul style="list-style-type: none"> Maintain existing facilities at this location.
Howard Road Boat Ramp	Multiple Resource Management Recreation – Low Density	ODNR	There is substantial congestion at the boat ramp during the summer season including weekends, holidays, and fishing tournaments. (RUO 1) There is only one center courtesy dock which impedes the efficiency of this boat ramp. (RUO 1) Ramp widths are relatively narrow compared to current boat usage and size, which reduces boat launch efficiency. (RUO 1)	<ul style="list-style-type: none"> Improve boat ramp to more efficiently accommodate current boat usage and size including expanding or adding courtesy piers. Provide improved striping and markings to delineate the boat ramp lanes, pre-launch areas, and areas for securing boats after retrieval, as well as procedural signage to increase user awareness and efficiency.
			The larger vessels using the lake (currently up to 32' in length) require longer truck/trailer combinations for which current truck/trailer parking spaces are not adequate. (RUO 1)	<ul style="list-style-type: none"> Develop truck/trailer parking bays adequate to accommodate longer trailers comparable to current boat usage and size.
			Turn-a-round areas are inefficient for boat prep prior to launch and securing boats after retrieval. This adds to congestion at boat ramps by blocking circulation and blocking access to parking areas. (RUO 1)	<ul style="list-style-type: none"> Improve the turn-a-round area near the boat ramp to more efficiently accommodate boat prep prior to launch and securing boats after retrieval.
Hogback Road Access Area	Multiple Resource Management Recreation – Low Density	ODNR	Area provides excellent scenic vistas of lake and wildlife, and also has substantial parking improvements however, no improvements have been made in the scenic and wildlife viewing area. The area is poorly delineated with signage. (RUO 3)	<ul style="list-style-type: none"> Provide entry and directional signage. Provide interpretive signage of the lake and osprey nests. Provide improved access between the parking lot and the viewing area and provide improved viewing platform with safety railing at the overlook.
Kilbourne Fishing Access	Multiple Resource Management Recreation – Low Density	ODNR	Alum Creek Lake offers limited developed areas for paddle sports. Paddle sports have been identified as the fastest growing component of boating based on titles issued for boats. (RUO 1)	<ul style="list-style-type: none"> Develop a paddle sport area for kayaks and canoes at the Kilbourne Fishing Access Area by providing improved non-motorized boat ramp and access.
			This area currently has parking, gated unimproved access to the shoreline, open space with picnic tables, and restroom facilities. The picnic and restroom facilities are old and in poor condition. (RUO 3)	<ul style="list-style-type: none"> Consider developing adjacent picnic sites equipped with tables, grills, and trash receptacles. Update restroom and picnic facilities.

Table 7-1: Resource Plan for the Lake Project

Project Area	Land Classification	Management Agency	Issue	Recommendations
Hunting Areas	Multiple Resource Management Recreation – Low Density	ODNR	High deer population is causing safety problems with vehicular conflicts on surrounding roadways and nuisance feeding on ornamental plants and gardens at surrounding residences. (RUO 4)	<ul style="list-style-type: none"> Maintain current hunting opportunities and restrictions to manage the deer population. Develop a wildlife control plan to manage deer population.
Hollenback Marina and Boat Ramps	Recreation (Intensive Use)	ODNR	The boat slips at the marina are 25 feet long and many boats utilizing the marina exceed this length. Additionally, the existing breakwater protecting the marina has experienced significant erosion. (RUO 1)	<ul style="list-style-type: none"> Upgrade boat docks at marina to accommodate vessels up to 32 feet long. Reconstruct the breakwater to protect the marina.
			There is currently a waiting list for seasonal boat slip rentals and a lottery is used to assign boat slip rentals. (RUO 1)	<ul style="list-style-type: none"> Consider additional seasonal boat slip rentals along with water and electrical service to the dock and supporting facilities including parking and restroom facilities. However, due to current medium to high density boating activity on the lake during recreational season weekends, any recommendation should be supported by a detailed Lake Carrying Capacity analysis to verify that marina expansion will not result in boating activity that exceeds the carrying capacity of the lake.
			High use of the picnic area and shoreline fishing area adjacent to the boat ramp results in passenger vehicles utilizing the adjacent parking areas designed for truck/trailer parking. This also mixes boat ramp traffic with day use/shoreline fishing traffic and adds to congestion. (RUO 1)	<ul style="list-style-type: none"> Provide separate parking areas to separate day use/shoreline fishing vehicular traffic from boat ramp traffic and the boat trailer parking area.
			There is substantial congestion at the boat ramp during the summer season including weekends, holidays, and fishing tournaments. Also, the ramps are obsolete relative to current boat usage and size; this effectively reduces launch capacity. Turn-a-round areas are inefficient for boat prep prior to launch and securing boats after retrieval. This adds to congestion at boat ramps by blocking circulation and blocking access to parking areas. The larger vessels (currently up to 32' in length) using the lake require longer truck/trailer combinations for which current truck/trailer parking spaces are not adequate. (RUO 1)	<ul style="list-style-type: none"> Approved plans are currently in place to improve the boat ramp area and associated parking area. Refer to Figure 7-3 showing existing conditions and Figure 7-3a showing the approved site design.
Alum Creek Sailing Marina	Recreation (Intensive Use)	ODNR partnership with Alum Creek Sailing Association	There is significant demand for additional boat storage capacity including, boat slips, mooring buoys, and dry storage. The marina has been 100% occupied since 2004 and there is a current waiting list for marina boat slips. Available area for marina expansion is limited without encroaching on the designated boaters swim area. (RUO 1)	<ul style="list-style-type: none"> Consider providing additional sailboat wet storage by developing a relatively small mooring field of 10 to 20 rentable mooring buoys. However, due to current medium to high density boating activity on the lake during recreational season weekends, any recommendation should be supported by a detailed Lake Carrying Capacity analysis to verify that marina expansion will not result in boating activity that exceeds the carrying capacity of the lake.
			There is no small sailboat launch ramp facility and the current beach storage area for small sailboats is steep. (RUO 1)	<ul style="list-style-type: none"> Develop a boat launch near the sailing marina beach to accommodate small sail boats. Provide additional dry storage capacity near the beach and dry storage area for small sail boats on trailers or small sail boats that can be moved using a mooring dolly.
			Additional space for storage of equipment and dry storage for trailers is needed; there is no office building for the dock manager and file storage. (RUO 1)	<ul style="list-style-type: none"> Develop an off-site location for sailboat and trailer dry storage. Develop, on-site, a small office building for the dock manager and file storage; and a storage facility for maintenance equipment.
Friends of Alum Creek Dog Park	Recreation (Intensive Use)	ODNR partnership with Friends of Alum Creek Dog Park	The Alum Creek Dog Park has high use, especially on weekday evenings and weekends during the recreation season. Parking facilities are over capacity, with dog park visitors parking along the street and in grassy areas. (RUO 3)	<ul style="list-style-type: none"> Provide additional parking spaces for dog park visitors in the vicinity of the dog park near the existing restrooms. Provide additional entrance to the large dog area near the proposed parking lot expansion.
			The stakeholders of the Alum Creek Dog Park have noted a need for an educational center/group meeting area. (RUO 3)	<ul style="list-style-type: none"> Develop a group shelter with one partial wall, electrical service, lighting and potable water near the existing restrooms and proposed additional parking area. This facility would be used for educational events concerning pet health, adoption events, and related day use activities.

Table 7-1: Resource Plan for the Lake Project

Project Area	Land Classification	Management Agency	Issue	Recommendations
Mountain Biking Trails	Recreation (Intensive Use)	ODNR partnership with Central Ohio Mountain Biking Organization	Events are typically held at the Phase 1 Trail Head and the parking capacity is exceeded at times. There is also no potable water or restrooms at the Phase 1 Trail Head. (RUO 3)	<ul style="list-style-type: none"> Improvements at the Phase 1 Trail Head should include expanding parking capacity, adding lighting, restrooms, and potable water.
			Safety concerns have been raised by users regarding traveling between Phase 1 and Phase 2 of the Mountain Bike Trails and not having a dedicated connecting bike trail adjacent to Lewis Center Road and Africa Road. (RUO 3)	<ul style="list-style-type: none"> Coordinate with the county to add separate bike lanes adjacent to Lewis Center Road and Africa Road to provide connectivity between Phase 1 and Phase 2 of the COMBO mountain bike trail systems.
Horseman’s Day Use and Horse Camp Area	Multiple Resource Management (Low Density Recreation)	Ohio Horseman’s Council	The only connectivity on the northern end of the project for the horse trail system between the west side and the east side of the lake is via SR 521 and the bridge over Alum Creek. This bridge is relatively narrow with minimal shoulders and creates safety concerns with potential conflicts between vehicles and horseback riders. (RUO 3)	<ul style="list-style-type: none"> Work with ODOT to implement signing, striping, and markings to designate the horse trail connection at the bridge crossing.
Lake	Not Applicable	USACE and ODNR	Shoreline fishing is a popular activity at the Project and there are dedicated areas for shoreline fishing access. Improved catch rates for shore anglers may reduce demand for boat fishing and help alleviate congestion at boat ramps. (RUO 1)	<ul style="list-style-type: none"> Implement fish attractors at dedicated shoreline fishing access locations to benefit shore angler catch rates.
			Boat swim and camp swim activities for boaters are increasing in popularity. (RUO 1)	<ul style="list-style-type: none"> Designate additional coves for boater’s swim areas and overnight boating activities to accommodate future demand.
Project Wide	Not Applicable	Multiple Agencies	Invasive species are present on site and may potentially threaten existing natural ecosystems. (RUO 4)	<ul style="list-style-type: none"> Implement an invasive species plan to prevent the introduction of invasive species and control and monitor invasive species already present at the Project area in a cost effective and environmentally sound manner.
			The Project area includes unique habitats such as wetlands, habitats that support neo-tropical migratory birds, and bottomland hardwoods. (RUO 4)	<ul style="list-style-type: none"> Conduct baseline study that identifies unique habitats throughout the Project (e.g., wetlands and bottomland hardwoods) and develop a monitoring program. Knowing the amount and range of the habitats would allow losses or gains to be tracked.
			There is expressed interest and public desire to better connect and link existing and planned pedestrian and bicycle facilities between the surrounding community/ neighborhoods and the Project. This could result in reduced vehicular congestion, reduced demand for parking, and reductions in energy and GHG emissions. Public survey of Orange Township identified trail connectivity to Alum Creek as the number two need. (RUO 5)	<ul style="list-style-type: none"> Establish improved bikeway and pedestrian connectivity between the Project and surrounding communities. Potential locations for improved connectivity include Bale Kenyon Road, Jacox Road, Africa Road, Cheshire Road, and CR 10.
			The forested habitats at Alum Creek Lake represent a unique resource in the Project area. Due to the rapid spread of development in the area as well as the large amount of open agricultural lands, the limited amounts of forested habitat are being further reduced. These unique areas support fairly contiguous mature second growth forested habitat with generally low density recreational development as part of the Project. (RUO 4)	<ul style="list-style-type: none"> These unique forested resources are shown as the “Forested Areas to be Preserved” on Figure 3-9.



Figure 7-1: Alum Creek Lake Below Dam Recreation Area Improvements

This page intentionally left blank.

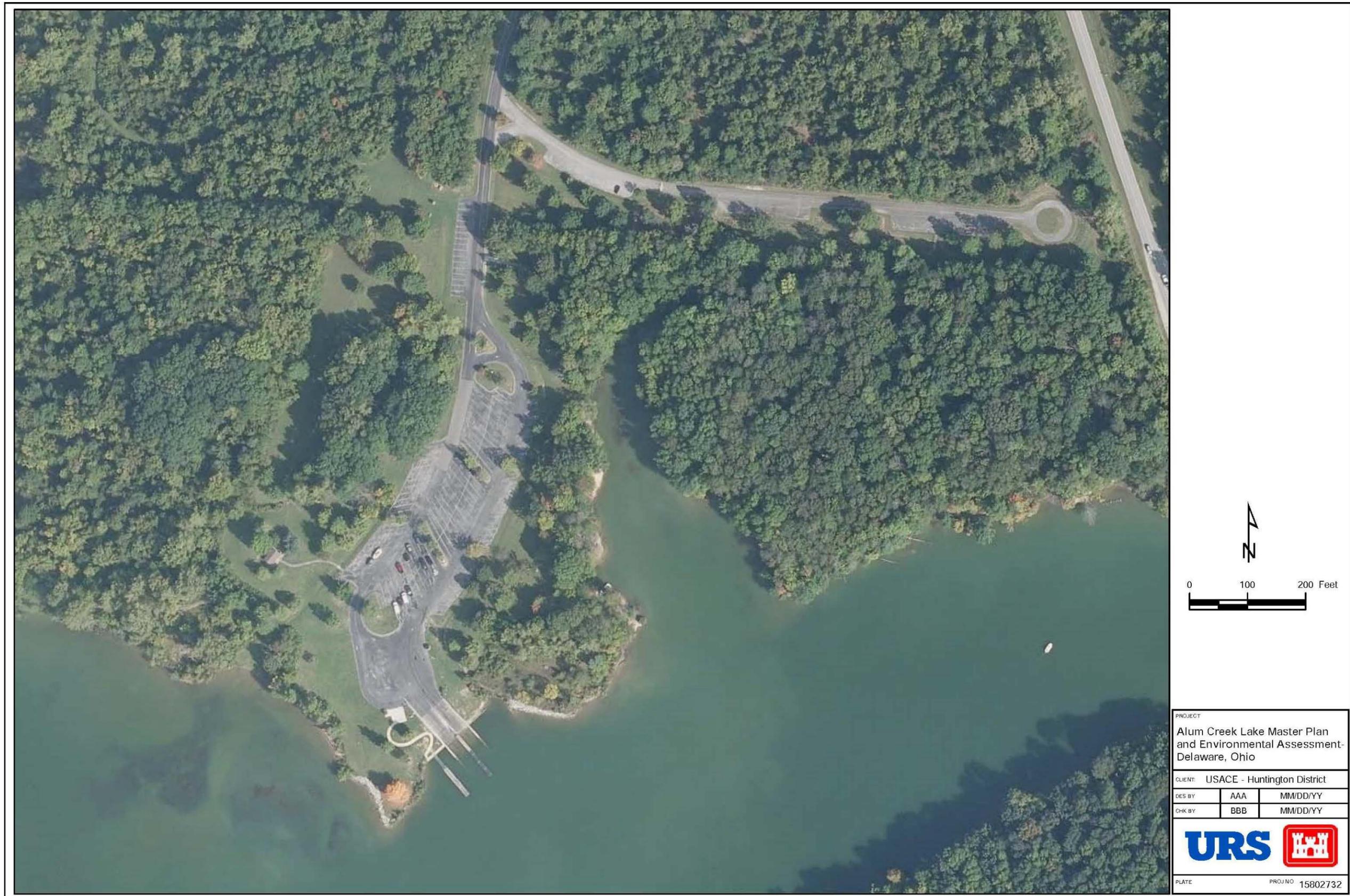


Figure 7-2: Alum Creek Lake New Galena Boat Ramp and Picnic Area, Existing Conditions

This page intentionally left blank.

This page intentionally left blank.

This page intentionally left blank.



Figure 7-3: Alum Creek Lake Hollenback Marina and Boat Ramp, Existing Conditions

This page intentionally left blank.

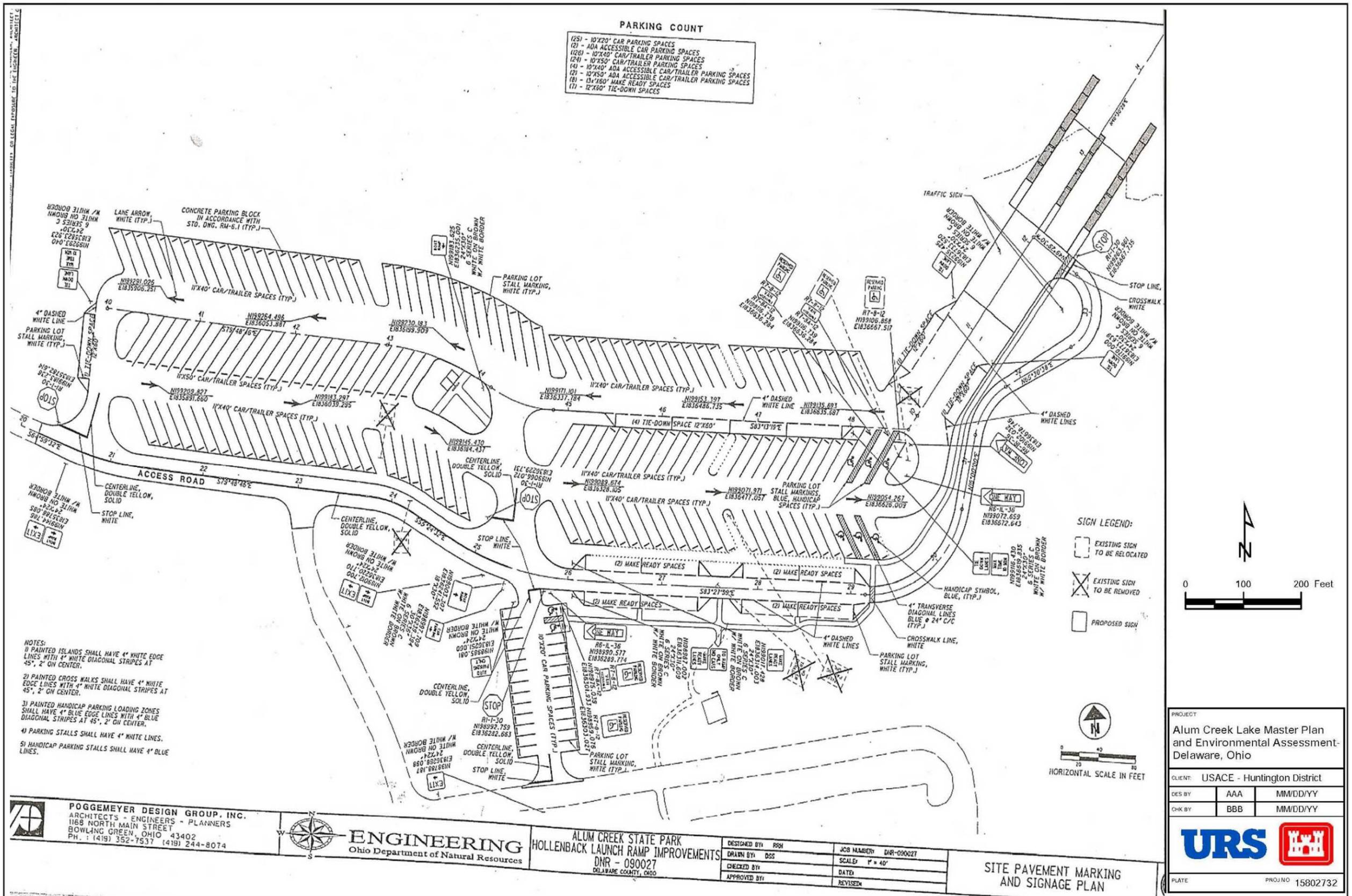


Figure 7-3: Alum Creek Lake Hollenback Boat Ramp and Parking Improvements, Site Plan

This page intentionally left blank.

8.0 Special Considerations

According to Engineering Pamphlet (EP) 1130-2-550, Recreation Operations and Maintenance Guidance and Procedures (USACE, 1996a), special programs are programs or situations that should be identified and discussed in a Master Plan but are not covered in other sections of the plan. The potential and suitability for utility corridors was identified as the special consideration at the Project.

8.1 Major Utility Corridor Considerations at the Alum Creek Lake Project

The Energy Policy Act of 2005 (PL 109-58) directed the Secretaries of Agriculture, Commerce, Defense Energy and Interior to identify corridors for oil, gas, and hydrogen pipelines and electrical transmission and distribution facilities on Federal lands and to schedule prompt action to identify, designate, and incorporate the corridors into the applicable land use plans. In 2009, the USACE issued a Non-Recreational Outgrant Policy (USACE, 2009a), which states that the primary rationale for authorizing any future non-recreational outgrant request for use on USACE lands or waters will be (1) no viable alternative to the activity or structure being located on Civil Works land or waters or (2) a direct benefit to the government. Public utilities including power lines and gas and fuel pipelines are past examples of outgrant requests the USACE has received. A designated corridor is defined as “A parcel of land with fixed boundaries that has been identified in the Project Master Plan or Operational Management Plan as being the preferred location for future outgrants or proposed modifications to existing outgrants suitable to accommodate compatible types of outgrants” (USACE, 2009a).

Although there is currently no proposal for either a major underground or aboveground utility line through the Project, such proposals may be put forth in the future. This section is concerned primarily with major utility corridors, such as cross-country utilities and pipelines that must cross the Project.

8.1.1 Land Use Compatibility and Site Suitability Considerations

Developing an alignment for a major utility transmission line or pipeline is a complex undertaking and must take into account numerous engineering and environmental issues as well as acquisition of rights-of-way and easements. The focus of this section is to evaluate the Project area relative to resource suitability, recreational uses, and presence of sensitive environmental resources to identify constraints and criteria to designate utility corridor(s) that minimize impacts on environmental and recreational resources.

As noted above, the focus is on major regional oil, gas, and hydrocarbon pipelines and electrical transmission and distribution facilities. Local utilities such as potable water and sewer service are not the focus of this evaluation.

If there are no reasonable and feasible alternatives to avoid Project lands, initial consideration should include existing disturbed corridors such as existing highways and utility corridors.

Existing Roadways

Roadways are present throughout the Project to provide access to the Project and allow residents to traverse through the area (see Figure 8-1). These roadways have already been removed from recreational use and have disturbed/impacted the natural environment. Placing utility corridors adjacent to primary existing roadways, i.e., state and county arterial and collector roads, not small access roads within Project recreation areas, could potentially decrease the recreational and environmental impacts to the Project.

Three primary roadway corridors, generally traversing east-west, bisect the Project. Kilbourne Road/SR 521 crosses the northern portion of the lake/Alum Creek and US 36/SR 37 crosses a relatively narrow portion of Alum Creek Lake north of the Big Run extension. Howard Road also crosses the lake between US 36/SR 37 and Kilbourne Road.

There are several primary transportation corridors that parallel the Project on either side of the lake. To the west of the lake, S. Old State Road enters Project land just south of the State Park Campground and eventually becomes the western border of the Project until it intersects with US 36/SR 37. North of US 36/SR 37, N. Old State Road becomes the general western border of the Project. While not directly adjacent, US 23 also parallels the west side of the lake varying from about 2.5 to 5 miles west of the Project. The Norfolk Southern and CSX Railroads also parallel the Project on the west side of the lake approximately two miles from Project lands. Decisions on any north-south proposed regional utility corridor on the west side of the lake should consider the railroad track and US 23 corridor prior to utilization of Project lands. Old State Road should be a corridor of last resort as it enters Project lands. On the east side of the Project, Africa Road begins on Project lands in the southern end of the Project and extends north until it terminates at US 36/SR37. I-71 parallels the east side of the Project and actually forms the southeastern border of the Project. N. Three B's and K Road is also parallel to the east side of the Project between I-71 and the Project border. Decisions on any north-south oriented regional utilities alignment on the east side of the Project lands should consider I-71 and N. Three B's and K Road corridors prior to utilization of any Project lands or Africa Road.

Existing Utility Corridors

The use of existing utility corridors should be evaluated to determine whether the proposed utilities can be placed along the same corridor. Using an existing corridor could cause less disruption to Project lands than constructing a new corridor. Grouping utilities into an existing utility corridor could reduce the recreational and environmental impacts.

There are six existing utility corridors for transmission lines and pipelines identified which traverse the Project from an east-west perspective, which are generally located in the northern portion of the Project (see Figure 8-1).

Intensive-Use Recreation Areas and Recreational Facilities

One of the primary objectives of the Project is recreational use. Development of a utility corridor through recreation areas and near recreational facilities could disrupt the use and enjoyment of the Project by visitors. The southern portion of the Project has the highest intensity recreational use. Avoidance of recreation areas should be a prime consideration in identifying utility corridors.

In addition to direct impacts on recreational use, utility corridors may affect the natural beauty of the Project lands. Even if a utility corridor does not cross an intensive-use recreation area, it may impact visitors using the recreation areas. For example, an overhead transmission line crossing the lake may impair the viewshed. Therefore, the visual impacts to areas that have intensive recreational use should be evaluated.

Environmentally or Culturally Sensitive Areas

A number of environmentally and potential culturally sensitive areas are located throughout the Project including wetlands and archeological resources (see Figure 8-1). These areas are unique and should be maintained; therefore, potential utility corridors should avoid these areas.

Forested habitats represent a unique resource in the Project area due to decline associated with the rapid spread of development in the area as well as the large amount of open agricultural lands. Avoiding or minimizing impacts to these forested habitats should be given strong consideration when selecting a potential utility corridor due to the rarity of such habitats in the region. While these areas are not designated as critical habitat for threatened and endangered species, the uniqueness of the habitat in the Project area increases the potential for any threatened and endangered species in the area to utilize this habitat. Before any utility related corridor work

is undertaken a survey of the potentially impacted area should be performed to verify the absence of any threatened and endangered species as well as cultural resources.

Footprint on Project Lands

The width of the Project varies throughout the Project area (see Figure 8-1). If a proposed utility corridor alignment cannot avoid Project lands, options that minimize the footprint on Project lands should be a strong consideration.

The location of the footprint is also important in relation to topography, soils, and stream/waterway crossings within the Project area. Areas with slopes of over 15 percent should be avoided due to the high erodibility of some of the soils in the Project area. This is also important in terms of stream crossings and riparian zones. Stream crossings should be avoided and/or minimized where possible. In the event that a stream cannot be avoided a buffer of vegetation could be left in the riparian zone to reduce the potential for erosion and increased sediment in the water body.

Once a formal proposal is received, an evaluation should be conducted using the factors above to identify potential impacts and alternatives to minimize impacts. Recommendations for alternative utility corridor locations should be based on the evaluation.

8.1.2 Considerations for a Systems Approach for Recreational Use of Alum Creek Lake and Delaware Lake Projects.

The USACE is considering approaching the Alum Creek Lake and the Delaware Lake Project as one system to accommodate the recreational needs as identified in the 2011 MPUs for each Project.

The intent is to more effectively utilize Project resource capabilities and balance those capabilities with future recreation needs while continuing to provide good stewardship of natural and environmental resources.

The two Projects are in close proximity, approximately 13 miles apart, and located in Delaware County, OH with significant overlap relative to the area of influence that they serve.

As noted in Section 4, Delaware County has experienced rapid growth in population and this rapid rate of growth is expected to continue in the future. Urbanization of Delaware County is continuing to move north as the greater Columbus metropolitan area expands. This is evidenced

by the significant residential growth and development along the southern perimeter of the Alum Creek Lake Project. This growth is anticipated to continue to spread northward in the future.

Issues for Consideration relative to Systems Approach

Land use around the Alum Creek Lake Project is suburban in nature with substantial residential development along the southern perimeter. Land use adjacent to the north section of the Project, above US 36/SR 37, is more rural with some low density residential.

Alum Creek Lake is approximately 3,300 acres at summer pool with substantial depth and good water quality. This type of lake supports fishing for saugeye, walleye, bass, and crappie. The watershed is 123 square miles, which is relatively small compared to the size of the lake. This reduces fluctuations in lake levels and the amount of sediment and debris from flood events. The summer pool is at 888 feet NGVD with the maximum flood pool at 901 feet NGVD, a difference of only 13 feet. These factors result in a lake that is very desirable for boating and other water based recreational activities.

The Delaware Lake Project is approximately 13 miles north of Alum Creek Lake in a more rural area of the county. Delaware Lake is approximately one third the size of Alum Creek Lake at 1300 acres at summer pool. With the watershed being 385 square miles, about three times greater than that of Alum Creek Lake at 123 square miles, lake level fluctuations during storm events are more significant at Delaware Lake. The summer pool is at 915 feet NGVD with the maximum flood pool at 947 feet NGVD, a difference of 32 feet. Delaware Lake also experiences more debris and sedimentation, which in turn reduces water clarity. Based upon these factors, the recreational quality and capacity of Delaware Lake for boating and other water based activities is not as favorable as that of Alum Creek Lake. Also, in contrast to Alum Creek Lake, Delaware Lake has a more serene setting and is a quality lake for bass fishing.

The lake carrying capacity analysis prepared for both lakes indicates moderate to high usage. While there is significantly less boating activity on Delaware Lake, it is only about one third the size of Alum Creek Lake. However, due to current medium to high density boating activity on both lakes during recreational season weekends, any recommendation should be supported by a detailed Lake Carrying Capacity analysis to verify that marina expansion will not result in boating activity that exceeds the carrying capacity of the lake.

Camping at both Alum Creek Lake and Delaware Lake is a popular activity, with both campgrounds operating near capacity on weekends and holidays during the recreation season. While both campgrounds appear to have the resource capability to expand, the Alum Creek Lake

Project has higher visitation, more traffic, and is closer to the urbanized area of Columbus. The Delaware Lake Project is in a more remote area and has lower overall visitation and less vehicular traffic, yet still provides the capability to support quality camp sites.

With significant residential development directly adjacent to the Alum Creek Lake Project, many visitors are able to walk or bike to the Project. This is especially true for the Below Dam Recreation Area which functions similar to a community park. This trend will likely continue as new development and growth continue around the perimeter of the Alum Creek Lake Project.

The Delaware Lake Project is more remote from residential development and could provide opportunities for hiking through natural areas and wildlife viewing.

The Delaware Lake Project has a large wildlife management area. The large expanses of forested areas, grasslands, and seasonally flooded wetlands north and east of the lake provide prime hunting opportunities in a relatively remote location.

In contrast to the Delaware Lake Project, the Alum Creek Lake Project does not have a designated area for wildlife management. However, hunting is allowed, but limited to areas on the eastern side of the lake. The encroachment of residential and suburban development along the perimeter of the Alum Creek Lake Project is not conducive to expanding consumptive uses such as hunting within the Alum Creek Lake Project.

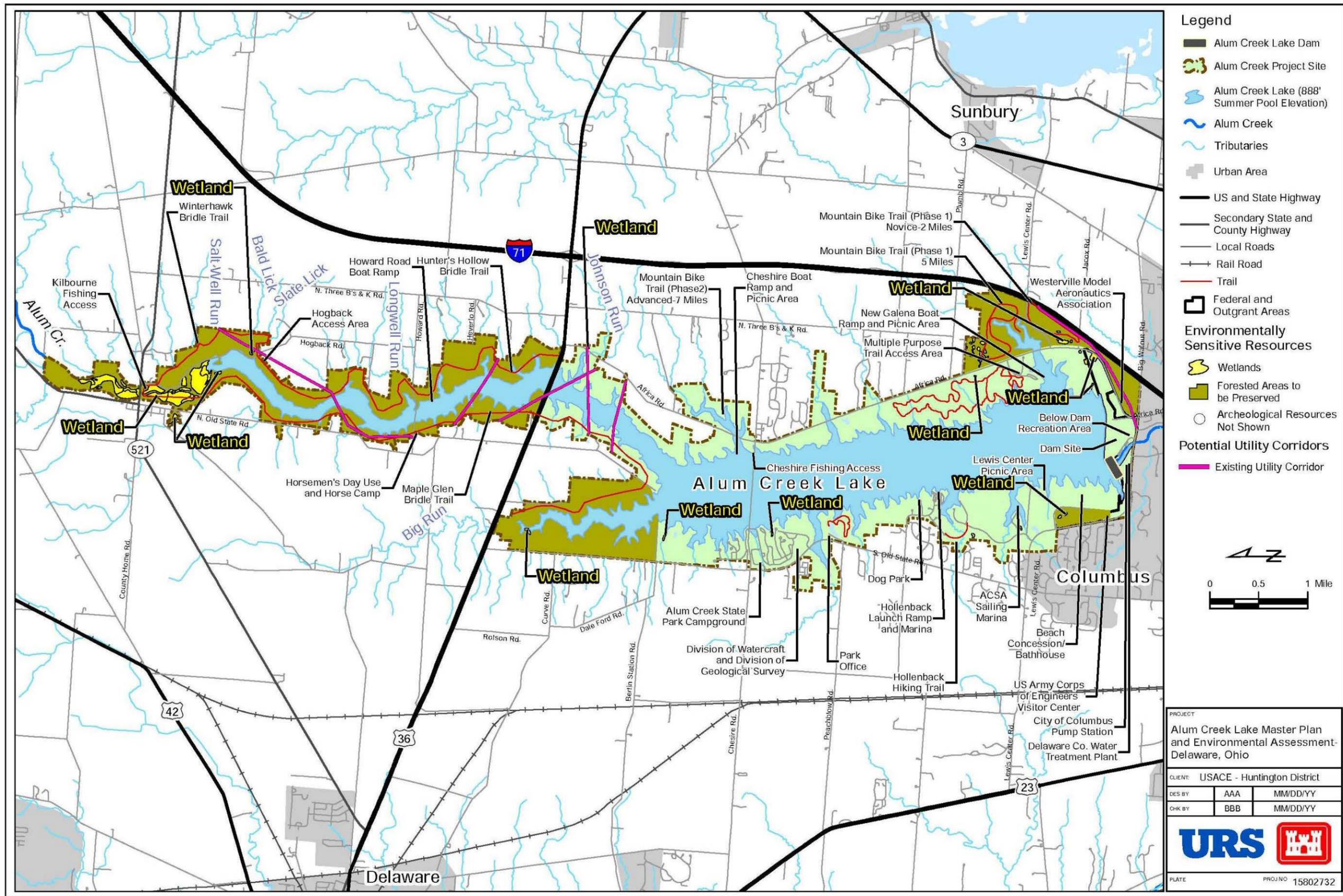


Figure 8-1: Potential Utility Corridor Considerations

This page intentionally left blank.

Appendix A: Acronyms and Abbreviations

This page intentionally left blank.

Acronyms and Abbreviations

ACPC	Alum Creek Powerboat Club
ACSA	Alum Creek Sailing Association
ADA	Americans with Disabilities Act
AMA	Academy of Model Aeronautics
ATV	All-Terrain Vehicle
BLM	Bureau of Land Management
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
COMBO	Central Ohio Mountain Bike Organization
CR	County Road
Del-Co	Delaware County Water Company, Inc.
DM	Design Memorandum
DNAP	Division of Natural Areas and Preserves
DNR	Department of Natural Resources
EA	Environmental Assessment
EM	Engineer Manual
EO	Executive Order
EP	Engineering Pamphlet
EPA	Environmental Protection Agency
ER	Engineering Regulation
FACT	Friends of Alum Creek & Tributaries
FLPMA	Federal Land Policy and Management Act
FY	Fiscal Year
GHG	Greenhouse Gas Emissions
GIS	Geographic Information System
GPM	Gallons per minute
HPMP	Historic Properties Management Plan
I-71	Interstate 71
IR	Ohio 2010 Integrated Water Quality Monitoring and Assessment Report
IWR	Institute for Water Resources
MORPC	Mid-Ohio Regional Planning Commission
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum
NHPA	National Historic Preservation Act
NPS	National Park Service
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
ODNR	Ohio Department of Natural Resources
OH	Ohio
OMBC	Ohio Mountain Bike Championship
OMP	Operational Management Plan
OWCS	Ohio Comprehensive Wildlife Conservation Strategy

PL	Public Law
RPA	Renewable Resources Planning Act
RUO	Resource Use Objective
RV	Recreational Vehicle
SCORP	State Comprehensive Outdoor Recreation Plan
SMCRA	Surface Mining Control and Reclamation Act
SR	State Route
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VERS	Visitor Estimation Reporting System
WMAA	Westerville Model Aeronautics Association

Appendix B: References

This page intentionally left blank.

- ASC Group, Inc. 2011. *Archaeological Survey of Shoreline, Dam Areas, and Recreation Areas for the US Army Corps of Engineers, Huntington District Lakes in Kentucky, Ohio, Virginia, and West Virginia (Draft)*. Contract W912P9-09-D-0536.
- Benson, A. J. and D. Raikow. 2010. *Dreissena polymorpha*. USGS Nonindigenous Aquatic Species Database, Gainesville, FL.
<http://nas.er.usgs.gov/queries/FactSheet.aspx?SpeciesID=5> 7 July 2010.
- Bowker, J., D. English, and H. Cordell. 1999. *Projections of Outdoor Recreation Participation to 2050*. USDA Forest Service. http://www.srs.fs.usda.gov/pubs/ja/ja_bowker005.pdf. 1999.
- Cordell, H., et al. 1999. *Outdoor Recreation in American Life: An Assessment of Demand and Supply Trends*. USDA Forest Service. 1999.
- Cordell, H., C. Betz, and G. Green. 2008. *Nature-Based Outdoor Recreation Trends and Wilderness*. *International Journal of Wilderness*. Volume 14, Number 2. August 2008. Available at http://www.srs.fs.fed.us/pubs/ja/ja_cordell022.pdf.
- The Friends of Alum Creek and Tributaries (FACT). 2005. *Lower Alum Creek Watershed Action Plan*. February 2005.
- Goudie, Andrew. 2006. *The Human Impact on the Natural Environment*. 2006.
- Michigan State University Extension. 2011.
http://web4.msue.msu.edu/mnfi/abstracts/zoology/Pleurobema_clava.pdf.
- MORPC. 2007a. *Final Transportation Improvement Program (TIP), State Fiscal Year 2008 to 2011*. May 2007.
- MORPC. 2007b. *2006 Regional Bicycle Transportation Facilities Plan*. June 2007.
- NPS, National Center for Recreation and Conservation Strategic Plan. 2005. *Strategic Plan: Rivers, Trails, and Conservation Assistance Program*.
<http://www.nps.gov/ncrc/programs/rtca/whatwedo/rtcastrategicplan.pdf>. Accessed 25 January 2011.
- National Recreation Reservation Service. 2010. *Recreation.gov: Explore your America*.
www.recreation.gov. Accessed July 2010.
- NatureServe. 2007. *International Ecological Classification Standard: Terrestrial Ecological Classifications*. NatureServe Central Databases. Arlington, VA, U.S.A. Data current as of 06 October 2007.
- NatureServe. 2009. *Fanshell Mussel (Cyprogenia stegaria)*.
<http://www.natureserve.org/explorer/servlet/NatureServe?searchSciOrCommonName=Cyprogenia+stegaria>. Accessed June 2010.

- Ohio Department of Development, Office of Strategic Research. 2003. *Population Projections by Age and Sex: 2005 – 2030*. July 2003.
- ODNR, Division of Real Estate and Land Management. 2005. *Trails for Ohioans: A Plan for the Future*. 2005.
- ODNR, Division of Water, Water Resources Section. 2005. *Ground Water Pollution Potential of Delaware County, Ohio*. 2005.
- ODNR, Division of Wildlife. 2005. *Ohio Comprehensive Wildlife Conservation Strategy*. October 2005.
- ODNR, Division of Wildlife. 2007. *2007 – 2008 Wildlife Population Status and Hunting Forecast*. October 2007.
- ODNR. 2008. *Ohio Statewide Comprehensive Outdoor Recreation Plan*. 2008.
- ODNR. 2010a. List of Threatened and Endangered Species by County.
<http://www.dnr.state.oh.us>.
- ODNR. 2010b. www.dnr.state.oh.us. Accessed January 2010.
- ODNR, Division of Wildlife. 2011. List of Species at Alum Creek Lake.
<http://www.dnr.state.oh.us/tabid/19510/Default.aspx>.
- Ohio Department of Natural Resources, Division of Natural Areas and Preserves. 2011.
<http://www.dnr.state.oh.us/Default.aspx?alias=www.dnr.state.oh.us/dnap>.
- Ohio Emergency Management Agency. 2008. *The State of Ohio Hazard Mitigation Plan*. 2008.
- Ohio EPA. 1999. *Biological and Water Quality Study of the Middle Scioto River and Alum Creek*. May 1999.
- Ohio EPA. 2010. *Ohio 2010 Integrated Water Quality Monitoring and Assessment Report*. March 2010.
- Ohio Historical Society. 2010. *Ohio River Flood of 1937*.
<http://www.ohiohistorycentral.org/entry.php?rec=528>. Accessed 17 March 2010.
- The Ohio Ornithological Society. 2010.
http://www.ohiobirds.org/birdingsites/showsite.php?Site_ID=19. Accessed 10 August 2010.
- Ohio River Valley Ecosystem Team, Mollusk Subgroup. 2002. *Status Assessment Report for the rayed bean, *Villosa fabalis*, occurring in the Mississippi River and Great Lakes systems (U.S. Fish and Wildlife Service Regions 3, 4, and 5, and Canada)*. September 2002.
- Ohio State University Extension Fact Sheet. 2010. http://ohioline.osu.edu/aex-fact/0480_21.html.

- Ohio University, Institute for Local Government Administration and Rural Development. 2007. *2006 Ohio Outdoor Recreation Participation and Satisfaction Survey Report*. June 2007.
- Pennsylvania Department of Conservation and Natural Resources. 2010. *What is the Hemlock Woolly Adelgid?* <http://www.dcnr.state.pa.us/forestry/woollyadelgid/index.aspx>. Accessed March 2010.
- Plant Conservation Alliance. 2008. *Fact Sheet: Japanese Stiltgrass*. March 2008.
- Public Land Journal. 2010. *Alum Creek Reservoir, Lewis Center, OH*. <http://publiclandjournal.com/oh/alum-creek-lake-oh>. Accessed January 2010.
- Rezek, Jon and Stephen Grado. 2009. *Recreational Visitation Patterns on Lake Impoundments in East-Central Mississippi*. <http://sofew.cfr.msstate.edu/papers/Rezek07.pdf>
- Spoke Junkies, 2010. <http://spokejunkies.com>. Accessed January 2010.
- URS. 2004. *I-71/Big Walnut Road Interchange Feasibility Study – Delaware County, Ohio*. July 2004.
- USACE, Institute for Water Resources. 1974. *Estimating Recreational Facility Requirements, Volume IV (IWR Research Report 74-R1)*.
- USACE. 1984. *Alum Creek Lake, Delaware County, Ohio - Master Plan Update*. April 1984.
- USACE. 1985. *Engineering Regulation (ER) 1165-2-400, Water Resources Policies and Authorities – Recreation Planning, Development, and Management*. Washington, DC. August 1985.
- USACE. 1993. *Historic Properties Management Plan for Alum Creek Lake, Delaware County, Ohio*. 1993.
- USACE, Hydrologic Engineering Center. 1994. *Authorized and Operating Purposes of Corps of Engineers Reservoirs*. 1994.
- USACE. 1996a. *Engineering Pamphlet (EP) 1130-2-550, Project Operations – Recreation Operations and Maintenance Guidance and Procedures*. Washington, DC. November 1996.
- USACE. 1996b. *Engineering Regulation (ER) 1130-2-500, Project Operations – Partners and Support (Work Management Policies)*. Washington, DC. December 1996.
- USACE. 1996c. *Environmental Stewardship and Maintenance Guidance and Procedures*.
- USACE. 2000. *Zebra Mussel Chemical Control Guide (ERDC/EL TR-00-1)*. January 2000.
- USACE. 2002. *Operational Management Plan, Alum Creek Lake*.

- USACE. 2003. *Draft Environmental Assessment, Alum Creek State Park, Marina Project*. July 2003.
- USACE. 2004. Engineering Manual (EM) 1110-1-400, *Engineering and Design – Recreation Facility and Customer Services Standards*. Washington, DC. November 2004.
- USACE, Directorate of Civil Works. 2005. *Recreational Development Policy for Outgranted Corps Lands*. 2005.
- USACE, Walla Walla District. 2006. *Lucky Peak Master Plan*.
<http://www.nww.usace.army.mil/planning/er/lpeak/>. 2006.
- USACE, Directorate of Civil Works. 2009a. *Non-Recreational Outgrant Policy*. 30 March 2009.
- USACE. 2009b. *Ohio River Basin Comprehensive Reconnaissance Report*.
www.orboutreach.com. December 2009.
- USACE. 2010. *Natural Resources Management Gateway*. <http://corpslakes.usace.army.mil/>. Accessed July 2010.
- USACE, Water Control. <http://www.lrh-wc.usace.army.mil/wc/summary.html>.
- USDA, Forest Service. 2000. *2000 RPA Assessment of Forest and Range Lands*.
<http://www.fs.fed.us/pl/rpa/rpaasses.pdf>. 2000.
- USDA, Forest Service. 2006. *Weed of the Week – Autumn Olive*. January, 2006.
- USDA, Forest Service. 2007. *Conservation Education Strategic Plan to Advance Environmental Literacy*, FS-879. http://fs.usda.gov/Internet/FSE_DOCUMENTS/fsmrs_100509.pdf.
[2007](http://fs.usda.gov/Internet/FSE_DOCUMENTS/fsmrs_100509.pdf).
- USDA. 2010a. *NRCS Plant Materials Program*. <http://plant-materials.nrcs.usda.gov>. Accessed March 2010.
- USDA. 2010b. *Invasive Plants website*. <http://www.na.fs.fed.us/fhp/invasive%5Fplants/>. Accessed March 2010.
- U.S. Department of Agriculture, Natural Resources Conservation Service. 2006. *Soil Survey of Delaware County, Ohio*. Columbus, Ohio.
- U.S. Department of Commerce, Bureau of Census. 2000. *US Census of Population and Housing, SF1 and SF3 data tables*. <http://factfinder.census.gov>. Accessed May 2010.
- U.S. Department of Commerce, Bureau of Census. 2010. *2008 Population Estimates*.
<http://www.census.gov/popest/cities/>. Accessed June 2010.
- U.S. Department of Commerce, Bureau of Census, American Factfinder. 2011. *2010 Census*.
<http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>. Accessed April 2011.

- USDOJ. 1986. *North American Waterfowl Management Plan*. May 1986.
- USDOJ and NPS. 2005. *Rivers, Trails, and Conservation Assistance Program: Strategic Plan*. National Center for Recreation and Conservation Strategic Plan. <http://www.nps.gov/ncrc/programs/rtca/whatwedo/rtcastrategicplan.pdf>. 2005.
- USDOJ and USGS. 2009. *Water-Data Report 2009, 03228805 Alum Creek at Africa, Oh.* 2009.
- USEPA. 1996. *Recreational Fishery Resources Conservation Plan Agency Action Plan*. <http://www.epa.gov/owow/fish/epafin.html>. 1996.
- USFWS. 2007. *National Bald Eagle Management Guidelines*.
- USFWS. 2010a. *National Wetlands Inventory*. <http://www.fws.gov/wetlands/>. Accessed March 2010.
- USFWS. 2010b. *Federally-Listed Species by Ohio County*. Columbus, Ohio. November 2010. <http://ecos.fws.gov>
- USFWS. 2010c. *Federal Laws that Protect Bald Eagles*. <http://www.fws.gov/midwest/eagle/protect/laws.html>. Accessed July 2010.
- USFWS. 2010d. *Trends in Fishing and Hunting 1991-2006: A Focus on Fishing and Hunting by Species*. December 2010.
- USGS. 2004. *Nonindigenous Aquatic Species Database*. Gainesville, FL. <http://nas.er.usgs.gov>. Accessed 12 August 2010.
- Weller & Associates, Inc. 2010. *Phase I Cultural Resources Management Survey for the 1.74 ha (4.3 ac) New Galena Launch Ramp Area at Alum Creek State Park in Orange Township, Delaware County, Ohio*. Prepared for Hartman Engineering Delaware, Ohio. 2010.
- WMAA. 2010. *Westerville Model Aeronautics Association*. www.wmaa-wags.org. Accessed January 2010.
- Wisconsin Department of Natural Resources. 2004. *Protect Your Boat and Engine from Zebra Mussels*. 2004.
- Virginia Department of Conservation and Recreation. 1998. *Managing Invasive Alien Plants in Natural Areas, Parks, and Small Woodlands*. 1998.
- Virginia Department of Conservation and Recreation. 1999. *Invasive Alien Plant Species of Virginia: Tall Fescue (Festuca elatior L.)*. 1999.
- Virginia Department of Conservation and Recreation. 2007. *2007 Virginia Outdoors Plan*. 2007.

This page intentionally left blank.

Appendix C: Public Comments

This page intentionally left blank.

**U.S. Army Corps of Engineers, Huntington District
Alum Creek Lake
8:30 Stakeholder Meeting (Water Supply Stakeholders)
August 11, 2009**

ATTENDEES:

Alison Rogers – USACE – Huntington District - Planning Branch
Dan Bock – USACE – Huntington District - Planning Branch
John Wargo – USACE – Alum Creek Lake Ranger
Kim Barnett – USACE – Huntington District – Parks and Recreation Branch
Susan Maynard – USACE – Huntington District
Terry Stadt – USACE – Huntington District
Sheliah Harlan – USACE - Huntington District – Real Estate
Kelley Poff – USACE – Huntington District - Real Estate
Tom Hunter – URS
Jonathan Martinez – URS
Christi Wilson – URS
John Carter – City of Columbus Public Utilities/Watershed Management
Lorraine Winters – City of Columbus Public Utilities/Watershed Management
Dan Langton – City of Westerville Water Department
Damon Dye – Del-Co Water Company
Ted Lozier – ODNR – Soil and Water Resources
David Hanselmann – ODNR – Soil and Water Resources

KEY POINTS:

Project purpose of Alum Creek Lake as authorized:

1. Flood Damage reduction
2. General Recreation
3. Fish and Wildlife Enhancement
4. Water Supply

The Alum Creek Lake Master Plan looks at 3 key items:

1. Regional Need
2. Resource Management
3. Local Input

COMMENTS / ISSUES

City of Westerville

- City water supply via lake;
- water quality and quantity are two main concerns;
- considering an engineering project to increase capacity in the next few years;
- also considering treatment capacity.

Columbus Water Utility

- City utilizes lake for backup water supply during drought conditions;
- next few years planning new upland reservoirs in northeast Delaware County;
- also considering building new water treatment plant;
- based upon increase in population and supply demand;
- significant reduction in agricultural land use associated with suburban development in area, has resulted in increase runoff rates / Hoover Lake is filling with sediment more rapidly.

Ohio DNR

- Significant regional watershed planning initiatives are getting underway;
- providing a lot of leadership on watershed planning;
- want to create conservation action plan for the lake and its watershed to raise public awareness of potential effects to the lake;
- Balanced Growth Program, looking at potential conservation areas, potential development areas, and infrastructure planning (water and sewer);
- Corps engage the entire watershed in master planning process.

Del-Co Water

- Comments are similar to Westerville or Columbus but in addition are concerned with security of facilities, both contamination and damage to dam;
- no plans for water supply expansion relative to Alum Creek Lake;
- consider water quality and quantity contingency plan using lake water during extreme drought conditions.

QUESTIONS / DISCUSSIONS

1. What are the contingency plans in time of drought?
 - Del-Co has two other small reservoirs in area;
 - City of Westerville does not have a contingency plan.
2. City of Columbus asked what federal action is needed to draw more water from Alum than currently authorized relevant to severe drought conditions;
 1. need to follow up on water control management criteria.
3. John Wargo, USACE Alum Creek, asked if there was a way to coordinate a release for maintenance with Columbus drawing water from the lake during drought conditions.
4. What would be largest concern in terms of water quality?
 2. City of Columbus noted nitrates and phosphates;
 3. MTBE, a fuel additive that causes odor and taste issues, comes from recreational watercraft;
 4. Management of algae bloom, and invasive species, including zebra mussels.

KEY ISSUES

5. Water quality and supply are key issues and becoming more prominent due to rapid urbanization in the project area.
6. Security is an important issue relevant to water supply, quality, and flood control / dam safety.
7. Utilization of lake water supply for contingency purposes during severe drought conditions.
8. Coordination with regional watershed planning initiative currently being initialized.

**U.S. Army Corps of Engineers, Huntington District
Alum Creek Lake
10:00 a.m. Stakeholder Meeting (User Groups)
August 11, 2009**

ATTENDEES:

Alison Rogers – USACE – Huntington District - Planning Branch
Dan Bock – USACE – Huntington District - Planning Branch
John Wargo – USACE – Alum Creek Lake Ranger
Kim Barnett – USACE – Huntington District – Parks and Recreation Branch
Susan Maynard – USACE – Huntington District
Terry Stadt – USACE – Huntington District
Sheliah Harlan – USACE - Huntington District – Real Estate
Kelley Poff – USACE – Huntington District - Real Estate
Tom Hunter – URS
Jonathan Martinez – URS
Christi Wilson – URS
Brian Adams – Central Ohio Mountain Bike Organization (COMBO)
Ohio Mountain Bike Association (OMBA)
Bob Sheppard – Alum Creek Sailing Association (ACSA)
Brian Kennedy – COMBO
Tom Rau – Westerville Model Aeronautics Association (WMAA)
Jim Green – COMBO
Ann Wennberg – Friends of Alum Creek Dog Park
Ron Graham – WMAA
Paul Haneisen – Ohio Horsemen Council

COMMENTS / ISSUES

Westerville Model Aeronautics Association (WMAA)

- Operated and managed facility for over 20 yrs (out grant agreement). Requested additional overgrown area be cleared as underbrush is an issue for downed plane retrieval. If approved, will increase use area up to 9.5 acres;
- maintenance costs approximately \$3500 per year;
- concern is any encroachment of public spaces near airport and increased restrictions on flight areas;
- approx 170 local members.

Central Ohio Mountain Bike Organization (COMBO)

Ohio Mountain Bike Association (OMBA)

- Operates and maintains mountain biking trails. (out grant agreement);
- completely redesigned the Phase I trail to meet official requirements / sustainable design;
- constructed Phase II to these same specifications / natural surface trails;
- insufficient parking and restroom facilities;
- Phase I has no water or restroom facilities;
- increased usage, with a high use record of 5200 users within a 30 day period;
- everything is constructed and maintained by hand and all maintenance is funded by private funds;
- purchased the counters to record number of users;
- only legal trail in Columbus area, destination use;
- looking for the ability to expand north to increase the 12 miles of existing trails;
- the trails are built multi-use for runners, hikers, bikers, also fisherman use the trails for access;

- increase in trail usage results in more maintenance issues;
- all trail systems are mapped in GIS;
- takes about 2000 volunteer hours to build a 6 to 8 mile trail;
- connectivity between trails and campground area, several bikers ride Africa road to go between the two phases, possibly add bike lane, lower speed, and signage.

Alum Creek Sailing Association (ACSA)

- ACSA started 27 years ago;
- mainly focus on education for sailing ;
- members supply all funding, built new docks, restroom facilities, and want to build new shelter facility for education purposes;
- built 135 slips and have 50 people on waiting list, would like to expand in future and maybe construct mooring field;
- considering the possibility of dry storage area.

Friends of Alum Creek Dog Park

- First dog park in Ohio state park system / destination site;
- funded and paid for by volunteers, state park staff cuts the grass;
- reach or contact about 1000 people/volunteers/users via email;
- are conducting fundraising activities to install lighting;
- biggest problem is erosion at the dog beach and would like to add an additional section of beach for small dogs;
- would like to add drinking fountains;
- improve drainage;
- estimated 300,000 visitors last year, parking is limited and insufficient during peak period;
- currently 4 acres in total.

Ohio Horsemen Council

- Main concern is erosion with only a small core 10 person group that maintains the horse trails;
- between 40 and 50 miles of trails, have trouble keeping up existing trail, no plans of expansion;
- state maintains the overnight camping area for horsemen;
- would like to have a shelter built on site at the overnight camping area.

ADDITIONAL COMMENTS

- Boat ramps are in very bad condition;
- better access for canoe and kayak launch areas needed;
- lake capacity analysis is needed.

KEY ISSUES

- Extensive use of out grants for public / private non-profit organizations for public benefit.
- Rapid expansion and popularity of mountain biking trails and dog park.
- Storage demand for sailing boat slips.
- Lack of parking capacity at high intensity use areas / need for improved connectivity between trails.

**U.S. Army Corps of Engineers, Huntington District
Alum Creek Lake
2:00 Stakeholder Meeting (Resource Agencies)
August 11, 2009**

ATTENDEES:

Alison Rogers – USACE – Huntington District - Planning Branch
Dan Bock – USACE – Huntington District - Planning Branch
John Wargo – USACE – Alum Creek Lake Ranger
Kim Barnett – USACE – Huntington District – Parks and Recreation Branch
Susan Maynard – USACE – Huntington District
Terry Stadt – USACE – Huntington District
Sheliah Harlan – USACE - Huntington District – Real Estate
Kelley Poff – USACE – Huntington District - Real Estate
Tom Hunter – URS
Jonathan Martinez – URS
Christi Wilson – URS
Brent Culver – ODNR – Parks and Recreation
Douglas Leed – ODNR – Division of Watercraft
Deb Green – ODNR – Division of Watercraft
Greg Schumacher – ODNR – Geological Survey
Victor Ricks – ODNR – Parks and Recreation
Loren Hart – ODNR – Alum Creek Recreation

COMMENTS / ISSUES / INFORMATION

ODNR - Office of State Parks / Division of Watercraft

- Key issue is the carrying capacity of the lake in terms of boat usage;
- need to update design of marina (launches, slips, parking, etc.) due to increases to recreational watercraft sizes utilized at the lake;
- pressure to increase boat launch capacity, add more boat slips, associated parking and restroom facilities;
- there appears to be demand for interconnected multi-use trails;
- deterioration of the breakwater at the marina on east side of the lake is creating undesirable wave action at marina facilities and resulting in shoreline erosion;
- ODNR state parks biggest problems are funding, manpower and facility maintenance (significant staff reductions);
- any new projects will require looking for volunteer groups to maintain it.

ADDITIONAL COMMENTS / ISSUES / INFORMATION

- Population increase and diversity is occurring in the project area:
- ODNR state parks no longer have budget to maintain the aging building and parking facilities;
- water supply as well as flood control issues will continue to be an important issue as the population continues to increase;
- there is significant interest connecting in to trail system at park from other areas, Delaware County has a trails master plan, and signage program;
- bike usage on roadways of Delaware County increasing exponentially to the point of being dangerous;
- gang and deviant activity means of control or prevention is another important consideration;
- issues between multi-use of area, hunting, hiking, biking etc. (uses competing for resources);

- Alum Creek second most used State Park in Ohio (high intensity use);
- new access proposed Interchange on I-71 ;
- northern end of project area experiencing substantial request for more carry on access, canoe/kayak;
- viewing area near Hogback parking lot area should be preserved / quality visual resource;
- boat registration has increased dramatically and also diversified and the different user groups have conflict (power boats, sail boats, canoes, kayaks, personal water craft, wake boarding, kite boarding, etc.);
- southern tier of lake attracts companies looking for shelters for day use, host an estimated 200 special events annually;
- expedition of project permits approval process is desired, as current process can be drawn out;
- facilities / programs mentioned as future possibilities include archery course, disk golf course, pull-thru full service camp sites, wind turbines, radio/cell towers, hydropower;
- utility infrastructures are aging and significant rehabilitation may likely be required.

POTENTIAL GIS SOURCES

- Division of Geological Survey Rep noted that they would be able to help with GIS databases and layers;
- ODNR Office of Information Technology may have applicable GIS datasets;
- Delaware County Regional Planning Commission another good source of GIS datasets;
- Section 6(f) issues (Land and Water Conservation funded improvements) due to funding for beach development should be considered in planning process.

KEY ISSUES

- Carrying capacity of the lake and conflict of usage between different user groups.
- Aging infrastructure and lack of O & M funding.
- Significant urbanization and population growth in region exerting significant pressure on Alum Creek resources, specifically recreational needs.
- Upgrade of marina facilities, boat launch ramps, slips and parking to accommodate larger watercraft typically in use today.
- Connectivity between multi-use trails and integration with local municipality plans.
- Numerous out grants to public / private entities for public benefit have been executed. With lack of capital and O & M funding at both the state and federal level, it is anticipated that this trend will continue.

**U. S. Army Corps of Engineers, Huntington District
Alum Creek – Public Meeting
August 11, 2009 6:00 p.m.**

ATTENDEES:

Alison Rogers – USACE Huntington District – Planning Branch
Dan Bock – USACE Huntington District – Planning Branch
Joseph Williams – USACE Huntington District – Alum Creek Park Ranger
John Wargo – USACE Huntington District – Alum Creek Park Ranger
Kim Barnett – USACE Huntington District – Parks and Recreation Branch
Susan Maynard – USACE Huntington District
Terry Stadt – USACE Huntington District
Sheliah Harlan – USACE Huntington District - Real Estate Branch
Kelley Poff – USACE Huntington District – Real Estate Branch
Mandy Lester – USACE Huntington District – Public Affairs
Tom Hunter – URS
Jonathan Martinez – URS
Christi Wilson – URS
General Public 27 citizens – see sign-in sheets

COMMENTS / ISSUES

Flood Damage Reduction (2 comments)

1. Erosion of downstream banks;
- noticeable increase in bank erosion when water is released.
2. Below dam flash flood control and risk of property loss;
- combination of USACE release plus increase in developed land.

Water Supply (2 comments)

1. Possible elimination of powerboats in Alum Creek Lake due to water supply function;
- overcrowded conditions and contamination from fuels;
- promote elimination of 2-stroke engines or promote usage of synthetic oil.
2. Water supply plan for level of lakes;
- designate times to lower level of lake for repair of ramps, etc.

General Recreation (53 comments)

Ramps / Docks (25 comments)

1. Provide improved boat launch ramps, docks and rentable boat slips. Provide more power boat slips. Provide new bathroom facilities with flush toilets and electricity;
- specifically new power boat dock facility at New Galena launch area and Howard Road.
2. Allow unused docks or mooring balls to be used by others.
3. Open WiFi areas at docks.
4. Boat ramp congestion;
- ramps are in poor condition and not able handle the capacity and size for larger watercraft fleet currently in use.
- long lines waiting to launch and pick-up boat;
- separate ramps for smaller boats and other crafts that can't idle;
- need updated and additional parking at boat launch ramps to accommodate larger boats and trailers;

5. Additional or designated boat launches for professional fisherman and tournaments.
6. Winter sailboat storage area near sail boat marina, dry storage areas.
7. Utilization of mooring fields in lieu of new boat slip capacity.

Trails / Observation Destinations (10 comments)

8. Improve walking, jogging, and biking trails connectivity;
 - Connect park trails to adjacent communities trail system, connect mountain bike trails;
 - Paved trails along major connecting roadways/routes.
9. Overall trail system around park also to provide bank fishing areas.
10. Access to wildlife observation areas – handicap accessible;
 - Boardwalk for fishing or wildlife viewing;
 - Platform at Hogback road.

Swimming (7 comments)

11. Re-open above Hwy 36/37 for boat anchorage and swim area, enforce no-wake zone;
 - posted no swimming at northern end is causing congestion and dangerous conditions in the southern portion.
12. Provide more boat/camp/swim areas, and larger swim areas.

Access / Parking (6 comments)

13. Increase and improve parking at boat launch areas consistent with current trailer and vehicle size.
14. Provide improved access and parking to foster bank fishing.
15. Enlarge parking at visitor center
16. Provide foot bridge across creek below dam
17. Improve handicap access at below dam recreational area and in other locations.
18. Park access (other than water sports) is needed in places other than south end of the lake
 - picnic areas for families in northern end.

Parks / Features / Structures (5 comments)

19. Develop park at northeast corner of Cheshire and Africa roads near monument tree;
 - need more trails and connectivity to keep from having to build parking areas;
 - include a nature area featuring conservation;
 - possibly build an amphitheater.
20. Add two new picnic shelters and parking at the below dam recreational area.
21. Wind surfing and kite surfing access near New Galena, possibly putting beach in, access on year round basis.
22. Expand office space for USACE on site.

Fish and Wildlife Enhancement (7 comments)

1. Wildlife viewing/nature observation areas;
 - some type of nature boardwalk in water for observation;
 - handicap accessibility is main concern.
2. Geese population control plans;
 - possibility of increasing areas for field hunting;
 - clean up of waste.
3. Stock lake with fish and place structures in water for fish habitat;
 - program to stock fish (yes, have seen local agency pumping in fish).
4. Plans to control the deer population;
 - hunting is allowed on property but with increased development, areas have been reduced for safety reasons.
5. How wildlife is segregated by park construction/activities?

Other

1. Use of public land for utilities.
2. Maintenance of existing utilities on corps land;
- have authority to maintain utilities under current easement.
3. Clean up and dredging of waterway around marinas.
4. More Corps office space and parking.
5. Update map and brochure of the facility also update video of Alum Creek.
6. Litter control along Howard Road area.
7. Breakwater erosion at the marina.
8. Boat regatta.
9. Boat access restaurant.
10. Safety and patrol.
11. Curtail special interest groups from restricting public use of facilities.
12. Problems with increase water rise during fall draw down, can draw down be modified.
13. Weather station located somewhere near dam site.
14. Post the new master plan on line for review.

Key Issues

- Capacity at boat launch including parking and need to update facility design consistent with current watercraft fleet.
- Need for improved access for bank fishing including trail parking and ADA accessibility.
- Connectivity of trail system and multi-use trails on site and integration with regional trail system plans.
- ADA accessibility.
- Long term maintenance and water quality relative to water supply function.
- Below dam/downstream erosion and flood control concerns due to encroachment of development.
- Allocation of lake usage and carrying capacity of lake.

This page intentionally left blank.