

Tygart Lake 2020 Master Plan



TYGART LAKE
MASTER PLAN

The attached Master Plan for Tygart Lake is in compliance with ER/EP 1130-2-550, Project Operations, Recreation Operations and Maintenance Policies. No further action is required.

Master Plan is approved.

ANDREW J. SHORT
Colonel, Corps of Engineers
Commanding

Executive Summary

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

The primary goals of this Tygart Lake (Project) Master Plan, revised in 2020, are to prescribe an overall strategic land use management plan, resource objectives, and associated design and management concepts, which: 1) use sound environmental principles to protect and enhance public lands; 2) cultivate volunteers, public-private partnerships, and apply for grants; 3) provide safe and memorable connections as part of multiple destination points; and 4) leverage emerging technology to tell the Corps’ story and enhance visitor experiences.

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

Five Year	Ten Year	Conditions Based Actions**
“Friends of Tygart Lake” group established	Enhanced security features	Oil, gas and coal mining leveraging and mitigation
Boundary surveys established for all fee land and flowage easement areas	Emergency Response Plan developed	Endangered species conservation methods
Volunteer dispatchers are placed at Information Center	Comprehensive Interpretive Plan established	Invasive species control methods
Initial description of biological and cultural resources are documented	Degraded facilities have been identified and divestment options have been considered*	Climate change impacts

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

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

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

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1. Project Authorization

The construction of the Project was authorized by the Rivers and Harbors Act of 1935. Authorizations subsequent to construction (Table 1-1, full list in Appendix A) provided for incidental benefits, including water quality improvement, fish and wildlife management, and recreational uses of the impoundments and Project lands.

Table 1-1. Project Purposes and Authorities

Operating Purpose	Authority	Citation
Flood Control	Rivers and Harbors Act of 1935	PL 74-409
Navigation	Flood Control Act of 1936	PL 74-738
Water Supply	Flood Control Act of 1938	PL 75-761
Water Quality Control	Clean Water Act	PL 92-500 (Water Quality Control)
Fish and Wildlife	Fish and Wildlife Coordination Act of 1934 (as amended)	PL 85-624
Recreation	Flood Control Act of 1944	PL 78-534

1.1 Project Purpose

The Project is operated for flood protection in the Tygart, Monongahela, and Ohio River Valleys. In addition to flood control, the reservoir provides navigational water supply, industrial and domestic water supply, and low flow augmentation. Additional uses of the reservoir area include water quality improvements, fish and wildlife management, and recreation. These additional uses shall not conflict with the primary function of flood control.

1.2 Watershed and Project Description

The Project is a multi-purpose and provides a storage system for flood risk reduction on the Tygart, Monongahela, and Ohio River Valleys (see Appendix B, Plate 1 for Watershed map). The Project is situated in West Virginia approximately 100 miles from Pittsburgh. The Project's land and waters extend over Taylor County and Barbour County (see Appendix B, Plate 2 for Project Overview and Transportation Corridors map). Refer to Table 1-2 below for Reservoir Information.

Table 1-2. Reservoir Information

Pool	Elevation (NAVD 88, ft.)	Storage (ac./ft.)
Minimum	1009.5	11,200
Winter Conservation Pool	1039.5	36,700
Summer Conservation Pool	1093.5	111,340
Full	1166.5	289,770

The Project consists of a total of 4,599.8 acres including road and flowage easement. Near the dam, the Corps maintains an information center, Project office, two dwellings, a maintenance building, a walking trail to the dam, outdoor restrooms, and a boat ramp.

The Corps leases 1,379 acres of Project lands to the West Virginia Division of Natural Resources (WVDNR) (Table 1-3, below). Appendix B, Plate 3 shows the Boundary map for the Project.

Table 1-3. Outgrant Areas

Grantee	Type	Acres
West Virginia Division of Natural Resources (Wildlife Resources Section)	Wildlife	1,056
West Virginia Division of Natural Resources (Parks and Recreation)	Recreation	323

1.3 Listing of Pertinent Project Information

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

Table 1-4. Project Information

Project Attribute	Description
Avg. Ann. Rainfall	49 in.
Drainage Area above Dam	1,184 sq. miles
Construction Completed	1938
Operation Start	1938
Dam Type	Concrete, gravity-type structure
Dam Length	1,921 ft.
Dam Height	234 ft.
Base Width	207 ft.
Outlet Works	8 sluices (10 ft. x 5'8") 2 ring jets (54" in diameter)
Spillway	230 ft. in length
Highest Inflows Recorded	78,820 c.f.s. (November 5, 1985)
Highest Outflows Recorded	20,600 c.f.s. (April 18, 2018)
Highest Elevation (NAVD 88)	1156.14 ft. (November 7, 1985)

1.4 Purpose & Scope of the Master Plan

This Master Plan presents updated land use categories, management objectives, resource plans, and recommendations for the management of Project lands and waters to meet current and future needs. It is a vital tool for the responsible stewardship of Project resources for the benefit of present and future

generations, guiding the comprehensive management and development of the natural, cultural, and man-made resources at the Project.

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

1.5 Management Goals

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

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

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

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

1. Strive to achieve environmental sustainability. An environment maintained in a healthy, diverse, and sustainable condition is necessary to support life.
2. Recognize the interdependence of life and the physical environment.
3. Proactively consider environmental consequences of Corps programs and act accordingly in all appropriate circumstances.
4. Seek balance and synergy among human development activities and natural systems by designing economic and environmental solutions that support and reinforce one another.

5. Continue to accept corporate responsibility and accountability under the law for activities and decisions under our control that impact human health and welfare and the continued viability of natural systems.
6. Seek ways and means to assess and mitigate cumulative impacts to the environment; bring system approaches to the full life cycle of our processes and work.
7. Build and share an integrated scientific, economic, and social knowledge base that supports a greater understanding of the environment and impacts of our work.
8. Respect the views of individuals and groups interested in Corps activities; listen to them actively, and learn from their perspective in the search to find innovative win-win solutions to the nation's problems that also protect and enhance the environment.

1.6 Resource Objectives

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

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

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

Management and Development Activity	Five-year	Ten-year	Desired State
Inventory natural and cultural resources	Initial description of biological and cultural resources are documented (E)	Operational Geospatial Database for Natural and Cultural Resources developed (E)	Completed and maintained biological/cultural resource inventory and associated management plans
	Operational Management Plan updated (S&E)	Information within the database registered with the State Historic Preservation Office (SHPO) (E)	
Identify threats (i.e. erosion, terrestrial & aquatic invasive species)	Work with partners (i.e. ERDC, other federal agencies) to implement erosion and pollution (air, noise, water) control methods (E)	Development of Invasive Species Management Plan (E)	Conservation and enhancement of Project land
Achieve and maintain desired natural and cultural resource conditions	Specific conservation organizations (federal and state agencies, academia, non-profits) are engaged (S&E)	Working relationships with federal, state, academia, and NGOs have been utilized to achieve these conditions (S&E)	Increased stakeholder buy-in and protection of the resources in and surrounding the Project
	Add and maintain additional fish habitat structures (S&E)		
	Project staff are sent to applicable trainings to enhance knowledge of natural and cultural resource management (S&E)		
	Available skill sets and equipment across Projects are leveraged (S&E)		
	Annual Work Plans implemented (E)	Update Forest, Fish and Wildlife Management Plan to include items such as: best management practices for timber harvesting; protection of shoreline buffers for wildlife and water quality; protection of Corps owned and managed riparian habitat; protection of contiguous habitat corridors; protection of viewsheds (S&E)	
	Annual working meetings with partners are being held (S&E)		

¹ S – Sustain
E – Establish

Goal 2: Cultivate volunteers, public-private partnerships, and grants¹

Management and Development Activity	Five-year	Ten-year	Desired State
Partnering for a shared public land management ethic	Opportunities with community action groups, local recreational clubs, and other Corps resources (such as Taylor County Adventure Club, National Wild Turkey Federation, WVU, and other future organizations) are initiated (S&E)	Appropriate Partnership Agreements (i.e. MOU/MOA) with natural resource management partners are established (E)	Engaged with appropriate resource management partners (WVDNR) to manage according to LRP's vision; partners are helping to share the Corps vision for the Project
Establishing the right partnership, at the right place, at the right time	Educational programs supporting the Project's goals and objectives are developed (S&E)	Seasonal natural resource crews are coming to the Project (E)	Partners, volunteers, and interns are augmenting Project staff responsibilities to further protect and enhance natural and cultural resources
	Partner with local universities or state/federal agencies to increase osprey platforms around the reservoir (E)		
	Establish partnership to reopen concession stand at Project Office (E)		
	Volunteers are working at the Information Center (E)	Student Conservation Association (SCA) has established relationship with the Project (E)	
	Add in host site at the Project (E)		
	Establish a "Friends of Tygart Lake" Group (E)		
	Enhance pollinator plot initiatives regionally with federal (intra-district), state, and local organizations (S&E)		

Goal 3: Provide safe, memorable connections as part of multiple destination points¹

Management and Development Activity	Five-year	Ten-year	Desired State
Ranger safety	Operational personal hand held communications and monitoring devices have been refreshed and are on the same frequency as county EMS (E)	Enhanced security features, such as video surveillance systems, a panic button, and an emergency exit are installed throughout the Project (E)	Rangers are working in a safe environment
	Improved communication with local Emergency Responders (E)		
	Facility and safety improvements made to Corps owned dock (E)		
Visitor safety	Consistent visitor assistance experience (playground inspections, life jacket loaner inspections) ensured (S&E)	Regular maintenance program established for facilities and recreation areas (S&E)	Low chances of incidents and quick response times for emergency personnel
	Emergency management partners actively engaged (S)	Project Site Areas (PSAs) with low use and degraded facilities have been identified and divestment options have been considered if appropriate (S&E)	
	Work with emergency management partners to establish weather alert systems in recreational areas (E)		
	Partner with WVDNR to conduct boating safety courses (E)		
	Emergency groups practice emergency safety at the Project on a regular basis (S&E)		
	Utilization of Federal Highway Transportation Programs to assist in road repairs (E)	Develop an Emergency Response Plan (E)	
Connect with other District reservoirs and locks	Joint ventures and recreational activities with other reservoirs and locks have been explored and are being promoted at the Project (i.e. Lock Fest, Special Recreation Day) (S&E)	Project staff is knowledgeable on operational/general information at other reservoirs and locks and dams, cooperation is improved (S&E)	Public is aware of the Corps recreational facilities at multiple Projects
	Project staff is cross-trained at other reservoirs throughout the District (E)		
Serve as part of multiple destination points	Serving as leaders in local Convention and Visitor Bureaus (E)	Access points to regional trails have been provided and promoted (e.g. Valley Falls) (S&E)	User groups from regional area are coming to the Project

	Local and regional outdoor recreation organizations have been engaged (S&E)	The Project has been integrated into the Heritage Tourism Program (E)	
	Year-round recreational opportunities have been promoted (E)	Increased winter recreational opportunities (e.g. hunting opportunities, migratory bird watching) (E)	
	Establish signature event (Taylor County Water Festival) (E)		
Promoting all that the Project has to offer; bringing in an increased number of visitors with varying interests and of varying ages	School groups, clubs, etc. have been reached out to and invited to the Project (S)	Signature event hosted annually; bringing visitors to the Project (E)	Visitors are aware and utilizing all of the available resources at the Project and are recreating year-round
	Signage regarding different activity areas have been displayed around the Project (e.g. Information Center, Pollinator Plot) (S&E)		
	Project staff participated in multiple outreach events (e.g. Farm Safety Day, West Virginia's Memorial Day Parade, local safety days, and health fairs) (S&E)		
	Regular dam tours are established (E)		
	Designate unmanned aircraft recreational area in accordance with Corps policies and guidelines (E)		

Goal 4: Leverage emerging technology to tell the Corps stories and enhance visitor experiences¹

Management and Development Activity	Five-year	Ten-year	Desired State
Assess and embrace emerging technology in interpretive services capabilities	Utilization of wireless devices in the work place to contribute to data collection (S)	Project boundary inventory and monitoring conducted wirelessly (E)	Public interaction with the Project is occurring through technology; Project staff are utilizing technology to better monitor and communicate about the Project and provide data to the public
	Have all fee and flowage boundaries surveyed and marked at Project (E)	Utilize Boundary Line/ENS OCA Tool to collect and inventory facility data (E)	
Enhance public outreach	Interpretive programming included in every OMP annual update (E)	Signage leading to the Project and within Project boundaries has been increased on highways and state roads, indicating the presence of the Project (S&E)	Visitation is increasing due to greater public awareness of events and opportunities at the Project
	Information Center is modernized (S&E)	Establish a comprehensive Interpretive Plan at the Project to grow and adapt to changing conditions (E)	
	Regional outdoor recreation activities are promoted on social media (S)		
	Sharing success stories with local news outlets in coordination with PAO (S&E)	Enhance day-use area and overlook to include additional shelters, new trail to dam, picnic facilities at overlook, playground, etc. (E)	
	Emerging social media technologies are being utilized for promotion and public outreach (District/Project App) (E)		

2. Project Setting and Factors Influencing Management and Development

2.1 Resource Analysis

2.1.1 Fish and Wildlife Resources

The Project's forested habitat, scrub-shrub uplands, wetlands, streams, and river and reservoir support a variety of wildlife species common to West Virginia. A few of the more common species likely to be observed in the Project area, include: bald eagle (*Haliaeetus leucocephalus*), turkey (*Meleagris gallopavo*), red-winged blackbirds (*Agelaius phoeniceus*), robins (*Turdus migratorius*), song sparrows (*Melospiza melodia*), common mergansers (*Mergus merganser*), mallards (*Anas platyrhynchos*), red fox (*Vulpes vulpes*), white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), and opossum (*Didelphis virginiana*). In addition, the Project supports a variety of amphibians and reptiles, including multiple frog, turtle, salamander, and snake species.

The Project also provides habitat for a diverse array of fish species which include smallmouth bass (*Micropterus dolomieu*), muskellunge (*Esox masquinongy*), walleye (*Sander vitreus*), bluegill (*Lepomis macrochirus*), white bass (*Morone chrysops*), rock bass (*Ambloplites rupestris*), yellow perch (*Perca flavescens*), various catfish (*Ictalurus punctatus*, *Ameiurus catus*, etc.), and carp (*Cyprinus carpio*), among others. Golden rainbow trout (*Oncorhynchus mykiss*, *color variant*) are stocked in the tailwaters below the dam. The depths of the reservoir accompanied by the dissolved oxygen coming out of the ringjets provide optimal habitat for cold water fisheries. Additionally, northern pike (*Esox lucius*), muskellunge (*Esox masquinongy*), walleye (*Sander vitreus*), and bass (*Micropterus salmoides*) are stocked in the reservoir periodically.

2.1.2 Vegetative and Timber Resources

Virtually all of the Project has been timbered and much has been grazed or farmed since European settlement in the eighteenth century. Consequently, forest cover on the Project has been extensively altered, and is currently comprised of second and third growth stands, which dominate the Project land cover (see Appendix B, Plate 4 for Vegetative Classification map).

In general, the vegetation of the Project area is of the mixed mesophytic forest region. Almost the entire drainage of the Buckhannon River and the Tygart River above the reservoir are located within the mixed mesophytic forest classification. The extreme upper reaches of the feeder streams of the Tygart River are located in the northern hardwood classification.

In the area immediately adjacent to the reservoir, both the mixed mesophytic and northern hardwood forest associations are present. The mixed mesophytic is characteristically found in

the more moist soils and on the lower slopes in valleys protected from the drying action of winds. The northern hardwoods are characteristically found on the upland slopes and in drier soils.

The mesophytic forest communities often support multiple canopy tree species at a single site, and rich understories of ferns, fungi, perennial and annual herbaceous plants, shrubs, small trees, and diverse animal communities. Songbirds, salamanders, land snails, and beetles are examples of some particularly diverse taxa. The ecoregion harbors some of the richest and most endemic land snail, amphibian, and herbaceous plant biotas in the United States and Canada. The ecoregion's freshwater communities are the richest temperate freshwater ecosystems in the world, with globally high richness and endemism in mussels, fish, crayfish, and other invertebrates.

Northern hardwood forests are composed of a mixture of deciduous trees and understory shrubs that typically grow together at more northern latitudes. Common trees include American beech (*Fagus grandifolia*), red maple (*Acer rubrum*), black cherry (*Prunus serotina*), sugar maple (*Acer saccharum*), and yellow birch (*Betula alleghaniensis*).

Northern hardwood forests provide space for everything from the smallest insects to the widest-ranging mammals and birds. If they are to remain common, these and other species require a forested backdrop within rapidly developing landscapes. Northern hardwoods face significant forest health threats.

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

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

Lentic riparian areas are functioning properly when adequate vegetation, landform, or debris is present to: dissipate energies associated with wind action, wave action, and overland flow from adjacent sites, thereby reducing erosion and improving water quality; filter sediment and aid floodplain development; improve flood-water retention and ground-water recharge; develop root masses that stabilize shoreline features against cutting action; restrict water percolation; support temperature necessary for fish production, waterbird breeding, and other uses; and support greater biodiversity.

When adequate vegetation, landform, or debris is present to dissipate energy associated with wind and wave action or overland flow, then a number of physical changes begin to occur, such as reduced erosion, floodplain development, and improved flood-water retention. As physical

aspects of an area begin to function, they start the process of developing wetland characteristics. These physical aspects have to be functioning properly to sustain characteristics that provide habitat for resource values.

2.1.3 Threatened and Endangered Species

Lists of threatened and endangered species are maintained by the U.S. Fish and Wildlife Service. Threatened and endangered species that may be affected by activities in the Project area are listed in Table 2-1. There is no critical habitat within the Project area. There are no confirmed federally threatened and endangered species at the Project property. However, potentially occupied habitat may be present (See Table 2-1, below). Periodic surveys should be conducted through coordination with local conservation groups and academia.

Table 2-1. Threatened and Endangered Species (USFWS IPaC, 8 January 2020)

Species	Scientific Name	Class	Status	Habitat
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Mammal	Threatened	Cavities or crevices in both live trees and snags (dead trees) during the summer
Indiana Bat	<i>Myotis sodalis</i>	Mammal	Endangered	Roost under the peeling bark of dead and dying trees during the summer
Running Buffalo Clover	<i>Trifolium stoloniferum</i>	Flowering Plant	Endangered	Requires periodic disturbance and a somewhat open habitat to flourish, but it cannot tolerate full sun, full shade, or server disturbance

2.1.4 Invasive Species

Under Executive Order (EO) 13112, Invasive Species (FR: 03 Feb 1999), as amended by EO 13751, Safeguarding the Nation From the Impacts of Invasive Species (FR: 08 Dec 2016), an invasive species is defined as a non-native species whose introduction does, or is likely to cause, economic or environmental harm or harm to human health. Invasive species can be microbes, plants, or animals that are non-native to an ecosystem. Invasive species can out compete native species by consuming their food, occupying their territory, and altering the ecosystem in ways that harm native species. Invasive species can be accidentally transported or they can be deliberately introduced because they are thought to be helpful in some way. Invasive species cost local, state, and federal agencies billions of dollars annually. The most common invasive terrestrial plant species occurring at the Project are: Japanese honeysuckle (*Lonicera japonica*), Japanese knotweed (*Polygonum cuspidatum*), autumn olive (*Elaeagnus umbellata*), buckthorns (*Rhamnus frangula*, *R. cathartica*), purple loosestrife (*Lythrum salicaria*), common reed or phragmites (*Phragmites australis*), reed canarygrass (*Phalaris arundinacea*), garlic mustard (*Alliaria petiolata*), multiflora rose (*Rosa multiflora*), giant hogweed (*Heracleum mantegazzianum*), and bush honeysuckles (*Lonicera maackii*, *L. tatarica*, *L. morrowii*). The

most common invasive insects are: emerald ash borer (EAB) (*Agrilus planipennis*), gypsy moth (*Lymantria dispar*), and the hemlock woolly adelgid (HWA) (*Adelges tsugae*). The most common aquatic invasive species are: hydrilla (*Hydrilla verticillata*), parrot feather milfoil (*Myriophyllum aquaticum*), Asian clam (*Corbicula fluminea*), zebra mussel (*Dreissena polymorpha*), virile crayfish (*Orconectes virilis*), and rusty crayfish (*Orconectes rusticus*).

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

2.1.5 Ecological Setting

The purpose of ecological land classification is to provide information for research, assessment, monitoring, and management of ecosystem components. The Natural Resource Management mission statement (ER 1130-2-550; Change 5, 30 Jan 2013) directly supports this paradigm. According to the U.S. Environmental Protection Agency's designation of ecoregions, the Project is located within the Western Allegheny Plateau Ecoregion.

2.1.6 Wetlands

According to the National Wetland Inventory (NWI), the Project includes approximately 61.4 acres of wetlands. There are 23.7 acres of freshwater emergent wetlands and 37.7 acres of freshwater forested/shrub wetlands. Wetlands serve important water quality and wildlife habitat functions. Particular conservation interest should be given to these features. See Appendix B, Plate 5 for Wetlands map.

2.1.7 Water Quality & Sedimentation

Water Quality

Tygart dam is operated for downstream water quality control. The Project discharges significantly increase the flow in the Monongahela and upper Ohio River to facilitate navigation and also improve water quality by diluting gross acid mine drainage, domestic, thermal, and industrial pollution. In addition, during periods when the flow in the upper Monongahela River is less than 600 c.f.s., the Project outflow is adjusted so that the ratio of Tygart to West Fork River contributions to the upper Monongahela River is at least a factor of 2:1, thereby serving as a dilutant to the poorer quality West Fork River.

The Pittsburgh District has monitored water quality in the Tygart Valley River Basin and at the Project since 1969 to assure optimum operation of Tygart dam for water quality. Data collected includes chemical, physical, and biological constituents at numerous sampling locations in the watershed upstream and downstream of the Project, and in the reservoir. Water quality monitoring includes:

- Bi-weekly sample collection by Project staff from the Tygart dam outflow and inflows
- Temporary monthly sample collection by Project staff at various locations at the reservoir to address particular water quality concerns
- Yearly limnology surveys of the reservoir and watershed by Water Quality staff with support from Project staff
- Once every ten years, monthly intensive limnology surveys of the reservoir and watershed are conducted by Water Quality staff with support from Project staff to understand decadal/spatial changes in limnological dynamics
- Operation of a continuous, real-time water quality monitoring buoy in the reservoir near the dam. See: <https://www.wqdatalive.com/public/15>
- Operation of a continuous, real-time water quality monitoring gage by the USGS on the Tygart River downstream of Tygart dam at Colfax, WV in cooperation with the WVDEP. See: <https://waterdata.usgs.gov/usa/nwis/uv?03057000>
- Operation of a continuous, real-time water quality monitoring gage by the USGS on the Tygart River upstream of Tygart dam at Philippi, WV. See: <https://waterdata.usgs.gov/usa/nwis/uv?03054500>

The Project can be characterized as a deep, clear, warm and low to moderately productive impoundment that is well aerated to considerable depths year round. The reservoir was formerly severely degraded by acid mine drainage from both active and abandoned bituminous coal mining activities, but there has been substantial abatement of mine drainage in the Tygart River basin and reservoir water quality has improved drastically.

However, mine drainage continues to be the primary source of water pollution in the basin, and the Project is still subject to sudden acid mine flushouts during heavy rainfall events. At times, this acid causes a taste and odor issue with the water which the City of Grafton withdraws from the reservoir. The reservoir presently supports a wide variety of plant and animal life, including many species of fish along with an important sport fishery. Tygart River water is generally of satisfactory quality for downstream purposes, and there is no provision for selective withdrawal from the reservoir.

Sedimentation

Three sedimentation surveys have been made since the beginning of full flood control operation of Tygart dam in June 1938. The first survey was made during October and November 1945, the second survey between November 1958 and March 1959, and the third in 1973. Results of the these three surveys showed that the silting that had occurred had been partly counterbalanced by scouring in the upper portions of the reservoir bed. Post 1973, there has been no sedimentation data.

2.2 Cultural Resources

The 2020 Project Master Plan update takes into consideration all records on file with the West Virginia State Historic Preservation Office (WVSHPO), which include prehistoric sites and historic structures. Prior coordination with the WVSHPO indicated a number of identified archaeological sites on Corps property dating from an undetermined Prehistoric period to Early Archaic (ca. 8,000 – 7,000 BCE) and Late Woodland (ca. 500 – 1000 CE) eras. An eligibility determination for listing on the National Register of Historic Places has not been made for every site, and additional site excavation would be required before making a final determination. There are currently 23 known prehistoric archaeological sites, of which one is listed and the remainder are classified as unknown. There are also two historic sites, Tygart dam and water works.

Prehistoric archaeological resources include a variety of lithics and temporary campsites, indicating that the earliest human presence was migratory hunter-gatherers following the game herds. Detailed site information has been excluded and should avoid public release to prevent possible looting or disturbance. Specific locations and information are on file with the Pittsburgh District, U.S. Army Corps of Engineers as well as the WVSHPO.

Historic structures located at the Project include the Tygart dam, which is listed on the National Register of Historic Places (NRHP) (Reference #95000763) under the Secretary of the Interior's Criterion A (broad patterns of United States history) as a contributing element of the Monongahela River Navigation System during the industrial era and from association with the Corps of Engineers' policy adoption of reservoirs in addition to levees for flood control during the early 20th century.

Included within the National Register nomination area are other contributing and non-contributing resources. Contributing elements are structures which add to the historic integrity of the area. In addition to Tygart dam itself, there are two damtender dwellings; a detached garage; a comfort, storage, and concession building; and an overlook and parking area that are classified as contributing elements. The resource manager's office and two maintenance buildings are considered non-contributing elements.

Required Reconnaissance

Since there has not been a complete survey of the Project, additional surveys may be required prior to any future land development. The planning process for any development activities should include coordination with the State Historic Preservation Officer, and applicable Tribal Historic Preservation Officers, as necessary.

A Phase I reconnaissance will be performed to identify possible archaeological/historical sites, provide an estimation of the potential data yield and site significance, and form a basis for

developing further detailed site survey plans if required. The results of this preliminary, low-intensity survey may lead to a Phase II systematic and comprehensive program of sampling at suspected sites of archaeological significance. The program will be planned to provide a statistically valid sampling survey of the surface and subsurface in the potentially affected area. Data obtained as a result of this intensive survey will be classified and evaluated to support or deny a determination that the site is significant from a local, state, or national perspective. Finally, the WVSHPO and the Corps will determine the site's potential eligibility for the National Register of Historic Places and/or the West Virginia Archaeological Inventory by applying the applicable nomination criteria.

No Project-related construction that could affect an archaeological site determined to be significant and potentially eligible for listing in the national register will proceed until consultation with the WVSHPO has been completed and an appropriate and acceptable mitigation plan has been developed. Such a plan may include in-place preservation of artifacts through site avoidance or salvage. If salvage is determined to be the optimum course of action, further detailed planning will be performed prior to initiation of any excavation work. Project planning/construction will resume upon completion of the archaeological salvage operations.

2.3 Demographics

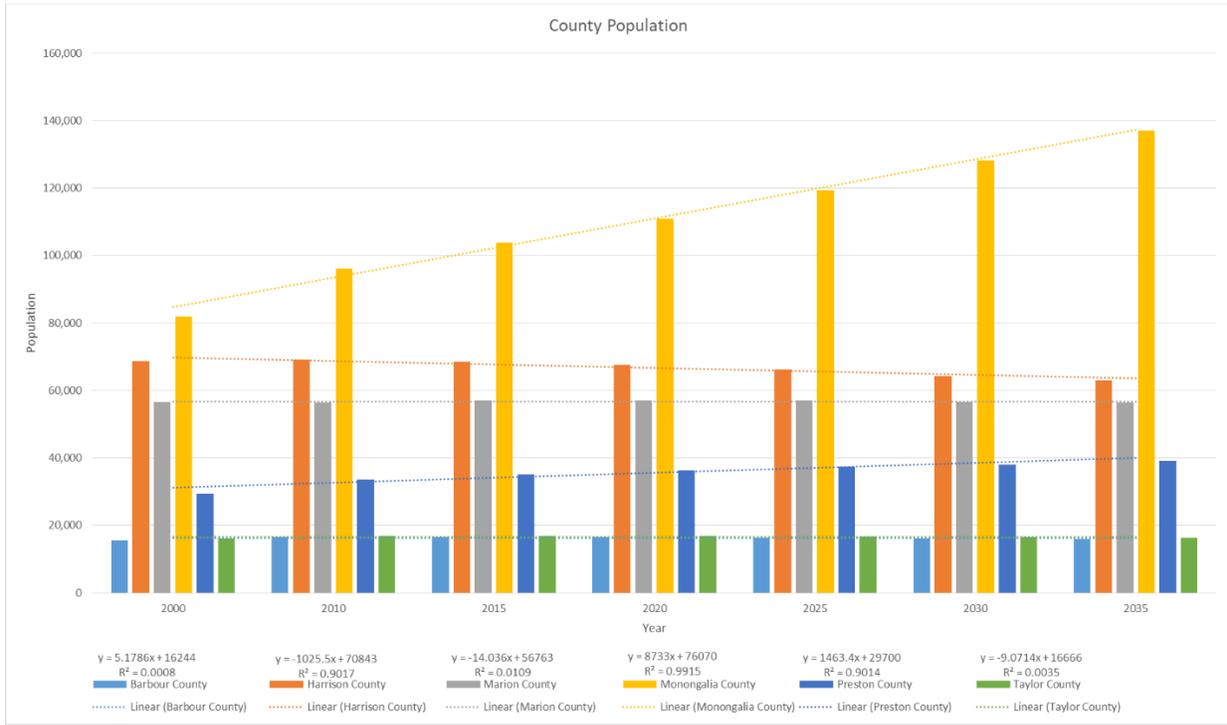
2.3.1 Market Area

The Project was constructed on the Tygart Valley River and is located in both Taylor County West Virginia and Barbour County West Virginia, near Harrison, Marion, Monongalia, and Preston Counties. The Project receives visitors primarily from these neighboring counties.

2.3.2 Population

Based on census data and population predictions through 2030 around the adjacent counties, we can assume that all things being equal, recreation at the Project will increase. Monongalia County gains approximately 8,100 residents every five years. Harrison County loses approximately 1,200 residents every five years. Preston County gains approximately 1,100 residents every five years. Barbour County loses approximately 100 residents every five years. Taylor County loses approximately 100 residents every five years. The population in Marion County is comparatively stable and not expected to change much between now and 2030. The total population of these six counties is expected to grow by approximately 7,800 residents every five years (Christiadi, Deskins, & Lego, 2014).

Graph 2-1. County Population



2.4 Economics

2.4.1 Income and Poverty Status

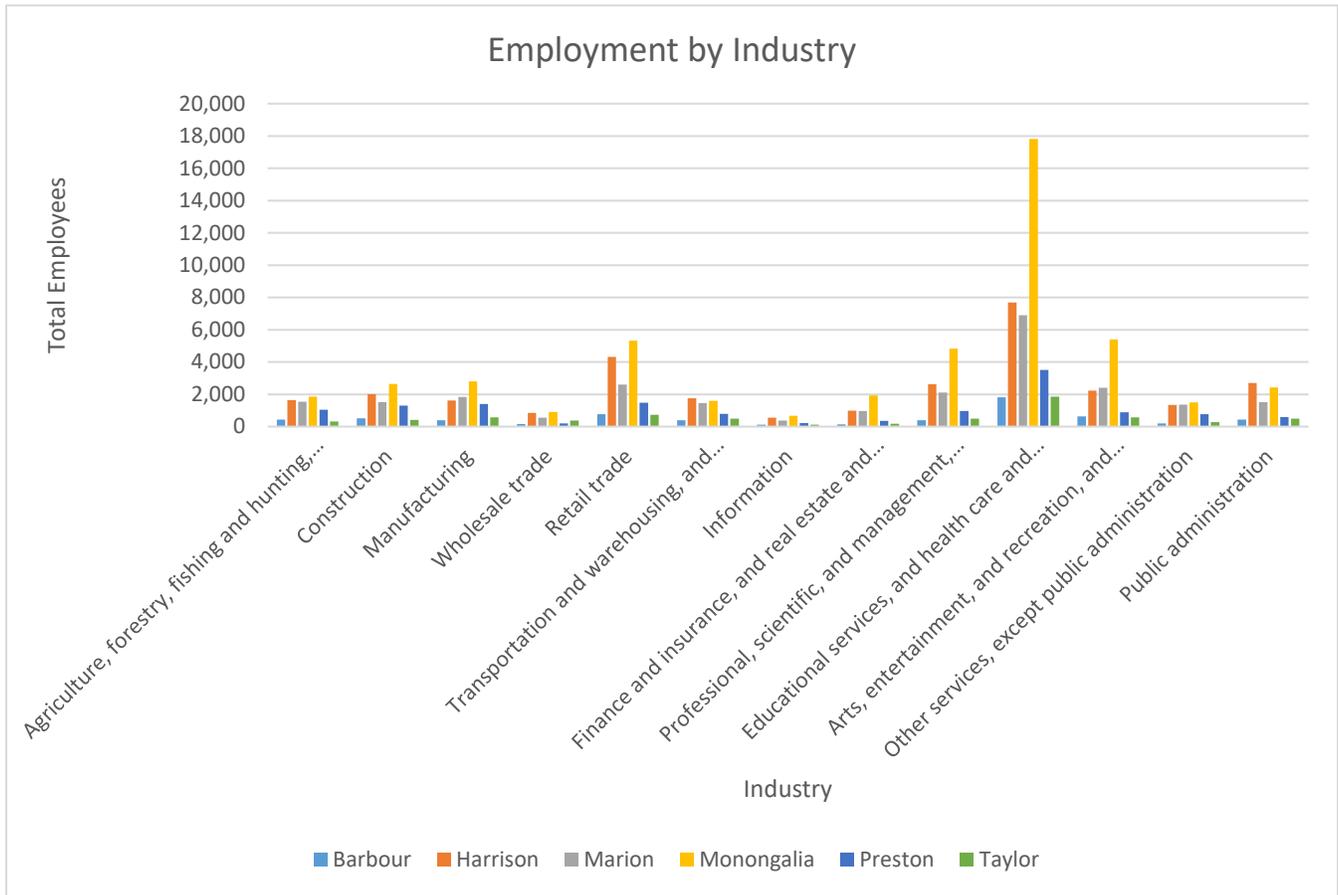
In 2017, the median household income in Barbour County was \$37,516 while the poverty rate was 22.5%. The median household income in Harrison County was \$48,315 while the poverty rate was 15.0%. The median household income in Marion County was \$48,158 while the poverty rate was 16.1%. The median household income in Monongalia County was \$49,624 while the poverty rate was 21.3%. The median household income in Preston County was \$46,673 while the poverty rate was 15.2%. The median household income in Taylor County was \$45,916 while the poverty rate was 15.7%. All except Barbour County are above the state of West Virginia’s average household income of \$44,061, although most are fairly close (American Fact Finder, 2020). Barbour County and Monongalia County have higher than the state of West Virginia’s 17.8% of population below the poverty line. Based on these facts, a sizable portion of the local population will likely use the Project as a vacation destination based on proximity and the relatively lower costs associated with recreating closer to home as opposed to incurring additional costs by choosing a site further away. By choosing to go to the Project for recreational needs, the populace will also contribute to the local economy of the area.

2.4.2 Area Industries

Barbour, Harrison, Marion, Monongalia, Preston, and Taylor Counties are fairly similar in regards to primary industries of employment. The three highest paying industries in Barbour are

Transportation and Warehousing (\$63,047); Mining, Quarrying, and Oil and Gas Extraction (\$62,443); and Utilities (\$60,273). In Harrison, the three highest paying industries are Utilities (\$75,096); Mining, Quarrying, and Oil and Gas Extraction (\$57,674); and Transportation and Warehousing (\$56,011). In Marion, the three highest paying industries are Mining, Quarrying, and Oil and Gas Extraction (\$69,674); Agriculture, Forestry, Fishing and Hunting, and Mining (\$67,582); and Utilities (\$58,558). In Monongalia, the three highest paying industries are Mining, Quarrying, and Oil and Gas Extraction (\$69,318); Agriculture, Forestry, Fishing and Hunting, and Mining (\$64,444); and Manufacturing (\$55,914). In Preston, the three highest paying industries are Mining, Quarrying, and Oil and Gas Extraction (\$64,526); Agriculture, Forestry, Fishing and Hunting, and Mining (\$61,523); and Utilities (\$60,488). In Taylor, the three highest paying industries are Mining, Quarrying, and Oil and Gas Extraction (\$82,746); Agriculture, Forestry, Fishing and Hunting, and Mining (\$64,306); and Utilities (\$60,417) (American Fact Finder, 2020). Given these top paying industries, there can be increased pressure for mining, forestry, and utility rights of way onto the Project. The number of employees in each industry for each of these six counties can be seen in the graph below.

Graph 2-2. Employment by Industry



2.4.3 Economic Impact of Recreation Related Spending

The Corps provides water-based recreation opportunities throughout the country, which provide economic benefits to the local and regional communities in which Corps’ Projects exist. To estimate the economic impact from the recreation-related spending at the Project, the Corps’ Institute for Water Resources, in collaboration with the Louis Berger Group and Michigan State University, have developed a regional economic impact modeling tool called the Regional ECONomic System (RECONS). This modeling tool automates calculations and generates estimates of jobs and other economic measures. This is done by extracting multipliers and other economic measures from more than 1,500 regional economic models that were built specifically for Corps Project locations. For 2016, RECONS shows an estimated 270,406 visits (person-trips) at the Project, predicted to result in direct benefits to the region of \$10,333,983 in sales, \$3,928,123 in labor income, \$5,709,324 in economic value added, and 132 jobs supported in the region.

2.5 Recreation Facilities, Activities and Needs

2.5.1 Zones of Influence

The primary zone of influence encompasses the Clarksburg Micropolitan Statistical Area as the basis in summarizing the population associated with the Project. The Clarksburg Micropolitan Statistical Area includes Harrison and Taylor Counties which had a total population of 94,196 in 2010 (American Fact Finder, 2020). Marion County, Monongalia County, and Preston County are included in the Morgantown-Fairmont, WV Combined Statistical Area, which had a total population of 186,127 in 2010. The Project is located in both Taylor County and Barbour County and near the city of Grafton, Taylor County. Taylor County's population as of the 2010 census is 16,895, a 5.0% increase from the 2000 census. Barbour County's population as of the 2010 census is 16,589, a 6.6% increase from the 2000 census.

2.5.2 Visitation Profile

Visitation is common at the campground and day-use areas as the Project is in close proximity to two major interstates and three major cities; Morgantown, Bridgeport, and Fairmont. Peak recreation season is from May through October. Visitation is concentrated during the weekends in both peak and non-peak seasons. Popular recreational activities at the Project include angling, paddlecraft (e.g. canoes, kayaks), boating, camping, hunting, bird watching, and hiking.

2.5.3 Recreation Analysis

Description of Facilities

The Project had an average visitation of approximately 289,457 from 2014 to 2016. The Project is a popular local attraction with a campground, lodge, and a main focus on the historical dam. Tygart Lake State Park Campground, which is managed by the WVDNR, Parks and Recreation, has a total of 36 campsites; 10 of which offer water and electric and 26 non-electric sites.

The Project has three boat launches total, two located at the marina and one located at Pleasant Creek. Visitor use and the increase in popularity of paddlecraft such as kayaks, canoes, and paddleboards indicates that additional small-craft launches would be desirable at the Project. Other recreation facilities managed by WVDNR, Parks and Recreation, include a marina with concessions, rental equipment, and a total of 374 dock slips, with an additional 60 slips approved; a swim beach with a picnic area; 4.5 miles of hiking trails; one large picnic shelter and five picnic areas; 11 cabins available to rent; a lodge with a restaurant, conference room, and 20 rooms for overnight stays; and a Nature Center with wildlife displays and naturalist programs. Recreation facilities managed by the Corps include an Information Center, a picnic area with a shelter and restrooms, and two miles of the Dogwood Trail and one mile of the Dam Trail.

Customer Satisfaction and Considerations

Visitor satisfaction is very high with visitors rating their overall experience at the Project as a "5 out of 5" on a 2018 solicited survey. According to comment cards and verbal opinions expressed to Project

staff, the areas that need most improvement are the entrance road to the Project and dam. There is also interest in having Wi-Fi available at the campground. There has been an expressed interest to expand the campground to accommodate larger RV's with more amenities and full hook-up sites. Other considerations include installing a fishing pier/dock with ADA accessibility. Visitor demand also indicates adding more paddlecraft launches and swim beaches.

2.5.4 Recreational Carrying Capacity

Carrying capacity, which includes both environmental (how much use can the resource can support without being compromised) and social (how much use can occur before the quality of visitor experience is diminished) dimensions, is currently balanced at the Project. The Project experiences few fatalities or boating accidents, and the Tygart Lake State Park Campground is booked throughout the recreation season, especially holidays. Tygart Lake Marina has all dock slips rented and is currently in the process of adding an additional 60 slips. Future recreational developments will require plans and studies to account for water quality and sedimentation changes, balancing recreational diversity, and accommodating new demands within a developed footprint in a manner that is environmentally and economically sustainable.

2.6 Related Recreational, Historical and Cultural Areas

The Project is located within the Mountaineer Country tourism region by West Virginia Tourism. The Project is located within a short distance of historical attractions including Prickett's Fort State Park, Arthurdale, the Barbour County Historical Museum, International Mother's Day Shrine in Grafton, and the Philippi Covered Bridge and Civil War battlefield. Additional nearby outdoor recreation opportunities include hiking trails at Coopers Rock State Forest, Valley Falls State Park, and whitewater rafting on the Cheat River.

2.7 Real Estate and Acquisition Policy

The total real estate at the Project encompass 4,599.8 acres, of which 3,343.5 acres are fee land and water and 1,256.3 acres are road and flowage easement. There are 62 total outgrants, with the majority of the land being outgranted to WVDNR. There are no mineral tracts at the Project.

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

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

3.1 Land Allocation

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

Operations

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

Recreation

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

Fish and Wildlife

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

Mitigation

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

3.2 Land Classification

Land classifications are the primary use for which Project lands are managed. The previous Master Plan dated 1976, used a now obsolete classification scheme that has been updated in this document to meet current standards. Current standards identify six classification categories:

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

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

3.2.1 Project Operations

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

3.2.2 High Density Recreation

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

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

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

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

3.2.3 Environmentally Sensitive Areas

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

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

Areas designated as sensitive can change over time, and continuous monitoring through programs like Multiple Species Inventory and Monitoring (MSIM) provide valuable information to keep identified sensitive areas current. Through the use of Geographic Information System (GIS) databases maintained with separated layers, the dynamic nature of sensitivity can be managed in an up-to-date program. Some areas may be highly sensitive to change, while other areas may need prescribed management to remain viable. The goal of sensitive area management is to protect and preserve known areas that contribute to the diversity and health of the Project area.

3.2.4 Multiple Resource Management Lands

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

Low Density Recreation

These lands are designated for dispersed and/or low impact recreation use. Development of facilities on these lands is limited. Emphasis is on providing opportunities for non-motorized activities such as walking, fishing, hunting, or nature study. Site-specific, low-impact activities such as primitive camping

and picnicking are allowed. Facilities may include boat ramps, boat docks, trails, parking areas and vehicle controls, vault toilets, picnic tables, and fire rings.

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

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

Low density recreation areas have the potential to be converted to High Density Recreation through the development of new trail systems, campgrounds, boat launches, or other recreational features. These areas also have the potential to be used for utility lines, timber sales, or mining activities if a third-party makes a request for such an activity. However, these actions would require additional study and would be approved on a case-by-case basis based on the anticipated impacts associated.

Wildlife Management

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

Vegetation Management

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. Management activities focus on the protection and enhancement of forest resources and vegetative cover. Forests are managed as a

multipurpose resource for sustained yield when consistent with recreation and wildlife management objectives and approved land uses. Hunting and fishing are allowed pursuant to tribal or state fish and wildlife management regulations where these activities are not in conflict with the safety of visitors and Project personnel. Other activities are conducted under the guidance of the Project's forest management and wildlife management plans.

Future or Inactive Recreation Areas

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

3.2.5 Water Surface

There are four possible sub-classifications.

- **Restricted.** Water areas restricted for Project operations, safety, and security purposes.
- **Designated No-Wake.** To protect environmentally sensitive shoreline and recreational water access areas from disturbance, and/or to protect public safety.
- **Fish and Wildlife Sanctuary.** Annual or seasonal restrictions on areas to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning.
- **Open Recreation.** Those waters available for year-round or seasonal water-based recreational use.

3.3 Easement Lands

Project Easement lands are lands on which easement interests are held, but no fee title ownership exists. Planned use and management of easement lands will be in strict accordance with the terms and conditions of the easement estate acquired for the Project. Easements were acquired for specific purposes and do not convey the same rights or ownership to the Corps as other lands. There are three different types of easements – operations, flowage, and conservation.

3.3.1 Operations Easement

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

3.3.2 Flowage Easement

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

3.3.3 Conservation Easement

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

4. Resource Plan

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

4.1 Classification and Justification

The land classifications are:

- **Project Operations.** Lands required for the dam, spillway and other areas that are used solely for operation of the Project (more fully described in Sec. 3.2.1 above).
- **High Density Recreation.** Lands developed for intensive recreational activities (more fully described in Sec. 3.2.2 above).
- **Environmentally Sensitive Areas.** Areas including scientific, ecological or cultural features such as those protected under the Endangered Species Act, National Historic Preservation Act, or other laws (more fully described in Sec. 3.2.3 above).
- **Multiple Resource Managed Lands.** Includes areas of low density recreation, wildlife management, vegetative management, and future/inactive recreation areas (more fully described in Sec. 3.2.4 above).
- **Water Surface.** Water surface areas restricted for Project operations, no-wake zones, used for open recreation, or restricted for fish and wildlife sanctuary (more fully described in Sec. 3.2.5 above).

Further details for managing these lands will be included in the OMP, as revised. Management tasks described in the OMP will support the resource objectives, land classifications, and resource plans set forth in this Master Plan. While the following sections address specific plans for the land classifications listed above, the Corps will strive to meet the following universal Project purposes at all Project lands: 1) take proactive measures to enhance universal access to lands and facilities, 2) improve safety for visitors, and 3) identify and eliminate encroachments and trespassing. In addition, the Corps will seek to identify important “unofficial” recreation activities and sites, such as undeveloped shoreline fishing areas, swimming areas outside of developed beaches, or other favorite areas used by recreationists. As development occurs in the future, the Corps will seek to protect these areas and may require mitigation for development actions that would negatively impact these sites. As these sites are identified, they will be included in future updates to the Master Plan and may also be included in the OMP.

4.1.1 Project Operations

This category includes lands required for the concrete gravity dam and outflow structures, Information Center, Project Office, Southern Area Office, maintenance compound, and other areas used to operate

and maintain the Project. There are 50.3 acres classified as Project Operations. The management plan (stated as “resource objectives”) for these areas is to continue providing physical security necessary to ensure continued operations of the dam and related facilities.

4.1.2 High Density Recreation

Lands developed for intensive recreational activities for the public are considered as high density recreation including day-use areas, campgrounds, commercial concessions (marinas, restaurants, resorts, etc.), and quasi-public development. Future possibilities for development of these areas include expansion of trail systems utilizing emerging technologies such as Quick Reference (QR) codes and other electronic media outreach, upgrades to designated watercraft (boats, kayaks, canoes, paddleboards, etc.) and associated launching areas, conversion of low density campsites to sites with electric and water hook-ups for RVs, and expansion of additional park recreation features. There is a total of 69.8 acres classified as High Density Recreation (see Appendix B, Plate 7 for the Recreation map).

Tygart Lake State Park Campground

Tygart Lake State Park Campground is managed by the WVDNR, Parks and Recreation. The campground consists of 36 sites, 10 with water and electric and 26 that are non-electric. There is one shower house/restroom and a camper dump station located at the beach. The campground is open from April through October. The Tygart Lake State Park Campground also contains a 9-hole disc golf course and a playground. There are also 11 cabins available to rent with six of them overlooking the reservoir. These cabins include bathroom showers, Wi-Fi, fireplaces, central heat and air, a full kitchen, and some contain multiple bedrooms. These cabins are available to rent April through December. Cabin 11 is pet friendly and open year round.

Tygart Lake Marina

The Tygart Lake Marina is managed by concessionaire. The building is a single story building. There is a restroom facility above the marina. Boat rentals (pontoon, cruise boats, and fishing boats), gasoline, and supplies are available at the marina. There are a total of 374 slips at the marina that can accommodate jet skis up to house boats. The marina is open from May through September. There are two, two-lane boat ramps at the marina that visitors can use; one of which is accessible year round while the other will be completely submerged at an elevation of 1045 feet.

Tygart Lake State Park Swim Beach

A 450 foot swim beach is located to the right of the marina in the next cove over. The area includes a 30 car parking lot, one restroom, and a small concession area that sells food. There are about four picnic tables at the swim beach. The swim beach is open from Memorial Day through Labor Day.

Tygart Lake State Park Lodge

The Tygart Lake State Park Lodge consists of a restaurant, store, conference room, and 20 rooms available for overnight stays. The State Park Lodge is typically open year round based on demand and budget. There is also an outdoor deck area with a firepit and seating. The State Park Lodge also includes a courtesy dock so boaters can visit the restaurant and store.

Information Center

The Information Center area consists of an information center, men and women's restroom, 15 picnic tables, and one picnic shelter. The picnic shelter is operated on both a first come/first serve basis or can be reserved through the Project for a \$40 fee. The picnic shelter can accommodate approximately 40 guests. The picnic shelter has the capability of having a fully operating concession stand. This area has approximately 75 parking spaces. The Information Center is open year round. Interpretive programming and visitor information provided by Corps staff and are available year round. Most common uses of this area by the public include participation in programs, inquiries, picnicking, and access to the dam for biking, jogging, fishing, and walking.

The Nature Center

The Nature Center houses the offices of the State Park superintendent, assistant superintendent, and State Park administrative staff. There is an interpretation area within the Nature Center that consists of wildlife exhibits and programming where the State Park Naturalist conducts presentations. This area is leased and operated by WVDNR, Parks and Recreation. There is a restroom, large picnic shelter, and playground associated with this area as well.

Best Management Practices for High-Density Recreation Lands:

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

4.1.3 Environmentally Sensitive Areas

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

Environmentally Sensitive Areas include locations of threatened and endangered species and cultural sites. Some areas may be highly sensitive to change, while other areas may need prescribed management to remain viable. The goal of sensitive area management is to protect and preserve known areas that contribute to the diversity and health of the Project area. There are a total of 101.5 acres classified as Environmentally Sensitive Areas.

The following types of landscape may be classified as an environmentally sensitive area:

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

Archaeological Sites

Approximately 33 acres are classified as lands containing archaeological resources. These include old state roads, a cemetery, and the remains of a canal and brick-land office building. These sites will be managed to protect these resources in accordance with the provisions of applicable laws, including the Archaeological Resources Protection Act, National Historic Preservation Act, and Native American Graves Protection and Repatriation Act. These areas, along with any other possible archaeological sites, will continue to be surveyed for the presence of archeological resources when development activities are proposed to ensure that utilities placement, mining, installation of recreation features, and other actions do not impact unknown resources. If additional resources are discovered, these parcels would be converted to this management category and additional protections would be afforded to ensure compliance with applicable laws.

Fresh Water Wetlands

Approximately 23.7 acres of freshwater emergent wetlands and 37.7 acres of freshwater forested/shrub wetlands were retained as Environmentally Sensitive Areas.

Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For the purposes of this classification, wetlands must have one or more of the following three attributes: 1) at least periodically, the land supports predominantly hydrophytes; 2) the substrate is predominantly undrained hydric soil; and 3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year. Wetland areas are functioning properly when adequate vegetation and

landforms are present to: 1) dissipate stream energy associated with high waterflows, thereby reducing erosion and improving water quality; 2) filter sediment, capture bedload, and aid floodplain development; 3) improve flood-water retention and ground-water recharge; 4) develop root masses that stabilize streambanks against cutting action; 5) develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and 6) support greater biodiversity.

Best Management Practices for Environmentally Sensitive Areas:

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

4.1.4 Multiple Resource Managed Lands

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

4.1.4.1 Low Density Recreation

Low density refers to lands with minimal development or infrastructure that support passive public recreational use (e.g. primitive camping, fishing, hunting, trails, wildlife viewing). There are 290 acres at the Project that fall under this category.

Pleasant Creek

Pleasant Creek is a multi-purpose area that includes a primitive campground and boat launch. The campground includes 40 non-electric sites with tent pads, picnic tables, and fire rings. The campground has two vault restrooms. The boat launch is paved with one launching lane and a courtesy dock. There is approximately 40 car and trailer spots. This area has a dirt boat ramp and a 35 car and trailer parking lot. This area is accessible for shoreline fishing and provides carry-in access for paddlecraft launching. This area is licensed to WVDNR, Wildlife Resources Section. Distance from Pleasant Creek to the dam is 15 miles. There is also availability in this area for hunting access. Hunting includes waterfowl, large game, and small game. This is also a popular bird watching area. Pleasant Creek is open year round.

Hiking Trails

Five hiking trails that total 7.5 miles are located throughout the Project. These trails include the Dam Trail (1.75 miles), Woodland Trail (1.5 miles), Ridge Trail (.75 miles), Lake Trail (.5 miles), and Dogwood Trail (3 miles). These trails are located on WVDNR land along with Corps property and are maintained by State Park staff and Corps personnel.

Best Management Practices for Low-Density Recreation Lands:

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

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

- There is no viable alternative to the activity or structure being placed on Corps lands
- There is a direct benefit to the Project and their respective authorized mission

4.1.4.2 Wildlife Management Areas

Wildlife lands are available for sightseeing, wildlife viewing, nature study, hunting, and hiking. There are 1,024.7 acres classified as Wildlife Management Areas. Taking of wildlife, including hunting,

fishing, and trapping, may be allowed when compatible with the wildlife objectives for a given area and within federal and state fish and wildlife management regulations as established with ER 1130-2-540.

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

Best Management Practices for Wildlife Management Areas:

- Surface disturbance will not be allowed within 660 feet (or if there are any more stringent state species-specific buffers) of active raptor nests on natural habitat features, such as trees, large brush and cliff faces
- The Master Memorandum of Understanding between the Corps and the Animal and Plant Health Inspection Service, Wildlife Services (WS), will guide nuisance species damage control
- Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 45 db measured at 30 feet from the source of the noise
- Manage forest resources and other vegetation for balanced uses of recreation, wildlife, and fisheries
- Monitor forest conditions to document health and identify pests
- A habitat restoration plan shall be developed to avoid, minimize, or mitigate negative impacts on vulnerable wildlife while maintaining or enhancing habitat values for other species. The plan shall identify revegetation, soil stabilization, and erosion reduction measures that shall be implemented to ensure that all temporary use areas are restored. The plan shall require that restoration occur as soon as possible after completion of activities to reduce the amount of habitat converted at any one time and to shorten the length of recovery time to natural habitats
- Recovery plans for species federally-listed as threatened or endangered will be implemented under the authority of the Endangered Species Act, including the reintroduction or relocation of native special status species in areas on public land in coordination and cooperation with local governments
- Increased intensity of research and monitoring will be needed to evaluate changes in habitat condition, land use threats to the species, species use and distribution, reclamation efforts, propagation, and other projects that may help in enlarging the knowledge base of these species
- All land use management prescriptions will be maintained as currently established to ensure aesthetics, habitat quality, and overland water flow. All existing ground disturbing activities will not be impacted by this designation
- No motorized use, unless previously authorized, will be allowed within Wildlife Management Area boundaries; other trails (i.e., foot trails, mountain bike trails, cross country skiing trails, etc.) will be analyzed on a case by case basis
- Prescribed fire should be considered as a management method for this land classification

4.1.4.3 Future Recreation Areas

There are no Future Recreation Areas planned at the Project.

4.1.4.4 Water Surface

There are four Water Surface categories within the boundaries of the Project: Restricted, Open Recreation, Fish and Wildlife Sanctuary, and Designated No-Wake. These areas make up 1,807.2 acres that are within the reservoir's conservation pool. See Appendix B, Plate 7 for Recreation map which shows the Water Surface categories.

4.1.4.5 Restricted

Restricted areas include those portions of the reservoir pool where public access is prohibited due to Project operations, security concerns, or to promote public safety. This includes the areas between the outlet structure and the upstream portion of the dam and the area immediately downstream of the dam. There are 47.5 acres at the Project that fall under this category.

4.1.4.6 Designated No-Wake

Designated no-wake zones are marked with buoys to protect environmentally sensitive shoreline areas, recreational areas (such as boat ramps and docks), and for public safety. Boats are required to slow down in these areas to prevent waves from impacting these areas. There are 331.3 acres at the Project that fall under this category.

4.1.4.7 Open Recreation

Open recreation areas are waters that are available year-round or seasonally for water-based recreational use. There are 1,428.4 acres at the Project that fall under this category.

4.1.4.8 Fish and Habitat Management

Fish and wildlife sanctuary zones have annual or seasonal restrictions on areas to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning. There are no acres at the Project that fall under this category.

Best Management Practices for Water Surface Areas:

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

4.2 Easement Lands

There are 1,256.3 total acres of easement lands at the Project.

4.2.1 Operations Easement

The Corps has 3.3 acres of operations easement lands at the Project. This area consists one roadway easement.

4.2.2 Flowage Easement

The Corps has 1,253 acres of flowage easement lands at the Project.

4.2.3 Conservation Easement

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

Best Management Practices for Easement Lands:

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

5. Special Considerations Affecting Natural Resources

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

1. Coal Mines

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

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

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

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

2. Oil and Gas Development

Currently, there are no proposals for new oil and gas related activities on Project lands. There is one abandoned gas well on Corps fee owned property. Ownership of the mineral rights underlying the Project may be owned outright by the federal government, may be third party owned, or a combination thereof. There may be subordination agreements or surface restrictions in place. It is also possible for the BLM to lease federally-owned mineral interests beneath the surface of Project land. It is necessary to review and consider the specific ownership documentation of each tract in order to determine the rights and controls that the Corps has on said tracts. Oil and gas well locations will be managed for surface disturbance such as invasive species, water quality, overland water flow, and erosion control. Potential impacts of mineral extraction activities include the footprint of the extraction site and construction and operation of access roads. Mineral extraction within the Project boundary could infringe on general recreational areas or fish and wildlife related recreation, either directly or from pollutants that are a result of extraction operations. Surface occupancy will be avoided for oil and gas development.

3. Federally-Owned Minerals

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

associated stipulations. If the developer is still interested, the BLM follows its procedures to make the minerals available. The Corps has the final say in whether minerals will be made available, and the Assistant Secretary of the Army (ASA) has final approval on any non-availability determination.

4. Owners of Private and State Minerals

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

5. State or Privately Owned Minerals Accessed from State or Privately-Owned Land

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

6. Indiana Bat and Northern Long-Eared Bat

Currently listed as federally endangered, the Indiana Bat (*Myotis sodalis*) is a small, gray to chestnut-brown colored bat that hibernates in caves and abandoned mines during winter months (starting mid-September into November) and roosts under peeling tree bark, under bridges, and sometimes in buildings, during warmer months (starting mid-April into May). The total body length of an adult Indiana Bat averages between 2-3 inches, with a wingspan of 9.5-10.5 inches. Populations have been declining since the 1960's, largely due to disturbance of winter cave hibernacula. The Northern Long-Eared Bat (*Myotis septentrionalis*), currently listed as federally threatened, is a medium-sized bat with a total body length of 3.0-3.7 inches, and a wingspan of 9-10 inches. Their fur color can be medium to dark brown on the back and pale-brown on the underside, primarily distinguishable by its long ears. The Northern Long-Eared Bat and Indiana Bat are similar with respect to their behavior, habitat use, and range, as well as the anthropogenic activities threatening existing populations.

While no known hibernacula for these bats exist on Project property, there is considerable suitable summer roosting habitat present in and amongst the forested components of the Project. At present, there is no current management or survey plan in effect; however, the U.S. Fish and Wildlife Service (USFWS) has adopted regional, seasonal cutting/disturbance restrictions. Generally, tree-cutting activities should be carried out from mid-November through the end of March during which time bats are hibernating in non-forest habitats. If any tree-cutting is necessary from the beginning of April to mid-November, trees greater than or equal to 5 inches in diameter at breast height should not be cut or physically disturbed in order to avoid potentially killing or injuring roosting bats. Special considerations should be given to trees with the following characteristics indicative of suitable roosting habitat: 1) dead or dying trees and snags (with exfoliating bark); 2) live trees with exfoliating or defoliating bark in the trunk or branches (e.g., shagbark and shellbark hickory); and 3) trees or snags that have characteristics typical of roost sites for bats (i.e., have exfoliating or defoliating bark, or contain cracks, crevices, or holes).

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

7. Bald Eagle

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

8. Invasive Aquatic and Terrestrial Species

The most common invasive terrestrial plant species occurring at the Project are: Japanese honeysuckle (*Lonicera japonica*), Japanese knotweed (*Polygonum cuspidatum*), autumn olive (*Elaeagnus umbellata*), buckthorns (*Rhamnus frangula*, *R. cathartica*), purple loosestrife (*Lythrum salicaria*), common reed or phragmites (*Phragmites australis*), reed canarygrass (*Phalaris arundinacea*), garlic mustard (*Alliaria petiolata*), multiflora rose (*Rosa multiflora*), giant hogweed (*Heracleum mantegazzianum*), and bush honeysuckles (*Lonicera maackii*, *L. tatarica*, *L. morrowii*). The most common invasive insects are: emerald ash borer (EAB) (*Agrilus planipennis*), gypsy moth (*Lymantria dispar*), and the hemlock woolly adelgid (HWA) (*Adelges tsugae*). The most common aquatic invasive species are: hydrilla (*Hydrilla verticillata*), parrot feather milfoil (*Myriophyllum aquaticum*), Asian clam (*Corbicula fluminea*), zebra mussel (*Dreissena polymorpha*), virile crayfish (*Orconectes virilis*), and rusty crayfish (*Orconectes rusticus*). While no management plan is currently in effect for invasive species, terrestrial or aquatic, on Corps managed property, considerations are taken when performing tasks on the Project to prevent the spread or introduction of invasive species. Efforts to educate the public on preventing the spread and introduction of invasive species is made through signage (e.g. Don't Move Firewood! signs), ranger led interpretive programs, and information on displays and pamphlets at the Information Center.

9. Unmanned Aircrafts

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

10. Climate Change

Long-term changes in West Virginia’s climate (i.e., altered air temperature and/or precipitation rates) will affect habitats and species. Intolerant flora and fauna, as well as species currently existing on the edge of their range, are at greatest risk of local extirpation as a result of altered environmental conditions under climate change. Existing data regarding climate change was predicted on models and climate data from 60 years ago. Given predictions, it may result in water management and water quality difficulties such as not being able to make summer pool in time for the recreation season or not having enough water in the late summer to meet downstream flow targets. Increased storm runoff due to climate change also has the potential to result in greater inputs of pollution which in turn can affect water quality of the reservoir and downstream of the Project. Similarly, increased runoff may alter rates of sedimentation within the reservoir. Ecosystems and associated species impacted by pre-existing

anthropogenic stressors are also at greater risk. Thus, preserving and promoting healthy and connected habitats will be critical to ensuring long-term persistence of all species under climate change.

6. Agency and Public Coordination

Throughout the scoping process, the Corps involved the public, engaged with partners and stakeholders representing interests at the local, regional, state, and federal levels. Comments from the various partner, stakeholder, and public meetings were received on a variety of topics, including:

Preferred qualities, characteristics, and components of the Project:

- Opportunities for campers, hikers, fishermen, hunters, wildlife viewers, boaters, swimmers, and recreational day-users
- The quality and scale of the fish habitat available
- Habitat management practices to include prescribed burns, timber cuts, invasive species control, etc., and being prepared to target any new threats
- Safe environment for boaters and swimmers on the reservoir

Potential Threats:

- Invasive species
- Shoreline erosion
- Oil, gas, and coal mining development

Regional Needs/Opportunities:

- Increasing access to the reservoir for kayakers and canoers via a boat launch
- Expanding the beach at Tygart Lake State Park
- Improving and expanding existing campground areas and associated facilities
- Improving visitor safety through increased signage
- Creating opportunities for volunteers and partners to maintain and manage the Project area
- Identifying signature events that can be held at the Project to draw in additional visitors
- Increasing trash receptacles and clean up events

See Appendix C for the compilation of the comments collected during the Scoping and Draft Release meetings. All comments made during these meetings, as well as those submitted online, were considered during the development of the current Master Plan. All formal comments submitted during the Draft Release meeting, along with Corps responses, can also be found in Appendix C.

6.1 Scoping Meetings

Scoping efforts began in August 2018 with a meeting between Corps staff and Project partners, West Virginia Division of Natural Resources, Parks and Recreation and Wildlife Resources Section. These scoping efforts were held in conjunction with efforts to also scope the Project Shoreline Management Plan. A workshop-style public meeting was then held on 20 August 2018, followed by an open house

public meeting and dam tour event on 25 August 2018. The objectives of these scoping meetings were to: 1) communicate the Corps' intent and need to revise the Master Plan and Shoreline Management Plan; 2) establish the scope of the Master Plan and Shoreline Management Plan updates; and 3) learn about the needs, opportunities, and concerns of partners, stakeholders, and the public. See Appendix C for a summary of the meetings and the public notice.

6.2 Draft Release Meetings

Follow-up partner and public meetings were held on March 17, 2020, with the purpose of unveiling the proposed recommendations and land use classifications and eliciting feedback on the proposed updates to the Master Plan, Shoreline Management Plan and accompanying Environmental Assessment.

6.3 Outreach Efforts

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

- **Fact Sheet:** A Master Plan Update fact sheet was developed to inform partners, stakeholders, and the public on the purpose and scope of the Master Plan update. This fact sheet was sent in email correspondence and handed out at each of the meetings.
- **Email Invitations:** Email invitations for both the partner and public meetings were sent out to all partners and stakeholders with available contact information. A Project fact sheet was attached.
- **Public Meeting Press Releases:** Sent to local media a week prior and the day before the public meetings were held.
- **Public Meeting Facebook Posts:** Facebook posts were made on the Tygart Lake Facebook page advertising the public meeting.
- **Crowdsource Reporter:** An online comment tool was set up to collect comments from Project visitors who could not attend the public meeting, but wanted to submit their input to be considered during the scoping phase.

7. Summary of Recommendations

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

Derived through correspondences, comments, scoping meetings (described in further detail below) by local citizens, stakeholders, and current and potential Project partners, along with Corps staff knowledge of the Project, the recommendations below address the regional needs, threats, and opportunities identified throughout the planning process. Section 2 describes those identified topics and the Project conditions that inspired the recommendations.

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

7.1 Coordination and Partnerships

The modest size of the staff at the Project creates a prime opportunity for partners and volunteers to augment and advance the operations and management at the Project. Therefore, an overarching recommendation for the Project is to create partnerships to leverage fiscal resources and continue to involve local communities and stakeholders in achieving the resource objectives set forth above, in Section 1.6. This recommendation includes: 1) collaborating with federal and state agencies to leverage resources for complimentary natural resource management; 2) working with recreation service providers to improve user experiences; 3) partnering with environmental groups to improve habitat; and 4) partnering with educational and community groups to encourage volunteer activities that are mutually beneficial.

In order to remain in accordance with other plans regarding resources and opportunities within Taylor and Barbour County, the Corps shall keep abreast of content within all existing plans reviewed during the update of this Master Plan, as well as any future plans developed for the area.

The Corps should also seek to continuously stay engaged and further coordination efforts. To encourage coordination and partnership, the Project staff should engage with external partners, including, but not limited to:

- Tygart Lake Marina
- Tygart Lake State Park
- West Virginia Division of Natural Resources (Parks and Recreation and Wildlife Resources Section)

7.2 Facility Modernization

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

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

- Installment of informational and directional signs around the Project and trails
- Demarcation of property lines (fee and flowage)

- Improvements to roads leading to, and surrounding, the Project

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

- Development of an Emergency Response Plan
- Identification of Project Site Areas (PSAs) with low use and degraded facilities; divest when appropriate
- Establishment of different ways for visitors to explore the Project, including: brochures, maps, and/or development of a phone app that enables visitors to access park maps, learn about the Project, and log information from their experience

7.3 Land Classification Changes

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

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

Table 7-1. Conversion of Land and Water Classifications

Original	Proposed
Wildlife Management Fish and Wildlife Lands	Wildlife Management or Environmentally Sensitive Areas
Recreation Intensive Use	High Density Recreation
Recreation Low Density Use	Low Density Recreation
n/a	Project Operations
Boating Prohibited Unlimited Speed Zone Idling “No Wake” Speed Zone	Restricted Open Recreation Designated No-Wake

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

Table 7-2. Summary of Land Class Changes

Existing Land Use Class	Existing Land Use Acres	Proposed Land Use Class	Proposed Land Use Acres
Wildlife Management	893.6	Wildlife Management Areas	1,024.7
Fish and Wildlife Lands	21.9	Environmentally Sensitive Areas	101.5
n/a	n/a	Project Operations	50.3
Recreation Intensive Use	232.2	High Density Recreation	69.8
Recreation Low Density Use	306	Low Density Recreation	290
n/a	n/a	Future Recreation	0.0
Boating Prohibited	82.8	Restricted	47.5
Unlimited Speed Zone	889.9	Open Recreation	1,428.4
Idling “No Wake” Speed Zone	812.7	Designated No-Wake	331.3
Unclassified	104.7	n/a	0.0

Acreage numbers for historical land use classifications were calculated in GIS software by scanning, georeferencing, and digitizing the 1976 Land Use Classification Map. Due to the scale and other limitations of the original hand-drawn map, acreages should be considered very approximate.

While these land use classifications may be updated in the future, those described in this document, dated 2020, represent the most current and relevant uses of various Project lands. Additional details of the uses and management goals for individual Project site areas will be provided in a forthcoming OMP for the Project.

7.4 Development Requests

West Virginia Division of Natural Resources, Parks and Recreation proposed adding in the use of a mountain bike trail. This trail would link to current trails along the Project.

The Corps also proposes putting in a volunteer host site near the dam. Currently, there is nowhere to place long term volunteers and the addition of a host site would greatly serve the Project and the Information Center.

Expansions or modernizations at the Project Office to include a new conference room have been considered. This room would serve several purposes including hosting meetings and school groups to better present educational materials.

Implementing hydroelectric power capabilities at the Project is another consideration that has received interest. Full consideration will be given to effects on other Project purposes, environmental impacts, and public opinion prior to formulating more detailed plans and recommendations for this request.

7.5 Wildlife Management and Environmentally Sensitive Areas

The Corps land at the Project represents a significantly-sized riparian corridor consisting of valuable wildlife lands. These lands are vulnerable to change by human disturbance. Therefore, large portions of these lands are outgranted to other agencies with the primary purpose of wildlife management and recreation representing a secondary use. At the Project there are large portions of land acreage remaining in an undeveloped natural state (i.e., heavily forested and rich in riverine habitat and wetlands). The Corps will continue to coordinate with resource agency partners to successfully manage

these lands for the use and enjoyment of our visitors and the conservation of our valuable natural resources. In the future, the Corps should develop survey methods to identify sensitive habitats, possibly using MSIM, and use the results to designate additional Environmentally Sensitive Areas, which would be converted from multiple resource managed lands. These lands should be protected from human disturbance and development activities to the extent possible in compliance with all applicable laws and regulations. If development activities are proposed for these areas, the Corps will work with partners to minimize the disturbance or mitigate the impacts. The Corps will also consider proactive steps to enhance natural areas for sensitive species and to restore sensitive habitats through native vegetation plantings, removal of invasive species, and/or other efforts targeted at non-game species habitat. In addition, the Corps will continue to protect cultural resources in existing Environmentally Sensitive Areas and promote education related to these resources.

7.6 Threatened and Endangered Species

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

8. Bibliography

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APPENDIX A

APPLICABLE PUBLIC LAWS, FEDERAL STATUTES, AND EXECUTIVE ORDERS

The following public laws, federal statutes, and executive orders are applicable to the Project.

A.1 PL59-209, Antiquities Act of 1906: The first federal law established to protect what are now known as "cultural resources" on public lands. It provides a permit procedure for investigating "antiquities" and consists of two parts: An act for the Preservation of American Antiquities, and Uniform Rules and Regulations.

A.2 PL74-292, Historic Sites Act of 1935: Declares it to be a national policy to preserve for (in contrast to protecting from) the public, historic (including prehistoric) sites, buildings, and objects of national significance. This act provides both authorization and a directive for the Secretary of the Interior, through the National Park Service, to assume a position of national leadership in the area of protecting, recovering, and interpreting national archeological historic resources. It also establishes an "Advisory Board on National Parks; Historic Sites, Buildings, and Monuments, a committee of eleven experts appointed by the Secretary to recommend policies to the Department of the Interior".

A.3 PL74-409, Rivers and Harbors Act of 1935: This act authorizes the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes.

A.4 PL74-738, Flood Control Act of 1936: This act authorizes the construction of certain public works on rivers and harbors for flood control, and for other purposes.

A.5 PL75-761, Flood Control Act of 1938: This act authorizes the construction of certain public works on rivers and harbors for flood control, and for other purposes.

A.6 PL78-534, Flood Control Act of 1944: Section 4 of the act, as amended, authorizes the Corps to construct, maintain, and operate public parks and recreational facilities in reservoir areas and to grant leases and licenses for lands, including facilities, preferably to federal, state or local governmental agencies.

A.7 PL85-500, Rivers and Harbors Act of 1958: This act authorizes the construction, repair, and preservation of certain public works on rivers and harbors for navigation, flood control, and for other purposes.

A.8 PL85-624, Fish and Wildlife Coordination Act 1934: This act, as amended, sets down the general policy that fish and wildlife conservation shall receive equal consideration with other Project purposes and be coordinated with other features of water resource development programs. Opportunities for improving fish and wildlife resources and adverse effects on these resources shall be examined along with other purposes which might be served by water resources development.

A.9 PL86-645, Rivers and Harbors Act of 1960: This act authorizes the construction, repair, and preservation of certain public works on rivers and harbors for navigation, flood control, and for other purposes.

A.10 PL86-717, Forest Conservation: This act provides for the protection of forest cover for reservoir areas under this jurisdiction of the Secretary of the Army and the Chief of Engineers.

A.11 PL88-578, Land and Water Conservation Fund Act of 1965: This act established a fund from which Congress can make appropriations for outdoor recreation. Section 2(2) makes entrance and user fees at reservoirs possible by deleting the words "without charge" from Section 4 of the 1944 Flood Control Act, as amended.

A.12 PL89-72, Federal Water Project Recreation Act of 1965: This act requires that not less than one-half the separable costs of developing recreational facilities and all operation and maintenance costs at federal reservoir projects shall be borne by a non-federal public body. An OCE/OMB implementation policy made these provisions applicable to projects completed prior to 1965.

A.13 PL89-90, Water Resources Planning Act (1965): This act established the Water Resources Council and gives it the responsibility to encourage the development, conservation, and use of the Nation's water and related land resources on a coordinated and comprehensive basis.

A.14 PL89-272, Solid Waste Disposal Act, as amended: This act authorized a research and development program with respect to solid-waste disposal. It proposes (1) to promote a national research and development program for new and improved methods of proper and economic solid-waste disposal, including studies directed toward the conservation of national resources by reducing the amount of waste and unsalvageable materials and by recovery and utilization of potential resources in solid waste; and (2) to provide technical and financial assistance to state and local governments and interstate agencies in the planning, development, and conduct of solid-waste disposal programs.

A.15 PL89-665, National Historic Preservation Act of 1966: This act provides for: (1) an expanded National Register of significant sites and objects; (2) matching grants to states undertaking historic and archeological resource inventories; and (3) a program of grants-in aid to the National Trust for Historic Preservation; and (4) the establishment of an Advisory Council on Historic Preservation. Section 106 requires that the President's Advisory Council on Historic Preservation have an opportunity to comment on any undertaking which adversely affects properties listed, nominated, or considered important enough to be included on the National Register of Historic Places.

A.16 PL90-483, Rivers and Harbors and Flood Control Act of 1968, Mitigation of Shore Damages: Section 210 restricted collection of entrance fee at Corps lakes and reservoirs to users of highly developed facilities requiring continuous presence of personnel.

A.17 PL91-190, National Environmental Policy Act of 1969 (NEPA): NEPA declared it a national policy to encourage productive and enjoyable harmony between man and his environment, and for other purposes. Specifically, it declared a "continuing policy of the federal Government...to use all practicable means and measures...to foster and promote the general welfare, to create conditions under which man and nature can exist in productive harmony, and fulfill the social,

Appendix A

economic, and other requirements of present and future generations of Americans.” Section 102 authorized and directed that, to the fullest extent possible, the policies, regulations and public law of the United States shall be interpreted and administered in accordance with the policies of the Act.

A.18 PL91-611, Rivers and Harbors and Flood Control Act of 1970: Section 234 provides that persons designated by the Chief of Engineers shall have authority to issue a citation for violations of regulations and rules of the Secretary of the Army, published in the Code of Federal Regulations.

A.19 PL92-463, Federal Advisory Committee Act: The Federal Advisory Committee Act, as amended, is the legal foundation defining how federal advisory committees operate. The law has special emphasis on open meetings, chartering, public involvement, and reporting.

A.20 PL92-500, Federal Water Pollution Control Act Amendments of 1972: The Federal Water Pollution Control Act of 1948 (PL 845, 80th Congress), as amended in 1956, 1961, 1965 and 1970 (PL 91- 224), established the basic tenet of uniform State standards for water quality. PL92-500 strongly affirms the federal interest in this area. “The objective of this act is to restore and maintain the chemical, physical and biological integrity of the Nation’s waters.”

A.21 PL92-516, Federal Environmental Pesticide Control Act of 1972: This act completely revises the Federal Insecticide, Fungicide and Rodenticide Act. It provides for complete regulation of pesticides to include regulation, restrictions on use, actions within a single State, and strengthened enforcement.

A.22 PL93-81, Collection of Fees for Use of Certain Outdoor Recreation Facilities: This act amends Section 4 of the Land and Water Conservation Act of 1965, as amended to require each federal agency to collect special recreation use fees for the use of sites, facilities, equipment, or services furnished at federal expense.

A.23 PL93-251, Water Resources Development Act of 1974: Section 107 of this law establishes a broad federal policy which makes it possible to participate with local governmental entities in the costs of sewage treatment plan installations.

A.24 PL93-291, Archaeological Conservation Act of 1974: The Secretary of the Interior shall coordinate all federal survey and recovery activities authorized under this expansion of the 1960 act. The Federal Construction Agency may transfer up to one percent of project funds to the Secretary with such transferred funds considered non-reimbursable project costs.

A.25 PL93-303, Recreation Use Fees: This act amends Section 4 of the Land and Water Conservation Act of 1965, as amended, to establish less restricted criteria under which federal agencies may charge fees for the use of campgrounds developed and operated at federal areas under their control.

A.26 PL93-523, Safe Drinking Water Act: The act assures that water supply systems serving the public meet minimum national standards for protection of public health. The act (1) authorizes the Environmental Protection Agency to establish federal standards for protection from all harmful contaminants, which standards would be applicable to all public water systems, and (2) establishes a

joint federal-state system for assuring compliance with these standards and for protecting underground sources of drinking water.

A.27 PL94-422, Amendment of the Land and Water Conservation Fund Act of 1965: Expands the role of the Advisory Council. Title 2 - Section 102a amends Section 106 of the Historical Preservation Act of 1966 to say that the Council can comment on activities which will have an adverse effect on sites either included in or eligible for inclusion in the National Register of Historic Places.

A.28 PL98-63, Supplemental Appropriations Act of 1983: The act authorized the Corps of Engineers Volunteer Program. The United States Army Chief of Engineers may accept the services of volunteers and provide for their incidental expenses to carry out any activity of the Army Corps of Engineers except policy making or law or regulatory enforcement.

A.29 PL99-662, The Water Resources Development Act of 1986: Provides for the conservation and development of water and related resources and the improvement and rehabilitation of the Nation's water resources infrastructure.

A.30 PL101-640, Water Resource Development Act of 1990: Provides for the conservation and development of water and related resources and the improvement and rehabilitation of the Nation's water resources infrastructure.

A.31 PL101-646, Coastal Wetlands Planning, Protection, & Restoration Act of 1990: Provides authorization to carry out projects for the protection, restoration, or enhancement of aquatic and associated ecosystems, including projects for the protection, restoration, or creation of wetlands and coastal ecosystems.

A.32 PL100-676, Water Resource Development Act of 1988: Provides for the conservation and development of water and related resources and the improvement and rehabilitation of the Nation's water resources infrastructure.

A.33 PL102-580, Water Resource Development Act of 1992: Provides for the conservation and development of water and related resources and the improvement and rehabilitation of the Nation's water resources infrastructure.

A.34 PL104-303, Water Resource Development Act of 1996: Provides for the conservation and development of water and related resources and the improvement and rehabilitation of the Nation's water resources infrastructure.

A.35 PL106-53, Water Resource Development Act of 1999: Provides for the conservation and development of water and related resources and the improvement and rehabilitation of the Nation's water resources infrastructure.

A.36 PL106-541, Water Resource Development Act of 2000: Provides for the conservation and development of water and related resources and the improvement and rehabilitation of the Nation's water resources infrastructure.

A.37 PL110-114, Water Resource Development Act of 2007: Provides for the conservation and development of water and related resources and the improvement and rehabilitation of the Nation's water resources infrastructure.

A.38 PL113-121, The Water Resources Reform and Development Act of 2014: This act authorizes the U.S. Army Corps of Engineers to carry out missions to develop, maintain, and support the nations vital ports and waterways infrastructure needs and support effective and targeted flood protection and restoration needs.

A.39 30 U.S.C. 22-42, General Mining Act of 1872: Authorizes and governs prospecting and mining for economic minerals, such as gold, platinum, and silver, on federal public lands.

A.40 30 U.S.C. 181, Mineral Leasing Act of 1920, as amended by the Federal Onshore Oil and Gas Leasing Reform Act of 1987: Authorizes and governs leasing of public lands for developing deposits of coal, petroleum, natural gas, and other hydrocarbons, in addition to phosphates, sodium, sulfur, and potassium.

A.41 30 U.S.C. 226, Lease of Oil and Gas Lands: Authorizes the use of public lands for oil and gas exploration and development.

A.42 30 U.S.C. 601-604, Materials Act of 1947: Authorizes the BLM to dispose of mineral materials on federal lands provided that the disposal is not otherwise expressly authorized or prohibited by law, and is not detrimental to the public interest.

A.43 16 U.S.C. 661-664, Fish and Wildlife Coordination Act of 1934, as amended by PL85-624: Provides the basic authority of the U.S. Fish and Wildlife Service to become involved in the evaluation of impacts to fish and wildlife from proposed water resource development projects or when federal actions result in the control or modification of a natural stream or body of water.

A.44 16 U.S.C. 668-668d, Bald and Golden Eagle Protection Act of 1940, as amended: Prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald eagles (*Haliaeetus leucocephalus*) or golden eagles (*Aquila chrysaetos*), including their nests or eggs.

A.45 16 U.S.C. 1531-1544, Endangered Species Act of 1973: Provides for the conservation of species that are endangered or threatened throughout all or a significant portion of their range, and the conservation of the ecosystems on which they depend.

A.46 16 U.S.C. 703-712, Migratory Bird Treaty Act of 1918: Makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to federal regulations.

A.47 AR 405-30, Mineral Exploration and Extraction of (15 July 1984): Governs exploration and extraction of minerals on Department of Army property.

A.48 43 CFR § 3503.20, Available Areas Managed by Others: The Bureau of Land Management will consult with the surface management agency before issuing a permit or lease for public domain lands where the surface is administered by another federal agency.

A.49 43 CFR Part 3160, Onshore Oil and Gas Operations: Gives the Bureau of Land Management authority to issue permits or leases on public lands for the purposes of exploration, extraction, or removal of oil or gas.

A.50 CFR, Title 36, Parks, Forests and Public Property, Chapter III: Principle set of rules and regulations issued by the U.S. Army Corps of Engineers regarding public use of water resource development projects.

A.51 Executive Order (EO) 13112, Invasive Species (FR: 03 Feb 1999), as amended by EO 13751, Safeguarding the Nation From the Impacts of Invasive Species (FR: 08 Dec 2016): Executive order to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.

APPENDIX B

MAP PLATES

Maps are for graphical purposes only. They do not represent a legal survey. While every effort has been made to ensure that this data is accurate and reliable within the limits of the current state of the art technology, the Corps cannot assume liability for any damages caused by any errors or omissions in the data, nor as a result of the failure of the data to function on a particular system. The Corps makes no warranty, expressed or implied, nor does the fact of distribution constitute such a warranty.



US Army Corps of Engineers
Pittsburgh District

Tygart Lake Plate 1

Watersheds at Project

Legend

County Seat

Population (2010)

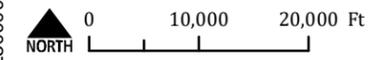
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- 5k - 10k
- 10k - 100k
- 100k +

Other Cities

Population (2010)

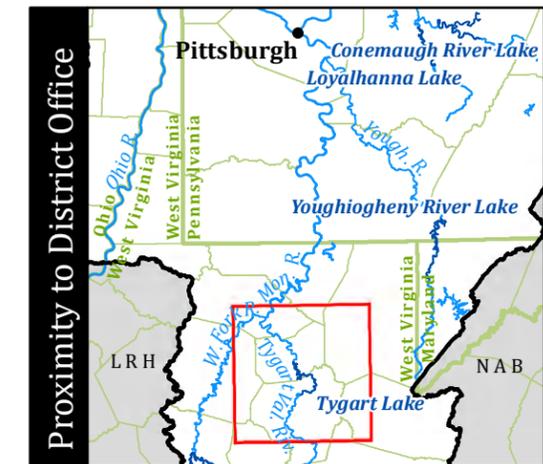
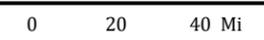
- 1k - 5k
- 5k - 10k
- 10k - 100k
- 100k +

- Tygart Lake (Average Water Elevation, USGS National Hydrography Dataset)
- Inundation Area (USGS National Hydrography Dataset)
- HUC12 within Lower Tygart Valley River, Sandy Creek, Three Fork Creek
- HUC10 within Lower Tygart Valley River
- HUC8 within Monongahela
- Reservoir Drainage Basin
- County

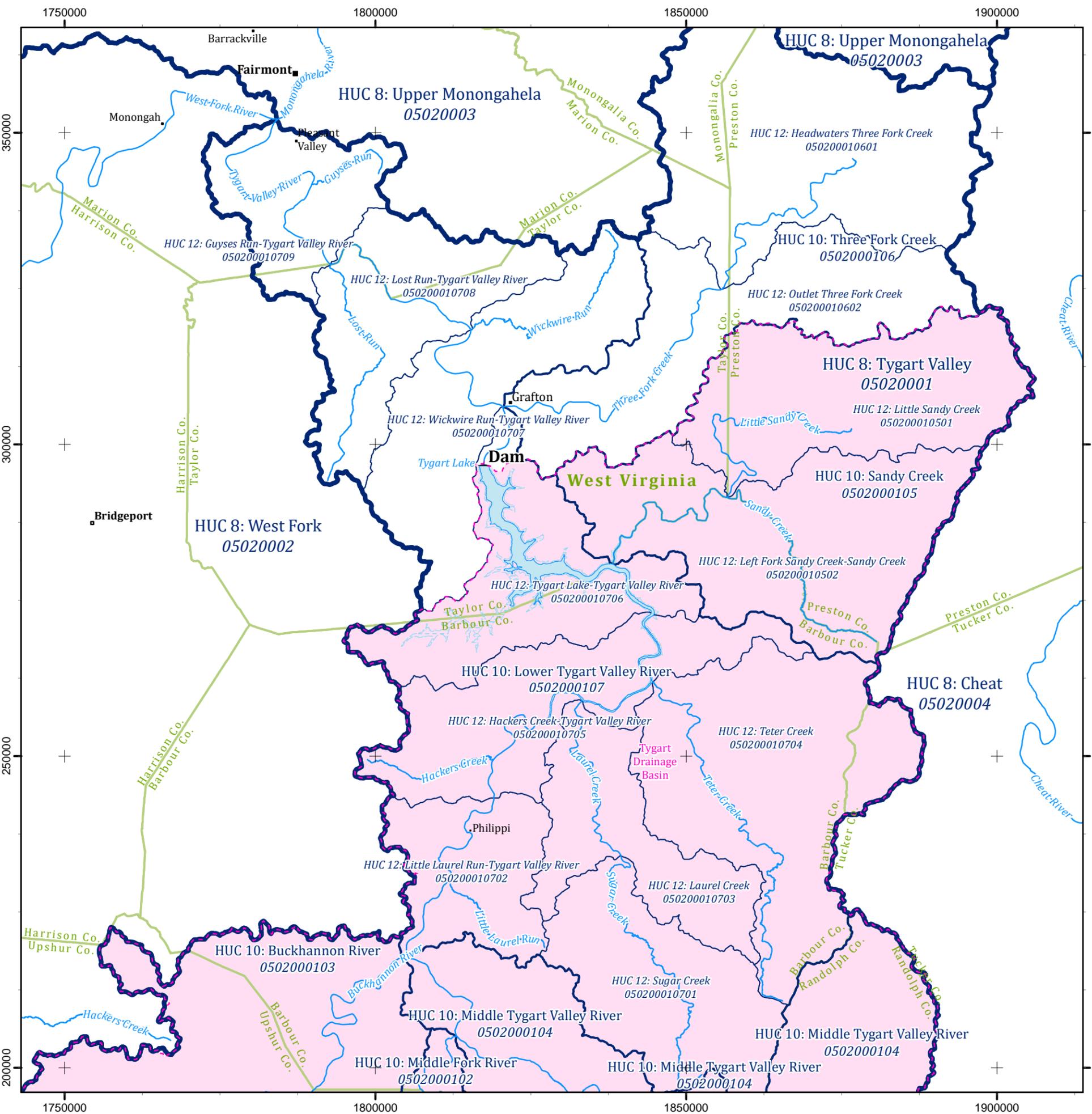


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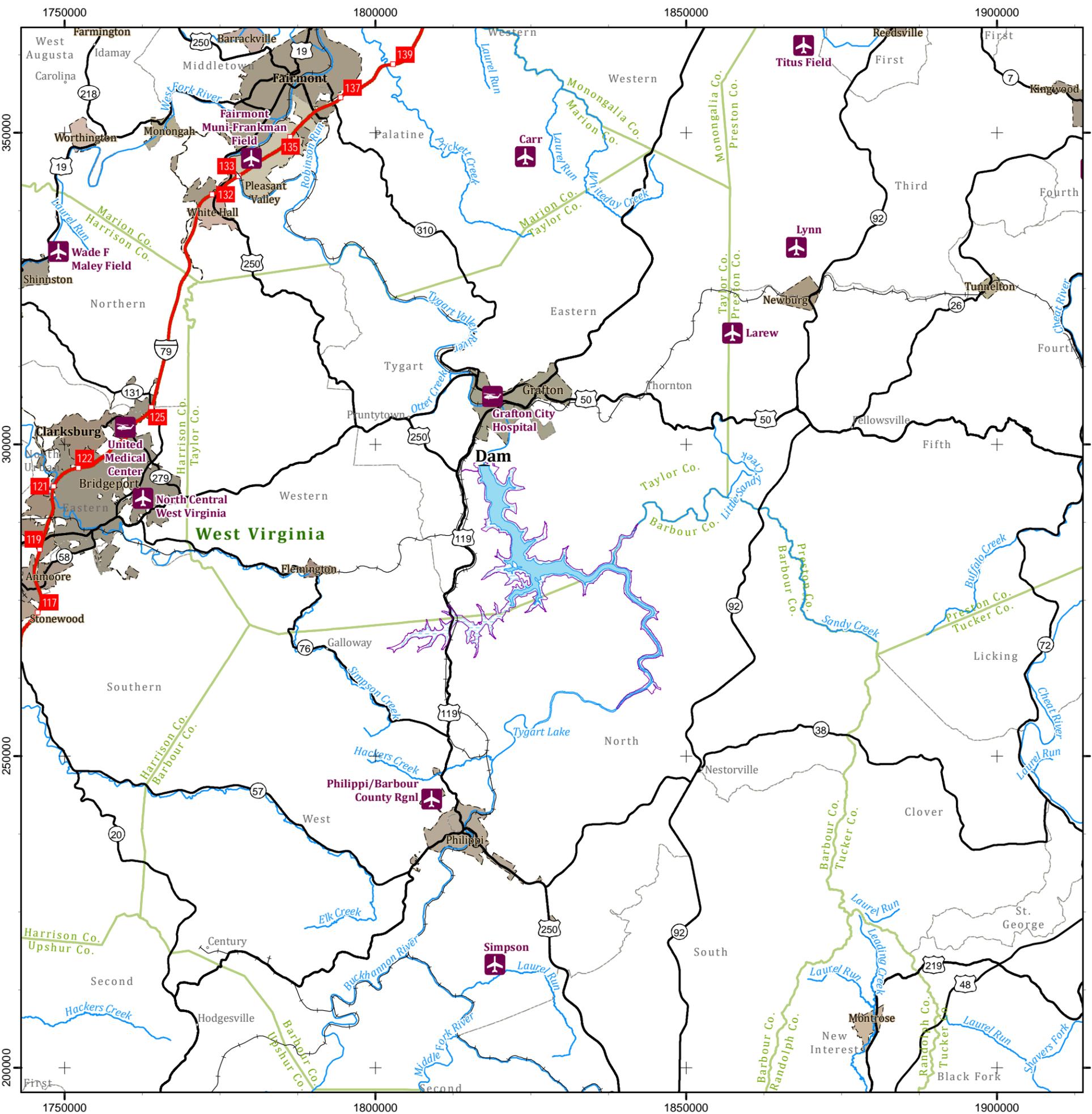
Coordinate System: NAD 1983 2011 StatePlane West Virginia North FIPS 4701 FtUS. Projection: Lambert Conformal Conic



Proximity to District Office



Data Sources: USACE,
USGS National Hydrography Dataset (NHD)
Map Date: 18 June 2019
USACE Pittsburgh Geospatial, 412-395-7553



US Army Corps of Engineers
Pittsburgh District

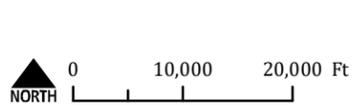
Tygart Lake

Plate 2

Project Overview and Transportation Corridors

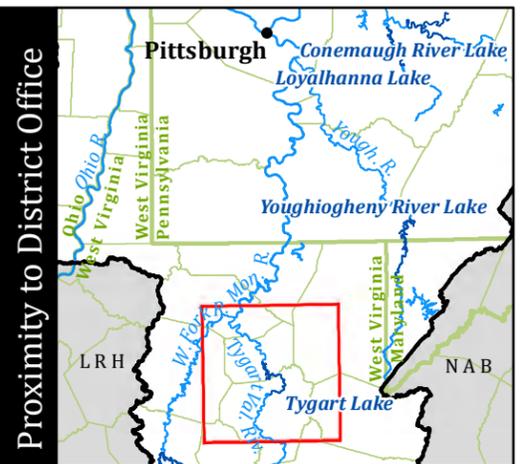
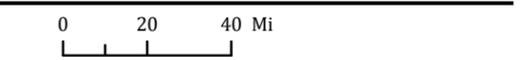
Legend

- Airport
- Heliport
- Interstate Exit
- Interstate
- US Hwy
- State Hwy
- Railroad
- Tygart Lake (Average Water Elevation, USGS National Hydrography Dataset)
- Inundation Area (USGS National Hydrography Dataset)
- Incorporated Area
- Unincorporated Area
- Other Populated Place (Unincorporated)
- County
- Tygart Fee, Easement, and Navigational Servitude Lands



Data Sources: USACE, USGS, USDOT BTS, State of West Virginia
Map Date: 18 June 2019
USACE Pittsburgh Geospatial, 412-395-7553

Coordinate System: NAD 1983 2011 StatePlane West Virginia North FIPS 4701 FtUS. Projection: Lambert Conformal Conic





US Army Corps of Engineers
Pittsburgh District

Tygart Lake

Plate 3

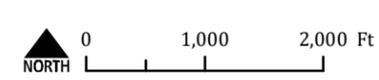
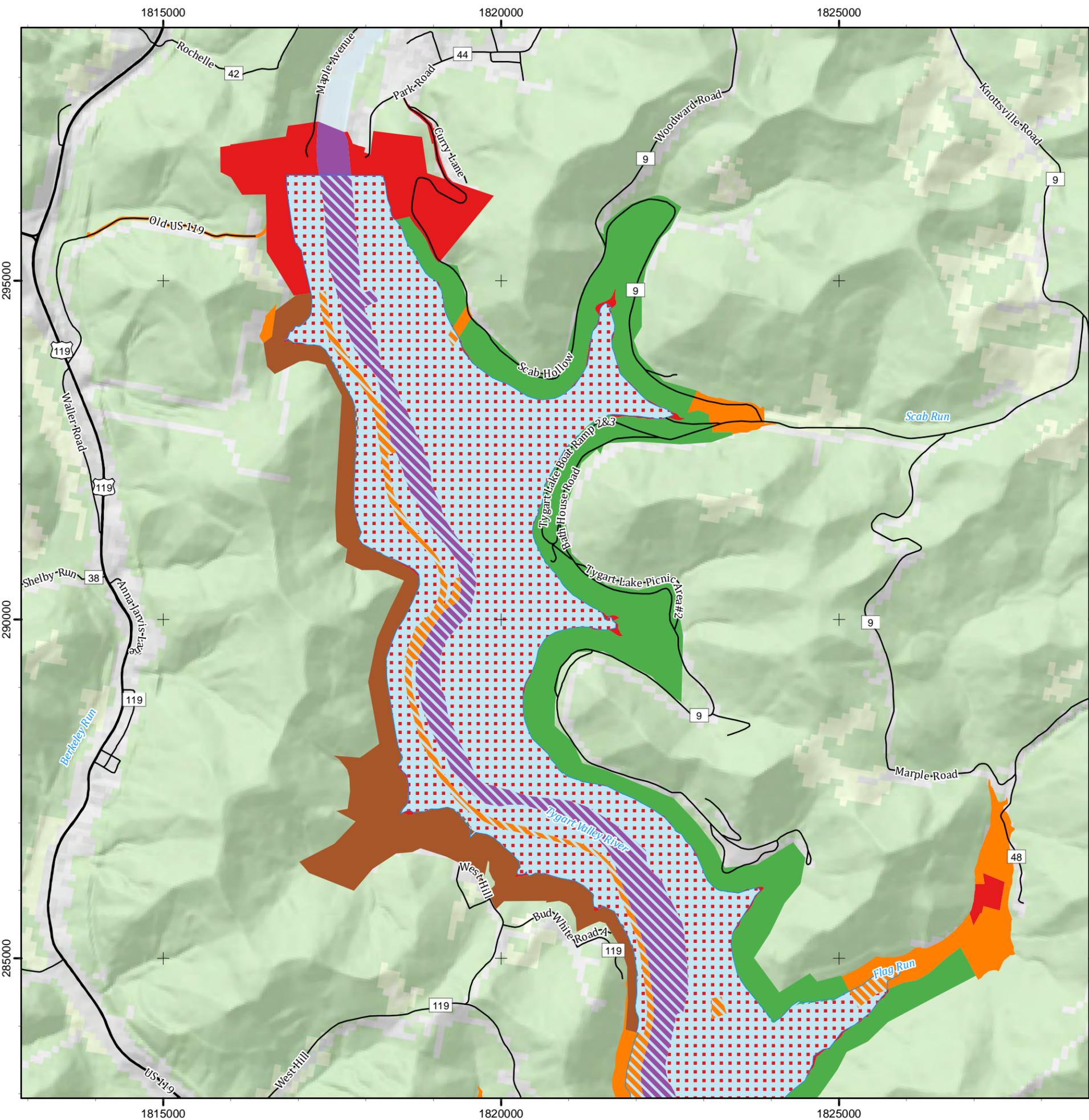
Boundaries

Sheet 1 of 3

Legend

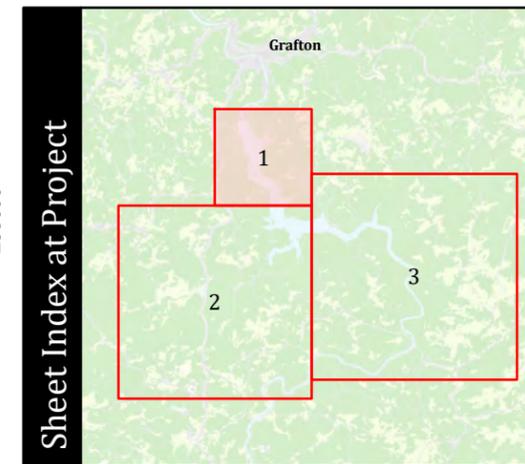
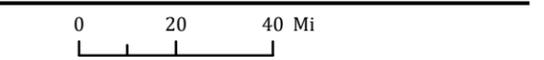
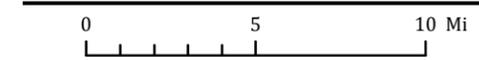
Ownership & Management vs Tygart Lake

- Fee
- Fee (Tygart Lake)
- Easement
- Easement (Tygart Lake)
- Fee (Outgrant, WV DNR Wildlife)
- Fee (Outgrant, WV DNR Wildlife) (Tygart Lake)
- Fee (Outgrant, WV DNR Parks)
- Fee (Outgrant, WV DNR Parks) (Tygart Lake)
- Navigational Servitude
- Navigational Servitude (Tygart Lake)
- Tygart Lake
- Interstate
- US Hwy
- State Hwy
- County Hwy
- Other



Data Sources: USACE, USGS, WVDOT
Map Date: 2 August 2019
USACE Pittsburgh Geospatial, 412-395-7553

Coordinate System: NAD 1983 2011 StatePlane West Virginia North FIPS 4701 FtUS. Projection: Lambert Conformal Conic





US Army Corps of Engineers
Pittsburgh District

Tygart Lake

Plate 3

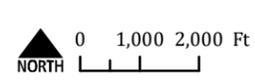
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Sheet 2 of 3

Legend

Ownership & Management vs Tygart Lake

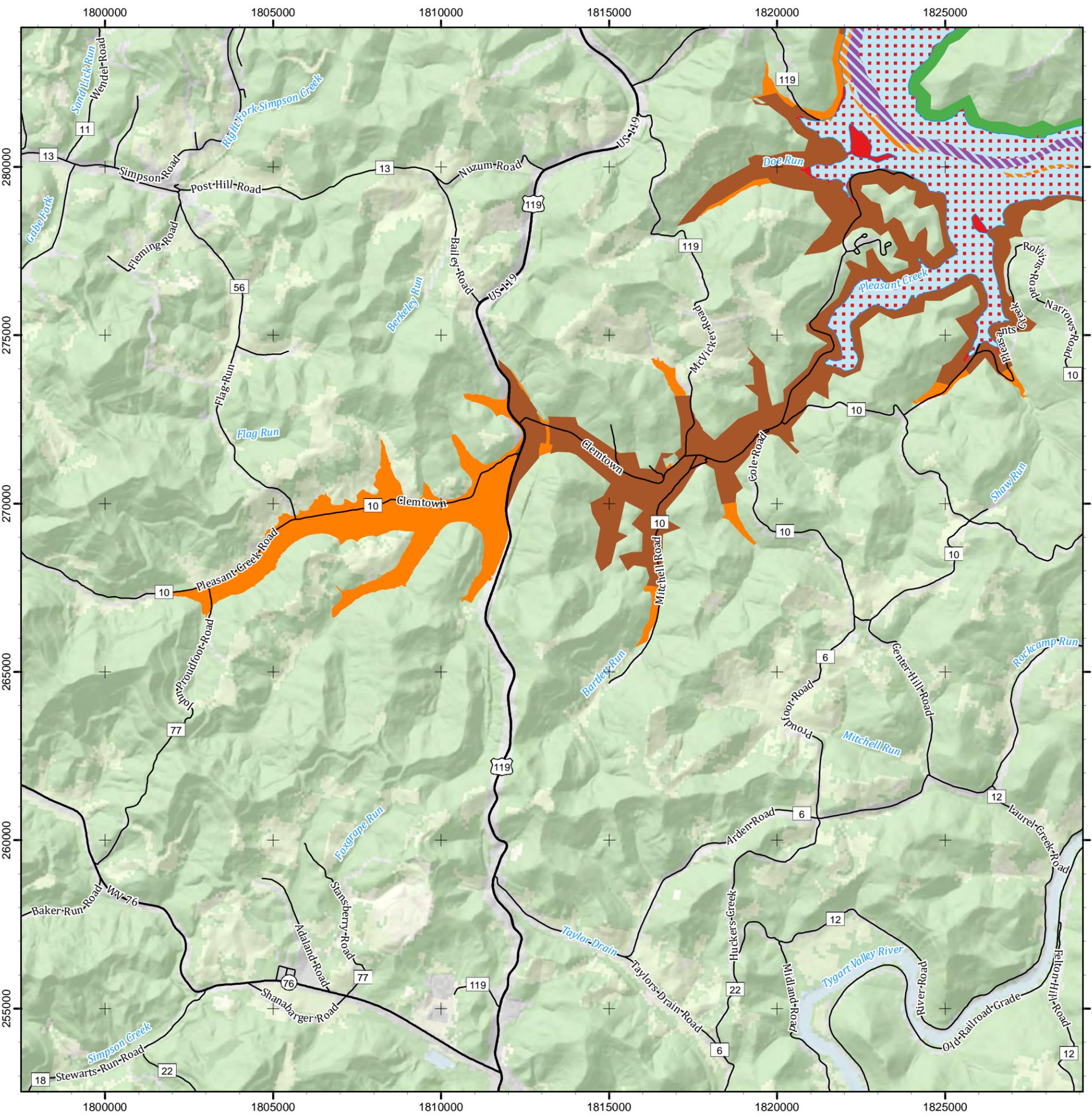
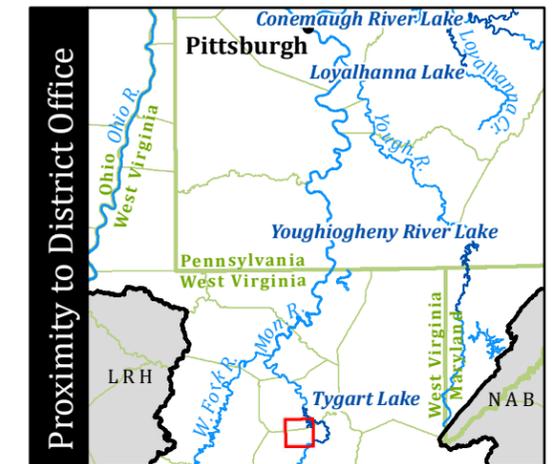
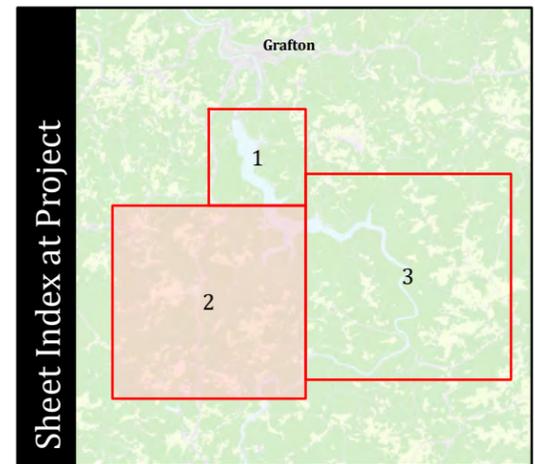
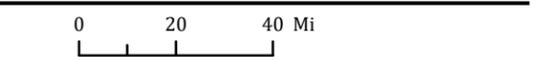
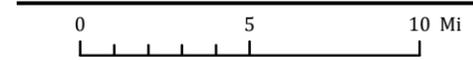
- Fee
- Fee (Tygart Lake)
- Easement
- Easement (Tygart Lake)
- Fee (Outgrant, WV DNR Wildlife)
- Fee (Outgrant, WV DNR Wildlife) (Tygart Lake)
- Fee (Outgrant, WV DNR Parks)
- Fee (Outgrant, WV DNR Parks) (Tygart Lake)
- Navigational Servitude
- Navigational Servitude (Tygart Lake)
- Tygart Lake
- Interstate
- US Hwy
- State Hwy
- County Hwy
- Other

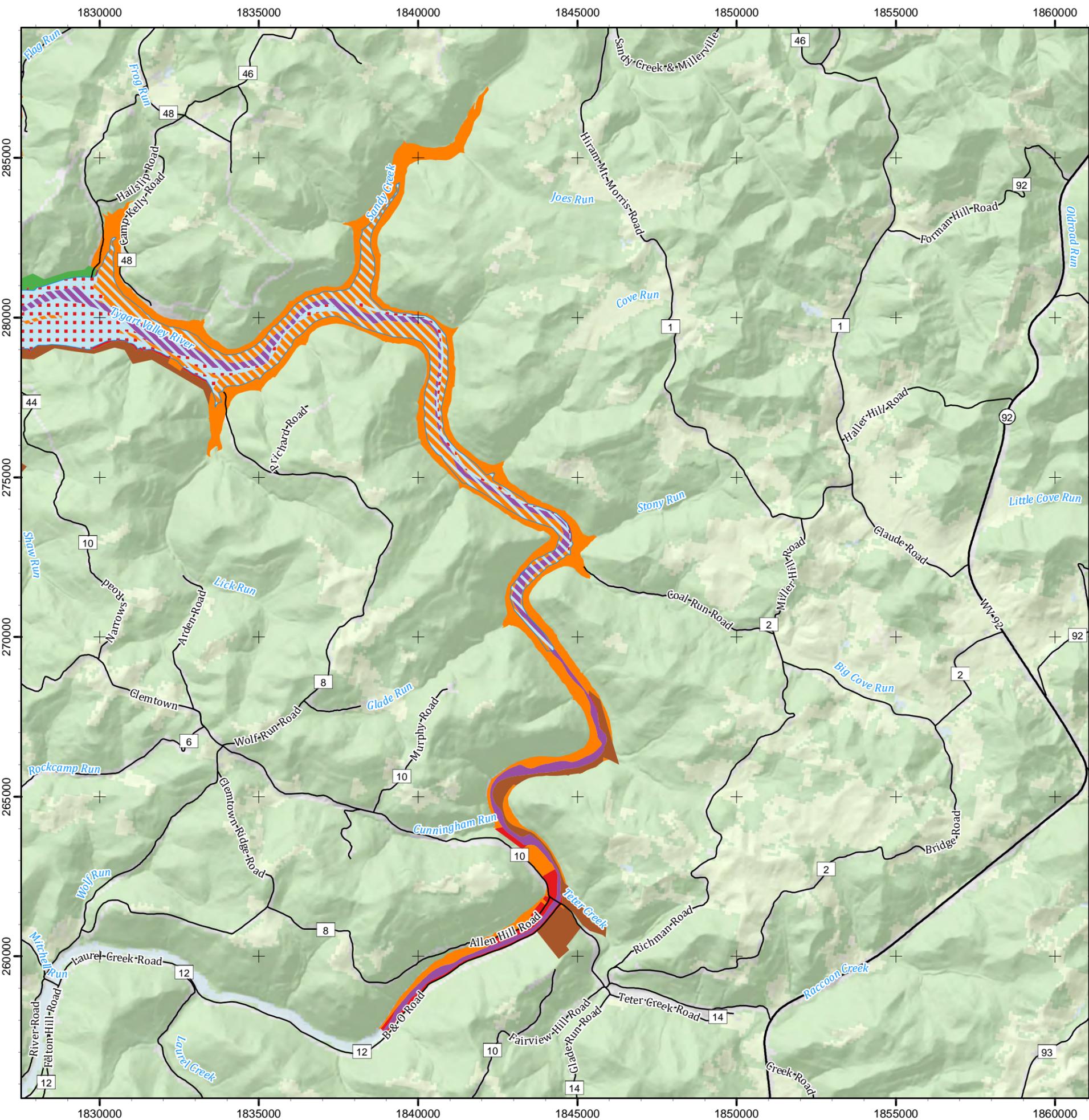


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Coordinate System: NAD 1983 2011 StatePlane West Virginia North FIPS 4701 FtUS. Projection: Lambert Conformal Conic





US Army Corps of Engineers
Pittsburgh District

Tygart Lake

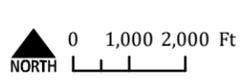
Plate 3

Boundaries

Sheet 3 of 3

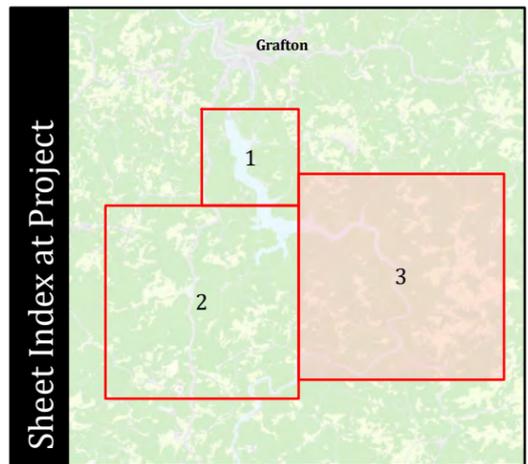
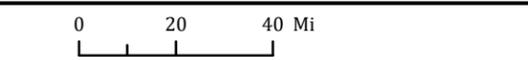
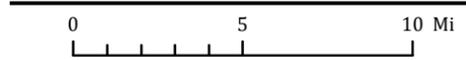
Legend

- Ownership & Management vs Tygart Lake**
- Fee
 - Fee (Tygart Lake)
 - Easement
 - Easement (Tygart Lake)
 - Fee (Outgrant, WV DNR Wildlife)
 - Fee (Outgrant, WV DNR Wildlife) (Tygart Lake)
 - Fee (Outgrant, WV DNR Parks)
 - Fee (Outgrant, WV DNR Parks) (Tygart Lake)
 - Navigational Servitude
 - Navigational Servitude (Tygart Lake)
- Tygart Lake
- Interstate
 - US Hwy
 - State Hwy
 - County Hwy
 - Other



Data Sources: USACE, USGS, WVDOT
Map Date: 2 August 2019
USACE Pittsburgh Geospatial, 412-395-7553

Coordinate System: NAD 1983 2011 StatePlane West Virginia North FIPS 4701 FtUS. Projection: Lambert Conformal Conic





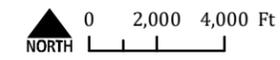
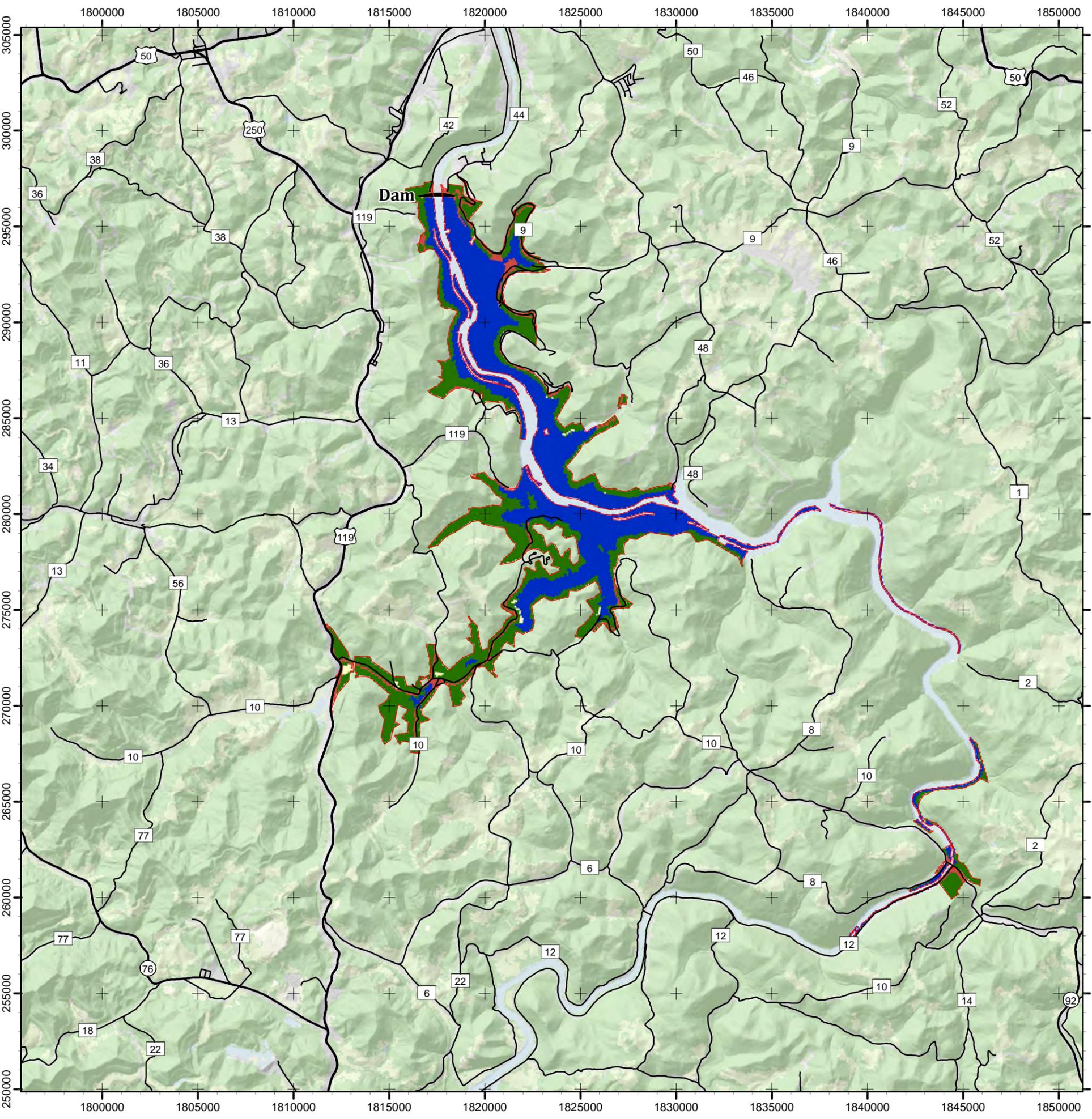
Tygart Lake

US Army Corps of Engineers
Pittsburgh District

Plate 4 National Vegetation Classification

Legend

- Fee Boundary
- NVC Class**
 - Agricultural Vegetation
 - Developed & Other Human Use
 - Forest & Woodland
 - Open Water
 - Shrubland & Grassland
- Road Type**
 - Interstate
 - US Hwy
 - State Hwy
 - County Hwy
 - Other



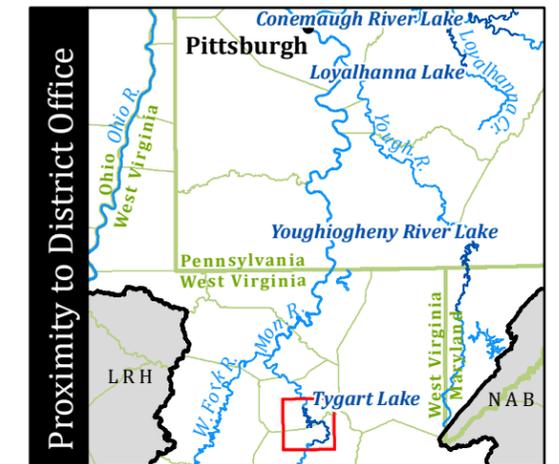
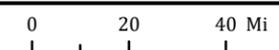
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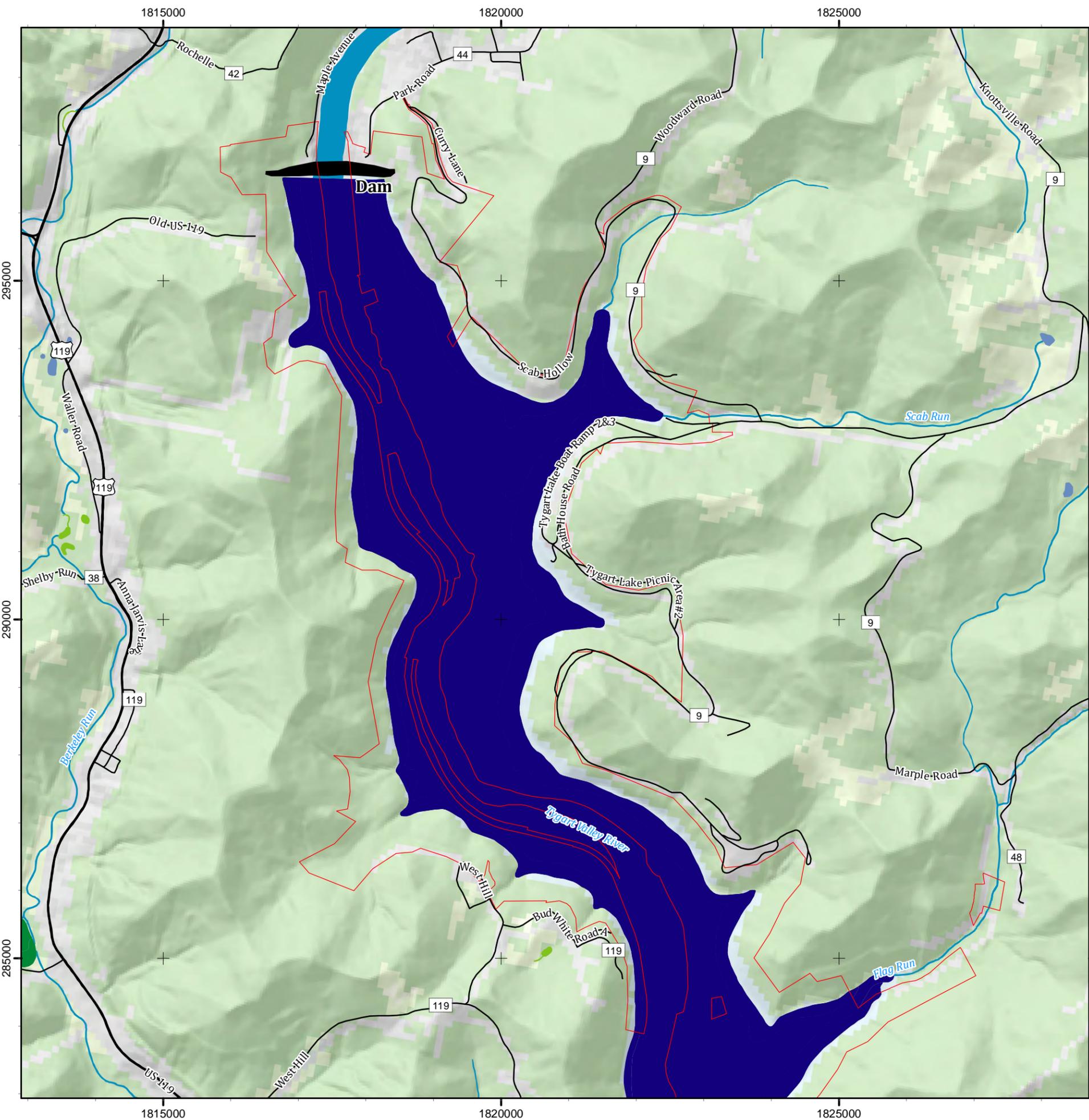
Data Sources: USACE, USGS,
USGS National Vegetation Classification
GAP Analysis Program
Map Date: 19 June 2019
USACE Pittsburgh Geospatial, 412-395-7553

Coordinate System: NAD 1983 2011 StatePlane West Virginia North FIPS 4701 FtUS. Projection: Lambert Conformal Conic

National Vegetation Classification	Acres*
Agricultural Vegetation	15.6
Developed & Other Human Use	174.6
Forest & Woodland	1148.1
Open Water	1390.1
Shrubland & Grassland	1.6
Total	2730

*Acres within fee boundary, rounded to 1/10 acre.
Source data is raster at 30-meter resolution.





US Army Corps of Engineers
Pittsburgh District

Tygart Lake

Plate 5

Wetlands

Sheet 1 of 3

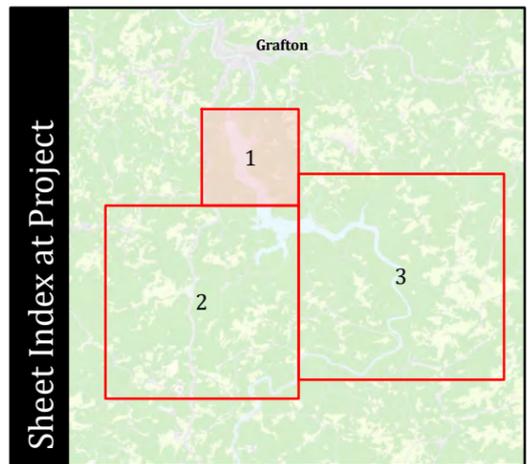
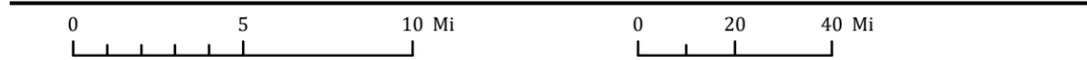
Legend

- Fee Boundary
 - Interstate
 - US Hwy
 - State Hwy
 - County Hwy
 - Other
- Wetland Type**
- Estuarine and Marine Deepwater
 - Estuarine and Marine Wetland
 - Freshwater Emergent Wetland
 - Freshwater Forested/Shrub Wetland
 - Freshwater Pond
 - Lake
 - Other Freshwater Wetland
 - Riverine

Wetland Type and Class	Code	Acres*	Description	
Lake (Lacustrine) (1146.7 acres total)	L1UBHh	812.7	Limnetic, Permanently Flooded, Diked/Impounded	
	L2USAh	296.8	Littoral, Temporary Flooded, Diked/Impounded	
	L2USCh	37.1	Littoral, Seasonally Flooded, Diked/Impounded	
Freshwater Emergent Wetland (Palustrine) (23.7 acres total)	PEM1/SS1E	4.3	Persistent, Scrub-Shrub, Broad-Leaved Deciduous, Beaver	
	PEM1/SS1Eb	0.6	Seasonally Flooded/Saturated	
	PEM1C	15.8	Persistent, Seasonally Flooded	
	PEM1Ch	1	Persistent, Seasonally Flooded, Diked/Impounded	
	PEM2Fh	2	Non persistent, Semipermanently Flooded, Diked/Impounded	
Freshwater Forested /Shrub Wetland (Palustrine) (37.7 acres total)	PF01/SS1C	7.2	Broad-Leaved Deciduous	Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded
	PF01A	4.8		Temporary Flooded
	PSS1/EM1C	16.9	Deciduous	Emergent, Persistent, Seasonally Flooded
	PSS1/EM1Eb	1.7		Emergent, Persistent, Seasonally Flooded/Saturated, Beaver
	PSS1Eb	7.1		Deciduous, Seasonally Flooded/Saturated, Beaver
Freshwater Pond (Palustrine)	PUBFb	2.9	Semipermanently Flooded, Beaver	
Riverine (Riverine) (41.3 acres total)	R3UBH	21.6	Upper Perennial, Permanently Flooded	
	R3USA	2.5	Upper Perennial, Temporary Flooded	
	R4SBC	4.5	Intermittent, Seasonally Flooded	
	R5UBH	12.7	Unknown Perennial, Permanently Flooded	
	Total		1252.2	<i>*Acres within fee boundary, rounded to 1/10 acre.</i>

Data Sources: USACE, USGS National Wetlands Inventory (NWI) US Fish & Wildlife Service (USFWS)
Map Date: 2 August 2019
USACE Pittsburgh Geospatial, 412-395-7553

Coordinate System: NAD 1983 2011 StatePlane West Virginia North FIPS 4701 FtUS. Projection: Lambert Conformal Conic





US Army Corps of Engineers
Pittsburgh District

Tygart Lake

Plate 5

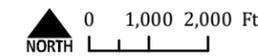
Wetlands

Sheet 2 of 3

Legend

- Fee Boundary
 - Interstate
 - US Hwy
 - State Hwy
 - County Hwy
 - Other
- Wetland Type**
- Estuarine and Marine Deepwater
 - Estuarine and Marine Wetland
 - Freshwater Emergent Wetland
 - Freshwater Forested/Shrub Wetland
 - Freshwater Pond
 - Lake
 - Other Freshwater Wetland
 - Riverine

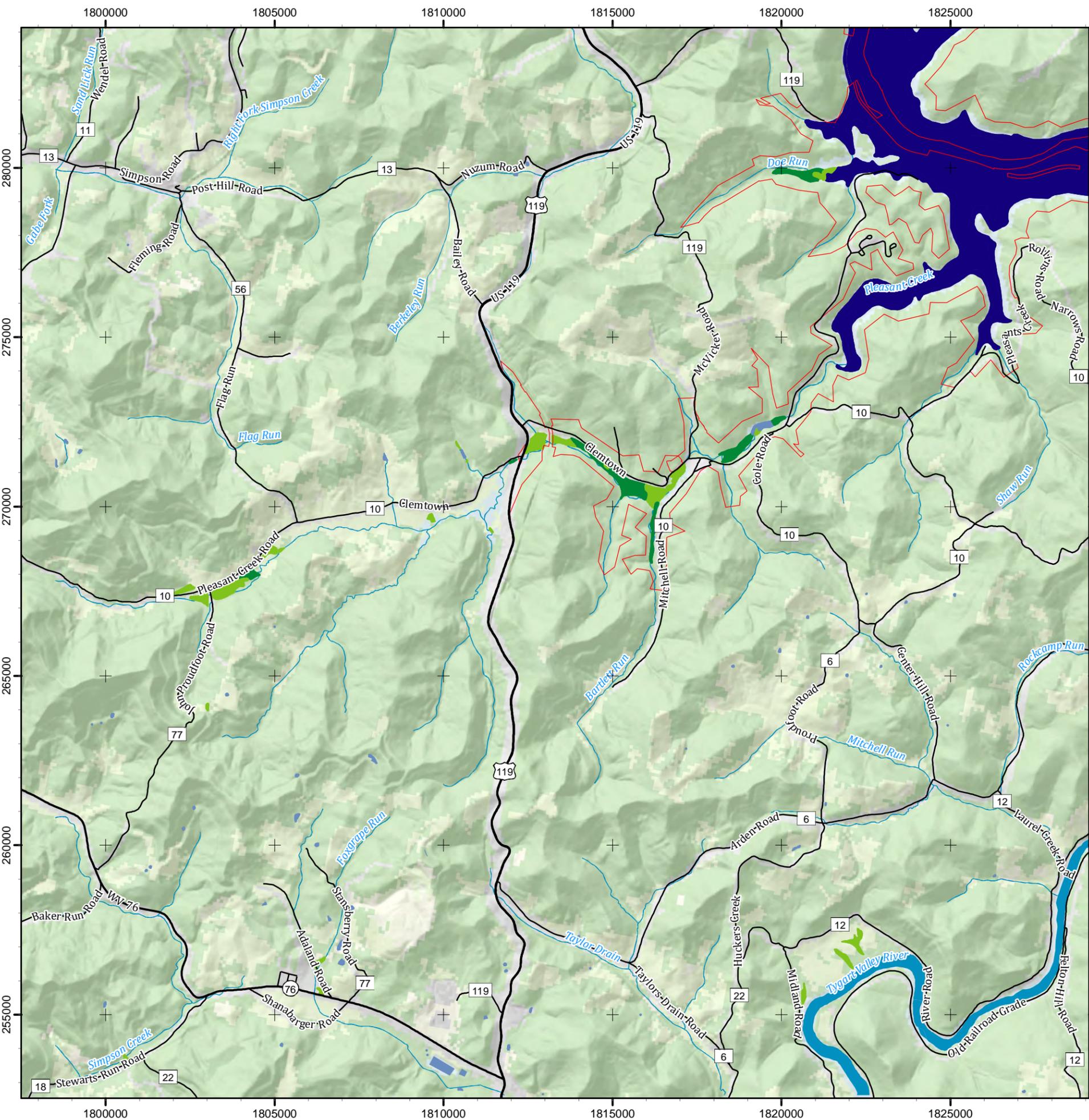
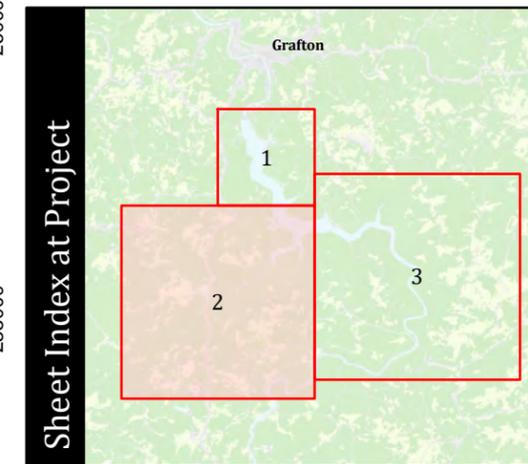
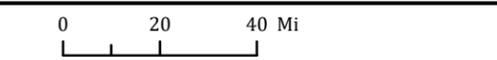
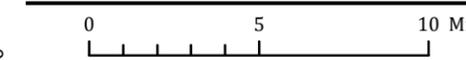
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Freshwater Forested /Shrub Wetland (Palustrine) (37.7 acres total)	PFO1/SS1C	7.2	Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded	
	PF01A	4.8		Temporary Flooded
	PSS1/EM1C	16.9	Broad-Leaved Deciduous	
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1:37,000

Data Sources: USACE, USGS
National Wetlands Inventory (NWI)
US Fish & Wildlife Service (USFWS)
Map Date: 2 August 2019
USACE Pittsburgh Geospatial, 412-395-7553

Coordinate System: NAD 1983 2011 StatePlane West Virginia North FIPS 4701 FtUS. Projection: Lambert Conformal Conic





US Army Corps of Engineers
Pittsburgh District

Tygart Lake

Plate 5

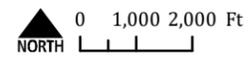
Wetlands

Sheet 3 of 3

Legend

- Fee Boundary
 - Interstate
 - US Hwy
 - State Hwy
 - County Hwy
 - Other
- Wetland Type**
- Estuarine and Marine Deepwater
 - Estuarine and Marine Wetland
 - Freshwater Emergent Wetland
 - Freshwater Forested/Shrub Wetland
 - Freshwater Pond
 - Lake
 - Other Freshwater Wetland
 - Riverine

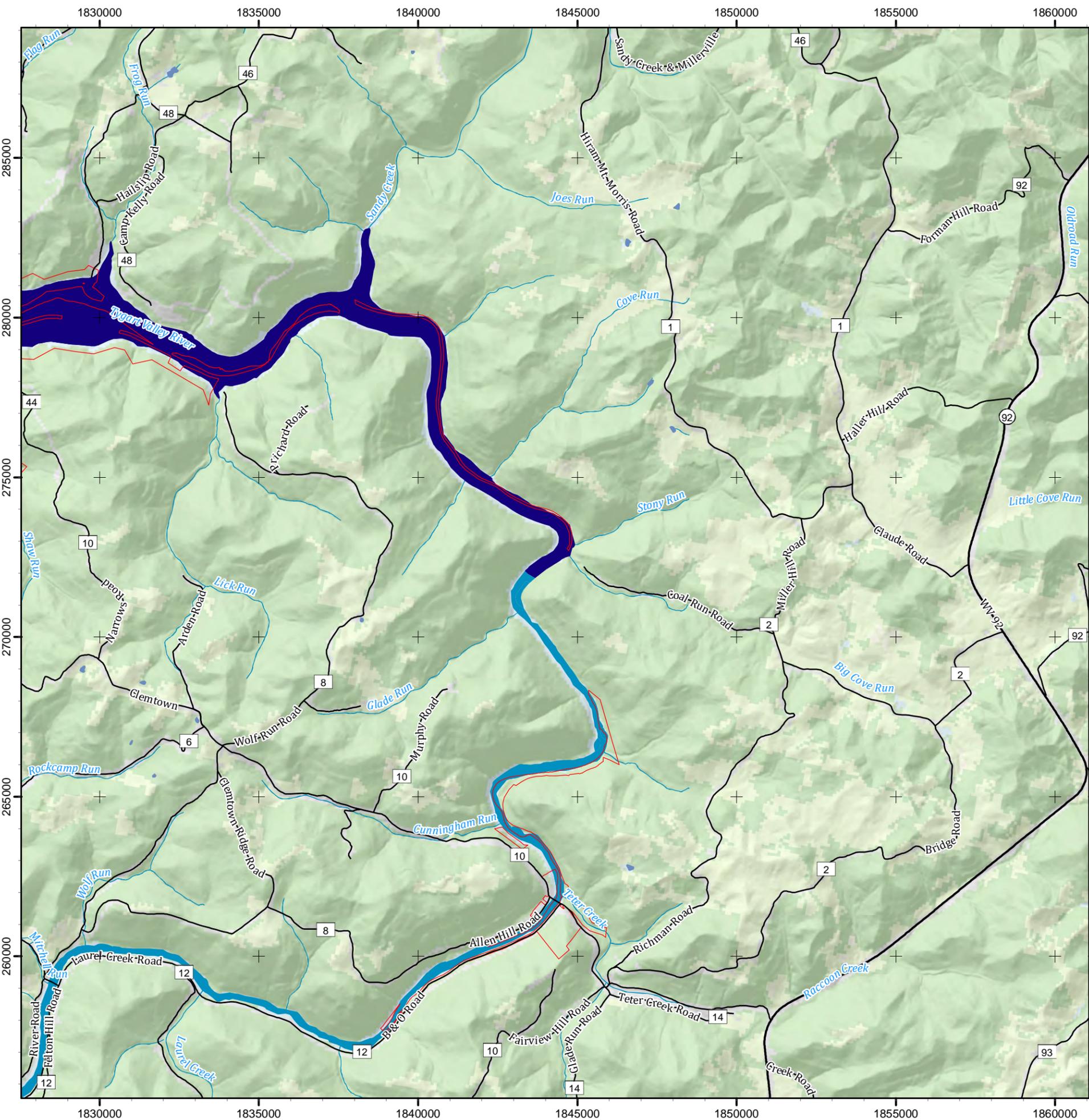
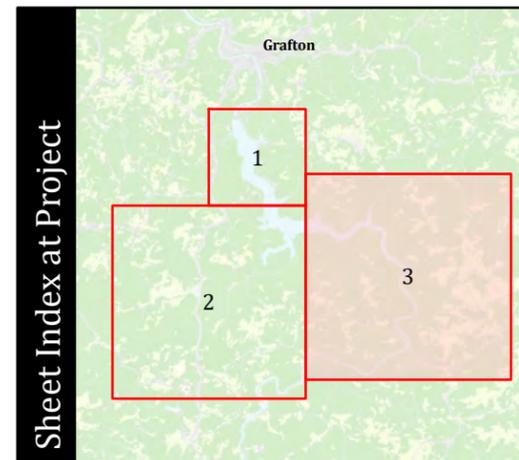
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	R5UBH	12.7	Unknown Perennial, Permanently Flooded	
	Total		1252.2	<i>*Acres within fee boundary, rounded to 1/10 acre.</i>



1:39,250

Data Sources: USACE, USGS
National Wetlands Inventory (NWI)
US Fish & Wildlife Service (USFWS)
Map Date: 2 August 2019
USACE Pittsburgh Geospatial, 412-395-7553

Coordinate System: NAD 1983 2011 StatePlane West Virginia North FIPS 4701 FtUS. Projection: Lambert Conformal Conic





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Pittsburgh District

Tygart Lake

Plate 6

Land Use Classification

Sheet 1 of 3

Legend

Land Use Classification

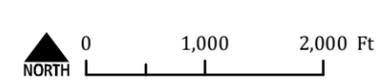
- Project Operations
- High Density Recreation
- Environmentally Sensitive Areas
- Multiple Resource: Low Density Recreation
- Multiple Resource: Wildlife Management

Tygart Lake

- Interstate
- US Hwy
- State Hwy
- County Hwy
- Other

Land Use Classification	Acres*
Project Operations	50.3
High Density Recreation	69.8
Environmentally Sensitive Areas	101.5
Multiple Resource: Low Density Recreation	290
Multiple Resource: Wildlife Management	1024.7
Total	1536.3

*Acres within fee boundary, rounded to 1/10 acre.



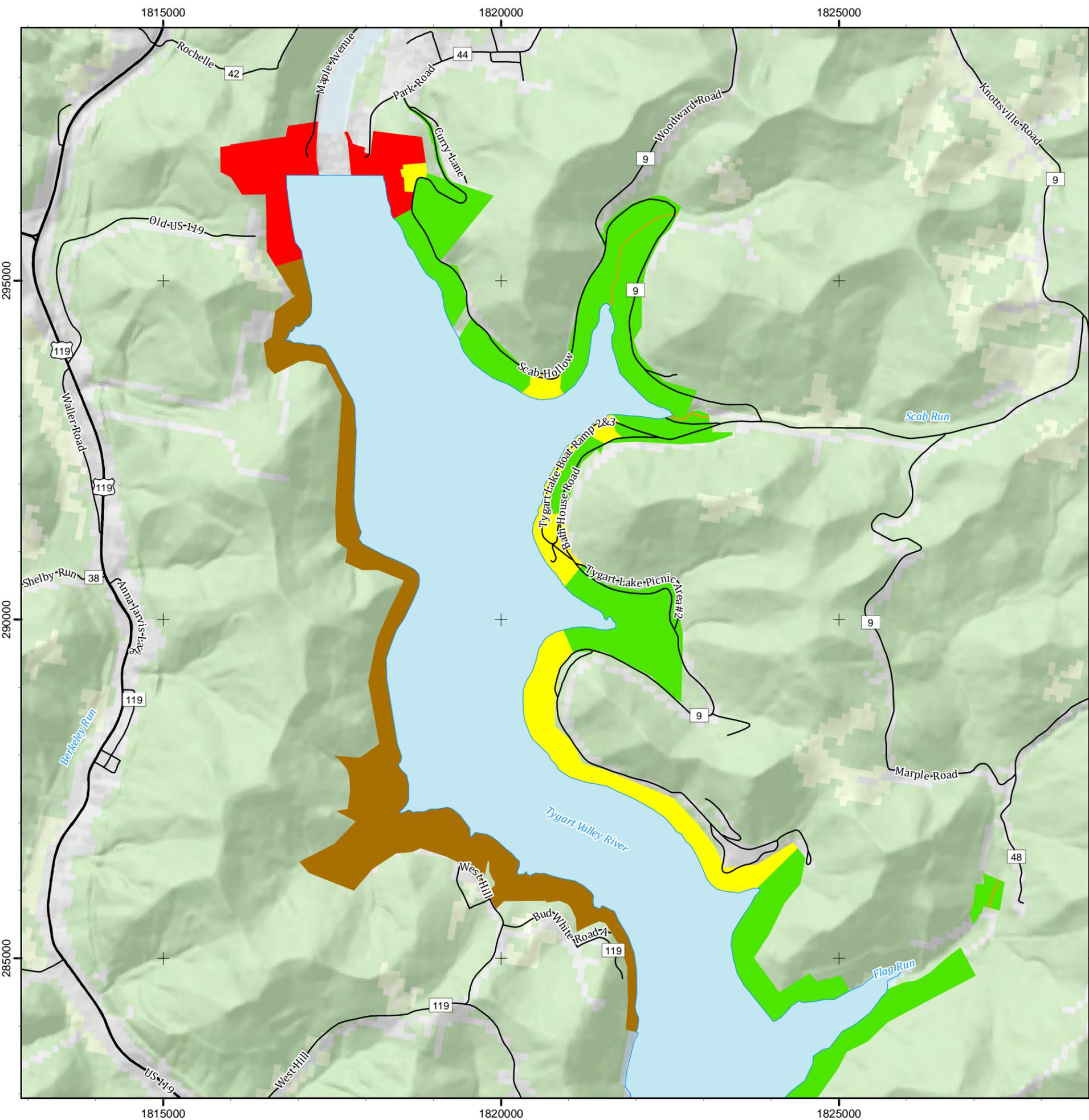
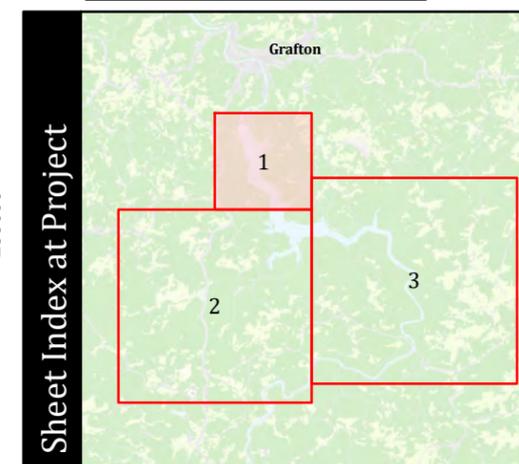
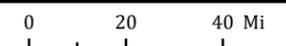
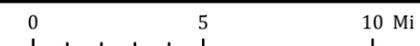
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Data Sources: USACE, USGS, WVDOT

Map Date: 2 August 2019

USACE Pittsburgh Geospatial, 412-395-7553

Coordinate System: NAD 1983 2011 StatePlane West Virginia North FIPS 4701 FtUS. Projection: Lambert Conformal Conic





US Army Corps of Engineers
Pittsburgh District

Tygart Lake

Plate 6

Land Use Classification

Sheet 2 of 3

Legend

Land Use Classification

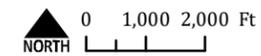
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- High Density Recreation
- Environmentally Sensitive Areas
- Multiple Resource: Low Density Recreation
- Multiple Resource: Wildlife Management

■ Tygart Lake

- Interstate
- US Hwy
- State Hwy
- County Hwy
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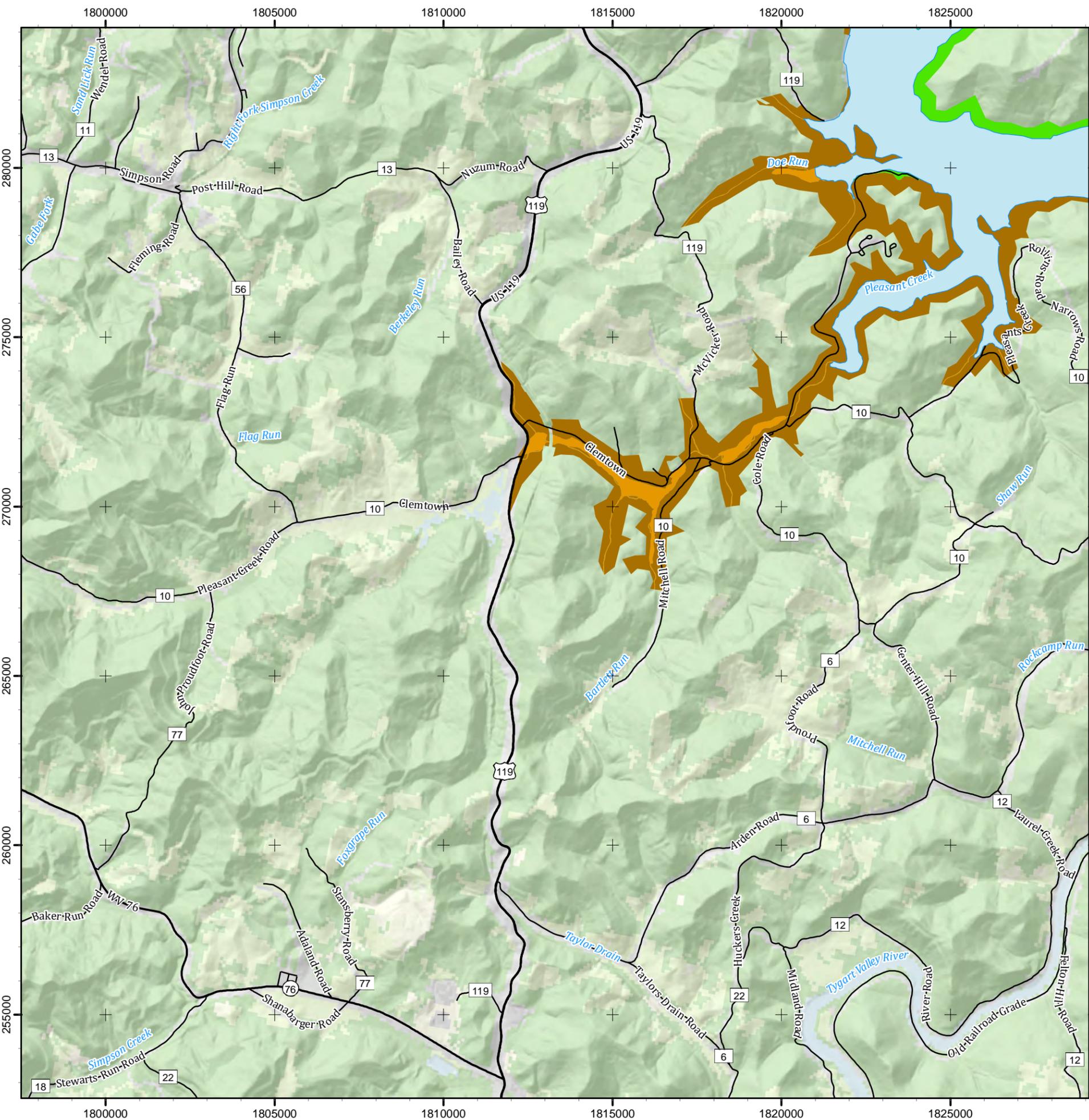
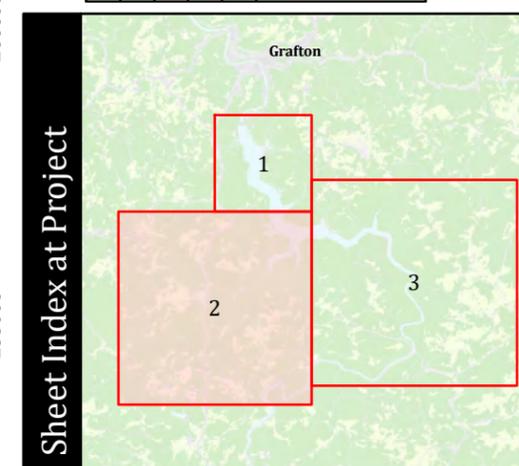
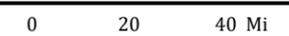
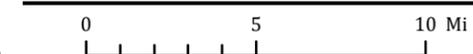
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Data Sources: USACE, USGS, WVDOT

Map Date: 2 August 2019

USACE Pittsburgh Geospatial, 412-395-7553

Coordinate System: NAD 1983 2011 StatePlane West Virginia North FIPS 4701 FtUS. Projection: Lambert Conformal Conic





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Pittsburgh District

Tygart Lake

Plate 6

Land Use Classification

Sheet 3 of 3

Legend

Land Use Classification

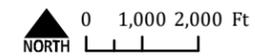
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- High Density Recreation
- Environmentally Sensitive Areas
- Multiple Resource: Low Density Recreation
- Multiple Resource: Wildlife Management

Tygart Lake

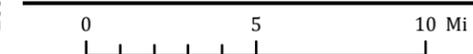
- Interstate
- US Hwy
- State Hwy
- County Hwy
- Other

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Coordinate System: NAD 1983 2011 StatePlane West Virginia North FIPS 4701 FtUS. Projection: Lambert Conformal Conic

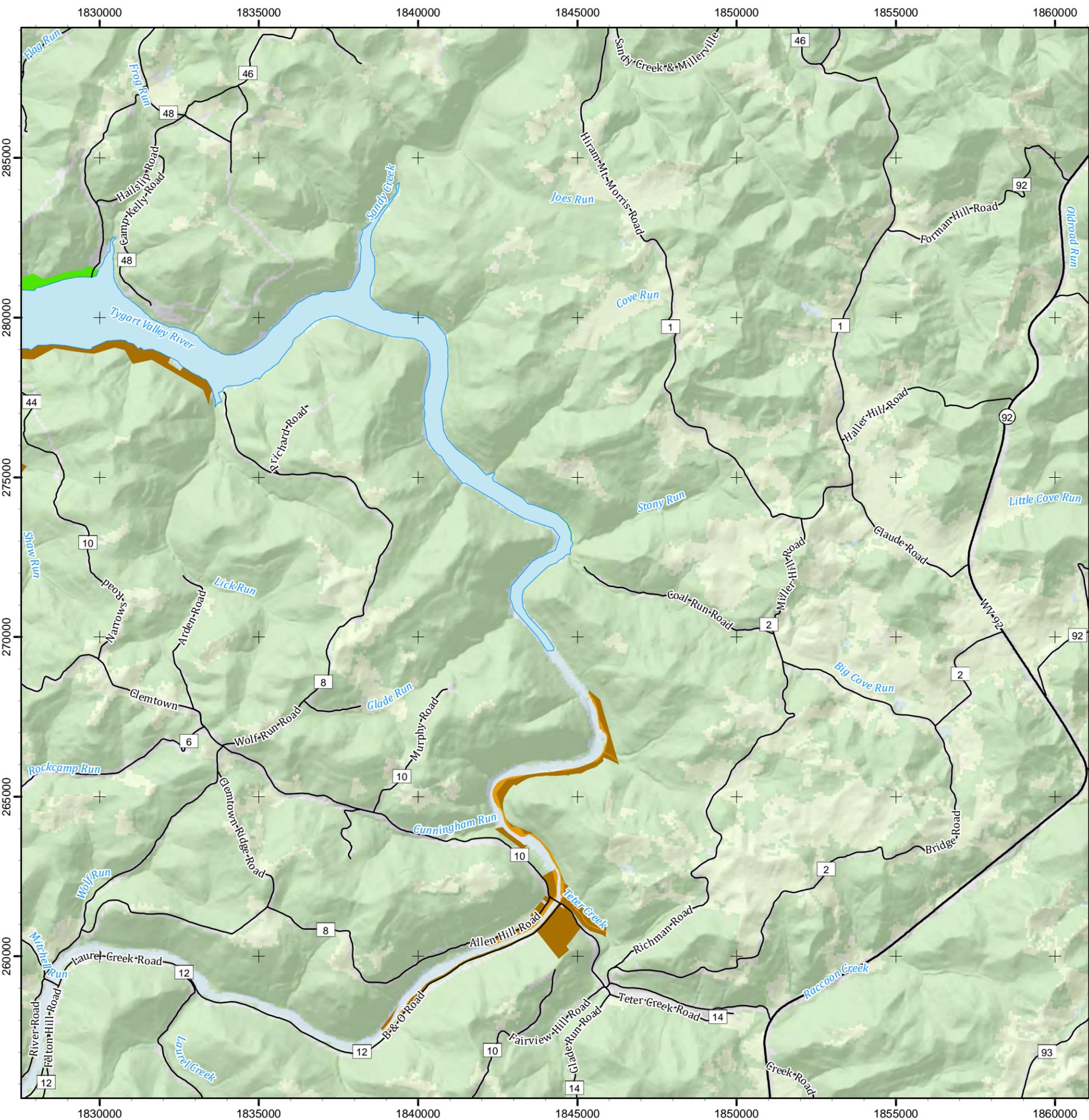
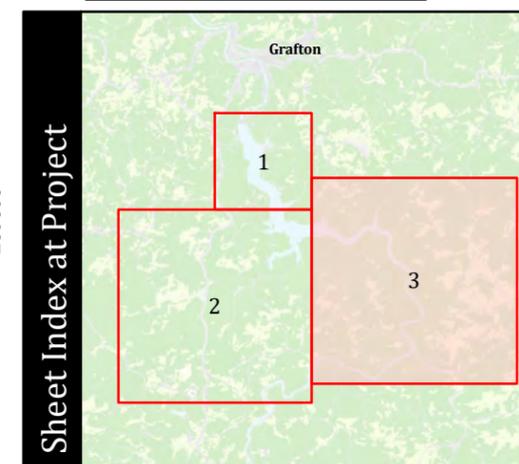
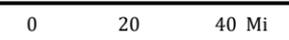


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Data Sources: USACE, USGS, WVDOT

Map Date: 2 August 2019

USACE Pittsburgh Geospatial, 412-395-7553





US Army Corps of Engineers
Pittsburgh District

Tygart Lake

Plate 7
Recreation
Sheet 1 of 3

Legend

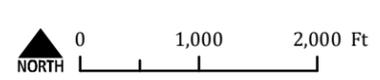
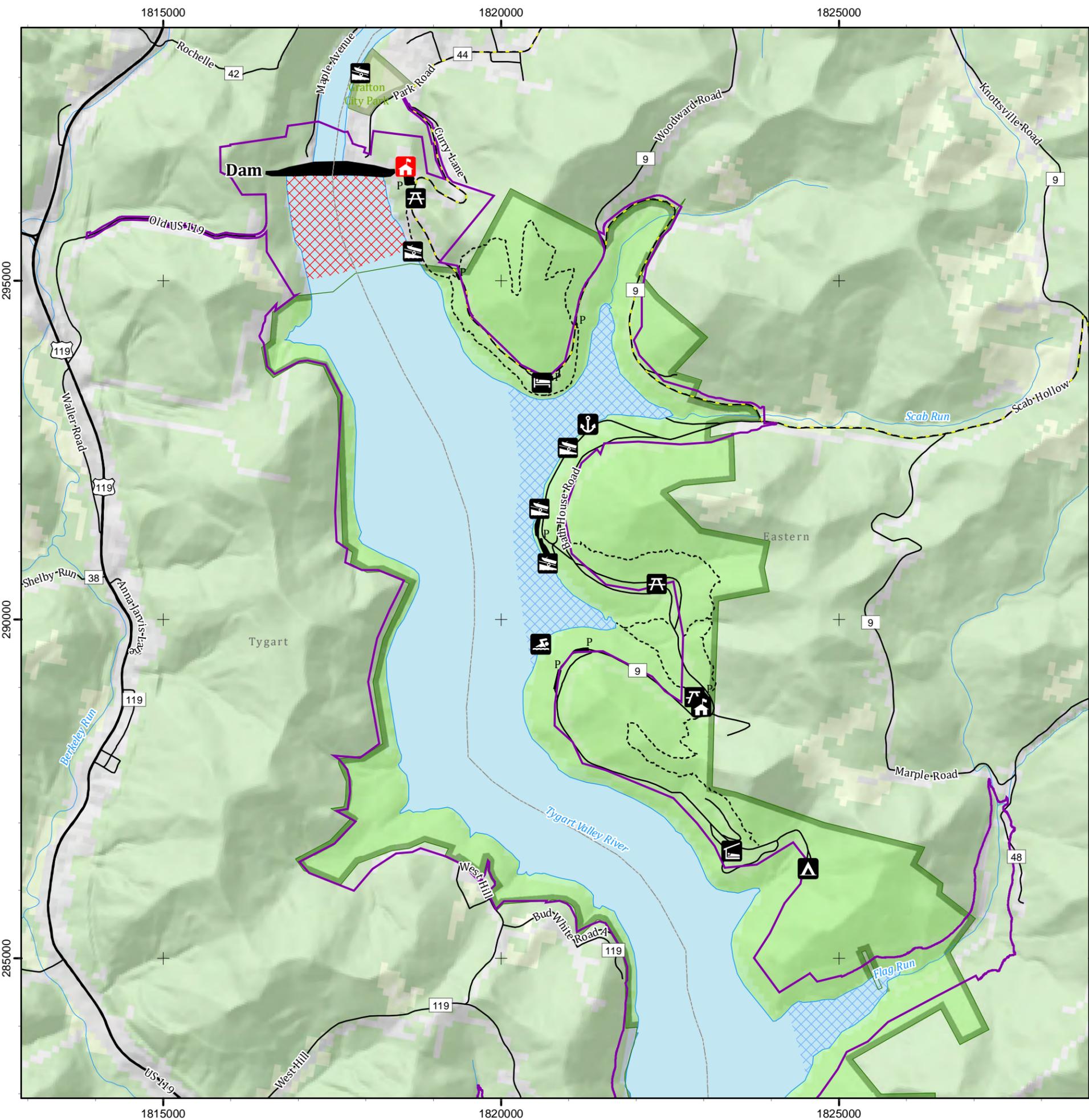
- Boat Ramp
- Cabin Area
- Campground
- Firearms Range
- Lodge, Restaurant, Gift Shop
- Marina
- Nature Center, State Park Office
- Picnic Site
- Swimming Beach
- USACE Offices, Visitor Center and Scenic Overlook

- Hiking Trail
- Hiking/Backpacking/Biking Trail
- Parking (P)

- Water Zoning**
- Open Recreation
 - No-Wake
 - Restricted

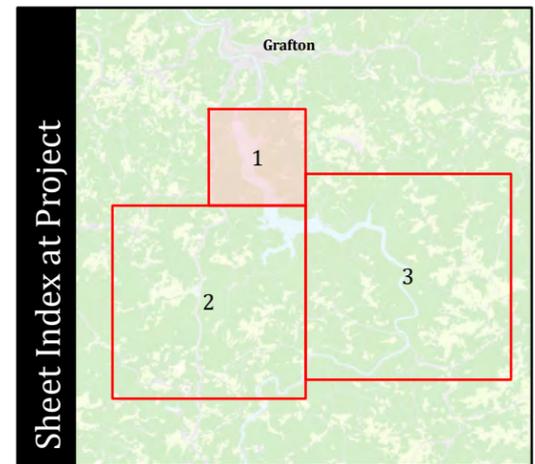
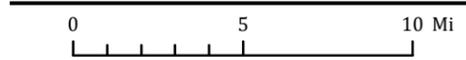
Road Type

- Interstate
- US Hwy
- State Hwy
- County Hwy
- Other
- County or City Park Boundary
- Pleasant Creek Wildlife Management Area Boundary
- Tygart Lake State Park Boundary
- Incorporated Area
- Unincorporated Area
- Other Populated Place (Unincorporated)
- County
- Tygart Fee, Easement, and Navigational Servitude Lands



Data Sources: USACE, USGS, WVDOT, WVGISTC
Map Date: 2 August 2019
USACE Pittsburgh Geospatial, 412-395-7553

Coordinate System: NAD 1983 2011 StatePlane West Virginia North FIPS 4701 FtUS. Projection: Lambert Conformal Conic





US Army Corps of Engineers
Pittsburgh District

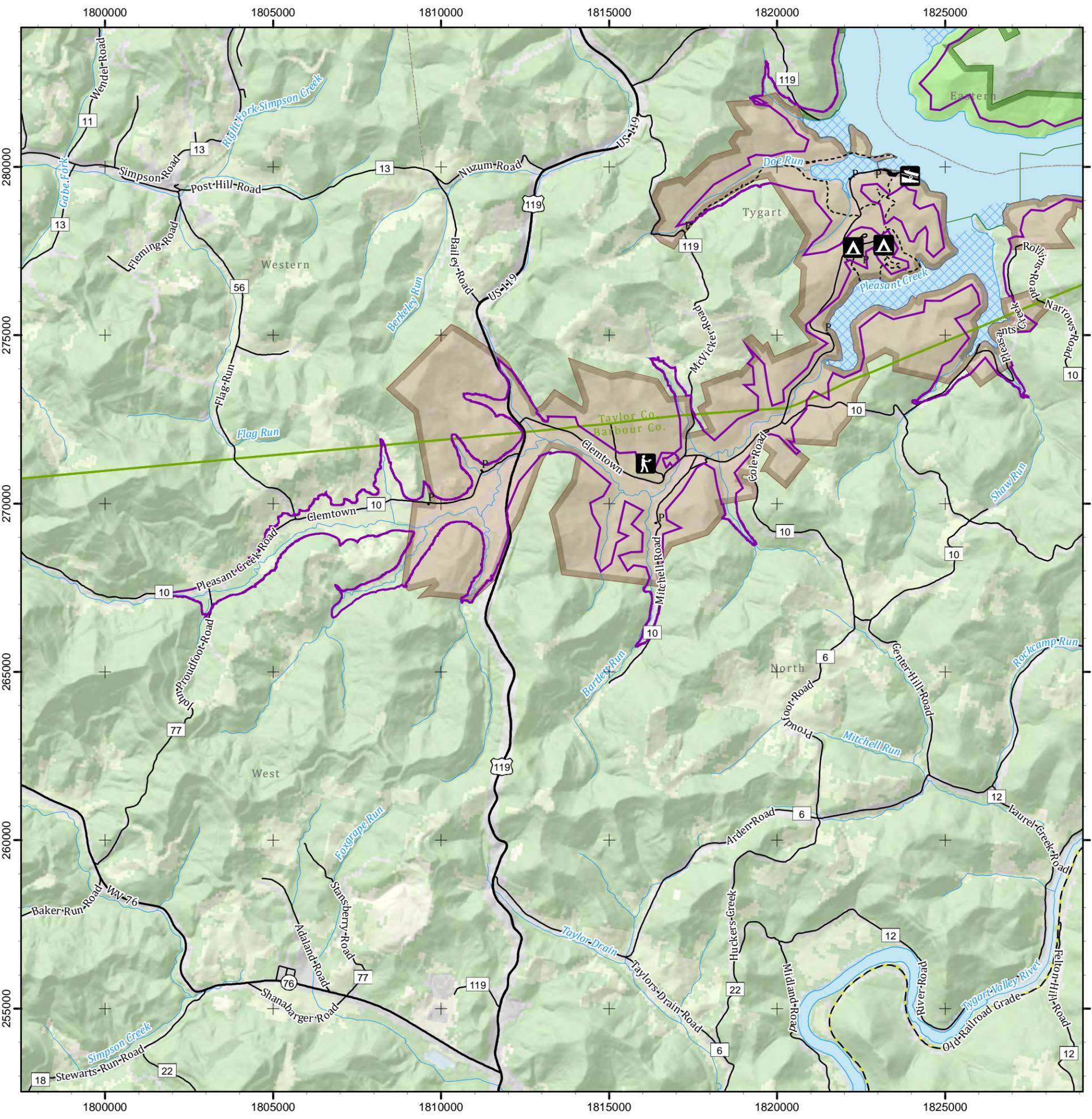
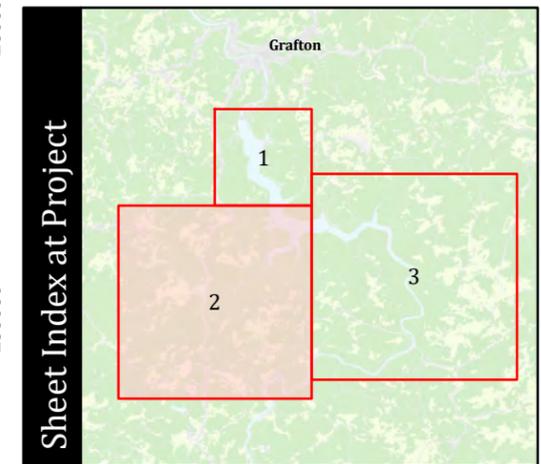
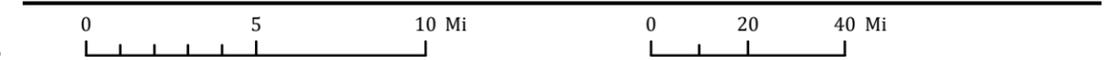
Tygart Lake

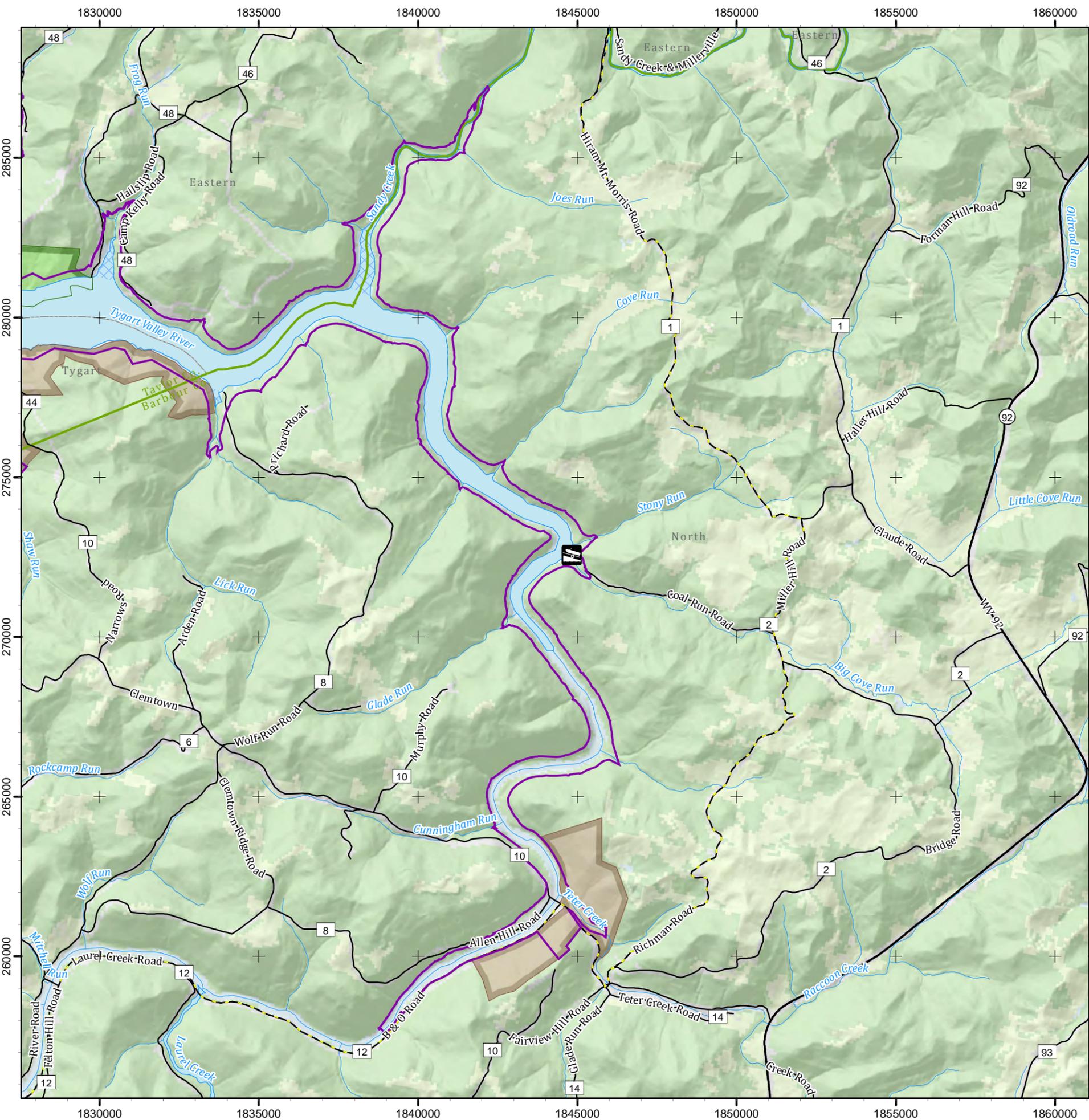
Plate 7
Recreation
Sheet 2 of 3

Legend

- | | | | |
|--|---|--|--|
| | Boat Ramp | | Interstate |
| | Cabin Area | | US Hwy |
| | Campground | | State Hwy |
| | Firearms Range | | County Hwy |
| | Lodge, Restaurant, Gift Shop | | Other |
| | Marina | | County or City Park Boundary |
| | Nature Center, State Park Office | | Pleasant Creek Wildlife Management Area Boundary |
| | Picnic Site | | Tygart Lake State Park Boundary |
| | Swimming Beach | | Incorporated Area |
| | USACE Offices, Visitor Center and Scenic Overlook | | Unincorporated Area |
| | Hiking Trail | | Other Populated Place (Unincorporated) |
| | Hiking/Backpacking/Biking Trail | | County |
| | Parking (P) | | Tygart Fee, Easement, and Navigational Servitude Lands |
| | Open Recreation | | |
| | No-Wake | | |
| | Restricted | | |

Data Sources: USACE, USGS, WVDOT, WVGISTC
Map Date: 2 August 2019
USACE Pittsburgh Geospatial, 412-395-7553
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US Army Corps of Engineers
Pittsburgh District

Tygart Lake

Plate 7

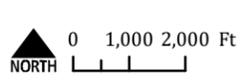
Recreation Sheet 3 of 3

Legend

- Boat Ramp
- Cabin Area
- Campground
- Firearms Range
- Lodge, Restaurant, Gift Shop
- Marina
- Nature Center, State Park Office
- Picnic Site
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- USACE Offices, Visitor Center and Scenic Overlook
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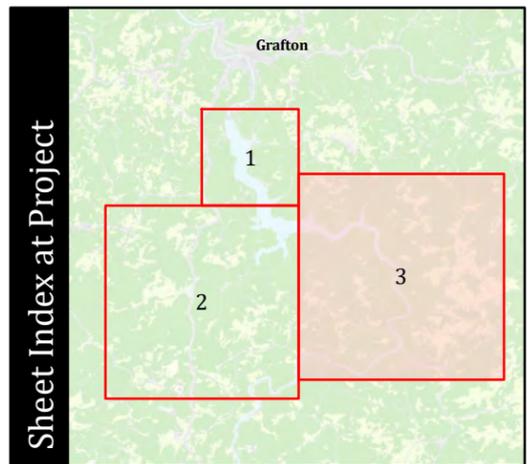
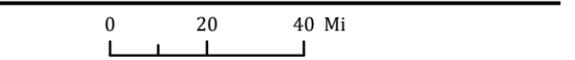
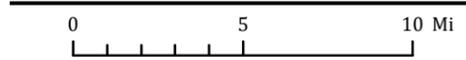
Road Type

- Interstate
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Data Sources: USACE, USGS, WVDOT, WVGISTC
Map Date: 2 August 2019
USACE Pittsburgh Geospatial, 412-395-7553

Coordinate System: NAD 1983 2011 StatePlane West Virginia North FIPS 4701 FtUS. Projection: Lambert Conformal Conic



APPENDIX C
SUMMARY OF PUBLIC COMMENTS

From:

Subject:

Tygart Lake Master Plan and Shoreline Management Plan Partner Meeting Invitation (UNCLASSIFIED)

Date:

Wednesday, July 25, 2018 8:34:16 AM

CLASSIFICATION: UNCLASSIFIED

All,

Tygart Lake is currently in the process of updating our Master Plan and Shoreline Management Plan. We would like to invite you to meet with us to discuss both of these plans and would like to get your professional perspectives on a variety of topics that each of these plans capture. The plans have needed updating for quite a while and we feel we can have two successful updates of these plans, but only with your help. We want to be sure and capture all areas of the project and each of you will be able to provide valuable input based on your varied disciplines.

Due to the fact that we are updating both plans simultaneously, our first step in this process is to engage you all in conversation and gather your ideas/concerns. A few things to consider as topics for our meeting would be visitor demands, environmental stewardship, and recreation opportunities, safety on the lake, changes you or your organization would like to see specifically at Tygart Lake, etc. The next step would then be to hold a public meeting.

We would like to have the meeting on Tuesday, August 7, 2018 from 10AM-Noon at the conference building here at the dam. Please let me know if you will be able to make this meeting. Your assistance in this process will be valuable and we appreciate our partnerships with you and look forward to your ideas!

Thank you,

Stacy

Stacy E. Lewis
Resource Manager
Tygart Lake

304-265-1760

304-266-0538

CLASSIFICATION: UNCLASSIFIED

PARTNER MEETING

TYGART LAKE MASTER PLAN UPDATE

Tuesday, August 7, 2018

10:00 AM – 12:00 PM

Tygart Lake – 1240 Paul East Malone Road, Grafton, WV 26354

When the meeting is over:

Partners will leave with an understanding of:

- Scope and purpose of a Master Plan
- Pittsburgh District's Vision for the Tygart Lake Master Plan
- How they can/are able to share in Pittsburgh District's Vision

US Army Corps of Engineers Pittsburgh District will leave with:

- Feedback from our partners on the – 1. Regional needs; 2. Potential threats; 3. Best management practices; and 4. Preferred qualities, characteristics, and components of Tygart Lake that should be incorporated into the Master Plan Update.

AGENDA

10:00 AM INTRODUCTIONS

Meeting Objectives

Overview of Master Plan Purpose & Process

- Project Timeline

Description of Tygart Lake Master Plan Update

- Driving Vision for Resource Objectives
 - Preliminary Alternatives

Discussion - Scoping of Master Plan & Partner Feedback

- Opportunities for us to work together
- Regional needs & potential threats to be addressed
 - Best Management Practices to include
- Preferred qualities, characteristics, and components
 - Gaps and missing opportunities

Next Steps

- Upcoming Public Meeting
- Additional partnering opportunities

12:00 PM ADJOURN

Questions guiding scoping:

What does the using public want?

How can we make this a destination point?

How can we provide services the community wants while minimizing the effect the project has on the resources? And while keeping the Corps mission of the flood protection?

What partnerships can we build in order to accomplish what we want in our Master Plan?

Master Plan changes over time:

- In the 1976 update, which projected population growth for the area, the Master Plan established objectives to include continued development and management of Tygart Lake.

Defining our user and their interests:***Who is the user?***

Campers, hikers, fishermen, hunters, wildlife viewers, boaters, swimmers, recreational day-users.

What do our user groups see recreation as?

Camping, more boating and recreational opportunities, options for wildlife viewing and being out with nature.

Preferred qualities, characteristics, and components:**WVDNR Parks and Recreation:**

- More access (for canoes and kayaks) – add in a kayak/canoe only boat launch or at least a trail down to the water (issues with motorized boaters and paddle craft not getting along)
 - Kayak/canoe trail leading down to the water at the first bend in the road near the Marina would be a good place after the parking lot is finished
- Currently an issue with people swimming at Pleasant Creek Boat Launch – there is no designated areas to swim other than the beach – **do we need more clarification on where people can go to swim?** (WVDNR states no swimming on their managed shoreline – only in designated swimming areas). People are also complaining that they don't have the money to afford canoes, kayaks, boats, etc. to be able to boat to an area and then swim on the shoreline
- Possibly expanding the beach at the State Park, or possibly an additional beach area?
- More signage regarding where people can and can't swim and boating rules/regulations (who has to wear a life jacket)
 - Problems with kayakers/canoers wearing life jackets
- Future plan for campground extension, including adding more water and electric sites, renovating/expanding bathhouses, renovating cabins, remodeling lodge (State Park has received additional funding)
- More mountain bike trails
- Parking density at the lake is an issue

WVDNR Fisheries:

- More fish habitat and expanding on what we already have (stumps, shoreline trees used for habitat)
- Designating fish sanctuaries in water where fish habitat structures are located

WVDNR Wildlife Management:

- Have an Annual Work Plan
 - **Due Out:** Review Annual Work Plan from Real Estate
- Continued habitat management – prescribed burns, timber cuts, invasive species control, etc. Keep future management practices more general so we can target any new threats

Other:

- Should we be planning for future development in surrounding communities that may put pressure on the Tygart Lake?
- Defining what is considered a vessel and who should be wearing flotation devices
- Doe Run impoundment dam needs to be repaired or replaced
- **Due Out:** Does the State Park have a Master Plan we need to be reviewing?
- **Due Out:** Get State Park current Corps drone policy. Do we foresee a need for designated drone areas in the future?

Next Steps:

- Incorporating this feedback into the resource objectives. Make jive with what USACE has preliminary developed.
 - Due-Out: Will send out what's been developed. And see what we got wrong or needs to change.
- USACE to send out notes. Partners to send us feedback.
- Public Meeting on August 20th from 5:00PM-8:00PM at Taylor County Middle School – Plan to ask the public: Here's what we're considering doing with Tygart Lake for next 25 years, what do you think?

Other stakeholders to reach out to:

From:



Subject: Tygart Lake Public Meeting and Open House Invitation (UNCLASSIFIED)

Date: Friday, August 17, 2018 11:02:25 AM

Attachments: [Tygart MP Fact Sheet Final 8.6.18 \(002\).jpg](#)
[Tygart SMP Revision Fact Sheet Final Invitation 8.6.18.pdf](#)

CLASSIFICATION: UNCLASSIFIED

This year Tygart Lake is starting the process of updating their Master Plan and Shoreline Management Plans. Attached are two factsheets that will help explain what each of these plans cover.

A large part of this process will involve public input. We are hosting two opportunities for the public to come and meet with us to discuss what works and what you would like to see added into these new plans.

The first public meeting will be on Monday, August 20, 2018 at Taylor County Middle School from 5PM-8PM. The second opportunity will be at our Open House on Saturday, August 25, 2018 from 10AM-2PM.

Thank you for your time and your input will be a very valuable part of this process. If you have any questions, please feel free to call me at 304-265-1760 between 7:30AM-4PM, Monday thru Friday.

We hope to see you!
Stacy

Stacy E. Lewis
Resource Manager
Tygart Lake
304-265-1760
304-266-0538

CLASSIFICATION: UNCLASSIFIED



US Army Corps
of Engineers®

News Release

Pittsburgh Corps seeks public input on Tygart Lake's future

Published Aug. 16, 2018

WHO: The U.S. Army Corps of Engineers Pittsburgh District

WHAT: The Pittsburgh District is seeking public input for the Tygart Lake Master Plan and Shoreline Management Plan revisions.

WHERE: Taylor County Middle School, 670 Spring Hills Road, Grafton, WV 26354

WHEN: 5 to 8 p.m., August 20.

WHY: We invite you to let us know what is important to you at Tygart Lake and to let us know your good ideas on how you would like Tygart Lake to be managed. This is your opportunity to provide input and help shape the future of Tygart Lake.

Corps regulations require periodic review of the plans to ensure they meet current public and environmental needs. The master plan guides the use of government-owned and leased lands around the lake, while the shoreline management plan guides use land adjacent to the lake in a way that promotes safe and healthful use, while maintaining environmental safeguards to ensure a quality resource for public use.

NOTE: Attendees are encouraged to stay for the entire set of presentations and breakout groups. USACE staff will be available at 7:30 p.m., at the conclusion of the breakout sessions for one-on-one questions and concerns.

Contact stacy.e.lewis@usace.army.mil to submit comments or sign up for the mailing list.

FOLLOW the Pittsburgh District: [Twitter](#), [Facebook](#) and [Flickr](#)

- [KnowTakeWear Know the waterways, Take a safety course, Wear your life jacket.](#)

###

Contact

Jeff Hawk
1000 Liberty Pittsburgh, PA 15222

Release no. 18-042

environment

Lake Management

master plan

public use

recreation

Tygart Lake

Public Comments from August 20th and August 25th Master Plan Meetings

Environmental:

- More fishing habitat structures (II) *
 - Possible partnership with WVDNR for Lake Trout stocking
- Trash clean-up (IIII)
 - Possible Lake Clean-up Signature event
- Erosion control methods (IIII) *
 - Possible rip-rap to control
 - West Hill 3 is an issue
- Gas development impacts – how will we address? (II)
- Settling pond/recharge station in case of future recreational development
- Eagle/Osprey cams or locations indicated for Eagle/Osprey viewing
- Addressing Lime for PH (apparent issue around the lake)
- Noise control measures around lake
- Cove Run for possible Osprey platforms *

Recreation/Partnership Opportunities:

- More hiking opportunities (III)
 - Horse trails, walking trails, mountain bike trails need to be added
- Signature Event
 - Kids Fishing Day
 - BBQ Cook-off
- Fireworks, zip lining, water ski shows
- Pollinator areas/bee keeping opportunities
- More parking at the Marina (II)
- More trash cans/recycle bins around the lake
- Add in a waterpark/playground at the State Park beach
- Add a courtesy dock near Corps dock along with fishing pier and vault toilets (II)
- Possible opportunities working with prison (II)
 - Trash pick-up
- Tygart Foundation opportunities
- Permit campfires
- Tourism from Railroad Trestle Bridge
- More opportunities for boaters to get gas
 - Additional Marinas (Meyers Landing)
- Better concessions around lake
 - Possible floating restaurant
- Add beach area to Pleasant Creek (II)
- Update State Park Lodge and Restaurant
 - Work with Fairmont State students or AB College students

- Possible hot dog concession stand *
- More Kayak/Canoe partnership opportunities
 - Access areas for paddle craft
- Boat access/mooring at swimming areas
- More recreational opportunities in the future
- More restrooms around the lake
- Contact number for boaters if boat breaks down
 - Is there a tow/service company around the lake?
- More dam tours for the public *
- More places to swim around the lake
- More advertisement of beach at State Park
 - Many people don't know it's there or its free
 - What are the operating hours? Can they be extended? (III)

Safety:

- Weather alert systems at different recreation areas around the lake *
- Possible boating course (II) *
 - Marina is sending people out on the lake with no knowledge of safe boating
- Increased signage around lake and recreation areas *
- Boating
 - Boat speeds monitored
 - Especially at Frog Run, Hazel Cove, and Cove Run
 - Increase "No Wake" areas
 - Private dock buffer zones
 - Designated mooring/no mooring zones
 - Corps to send boat dock owners current rules and regulations
- Increased presence on lake (III)
 - Rangers and WVDNR

Other:

- Use Tygart Creek Lake for hydropower *
- Water levels – holding back until October 1st
 - Extended boating season (III)
- Water withdrawals – are they permitted?

Red text indicates action items that they directly impact WVDNR.

Master Plan Update Fact Sheet

Tygart Lake

Master Plan Revision

The US Army Corps of Engineers, Pittsburgh District, is revising the Tygart Lake Master Plan to guide the management of government-owned and leased lands around the Lake. This will impact future use of natural resources and recreational activities at Tygart Lake for the next 25 years.

This is your opportunity to let the Corps know how you would like the Lake to be managed in the future. The Master Plan Update process will include an analysis of potential effects of updates in the land management plan on the natural and social environment, including: fish and wildlife, cultural and historic resources, recreational opportunities, economics, land use, aesthetics, and public health and safety.

Objectives of Update

- Conserve the resources of the lake within the current policies and guidelines of the Corps of Engineers
- Accommodate current and projected use patterns with maximum efficiency
- Identify and protect cultural and natural resources
- Attract maximum participation by the general public and local government

Why Update

The original Master Plan was developed more than 40 years ago and does not reflect current conditions at the Lake. Changes in Corps regulations and community needs necessitate a revision to this Master Plan.

The Master Plan revision will classify the government lands around the Lake based on environmental and socioeconomic considerations, public input, and an evaluation of past, present, and forecasted trends. This update is stewardship driven and seeks to balance recreational development and use with the goal of conservation of natural and cultural resources.



SAVE THE DATE
Shoreline Management Plan & Master Plan Revision
Public Meeting

The U.S. Army Corps of Engineers (USACE), Pittsburgh District will host a public meeting on:

Monday August 20, 5:00-8:00 pm
(presentation followed by breakout groups)

at the Taylor County Middle School
670 Spring Hills Road, Grafton, WV 26354

If you cannot attend in-person, send us your input via:
Visit - Tygart River Dam & Lake
Saturday August 25, 10:00 am - 3:00 pm
for a dam tour & open house

Email - celrp-pa@usace.army.mil

Or mail - Tygart River Dam & Lake
530 Paul E. Malone Road, Grafton, WV 26354

About the Lake

Tygart Lake and Dam was authorized by the Rivers and Harbors Act of 1935. It is unique in that the dam's original authorization was for navigation, providing water to downstream locks and dams. It was also the first of 16 flood damage reduction projects in the Pittsburgh District.

The dam provides flood protection for the lower Tygart River Valley, as well as the Monongahela and upper Ohio Rivers. The lake has the capability to store the equivalent runoff of 4.56 inches of precipitation from its 1,184 square mile watershed. Since its completion in the 1938, Tygart Dam has prevented flood damage in excess of \$1.2 billion.

Recreational activities at Tygart Lake are managed by the following partners:

- Division of Natural Resources State Parks
- Division of Natural Resources Wildlife Section



Master Plan 101

The Corps is responsible for the maintenance, restoration and stewardship of natural resources on the multipurpose reservoir projects it manages. To facilitate the management and use of these lands, a Master Plan is maintained for each reservoir.

A Master Plan is a strategic land use management document that guides the comprehensive management and development of recreation, natural and cultural resources at Corps reservoirs and provides a vision for how the lake should look in the future.

The Pittsburgh District is proposing to adopt and implement a revision to the Tygart Lake Master Plan which was originally developed in 1976.



Share your perspective, sign up for our mailing list, and/or let us know how you'd prefer to be involved in the Tygart Lake Master Plan Update by emailing us at celrp-pa@usace.army.mil.



Shoreline Management Plan (SMP) Update Tygart Lake Fact Sheet

SMP Revision

The Army Corps of Engineers, Pittsburgh District, is revising the Tygart Lake Shoreline Management Plan (SMP). The SMP guides the management of shorelines in a manner which will promote the safe and healthful use of these shorelines while maintaining environmental safeguards to ensure a quality resource for use by the public. Topics to be included but not limited to in the SMP are: boat density, appearance of private property, the permitting process, and the flowage easement.

This is an opportunity for members of the public to provide valuable input in the revision of the Shoreline Management Plan. The planning process will include an analysis of potential effects of any proposed changes to the Shoreline Management Plan, including: the natural and social environment, fish and wildlife, cultural and historic resources, recreational opportunities, economics, land use, aesthetics, and public health and safety.

Objectives of Update

- Promote the safe and healthful use of these shorelines by the public
- Maintain environmental safeguards to ensure a quality resource now and into the future
- Achieve a balance between permitted private uses and resource protection for general public use

Why Update

The Tygart Lake Shoreline Management Plan was last updated in 1982. Engineer Regulation 1130-2-406 requires periodic review and revision of Shoreline Management Plans to make sure they are still meeting current public and environmental needs.

It is the policy of the Chief of Engineers to protect and manage the shorelines of all Army Corps' Civil Works water resource development projects in a manner which will promote the safe and healthful use of these shorelines while maintaining environmental safeguards to ensure a quality resource for use by the public. The objectives of all management actions will be to achieve a balance between permitted private uses and resource protection for general public use. Public pedestrian access to these shorelines shall be preserved.



SAVE THE DATE

Shoreline Management Plan & Master Plan Revision
Public Meeting

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Pittsburgh District will host a public meeting on:

Monday August 20, 5:00-8:00 pm
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Authorized Missions of Tygart Lake:

- Navigation
- Flood Damage Reduction
- Water Supply
- Environmental Stewardship
- Recreation

SMP Timeline

30 May 1974: Proposed ER 1130-2-406 Lakeshore Management at Civil Works Projects was published in the Federal Register

17 Nov 1976: USACE holds a public meeting at Grafton High School to discuss the need for a shoreline management plan at Tygart Lake

1977: Planning committee was formed and met 4 times

7 May 1978: Public meeting was held at Grafton High School to present a draft Shoreline Management Plan to the public.

1982: Shoreline Management Plan was revised



If you are interested in learning more about this project, signing up for our mailing list, or sharing information relevant to this project, please visit our website at:

<https://www.lrp.usace.army.mil/Missions/Planning-Programs-Project-Management/Key-Projects/Shoreline-Management-Program/>



APPENDIX D

ENGINEER REGULATIONS, PAMPHLETS, MANUALS, AND CIRCULARS

- D.1** ER 200-1-5, Environmental Quality – Policy for Implementation and Integrated Application of the U.S. Army Corps of Engineers Environmental Operating Principles and Doctrine, 30 Oct 2003
- D.2** ER 1130-2-540, Environmental Stewardship Operations and Maintenance Policies, 15 Nov 1996 (with changes 4 Nov 2002, 31 July 2005, and 11 Aug 2008)
- D.3** ER 1130-2-550, Project Operations – Recreation Operations and Maintenance Guidance and Procedures, 15 Nov 1996 (with changes 1 Oct 1999, 1 Mar 2002, 15 Aug 2002, 30 Aug 2008, 30 Mar 2009, 30 Jan 2013, and 30 Sep 2013)
- D.4** EP 1130-2-550, Project Operations – Recreation Operations and Maintenance Guidance and Procedures, 15 Nov 1996 (with changes 1 Oct 1999, 1 Mar 2002, 15 Aug 2002, 30 Aug 2008, and 30 Jan 2013)
- D.5** EM 1110-1-400, Engineering and Design – Recreation Facility and Customer Service Standards, 1 Nov 2004
- D.6** EC 1165-2-220, Water Resource Policies and Authorities – Policy and Procedural Guidance for Processing Requests to Alter U.S. Army Corps of Engineers Civil Works Projects Pursuant to 33 U.S.C. 408, 10 Sep 2018