

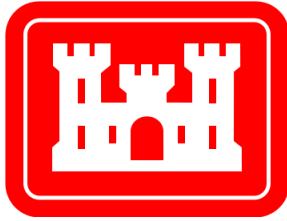
Indian Rock Dam

Master Plan



Draft Submittal
April 2019





Indian Rock Dam Master Plan York County, PA

Draft Submittal

April 2019

For:

Indian Rock Dam
2933 Access Road
West Manchester Township, PA 17408

Under Contract With:

U.S. Army Corps of Engineers—Baltimore District
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Indian Rock Dam Master Plan

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1 Introduction

1.1 PROJECT AUTHORIZATION

The Indian Rock Dam project on Codorus Creek was authorized by the Flood Control Act of June 22, 1936 (Public Law 74-738, 74th Congress, 2nd Session), as amended by the Flood Control Act of June 22, 1938 (House Do. 702, 77th Congress, 2nd Session), in order to control floods in the Susquehanna River Watershed in southern New York and eastern Pennsylvania. In addition to Indian Rock Dam, the Codorus Creek Improvement Project was also approved by the Flood Control Act of 1936 and provided flood damage reduction by way of a levee system and other channel improvement projects. The focus of this document is strictly on the Indian Rock Dam project. However, a brief description of the Codorus Creek Improvement Project is included in Section 1.4 For informational purposes.

Congressional authority for the recreational program at reservoir projects under the control of the Department of the Army is contained in the Flood Control Act approved December 22, 1944 (Public Law 534, 78th Congress, 2nd Session) and amended by additional acts as follows: the Flood Control Act approved July 24, 1946 (Public Law 526, 79th Congress, 2nd Session), the Flood Control Act approved September 3, 1954 (Public Law 780, 83rd Congress, 2nd Session), and the Flood Control Act approved October 23, 1962 (Public Law 87-874, substantially in accordance with House Document 469, 87th Congress, 2nd Session).

This Update to the Indian Rock Dam Master Plan is required according to January 2013 updates to the Engineer Regulation (ER) and Engineering Pamphlet (EP) 1130-2-550. The United States Army Corps of Engineers (USACE) is also required to prepare the appropriate National Environmental Policy Act (NEPA) documentation to support the Master Plan.

1.2 PROJECT PURPOSE

Indian Rock Dam was authorized and constructed for the primary purpose of controlling floods in the Susquehanna River Watershed. The project provides immediate flood protection for the city of York, Spring Garden Township and York County, all located within Pennsylvania, and has a

drainage area equivalent to 41 percent of the watershed upstream from York. A major secondary use of the project lands and waters is recreation and environmental stewardship of natural and cultural resources. The project area is heavily utilized by individuals and groups from near and far who participate in a variety of activities, like hunting, wildlife viewing, hiking, and enjoying the great outdoors.

1.3 PURPOSE AND SCOPE OF MASTER PLAN

The purpose of this document is to update the Master Plan, written in 1959, and the Environmental Assessment (EA) for Indian Rock Dam. It should be noted that CENAB is currently creating an EA for the Codorus Creek Improvement Project. This EA is expected to be completed in 2019. The Indian Rock Dam Master Plan is the 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. It is the basic document guiding USACE responsibilities pursuant to Federal Laws to preserve, conserve, restore, maintain, manage, and develop the project lands, waters, and associated resources.

Since the construction of the dam, the original objective of flood risk management continues to be achieved, allowing the increased opportunity for numerous recreation activities around the dam. This document updates the existing Master Plan, written in 1959. This Plan provides an analysis of and guidance for future recreation enhancement and development activities at Indian Rock Dam in response to the increased demand for improvements to existing recreation resources, as well as additional new recreation resources on the project site.

This document presents a re-evaluation of the assets, needs, and potentials of Indian Rock Dam. This Plan reflects changes that have occurred to the project site, in the region, in recreation trends, and in USACE policy, in the 60 years since the original master plan. It provides a management framework that balances the stewardship of natural resources and provision of high-quality recreation activities with the primary project purpose of flood risk management. This Plan addresses expressed public interest in the overall stewardship and management of all project resources and includes graphics showing the most desirable and feasible enhancements to existing facilities, as well as locations and types of new facilities needed to meet the identified needs.

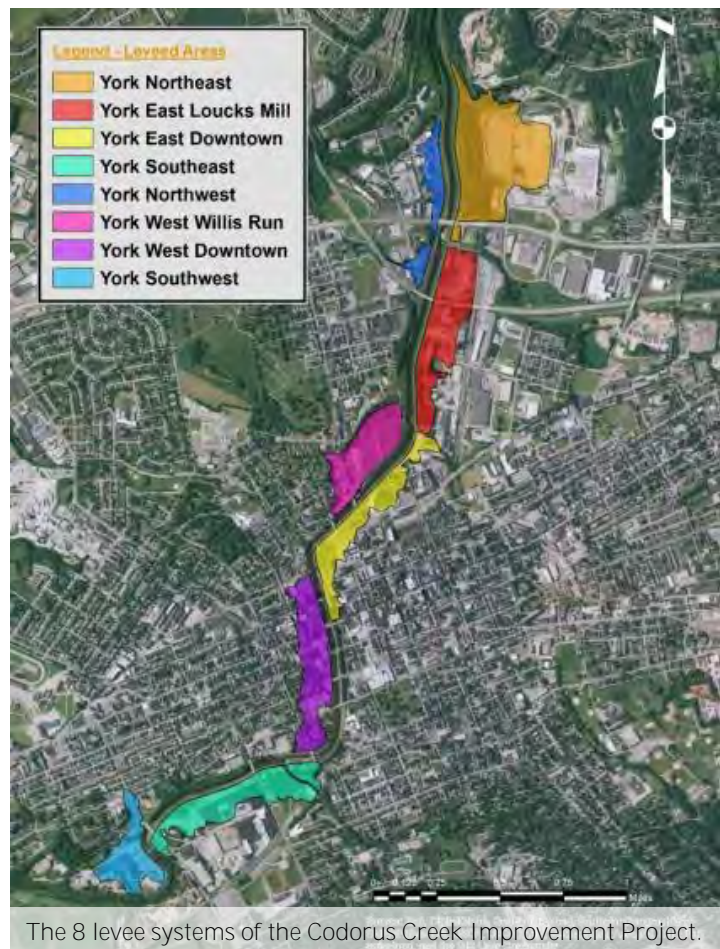
Implementation of this Plan must recognize and be compatible with the primary project mission of flood risk management. Recreation facility development and natural resources management activities proposed in this Plan are dependent on the availability of appropriated funds, but may also be achieved through partnerships, donations, and volunteer efforts.

1.4 DESCRIPTION OF PROJECT AND WATERSHED

Indian Rock Dam is located on the Main Branch of Codorus Creek in York County, Pennsylvania, approximately 3 miles upstream of the city of York and approximately 15 miles upstream of Codorus Creek's confluence with the Susquehanna River, as shown in Figure 1-1 on page 1-5. The Main Branch joins the South Branch to form Codorus Creek, at a point 2.5 miles above the southernly limits of the city of York, Pennsylvania. The dam site is on the Main Branch, approximately 700 feet above its confluence with the South Branch. Project lands occupy approximately 1,755 acres of land, with 1,660 fee simple acres and 95 flowage easement acres. Indian Rock Dam controls a drainage area of 94 square miles, 100 percent of the drainage area

of the Main Branch of Codorus Creek and approximately 41 percent of the total drainage area upstream of York. Figure 1-2 is a site map of Indian Rock Dam and can be found on page 1-6.

Construction of the dam and levee system began in February 1940 and took almost 3 years to complete. Upon completion in September 1942, the final government cost was \$5,061,000. Indian Rock Dam was originally designed as a dry dam due to the pollution of the creek by papermill wastes at Spring Grove, located in the upper reaches of the reservoir. The paper mill is still operational and Indian Rock Dam remains a dry dam to this day. There have been no formal considerations about converting the dam from dry to a permanent pool, but overall feasibility, including the presence of upstream water pollutants and the associated high operation and maintenance costs, remains an effective blockade to development. The original 1959 master plan stated that if a small recreation pool was supported, it would total approximately 100 acres at elevation 390 feet National Geodetic Vertical Datum (NGVD) and it would store approximately 800 acre-feet of water, which is equivalent to 0.16 inch of runoff.



Combined with Indian Rock Dam, the Codorus Creek Improvement Project provides flood damage reduction to the City of York and other downstream communities. The Codorus Creek Improvement Project is 4.8 miles in length and consists of 8 hydraulically independent levee systems (shown to the right), a widened and deepened creek channel, floodwalls, and bank protection elements. The project is entirely within York County, Pennsylvania and passes through 3 townships, 1 borough, and the city of York. Although USACE owns, operates, and maintains the Codorus Creek levee system, USACE does not own the lands. USACE only possesses a channel improvement easement. There are also 54 outgrants, including the Heritage Rail Trail County Park, located on the Codorus Creek levee system, but all structures or surfaces must not inhibit the easement rights of USACE.

1.5 DESCRIPTION OF DAM

The normally dry reservoir area of Indian Rock Dam as a storage capacity of 28,000 acre-feet, or 9.1 billion gallons of water, at spillway crest and 47,000 acre-feet when the spillway is surcharged to 10.5 feet. Reservoir storage is currently only utilized in times of flood. The reservoir is operated by regulating the gate openings in such a manner that the total flow in the creek will not exceed the capacity of the downstream channel. When the reservoir is full to spillway crest, the lake formed

will have a surface area of 1,430 acres and a main valley length of about 7.8 miles. The dam controls a drainage area of 94 square miles, totaling 100 percent of the drainage area of the Main Branch of Codorus Creek and approximately 41 percent of the total drainage area upstream of York.

A major portion of the 1,755 acres of project lands lie below the elevation 435 feet NGVD, or the top of the full flood control pool at spillway crest. Since the dam does not support a permanent pool, all lands within the project boundary are subject to inundation to varying depths at infrequent intervals during the operation of the dam for flood control. The typical top elevation at low water is only 372.5 feet NGVD.

1.5.1 Embankment

The dam is a rolled-fill earth embankment with rock facings extending across the Codorus Creek Valley. The dam stands 83 feet above the streambed and stretches approximately 1,000 feet long. The top elevation of the dam is 452.5 feet NGVD.

1.5.2 Spillway

The concrete spillway, located on the right abutment, has a crest length of 461 feet and height of 65 feet. It is a side-channel and ogee weir type with a concrete overflow section, a concrete-lined discharge channel, and a stilling basin at the outfall of the discharge channel. The spillway crest at elevation 435 feet NGVD is 17.5 feet below the top of the dam and was designed to discharge 62,000 cubic feet per second (cfs). The channel is 750 feet in length. The side walls of the channel are built in blocks, approximately 20 square feet, and are anchored to the rock slope. The concrete spillway is only used in the event of a flood that exceeds reservoir capacity.

1.5.3 Flood Control Outlet Works

The outlet works for releasing impounded water from the reservoir consist of an approach channel, intake tower and operating house, tunnel, stilling basin, and outlet channel located near the right abutment of the dam. The discharge of impounded water is controlled by three 6-foot by 13-foot vertical-lift tractor gates of the Broome type. A 15-foot circular tunnel, 432 feet long including intake, has been excavated through quartzite rock in the right abutment. The intake transition is 36 feet and 6 inches long, tapering from a rectangular section about 13 feet high and 27 feet wide upstream, to the 15-foot diameter circular section at the downstream end. The outlet transition is 20 feet long, tapering from the circular section at the upper end to a horseshoe section at the portal.



Indian Rock Dam Embankment and Inlet

Figure 1-1

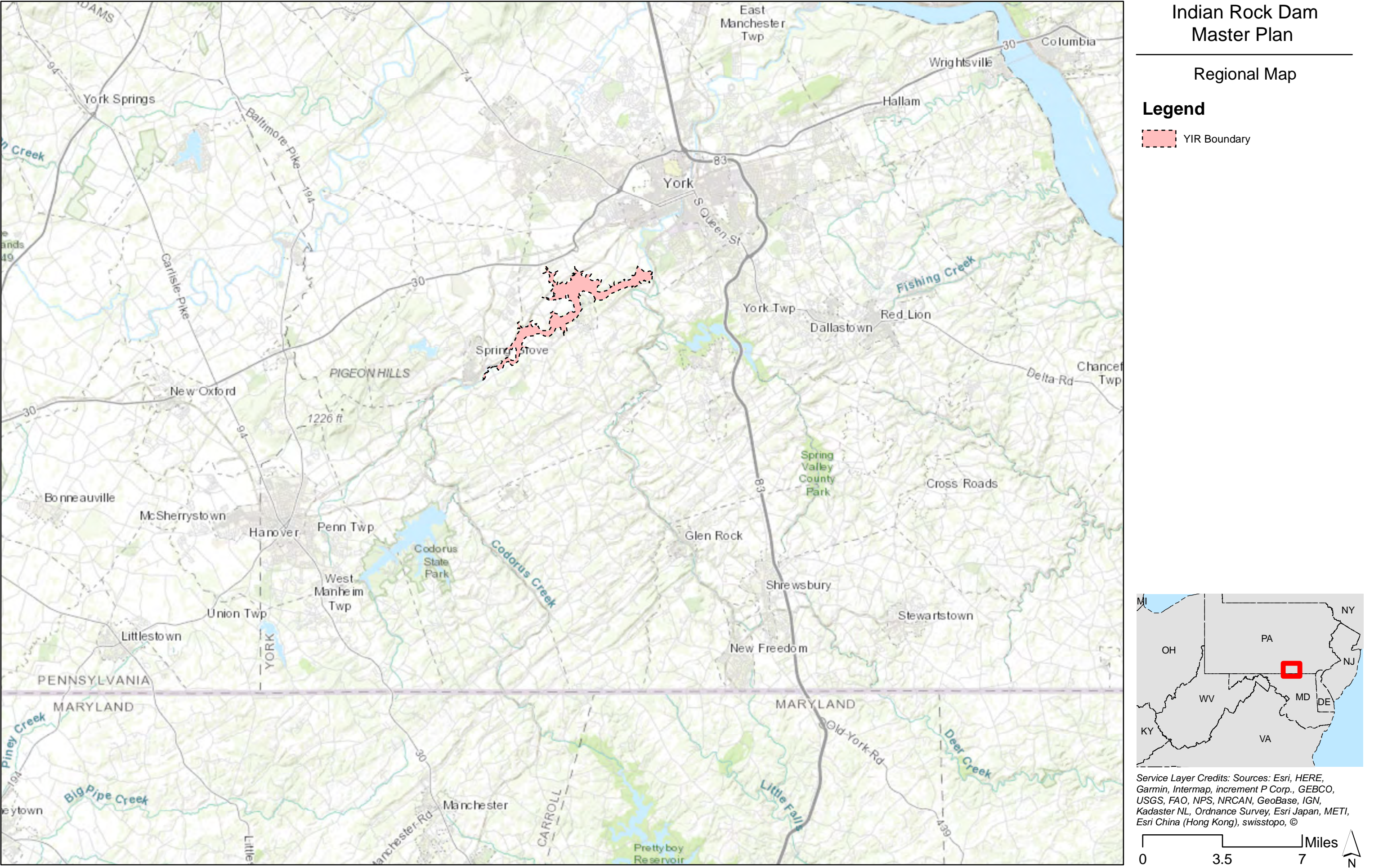
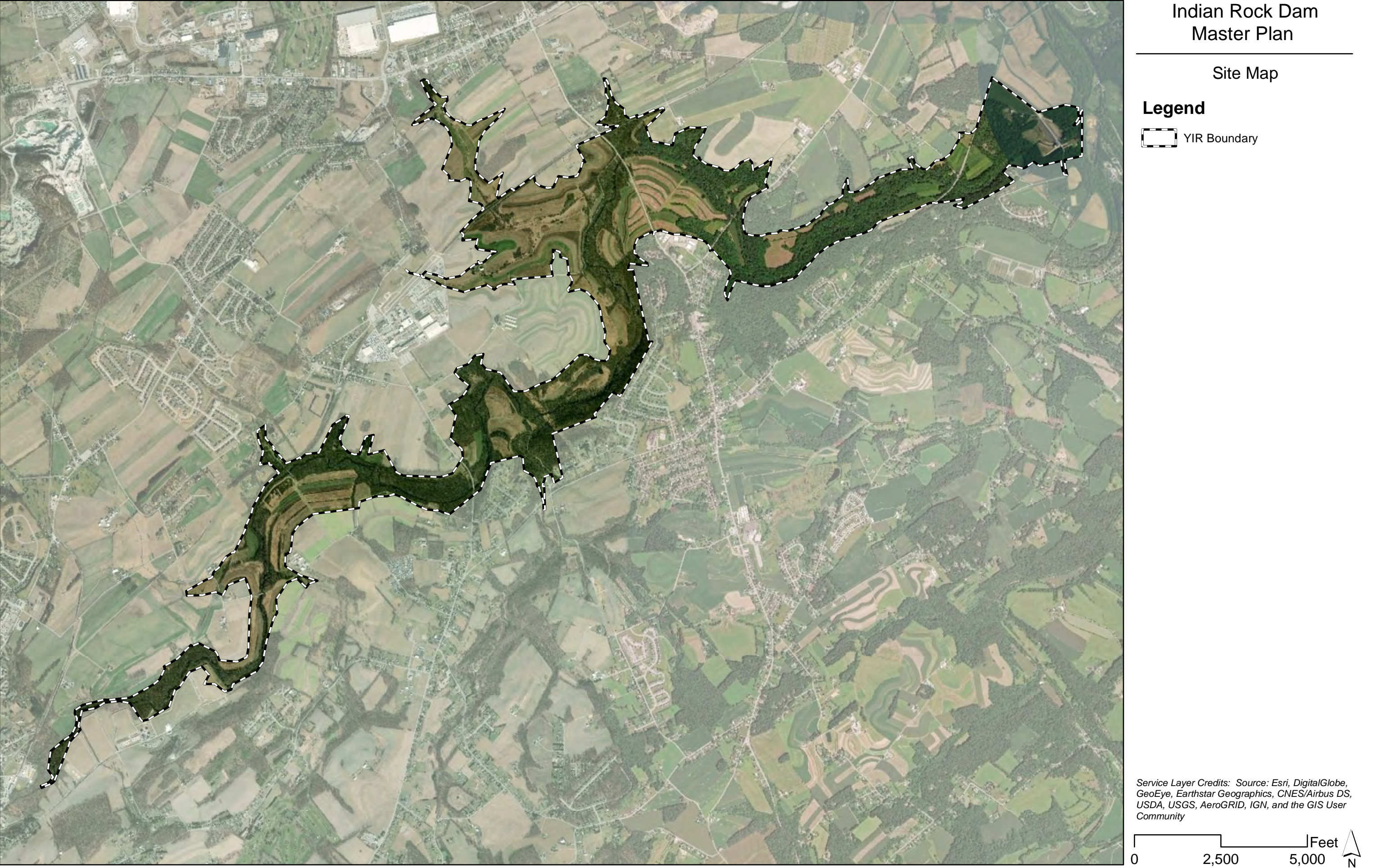


Figure 1-2



1.6 PROJECT ACCESS

Indian Rock Dam is well-served by a network of Federal, State, and county highways providing site accessibility to population centers east and west of York. U.S. Highway 30 runs between the city of York and the borough of Gettysburg. It passes within 1 mile of the site to the north. State Routes 616, 116, 516, and 498 lead from U.S. Highway 30 across the reservoir area. Interstate 83 is the closest major interstate to the site. It connects York with Harrisburg to the north and Baltimore to the south. The interstate passes approximately 3 miles from the site to the east with several secondary roads leading from the highway to the reservoir area. State Route 182, better known as Indian Rock Dam Road, borders the property to the north and east. There is also a thru access road, fittingly named Access Road, that passes over the dam itself.

The Heritage Rail Trail County Park also meanders near project lands. This 21-mile rail trail provides pedestrian and cyclist access to areas the project site from downtown York and surrounding townships. Phased development and future extensions to the Hanover Trolley Trail, which has a small portion located within project easement lands, to the west and the 150-acre John C. Rudy County park to the east. The Heritage Rail Trail currently connects with Maryland's 20-mile Torrey C. Brown Trail. This seamless connection at the state line creates more than 40 miles of off-street trails for pedestrians, cyclists, and horseback riders.

1.7 PERTINENT PRIOR REPORTS AND RELATED STUDIES

Documents and studies related to the Master Plan update are listed in this section with the dates of publication. The Bibliography section contains the full annotation for each report or study.

- *Indian Rock Reservoir Master Plan, 1959*
- *Indian Rock Dam / Codorus Creek Flood Risk Management Rehabilitation Project Environmental Assessment, Ongoing – Expected 2019*
- *Indian Rock Dam Environmental Baseline Survey, 2003*
- *Indian Rock Dam Value to the Nation*
- *Master Manual for Reservoir Regulation – Indian Rock Dam, 1972 and 1987*



Indian Rock Dam 75th Anniversary Ceremony, October 2017

- *Pennsylvania Chesapeake Watershed Implementation Plan Phase 1, 2010*
- *Pennsylvania Chesapeake Watershed Implementation Plan Phase 2, 2012*
- *Wildlife Management Current Practices at Baltimore District Dry Dam Projects, 1982*

1.8 PERTINENT PROJECT INFORMATION

Table 1-1 below provides pertinent information regarding existing storage capacity at Indian Rock Dam.

Table 1-1: Water Storage Capacity and Related Pertinent Data at Indian Rock Dam.

	Elevation (Feet NGVD)	Storage (Acre-feet)	Acres
Top of Dam	452.5		
Maximum Pool (Spillway Surge)	445.5	47,000	
Full Flood Control (Spillway Crest)	435	28,000	1,430

Source: 1959 Indian Rock Dam Master Plan

Table 1-2 provides pertinent information regarding acreages by land use classifications at Indian Rock Dam. Acreages were calculated by Geographical Information Systems (GIS) data.

Table 1-2: Current Land Classifications at Indian Rock Dam.

Land Classifications	Acres
Project Operations	95
High-Density Recreation	0
Multiple Resource Management	1,590
Low Density Recreation	2
Vegetative Management	1,588*
Water Surface	70
Restricted	1
Open Recreation	69
Total	1,755

Source: GIS Data

* All lands that are not designated operations, water surface, or low density recreation, fall under vegetative management.

2 Existing Conditions & Analysis

2.1 PHYSIOGRAPHIC SETTING

2.1.1 Ecoregion Overview

Indian Rock Dam is located within the Piedmont Uplands Ecoregion, which stretches from Washington D.C. in the south to Philadelphia in the north. The ecoregion is defined by rounded hills, low ridges, relative high relief, and narrow valleys and is underlain by metamorphic rock. The Susquehanna River is the major water body found within the ecoregion. Ruggedness of the terrain increases towards the river, where relief can reach upwards of 600 feet. The Piedmont Uplands Ecoregion is a subset of the larger Northern Piedmont Ecoregion.

2.1.2 Climate

Indian Rock Dam is located within a portion of the Susquehanna River Basin, which falls within the National Oceanic and Atmospheric Administration (NOAA) Climate Division 36-4 (Pennsylvania – Lower Susquehanna). This area is characterized by a temperate climate, with the average annual temperature in 2017 being approximately 54 degrees Fahrenheit and the average annual precipitation being approximately 42 inches. The greatest monthly precipitation in the basin occurs from May through August and the least precipitation occurs in the late fall and winter. The winters are not considered severe, but is usually accompanied by moderate to heavy snowfall.

2.1.3 Topography

Indian Rock Dam falls within the Uplands Section of the Piedmont Physiographic Province, which is characterized by broad, rounded to flat-topped hills and narrow valleys. The underlying metamorphic rock type is mainly schist, gneiss, and quartzite, with some saprolite.

The project occupies a narrow, shallow valley, which was previously used largely as farm and pasture land. The project site is a relatively flat and open area with a slight southward slope. The region surrounding the site is still largely used for agricultural purposes. The amount of timber cover in and around the reservoir is generally rather sparse.

2.1.4 Hydrology and Groundwater

Codorus Creek is a 42.4-mile long tributary of the Susquehanna River, which falls entirely within York County, Pennsylvania. The source of the stream is located just 2 miles north of the Pennsylvania-Maryland line. The main branch, also referred to as the West Branch, flows northwest to Menges Mills, then turns northeast and flows through Spring Grove and New Salem. Indian Rock Dam is located less than a mile upstream of the confluence between the West Branch and the South Branch of the stream. Codorus Creek then flows through the city of York and continues until it meets the Susquehanna River approximately 15 miles downstream of the Dam near the community of Saginaw.

The normally dry reservoir area has a storage capacity of 28,000 acre-feet (9.1 billion gallons) at spillway crest and controls a drainage area of 94 square miles, equivalent to 41 percent of the Codorus Creek watershed upstream from the city of York.

2.1.5 Soils, Sedimentation, and Shoreline Erosion

The project's soils are primarily derived from limestone parent material and consist mainly of soils in classes I, II and III, see Table 2-1 below. Dominant among these are the Glenville, Codorus, Lindside, Elk, Mt. Airy and Manor, and Conestoga silt loams. Most of these soils are highly productive, well drained, and well suited to agricultural practices. Most soils on project lands have less than 15 percent slopes, except for Mt. Airy and Manor soils which have between 3 to 60 percent slopes and Glenelg silt loams which have between 3 to 25 percent slopes.

Table 2-1: Land Capability Classes

Limitations	
Class I	Few limitations which restrict use.
Class II	Moderate limitations which may reduce the choice of plants and/or require simple conservation measures.
Class III	Severe limitations which may reduce choice of plants and/or require special conservation measures.
Class IV	Severe limitations. Generally unsuited for cultivation. Use is largely limited to pasture, woodland, wildlife, or some other recreation.

Sedimentation and shoreline erosion are not major concerns at Indian Rock Dam due to the fact that the dam is dry. Part of the Codorus Creek Improvement Project, which USACE plays a role in, includes the protection of bank slopes.

2.2 ECOREGION AND NATURAL RESOURCES ANALYSIS

Natural resources include the vegetation, wetland, wildlife, fisheries, and aquatic resources, and the endangered and threatened species present near Indian Rock Dam.

2.2.1 Vegetation

The land within and surrounding the Indian Rock Dam drainage area can be separated into two categories, the valley areas and the slope/upland areas. Most of the land within the valley areas has been previously disturbed by human activities and includes agricultural fields, abandoned fields, and some bottomland forests. Most of the vegetative ecosystems remain in immature stages of succession as a result of human disturbances.

The forested areas that do exist in the area are remnant of the natural vegetative cover. Indian Rock Dam is located within the transition zone between Northern Oak-Chestnut and Southern Oak-Hickory forest communities. Species composition differ between the bottomlands and uplands forested areas. Species such as Beech, Red Oak, and Basswood are dominant in bottomland forests, while species such as Chestnut Oak and White Oak dominate upland forested areas. Very little primary vegetation remains, although groups of remnant trees still exist along Codorus Creek. Forested areas on the project range from a narrow continuous strip along the creek to areas of several acres. Except for timber sales, which have resulted from the theft of several walnut trees, no other silviculture practices have been employed by USACE on project lands.

The slope/upland areas are mostly open, due to the result of past farming practices. These open-land areas are essential for small game wildlife. In order to support a healthy diversity of open game species, The Pennsylvania Game Commission continues to maintain and enhance the following habitat elements: 1) domestic grain and seed producing annual plants such as corn, wheat and millet; 2) domestic perennial grasses and herbaceous legumes such as timothy, alfalfa, and reed canary grass, 3) wild perennial grasses and weeds such as goldenrod, ragweed and pokeweed; and 4) deciduous trees, shrubs or vines such as oaks, dogwoods, grapes and briars.

There are also several private agricultural leases within project lands. Popular crops include corn, soybeans, wheat, and hay. Livestock farming is also popular for farmers in the area.

2.2.2 Wetlands

There are numerous natural and constructed wetlands located on the project lands, totaling around 275 acres. A majority of the wetlands are Freshwater Forested/Shrub with PFO1A classification. See Table 2-2 below for a break down of the PFO1A classification. There are approximately 213 acres of Freshwater Forested/Shrub wetlands on project lands. Other major wetlands within project lands include Riverine totaling 43 acres, Freshwater Emergent totaling 14 acres, and Freshwater Pond totaling 3 acres. Figure 2-1 on page 2-5 shows the four types of wetlands that can be found at York Indian Rock.

Table 2-2. PFO1A Wetland Classification Summary.

Code	Name and Class	Description
P	Palustrine (System)	All nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens.
FO	Forested (Class)	Characterized by woody vegetation that is 6 meters in height or taller.
1	Broad-Leaved Deciduous (Sub-class)	Wetland includes woody trees or shrubs with relatively wide, flat leaves that are shed during the cold or dry season.
A	Temporary Flooded (Water Regime)	Surface water is present for brief periods during the growing season, but the water table usually lies well below the ground surface for most of the season.

Source: National Wetlands Inventory, produced by the United States Fish and Wildlife Service (USFWS).

2.2.3 Wildlife

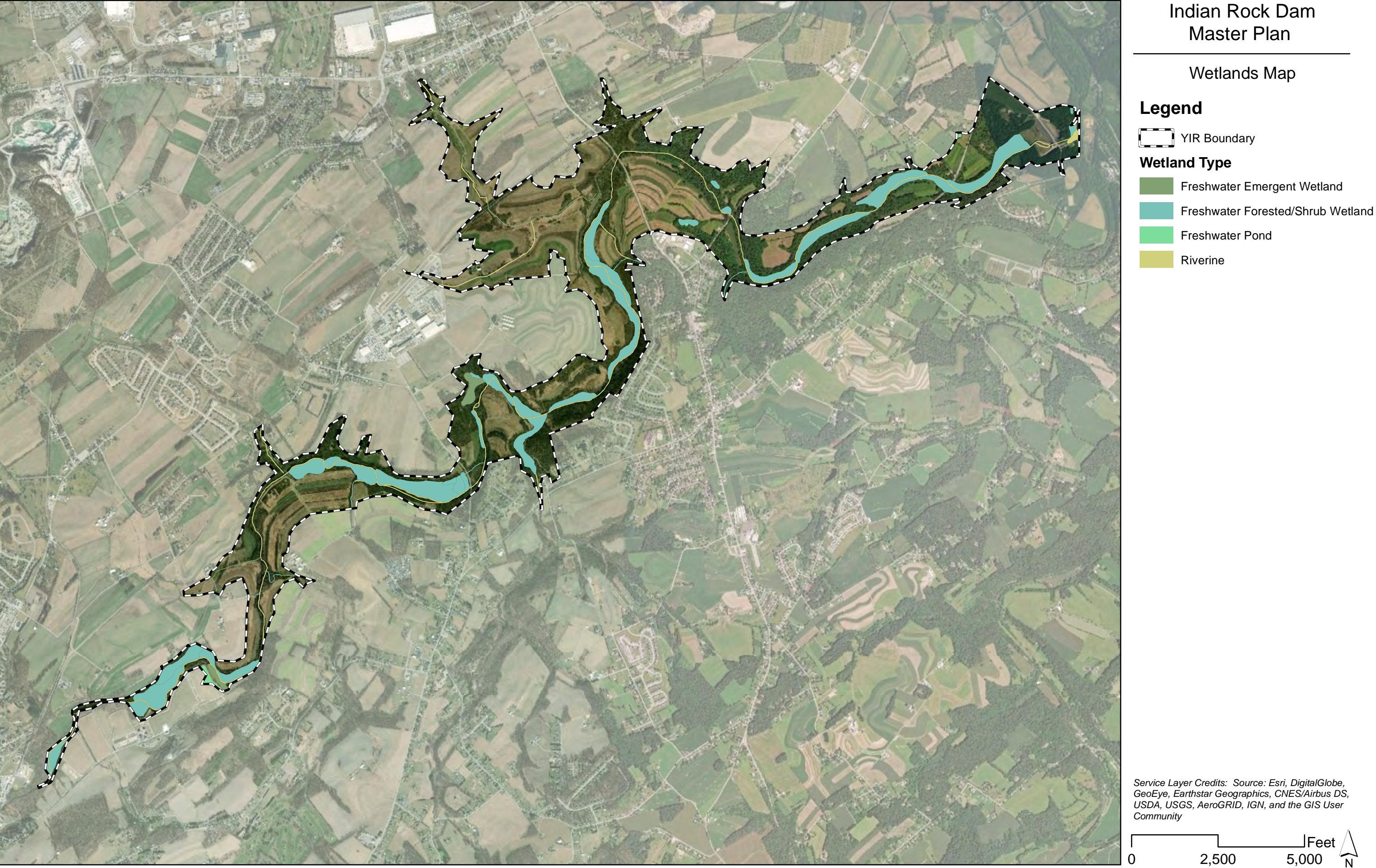
There are numerous game and non-game species present in the vicinity of the project. These species can be broken down into two major categories, open land wildlife and woodland wildlife. Open-land wildlife includes birds and mammals commonly associated with crop fields, meadows, pastures and non-forested overgrown lands. Examples of open-land wildlife in the project area are eastern cottontail rabbits, ring-necked pheasants, skunks, mourning doves, woodchucks, hawks, owls and songbirds. Woodland wildlife in the Indian Rock Dam area includes birds and mammals such as raccoons, red foxes, opossums, white tailed deer, ruffed grouses, grey squirrels, black bears, wild turkeys, and long-tailed weasels.

USFWS produced a wildlife conservation and game management plan in 1957, approved by the Pennsylvania Game Commission (PGC), the Secretary of the Army, and the Assistant Secretary of the Interior. This plan gives the Commonwealth of Pennsylvania a 25-year renewable license to develop, use, and control, for the purpose of wildlife and game management, with the exception of fish, and to administer and enforce the laws of the Commonwealth pertaining to all fee-simple acres of the project except the 95 acres contiguous to the dam withheld for project operations. Although the leased project lands used for agricultural and grazing purposes did not fall under this plan, PGC used these leases to increase the food supply for wildlife on the project. The goals of this plan to conserve wildlife and promote certain species, including deer and pheasants, to provide an annual recreational hunting harvest are complementary to the objectives of both PGC and USACE.

2.2.4 Threatened and Endangered Species

As of 2018, there is only one federally listed endangered or threatened species known to exist within the project impact area, the Bog Turtle (*Clemmys muhlenbergii*).

Figure 2-1



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The Bog Turtle is the smallest turtle found in the United States and lives in a mosaic of open, sunny, spring-fed wetlands and scattered dry areas. Major threats to the species include the animal black market, erratic weather patterns and the alteration of hydrological cycles, habitat fragmentation by roads and other development, and invasive species, like Purple Loosestrife, that dry out large areas of suitable habitat.

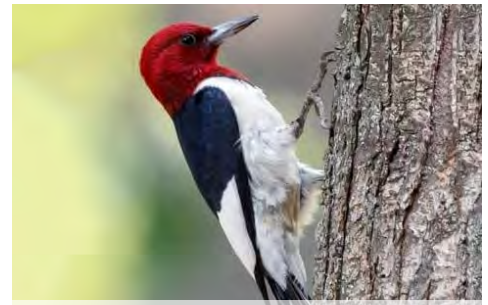


Bog Turtle.

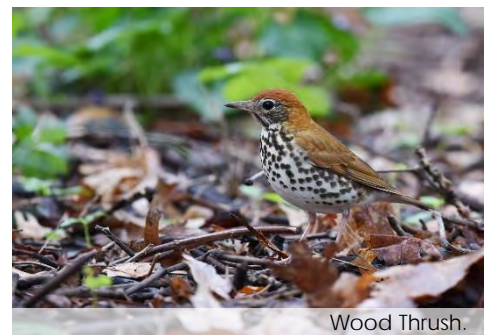
There are three migratory birds that are known to breed within the project boundary that are USFWS Birds of Conservation Concern and are protected under the Migratory Bird Treaty Act, the Cerulean Warbler (*Dendroica cerulea*), the Red-headed Woodpecker (*Melanerpes erythrocephalus*), and the Wood Thrush (*Hylocichla mustelina*). The Cerulean Warbler is a small songbird that likes to breed in older deciduous forests, especially among river valleys, with tall trees and an open understory. In recent years, their numbers have declined due to the loss of suitable habitat and increase of cowbird parasitism in these smaller patches of forest. The Red-headed Woodpecker favors open country lands, forest edges, and groves of tall trees in open country over unbroken forest habitats. Once a very common species throughout the east but has been decreasing and is predicted to continue to decrease in numbers. Reasons for decline include loss of potential nesting sites, competition with other birds for nest cavities, and collision with automobiles. The Wood Thrush breeds in the understory of deciduous woodlands and are more numerous in damp forests and near streams. In recent decades, numbers have declined drastically. As forests are cut into smaller fragments, cowbirds are able to take over Wood Thrush nests, thus resulting in thrushes raising mainly cowbirds rather than young of their own.



Cerulean Warbler.



Red-headed Woodpecker.



Wood Thrush.

Bald eagles can also be found on project lands. Bald eagles were removed from the federal list of threatened or endangered species in August of 2007. Although bald eagles are no longer a federally threatened or endangered species, the species is still protected under the Bald and Golden Eagle Protection Act, and known nesting locations are protected from impact.

Insect pollinators, including bees, pollen wasps, ants, flies, butterflies, moths, and flower beetles, in the region have also decreased drastically in recent years. Alongside mammal pollinators, like birds and bats, these hard-working insects help pollinate over 75 percent of the United States' flowering plants and nearly 75 percent of the United States' crops. One species of the Fritillary

Butterfly is considered endangered due to the loss of habitat through fragmentation and frequent water inundation. PGC continues to restore the habitat of the butterfly and is considering supporting a “trap and transfer” project in order to relocate habitats away from frequently flooded areas.

2.2.5 Invasive Species

Invasive species are defined as non-native species whose introduction into an ecosystem is likely to cause environmental, human, or economic harm. Non-native, or exotic species, have not evolved the natural checks and balances that normally keep population growth in check, thus they can spread rapidly and completely take over natural areas. These species are often difficult and expensive to control. Like almost all ecological systems, Indian Rock Dam hosts several invasive species, both terrestrial and aquatic.

The biggest hurdle for project lands managed by PGC is invasive species control. There are numerous present, including Japanese Silt Grass (*Microstegium vimineum*), Poison Hemlock (*Conium maculatum*), Johnson Grass (*Sorghum halepense*), Japanese Honeysuckle (*Lonicera japonica*), and Purple Loosestrife (*Lythrum salicaria*). Japanese Silt Grass is a summer annual and spreads quickly through seed in already disturbed soils in both sun and shade. Seeds can remain viable for up to 3 years in soils, so it is important to remove the grass before it goes to seed. The invasive can take over large patches and out compete native grasses and plants. Poison Hemlock is a biennial weed that is acutely toxic to people and animals. It can spread quickly in sunny areas, fields, vacant lots, and along roadsides. Johnson Grass is a grass native to the Mediterranean region that was originally used to stop erosion on crop fields and pastures. It grows and spreads quickly which allows it to choke out other crops planted by farmers. It can now be found in other open and already disturbed lands, like abandoned fields, rights-of-ways, forest edges, and along streambanks. It has also become resistant to common herbicides, making it very hard to eradicate. Japanese Honeysuckle is a twining vine able to climb up trees reaching heights of over 30 feet. The vines aggressively grow over and choke out native shrubs and trees, which can ultimately create mat-like monocultures that alter the succession cycle. Purple Loosestrife is a perennial plant that spreads rapidly in wetlands, shorelines, and roadside ditches. It grows in thick, dense patches and can crowd out native plants and reduce food, shelter, and nesting sites for wildlife, birds, frogs, and turtles. Purple Loosestrife is a major threat to the Bog Turtle as seen in the previous section.



Poison Hemlock.

2.2.6 Mineral and Timber Resources

Much of the area around Indian Rock Dam is underlain with metamorphic rock, including schist, gneiss, quartzite, and some saprolite.

The primary timber type of the project lands is northern hardwoods, with a significant presence of walnut. The forest resources at the project are well-suited for timber production, but mismanagement and disagreements have suspended timber sales since the early 1970s. Over the years, there have been some walnut theft issues. There are talks to reconsider allowing walnut timbering as a source of revenue for the project. In accordance with ER 1130-2-550, all forest products generated through clearing, salvage operations, sanitation cuts, or operation and maintenance, and not required for USACE use, will be sold after approval of a disposal plan.

2.2.7 Water Quality

Indian Rock Dam falls within the Codorus Creek watershed. The watershed has a wide diversity of land uses including agricultural, forest, residential, commercial, and industrial. The water quality of the Codorus drainages varies from those supporting wild trout populations, to those heavily influenced by watershed modifications. Field observations indicate good water quality, supporting a diversity of benthic macroinvertebrate and fish populations. The streams in the watershed however are far from reaching their full potential as a biological and recreational resource due to severe bank erosion, high sediment loads, and thermal warming.

There are also concerns about the quality of the surface water within and adjacent to the project due to the presence of a papermill upstream of the site. The paper mill is currently being monitored for pollution by the Department of Environmental Protection, but as long as the paper mill is functional, water quality will remain a concern.

2.3 CULTURAL RESOURCES

2.3.1 Prehistoric

Prehistoric cultural periods in south-central Pennsylvania have typically been separated into 4 periods: Paleo-Indian (15,000 BC – 8000 BC), Archaic (8000 BC – 1000 BC), Woodland (1000 BC-1500 AD), and Proto-Historic (1500 AD – 1750 AD).

A hunting and gathering lifestyle characterized the Paleo-Indian Period. Small nomadic groups traveled frequently in search of food and other resources. Only short-term base camps would have been created at a variety of locations, though it is possible that these base camps would have been revisited on a periodic basis.

Due to the changes in subsistence patterns and technological variation over the 7,000-year period, the Archaic Period is typically divided into the Early (8000 BC – 6000 BC), Middle (6000 BC – 4000 BC), and Late (4000 BC – 1000 BC) Archaic Periods. Hunting and gathering was still the most popular lifestyle during the entirety of this period. Seasonally occupied base camps are the most common site types associated with this period. During the Late Archaic period, population densities increased, and sites became increasingly unique and differentiated. Populations began to locate camps within river valleys due to the stabilization of alluvial environments.

The Woodland Period is also divided into Early (1000 BC – 200 AD), Middle (200 AD – 1000 AD), and Late (1000 AD – 1500 AD) Periods. During this period, populations continued to increase, social organizations gained in complexity, settlements became more permanent and sedentary, and horticulture was introduced. Food also became seasonally abundant due to the creation of

ceramics vessels and subterranean storage pits. Seasonal hunting and gathering still dominated in the Early and Middle Woodland Periods, while horticulture and a more sedentary village life became more popular in the Late Woodland Period. The bow and arrow was also introduced in the Late Woodland Period.

The Susquehannock Indians moved into central Pennsylvania during the Proto-Historic Period, gradually replacing the earlier Woodland cultures. The Susquehannocks were an Iroquoian group that typically built large stockade villages near major rivers in central Pennsylvania. They later controlled the fur trade in the early 17th century. By 1660, they dominated the entire region. In 1681, William Penn founded the Pennsylvania colony to establish a safe haven for persecuted religious minorities. At the time, most lands were controlled by the Susquehannock, Shawnee, and Delaware Indians and Penn forbade intrusion into their territories until the lands had been legally purchased, slowing the rate of development of the frontier. In 1736, a treaty between the European settlers and the Iroquois ceded all lands west of the Susquehanna River to the Penn's. The lands making up present-day York County were included in this treaty. The town of York was established in 1741, while York County wasn't established until 1749 after it broke away from Lancaster County due to the distance from the main governing body, Lancaster Court. York County was a focal point for early industry, especially regarding iron works since there was plenty of iron ore for extraction.

2.3.2 Historic

During the mid-18th century and early 19th century, there were numerous industrial sites operating within county lines. Also during this time period, York County was involved in major bouts of warfare. Battles and attacks from the French and their Native American allies were common during the French and Indian Wars in the late 1750s. York County was also involved in the Revolutionary War, when they provided military support by forming militias and dividing the county into five battalions. Towards the end of the war, in 1777 and 1778, the town of York served as the meeting location of the Continental Congress. Growth continued during the Industrial Revolution. Then, during the Civil War, many residents volunteered as Union soldiers, but the town was taken over by the Confederate Army in 1863. Later, the City of York became a commercial center during the mid-20th century.

2.3.3 Previous Investigations

There have been no previous cultural investigations or studies completed at Indian Rock Dam.

2.3.4 Recorded Cultural Resources

There are no known historic structures or archaeological sites in the project boundary that are eligible for or listed on the National Register of Historic Places (NRHP), though there are almost 100 historic properties and districts located within York County. The Samuel Stoner Homestead, a historic home and farm, is located just outside of the project boundary off of Indian Rock Dam Road. USACE recently received funding to conduct a study to determine whether any project features at the site are eligible for NRHP. There is no set time frame for this study yet, but it is expected to be completed by 2020.

2.3.5 Long-term Objectives for Cultural Resources

There has been no Cultural Resources Management Plan (CRMP) completed for Indian Rock Dam since its completion in 1942.

2.4 DEMOGRAPHIC AND ECONOMIC RESOURCES

2.4.1 Current Demographics, Economics, Trends and Analysis

The zone of interest for the socio-economic analysis of the Indian Rock Dam project consists of York County. The entire project area falls within York County.

2.4.2 Population

According to the 2016 American Community Survey (ACS) 5-year Population estimate, the total population for the zone of interest is 440,604 people, up from 428,175 people in 2010. The population in the zone of interest makes up approximately 3.5 percent of the total population of Pennsylvania (12,783,977 people). From 2016 to 2030, the population in the zone of interest is expected to increase to 484,497 people. The City of York is also near the site and has a total population of 43,848 people, up from 43,592 people in 2010. Table 2-3 below shows all of the population estimates and projections.

Table 2-3: Population Estimates and 2030 Projections.

Geographical Area	2010 Population Estimate	2016 Population Estimate	2030 Population Projection
Pennsylvania	12,612,705	12,783,977	13,759,594
York County (Zone of Interest)	428,175	440,604	484,497
City of York	43,592	43,848	No Data

Source: U.S. Bureau of Census, Population Division (2010 & 2016 Estimates) and The Center for Rural Pennsylvania, Pennsylvania Population Projections 2010-2040 (2030 Projection).

The distribution of the population among gender, as shown in Table 2-4 below, is approximately 51 percent (222,946) female and 49 percent (217,658) male in the zone of interest, which is the same as Pennsylvania and the City of York who also have a slightly larger female population than male population.

Table 2-4: 2016 Percent of Population Estimate by Gender.

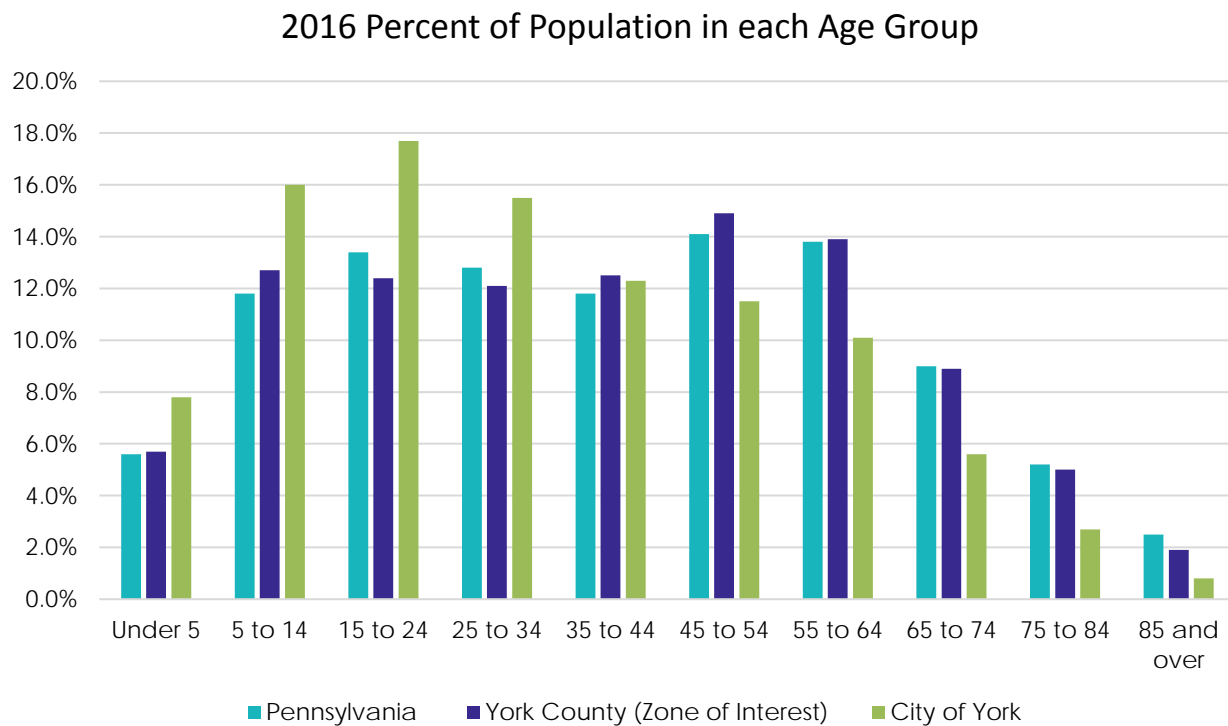
Geographical Area	Male	Female
Pennsylvania	6,251,365	6,532,612
York County (Zone of Interest)	217,658	222,946
City of York	21,482	22,366

Source: U.S. Bureau of Census, 2012-2016 ACS 5-Year Estimates (2016 Estimate).

Table 2-5 below shows the population by age group. The distribution by age group is relatively similar among York County and the state of Pennsylvania in terms of percentages of the

respective population, while the city of York trends younger. The top age groups for both York County and the State of Pennsylvania include 45 to 54 years and 55 to 64 years. The largest age group in York County is the 45 to 54 group (14.9 percent of the population) with the 55 to 64 group (13.9 percent of the population) following close behind. The largest age group in the state of Pennsylvania is also the 45 to 54 group (14.1 percent of the population) with the 55 to 64 group (13.8 percent of the population) following close behind. The top age groups for the City of York include the 15 to 24 group (17.7 percent of the population) and the 5 to 14 group (16.0 percent).

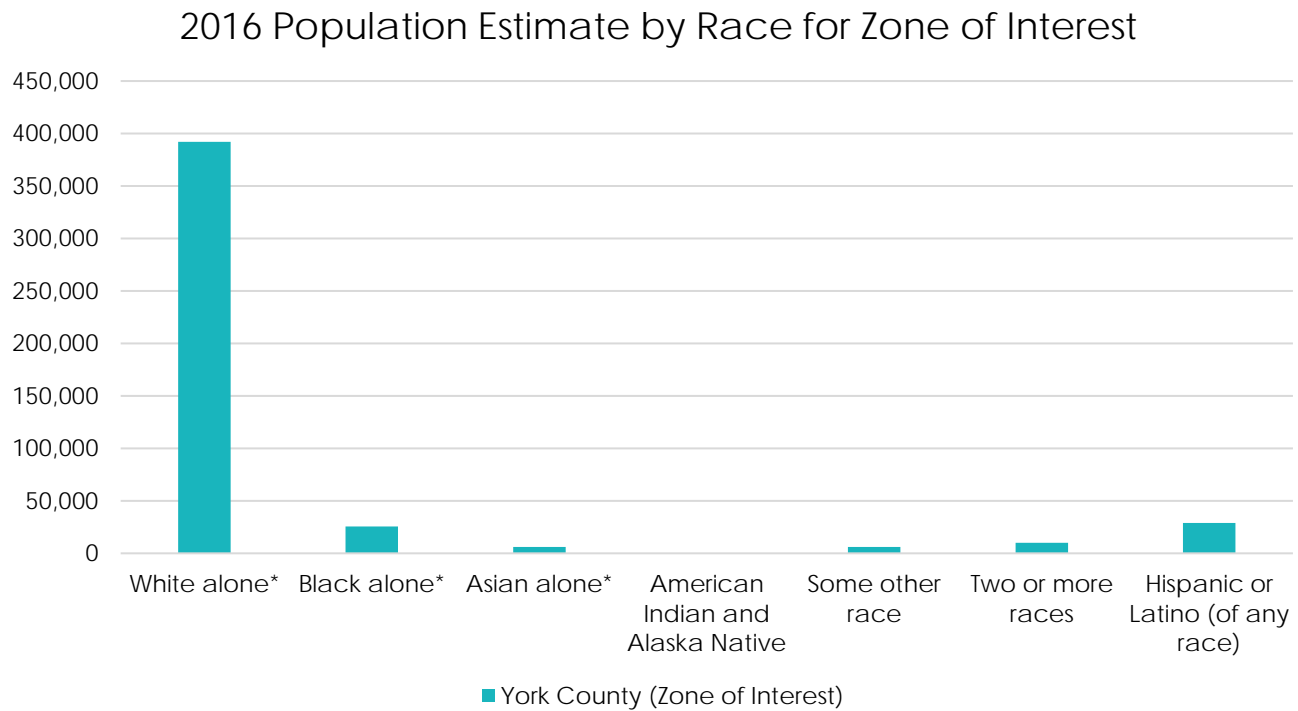
Table 2-5: 2016 Percent of Population by Age Group



Source: U.S. Bureau of Census, 2012-2016 ACS 5-Year Estimates (2016 Estimates)

Population by race is displayed in Table 2-6 below. For the zone of interest, approximately 89.0 percent of the population is White, 5.8 percent Black, 1.4 percent Asian, 0.1 percent American Indian and Alaska Native, 1.4 percent Some other race, and 2.3 percent Two or more races. At the time of data collection, 6.6 percent of the York County population identified as Hispanic/Latino.

Table 2-6: 2016 Population Estimates by Race



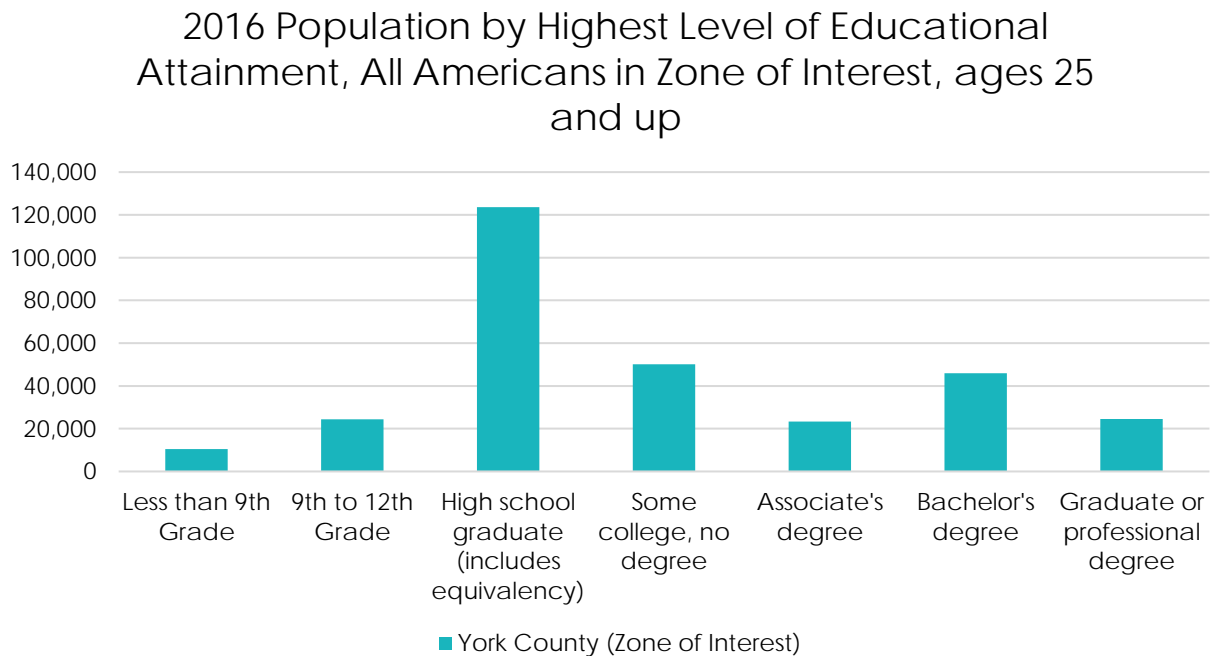
Source: U.S. Bureau of Census, 2012-2016 ACS 5-Year Estimates (2016 Estimates).

* Note that alone in this case means only one race and does not say anything about ethnicity. There may be some overlap with the Hispanic or Latino category.

2.4.3 Education and Employment

In the zone of interest, for approximately 41 percent of the population age 25 and older the highest level of education attained is a high school diploma or equivalent (123,672 people). Approximately 17 percent have some college education, but no degree (50,196 people), 15 percent have a Bachelor's degree (45,907 people), 8 percent have an Associate's degree (25,356 people), 8 percent have a Graduate or Professional degree (24,485 people), 8 percent have a 9th to 12th grade education (24,425 people), and 3 percent have less than a 9th grade education (10,484 people). Table 2-7 on the following page shows the level of education attained for persons residing in the county that makes up the zone of interest.

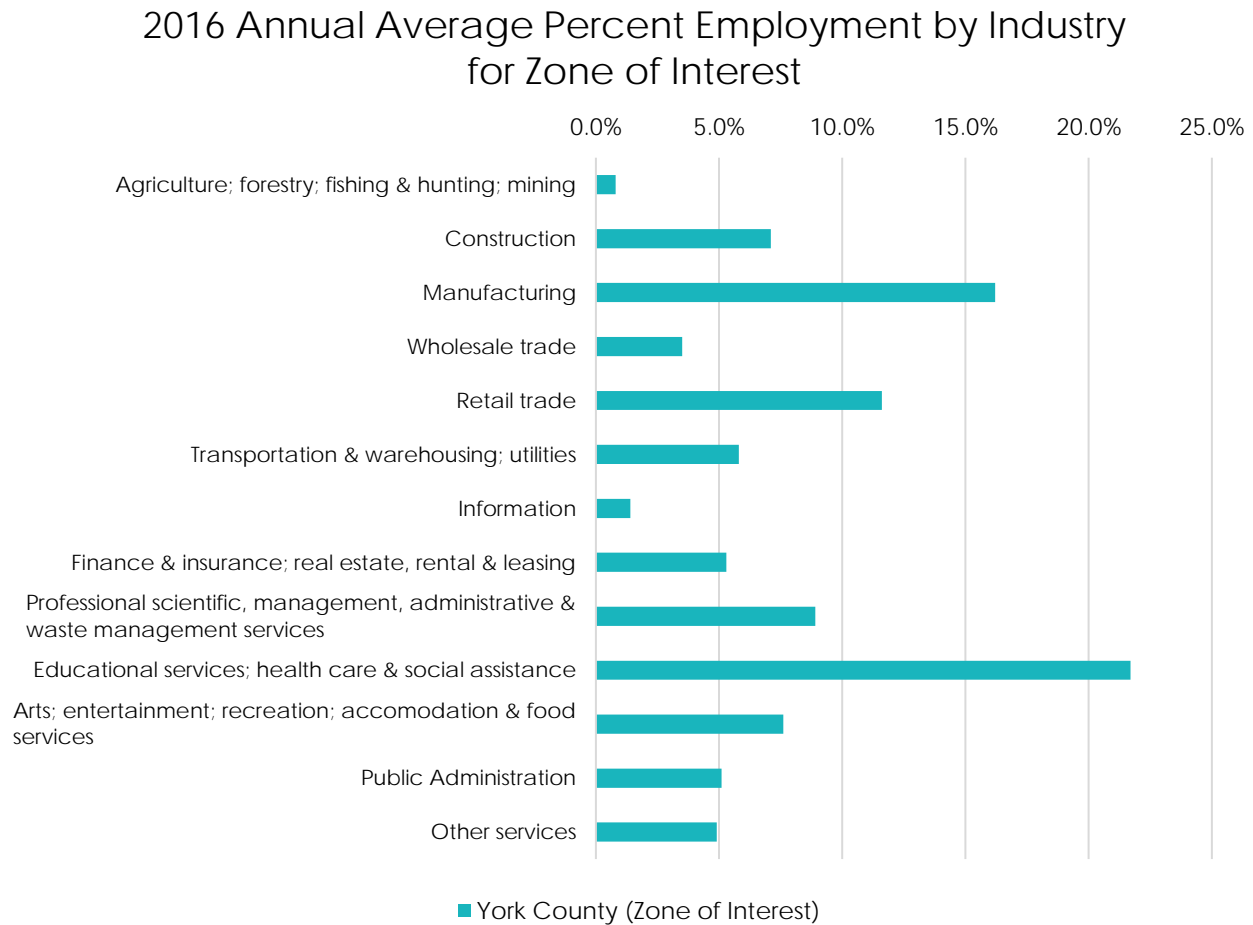
Table 2-7: 2016 Population by Highest Level of Educational Attainment, Population 25 Years of Age and Older.



Source: U.S. Bureau of Census, 2012-2016 ACS 5-Year Estimates (2016 Estimates)

Most of the zone of interest is employed in the Educational Services, Health Care and Social Assistance industry at approximately 22 percent, followed by 16 percent in Manufacturing, 12 percent in Retail Trade, 9 percent in Professional, Scientific, and Management, and Administrative and Waste Management Services, 8 percent in Arts, Entertainment and Recreation, and Accommodation and Food Service, 7 percent in Construction, 6 percent in Transportation and Warehousing, 5 percent in Finance and Insurance, and 5 percent in Public Administration. The remaining industries employed less than 5 percent each of the York County civilian workforce. Table 2-8, on the following page, shows the distribution of employment by industry for the county within the zone of interest.

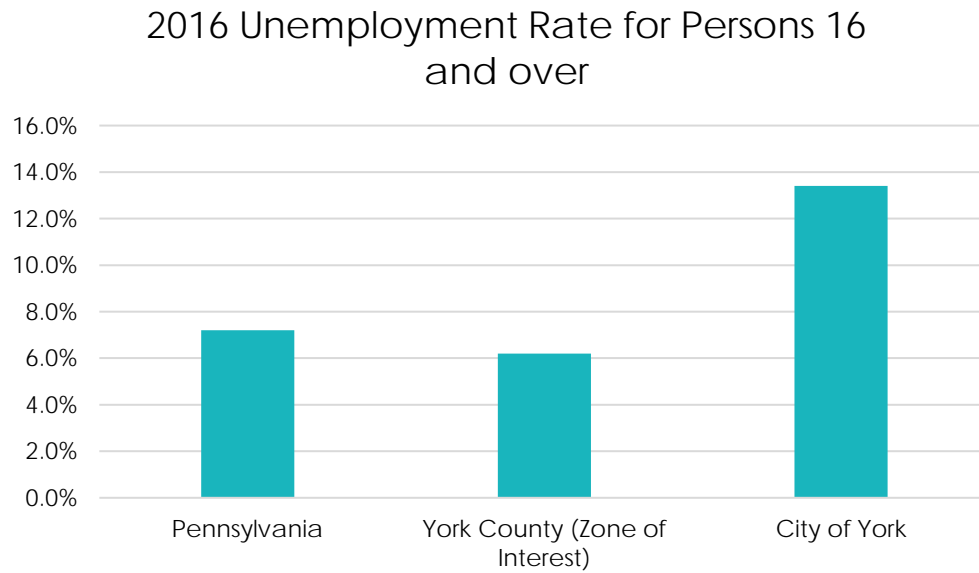
Table 2-8: 2016 Annual Average Percent Employment by Industry.



Source: U.S. Bureau of Census, 2012-2016 ACS 5-Year Estimates (2016 Estimates)

The unemployment rate for persons age 16 and over, within the zone of interest is approximately 6.2 percent. Table 2-9 shows that York County has a slightly lower unemployment rate than the state of Pennsylvania at 7.2 percent and a significantly lower unemployment rate than the City of York at 13.4 percent.

Table 2-9: 2016 Unemployment Rate.

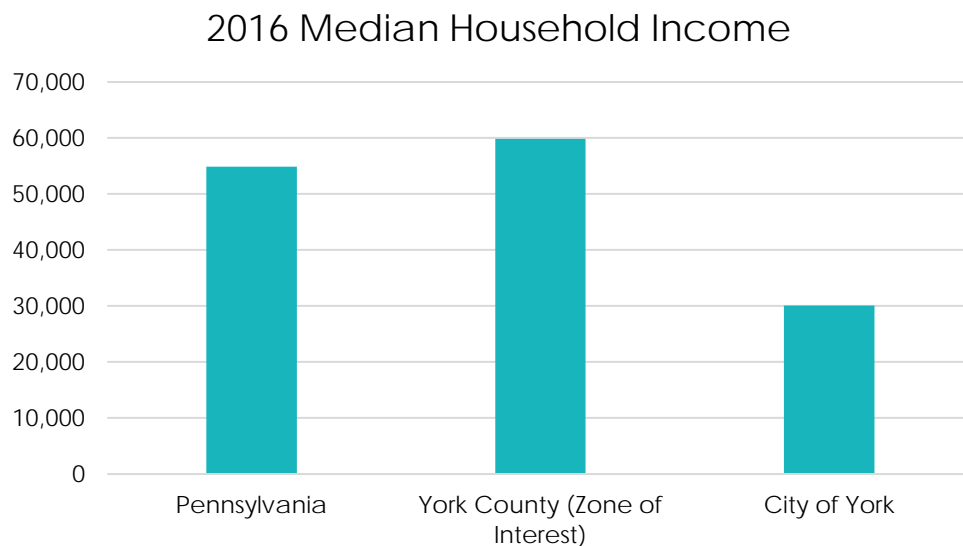


Source: U.S. Bureau of Census, 2012-2016 ACS 5-Year Estimates (2016 Estimates)

2.4.4 Households and Income

There are approximately 4,961,929 households in Pennsylvania, 168,008 households within the zone of interest, and 16,280 households within the City of York. The median household income, shown on Table 2-10, is significantly higher in York County than Pennsylvania overall. The median household income in York County is \$59,863 while the median household income for Pennsylvania is \$54,895. Both are significantly higher than the median income for the City of York (\$30,068).

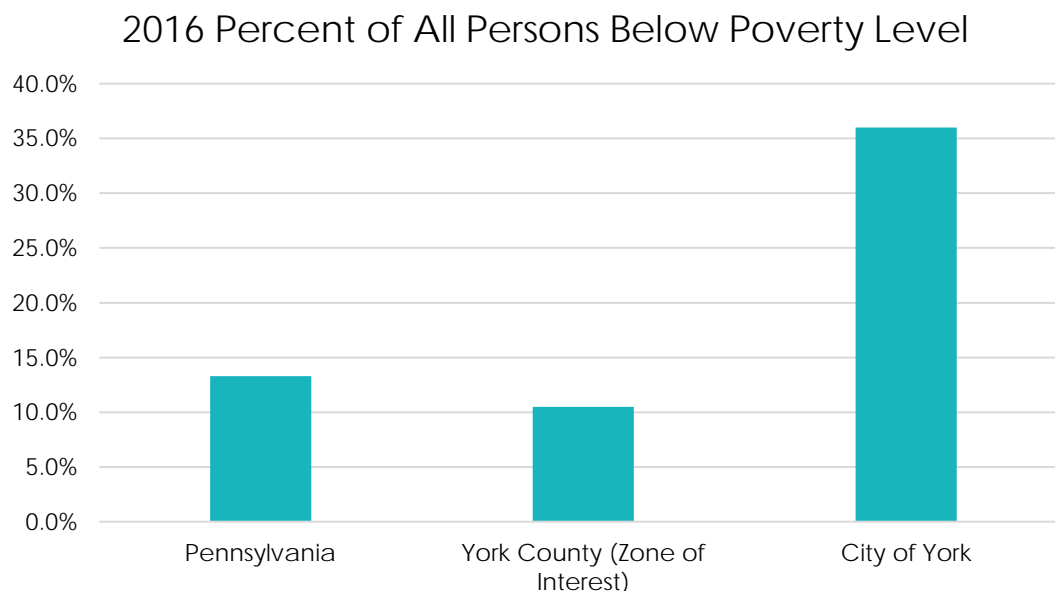
Table 2-10: 2016 Median Household Income.



Source: U.S. Bureau of Census, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimates)

The percent of persons living below the poverty level is slightly lower in York County than in the state of Pennsylvania. York County has 10.5 percent of its population living below the poverty level while the state of Pennsylvania has 13.3 percent of its population living below the poverty level. The City of York has a significantly more persons living below the poverty line (36.0 percent). Table 2-12 shows the distribution of persons living below the poverty level within the zone of interest's county, the state of Pennsylvania, and the City of York.

Table 2-12: 2016 Percent of All Persons Below Poverty Level.



Source: U.S. Bureau of Census, 2012-2016 ACS 5-Year Estimates (2016 Estimates)

2.5 RECREATION FACILITIES, ACTIVITIES, AND NEEDS

2.5.1 Zone of Influence

The primary area of influence for Indian Rock Dam is York County, Pennsylvania. Data from this one-county region provides the basis for summarizing the population characteristics of Indian Rock Dam in the previous section.

2.5.2 Visitation Profile

Most visitors to Indian Rock Dam come from York County, as stated above. These visitors come with a wide variety of interests, with fishing, kayaking, hunting, hiking, bird watching, and wildlife viewing being the most popular recreation activities. There are no developed recreational facilities or amenities within the site, besides for the five small designated parking areas and a small portion of the Hanover Trolley Trail that passes through part of the flowage easements. There is no formal tracking system for the number of visitors pursuing these low-density recreation activities at Indian Rock Dam.

2.5.3 Recreation Facilities

Although the primary function of the dam is flood risk management, the project is also authorized to support recreation opportunities around the dam. The only formal recreational facilities within

the project area are the 5 small designated parking areas used by hunters, anglers, bird watchers, and wildlife viewers, and the small portion of the Hanover Trolley Trail that passes through part of the flowage easements. Neither formal recreational facilities are managed by USACE. PGC manages and maintains the designated parking areas and the York County Rail Trail Authority (YCRTA) manages and maintains the Hanover Trolley Trail. All other recreational facilities are natural areas and have no physical or permanent structures or surfaces.

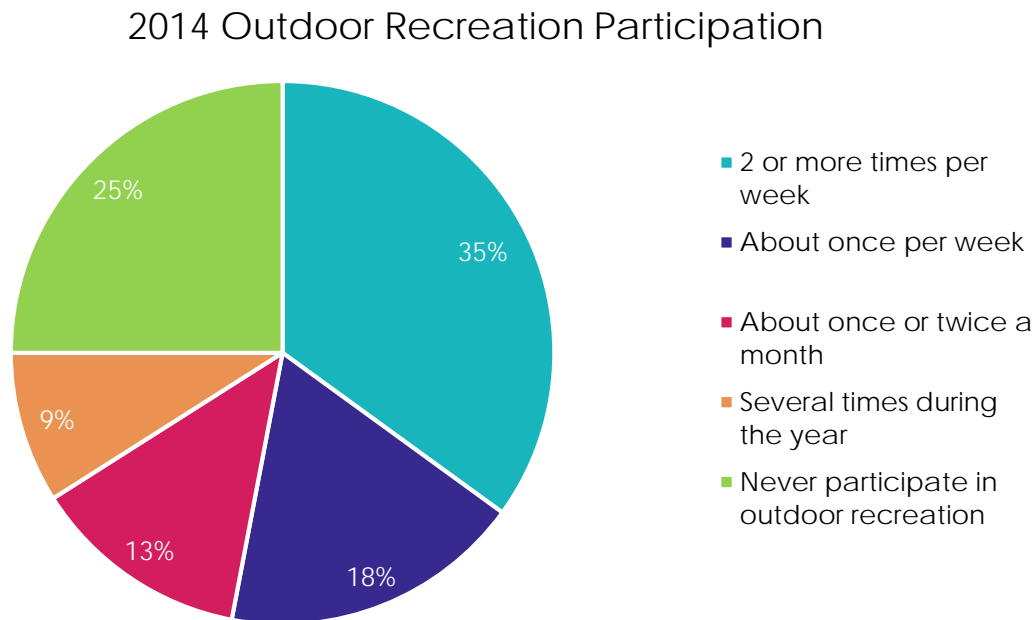
Public lands, like Indian Rock Dam, have allowed nature-based recreation to become an important and growing segment of the regional economy. The existing recreational opportunities and future potential of Indian Rock Dam is of great importance within the project's zone of influence.

2.5.4 Recreation Analysis

Indian Rock Dam passive recreation areas and water surface add to the attractiveness, vitality, and increased appreciation for the outdoors by users. These areas provide a sense of place and allow nearby urban populations to enjoy outdoor recreation opportunities in a rural, natural setting. Outdoor recreation at Indian Rock Dam generally falls within two broad categories; land-based or water-based recreation. Codorus Creek provides recreational opportunity for kayaking, fishing, and wildlife viewing. The area around the creek provides pristine natural areas for hunting, hiking, wildlife viewing, bird watching, and enjoying the great outdoors. Recreation management objectives in this Plan project future direction and actions necessary to meet the public's needs for land and/or water-based recreation.

The most recent recreational trends and analysis for the state of Pennsylvania were summarized in the Statewide Comprehensive Outdoor Recreation Plan (SCORP) 2014-2019, produced by the Pennsylvania Department of Conservation and Natural Resources (PDCNR). Recreation trends findings and analysis within the SCORP are a good representation of the recreation trends in the vicinity of the Indian Rock Dam site. As part of the SCORP, three unique surveys were used in order to better represent Pennsylvanians across the state. Almost three-quarters of respondents said they participate in outdoor recreation activities and over half (approximately 53 percent) do so one or more times per week. Table 2-13 below shows the breakdown of outdoor recreation participation among survey respondents. Pennsylvanians said providing more long distance trails and pathways and protecting and encouraging more natural settings at outdoor recreation areas and facilities would be the most effective way to participate more in outdoor recreation.

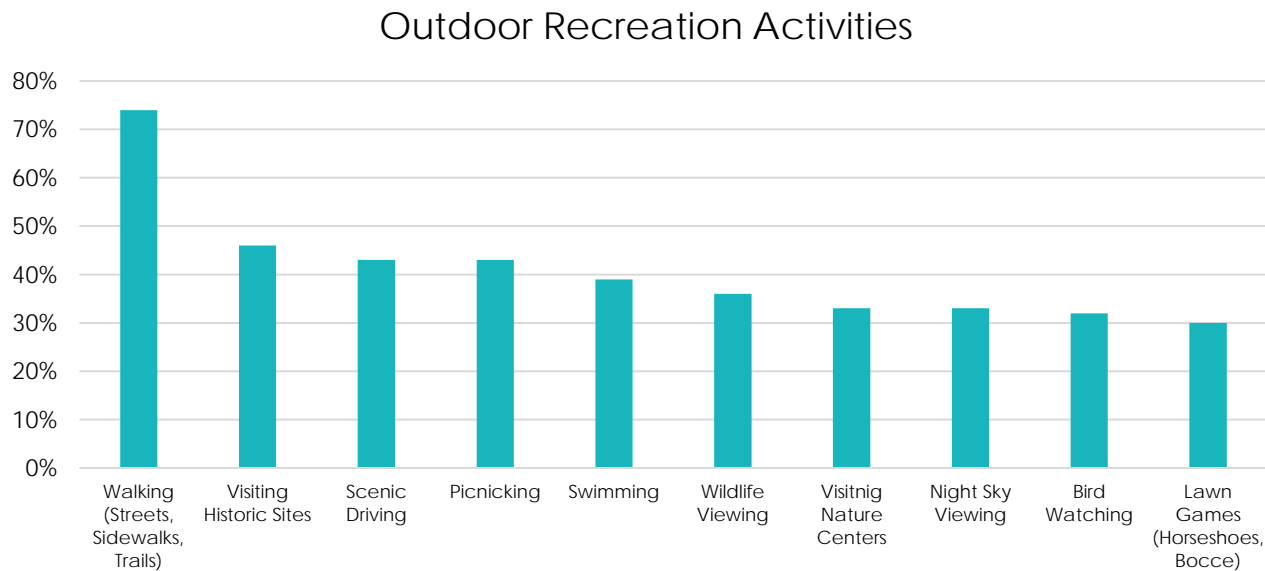
Table 2-13: 2014 Pennsylvania Outdoor Recreation Participation.



Source: Pennsylvania SCORP 2014-2019, produced by PDCNR.

Pennsylvanians place high value on the recreational and natural amenities in their community. Of 10 choices of what best represents what they value most in a community, 90 percent of respondents listed the trails, natural areas and waterways category as a choice and 75 percent listed the surrounding countryside and farm land as well as local parks and public spaces as top choices. The next highest choice, residential neighborhoods, was selected by only 35 percent of respondents. These very popular recreational and natural amenities support a wide variety of outdoor recreation activities. The most popular activity by far is walking (74 percent of respondents). Visiting historic sites is the next most popular activity at 46 percent. The other top 10 outdoor recreation activities include scenic driving, picnicking, swimming, wildlife viewing, visiting nature centers, night sky viewing, bird watching, and lawn games. Both bird watching and wildlife viewing have seen big gains in participation since 2004. See Table 2-14 below for a percentage breakdown of the top 10 outdoor recreation activities in 2014.

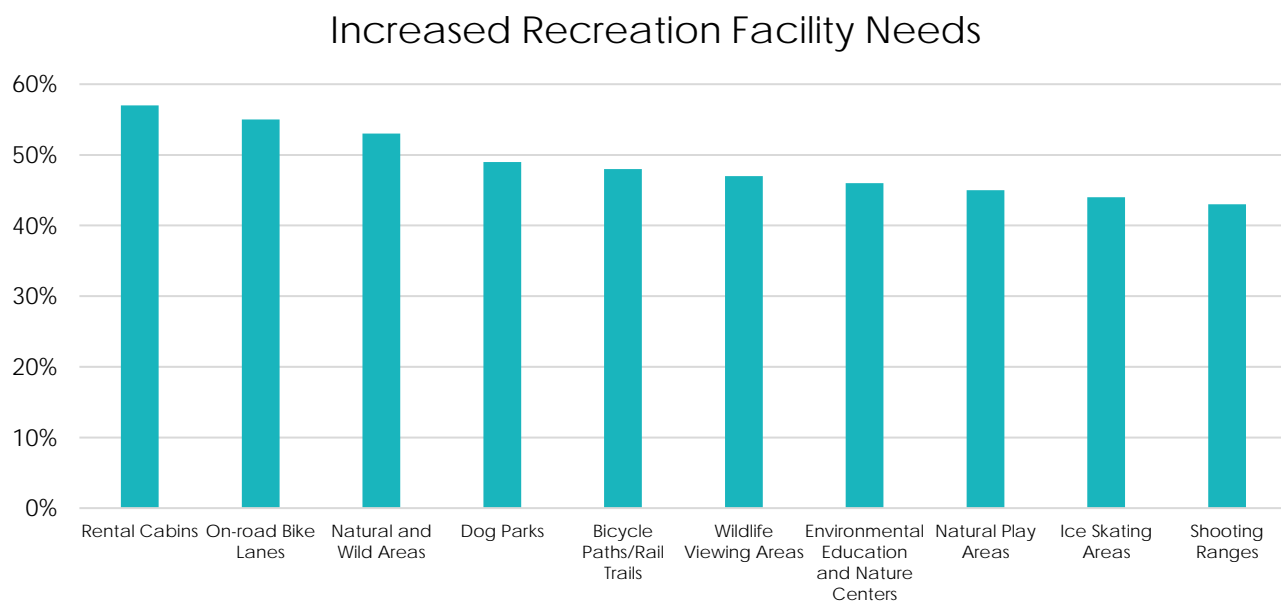
Table 2-14: Top 10 Outdoor Recreation Activities for Pennsylvanians in 2014.



Source: Pennsylvania SCORP 2014-2019, produced by PDCNR.

Survey participants were asked if certain facilities and areas were adequate or needed to be increased. Pennsylvanians seemed to be most satisfied with the number of golf courses, ice-fishing areas, waterfowl hunting areas, downhill skiing/snowboarding areas, and baseball/softball fields. 57 percent of respondents stressed a need for an increased number of rental cabins. Other increased recreation facility needs included on-road bicycle lands, natural and wild areas, dog parks, bicycle paths/ rail trails, wildlife viewing areas, environmental education/nature centers, natural play areas, ice skating areas, and shooting ranges. See Table 2-15 below for a percentage break down of the increased facility needs for Pennsylvanians in 2014.

Table 2-15: Top Recreation Areas and Increased Facility Needs for Pennsylvanians in 2014.



Source: Pennsylvania SCORP 2014-2019, produced by PDCNR.

One of the main priorities of the SCORP was Resource Management and Stewardship. Due to the strong hunting and fishing heritage, Pennsylvanians believe strongly in their natural resources and taking care of what they have, so the precious lands and waters can continue to be the setting for recreation for generations to come. Three of the SCORP Resource Management and Stewardship Objectives were to:

- Conserve and protect Pennsylvania's natural places.
- Maintain existing park, trail, and recreation areas, and prioritize other infrastructure needs.
- Cultivate support to protect wildlife and fish habitat through wildlife viewing, fishing, and hunting.

2.5.5 Recreation Carrying Capacity

Recreational carrying capacity is considered by USACE to ensure that visitors have a high quality and safe recreational experience, and that natural resources are not compromised at Indian Rock Dam.

The plan formulated herein proposes to provide a variety of activities and to encourage optimal use of present public use areas, where possible, based on the carrying capability of the land. The carrying capability of the land is determined primarily by the distinct characteristics of the site. These characteristics, both natural and manmade, are development constraints that often determine the type of facilities that should be provided.

Having amenities that cater to a variety of tastes and different members of the family will encourage visitors to enjoy the creek and natural areas. Presently, PGC and YCRTA manage recreation areas using best professional judgment to address recreation areas considered to be overcrowded, overused, underused, or well balanced. The partnership will continue to identify possible causes and effects of overcrowding and overuse and apply appropriate best management practices including: site management, regulating visitor behavior, and modifying visitor behavior.

2.6 REAL ESTATE

In 1940, approximately 1,663 acres were acquired in fee and 95 acres were placed under flowage easements for the construction of Indian Rock Dam. The project was designed to be a dry dam and remains a dry dam to this day. Approximately 3 acres were also disposed on in 1940. Currently, the fee simple lands total approximately 1,660 acres and the flowage easements total approximately 95 acres.

Since completion of the dam in September 1942, project lands continue to be outleased for agriculture, grazing, and wildlife management purposes. At the time of the original master plan, 1,630 acres of the 1,755 project acres were under lease for agriculture, grazing, and wildlife management purposes to 20 separate lessees, while 125 acres contiguous to the dam were withheld for project operations. The largest out-lease, totaling approximately 1,539 acres, was the 25-year renewable license which was granted to PGC to develop use, and control, for the purpose of wildlife and game management, except for fish, and to administer and enforce the laws of the Commonwealth pertaining to all fee-simple acres of the project besides the area designated for dam operations. In 1957, a 38-acre property within the 125 acres classified as Project Operations was out-leased to the Fraternal Order of Police to be used as a firing range and training area. Currently, there are 54 out-leases located within project lands; one to PGC for

Wildlife and Game management, one to the Fraternal Order of Police, and several for private agricultural and grazing purposes as well as public roads and private rail lines.

2.7 PERTINENT PUBLIC LAWS

The following public laws are applicable to Indian Rock Dam.

2.7.1 Federal Law

Public Law 59-209, Antiquities Act, 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.

Public Law 74-292, Historic Sites Act, 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".

Public Law 78-534, Flood Control Act, 1944. Section 4 of the act as last amended in 1962 by Section 207 of Public Law 87-874 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.

Public Law 85-624, Fish and Wildlife Coordination Act, 1958. This act as amended in 1965 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.

Public Law 86-717, Forest Conservation, 1960. This act provides for the protection of forest and other vegetative cover for reservoir areas under this jurisdiction of the Secretary of the Army and the Chief of Engineers.

Public Law 87-874, Rivers and Harbors Act, 1962. This act authorizes the construction, repair, and preservation of certain public works on rivers and harbors for navigation, flood control, and for other purposes.

Public Law 88-578, Land and Water Conservation Fund Act, 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.

Public Law 89-90, 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.

Public Law 90-483, River and Harbor and Flood Control Act, Mitigation of Shore Damages, 1968. Section 210 restricted collection of entrance fee at Corps lakes and reservoirs to users of highly developed facilities requiring continuous presence of personnel.

Public Law 91-190, National Environmental Policy Act (NEPA), 1969. 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, 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.

Public Law 91-611, River and Harbor and Flood Control Act, 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.

Public Law 92-500, Federal Water Pollution Control Act Amendments, 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. Public Law 92-500 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."

Public Law 92-516, Federal Environmental Pesticide Control Act, 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.

Public Law 93-81, Collection of Fees for Use of Certain Outdoor Recreation Facilities, 1978. 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.

Public Law 93-291, Archeological Conservation Act, 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.

Public Law 93-303, Recreation Use Fees, 1974. 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.

Public Law 93-523, Safe Drinking Water Act, 1974. 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.

Public Law 94-422, Amendment of the Land and Water Conservation Fund Act, 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 NRHP.

Public Law 99-662, The Water Resources Development Act, 1986. Provides the conservation and development of water and related resources and the improvement and rehabilitation of the Nation's water resources infrastructure.

2.7.2 State Law

State of Pennsylvania, Act 8 Project 70 Land Acquisition and Borrowing Act, 1964. This act created funding for PGC to acquire land for conservation.

State of Pennsylvania, Act 170 Wild Resource Conservation Act, 1982. This law was passed to protect endangered plants and animals.

State of Pennsylvania, Environmental Stewardship and Watershed Protection Act, 1999. This law provides money to protect open space and critical habitat, conserve river resources, create greenways, build community parks, and enhance tourism.

State of Pennsylvania, Clean Streams Law, 1937. This law provided Pennsylvania with the authority to protect stream from pollution. It prohibits littering or dumping that effects the waters and can fine up to \$10,000 for offenses.

State of Pennsylvania, Article 1 Section 27 Environmental Rights Amendment, 1969. This article provides two rights to a clean environment for Pennsylvania's citizens: a right to clean air, pure water, and the preservation of the natural, scenic, historic, and aesthetic values of the environment and a right to have public natural resources conserved and maintained by the Commonwealth for the benefit of present and future generations.

3 RESOURCE OBJECTIVES

3.1 INTRODUCTION

This chapter sets forth goals and objectives necessary to achieve the USACE vision for the future of Indian Rock Dam. The terms “goals” and “objectives” are often defined as synonymous, but in the context of this Plan, goals express the overall desired end state of the cumulative land and recreation management programs at Indian Rock Dam. Resource objectives specify task-oriented actions necessary to achieve the master plan goals.

3.2 MANAGEMENT GOALS

The following goals are the priorities for consideration when determining management objectives and development activities. Implementation of these goals is based upon time, manpower, and budget. The objectives provided in this chapter are established to provide high levels of stewardship to USACE managed lands and resources while still providing a high level of public service. These goals will be pursued using a variety of mechanisms such as: assistance from volunteer efforts, hired labor, contract labor, permit conditions, remediation, and special lease conditions. It is the intention of Indian Rock Dam staff to provide a realistic approach to the management of all resources.

- **Goal A** Provide the best management practices to respond to regional needs, resource capabilities and capacities, and expressed public interests consistent with authorized project purposes.
- **Goal B** Protect and manage project natural and cultural resources through sustainable environmental stewardship programs.

- **Goal C** Provide public outdoor recreation opportunities that support project purposes and public interests while sustaining project natural resources.
- **Goal D** Recognize the unique qualities, characteristics, and potentials of the project.
- **Goal E** Provide consistency and compatibility with national objectives and other state and regional goals and programs.

In addition to the above goals, USACE management activities are guided by USACE-wide Environmental Operating Principles (EOPs) as follows:

- Strive to achieve environmental sustainability. An environment maintained in a healthy, diverse and sustainable condition is necessary to support life.
- Recognize the interdependence of life and the physical environment. Proactively consider environmental consequences of USACE programs and act accordingly in all appropriate circumstances.
- Seek balance and synergy among human development activities and natural systems by designing economic and environmental solutions that support and reinforce one another.
- 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.
- Seek ways and means to assess and mitigate cumulative impacts to the environment; bring systems approaches to the full life cycle of our processes and work.
- Build and share an integrated scientific, economic and social knowledge base that supports a greater understanding of the environment and impacts of our work.
- Respect the views of individuals and groups interested in USACE 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.

3.3 RESOURCE OBJECTIVES

Resource objectives are defined as clearly written statements that respond to identified issues and that specify measurable and attainable activities for resource development and/or management of the lands and waters under USACE jurisdiction. The objectives stated in this master plan support the Plan's goals, USACE EOPs, and applicable national performance measures. They are consistent with authorized project purposes, Federal laws and directives, regional needs, resource capabilities, and they take public input into consideration.

The objectives in this Master Plan are intended to provide project benefits, meet public needs, and foster environmental sustainability for Indian Rock Dam to the greatest extent possible.

Resource Objective 1. Improve infrastructure and utilities.

Supporting Objectives:

- Address key safety concerns.

Resource Objective 2. Enhance existing recreation sites and amenities.

Supporting Objectives:

- Maintain the natural character of the area.
- Focus on projects that enhance the existing low-density recreation activities on project lands, including fishing, kayaking, hunting, hiking, and wildlife viewing.

Resource Objective 3. Expand recreational opportunities in key areas.

Supporting Objectives:

- Consider low impact recreational amenity development, like soft surface trails, kayak intake areas, or designated parking areas in order to support an increased recreational demand while also maintaining the natural character of the project.

Resource Objective 4. Invest in key operational and support facilities.

Supporting Objectives:

- Provide proper maintenance and care for dam works and administrative / maintenance facilities.

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4 Land Details

4.1 LAND ALLOCATION

All project lands, for USACE water resource development projects, are allocated by USACE into one of four categories, in accordance with the congressionally authorized purpose for which the project lands were acquired. There are four possible categories of allocation identified in USACE regulations including Operations, Recreation, Fish and Wildlife, and Mitigation. When Indian Rock Dam was established, the only land allocation category that applied to the project was Operations, which includes lands required to operate the dam and accomplish the primary authorized purposes of the project.

4.2 LAND CLASSIFICATION

The objective of classifying project lands is to identify how a given parcel of land shall be used now and in the foreseeable future. Land classification is a central component of this plan, and once a classification is established any significant change to that classification would require a formal process including public review and comment. Ongoing and planned management practices for each classification are set forth in Chapter 5 – Resource Plan.

4.2.1 Prior Land Classifications

Land classification was completed when the project was originally constructed. The classification process refines the land allocations to fully utilize project lands and must consider public desires, legislative authority, regional and project specific resource requirements, and suitability.

The 1959 Master Plan for Indian Rock Dam broke up the fee ownership land into two categories of land classification, Project Operations and Wildlife and Game Management, where the Project Operations area was not open for out-leasing, while the Wildlife and Game Management Area was already leased or had the potential to be leased in the future. In the 60 years since the previous Master Plan was published, although most of the land remains under lease for wildlife and vegetative management purposes, USACE documentation and policies have experienced changes and updates, thus classification revisions are necessary. A summary of prior land use classifications and newly proposed current land use classifications is provided in Table 4-1 below.

Table 4-1 Land Classification Summary

Prior (1959) Land Classifications	Acres	Current Land Classifications	Acres
Project Operations	125	Project Operations	95
Wildlife and Game Management	1,634*	High-Density Recreation	0
Total	1,759*	Multiple Resource Management	1,590
		Low Density Recreation	2
		Vegetative Management	1,588
		Water Surface	70
		Restricted	1
		Open Recreation	69
		Total	1,755

*The 1959 Master Plan stated that 1,664 acres of land, of which 1,539 acres fell under the classification of Wildlife and Game Management and 125 acres fell under the classification of Project Operations, were acquired in fee, while 95 acres were under flowage easements. For the sake of consistency, flowage easement and fee-simple acreages were combined for the Prior Land Classifications, where the 95 acres of flowage easements were classified as Wildlife and Game Management.

Figure 4-1

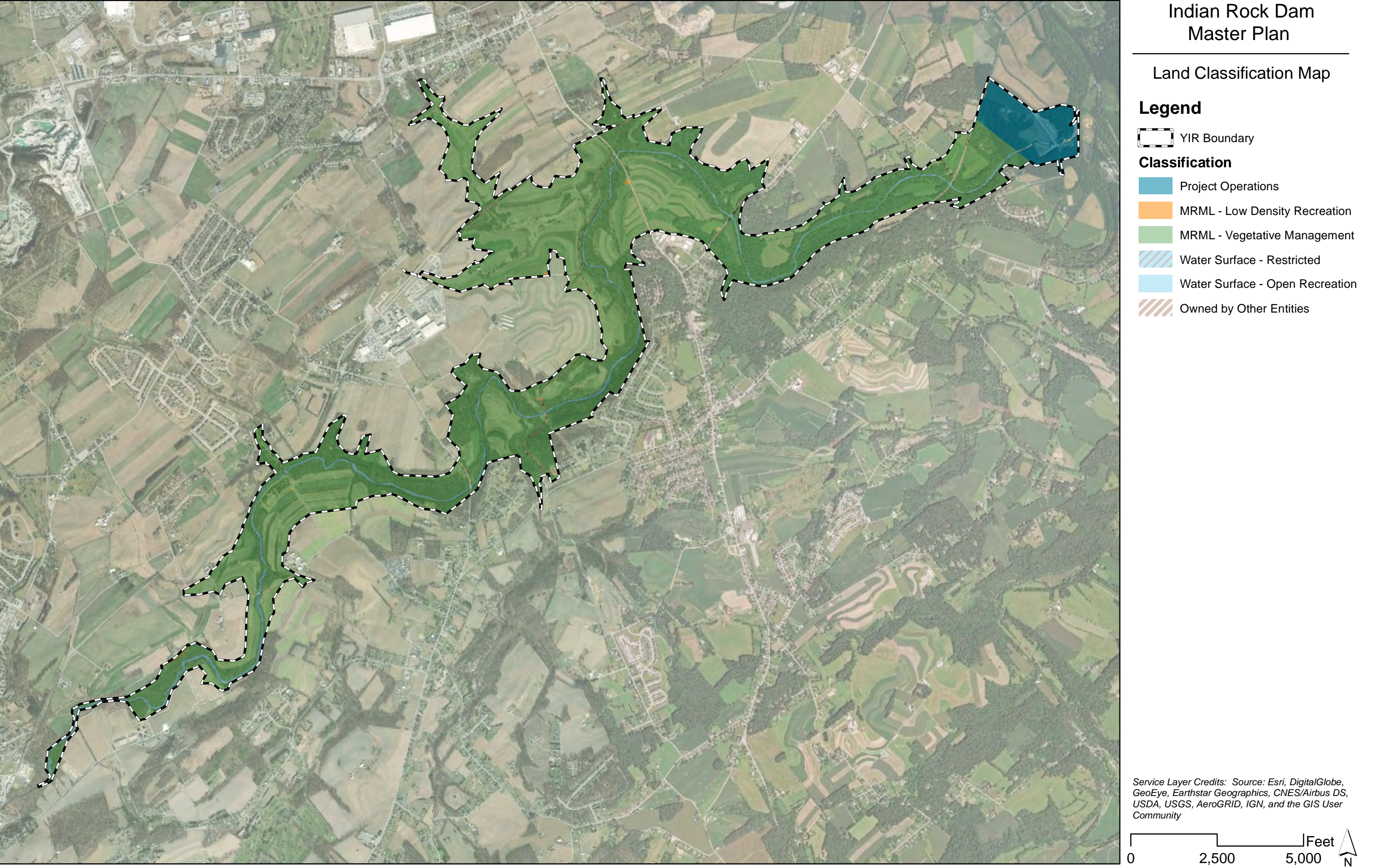
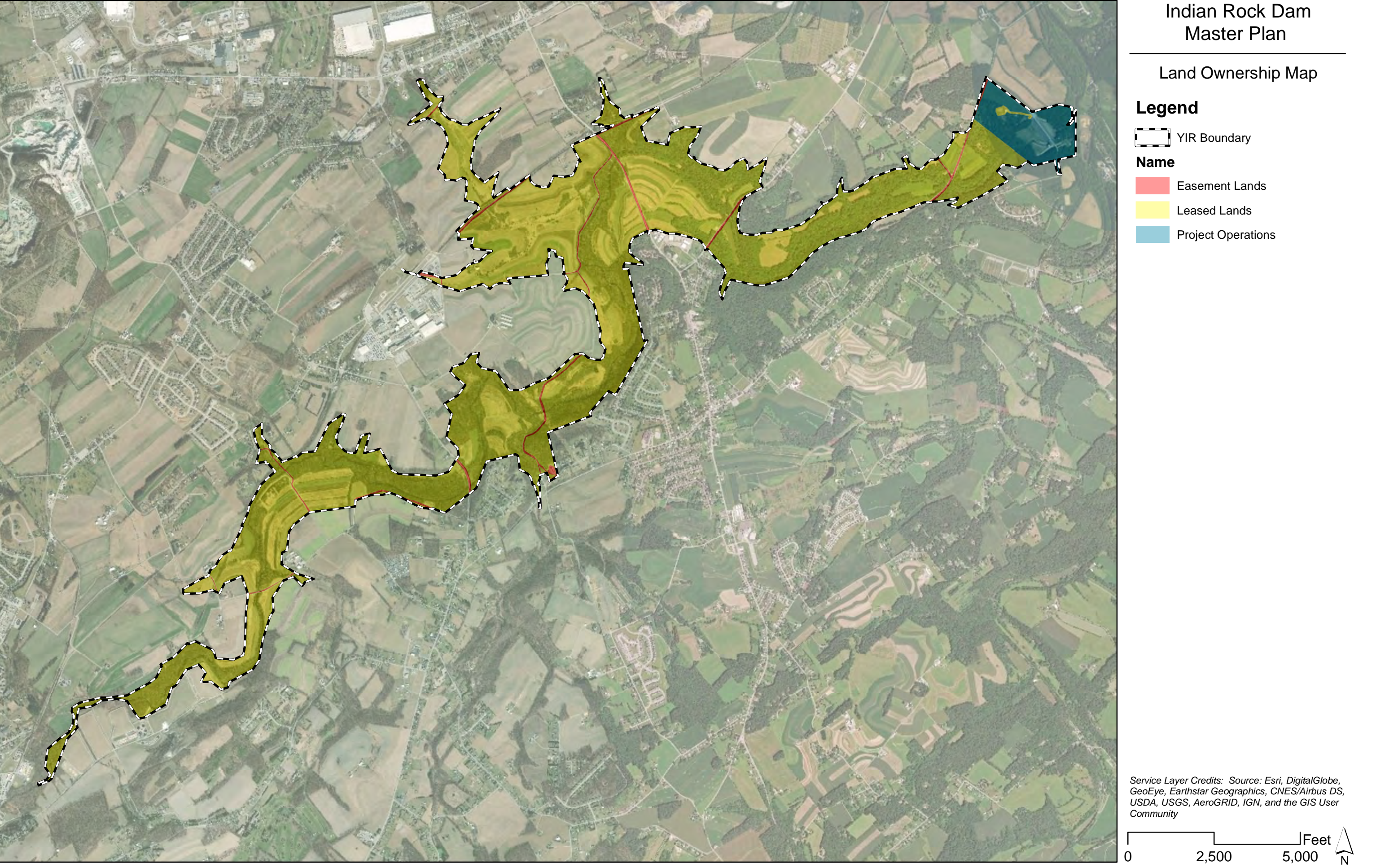


Figure 4-2



INDIAN ROCK DAM MASTER PLAN

4-4

4.2.2 Current Land Classifications

Land Classification indicates the primary use for which project lands are managed. There are 4 categories of classification identified in USACE regulation EP 1130-2-550, Chapter 3, including: Project Operations, High Density Recreation, Multiple Resource Management Lands, and Water Surface. Figure 4-1 on page 4-3 shows the breakdown of land classifications at Indian Rock Dam. Figure 4-2 on page 4-4 shows the breakdown of total land acreages, either in fee or under easement, for the site. Project Easements are also explained in section 4.3 on page 4-6.

4.2.2.1 Project Operations

This classification category includes all project lands required for the structure, operation, administration, or maintenance of the project and which must be maintained to carry out the authorized purpose of flood risk management. Approximately 95 acres at Indian Rock Dam are allocated to project operations, encompassing dam operations including the dam, control tower, maintenance facility, spillway, restricted access roads, and administration offices. This classification also includes a private firing range and training facility that is leased and managed by the Fraternal Order of Police. This facility has no effect on dam operations.

4.2.2.2 High Density Recreation

These are lands developed for intensive recreational activities. There are no areas within the project boundary that are designated High Density Recreation.

4.2.2.3 Multiple Resource Management

This classification category identifies the predominant use of an area with the understanding that the other compatible uses can occur within the area. This classification is divided into three sub-classifications identified as: Low Density Recreation, Vegetative Management, and Wildlife Management. A given tract of land may be classified using one or more of these sub-classifications. There are 1,590 acres of land that are under this classification. The following identifies the amount contained in each sub-classification of Multiple Resource Management Lands (MRML).

Low Density Recreation

These are lands with minimal development or infrastructure that support passive public recreation use, like fishing, hunting, hiking, or wildlife viewing. Low density recreation areas include 5 PGC-maintained dedicated parking areas as well as the Hanover Trolley Trail, which crosses over part of the flowage easements on the property. There are less than 2 acres under this classification.

Vegetative Management

These are lands designated for stewardship of forest, prairie, and other native vegetative cover. The primary objective for these lands is to manage the forest to ensure a healthy, diverse, and visual aesthetic continuous forest canopy throughout the Indian Rock Dam property. The provision and protection of wildlife habitat and the availability of these lands for passive recreation activities are also important objectives. PGC completes prescribed burns on 350 acres of land under this sub-classification in order to stabilize the vegetative areas. They also manage several Habitat Restoration Areas in order to support a healthy

ecosystem for all plant and animal species in the area. There are 1,588 acres classified as MRML - Vegetative Management.

4.2.2.4 Water Surface

There is no permanent pool at Indian Rock Dam. In accordance with national USACE guidance set forth in EP 1130-2-550, the water surface of Codorus Creek may be classified using the following 2 classifications: Restricted and Open Recreation. There are 70 acres of water surface within project boundaries. The following water surface classifications are designated at Indian Rock Dam.

Restricted

Restricted water surface includes those areas where recreational fishing and kayaking is prohibited or restricted for project operations, safety and security purposes. The Restricted water surface at Indian Rock Dam include a small area around the dam and intake tower as well as the spillway. The total acreage of Restricted water surface is less than 1 acre.

Open Recreation

Open Recreation includes all water surface areas available for year-round or seasonal water-based recreational use. With the exception of the Restricted areas described in the above paragraphs, the remaining water surface of approximately 69 acres at Indian Rock Dam is designated as Open Recreation.

4.3 PROJECT EASEMENT LANDS

Easement lands include all lands for which USACE holds an easement interest but not fee title. This could describe a situation in which USACE agreed to easement rights on fee title property, or pursued easement rights on land outside the original fee simple purchase. There are several utility easements on original fee title property at Indian Rock Dam. Public roads and private rail lines within the project property total approximately 10 acres. PGC leases approximately 1,539 acres of land for wildlife and vegetative management purposes. The Fraternal Order of Police leases 38 acres for a private shooting range at the far end of the dam. There are also several private agricultural out-leases scattered throughout project lands that total approximately 150 acres. Additionally, USACE has the right to flood approximately 95 acres of lands that are within flowage easements at Indian Rock Dam. *[Note: Awaiting real estate information to populate land-ownership data.]*

5 Resource Plan

5.1 RESOURCE PLAN OVERVIEW

This chapter sets forth a resource plan describing, in broad terms, how each land classification within the Master Plan will be managed. All management goals described in Section 3.2 apply to each land classification, but the primary goal(s) for each classification is listed below for emphasis. Refer to Section 3.2 for a listing of management objectives applicable to each management goal.

Management of all lands, recreation facilities, and related infrastructure must take into consideration the effects of pool fluctuations associated with the authorized flood risk management mission. Management actions are dependent on congressional appropriations, the financial capability of lessees and other key stakeholders, and the contributions of labor and other resources by volunteers. The land classifications and applicable management goals for each classification for Indian Rock Dam include the following:

- Project Operations: Goal A, E
- High Density Recreation: Not Applicable
- Multiple Resource Management Lands for:
 - Low Density Recreation: Goal C, E
 - Vegetative Management: Goal B, D, E
 - Wildlife Management: Goal B, D, E
- Water Surface:
 - Restricted Area: A, E
 - Open Recreation: A, C, E

A more descriptive and detailed plan for managing project lands can be found in Indian Rock Dam – Operations Management Plan (OMP) which is an annually-updated, task and budget-oriented plan identifying tasks necessary to implement the Resource Plan and achieve the goals and objectives of the Master Plan.

5.2 PROJECT OPERATIONS

This land is associated with the dam and spillway structures that are operated and maintained for the purpose of fulfilling the flood risk management mission of Indian Rock Dam, as well as with the 35-acre private firing range leased to the Fraternal Order of Police to use for training and administrative purposes. There are 95 acres of lands under this classification.

Since the firing range site is out-leased, USACE does not manage the site nor do they provide direct maintenance within the area, but they do review requests and ensure compliance with applicable laws and regulations for proposed activities, like creating an indoor firing range facility within the leased lands. USACE works with the Fraternal Order of Police to ensure that the firing range is managed and operated in accordance with the goals and objectives prescribed in Chapter 3.

5.3 HIGH DENSITY RECREATION

Lands classified for High Density Recreation are currently developed for intensive recreational activities. Indian Rock Dam does not have any distinct areas within this sub classification.

5.4 MULTIPLE RESOURCE MANAGEMENT LANDS

MRML are, as the name implies, lands that serve multiple purposes, but that are sub-classified and managed for a predominant use. The following paragraphs describe the various sub-classifications of these lands at Indian Rock Dam, the number of acres in each sub-classification, and the management plan for these lands.

Low Density Recreation

Future management of these lands calls for maintaining a healthy, ecologically adapted vegetative cover to reduce erosion and improve aesthetics while also supporting low impact recreational opportunities. The general public may use these lands for bank fishing, hiking, wildlife viewing, and for access to the shoreline. Hunting is allowed in select areas that are a reasonable and safe distance from high density recreational areas, dam operations, and adjacent residential properties. There are currently less than 2 acres of MRML – Low Density Recreation at Indian Rock Dam. There are no future plans for the existing low-density recreation lands. Figure 5-1 on page 5-5 calls out all existing recreational interests located on project lands.

Vegetative Management

In general, vegetative resources on USACE lands are managed for multiple purposes including wildlife habitat, landscape aesthetics, and timber. Management of forest on USACE lands nationwide is guided, in part, by policy set forth in Public Law 86-717, the Forest Cover Act, which states that "...project lands shall be developed and maintained to assure a future supply of timber through sustained yield programs to the extent that such management is practicable and compatible with other uses of the project." Additional forest management guidance is set forth in USACE regulations ER & EP 1130-2-540, which specifies that stewardship of project land shall be

ecosystem based. PGC completes prescribes burns on 350 acres of land under this sub-classification in order to stabilize the vegetative areas.

Current recreational use of these lands includes, but is not limited to hunting, bank fishing, wildlife viewing, and hiking. Future uses include all existing uses with the possibility of enhancing these uses with amenities like signage or new primitive access trails. There are 1,592 acres of land classified as MRML – Vegetative Management at Indian Rock Dam.

5.5 WATER SURFACE

There is no permanent pool at Indian Rock Dam. In accordance with national USACE guidance set forth in EP 1130-2-550, the water surface of Codorus Creek may be classified using the following 2 classifications:

- Restricted
- Open Recreation

There are 70 acres of water surface within project boundaries. The following water surface classifications are designated at Indian Rock Dam.

Restricted

Restricted water surface includes those areas where recreational fishing and kayaking is prohibited or restricted for project operations, safety and security purposes. The Restricted water surface at Indian Rock Dam include a small area around the dam and intake tower as well as the spillway. The total acreage of Restricted water surface is less than 1 acre.

Open Recreation

Open Recreation includes all water surface areas available for year-round or seasonal water-based recreational use. Except for the Restricted areas described in the above paragraphs, the remaining water surface of approximately 69 acres at Indian Rock Dam is designated as Open Recreation.

5.6 PROJECT EASEMENT LANDS

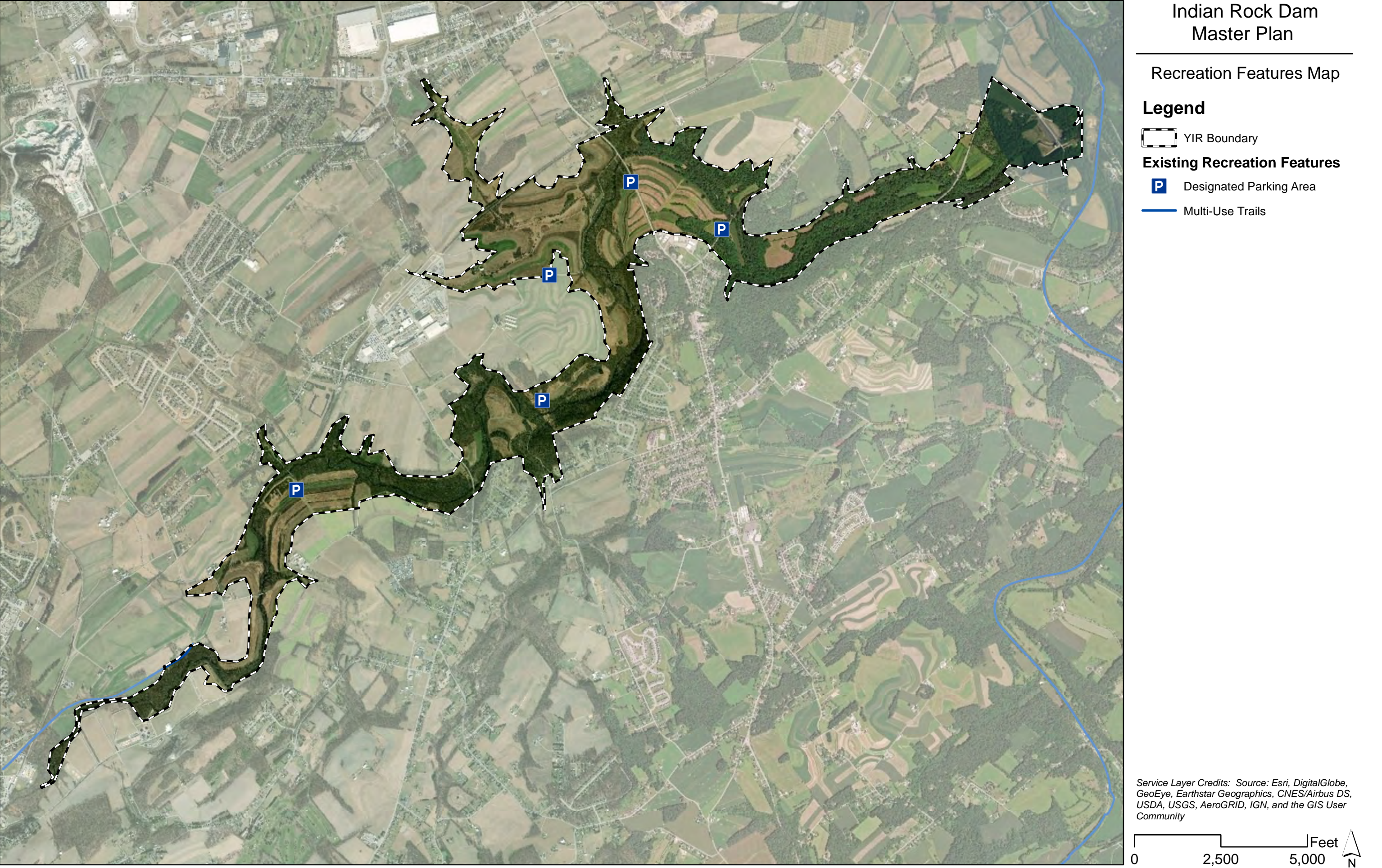
Future management of easement Lands at Indian Rock Dam includes routine inspection of these areas to ensure that the Government's rights specified in the easement deeds are protected. Placement of any structure that may interfere with the USACE flood risk management mission may be prohibited.

5.7 DEVELOPMENT COURSE OF ACTION

The planning team met with Indian Rock Dam and PGC representatives in November 2018. At that time, no future development initiatives were identified for project lands. Any proposed future development courses of action will remain in the out-leased portions of the property. Low density recreation opportunities, like hunting and shoreline fishing, will continue to be pursued on project lands. Most land will remain classified as MRML – Vegetative Management and any enhancements will be aimed at enhancing the natural features of the area.

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Figure 5-1



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6 Special Topics, Issues, Considerations

6.1 ADDITIONAL MISSIONS

Indian Rock Dam operates under the single authorized purpose of flood risk management. This mission serves a critical need to the local community and will remain paramount to project operations in the long-range future. Other projects like Indian Rock Dam have taken on additional mission-sets which provide additional services to the local community, such as recreational amenities, while continuing to answer the call of the primary mission.

6.2 PERMANENT POOL

Accepting the additional missions is only possible if the primary mission is not compromised by the service requirements of additional mission-sets, while ensuring the natural environment is unharmed. One frequent topic of discussion for Indian Rock Dam is the possibility of hosting a permanent pool to support recreation activities or water supply requirements. Key considerations of this possibility are discussed below.

- There is an operational papermill upstream of the project. Although the papermill is under stricter environmental guidelines and overall pollution has decreased over the years, the papermill still significantly pollutes Codorus Creek. Until the papermill is no longer operational, there will always be a pollution issue for Codorus Creek.
- Since the dam was originally built as a dry dam, the overall design and building materials used may not hold up with a permanent increase in water level. For example, the cables used for the flood gates were not designed to be constantly submerged in water. If a permanent pool was supported, then the cables may need to be replaced more frequently. Thus, maintenance and overall costs would most likely increase.
- There is a large recreational lake near the site. Thus, the recreational demand for water-based recreation may already be fulfilled by other projects in the area.

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7 Public and Agency Coordination

7.1 PUBLIC AND AGENCY COORDINATION OVERVIEW

USACE policy guidance in ER 1130-2-550, Change 7, January 30, 2013 and EP 1130-2-550, Change 5, January 30, 2013 requires thorough public involvement and agency coordination throughout the master plan revision process including any associated environmental assessment process. Public involvement is especially important at Indian Rock Dam to ensure that future management actions are both environmentally sustainable and responsive to public outdoor recreation needs within the region. The following milestones provide a brief look at the overall process of revising the Indian Rock Dam Master Plan.

- 13 November 2018, the planning team visited Indian Rock Dam where initial introductions, site orientation, a site tour, and concept discussions took place.
- Pre-Draft Master Plan & Environmental Assessment (EA) Submittal to project staff and USACE: 15 February 2019.
- Draft Master Plan & EA Submittal (Public Review): 25 April 2019.
- A Public Review—Town Hall Meeting will be held on (tentatively) 16 May 2019.
- Prefinal Master Plan & EA Submittal: 7 June 2019.
- Final Master Plan and EA Submittal: 31 July 2019.
- EA Administrative Record: 29 August 2019.

[This section will be updated in subsequent submittals to provide an accurate description of all review milestones and public engagement initiatives]

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8 Summary of Recommendations

8.1 SUMMARY OVERVIEW

The preparation of the Indian Rock Dam Master Plan follows the USACE master planning guidance in ER 1130-2-550 and EP 1130-2-550, both dated 13 January 2013. Three major requirements set forth in the new guidance include (1) the preparation of contemporary Resource Objectives, (2) Classification of project lands using the newly approved classification standards, and (3) the preparation of a Resource Plan describing in broad terms how the land in each of the land classifications will be managed into the foreseeable future. Additional important requirements include rigorous public involvement throughout the process, and consideration of regional recreation and natural resource management priorities identified by other federal, state, and municipal authorities. The study team followed this guidance to prepare a master plan that will provide for enhanced recreational opportunities for the public, improve environmental quality, and foster a management philosophy conducive to existing and projected staff levels at Indian Rock Dam. Factors considered in the Plan were identified through discussions with project representatives, USACE, PGC, and the general public. This Master Plan will ensure the long-term sustainability of the USACE-managed recreation program and natural resources associated with the Indian Rock Dam project.

8.2 LAND RECLASSIFICATION PROPOSALS

While proposed changes in land classification at the project, as presented in Section 4, are indicative of future development initiatives, it should be noted that most land classification changes at Indian Rock Dam reflect classification criteria change more than any planned development. A summary of land classification changes is provided in Table 8-1.

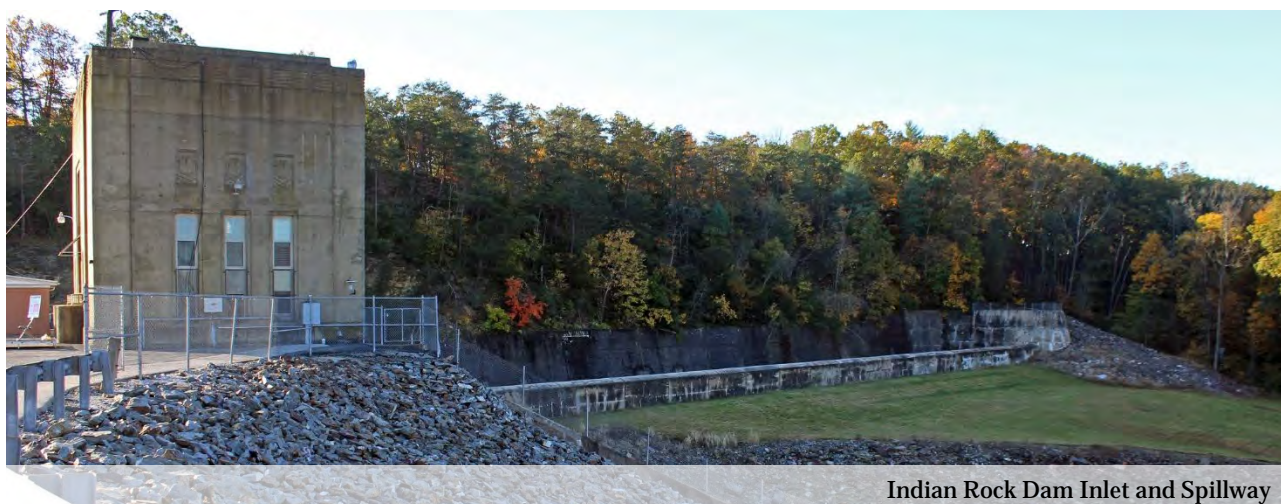
Table 8-1 Land Classification Summary

Prior (1959) Land Classifications	Acres	Current Land Classifications	Acres
Project Operations	125	Project Operations	95
Wildlife and Game Management	1,634*	High-Density Recreation	0
		Multiple Resource Management	1,590
		Low Density Recreation	2
		Vegetative Management	1,588**
		Water Surface	70
		Restricted	1
		Open Recreation	69
	Total	Total	1,759

*The 1959 Master Plan stated that 1,664 acres of land, of which 1,539 acres fell under the classification of Wildlife and Game Management and 125 acres fell under the classification of Project Operations, were acquired in fee, while 95 acres were under flowage easements. For the sake of consistency, flowage easement and fee-simple acreages were combined for the Prior Land Classifications, where the 95 acres of flowage easements were classified as Wildlife and Game Management.

** All lands that are not designated operations, water surface, or low density recreation, fall under vegetative management.

Land classification criteria is now more specific and conservative than previous versions of Master Planning guidance. The changes are in large part semantics, with no real modification to land use at the site. A summary of land classification changes and justification is provided in Table 8-2 on the following page.



Indian Rock Dam Inlet and Spillway

Table 8-2 Land Classification Change Justifications

Land Classification	Totals (acreage)	Justification
Project Operations	1961: 125 2019: 95	Under the current land use classification criteria, Project Operations is limited to land provided direct support to the operations of the project's primary missions. Although unrelated to USACE project operations, this classification also includes the private firing range leased and managed by the Fraternal Order of Police. Although the mission-support areas of the project have not changed since the 1961 Master Plan, the land fitting the new criteria totals 95 acres due
High-Density Recreation	1961: 0 2019: 0	Under the new criteria, areas developed specifically to support recreation activities meet the intent of the high-density recreation classification. There are no areas designated High Density Recreation within the project boundary.
Multiple Resource Management Land— Low Density Recreation	1961: 0 2019: 2	There was no previous classification that addressed low density recreation. The 1959 Master Plan designated all areas not associated with project operations as Wildlife and Game Management Areas. When applying the current definition to the land classification, it leaves only areas with minimal development to support passive recreation use, i.e. the five parking areas for hunting, fishing, and wildlife viewing activities as well as the Hanover Trolley Trail within a part of the flowage easements. There are less than 2 acres fitting the current criteria.
Multiple Resource Management Land— Vegetative Management	1961: TBD 2019: 1,588	This classification was not considered in the previous Master Plan. Under the current criteria, this category includes land designated for stewardship of forest, prairie, and other native vegetative cover. The land may or may not be protected from development but is currently (and for the foreseeable future) undeveloped green space. There are 1,588 acres that fall within the current criteria. The 350-acres of Prescribed Burn Zones, managed by PGC, are included within the sub-classification. PGC also manages several Habitat Restoration Areas in order to support a healthy ecosystem for plant and animal species in the area.
Multiple Resource Management Land— Wildlife Management	1961: 1,759 2019: 0	The previous classification of Wildlife and Game Management Area is comparable to the intent of Wildlife Management, but the classification also included Vegetative Management areas. The current regulations separate the two classifications. The Wildlife Management criteria includes land

designated for stewardship of fish and wildlife resources. There are no areas that fall within the current criteria.

Water Surface, Restricted	1961: 0 2019: 1	At the time of the original 1959 Master Plan, there was no classification that addressed the water surface of Codorus Creek. Since Indian Rock Dam is a dry dam, the only restricted water surface includes the areas around the dam and the spillway. There is less than an acre under this sub-classification
Water Surface, Open Recreation	1961: 0 2019: 69	At the time of the original 1959 Master Plan, there was no classification that addressed the water surface of Codorus Creek. Indian Rock Dam is a dry dam, so the Water Surface – Open Recreation Areas include all remaining water surface area outside of the restricted zones.

**Note: Awaiting real estate information to populate land-ownership data.*

9 Appendices

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Appendix D: Land Classification and Recreational Asset Maps	9-11

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APPENDIX A: ACRONYMS AND ABBREVIATIONS

ac	Acres
ACS	American Community Survey
CENAB	United States Army Corps of Engineers – Baltimore District
cfs	Cubic Feet Per Second
CRMP	Cultural Resources Management Plan
EA	Environmental Assessment
EOP	Environmental Operating Principle
EP	Engineering Pamphlet
ER	Engineering Regulation
ft	Feet
GIS	Geographic Information Systems
MRML	Multiple Resource Management Lands
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum (NGVD)
NOAA	National Oceanic and Atmospheric Administration
NRHP	National Register of Historic Places
OMP	Operations Management Plan
PDCNR	Pennsylvania Department of Conservation and Natural Resources
PGC	Pennsylvania Game Commission
SCORP	State Comprehensive Outdoor Recreation Plan
UFC	Unified Facilities Criteria
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
YCRTA	York County Rail Trail Authority

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APPENDIX B: REFERENCES

A number of documents and reference materials, including reports, presentations, plans, engineering studies, programming documents, inventories, maps, graphics, and memoranda, were provided by USACE-Baltimore District. This data has been essential in developing the Project Support Documentation. The following is a list of the principal references used in the course of this planning study.

Center for Rural Pennsylvania. 2014. Pennsylvania Population Projections 2010-2040. Pennsylvania General Assembly.

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York Indian Rock Master Plan Update Data Gathering Site Visit



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Marietta, GA 30062
Telephone 770.321.4040

TO: MAJ Terrence Harrington, USACE-Baltimore District, Planning Division
Melanie Mathesz, USACE-Baltimore District, Planning Division, Assistant Project Manager
Phil Cwiek, USACE-Baltimore District, Operations Division, Natural Resource Management Specialist
Steve Young, Head Dam Operator
Eric Horsch, Pennsylvania Game Commission, Land Manager

CC: Patrick West, JG&A
Caitlin Crawford, JG&A

FROM: John Minter, JG&A
04 December 2018

ACTIVITY: Site Visit Kickoff Meeting and Site Tour
DATE/TIME: 13 November 2018 / 1000 hrs
LOCATION: York Indian Rock-Dam Operations Office
ATTENDEES: Phil Cwiek, Steve Young, John Minter, and Caitlin Crawford

The planning team met with United States Corps of Engineers (USACE) and York Indian Rock (YIR) representatives to discuss the intent of the update to the YIR Master Plan. Key points from the introductory discussion are presented below:

- The background data for the project area is unclear. A lot of markers are inaccurate and it's unclear where the boundary ends. Generally follows the 435 foot elevation line. Contacting Real Estate will dictate the total acreage.
- The primary mission of YIR is flood-risk management.
 - No other missions at this time.
- There was a spillway event in 1972 (Hurricane Agnes).
- Discussions about converting into a recreation pool.
 - Not a viable option as long as the paper mill is still operational upstream.
 - Major source of pollution.
 - Not economically feasible due to cables and increase in maintenance.
 - There is a large recreational lake already near the site.
- There are no known borrow areas at YIR.
- USACE operates and manages the dam and small area surrounding area.
 - A majority of the rest of project lands are managed by the Pennsylvania Gaming Commission.

- Offers 1,400+ acres of hunting.
- There is a shooting range located within project lands that is leased to the Fraternal order of police (35 acres).
 - They have a desire to build an indoor range, but this would require a 50 year lease.
- USACE also participates in the Cordorus Creek Project due to a majority of the projects being located within USACE flowage easements.
 - The project is managed by USACE, York Township, and other various entities.
 - Located downstream of the dam.
 - Projects include 265 drainage structures, levees, concrete floodwalls, embankments, channel improvements, etc.
- There is a popular rail trail that meanders on project and easement lands.
 - Currently in phased development.
 - Phase 2 is located on top of levee
 - Phase 3 is also located within flow easements
 - Phase 4 has just begun
- USACE owns the road that runs on top of the dam. This is a thru road that is also open to the public.
- There are some encroachment issues due to boundary line discrepancies and lost monuments.

USACE representatives guided the planning team while visiting each of the important activity nodes. Below is a listing of locations that were visited and explained:

- York Indian Rock Dam and Operations area
- Town of York
- Multiuse Rail Trail
- Cordorus Creek Project
- Flowage easements
- Dedicated parking areas for hunting

ACTIVITY:	Pennsylvania Game Commission Conference Call
DATE/TIME:	13 November 2018
LOCATION	East Sidney Lake-Dam Operations Office
ATTENDEES	Eric Horsch, Phil Cwiek, Steve Young, John Minter, and Caitlin Crawford

The planning team talked with USACE and Pennsylvania Game Commission (PGC) representatives through phone conversation to discuss the leased lands and environmental conservation aspects of YIR. Below is a summary of the topics covered:

- The biggest hurdle for project lands managed by PGC is invasive species control.
 - Numerous species present, including silt grass, poison gemlock, johnson grass, honey suckle, etc.
 - Experimenting with new herbicides that attack non-native annuals and affect native species less.

- Agriculture pattern is majority share-cropping but is now moving more towards native habitats and invasive species control areas.
 - There are still currently 150 acres of project lands dedicated to share-cropping.
- PGC just completed a 350 acre prescribed fire burn plan for the site.
- Foresters have shown the desire to harvest timber on-site.
 - There is concern about the that activity jeopardizing the flood-risk management mission
 - There is a YIR Comprehensive Management Plan currently in the works which will set forth plans for both the forested areas and the herbaceous areas.
 - This plan will include the history of the site as well as objectives and strategies for the future management of the site. All information and recommendations will be concurrent with dam strategies.
- There is also a desire to place constructed wetlands on project lands.
 - The contractor is Skelly and Lloyd.
 - Concerns about this due to the future ongoing management (in perpetuity) of the wetland areas.
 - Wetlands developed on site in the past all failed and ended up draining completely.
 - There would need to be a very detailed management process that would guide the mitigation agreement.
- There are no Threatened or Endangered Flora species on site.
- There are some Threatened or Endangered Fauna species on site.
 - Pollinators have taken a hit in the region in the recent years.
 - Restoring habitat of the Fritillary Butterfly.
 - Could potentially support a “trap and transfer” project in order to relocate the habitats away from frequently flooded areas.
- PGC does not do anything with fish.
 - The Pennsylvania Fish Commission is in charge of aquatic species.
 - Fishing is popular within stilling basin and along Cordorus Creek.
 - There are no known fish management or fish habitat restoration areas on site.
- Hunting is allowed throughout project lands managed by PGC.
 - Must follow all state-wide hunting rules and regulations.
 - Dedicated parking areas exist throughout the site and are maintained by PGC.
 - Mostly small-game species like pheasants and deer.
- PGC has a GIS guy – Jeremy – who can share information with JG&A.
 - Information available includes data on dedicated parking areas, habitat restoration areas, prescribed burn areas, share-crop fields, and forested areas.
- Project lands are covered in walnut trees.
 - There was a high number of timber sales in the early history of the project.
 - Sales stopped in the early 70s due to mismanagement and disagreements.
 - There has been walnut theft issues recently.
 - Could reconsider allowing walnut timbering as a source of revenue for the project.
- The upstream paper mill is currently being monitored for pollution.
 - The Department of Environmental Protection monitors the discharges.
 - Still a major water quality concern in the area.
 - Must look into a further discussion about this.

Please direct additions or corrections to these minutes to JG&A in writing within seven days of receipt; they become our official record of the meeting at that point in time. Thank you.

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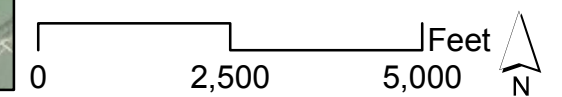
Land Classification | Grid View

 YIR Boundary

Grid

-  Project Operations
-  MRML - Low Density Recreation
-  MRML - Vegetative Management
-  Water Surface - Restricted
-  Water Surface - Open Recreation
-  Owned by Other Entities

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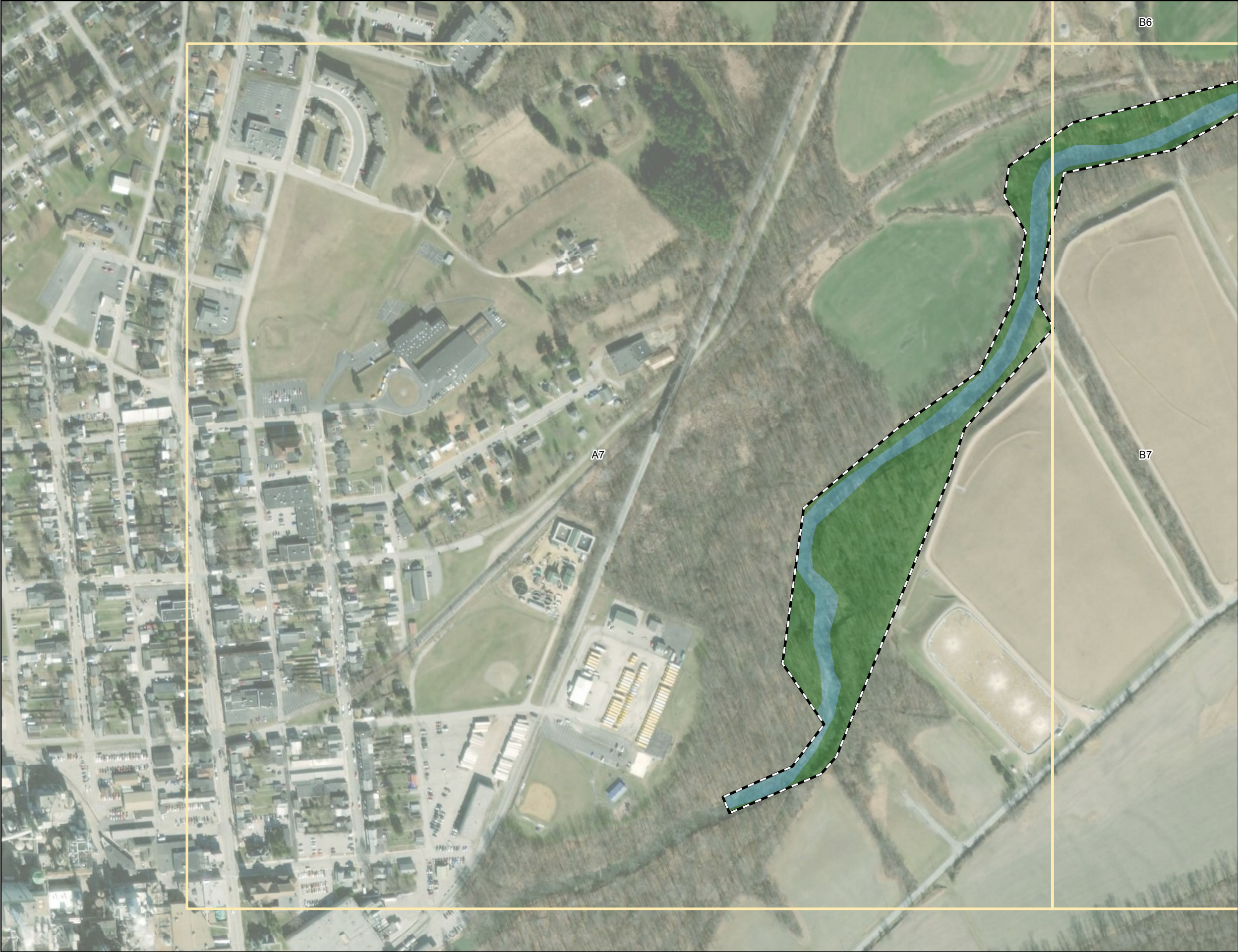


Indian Rock Dam
Master Plan

Land Classification | Grid View

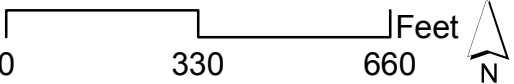
Legend

- YIR Boundary
- Grid
- Classification**
- MRML - Vegetative Management
- Water Surface - Open Recreation



Overall IRD Site

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Indian Rock Dam
Master Plan

Land Classification | Grid View

Legend

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- Classification**

MRML - Low Density Recreation

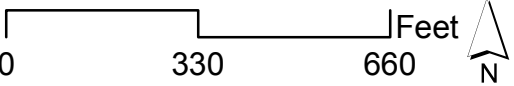
MRML - Vegetative Management

Water Surface - Open Recreation



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
Indian Rock Dam
Master Plan

Land Classification | Grid View

Legend

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-  Grid

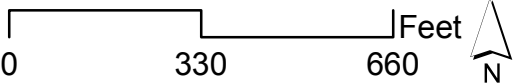
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Indian Rock Dam
Master Plan

Land Classification | Grid View

Legend

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MRML - Vegetative Management

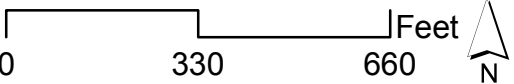
Water Surface - Open Recreation

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Indian Rock Dam
Master Plan


Land Classification | Grid View

Legend


 YIR Boundary


 Grid

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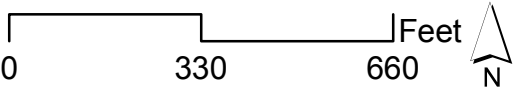
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Indian Rock Dam Master Plan

Land Classification | Grid View


Legend


 YIR Boundary

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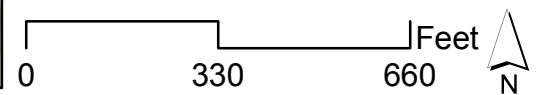
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Overall IRD Site







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Indian Rock Dam Master Plan

Land Classification | Grid View

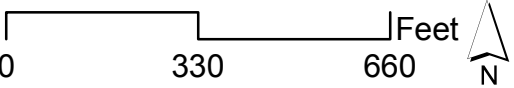
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Indian Rock Dam Master Plan

Land Classification | Grid View

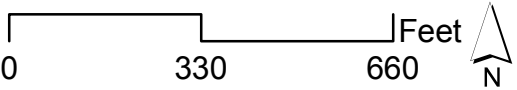
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Indian Rock Dam
Master Plan

Land Classification | Grid View

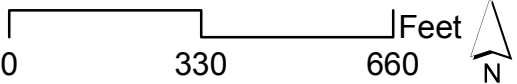
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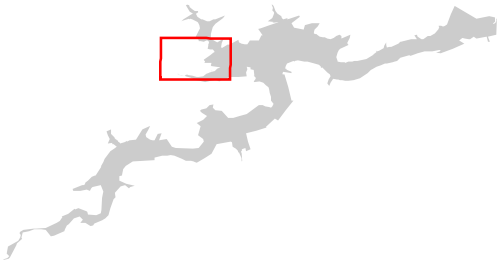


Indian Rock Dam Master Plan

Land Classification | Grid View

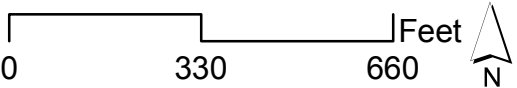
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Indian Rock Dam Master Plan

Land Classification | Grid View


Legend


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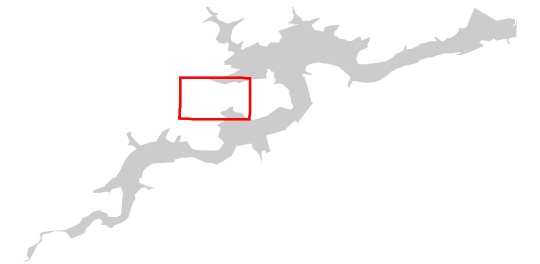
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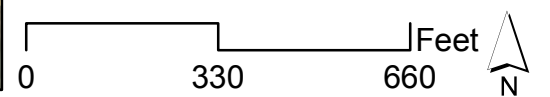
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Indian Rock Dam Master Plan

Land Classification | Grid View

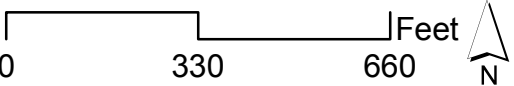
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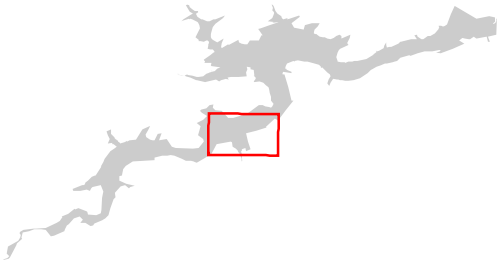


Indian Rock Dam Master Plan

Land Classification | Grid View

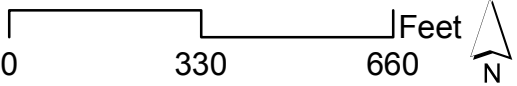
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Indian Rock Dam Master Plan

Land Classification | Grid View

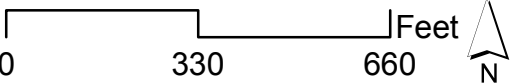
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Indian Rock Dam Master Plan

Land Classification | Grid View

Legend


 YIR Boundary


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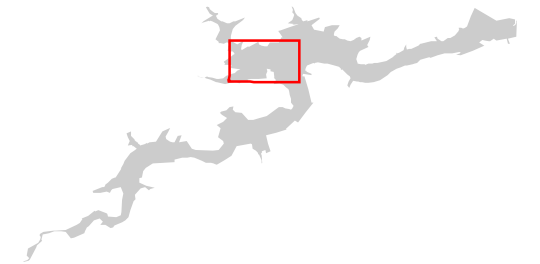
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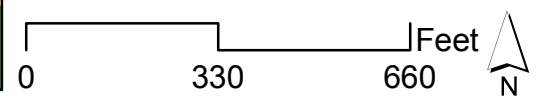
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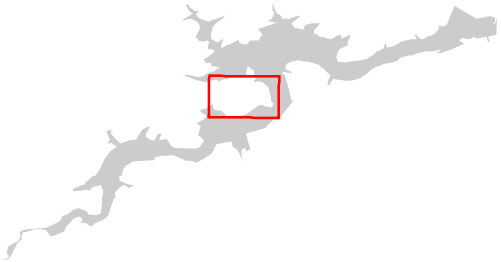


Indian Rock Dam Master Plan

Land Classification | Grid View

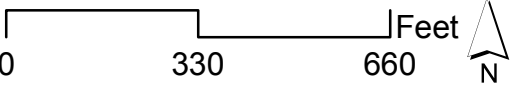
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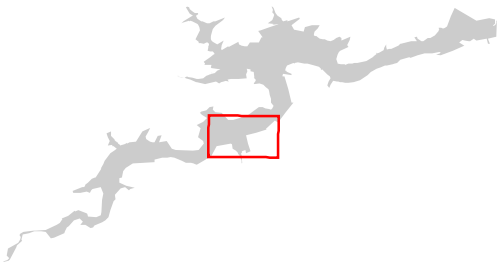


Indian Rock Dam Master Plan

Land Classification | Grid View

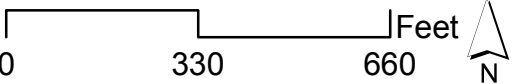
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



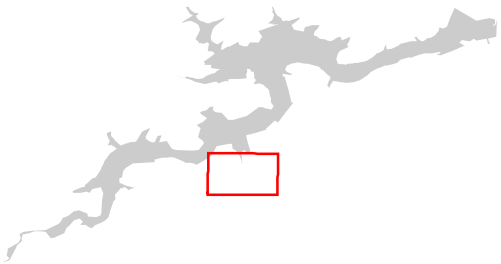


Indian Rock Dam
Master Plan

Land Classification | Grid View

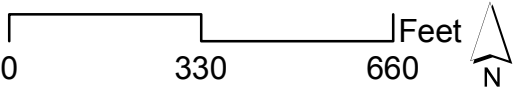
Legend

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Overall IRD Site

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Indian Rock Dam
Master Plan

Land Classification | Grid View

Legend

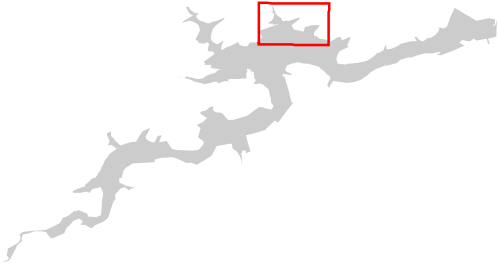
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MRML - Low Density Recreation

MRML - Vegetative Management

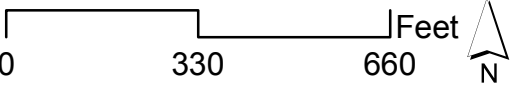
Water Surface - Open Recreation

Owned by Other Entities



Overall IRD Site

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



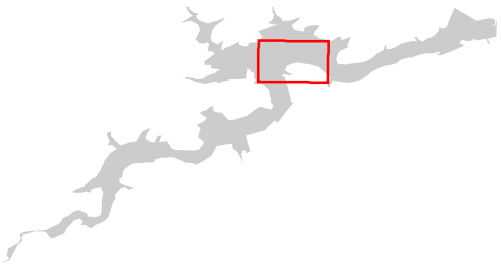


Indian Rock Dam Master Plan

Land Classification | Grid View

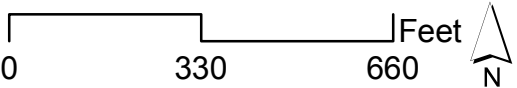
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

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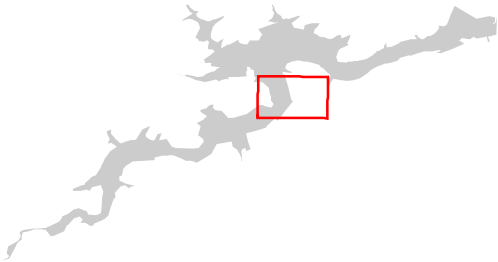


Indian Rock Dam
Master Plan

Land Classification | Grid View

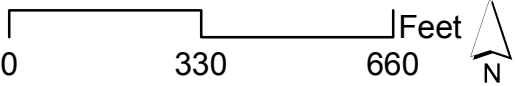
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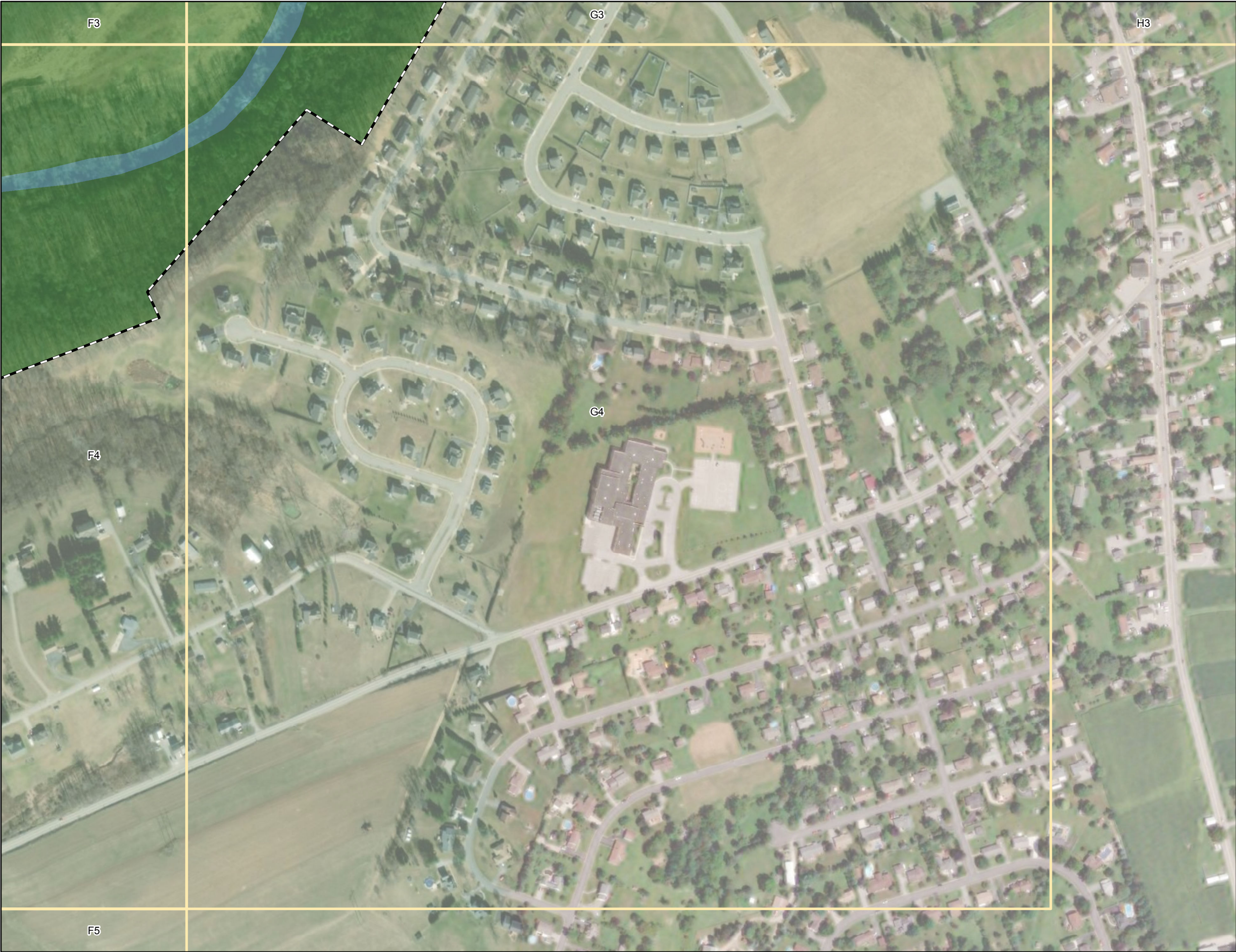
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


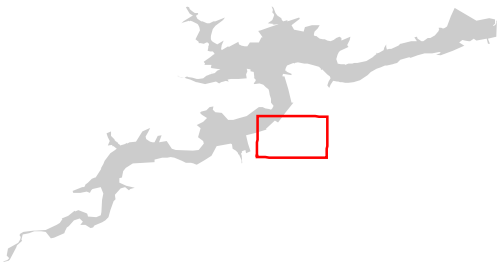


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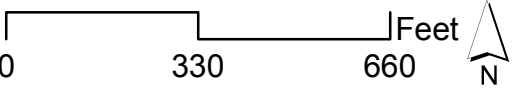
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Indian Rock Dam
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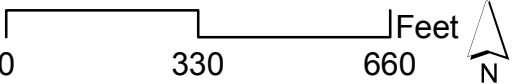
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-  Water Surface - Open Recreation



Overall IRD Site

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



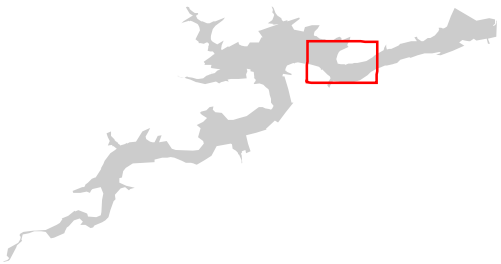


Indian Rock Dam Master Plan

Land Classification | Grid View

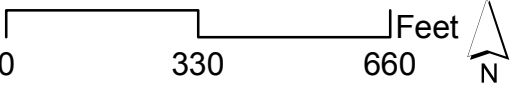
Legend

- YIR Boundary
- Grid
- Classification**
- MRML - Low Density Recreation
- MRML - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



Overall IRD Site

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community







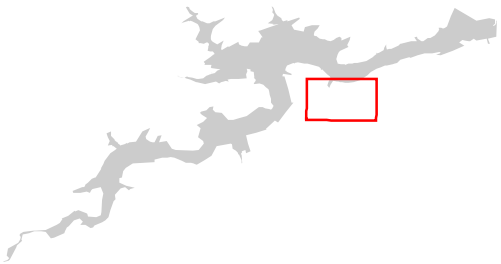


Indian Rock Dam Master Plan

Land Classification | Grid View

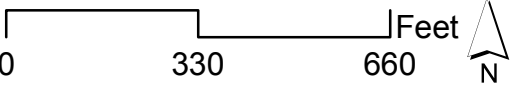
Legend

-  YIR Boundary
-  Grid
- Classification**
-  MRML - Vegetative Management
-  Water Surface - Open Recreation



Overall IRD Site

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Indian Rock Dam
Master Plan

Land Classification | Grid View

Legend

- YIR Boundary
- Grid
- Classification**

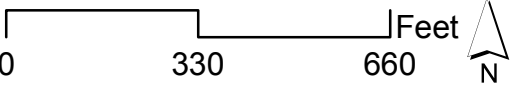
MRML - Vegetative Management

Water Surface - Open Recreation



Overall IRD Site

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community









Indian Rock Dam
Master Plan

Land Classification | Grid View

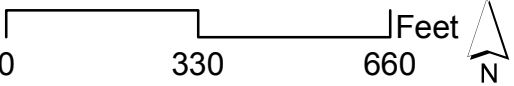
Legend

-  YIR Boundary
-  Grid
- Classification**
-  MRML - Vegetative Management
-  Water Surface - Open Recreation



Overall IRD Site

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Indian Rock Dam
Master Plan

Land Classification | Grid View

Legend

- YIR Boundary
- Grid
- Classification

Project Operations

MRML - Vegetative Management

Water Surface - Restricted

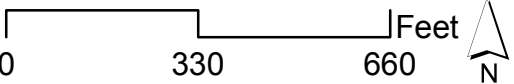
Water Surface - Open Recreation

Owned by Other Entities



Overall IRD Site





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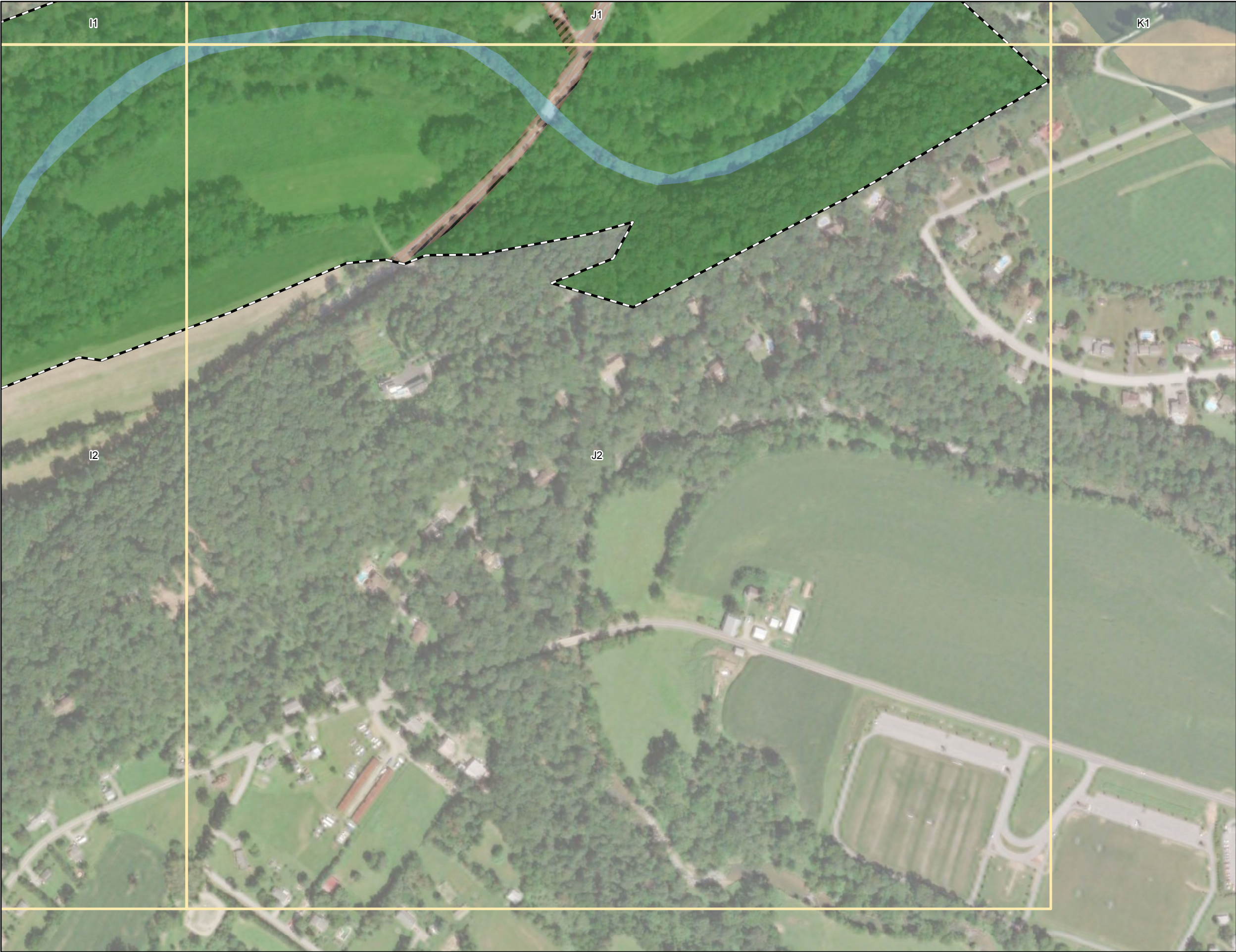


Indian Rock Dam Master Plan

Land Classification | Grid View

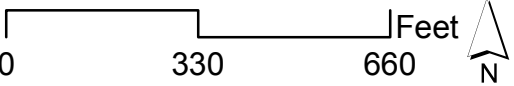
Legend

-  YIR Boundary
-  Grid
- Classification**
-  MRML - Vegetative Management
-  Water Surface - Open Recreation
-  Owned by Other Entities



Overall IRD Site








Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

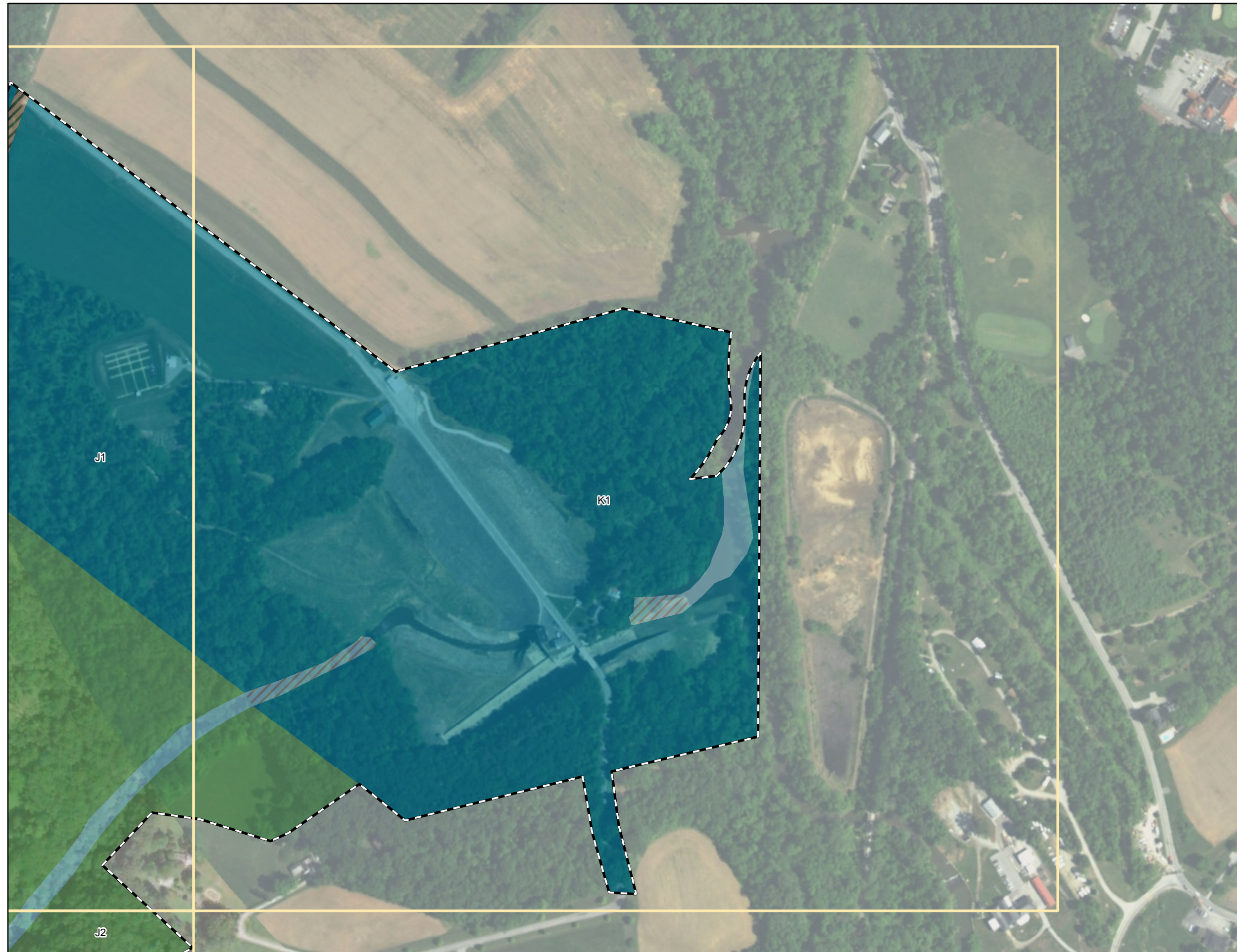


Indian Rock Dam Master Plan

Land Classification | Grid View

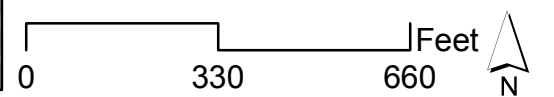
Legend

-  YIR Boundary
-  Grid
- Classification**
-  Project Operations
-  MRML - Vegetative Management
-  Water Surface - Restricted
-  Water Surface - Open Recreation
-  Owned by Other Entities



Overall IRD Site

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Indian Rock Dam
Master Plan

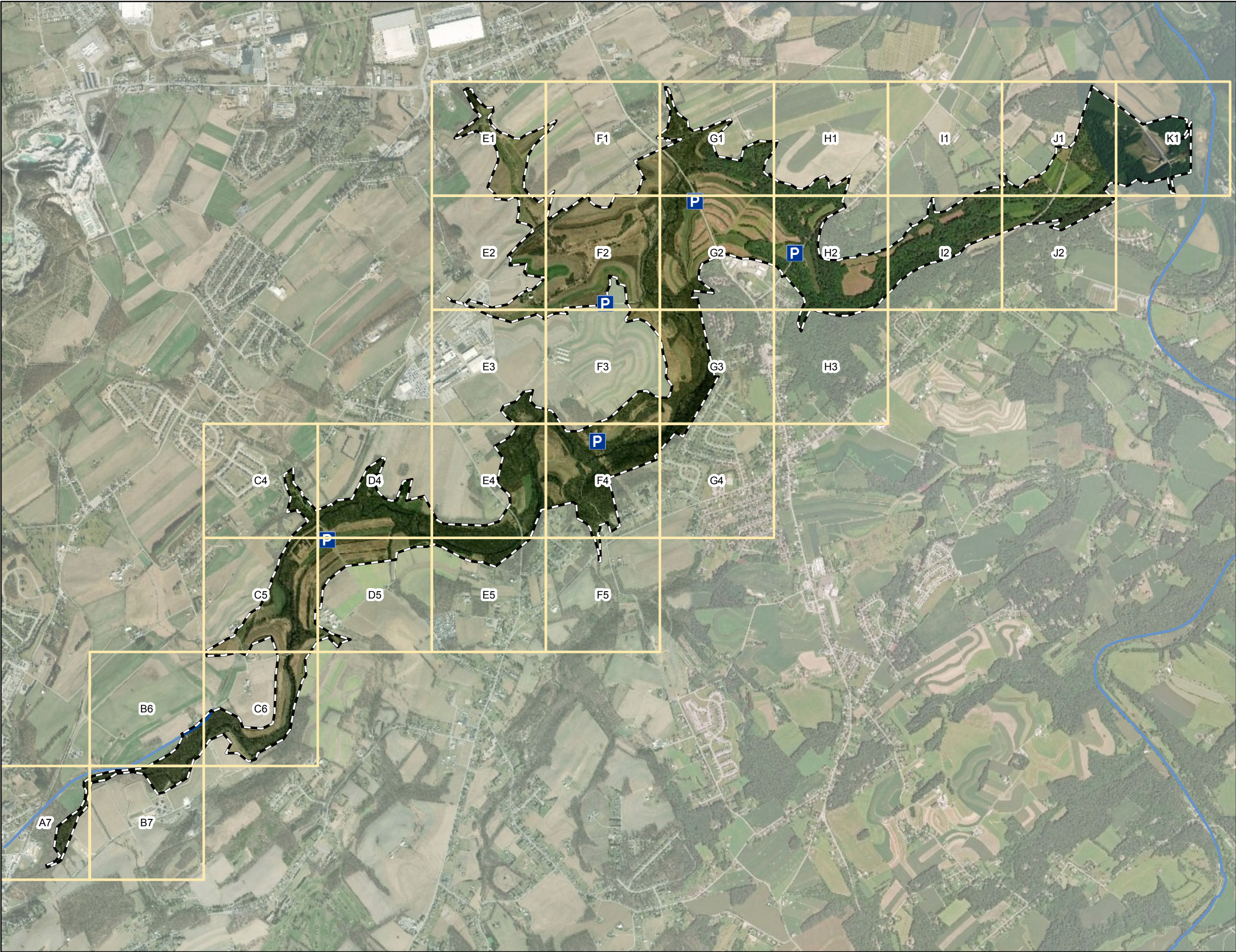
Recreation Features | Grid View

Legend

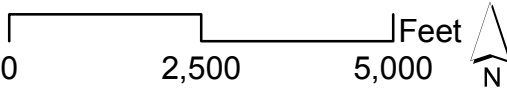
- Grid
- YIR Boundary

Existing Recreation Features

- Designated Parking Area
- Multi-Use Trails






Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Indian Rock Dam Master Plan

Recreation Features | Grid View

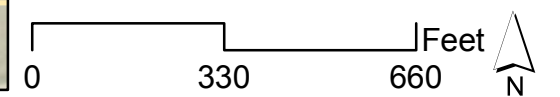
Legend

-  Grid
-  YIR Boundary
-  Multi-Use Trails



Overall IRD Site

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





Indian Rock Dam
Master Plan

Recreation Features | Grid View

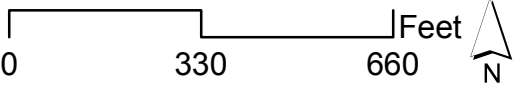
Legend

- Grid
- YIR Boundary
- Multi-Use Trails



Overall IRD Site

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community








Indian Rock Dam
Master Plan

Recreation Features | Grid View

Legend

-  Grid
-  YIR Boundary

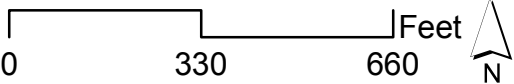
Existing Recreation Features

-  Designated Parking Area



Overall IRD Site

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community







Indian Rock Dam Master Plan

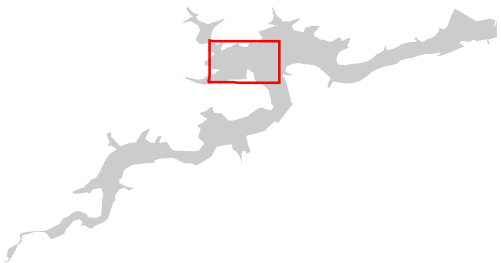
Recreation Features | Grid View

Legend

-  Grid
-  YIR Boundary

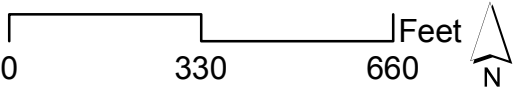
Existing Recreation Features

-  Designated Parking Area



Overall IRD Site

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Indian Rock Dam Master Plan

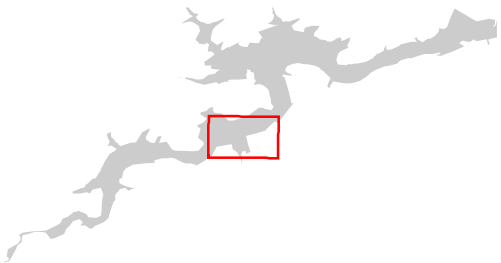
Recreation Features | Grid View

Legend

-  Grid
-  YIR Boundary

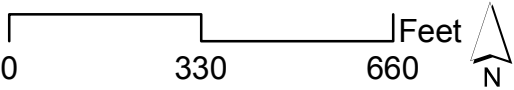
Existing Recreation Features

-  Designated Parking Area



Overall IRD Site

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Indian Rock Dam Master Plan

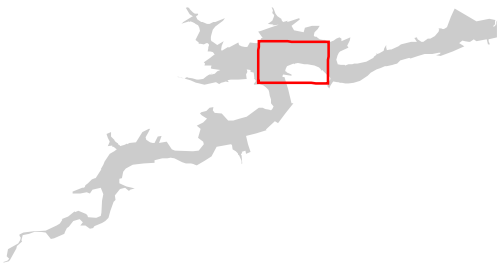
Recreation Features | Grid View

Legend

-  Grid
-  YIR Boundary

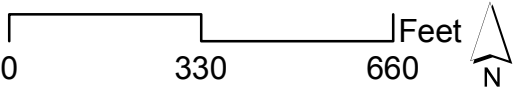
Existing Recreation Features

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Indian Rock Dam
Master Plan

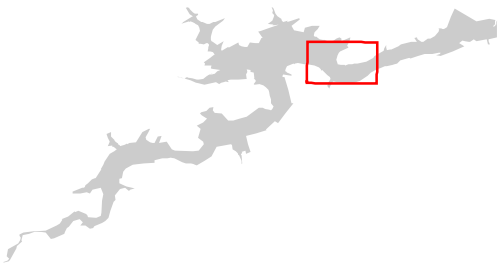
Recreation Features | Grid View

Legend

- Grid
- YIR Boundary

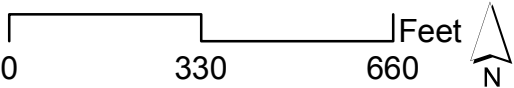
Existing Recreation Features

- Designated Parking Area



Overall IRD Site

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Draft Submittal
April 2019

