Jennings Randolph Lake
Master Plan

Draft Submittal
January 2019

Jennings Randolph Lake
Master Plan
Garrett County, MD—Mineral County, WV

Draft Submittal
January 2019

For:
Jennings Randolph Lake
1700 Jennings Randolph Lane
Oak Garden, WV 26717

Under Contract With:
U.S. Army Corps of Engineers—Baltimore District
2 Hopkins Plaza
Baltimore, Maryland 21201
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Jennings Randolph Lake Master Plan

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1 Introduction

1.1 PROJECT AUTHORIZATION

The Jennings Randolph Lake Project on the North Branch Potomac River was authorized by the Flood Control Act of October 23, 1962 (Public Law 87-874, substantially in accordance with House Document 469, 87th Congress, 2nd Session).

In May 1987, the name of the project changed from Bloomington Lake to Jennings Randolph Lake. The name change was in honor of longtime West Virginia Senator, Jennings Randolph (1958-1985). Mr. Randolph had a major interest in water resources projects nationwide.

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).

Jennings Randolph Lake, View from Howell Run Picnic

The 1997 Jennings Randolph Lake Master Plan, a revision to the 1973 Master Plan, was authorized by the 1995 Energy and Water Development Appropriations Act (Public Law 103-316, 108 Stat. 1701, dated 26 August 1994). The language states that "[the] United States Corps of Engineers (USACE) is directed to use available funds to initiate work on a revised master plan for Jennings Randolph Lake to reflect changing demands. To the extent practical, USACE should consult and work with all affected interest groups in developing the revised plan."

This update to the Jennings Randolph Lake Master Plan is required according to January 2013 updates to the Engineer Regulation (ER) and Engineering Pamphlet (EP) 1130-2-550. USACE is also required to prepare the appropriate National Environmental Policy Act (NEPA) documentation to support the Master Plan.

1.2 PROJECT PURPOSE

The Jennings Randolph Lake Project was authorized and constructed for the primary purposes of controlling floods originating on the North Branch Potomac River, providing an adequate supply of water for domestic and industrial uses, and increasing downstream water quality in the North Branch Potomac River. 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 camping, boating, fishing, hiking, picnicking, and enjoying the great outdoors.

1.3 PURPOSE AND SCOPE OF MASTER PLAN

The purpose of this document is to update the Master Plan and Environmental Assessment, written in 1973 and updated in 1997. The Jennings Randolph Lake 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.

Jennings Randolph Lake, View Maryland Overlook #1

The original objective of the establishment of Jennings Randolph Lake was flood risk management, water quality control, and domestic / industrial water supply. The success of these original tenants presented additional opportunities for recreation activities on and around the lake. This Plan provides an analysis of and guidance for recreation enhancement and potential development activities at Jennings Randolph Lake.

This document presents an evaluation of the assets, needs, and potentials of Jennings Randolph Lake. This Plan reflects changes that have occurred to the project site, in the region, in recreation trends, and in USACE policy in the 24 years since the last master plan update. It provides a management framework that balances the stewardship of natural resources and provision of high-quality recreation activities with the primary project purposes of flood risk management, water quality control, and water supply. 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 the Jennings Randolph Lake Master Plan must recognize and be compatible with the primary project missions of flood risk management, water quality control, and water supply. 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

Jennings Randolph Lake, formerly named Bloomington Lake, is located on the North Branch Potomac River in Garrett County, Maryland and Mineral County, West Virginia approximately 8 miles upstream of Bloomington, Maryland and approximately 5 miles north of Elk Garden, West Virginia, as shown in Figure 1-1 on page 1-5. Project lands occupy approximately 4,500 acres of land. The dam that created Jennings Randolph Lake controls a drainage area of 263 square miles, approximately 20 percent of the total North Branch floodbasin, and prevents nearly half the yearly flood damages that historically occurred along the North Branch Potomac River. Figure 1-2 is a site map of Jennings Randolph Lake and can be found on page 1-6.


North Branch Potomac River

Construction of the project began in 1971 and took 10 years to complete at a total cost of approximately $175 million, of which $57.1 million was composed of non-Federal contributions. Impoundment of water to form the lake was completed in June 1982. The Maryland Potomac Water Authority, an agency

of the State of Maryland, contributed funds to cover the initial water supply costs of the project, and continues to purchase long-term water supply storage space in the reservoir.

The project is located in a narrow, winding valley typical of the many streams and rivers in the central Appalachian area. The slopes forming the shoreline are wooded and steep, severely limiting the development of recreation areas adjacent to the seasonal pool. The rugged topography in and around the lake discourages the construction of access roads, particularly on the Maryland shore.

1.5 DESCRIPTION OF LAKE

With a conservation pool, the lake, controlling a drainage area of 263 square miles, is about 2,600 feet wide, 5.5 miles long, has a surface area of 952 acres, and has an elevation of 1,466 feet national geodetic vertical datum (NGVD). At conservation pool, the lake stores approximately 94,700 acre-feet of water, where 92,000 acre-feet is used for downstream water quality improvement (40,995 acre-feet of municipal water supply storage for Washington D.C. and 51,005 acre-feet for water quality control) and 2,700 acre-feet is dead storage. This translates into a volume of about 31 billion gallons of water that can be used for water supply, water quality improvement, and recreation. The project also supports a maximum of 36,200 acre-feet above the conservation pool level for flood control. If the reservoir reaches the designed flood control level, elevation 1,500 feet NGVD, it will cover 1,184 acres and extend 6.6 river miles upstream of the dam. The pool has a winter draw down every year. The recreation (summer) pool has an elevation of 1,1468 feet NGVD, surface area of 965 acres, and stores approximately 96,600 acre-feet of water.

Jennings Randolph Lake reservoir is operated, according to the Reservoir Regulation Plan, to (1) reduce flood flows at downstream damage centers on the North Branch and the main stem of the Potomac River, (2) improve downstream water quality via low flow augmentation, (3) supply water to Washington, D.C., and the local region, and (4) provide public recreation.

1.5.1 Embankment

The dam, one of the largest rolled earth and rockfill dams east of the Mississippi River, is 296 feet high and 2,130 feet long. The crest width is 25 feet, and the top elevation of the dam is 1,514 feet NGVD, which provides a freeboard of 5.1 feet above the spillway.

Shaw Beach

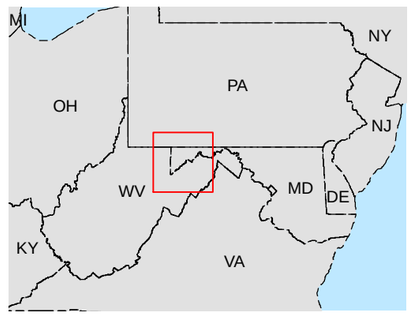
Figure 1-1

Jennings Randolph Lake Master Plan Update

Regional Context Map

Legend

- State Boundary
- JRL Site Boundary



Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, ©

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Figure 1-2

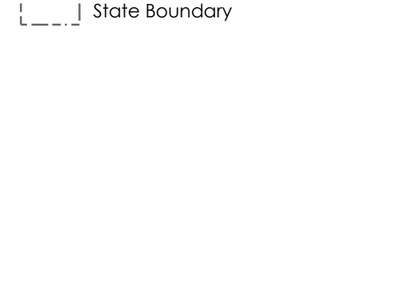
Jennings Randolph Lake
Master Plan Update

Site Map

Legend

JRL Site Boundary

State Boundary



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

0 2,800 5,600 Feet

N

1.5.2 Spillway

The spillway, located on the left abutment, has a crest length of 210 feet. The weir is an ogee section, gated and founded on bedrock. The elevation of the spillway crest is 1,468 feet NGVD, which is 2 feet above the conservation pool level. The spillway contains five tainter gates that are 42 feet wide and 32 feet high. Together, these gates provide controlled storage up to an elevation of 1,500 feet NGVD. Operating machinery for the tainter gates is located downstream from the roadway deck on machinery frames, anchored to the piers and abutments. Access over the spillway is provided by a service bridge.

1.5.3 Dikes

There is one dike on the left (north) bank of the dam. The dike is constructed of rolled earth and rockfill. It is 900 feet in length and has a maximum height of 90 feet and top elevation of 1,514 feet NGVD. The crest width is 25 feet, accommodating a gravel maintenance road, and the maximum width at the base is 845 feet.

1.5.4 Flood Control Outlet Works

The outlet works are located within the right abutment and consist of an inlet channel and tower, a tunnel under the dam, a stilling basin, and an outlet channel. The length of the inlet channel is approximately 100 feet. The intake tower is located 1,080 feet upstream of the dam, along with a 30-feet-high operating house consisting of a dry well structure approximately 332-feet-high. The tower has 4 hydraulically operated slide gates, 2 of which are service gates and 2 of which are emergency gates. The intake tower has a selective withdrawal system with multi-level outlets for water quality control. The tower has 2 independent wet wells with 5 pairs of portal gate intakes at centerline elevations of 1,342, 1,375, 1,400, 1,426, and 1,449 feet NGVD to provide releases for water quality control. Each wet well has a low flow quality control gate measuring 3 feet high and 2 feet wide at its bottom to control releases. The tunnel extends 2,092 feet between portals and is excavated in rock for most of its length. The upstream invert is located at an elevation of 1,255 feet NGVD and the outlet portal invert elevation is 1,238.3 feet NGVD. Except for the transition, the diameter of the inverts are 16.3 feet.

1.5.5 Flood Control Outlet Works Stilling Basin

A stilling basin with baffle blocks and end sills is provided downstream from the outlet portal to dissipate the energy of the high velocity tunnel flow. A flared transition includes a parabolic drop from the portal to the stilling basin floor. The basin is 64 feet wide and 116 feet long.

Jennings Randolph Lake Stilling Basin

1.5.6 Outlet Works Discharge Channel

The discharge channel begins at elevation 1,187.5 feet NGVD and is 74 feet wide at the downstream end of

the stilling basin. The channel is horizontal for 30 feet downstream from the stilling basin and slopes up from this point at a 1 on 7 slope to elevation 1,212 feet NGVD and widens to 85 feet. Downstream from this section the channel curves to the right and flows back into the river. The sides of the channel are sloped upward at 1 vertical to 3.5 horizontal to elevation 1,229 feet NGVD and are lined with riprap for erosion protection.

1.6 HYDROPOWER FACILITIES

There are currently no hydropower facilities on project lands. A hydroelectric system is expected to be constructed within the next 2 years. This system will piggyback the existing dam infrastructure and is not expected to impact dam operations or recreation amenities. The system will generate approximately 65 ohms, equivalent to powering up to 6,500 homes. The water surface level will be lowered to 1,420 feet to facilitate construction.

A bill was passed into law (July 23, 2018) reinstating and extending the deadline for commencement of construction of a hydroelectric project at Jennings Randolph Lake (Public Law 115-205, 115th Congress). The bill authorizes the Federal Energy Regulatory Commission (FERC), upon request, to extend for up to 6 years the time period during which construction must commence on the Jennings Randolph Lake Hydroelectric Project. This extension (originally only a 2-year time frame) will help FERC gain the necessary permits to facilitate construction of the hydroelectric system.

In July 2018, the U.S. Senate passed legislation championed by Senator Joe Manchin to provide licensing certainty for the construction of the hydroelectric facility at the Jennings Randolph Lake. Fairlawn Hydroelectric Company LLC, a subsidiary of Advanced Hydro Solutions LLC, has received an original license from FERC for the project.

1.6.1 Water Supply Facilities

One of the main goals of the Jennings Randolph Lake Project is to supply water to downstream, Washington, D.C.. Since the lake is some 200 miles upriver from the City, there are currently no water supply facilities on site. Instead, the lake, in conjunction with Little Seneca Reservoir, is used to augment low flows in the Potomac River and supply water through scheduled water releases. Releases from Jennings Randolph and Little Seneca are made when the predicted demand plus environmental flow requirements is greater than predicted Potomac flow. Because of the long distance that the water must travel, releases must be made approximately nine days in advance to allow for travel time downstream. Jennings Randolph Lake fluctuates between elevation 1,320 feet NGVD and 1,466 feet NGVD when making water supply releases. The pool at Jennings Randolph Lake will not be lowered to elevation 1,320 feet NGVD due to the absolute minimum water quality storage needed for dilution in the lake.

The operations procedure for a Jennings Randolph Lake release is to determine how much water, if any, to release in order to meet anticipated demand nine days in the future. The Little Seneca Reservoir, less than a day's travel time from metropolitan intakes, is used in conjunction with Jennings Randolph Lake so that releases made from the latter can be more conservative. If the Jennings Randolph Lake release is too small (because of lower than expected river flow or higher than expected demand), a release can be made from the smaller, closer reservoir to make up for any temporary shortfalls that become apparent as Jennings Randolph water travels to the intakes.

1.7 PROJECT ACCESS

A series of crushed stone access roads connect the dam, outlet works, spillway embankment, connecting channel, and maintenance complex. A road from the right abutment overlook, down the downstream face of the dam, provides access to the outlet works and to an area on the left bank below the spillway and is closed to the public.

The recreation sites located in West Virginia may be accessed by the public from Keyser, West Virginia via State Route 42 to State Route 46; these are paved, two-lane state highways. To reach these sites from Maryland, the public must use State Route 38 that crosses into West Virginia at Kitzmiller, Maryland and becomes State Route 42. The public can then access the recreation sites by way of State Route 46. Access to the Maryland Overlooks is provided by State Route 135 via Walnut Bottom and/or Chestnut Grove Roads. The Maryland Boat Launch is accessible by State Route 135 via Mt. Zion road. Interstate 68 is located north of the site and connects Morgantown, West Virginia to the west with Hagerstown, Maryland to the east.

1.8 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.

- *Bloomington Lake Pre-Impoundment Study, 1984*
- *Bloomington Lake Reformulation Study, 1983*
- *Design Memorandum No. 1, Site Selection, 1964*
- *Design Memorandum No. 2, Hydrology and Hydraulics, 1965*
- *Design Memorandum No. 3, General Design Memorandum, 1966; revised 1968*
- *Design Memorandum No. 4a, Preliminary Master Plan, 1966; revised 1969*
- *Design Memorandum No. 14, Master Plan, 1973; revised 1975 and 1978*
- *Design Memorandum No. 18, Environmental Analysis, 1972*
- *Environmental Statement, 1971*
- *Forest Management Activities Jennings Randolph Lake, 2012*
- *Jennings Randolph Lake Cultural Resources Management Plan, 2001*
- *Jennings Randolph Lake Dam Safety Assurance Program, 2003*
- *Jennings Randolph Lake Master Plan & Integrated Environmental Impact Statement, 1997*
- *Jennings Randolph Lake Reallocation Feasibility Study*
- *Jennings Randolph Lake Section 1135(b) Study*
- *Jennings Randolph Lake Spillway Evaluation Study, Phase II, 2003*
- *Maryland Land Preservation, Parks & Recreation Plan, 2009*
- *Maryland Land Preservation and Recreation Plan, 1993; updated 2014*
- *Master Manual for Reservoir Regulation North Branch Potomac River Basin*
- *North Branch Potomac River Environmental Restoration Reconnaissance Study, 1995*
- *North Branch Potomac River Environmental Restoration Feasibility Study*
- *Operations and Maintenance Manual, 1984; revised 1984*
- *Operational Management Plan, last revision 1995*
- *Potomac River Basin Report- North Branch Potomac River above Cumberland, 1963*
- *West Virginia Statewide Comprehensive Outdoor Recreation Plan—SCORP, 2015*
- *West Virginia Ten Year Tourism Plan, 2012*
- *West Virginia Water Resources Plan, 2013*

1.9 PERTINENT PROJECT INFORMATION

Table 1-1 below provides pertinent information regarding existing storage capacity and Table 1-2 provides pertinent information regarding acreages by land use classifications at Jennings Randolph Lake. Land classification acreage is estimated using Geographic Information Systems (GIS) data.

Table 1-1: Water Storage Capacity and Related Pertinent Data at Jennings Randolph Lake.

	Elevation (Feet NGVD)	Storage (Acre-feet)	Acres
Top of Dam	1,514	148,200	
Maximum Pool (Spillway Surcharge)	1,509	141,700	1,247
Full Flood Control (Spillway Crest)	1,500	130,900	1,184
Recreation Pool (Summer)	1,468	96,600	965
Conservation Pool (Winter)	1,466	94,700	952
Inactive Pool (Dead Storage)	1,255	309	42

Source: 2003 Jennings Randolph Lake Spillway Evaluation Study.

Table 1-2: Current Land Classifications at Jennings Randolph Lake.

Land Classifications	Acres
Project Operations	78
High-Density Recreation	74
Multiple Resource Management	2,869
Low Density Recreation	22
Vegetative Management	2,782
Future Recreation	65
Water Surface	965
No Wake	18
Restricted	12
Open Recreation	938
Total	3,986

Source: GIS analysis based on the Forest Management Study, edited according to site investigation and CENAB, Real Estate Division Documentation. Note that land acreages were rounded to the nearest whole number.

2 Existing Conditions & Analysis

2.1 PHYSIOGRAPHIC SETTING

2.1.1 Ecoregion Overview

Jennings Randolph Lake is located within the Central Appalachian level IV ecoregion which stretches from the Blue Ridge Mountains in the southern United States to the Allegheny Mountains of Virginia, West Virginia, and Maryland. The ecoregion is primarily a high, dissected, rugged plateau composed of sandstone, shale, conglomerate, and coal. The rugged terrain, cool climate, and infertile soils limit agriculture and result in a mostly forested land cover.

2.1.2 Climate

Jennings Randolph Lake is located within a portion of the North Branch Potomac River basin, which falls within the National Oceanic and Atmospheric Administration (NOAA) Climate Divisions 46-6 (West Virginia - Northeastern) and 18-8 (Maryland - Allegheny Plateau). This area is characterized by a temperate climate, with the average annual temperature in 2017 being between 49 and 53 degrees Fahrenheit and the average annual precipitation being between 36 and 53 inches. The greatest monthly precipitation in the basin occurs from May through August; the least occurs in the late fall and winter. The winters are not considered severe, but are vigorous, since there is usually heavy snowfall.

2.1.3 Topography

The project area falls within the Allegheny Plateau physiographic province, which is located in the winding gorge of the North Branch watershed. The Allegheny Plateau is a high, deeply dissected plateau bounded by an eastward-facing escarpment known as the Allegheny Front. Prominent ridges are the Allegheny Front (elevation 3,500 feet NGVD) and Knobly Mountain (elevation 2,850 feet NGVD) in the eastern portion, and Meadow Mountain (elevation 3,031 feet NGVD) and Backbone Mountain (elevation 3,278 feet NGVD) in the western portion. The basin topography and branching pattern of its minor stream channels are a result of the plateau and ridge geomorphology, and the sedimentary origin of the bedrock. Valleys slope toward the center of the basin, at which point the rivers and streams cut through the ridge lines at right angles into the valleys to the east. The westernmost basin is drained by the Savage River, which is joined in successive valleys by the North Branch Potomac River, George's Creek, and New Creek.

The Jennings Randolph project lands have generally steep slopes, usually over 10 percent. Slopes greater than 10% are too unstable or steep for recreational development other than trail usage. Steeply sloping land is expensive to develop, and development can lead to erosion, poor accessibility, and other negative environmental and economic impacts.

2.1.4 Hydrology and Groundwater

The North Branch Potomac River descends 1,930 feet in the 36 river miles from its source to the Jennings Randolph Lake site, from 3,150 feet NGVD to 1,220 feet NGVD. The watershed above the dam has a drainage area of 263 square miles, is about 23 miles long and 12 miles wide, and is roughly rectangular in shape. The dam at Jennings Randolph Lake controls about 20 percent of the North Branch's entire drainage area. The principle tributaries of the North Branch above the dam site are Stony River and Abrams Creek. The watershed contains no natural lakes and only a few small marshy areas.

Two man-made reservoirs upstream of Jennings Randolph Lake are located on the Stony River. Mount Storm Reservoir, owned by the Virginia Electric Power Company (VEPCO), provides cooling water for an electricity generating station. This reservoir has a drainage area of 31.2 square miles, a normal pool area of 1,110 acres, and a storage capacity of 47,600 acre-feet. Stony River Dam is located upstream of Mount Storm Reservoir, but has been drained and abandoned.

The fourth reservoir located in the North Branch watershed is located downstream of Jennings Randolph Lake. Savage River Dam is located on the Savage River in Garrett County, Maryland, approximately 4.5 miles above the confluence of the Savage River with the North Branch. The total drainage area is 104 square miles. The reservoir is operated in conjunction with the Jennings Randolph reservoir to augment stream flows in order to supply water for Washington, D.C. and other industries as well as to control water quality.

2.1.5 Soils, Sedimentation, and Shoreline Erosion

According to the soil survey for Garrett County, Maryland, soils within the Maryland side of the Project are mapped as belonging to the relatively steep sloped Dekalb and Gilpin very stony loams (DgC and DgD), as well as the relatively steep Cookport and Ernest very stony silt loams (CuD). These soils are very stony, on moderate to steep slopes (8 to 25 percent), are moderately

well drained, and vary in depth to bedrock from 1.5 to 3.5 feet. Similar soils are found on the West Virginia side of the Jennings Randolph Lake Project. The U.S. Natural Resource Conservation Service (once referred to as the Soil Conservation Service) soil surveys confirmed that there are no unique farmland soils in the proximity of the project area. All soils were disturbed by the construction of the dam in 1981.

Most areas considered to be well-suited for recreational development are either below the conservation lake or in areas of limited or difficult access. The primary exception is the Robert W. Craig Campground, whose soils are slightly to moderately limited, and therefore suitable for recreational development.

The Howell Run facilities, including the Boat Launch and the Picnic Area, are both located in areas theoretically poorly suited for recreational development. The boat launch site required a minimum amount of earth moving, and was built up with fill material. Regrading, filling, and reshaping were required in the picnic area, along with construction of access roads and parking lots and subsequent re-seeding and planting. As shown by this example, site verification of the soil characteristics must be completed to determine requirements for future development in selected undeveloped areas.

Many areas at the project have moderate to severe erosion problems due to the nature of the soils and the steep topography of the project land. The areas of erosion that affect operation and recreational use of the project are described in the following paragraphs.

West Virginia Access Road When driving into the project from SR 46, the access road is bordered by a steep drop on the lake side of the road, and a steep rising slope on the right side. The right side is prone to slides, especially during the spring and winter months, when the ground becomes saturated with water. In the Spring of 1996, this area experienced severe slides, which blocked and undercut the road. This area has been fixed, but the potential remains for this type of slide to reoccur at any place along the access road due to the slope of the hill and the erodibility of the soils.

Approximately 2,000 feet from the administration building the hillside is slowly sliding toward the lake. Signs of the slide can be seen in the buckling of the road surface. Presently, USACE is monitoring the movement of the hillside.

Howell Run Picnic Area The slope facing the lake is slowly eroding. The area is vegetated with crown vetch, but not in the eroded areas.

2.1.6 Borrow Areas

The primary borrow site used to construct the rolled earth dam is located approximately 0.75 miles south of the dam. The site once featured a mountain form that rivaled the topography on the opposite site (north) of the valley of the North Potomac River. Today, the site is an undeveloped vegetative area, which provides a clear view from the Mountain Meadow Overlook to the dam.

2.2 ECOREGION AND NATURAL RESOURCES ANALYSIS

2.2.1 Vegetation

Approximately 80 percent of the land cover on the project property is deciduous forest. The most common species are American basswood, tulip poplar, sugar and red maple, and red, white, and chestnut oaks. Some vegetation species unique to the Mid-Atlantic Region, like black maple, smooth azalea, winterberry, redbud, great Solomon seal, black ash, burning bush, serviceberry, and flowering dogwood, are also found on the project lands. The U.S. Forest Service previously defined the major forest types as spruce, fir, and northern hardwoods. Extensive logging during the 19th century and fires on the over-cut areas reduced the amount of conifer cover. Conifer species are also declining due to age. The eastern hemlock is severely declining due to the hemlock woolly adelgid infestation. Continuous harvesting has also reduced the average age and size of the trees in the present forest as well as lower the value of the ecological productivity of the area compared to more pristine, forested river valley ecosystems.

Herbaceous rangeland comprises the remaining 20 percent of the terrestrial habitat of the project lands. Grasses and forbs predominate, but shrub/brush vegetation also occurs. Species found within this habitat are yellow poplar, black locust, fire cherry, blackberry, sweet clover, thistle, and crown vetch. Many wildflowers are also found in the area, including snow trillium, jack-in-the-pulpit, violets, painted trillium, and fireweed.

2.2.2 Wetlands

Emergent wetlands have become established downstream of the dam as a result of the dam construction and are fed by incidental seepage and runoff. Generally, wetlands located on the project lands are limited by the steep topography and are in relatively flat, low-lying areas, along the lake at the mouths of tributary systems. These wetlands are also found in the seepage basins, along the river, and on the face of the emergency spillway. There are fifteen wetlands on the project lands totaling 9.97 acres or approximately 0.23 percent of the project lands at Jennings Randolph Lake.

2.2.3 Wildlife

The Southern Appalachians, beginning in West Virginia, is one of 4 major biodiversity hot spots in North America. Biodiversity is extremely high in terms of both the variety of different species and the abundance of each species. Nearly 10,000 species are already known to exist here. Some kinds of organisms, such as salamanders and fungi, reach their highest levels of diversity in the Southern Appalachians. Other diverse groups include trees, mosses, millipedes, spiders, moths, beetles, and snails. Many of these species are endemic to the region as well. Jennings Randolph Lake sits in the Southern Appalachians far northern corner and is technically not located within the biodiversity hot spot.

The common species of mammals in the area are white-tailed deer, black bears, gray, red, flying and fox squirrels, gray and red foxes, skunks, raccoons, opossums, ground hogs, bobcats, and cottontail rabbits. Beaver, mink, and muskrats are attempting to inhabit the reservoir, but are finding the often-radical fluctuations of the pool to be a major obstacle. They have, however, found no problems inhabiting the tributaries leading into the reservoir. Birds, such as woodcock, grouse, and a variety of songbirds inhabit the area. Bald eagles have been breeding at Jennings Randolph Lake for over 10 years. Bat species are also present in the region.

When Jennings Randolph Lake was constructed, the North Branch Potomac River was so highly acidic that no thought was given to sustaining a viable fisheries program at the new lake. The improved water quality has provided the previously unfeasible opportunity to create a good quality fishery near the lake. Both upstream and downstream, the fish population, especially trout, is plentiful. The release tower at the lake allows USACE to withdraw water from various depths, which in turn lets them control the flow, quality, and temperature of the water downstream. The water release from the dam remains cold all summer, so the river can support a trout fishery year-round. The tailwater area of the dam is stocked with several thousand trout annually. In addition to stocked trout, the downstream area of North Branch also supports natural reproduction of wild brook trout and brown trout as well as some small quantities of rainbow trout. Other fish species also inhabit the lake and river, including small mouth bass, lake trout, brown trout, rainbow trout, white sucker, and walleye.

Due to steeply sloping sides of the river gorge, shallow water habitat continues to decline and is currently at a minimal level. This factor has effectively diminished the vegetation in the littoral zone, which in return reduced the food base for resident fish. In addition, the fluctuating pool level and the absence of any other forms of cover, such as stumps or downed trees, makes the lake less suitable as fish habitat.

2.2.4 Threatened and Endangered Species

As of 2018, 2 federally listed threatened or endangered species are known to exist within the project impact area, the Indiana Bat (Myotis sodalist) and the Northern Long-eared Bat (Myotis septentrionalis). Indiana bats hibernate during winter in caves or, occasionally, in abandoned mines. Since 1950, the major winter colonies in caves in West Virginia, Indiana, and Illinois have disappeared. The overall population, at major roosts, declined about 56% between 1960/1970 and 2003. The Northern Long-eared bat is a small bat associated with mature, interior forest environments. Unlike most other bats, the Northern Long-eared forages along wooded hillsides and ridgelines — not above valley-bottom streams and along the edges of riparian forests. Of the seven species known to

Myotis sodalist, Indiana Bat

Myotis septentrionalis, Northern Long-eared Bat

be affected by white nose syndrome, the deadly bat disease, the northern long-eared is among the hardest hit. In the U.S. Northeast, where white-nose syndrome has been killing bats since 2006, the Northern Long-eared bat has declined by a shocking 99 percent. Forest fragmentation and logging/forest conversion are also major threats to the species due to its' strong association with large blocks of older forests.

Bald eagles, a previously listed federally endangered species, were removed from the federal list in August 2007 and Maryland's list in April 2010. Although this species is not listed as an endangered or threatened species, it is protected under the Bald and Golden Eagle Protection Act, as noted by the United States Fish and Wildlife Service (USFWS). In 1993, a pair of bald eagles established a nest near the shore on a steeply wooded hillside on the south side of the lake in Mineral County, West Virginia. The pair has fledged young every year since 1993, with the exception of 1996 and 1999.

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, Jennings Randolph Lake is experiencing several invasives, both terrestrial and aquatic.

Didymosphenia geminate, Didymo Algae

Threats to the fisheries surrounding Jennings Randolph Lake include invasive fish and plant species as well as environmental pollutants. Established invasive species can spread quickly throughout a water body and once spread, can be both ecologically and economically expensive. One such species, which currently has not been found at Jennings Randolph Lake, but occurs within nearby Garrett County, Maryland is the didymo algae (didymosphenia geminate). Didymo has the ability to coat the bottom of rivers and lakes and smother the habitat and food supply of fish. The species hitchhikes from stream to stream on boats, fishing gear, and the bottom of felt boots and waders. Although not harmful to humans, the algae population is nearly impossible to eradicate once established. It was first discovered in Maryland in 2008 and spread quickly to other areas, including Garrett County's

Savage River. To prevent the widescale didymo infestation, the Maryland Department of Natural Resources installed washing stations at popular boating spots and fishing sites, so that visitors could clean their waders and gear and prevent the transport of algae into other bodies of water.

Agrilus planipennis, Emerald ash borer beetle

Two exotic beetles have been found at Jennings Randolph Lake, Emerald ash borer and Asian long-horned beetle. Emerald ash borer (Agrilus planipennis) is an exotic beetle that has killed hundreds of millions of ash trees in North America. Adult beetles cause little damage, but the larvae feed on the inner bark of ash trees, which disrupts the tree's ability to transport water and nutrients. Asian long-horned beetle (Anoplophora glabripennis) feeds on a wide variety of trees across the United States, resulting in tree death after 10 to 15 years.

Anoplophora glabripennis, Asian long-horned beetle

Another invasive species found on project lands is Japanese Knotweed (Polygonum cuspidatum). Japanese Knotweed is a flowering, bamboo stemmed plant that is indigenous to Eastern Asia. It was introduced to the United States in the late 1880s as an ornamental on estates as well as for erosion control. It was quickly seen as a vigorous pest since each stem can reach heights of 10 to 15 feet and it can quickly form dense thickets that crowd and shade out native vegetation. Once established, it is nearly impossible to eradicate. Long term negative impacts include reducing species diversity, altering natural ecosystems, and negatively impacting wildlife habitats.

2.2.6 Mineral and Timber Resources

The primary rock type on the West Virginia side of the project is shale, whereas the primary rock type on the Maryland side is claystone. Large swaths of sandstone are found across the property.

The major forest types on the project lands are oak, spruce, fir, and mixed northern hardwoods. Large-scale logging and fires in the 19th century significantly reduced the numbers of spruce trees in the project area. Existing second-growth forests are dominated by broad-leaved deciduous trees. Common tree species in the lower slopes include American basswood, tulip poplar, and red maple. Upper slope trees include red and white oak,

chestnut oak, hickories, and sugar maple. Approximately 80 percent of the trees on the property are mature canopy-layer trees, 30 to 50 years old.

Forest species unique to the area include overstory species, such as black maple and black ash, and understory species, such as smooth azalea, winterberry, alternate-leafed dogwood, flowering dogwood, redbud, serviceberry, and burning bush. Black Ash is on the Maryland State Watch List. This means that this species is "rare to uncommon with the number of occurrences typically in the range of 21 to 100 in Maryland. It may have fewer occurrences but with a large number of individuals in some populations, and it may be susceptible to large-scale disturbances." One potential cause of limited population is the presence of Emerald ash borer beetles in the area as discussed in the invasive species section.

The forest resources at the project are not particularly well suited to timber production. This is due primarily to steep slopes and potential aesthetic impacts. Slopes on the project lands range up to 65 percent. The erosion potential at slope sites is moderate to severe, making timbering an unfavorable option. Many forest sites are also clearly visible from the lake and recreation areas, making these sites unfavorable for timbering due to aesthetic impacts.

The forest management program is aimed at protecting and enhancing forest lands for wildlife and recreation. Vegetation, either living or dead, is removed only for disease control, pest control, fire hazard reduction, flood clean-up, construction, or dam maintenance.

Timber Sales. 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. A timber harvest contract was recently initiated to leverage key areas of project property for timber sales. The first area identified for timber harvest is on the Maryland side, off Mount Zion Road. The project will require the construction of a staging area and access road to reach the timbering site. The access area could remain after the timber harvest project to serve as a parking area for visitors.

Fire Protection and Erosion Control. The objectives of the project's fire protection and erosion control procedures are to maintain and preserve the diverse vegetative cover and to protect it from wildfire, insects, and disease. These practices are meant to enhance the health and vigor of the forest cover by protecting the watershed from erosion, and to maintain high water quality by reducing runoff and siltation.

Through normal operations and patrols of the Jennings Randolph Lake project, the ranger staff will note any areas that may be susceptible to fire damage, such as those areas with heavy concentrations of grapevines, which cause damage by uprooting or breaking trees. If it is necessary to remove the hazardous or damaged vegetation, the work will be scheduled for completion as soon as practical. If the Project Manager feels that the job is too large for project staff, the manager will have the work performed by a contractor.

As authorized in Title 42, U.S.C., Sec. 1856a., USACE may enter into reciprocal agreements with responsible fire organizations for fire protection of USACE properties. Such agreements would include a waiver of all claims for compensation for any loss, damage, personal injury, or death resulting from the performance of the terms of the agreement. The agreement may also provide for the reimbursement for all costs incurred in furnishing fire protection on USACE lands. At the

present time, the Jennings Randolph Lake project has no such formal agreement with any agency for fire protection. However, the Elk District Fire Company on the West Virginia side of the reservoir will respond to calls from USACE and will provide protection for those portions of the project. They are well equipped to handle all types of fires, including forest, grass, and structural fires. In the case of a fire in the operations area, such as at the spillway, the Elk District Fire Company is notified, because they are able to respond more quickly in this sort of crisis, even if the fire technically occurs on the Maryland side of the project.

In the event of a fire on the Maryland side of the project, Garrett County Civil Defense can be reached by dialing 911 or by radio. Emergency radios are located in the vehicles of the Reservoir Manager, Head Dam Operator, and Chief Ranger, and at the base station in the Manager's office. The Garret County dispatcher will alert the closest available unit to respond to all fires. Fire personnel respond to the call, and are directed to the specific location of the fire by project personnel.

USACE maintains some minor firefighting equipment on-site, such as fire rakes, Indian backpack pumps, a 525-gallon water bladder, and a backhoe. The project staff are trained to contain a fire until trained firefighters arrive on the scene.

2.2.7 Water Quality

One of the primary purposes of the Jennings Randolph Lake is to provide water quality control in the river downstream of the dam. The regulation of Jennings Randolph Lake for water quality improvement provides numerous benefits to both the in-lake and downstream environment and water users. This regulation produces uniform water quality downstream by eliminating extreme variations in pH and acidity. The impoundment traps and stores sediments and precipitates, allowing better quality water to be released, although the quality is no better than the long-term average quality of the existing river.

Since the early 1900's, the area has been strip-mined for bituminous coal, resulting in wide-ranging environmental impacts. This activity has created continuous problems of erosion, sedimentation, and acid mine drainage, thereby degrading river water quality. For many years, the North Branch suffered from high acid content, the result of drainage from old, abandoned coal mines and poorly treated wastes from cities, towns, and industries. The major characteristics of mine drainage are the presence of sulfuric acid, heavy metals, and high dissolved solids. However, during the past 15 years, several Federal, state, and local agencies have been working to improve the water quality in the area.

At present, approximately 40 miles of the North Branch and 100 miles of tributary streams are still somewhat affected by acid mine discharges. Measures being employed include waste treatment, reclamation of abandoned strip mines, lime treatment at Mount Storm Reservoir, and lime losers. These measures have improved the water quality in this reach of the North Branch Potomac River to a pH of 6.0 or more. In an aquatic ecosystem, species composition, relative abundance, and biological condition of the aquatic community are influenced by stream depth, width, velocity, substrate, habitat cover, turbidity, temperature, and chemical composition of the water. Since 1987, the water quality at Jennings Randolph Lake has improved to an average pH of 6.0, and has stayed relatively uniform. The recent water quality improvements are believed to be the result of mine reclamation efforts and state-sponsored

water treatment stations upstream of the lake. These improvements have significantly reduced the quantity and toxicity of the mine runoff reaching thelake.

2.3 CULTURAL RESOURCES

2.3.1 Prehistoric

The Paleoindian period dates from 10,000 to 8,000 B.C. Paleoindians are the first people known to have lived in Maryland and West Virginia. Climatically, Maryland and West Virginia were somewhat cooler and moister than they are today, but a warming trend had begun. During this period, circumglacial coniferous forests, grasslands, or areas with "mosaic" vegetation began to be replaced with a closed canopy mixed deciduous hardwood forest.

The Archaic period is that segment of eastern North American prehistory extending from 8,000 to 1,000 B.C. This period has been divided into Early, Middle, and Late subdivisions based on various technological, social, subsistence, and settlement criteria. For purposes of this document, the following temporal framework is employed:

1) Early Archaic - 8,000 to 6,500 B.C.
2) Middle Archaic - 6,500-3,000 B.C.
3) Late Archaic - 3,000- 1,000 B.C.

The Early Archaic is defined based on technological and social changes associated with the retreat of the last Pleistocene glacier. The glacial retreat brought about significant regional climatic changes, the complete replacement of the circumglacial coniferous forests with mixed deciduous forests, and the replacement of Pleistocene fauna with modern species.

The Middle Archaic is recognized as a time of increased regionalization of cultures, which is reflected by a variety of technological, settlement, subsistence, and social traits. The temporal unit also is characterized by the appearance of regional Projectile point styles. A variety of specialized tools, which reflect the exploitation of a wide array of resources and new processing techniques, first appear during this temporal unit. The increased number and diversity of both formal and informal ground stone tools, many used for plant food processing, is a particularly noticeable aspect of many Middle Archaic assemblages.

Late Archaic cultures in eastern North America reflect a continuum of the trend toward greater regional specialization and adaptation first evident in the Middle Archaic. Adaptation to unique regional environmental conditions resulted in the development of specialized technologies that were used to exploit locally available plant and animal resources. Evidence of increased social complexity is present at some Late Archaic sites. The association of grave goods manufactured from non-local raw materials with some burials suggests special treatment of certain individuals.

As with the Archaic period, the Woodland period has been divided into three chronological subdivisions: Early, Middle, and Late. For the purposes of this document, the following temporal framework is employed: Early Woodland - 1000 to 200 B.C.; Middle Woodland 200 B.C. to A.D. 500; and Late Woodland - A.D. 500 to A.D. 1630.

The Early Woodland is distinguished from the preceding Late Archaic by the appearance of ceramics in the archeological record. However, subsistence patterns changed little from Late Archaic times. In central and eastern Maryland and West Virginia, the construction of earthen

enclosures and burial mounds during the Early Woodland is suggestive of increased social complexity.

During the Middle Woodland, the construction of earthen enclosures and burial mounds continued, and reached its height. Many grave goods are indicative of interregional exchange. Middle Woodland habitation sites range from large base camps to small dispersed settlements.

Late Woodland artifacts are similar to those from late Middle Woodland sites. However, most lack items indicative of interregional exchange. During this period, there is evidence of increased reliance on agriculture, increased nucleation of local populations, and a shift to a more sedentary lifestyle. Late Woodland subsistence patterns reflect a hunting and gathering-gardening strategy similar to that of the Middle Woodland but with increased use of native cultigens. By the end of the Woodland period tropical cultigens such as corn had been incorporated into local diets.

2.3.2 Historic

The Iroquois occupied the Project vicinity from between 1450 and 1600 to the early 1700s. Archaeological evidence of occupation by the Cherokee, Lenape, Shawnee, and Mingo tribes has also been reported for Garrett County.

The Colony of Virginia was established through the 1609 charter from the King of England to the London Company, including all lands west of Jamestown to the Ohio River. By the mid-1700s, the Colony considered that the French had usurped England's rights to the Ohio River territory. This territory was included among those disputed in the French and Indian War of 1754 to 1763. The Project vicinity was historically a major transportation route. Westward passage from the settlement in Cumberland, Maryland was over an old military road built during the French and Indian war in 1755. In 1806, Thomas Jefferson authorized the construction of new road from Cumberland to Wheeling, West Virginia on the banks of the Ohio River, which was completed in 1818. Late in the 1800s, timber cutting, and tanneries cropped up in the Potomac River Valley.

In 1881, the West Virginia Central and Pittsburgh Railroad (later the Western Maryland Railway) began its push up the river valley, and with it, branch lines along river tributaries and additional saw mills at strategic locations along the railroad. Timber industries threatened extensive deforestation in the area. Proximity of the area to major urban centers coupled with the ease of access to the region provided by the railroad led to a shift to tourism and recreation use in the late 19th century. Construction of resorts and other vacation development was undertaken at locations along the railroad beginning in 1872. In 1906, Robert and John Garrett gave the State of Maryland 2,000 acres of forest land, contingent upon management of the area for conservation. As tourism in the region declined, coal mining and timber production continued with these and agriculture being the largest economic sectors in the Project vicinity today.

2.3.3 Previous Investigations at Lake

In 1979, Thunderbird Research Corporation, under the direction of USACE, performed a Phase I cultural resources investigation of the Jennings Randolph Lake project lands as part of the original reservoir and dam construction. This investigation was conducted in accordance with Section 106 of the National Historic Preservation Act of 1966, and its implementing regulation 36 CFR 800, "Protection of Historic Properties." Two previous investigations, in 1967 and 1970, interviewed residents that had collected a variety of Middle

Archaic to Woodland Period projectile points on the floodplain within the reservoir boundaries; however, no sites were located during a surface inspection.

The 1979 investigation assessed and documented prehistoric and historic resources by conducting a review of the existing literature and archival sources, cartographic review, interviews with persons knowledgeable of the area, and field examination of the project impact area between elevations of 1,330 feet and 1,500 feet NGVD. No sites were located during the surface inspection of the North Branch Potomac River floodplain area. The field investigation concluded that the project lands were largely disturbed by strip mining, lumbering operations, and dam construction. Even though the report concluded that the project lands were largely disturbed, it recommended that archaeological surveys should be conducted on the small floodplain locales associated with the tributaries that enter the lake and undisturbed hill tops.

The communities of Shaw and Barnum which represented economic development of the coal and timber industries were razed as a result of the dam construction. A brief architectural reconnaissance of the project area and along Walnut Bottom Road on the Maryland shoreline noted stone and wooded fences, a few 20th century houses, most dating since the 1940's. Local residents reported no structures of historic value existed in the project area.

A 1989 Jennings Randolph Reallocation Reconnaissance report identified three types of sensitive areas on the property, but concluded that the potential for significant historic and pre-historic cultural resources in the Jennings Randolph project area is low. The 3 areas were identified as stable alluvial floodplain surfaces, higher terraces, and rock overhangs located between elevations 1,466 feet and 1,484 feet NGVD.

In response to the identification of sensitive areas in the Reconnaissance report, the Phase I investigation for the Jennings Randolph Feasibility Report was carried out in 1991. Through map review, numerous potentially sensitive areas were identified at Howell Run, Deep Run, Chaffee Railroad Siding, Stone Cliff downstream of Chaffee, and the upstream end of the North Branch Potomac River, as well as in the Maryland study area at Three Forks Run, Stony Hollow, and Elklick Run. These areas were subject to a pedestrian survey and shovel test survey. Shovel tests were excavated in 15-meter intervals along single transects. All excavated soils were screened through one-quarter-inch mesh.

The results of the Phase I investigation determined that there are no significant historical artifacts or sites below elevation 1,484 feet NGVD within the project boundaries. Elevations below 1,466 feet NGVD were surveyed prior to project construction, and the project area between 1,466 and 1,484 feet NGVD was surveyed during the study for reallocation of the project. Also, no historic architectural resources were identified within the project boundary. These findings were reported to the Maryland and West Virginia State Historic Preservation Officers, both of whom concurred.

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). In Garrett County, Maryland, the Bloomington Viaduct, a sandstone bridge featuring three arches, spans the North Branch Potomac River several miles downstream of the Project and was listed on the NRHP in 1976. This site is located approximately 7 miles downstream of the Project. The Folly Run Site, also referred to

as the Meyer Site, is a Late Prehistoric Village located outside the northeastern portion of Jennings Randolph Lake project lands.

2.3.5 Long-term Objectives for Cultural Resources

In 2001, a Cultural Resource Management Plan (CRMP) was developed and incorporated into the Operational Management Plan. This CRMP was developed in accordance with ER 1130-2-540 and complies with Section 110 of the National Historic Preservation Act. The plan includes an inventory of cultural resources on project lands and develops administrative and maintenance procedures for cultural resource management. There are three main objectives for the CRMP: 1) Update the CRMP as substantial changes occur; 2) Inventory and evaluate any remaining areas that have medium to high potential of containing archaeological resources, as funds permit; and 3) Increase public awareness and education of regional history.

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 Jennings Randolph Lake consists of Allegany and Garrett Counties in Maryland and Grant and Mineral Counties in West Virginia. The lake lies within Garrett and Mineral Counties. Allegany and Grant are surrounding counties.

2.4.2 Population

According to the 2016 ACS 5-year Population estimate, the total population for the zone of interest is 142,113, down from 144,521 in 2010. Approximately 52 percent of the population is in Allegany County (73,060 people), 21 percent in Garrett County (29,677 people), 19 percent in Mineral County (26,606 people), and 8 percent in Grant County (11,770 people). The population in the zone of interest makes up approximately 2 percent of the total population of Maryland (5,959,902 people) and West Virginia (1,846,092 people) combined. From 2016 to 2030, the population in the zone of interest is expected to increase to 147,097, an annual growth rate of 0.3 percent per year. Table 2-1 shows the population estimates and projections for the zone of interest.

Table 2-1: Population Estimates and 2030 Projections.

Geographical Area	2010 Population Estimate	2016 Population Estimate	2030 Population Projection
Maryland	5,696,423	5,959,902	6,612,200
West Virginia	1,840,802	1,846,092	1,833,536
Allegany County	74,638	73,060	76,650
Garrett County	30,145	29,677	31,550
Grant County	11,942	11,770	11,671
Mineral County	27,796	27,606	27,226
Zone of Interest Total	**144,521**	**142,113**	**147,097**

Source: U.S. Bureau of Census, Population Division (2010 & 2016 Estimates); West Virginia University Bureau of Business & Economic Research (2030 Estimates); and Maryland Department of Planning (2030 Estimates).

The distribution of the population among gender, as shown in Table 2-2 below, is approximately 51 percent (72,410 people) male and 49 percent (69,703 people) female in the zone of interest, which is different than both Maryland and West Virginia who have a slightly larger female population than male population. Allegany County has the most significant difference in gender populations with approximately 52 percent (38,077 people) males and 48 percent (34,983 people) females. Grant, Garrett, and Mineral Counties all have close to a fifty-fifty distribution of male and female populations, with Garrett and Mineral Counties having slightly more females than males and Grant County having slightly more males than females.

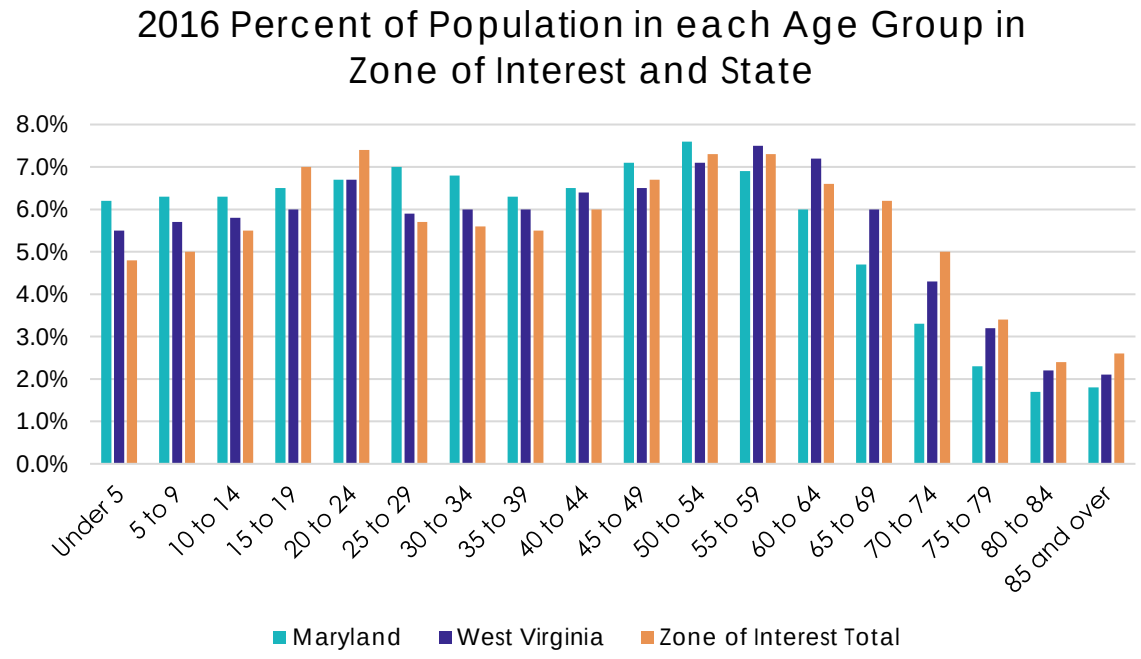
Table 2-2: 2016 Percent of Population Estimate by Gender.

Geographical Area	Male	Female
Maryland	2,886,734	3,073,168
West Virginia	912,270	933,822
Allegany County	38,077	34,983
Garrett County	14,701	14,976
Grant County	5,908	5,862
Mineral County	13,724	13,882
Zone of Interest Total	**72,410**	**69,703**

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

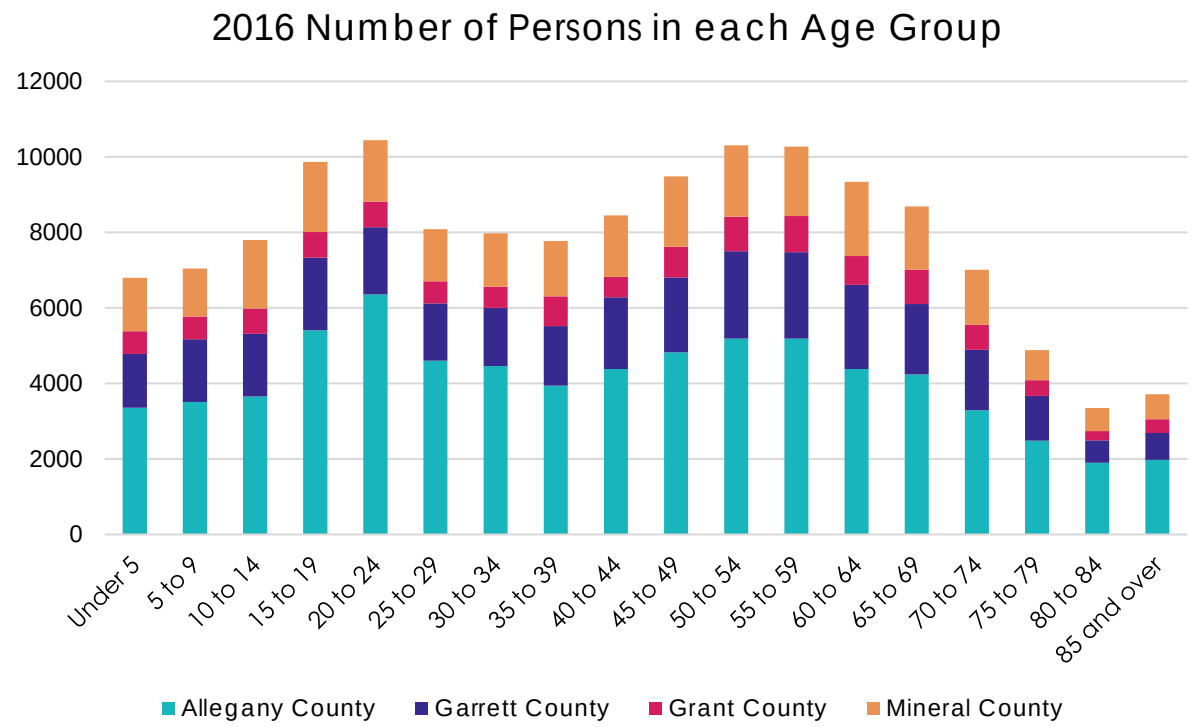
Tables 2-3 and 2-4 on the following page show the population by age group. The distribution by age group is relatively similar among the individual counties, the overall zone of interest, and the two states in terms of percentages of the respective population. The largest age group in the zone of interest is the 20 to 24 group (7.4 percent of the population) with the 50 to 54 (7.3 percent of the population) and the 55 to 59 (7.3 percent of the population) groups following close behind. The largest age group in the state of Maryland is the 50 to 54 group (7.6 percent of the population) while the 55 to 59 group (7.5 percent of the population) is the largest age group in West Virginia.

Table 2-3: 2016 Percent of Population by Age Group in Zone of Interest and State



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

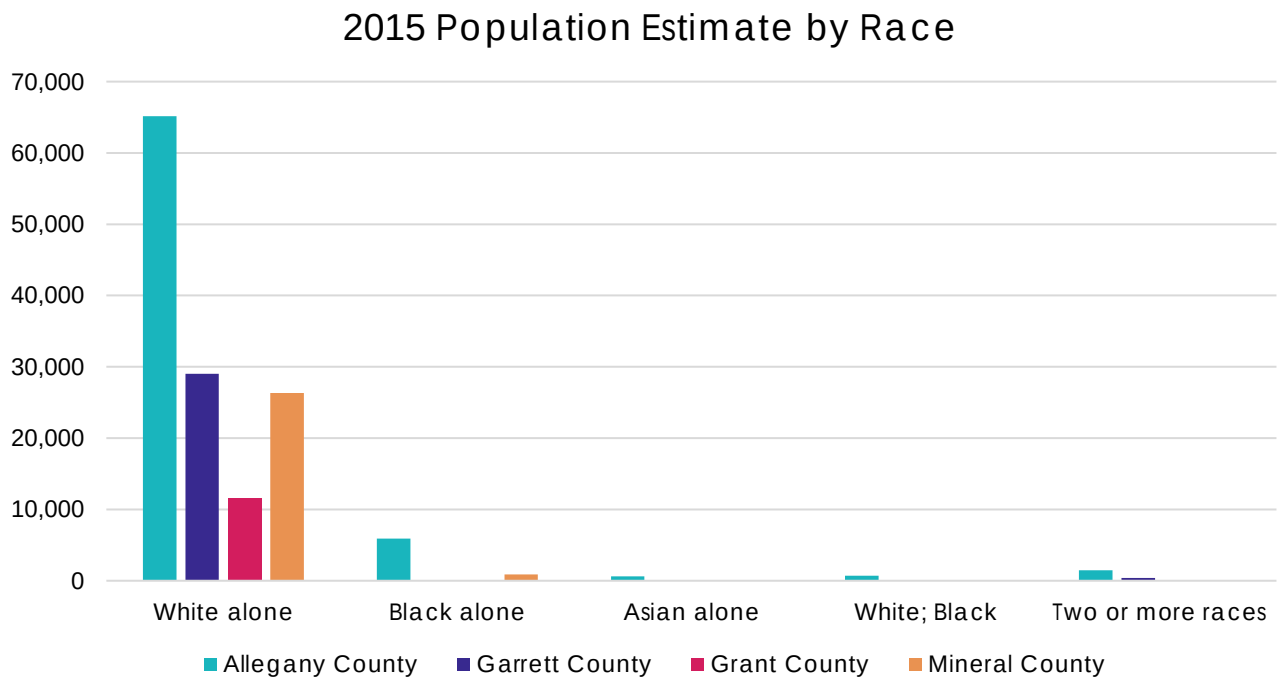
Table 2-4: 2016 Number of Persons by Age Group in Counties



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

Population by race is displayed in Table 2-5 below. For the zone of interest, approximately 93 percent of the population is White, 5 percent Black, 0.5 percent Asian, 0.5 percent Black/White, and 1 percent Two or more races. At the time of data collection, no persons within the zone of interest identified as Native American or Hispanic/Latino.

Table 2-5: 2015 Population Estimates by Race

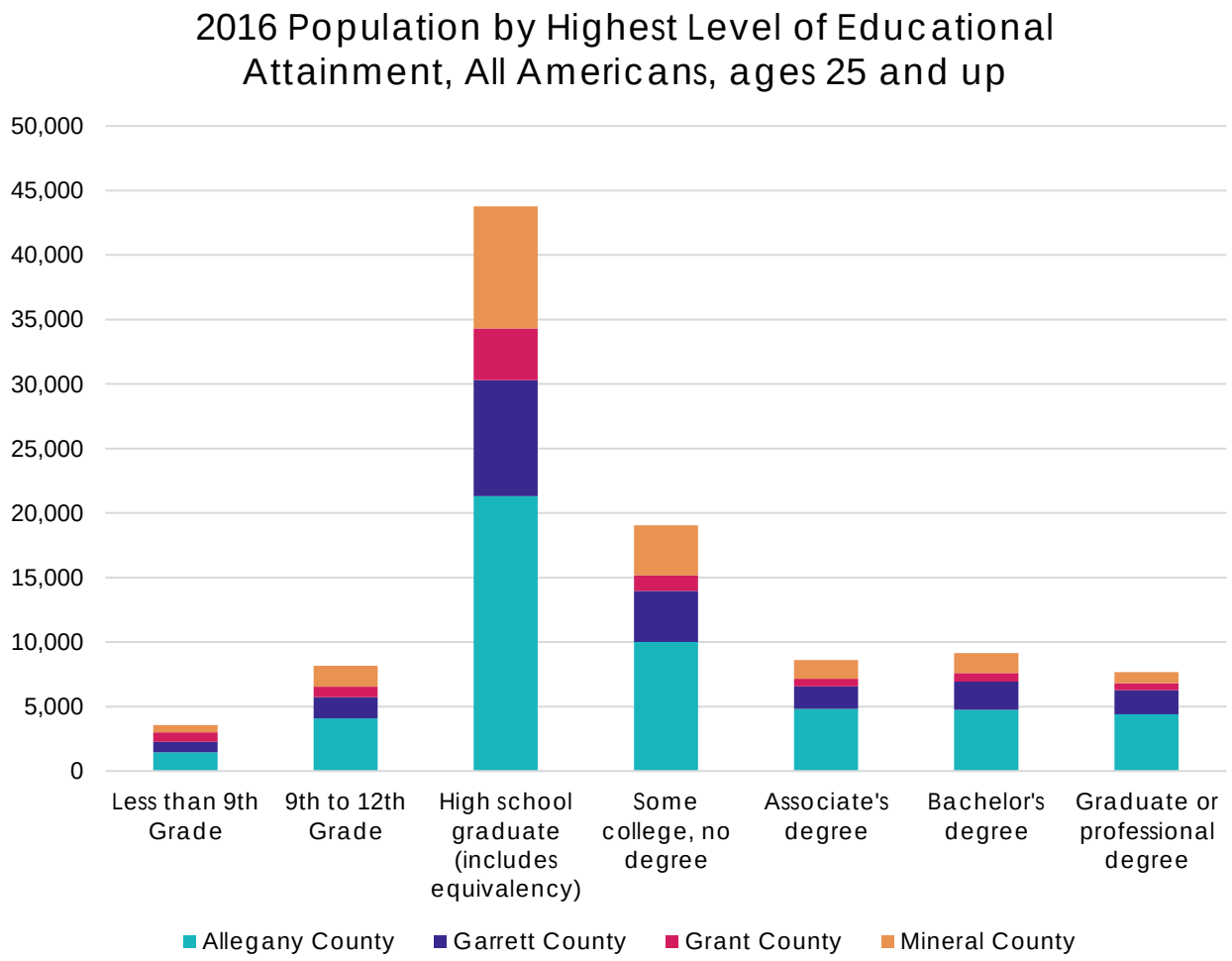


Source: U.S. Bureau of Census, 2012-2016 American Community Survey 5-Year Estimates (2015 Estimates)

2.4.3 Education and Employment

In the zone of interest, for approximately 31 percent of the population age 25 and older, the highest level of education attained is a high school diploma or equivalent. Approximately 13 percent have some college education, but no degree, 6 percent have an Associate's degree, 6 percent have a Bachelor's degree, 5 percent have a 9th to 12th grade education, 5 percent have a graduate or professional degree, and 3 percent have less than a 9th grade education. Table 2-6 below shows the level of education attained for persons residing in the four counties that make up the zone of interest.

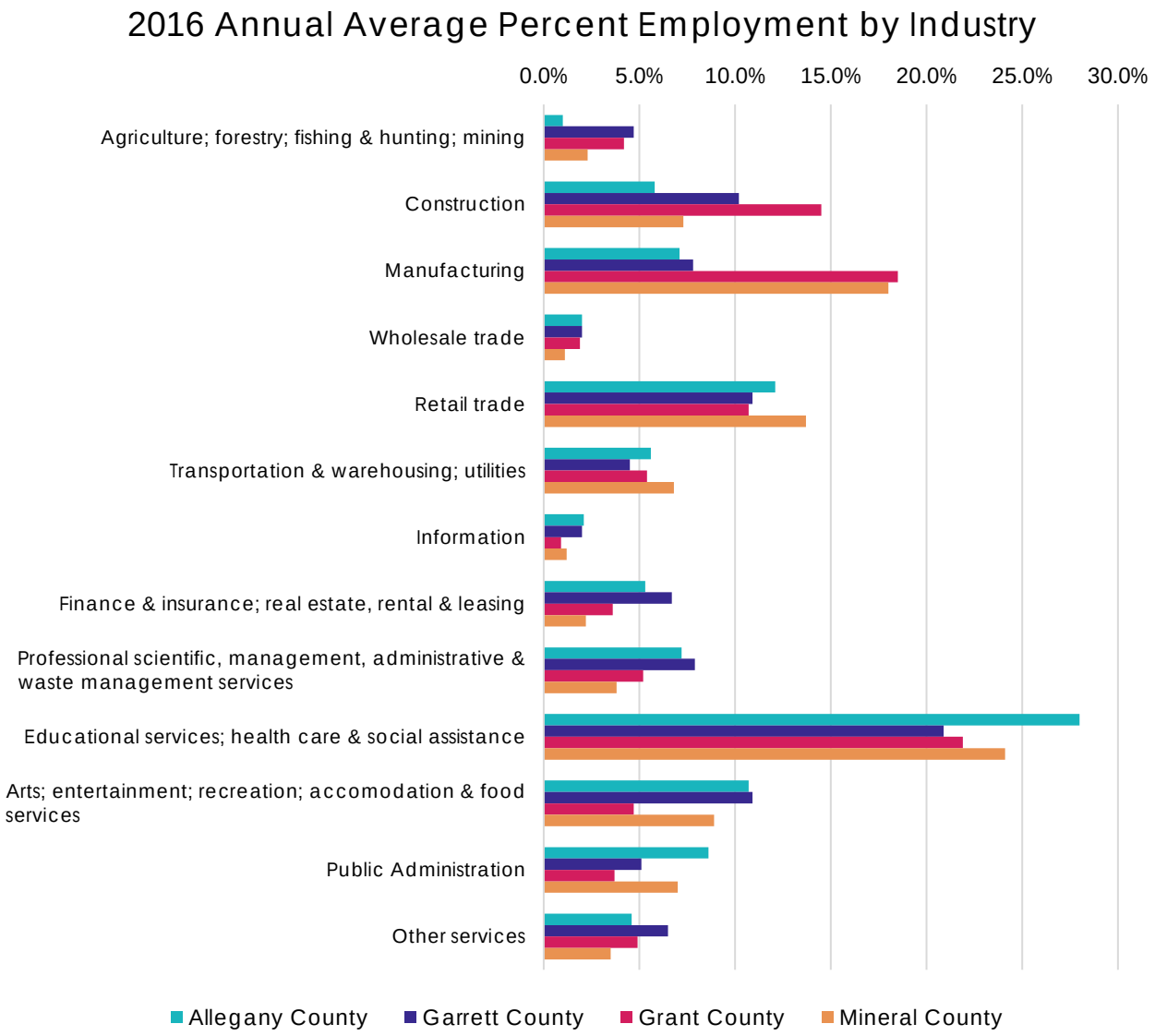
Table 2-6: 2016 Population by Highest Level of Educational Attainment, Population 25 Years of Age and Older



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

The majority of the zone of interest is employed in the Educational Services, Health Care and Social Assistance industry at approximately 25 percent, followed by 12 percent in Retail Trade, 10 percent in Manufacturing, 10 percent in Arts, Entertainment and Recreation, and Accommodation and Food Service, 8 percent in Construction, 7 percent in Public Administration, 6 percent in Professional, Scientific, and Management, and Administrative and Waste Management Services. The remaining industries employed less than 5 percent each of the zone of interest's civilian workforce. Table 2-7 below shows the distribution of employment by industry for the four counties within the zone of interest.

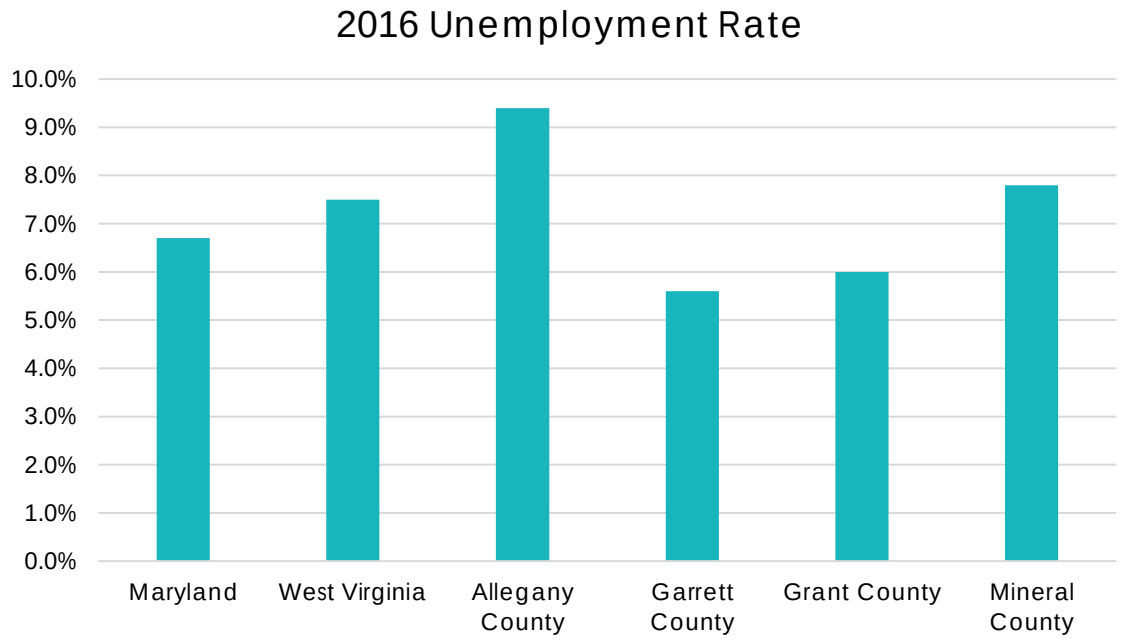
Table 2-7: 2016 Annual Average Percent Employment by Industry



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

The unemployment rate within the zone of interest is 8 percent. Table 2-8 shows that Allegany County has the highest unemployment rate at 9.4 percent, followed by Mineral County at 7.8 percent, Grant County at 6 percent, and Garrett County at 5.6 percent. West Virginia has a higher overall unemployment rate than Maryland, 7.5 percent compared to 6.7 percent, but both states have a lower rate than the zone of interest.

Table 2-8: 2016 Unemployment Rate in Counties and States

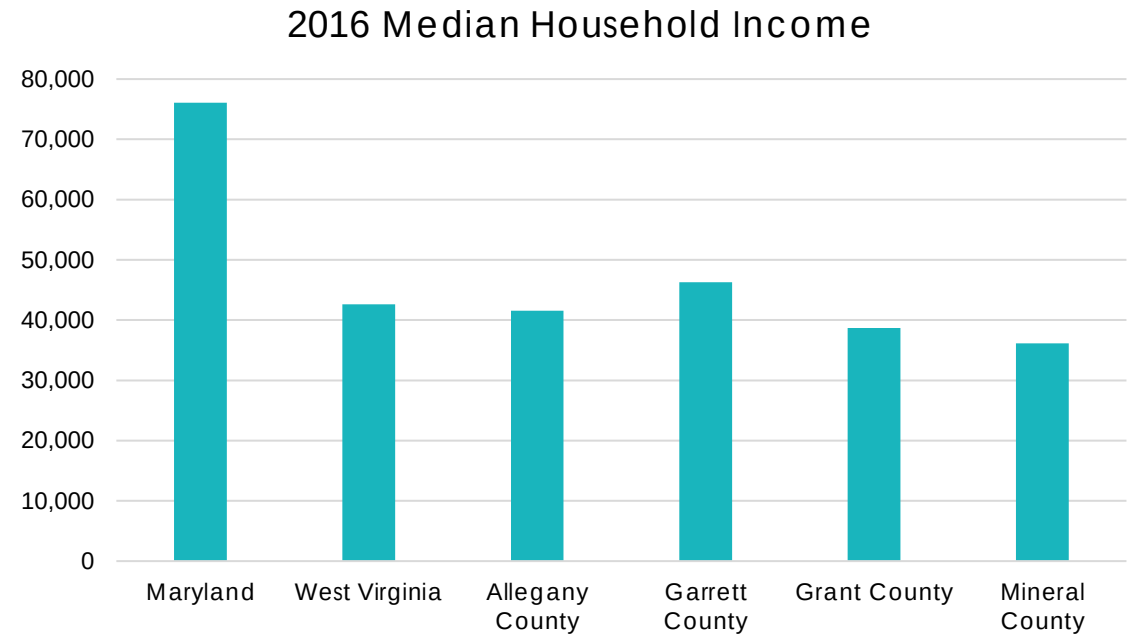


Source: U.S. Bureau of Census, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimates)

2.4.4 Households and Income

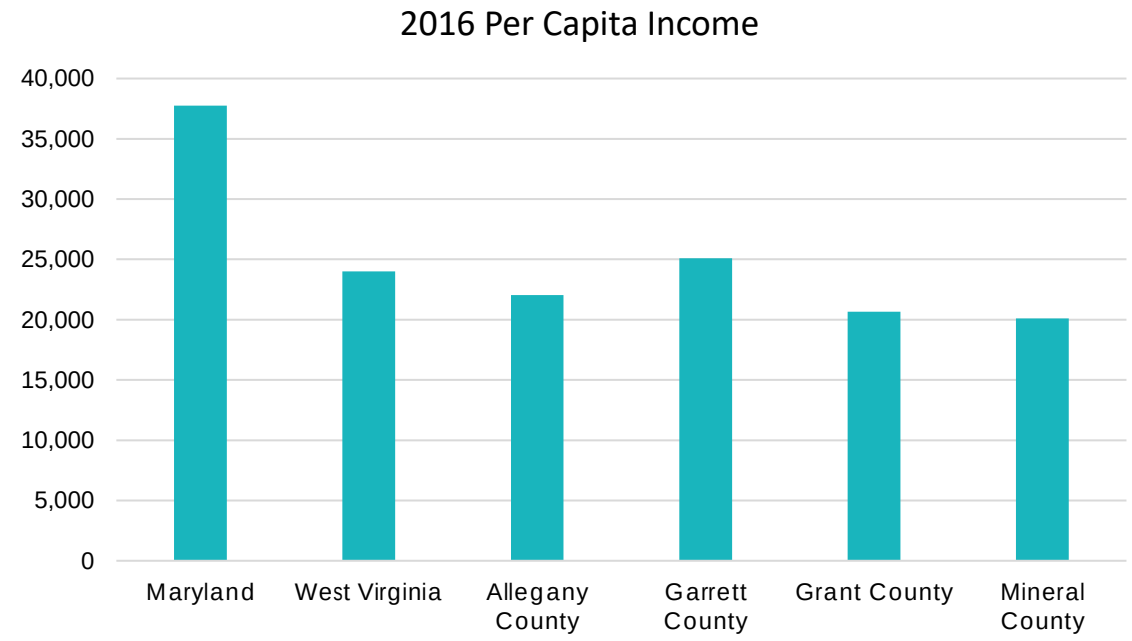
There are approximately 2,177,492 households in Maryland and 730,307 households in West Virginia. Within the zone of interest, there are approximately 55,258 households. The median household income is lower in each of the counties than Maryland overall. West Virginia has a similar median household income as the counties, even being lower than Garrett County. The median household income in the zone of interest ranges from $36,153 in Mineral County to $46,277 in Garrett County. The median household income for Maryland is $76,067 and $42,644 in West Virginia. This relationship is also seen for per capita income with Mineral County having the lowest at $20,093 and Garrett County having the highest at $25,096. Once again, the state of Maryland has a much higher per capita income than the counties within the zone of interest, clocking in at $37,756, and West Virginia is lower than Garrett County at $24,002. Tables 2-9 and 2-10 on the next page show the respective incomes for the counties within the zone of interest and the overall states.

Table 2-9: 2016 Median Household Income in Counties and States



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

Table 2-10: 2016 Per Capita Income in Counties and States

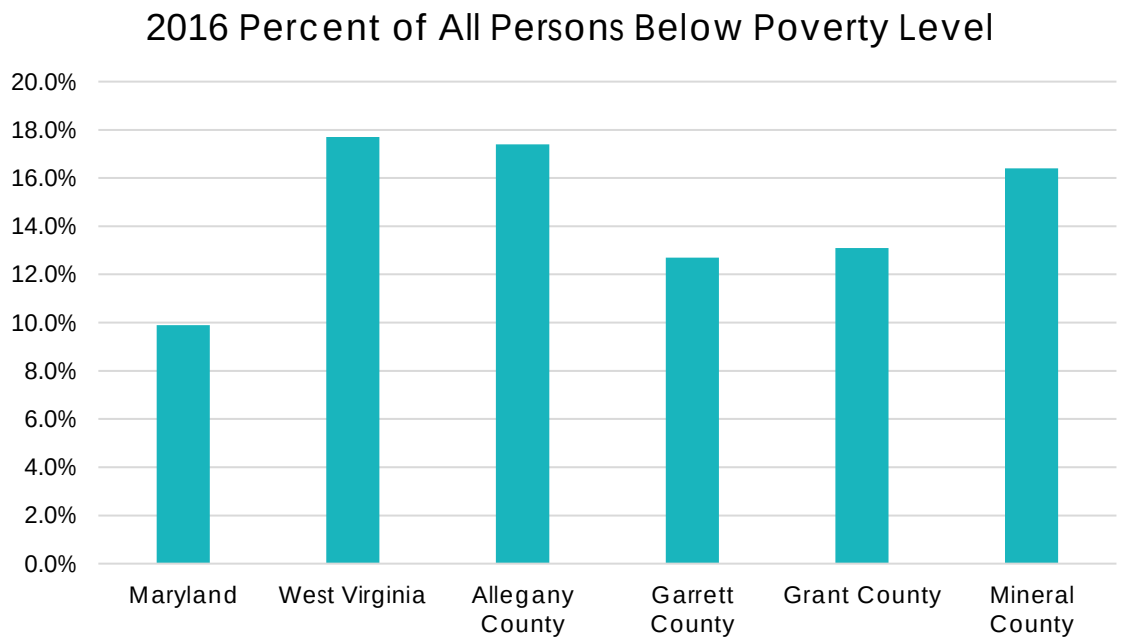


Source: U.S. Bureau of Census, 2012-2016 American Community Survey 5-Year Estimates (2016 Estimates)

The number of persons whose income was below the poverty level is greater in Allegany and Mineral Counties as well as the state of West Virginia compared to Garrett and Grant Counties as well as the state of Maryland. West Virginia has the highest percent of persons below the poverty level at 17.7 percent, closely followed by Allegany County at 17.4 percent and Mineral County at

16.4 percent. Garrett County has 13.1 percent of persons with incomes below the poverty level and Grant County has 13.1 percent. The state of Maryland has the fewest percent of persons below the poverty level at 9.9 percent. Table 2-11 shows the distribution of persons with incomes below the poverty level within the zone of interest's counties and the overall states.

Table 2-11: 2016 Percent of All Persons Below Poverty Level in Counties and States



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

2.5 RECREATION FACILITIES, ACTIVITIES, AND NEEDS

2.5.1 Zone of Influence

The primary area of influence for Jennings Randolph Lake encompasses portions of Allegany (MD), Garrett (MD), Grant (WV), and Mineral (WV) Counties. Data from this four-county region provides the basis for summarizing the population characteristics of Jennings Randolph Lake.

2.5.2 Visitation Profile

The majority of visitors to Jennings Randolph Lake come from the 4 counties surrounding the property, stated above. These visitors come with a wide variety of interests, with camping and hiking being the two most popular recreation activities. Examples of visitors include campers who utilize the Robert W. Craig campground; fishers who spend their days catching trout along the North Branch Potomac River just south of the lake and their nights camping alongside the whitewater kayakers and rafters at the Barnum Camping Area; water enthusiasts who spend their days on their boats on the lake; and day users who picnic, hike, bird watch, bicycle, and visit the 3-D archery range. Jennings Randolph Lake is the primary location for water-related recreation, providing the public with a location for boating, sailing, canoeing/kayaking, paddle boarding, waterskiing, and swimming in the area. Jennings Randolph has consistently provided high quality fishing opportunities for multiple fish species and is regarded as a premier fishing destination in the region as well as for the entire United States.

The Robert W. Craig has a 155-day season with occupancy averaging around 50 to 60 percent besides for holidays where occupancy typically reaches maximum capacity. Typically, peak visitation periods at Jennings Randolph Lake occur during weekends and holidays. On an average weekend, 50 to 60 sites at the campground are occupied. Shaw Beach and the Howell Run Picnic Area are typically full on the weekends. There is also always an observed increase in visitation upon opening a new recreation feature. In 2015, the Jennings Randolph Lake maintenance team redeveloped the Robert W. Craig Campground and the average use increased by approximately 300 percent.

2.5.3 Recreation Facilities

Although the primary functions of the lake are to improve water quality, water supply, and flood control, the project is also authorized to provide recreation above and below the dam. Recreation facilities with the project area are mostly nature-based, including picnic areas, boat ramps, camp sites, hiking trails, and natural areas. Public lands, like Jennings Randolph Lake, have allowed nature-based recreation to become an important and growing segment of the regional economy. The existing recreational opportunities and future potential of Jennings Randolph Lake is of great importance within the project's zone of influence.

USACE operates and maintains 11 recreation areas at Jennings Randolph Lake including a campground, 3 overlooks, a picnic area, a trail system, an archery range, a covered pavilion/basketball court, 2 beaches, and a boat launch. The Water Resources Development Act of 1988 added downstream recreation, including whitewater rafting and fishing, as an authorized project purpose. USACE conducts annual whitewater releases in the April-May time frame, if conditions permit. The Mineral County Park and Recreation Commission signed a lease for 12 acres in March 1990 to develop, operate, and maintain the whitewater/fishing access downstream of the dam near Barnum, West Virginia. In June 1998, the lease was amended to include an additional 33 acres for a total of approximately 45 acres of land and the development of cabins, primitive camping sites, restrooms, parking, and a river access trail. This area is referred to as the Barnum Whitewater Area. The Maryland Department of Natural Resources constructed and operates a boat launch to provide access to the lake from the Maryland side of the project. The Maryland DNR also maintains the Robert S. Brown Overlook and a grant-funded 22-acre habitat restoration area within their leased land.

The lake, which offers unlimited horsepower boating, has deep and shallow areas and small coves created by tributaries, providing diverse opportunities for boaters. The only boating constraints are the no-wake zone around the boat launches and the restricted area around the dam and intake tower.

The acidity of the water during the first few years of reservoir operation made it appear that fishing and swimming would never be possible at the lake. Therefore, only one water-based recreational facility was developed. However, reclamation of old mine sites and cleaner, more efficient production at current mine sites have reduced the quantity and toxicity of the mine runoff reaching the river and lake. Maryland Department of Natural Resources has lime dosers located upstream of the project, which assist in treating acid streams. Because of these efforts, the water quality in the reservoir is now sufficient to support water contact activities. Current lake activities include power boating, non-power boating, water skiing, fishing, and swimming.

Current developed recreation facilities include the Howell Run and Maryland DNR Boat Launches, the Howell Run Picnic Area, the Robert W. Craig Campground, the Barnum Camping Area, Shaw Beach, Dragon Head Beach, the High Timber Trail, the Sunset Trail, the Songbird Trail, Senator Paul B. Sarbanes River Access Trail, and the Maryland and West Virginia overlooks. Table 2-12 provides a summary of the current recreational facilities and their amenities.

Howell Run Picnic Area

Howell Run Picnic Area: The area is benched into a steep slope on the West Virginia side, which gives it an excellent position and a panoramic view of the lake and project lands. The picnic area is only open from dawn to dusk during the recreation season and is closed during the winter months.

Howell Run Boat Launch

Howell Run and Maryland DNR Boat Launches: The Howell Run Boat Launch is in West Virginia, in a small cove at the upstream end of Howell Run. The boat ramp is open from April to October, except when the lake level falls below elevation 1,445 feet NGVD, or rises above 1,470 feet NGVD, when the ramp is unusable. The Maryland DNR Boat Launch is in Maryland, at the end of Mt. Zion Road on Backbone Mountain. There is a service charge to use the ramp, but there is also a comfort station and paved parking lot for convenience.

Robert W. Craig Campground: The Robert W. Craig Campground is in West Virginia on a high ridge adjacent to the dam borrow area, approximately 3 miles from the lake. There are no physical connections between the campground area and the lake, but Sunset Trail, located at the entrance to the campground, offers a view of the dam and a portion of the lake. The campground operates May through September with a season of 155 days. There are 2 contracted park attendants permanently stationed at the campground to run the online reservation system as well as assist campers utilizing the park. In 2015, the campground site was redeveloped by the maintenance team to provide new features requested by campers, including the removal of useless sites to enlarge other stalls and the clearing of brush from canopy-side areas. There are currently 68 sites, all of which have electrical services.

Barnum Whitewater Area: The Barnum Whitewater area is in West Virginia downstream from the lake along the North Branch Potomac River. The 45-acre area is leased and managed by the Mineral County Parks and Recreation Commission. There are 10 primitive cabins available for rent with each cabin having electric service. There are also picnic tables, fire rings, and primitive camping sites available. There is a waterless restroom facility located in the parking area. The Barnum Whitewater Area is a frequent place of choice for fishing and whitewater kayaking enthusiasts due to easy access to the river through a 4.1-mile rail trail.

Robert W. Craig Campground

Barnum Camping Area

Overlooks: There are 4 overlooks at the Jennings Randolph Lake: 3 in Maryland and 1 in West Virginia. Normally, these are open year-round from dawn to dusk, and provide opportunities for picnicking, hiking, and sightseeing. Maryland Overlook #1 is located downstream of the dam and Maryland Overlook #2 is located on natural benches in the hillside upstream of the dam. Both offer different panoramic viewpoints of the lake. The Robert S. Brown Overlook is also located on the Maryland side just up the road from the Maryland DNR boat launch. It is also managed by the Maryland DNR. The two-story West Virginia overlook, which also serves as the project's Visitor Center, is located adjacent to the dam and the administrative complex. The view from the overlook encompasses the lake, dam, intake tower, dike, and spillway gates.

View from Maryland Overlook #1

Beaches: Shaw Beach is a 200-foot swim beach located in West Virginia. The beach is located near the West Virginia Overlook/Visitor Center. There are no lifeguards on duty, but there is a dedicated swimming area marked by floating buoys to prevent conflicts between boats and swimmers. Dragon Head Beach is a relatively new recreation area at the lake. It is accessed from the Maryland side of the lake by car or the Senator Paul B. Sarbanes River Access Trail by foot. The area includes a small gravel parking lot and some picnic tables for users to enjoy.

Shaw Beach

Trails: There are four trails at the project that are open from dawn to dusk. Two of the trails are located at the Robert W. Craig Campground. The High Timber Trail, a 0.7-mile self-guided tree identification trail, is located directly west of the campground, following the natural contours of the land. The Sunset Trail, a 1.2-mile down-and-back trail, offers a panoramic view of the dam and lake. The trail winds through a wooded area, across a small stream, and through the old quarry area. The third trail, Songbird Trail, is located on the Maryland side, and begins at Maryland Overlook #2. Songbird Trail was constructed in 1988. The trail is a half mile long and ends at a waterfall and pond area. Another trail on the Maryland side is the Senator Paul B. Sarbanes River Access Trail. This trail is 1.75 miles long connecting the Maryland Overlook to the bank of the North Branch Potomac River. The trail meanders across open fields through deciduous woodlands and ends on the river's edge. The Shoreline Access Trail is a 0.5-mile spur trail that takes hikers from the Maryland Overlook parking area to the shores of Jennings Randolph Lake.

View from Paul Sarbanes Trailhead

Table 2-12: Summary of Recreational Facilities and Available Amenities.

	Parking	Potable Water	Restrooms	Picnic Tables	Fire Rings / Grills	Electrical Outlets	Pavilions	Showers	Trail Access	Camping	Fee
Barnum Whitewater Area	■		■	■	■	■			■	■	■
Dragon Head Beach	■			■					■		
Howell Run Boat Launch	■	■	■								
Howell Run Picnic Area	■	■	■	■	■	■	■		■		
Maryland DNR Boat Launch	■	■	■	■	■		■				■
Maryland Overlook #1	■			■					■		
Maryland Overlook #2	■			■					■		
Robert W. Craig Campground	■	■	■	■	■	■	■	■	■	■	■
Shaw Beach	■	■	■	■	■				■		
West Virginia Overlook	■	■	■						■		

2.5.4 Recreation Analysis

Jennings Randolph's 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 Jennings Randolph Lake generally falls within two broad categories; land-based or water-based recreation. The lake provides recreational opportunity for swimming, boating, fishing, and other water sports. The area around the lake provides picnicking and camping for the casual, overnight, or vacationing visitors. Additionally, hiking and bird watching are encouraged throughout the project lands.

Management objectives for each type vary depending on the location and the intensity of use. 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 for the states of West Virginia and Maryland were summarized in the Statewide Comprehensive Outdoor Recreation Plan (SCORP) 2015-2020, produced by the West Virginia Development Office, and the Maryland Land Preservation and Recreation Plan (MLPRP) 2014-2018, produced by Maryland DNR. These documents look at statewide trends and provide regional context for future outdoor recreation trends at Jennings Randolph Lake.

In West Virginia, civilians living in both urban and rural areas preferred trails and good views as recreation facility priorities. Other priorities included water features, picnic areas, and courts and playgrounds and can be found in Table 2-13 below. Looking at outdoor recreation participation further, trails were the number one facility priority for casual and high (daily or near daily) outdoor recreation participants and good views and picnic areas were the number one facility priority for low (limited) outdoor recreation participants. Tables 2-14 and 2-15 on the following page show the physical levels of West Virginia residents and the facility priority preferences for each physical level.

Table 2-13: 2014 Preferred Outdoor Recreation Facility Priorities for Urban and Rural West Virginians

Facility Priorities	% of Population in Urban Areas	% of Population in Rural Areas
Good Views	78%	50%
Trails	52%	65%
Water Features	42%	38%
Picnic Areas	39%	45%
Courts & Playgrounds	32%	34%

Source: West Virginia SCORP, 2015-2020, produced by the West Virginia Development Office.

Table 2-14: 2014 Physical Activity Level of West Virginia Outdoor Recreation Participants

	Low Level of Activity	Casual Level of Activity	High Level of Activity
Urban Areas	25%	46%	29%
Rural Areas	33%	52%	15%
Mean	29%	49%	22%

Source: West Virginia SCORP, 2015-2020, produced by the West Virginia Development Office.

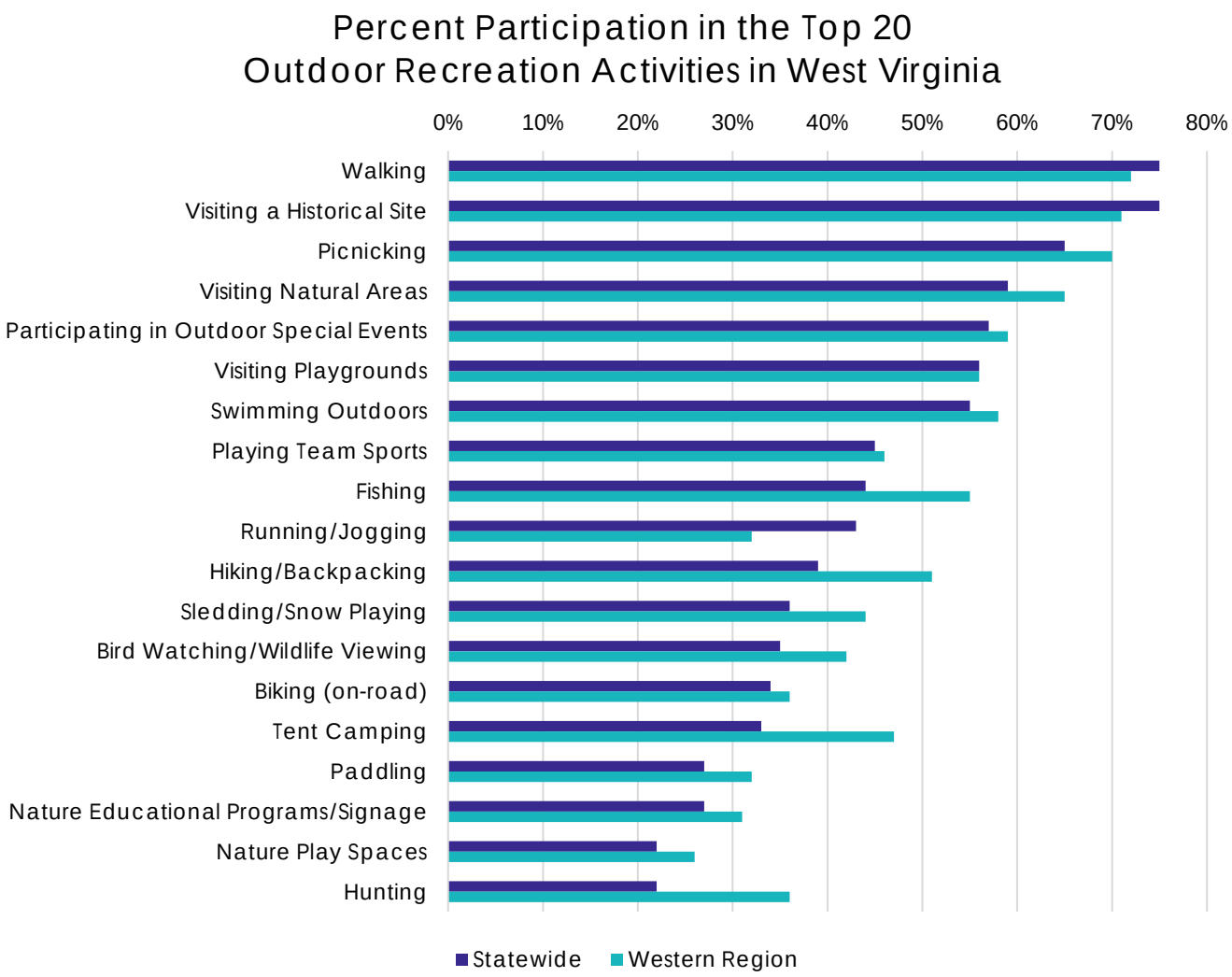
Table 2-15: 2014 Preferred Outdoor Recreation Facility Priorities for Low, Casual, and High Outdoor Recreation Participants

Facility Priorities Ranking*	Low Level of Activity	Casual Level of Activity	High Level of Activity
1	Good Views & Picnic Areas (tie)	Trails	Trails
2	Trails	Picnic Areas	Water Features or Access
3	Water Features or Access	Good Views	Good Views

**Note that a ranking of 1 refers to the most preferred facility priority among the given user group.*
Source: West Virginia SCORP, 2015-2020, produced by the West Virginia Development Office.

In Maryland, 82 percent of respondents to a 2014 survey indicated that at least one member of the household participates in outdoor recreation activities. Overall, the most popular outdoor recreation activities statewide included walking (75 percent), visiting historical sites (75 percent), picnicking (65 percent), visiting natural areas (59 percent), participating in outdoor special events (57 percent), visiting playgrounds (56 percent), and swimming outdoors (55 percent). The Maryland DNR divided the state into four regions in order to better understand the most popular activities in each of the areas. Jennings Randolph Lake falls within the Western Region where residents are more likely to participate in hiking/backpacking (51 percent), fishing (55 percent), hunting (36 percent), or tent camping (47 percent) than the average Marylander. Table 2-16 below shows participation in the top 20 outdoor recreation activities statewide and within the western region.

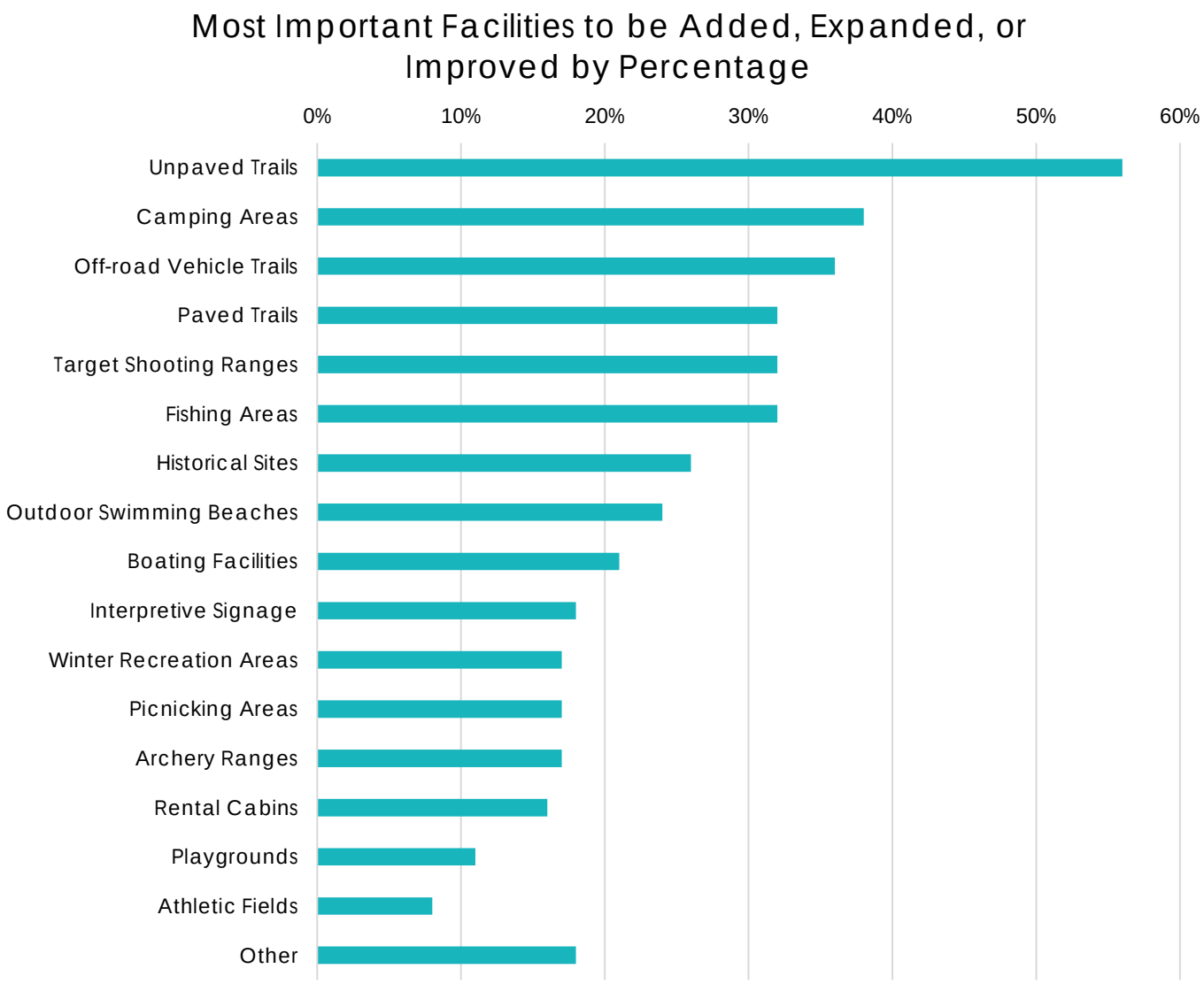
Table 2-16: Participation in Outdoor Recreation Activities – Top 20



Source: MLPRP 2014-2018, produced by Maryland DNR.

This combination of data suggests relocating resources to support the most popular activities such as: trail connectivity for expanded walking and jogging opportunities; increasing land acquisition for nature-based recreation and land protection; and expanding access to water-based recreation to support swimming and fishing. Marylanders identified the top four aspects of outdoor recreation that are most in need of improvement including, the number of trails available (48 percent), the overall number of parks (42 percent), connectivity of trails (32 percent) and the quality and maintenance of parks (31 percent). Furthermore, Marylanders identified the most important recreation facilities that need to be added, expanded, or improved in order to enhance outdoor recreation opportunities across the state. Table 2-17 below shows the percentages for each facility.

Table 2-17: Most Important Facilities to Enhance Recreation Opportunities



Source: MLPRP 2014-2018, produced by Maryland DNR.

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 Jennings Randolph Lake.

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 facilities that cater to a variety of tastes and different members of the family will encourage visitors to enjoy the lake. Presently, USACE manage recreation areas using historic

visitation data combined with best professional judgment to address recreation areas considered to be overcrowded, overused, underused, or well balanced. USACE 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

According to the Executive Order Survey, a total of 5,004 acres of real estate were originally accountable in 1987. Of these 5,004 acres, 4,496 acres were acquired in fee and 507 acres were under permanent easements, shown in Table 2-18 on the following page. Approximately 3,953 acres were acquired for the dam, spillway, outlet works, reservoir, borrow, and spoil areas. In addition, 543 acres outside the reservoir area were acquired in fee for relocations of railways and highways, as required for project construction and operation. The 507 acres of permanent easements were granted for a change in the channel, a drainage ditch, highway relocation, public access roads, and temporary work areas. The guide acquisition line for the project was based on the full flood control pool elevation of 1,500 feet NGVD plus a freeboard allowance of 5 vertical feet. For real estate acquisition purposes, freeboard is defined as reasonable allowance above the full pool elevation for storing water for operational purposes. The freeboard allowance also provides for the adverse effects of wave action and bank erosion. Where property acquisition to the contour of 1,505 feet NGVD did not provide a minimum of 300 feet horizontally from the contour of 1,500 feet NGVD, the guide acquisition line was increased to cover a minimum of 300 feet horizontally from the contour of 1,500 feet NGVD. These acquisition areas between elevations are broken down in Table 2-18 below as well.

Table 2-18: Original Project Acreages

Description	Acres	In Fee or Easement
Dam Site and Downstream	400	In Fee
Area Below Elevation 1,466 feet NGVD	927	In Fee
Area Between Elevations 1,466 and 1,500 feet NGVD	145	In Fee
Area Between Elevation 1,500 feet NGVD and Boundary	2,481	In Fee
Channel Change	1	Easement
Drainage Ditch	2	Easement
Highway Relocation	50	In Fee
Highway Relocation	69	Easement
Public Access Roads	9	Easement
Railroad Relocation	493	In Fee
Temporary Work Areas	427	Easement

Source: Data from the 1987 Executive Order Survey Numbers. Note that acreages are rounded to the nearest whole number.

According to a 1999 Realty Control File Summary Record produced by CENAB, Real Estate Division, after a disposal of 1,022 acres, of which 539 were in fee and 483 were under easements, net project lands totaled 3,986 acres, of which 3,964 were in fee and 22 acres were under easements. No other disposal records were found, thus current project lands remain at 3,986 acres, of which 3,964 are in fee and 22 acres are under easements.

2.7 PERTINENT PUBLIC LAWS

2.7.1 Federal Laws

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 USACE 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 USACE 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 Maryland, Economic Growth, Resource Protection, and Planning Act, 1992. This act articulates the State's growth policy through seven visions, which concentrate development, protect sensitive areas, and establish funding mechanisms to achieve the visions. The Act also requires local jurisdictions to address these visions in their comprehensive plans. The General Assembly amended the act with an eighth vision in 2000.

State of Maryland, Planning Legislation, House Bill 1141 and House Bill 2, 2006. In 2006 legislation was passed (House Bill 1141 and House Bill 2) that will affect comprehensive plans, annexations and land preservation programs. This includes new and expanded elements required in all comprehensive plans. The law makes changes to basic land use planning and zoning requirements and annexation procedures, agricultural land preservation, and Maryland's Smart Growth programs.

State of Maryland, Smart and Sustainable Growth Act, 2009. This act clarifies the link between local comprehensive plans and local land use ordinances. The bill defines the current requirement of "consistency".

State of Maryland, Sustainable Growth & Agricultural Preservation Act, 2012. Also known as the "septics law", this addresses subdivision developments, which are served by individual septic systems, and their impacts on farm and forest land, streams, rivers and coastal areas. Four growth tiers of land use categories were created to identify where major and minor residential subdivisions may be located and what type of sewerage system can serve it.

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3 RESOURCE OBJECTIVES

3.1 INTRODUCTION

This chapter sets forth goals and objectives necessary to achieve the USACE vision for the future of Jennings Randolph Lake. Goals express the overall desired end state of the cumulative land and recreation management programs at Jennings Randolph Lake. Resource objectives specify task-oriented actions necessary to achieve the master plan goals. Overarching USACE management goals and environmental operating principles are presented in the following sections and specific Jennings Randolph Lake goals and development objectives are presented at the end of this section.

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 Jennings Randolph 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 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 Jennings Randolph Lake to the greatest extent possible.

- **Resource Objective 1** Improve infrastructure and utilities.

Supporting Objectives:

1. Improve reliability of electrical infrastructure
2. Improve reliability of communications infrastructure
3. Address key safety concerns
4. Establish a local water source at Robert Craig Campground

- **Resource Objective 2** Enhance existing recreation sites and amenities.

Supporting Objectives:

1. Expand hiking trails – connect current system of trails
2. Robert Craig Campground
    a. Road repair, RV parking improvements
        i. Leach field repair
        ii. Overflow parking improvements
3. Mountain View Overlook
    a. Develop on-street parking
    b. Construct viewing platform
4. Howell Run Picnic Area
    a. Power/water to all picnic pavilions
    b. Lighting improvements
5. Shaw Beach
    a. Expand parking
6. Dragon Head Beach
    a. Pave access road
7. West Virginia Overlook
    a. Renovate Administrative/Maintenance facilities
8. Howell Run Boat Launch
    a. Improve lighting

- **Resource Objective 3** Expand recreational opportunities in key areas.

Supporting Objectives:

1. Big Bend Recreation Area
    a. Establish hike-in camping area
    b. Construct swing-bridge to allow safe pedestrian river crossing
2. Robert Craig Campground
    c. Establish primitive camping area
    d. Construct indoor event area – i.e. indoor nature center
    e. Expand trail system around the archery range – i.e. mountain bike trail
3. Dragon Head Beach
    f. Expand beach area, parking, enhanced paved access route (switchback)
4. Shaw Beach
    g. Construct fishing pier and dock
5. Howell Run Boat Launch
    h. Reconstruct to extend boat launch to remain functional in low water-level conditions
6. Maryland Overlook
    i. Improve/expand parking lot
7. Howell Run Picnic Area
    j. Construct trail down to shoreline and over to the Howell Run Boat Launch
    k. Establish shoreline primitive camping area
8. Peninsula B
    l. Develop boat-in primitive camping area
9. Hogback Ridge

m. Develop campground and/or enhanced use lease lodge
n. Construct deep run fishing access

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

Supporting Objectives:

1. West Virginia Overlook
   a. Renovate/expand maintenance facility – consider 2nd story addition to maximize maintenance and support space
   b. Construct a combined visitor center/administrative support facility

Table 3-1 Resource Objective Matrix

Resource Objectives	USACE Goals				
	A	B	C	D	E
Improve infrastructure and utilities	✓	✓			✓
Enhance existing recreation sites and amenities	✓	✓	✓	✓	✓
Expand recreational opportunities in key areas	✓		✓	✓	✓
Invest in key operational and support facilities				✓	✓

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 Jennings Randolph Lake 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.

A large portion of the total land area lies above the elevation required to support the flood control, water quality, and water supply missions of the project. These lands support recreation land uses today, but at the time of acquisition, these lands were not separable from the portions of the parcels that were required to support the primary missions. Therefore, the entire acreage of approximately 4,500 acres at Jennings Randolph Lake was originally allocated as Operations.

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 particular 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 1997 Master Plan for Jennings Randolph Lake included a land classification summary using criteria similar to the current land use classification criteria. In the 21 years since the previous Master Plan was published, surrounding land use, recreational opportunities, and regional recreation trends have experienced changes, thus classification revisions are necessary. A summary of prior land use classifications and newly proposed land uses is provided in Table 4-1.

Table 4-1 Land Classification Summary

Prior Land Classifications*	Acres
Project Operations**	178
Recreation	450
Multiple Resource Management	3,358
Low Density Recreation	3,357
Wildlife Management	1
Total	3,986

Current Land Classifications	Acres
Project Operations	78
High-Density Recreation	74
Multiple Resource Management	2,869
Future Recreation	65
Low Density Recreation	22
Vegetative Management	2,782
Water Surface	965
No Wake	18
Restricted	12
Open Recreation	938
Total	3,986

** Note that according to a record published in 1999, 1,022 acres were disposed after the original project land acquisition. Thus, the prior land classifications represent the total project acreages after disposal.*

*** The 1997 Master Plan was completed before the 1999 record of land disposal. The 1997 Master Plan designated 1,200 acres as Project Operations. Due to the nature of the land disposal, there is an assumption that the 1,022 acres fell within the Project Operations Classification, thus reducing the Prior Project Operations Classification from 1,200 acres to 178 acres. The Multiple Resource Management Classification was also updated to reflect the 1999 record of net total project acreages, 3,986 acres, after disposal.*

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 4-5 shows the break down of land classifications at Jennings Randolph Lake. Figure 4-2 on page 4-6 shows the break down of total land acreages, either in fee or under easement, for the site. Project Easements are also explained in section 4.3 on page 4-8.

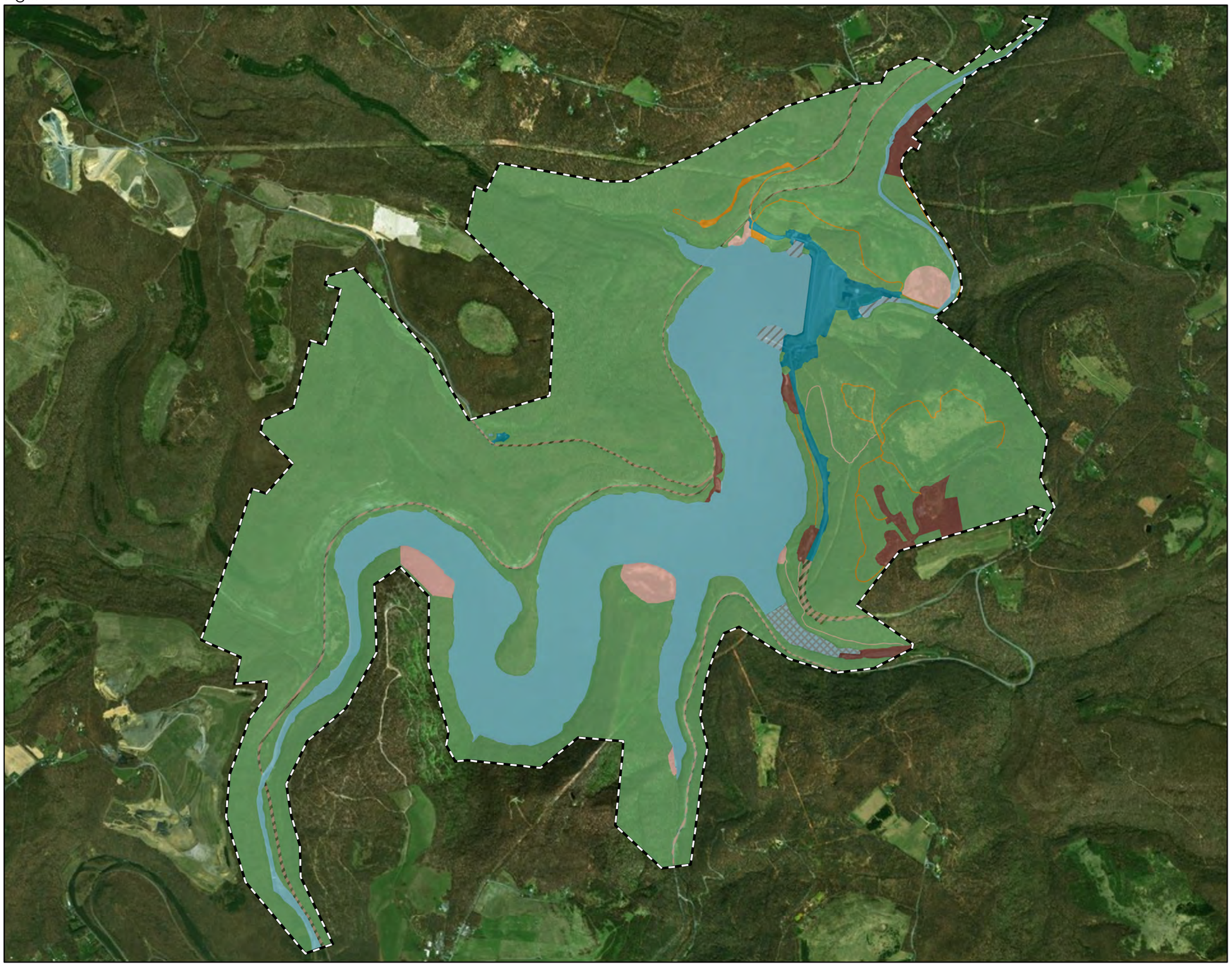
4.2.2.1 Project Operations

This classification category includes all project land required for the structure, operation, administration, or maintenance of the project and which all must be maintained to carry out the authorized purposes of flood risk management, water supply, and water quality. Approximately 78 acres at Jennings Randolph Lake are allocated to project operations, including the dam, control tower, maintenance facility, ranger offices, and West Virginia Overlook facility. The maintenance facility consists of a radio room, heater room, workshop, storage, and garage facilities. The West Virginia Overlook facility is a 2-story building with a visitor center and administrative offices. A ranger office as well as a camp store is located at Robert W. Craig Campground. Other operational units include the spillway, restricted access roads, and utility rights of way.

Figure 4-1

Jennings Randolph Lake Master Plan Update

Land Classification

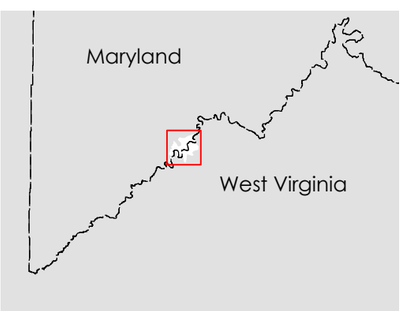


Legend

- JRL Site Boundary

Land Classification

- High Density Recreation
- Multiple Res Mgmt Lands - Future Recreation
- Area Multiple Res Mgmt Lands - Low Density
- Recreation Multiple Res Mgmt Lands - Vegetative
- Management Project Operations
- Water Surface - Open Recreation
- Water Surface - Restricted
- Water Surface - No Wake
- Owned by Other Entities



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

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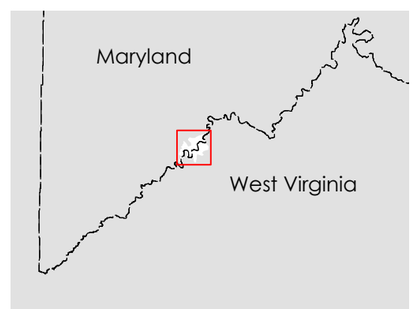
Figure 4-2

Jennings Randolph Lake
Master Plan Update

Project Easements

Legend

- JRL Site Boundary
- Fee Simple
- Easement



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

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4.2.2.2 High Density Recreation

These are lands developed for intensive recreational activities for the visiting public including the two boat launches, the Robert W. Craig Campground, the Howell Run Picnic Area, and Shaw Beach. This category includes approximately 74 acres of land.

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 Future Recreation. A given tract of land may be classified using one or more of these sub-classifications. There are 2,869 acres of land that are under this classification. The following identifies the amount contained in each sub-classification of Multiple Resource Management Lands.

Low Density Recreation

These are lands with minimal development or infrastructure that support passive public recreation use, like fishing, primitive camping, hunting, wildlife viewing, or hiking. Low density recreation areas include the Barnum Camping Area, the four hiking trails, the 3-D archery course, and the Maryland Overlooks. There are 22 acres that are 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 Jennings Randolph Lake property. The provision and protection of wildlife habitat and the availability of these lands for passive recreation activities are also important objectives. There are 2,782 acres under this classification.

Future Recreation

These are lands with site characteristics compatible with potential future recreation development. Some of these areas may have never been developed or were developed and subsequently closed or remain open but are no longer maintained. These areas will be managed as Multiple Resource Management Lands – Vegetative Management until there is a need or opportunity to develop or reopen these areas. There are 65 acres under this classification.

4.2.2.4 Water Surface

In accordance with national USACE guidance set forth in EP 1130-2-550, the water surface of the lake at the conservation pool elevation may be classified using the following 3 classifications: Restricted, No-Wake, and Open Recreation.

At the recreation pool elevation of 1,468 feet NGVD, Jennings Randolph Lake has a water surface of 965 acres. The following water surface classifications are designated at Jennings Randolph Lake.

Restricted

Restricted water surface includes those areas where recreational boating is prohibited or restricted for project operations, safety and security purposes. The Restricted water surface at Jennings Randolph Lake include a small area around the dam and intake tower. Designated swimming beaches are also classified as Restricted water surface. There is a small designated swimming area attached to Shaw Beach. The total acreage of Restricted water surface is approximately 12 acres. These areas are normally marked with standard United States Coast Guard (USCG) regulatory buoys stating that boats are excluded from the area. In some instances, physical barriers may be in place on the water.

No-Wake

No-Wake areas are intended to protect environmentally sensitive shorelines and improve boating safety near key recreational water access areas such as boat ramps. No-Wake areas at Jennings Randolph Lake include areas surrounding the two boat ramps. No Wake areas encompass approximately 18 water surface acres. These areas are typically marked with standard USCG regulatory buoys.

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 and No-Wake areas described in the above paragraphs, the remaining water surface of approximately 938 acres at Jennings Randolph Lake water surface 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 seven easements totaling 22 acres and include electrical lines, private access roads, and a public trail.

USACE also maintains 3 outleases at Jennings Randolph Lake. The Mineral County Recreation Department leases approximately 6 acres of land downstream of the dam to provide river access and rentable cabins. Additionally, Maryland DNR manages and maintains approximately 125 acres of leased lands for operations and maintenance functions and the Maryland Boat Launch. Friends of Jennings Randolph Lake lease .02 acres of land within the Robert W. Craig Campground to run a camp store during the summer season.

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 authorized flood risk management, water supply, and water quality missions. 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 Jennings Randolph Lake include the following:

Project Operations: Goal A, E
High Density Recreation: Goal C, E
Multiple Resource Management Lands for:
- Low Density Recreation: Goal C, E
- Vegetative Management: Goal B, E
- Future/Inactive Recreation: Goal B, C, E

Water Surface:
- Designated No Wake: A, C, E
- Restricted Area: A, E
- Open Recreation: A, C, E

A more descriptive and detailed plan for managing project lands can be found in Jennings Randolph Lake – 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, water supply, and water storage missions of Jennings Randolph Lake. There are 78 acres of lands under this classification all of which are managed by USACE.

5.3 HIGH DENSITY RECREATION

Lands classified for High Density Recreation are currently developed for intensive recreational activities. Jennings Randolph Lake has 5 distinct areas included in this classification. Depending on available space, funding, and public demand, lands classified for High Density Recreation may support additional outdoor recreation development in the future. These areas include boat launches, day use areas, and campgrounds. These areas have been developed to support concentrated visitation and use of the recreational facilities they host.

Of all high-density recreation areas, only the Maryland DNR Boat Launch is not operated and managed by USACE. USACE does not provide direct maintenance within the Maryland DNR Boat Launch but may occasionally lend support where appropriate. USACE reviews requests and ensures compliance with applicable laws and regulations for proposed activities in all high-density recreation areas. USACE works with the Maryland DNR to ensure that recreation areas are managed and operated in accordance with the goals and objectives prescribed in Chapter 3. A description of each high-density recreation area is provided as follows.

Maryland DNR Boat Launch

The Maryland DNR Boat Launch is located on the Maryland bank, at the end of Mt. Zion Road on Backbone Mountain. The site includes a boat launch, a restroom facility, and paved parking lot. Maryland DNR charges a nominal fee of five dollars for use of the boat ramp. There are no known planned improvements to the Maryland DNR Boat Launch.

Howell Run Boat Launch

The Howell Run Boat Launch is in West Virginia, in a small cove at the upstream end of Howell Run. The boat ramp is open from April to October, except when the lake level falls below elevation 1,445 feet NGVD or rises above 1,470 feet NGVD. Future plans for Howell Run Boat Launch include improving the lighting in the restroom facility and around the boat launch. There is a long-range need to modify the boat launch and extend the ramp to enable use during low water levels.

Howell Run Picnic Area

This area is benched into a steep slope on the West Virginia side, which gives it an excellent panoramic view of the lake and project lands. This picnic area is only open from dawn to dusk during the recreation season and is closed during the winter months. Future plans for Howell Run Picnic Area include providing power and water to all of the picnic pavilions and improving the lighting in the restrooms and around the site. Long-range proposed improvements include constructing a trail that connects to the shoreline and the Howell Run Boat Launch and establishing a shoreline primitive camping area along the water's edge.

Robert W. Craig Campground

The Robert W. Craig Campground is in West Virginia on a high ridge adjacent to the dam borrow area approximately 3 miles from the lake. There are no physical connections between the campground area and the lake, but Mountain Meadow Overlook, located outside the entrance to the campground, offers a view of the dam and a portion of the lake. The campground operates May through September with a season of 155 days. There are 2 contracted park attendants permanently stationed at the campground to run the online reservation system as well as assist campers utilizing the park. In 2015, the campground site was redeveloped by the maintenance team to provide new features requested by campers, including the removal of useless sites to enlarge other stalls and the clearing of brush from canopy-side areas. There are currently 68 sites, all of which have electrical services. Future plans for Robert W. Craig Campground include maintaining and updating existing infrastructure, upgrading facilities to current standards, and expanding recreational opportunities, like establishing a primitive camping area, constructing an indoor event area, and expanding the trail system to connect the campground to the access road to Shaw Beach.

Shaw Beach

Shaw Beach is a 200-foot swim beach located in West Virginia. The beach is located near the West Virginia Overlook/Visitor Center. There are no lifeguards on duty, but there is a dedicated swimming area marked by floating buoys to prevent conflicts between boats and swimmers. Future plans for Shaw Beach include expanding recreational opportunities by constructing a fishing pier and dock and expanding access and available parking.

Figure 5-1 on page 5-7 calls out all existing recreational interests, including the high density recreation amenities stated above and the low density recreation amenities discussed in the next section.

5.4 MULTIPLE RESOURCE MANAGEMENT LANDS

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 Multiple Resource Management Lands at Jennings Randolph Lake, 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 may be 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 22 acres of MRML – Low Density Recreation at Jennings Randolph Lake. Future plans for existing low-density recreation lands include improving, extending, and adding designated natural surface multiuse trails, improving and enhancing the overlook areas, and establishing hike-in and boat-in camping areas.

Vegetative Management

In general, vegetative resources on USACE lands are managed for multiple purposes including wildlife habitat, recreational activities in parks, 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.

Current recreational use of these lands includes, but is not limited to hunting, bank fishing, and hiking. Future uses include all existing uses with the possibility of creating hike-in and boat-in primitive camping sites and new, natural surface multiuse trails. There are 2,782 acres of MRML – Vegetative Management at Jennings Randolph Lake.

Future Recreation

These areas either have site characteristics compatible with potential future development or are currently closed recreation areas. These areas, which include the Big Bend Recreation Area, the Peninsula B Boat-In Primitive Camping Site, the Hogback Ridge Development Area, the Howell Run Primitive Camping/Fishing Area, and the Dragon Head Beach Expansion, will be managed as MRML – Vegetative Management until opportunities to develop or reopen them arise. Figure 5-2 on page 5-8 calls out these future areas of recreational interest.

5.5 WATER SURFACE

In accordance with national USACE policy set forth in EP 1130-2-550, the water surface of the lake at the conservation pool elevation may be classified using the following 3 classifications:

- Restricted
- No-Wake
- Open Recreation

At the recreation pool elevation of 1,468 feet NGVD, Jennings Randolph Lake has a water surface area of 965 acres. The following water surface classifications are designated at Jennings Randolph Lake:

Restricted

Restricted water surface includes those areas where recreational boating is prohibited or restricted for project operations, safety and security purposes. The Restricted water surface at Jennings Randolph Lake include a small area around the dam and intake tower. Designated swimming beaches are also classified as Restricted water surface. There is a small designated swimming area attached to Shaw Beach. The total acreage of Restricted water surface is approximately 12 acres. These areas are normally marked with standard USCG regulatory buoys stating that boats are excluded from the area. In some instances, physical barriers may be in place on the water.

No-Wake

No-Wake areas are intended to protect environmentally sensitive shorelines and improve boating safety near key recreational water access areas such as boat ramps. Designated No-Wake areas at Jennings Randolph Lake include areas surrounding the two boat ramps. Designated No-Wake areas encompass approximately 18 water surface acres. These areas are typically marked with standard USCG regulatory buoys.

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 and Designated No-Wake areas described in the above paragraphs, the remaining water surface of approximately 922 acres at Jennings Randolph Lake water surface is designated as Open Recreation.

5.6 PROJECT EASEMENT LANDS

Future management of the approximate 22 acres of easement Lands at Jennings Randolph Lake includes routine inspection of these areas to insure that the Government's rights specified in the easement deeds are protected. Placement of any structure that may interfere with USACE flood risk management and water supply and water quality missions may be prohibited.

5.7 ALTERNATIVE DEVELOPMENT COURSES OF ACTION

The planning team developed a list of future development actions with Jennings Randolph Lake and USACE-Baltimore District representatives during a site visit conducted 13-15 August 2018. Subsequent public scoping meetings held in Keyser, WV on 25 September 2018 and 29 October 2018 leverage public input to refine and solidify the proposed projects at Jennings Randolph Lake. The project list and Alternative Development Courses of Action presented herein reflect materials briefed to the general public during the public scoping meetings.

Three proposed alternatives for future development at Jennings Randolph Lake scale in development intensity at the project as Alternative 1: Enhancement, Alternative 2: Moderate Growth, and Alternative 3: High Growth scenarios. Alternative 1 recommends improvements to existing recreation sites and amenities with no growth to currently developed areas. Alternative 2 recommends modest growth to currently developed areas in addition to enhancement of existing sites and amenities. Alternative 3 includes recommendations from Alternatives 1 and 2 in addition to the development of high-density recreation features in currently undeveloped areas. Alternative project lists are summarized in Tables 5-1 through 5-3 on the following pages.

JRL Master Plan Public Scoping

Table 5-1: Alternative 1—Enhance

Key Area	Project Description
Overall	• Improve reliability of electrical infrastructure • Improve reliability of communications infrastructure
Dragon Head Beach	• Pave access road & develop access switchback • Expand / improve beach area
Shaw Beach	• Expand parking lot • Construct boat dock / fishing pier
Mountain Meadow Overlook	• Develop on-street parking • Construct viewing platform with viewing scopes
Robert Craig Campground	• Repave roads, optimize RV pads, level dump station • Redevelop leach field • Provide direct water source
Howell Run Picnic Area	• Provide power and water to all 3 picnic pavilions • Improve lighting
Howell Run Boat Launch	• Add lighting • Rebuild boat launch in order to allow use during periods of low water level

Table 5-2: Alternative 2—Moderate Growth

Key Area	Project Description
Overall	• Includes all projects from Alternative 1 • Expand recreational opportunities in key areas
Big Bend Recreation Area	• Establish a hike-in campground with rentable yurts, designated primitive camping sites, and fire rings • Construct swing bridge to allow safe pedestrian river crossing during periods of high water • Connect the Barnum rail trail with the Sarbanes trail
Robert Craig Campground	• Establish a primitive camping area • Develop a mountain bike trail adjacent to the archery range
Dragon Head Beach	• Establish a primitive camping area
Howell Run Picnic Area	• Construct a trail that connects the picnic area to the shoreline and the Howell Run Boat Launch (1.2 miles) • Establish a shoreline primitive camping area
Peninsula B	• Develop a boat-in primitive camping area
West Virginia Overlook	• Expand trail to link existing High Timber and Sunset trails with the West Virginia Overlook area (1 mile)
Deep Run Fishing Access	• Capitalize on a former roadway as an access route • Develop a vehicle parking/ turnaround point for safe vehicular access to the shoreline • Clear shoreline for fishing or a kayak entry area

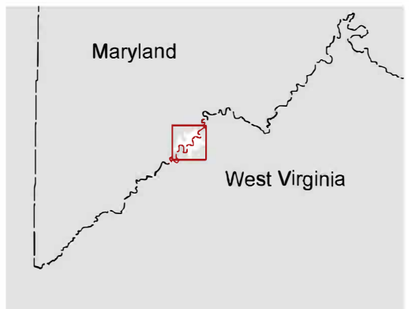
Figure 5-1

Jennings Randolph Lake
Master Plan Update

Existing Features

Legend

- JRL Site Boundary
- State Boundary
- Existing Recreation Trails
- Existing Areas of Interest



Service Layer Credits: Source: Esri, Digita/ Globe, GeoEye, Earthstar Geographies, CNES/Airbus OS, USDA, USGS, AeroGR/0, / GN, and the G/S User Community

0 2,800 5,600 Feet

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Figure 5-2

Jennings Randolph Lake Master Plan Update

Future Recreation Areas

Legend

- JRL Site Boundary
- State Boundary
- Existing Recreation Trails
- Future Recreation Trails
- Existing Areas of Interest
- Future Areas of Interest

Service Layer Credits: Source: Esri, Digita/ Globe, GeoEye, Earthstar Geographies, CNES/Airbus OS, USDA, USGS, AeroGR/0, / GN, and the G/S User Community

0 2,800 5,600 Feet

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Table 5-3: Alternative 3—High Growth

Key Area	Project Description
Overall	• Includes all projects from Alternatives 1 and 2 • Invest in key operational and support facilities
Robert Craig Campground	• Construct an indoor nature or exhibit center
West Virginia Overlook	• Expand the maintenance facility (add a second story) • Construct a new visitor center/ administration facility
Hogback Ridge	• Construct a fully-developed campground • Develop access road to development area • Construct utilities to support campground development • Construct floating access dock/ fishing pier to allow water access during periods of low water level

The three proposed alternatives were discussed with project and community stakeholders at two public scoping meetings, conducted 25 September 2018 and 29 October 2018. The High Growth scenario was endorsed by stakeholders as the preferred long-range development strategy. Jennings Randolph Lake staff emphasized enhancement as the priority for the immediate future. There are no immediate plans to pursue high growth expansion projects such as the campground at Hogback Ridge, but there is a desire to include the project for consideration if funding or a strategic partnership were to become available for implementation.

5.8 PROJECT IMPLEMENTATION PLAN

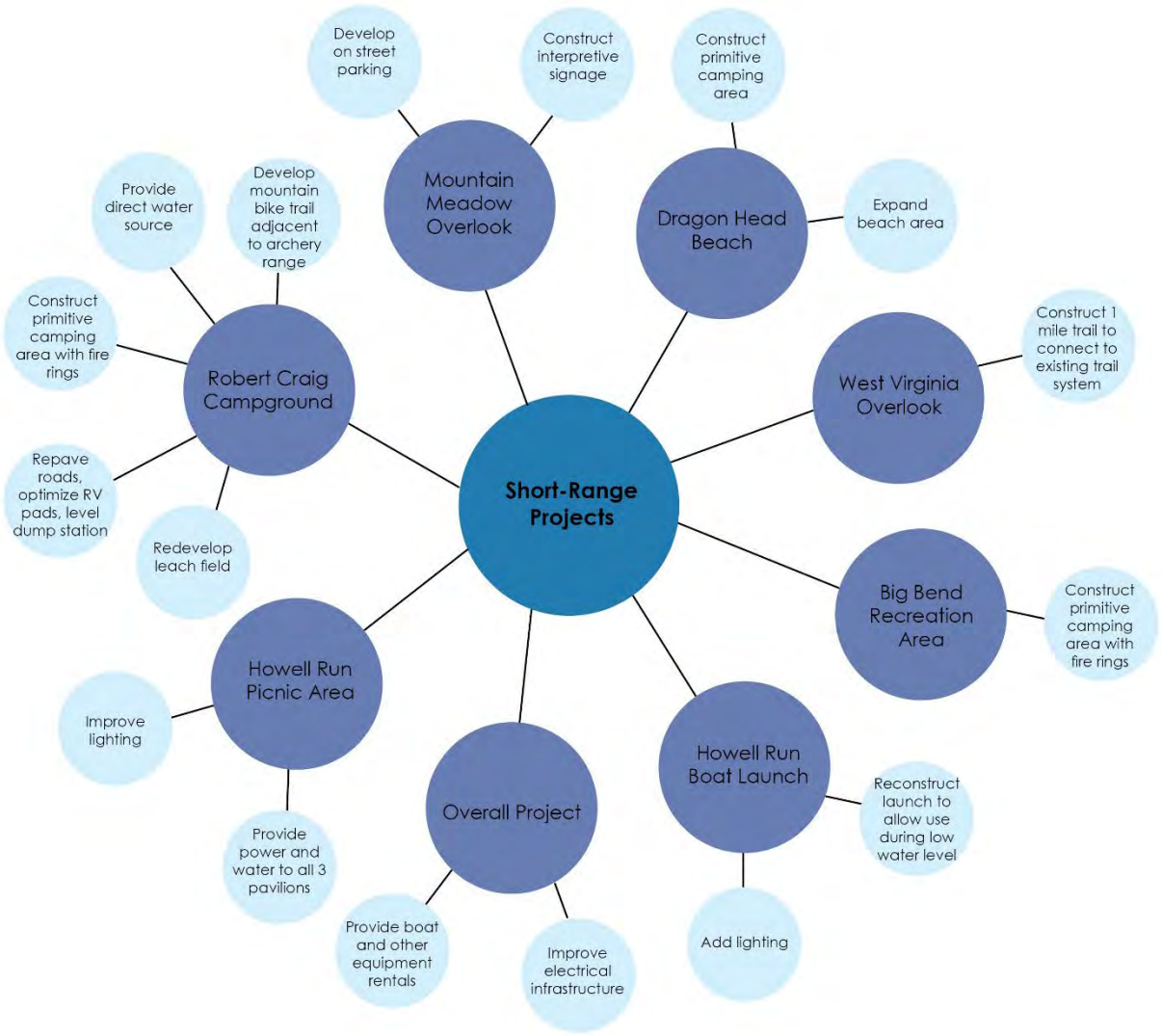
As part of the Jennings Randolph Lake Master Plan, future projects are categorized as short-, mid- or long-range opportunities based on status, funding, and urgency, as understood today. Short-range projects are planned for execution within the next five years, mid-range projects may be constructed within six to ten years, and long-range projects are planned to be executed eleven or more years in the future. Projects may shift between short- and mid-range or mid- and long-range as priorities shift or funding becomes available.

While the funding availability and priority evolution is unknown, the Alternative Plans set forth the end goal for the Jennings Randolph Lake Project. The Project Implementation Plan breaks the future plan down into the project range viewpoints. This plan is intended to help guide the development pattern and is flexible in its implementation.

5.8.1 Short-Range Implementation Strategy

The Short-Range Implementation Strategy includes projects that enhance the existing recreational amenities and facilities. Several of these projects are infrastructure related, like repaving roads, expanding parking lots, adding lighting, and providing local water sources. The Short-Range Implementation Strategy also includes projects that support existing amenities by adding new low-density recreation opportunities that require little infrastructure or construction, like primitive camping areas and trails.

Figure 5-3: Short-Range Projects



Mountain Meadow Overlook Concept Rendering

5.8.2 Mid-Range Implementation Strategy

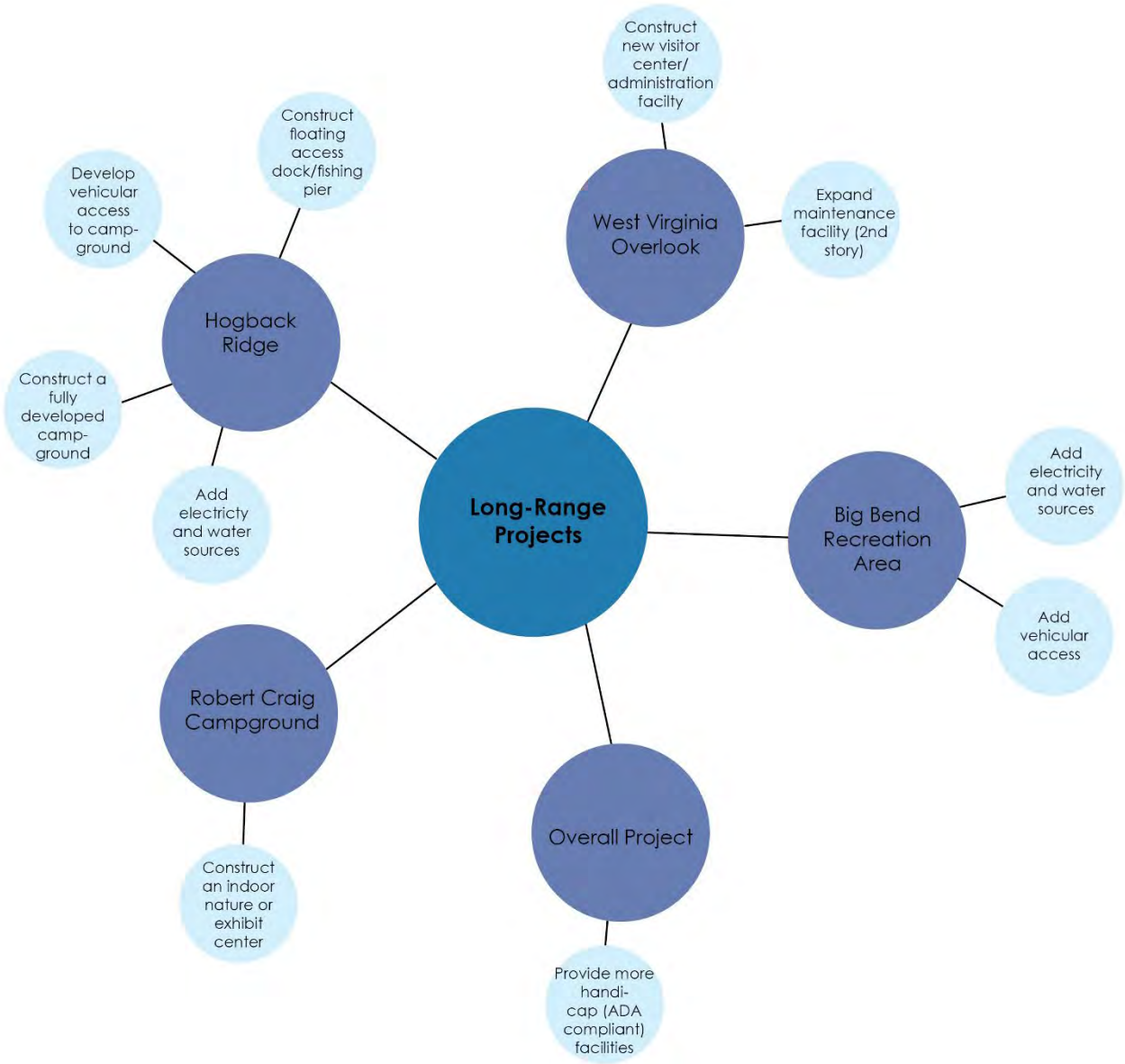
The Mid-Range Implementation Strategy includes projects that add to the existing recreational amenities and facilities. Several of these projects build upon the addition of low-density recreation opportunities, like more developed camping areas, improved vehicular access, and construction of bridges, docks, and viewing platforms.

Figure 5-4: Mid-Range Projects

5.8.3 Long-Range Implementation Strategy

The Long-Range Implementation Strategy includes projects that drastically change existing conditions at Jennings Randolph Lake. Several of these projects include the addition of new high-density recreation opportunities and major renovations to on-site facilities. These projects will require an ample amount of funding, planning, and coordination. Infrastructure and access will also need to be addressed.

Figure 5-5: Long-Range Projects



Dragon Head Beach Development Concept | Primitive Camping, Expanded Parking, Picnic Tables, and Swim Beach

Big Bend Rec Area Development Concept | Yurts, Primitive Camping, Shoreline Fishing, and Swing Bridge

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6 Special Topics, Issues, Considerations

6.1 COMPETING INTERESTS ON THE NATURAL RESOURCES

Jennings Randolph Lake is a large multi-purpose project with numerous authorized purposes. The authorized purposes accommodate the needs of federal, state and municipal users that have developed over time and have contractual rights that must be honored. The benefits provided are critical to the local and regional economies and are of great interest to the public. Aside from operating the lake to meet the needs of those entities with contractual rights, there are many competing interests for the utilization of federal lands including recreational users, adjacent landowners, utility providers, and all entities that provide and maintain public roads. A major challenge is balancing the interests of each of these groups to ensure that valid needs are met while simultaneously protecting natural and cultural resources. The purpose of this Plan is to guide management into the foreseeable future to ensure the responsible stewardship and sustainability of the project's resources for the benefit of present and future generations.

6.2 HYDROPOWER

A hydroelectric system is coming to the dam and expected to be constructed within the next two years. The system will piggyback off the existing dam infrastructure and is not expected to impact dam operations. Once complete, the system will generate approximately 65 ohms, which is equivalent to powering approximately 6,500 homes. The 404 permit had been issued, but was recently postponed for a year. During construction, the lake will have to drop down to elevation 1,420 feet NGVD. This does not present a problem as long as there are no construction delays.

6.3 WATER SUPPLY

One of the main goals of the Jennings Randolph Lake is to supply water to downstream, Washington, D.C.. The lake, in conjunction with Little Seneca Reservoir, is used to augment low

flows in the Potomac River and supply water through scheduled water releases. Releases from Jennings Randolph and Little Seneca are made when the predicted demand plus environmental flow requirements is greater than the predicted Potomac flow. Because of the long distance that the water must travel, releases must be made approximately nine days in advance to allow for travel time downstream. Jennings Randolph Lake fluctuates between elevation 1,320 feet NGVD and 1,466 feet NGVD when making water supply releases. The pool at Jennings Randolph Lake will not be lowered to elevation 1,320 feet NGVD due to the absolute minimum water quality storage needed for dilution in the lake.

The operations procedure for a Jennings Randolph release is to determine how much water, if any, to release in order to meet anticipated demand nine days in the future. The Little Seneca Reservoir, less than a day's travel time from metropolitan intakes, is used in conjunction with Jennings Randolph so that releases made from the latter can be more conservative. If the Jennings Randolph release is too small (because of lower than expected river flow or higher than expected demand), a release can be made from the smaller, closer reservoir to make up for any temporary shortfalls that become apparent as Jennings Randolph water travels to the intakes. This Plan will not have any impacts on water supply and releases for Washington, D.C..

6.4 ECONOMIC BENEFITS OF FISHING TOURNAMENTS

There is potential to host fishing tournaments at Jennings Randolph Lake as an additional outdoor recreation amenity. The popularity of recreational fishing tournaments rapidly increased in the 1970s and 1980s. According to a paper by Kevin M. Hunt, there are 4 overarching benefits to fishing tournaments, including: enhanced fishery management, increased popularity and interest in fishing, perceived positive economic value, and increased biological monitoring. Enhanced fishery management occurs due to strengthening the positive relationship between the management team and the recreational fishers as well as promoting fishing as a valued activity on the site. Fishing tournaments increase the popularity and interest in fishing by recruiting new fishers in a fun, but also competitive atmosphere. Spectators at one tournament can come back as fishers at the next tournament. High school fishing tournaments are also becoming more popular across the country. There is a perceived positive economic value for fishing tournaments. The idea of "pre-fishing" means that many fishers will come early and spend a few extra days fishing and spending money in the nearby town. Fishers will buy groceries, eat at restaurants, stay at hotels or campsites, buy gas and other fishing supplies for their boats, and do other shopping activities. Tournaments also bring in spectators that also participate in these economic activities. The final benefit of fishing tournaments is secondary biological monitoring. Management teams can collect information on fish populations from observing what fish are being caught during the tournament.

With all these benefits, there are also some potential issues that need to be considered. Fishing tournaments can cause overcrowding and overuse of site facilities and resources. Before hosting large tournaments, the management team must make sure that the area can support the influx of people. This includes making sure there are adequate restroom facilities, parking availability, boat launches, camping sites and other amenities. At Jennings Randolph Lake, one of the 2 boat launches is operational during low water level (or the winter season). This could potentially hinder the success of a fishing tournament due to limited boat access. Addressing the shortage of year-round water access is recommended before supporting large recreational fishing tournaments at the lake. Other potential issues include user-group conflicts, overall costs, and overfishing.

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 Jennings Randolph Lake 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 Jennings Randolph Lake Master Plan.

- 13-15 August 2018, the planning team visited Jennings Randolph Lake where initial introductions, site orientation, a site tour, and concept discussions took place.
- 25 September 2018, the planning team and USACE hosted a public outreach meeting in Keyser, WV. This meeting included presentation of maps depicting existing conditions, proposed development alternatives, and open discussion.
- 29 October 2018, the planning team and USACE hosted a second public outreach meeting in Keyser, WV. The purpose of this meeting was to brief the plan and solicit feedback from residents of surrounding communities.

- Pre-Draft Master Plan & Environmental Assessment (EA) Submittal to project staff and USACE: 16 November 2018.
- Draft Master Plan & EA Submittal (Public Review): 24 January 2019.
- A Public Review—Town Hall Meeting is planned after the draft submittal to give stakeholders the opportunity to discuss the Master Plan with the project team and USACE representatives. This meeting is planned for 19 February 2019 at the Mineral County Health Department in Keyser, WV.
- Prefinal Master Plan & EA Submittal: 10 March 2019.
- Final Master Plan and EA Submittal: 1 May 2019.
- EA Administrative Record: 31 May 2019.

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

8 Summary of Recommendations

8.1 SUMMARY OVERVIEW

The preparation of the Jennings Randolph Lake 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 Jennings Randolph Lake. Factors considered in the Plan were identified through discussions with project representatives, USACE, and the general public. This Master Plan will ensure the long-term sustainability of the USACE-managed recreation program and natural resources associated with Jennings Randolph Lake.

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 at the lake, it should be noted that the majority of land classification changes at Jennings Randolph Lake reflect classification criteria change more than any planned development. A summary of land classification changes is provided in Table 8-1 on the following page.

Table 8-1 Land Classification Summary

Prior Land Classifications*	Acres
Project Operations**	178
Recreation	450
Multiple Resource Management	3,358
Low Density Recreation	3,357
Wildlife Management	1
Total	3,986

Current Land Classifications	Acres
Project Operations	78
High-Density Recreation	74
Multiple Resource Management	2,869
Future Recreation	65
Low Density Recreation	22
Vegetative Management	2,782
Water Surface	965
No Wake	18
Restricted	12
Open Recreation	938
Total	3,986

** Note that according to a record published in 1999, 1,022 acres were disposed after the original project land acquisition. Thus, the prior land classifications represent the total project acreages after disposal.*

*** The 1997 Master Plan was completed before the 1999 record of land disposal. The 1997 Master Plan designated 1,200 acres as Project Operations. Due to the nature of the land disposal, there is an assumption that the 1,022 acres fell within the Project Operations Classification, thus reducing the Prior Project Operations Classification from 1,200 acres to 178 acres. The Multiple Resource Management Classification was also updated to reflect the 1999 record of net total project acreages, 3,986 acres, after disposal.*

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. For example, at face value table 4-1 suggests a reduction in total low-density recreation from 2,849 acres to 22 acres. In reality, the new land allocation guidance introduces vegetative management within the Multiple Resource Management Land category and retains low density recreation as areas with minimal development supporting passive recreation activities. This nuance allows for the reclassification of undeveloped open space in the vegetative management category while identifying key areas to support low density recreation activities.

The key substantive change in land classification from the 1997 plan to the 2018 plan is the identification of Future Recreation under the Multiple Resource Management Land category. These areas are not currently developed but are targeted as opportunities in the mid- to long-range future of the site. Big Bend Recreation Area lies just downstream of the dam and represents one of the best locations for trout fishing in the region. This area is envisioned as a designated hike-in campground, potentially with yurt development. A boat-in, primitive camping area is envisioned for Peninsula B, and a large undeveloped swatch of Hogback Ridge is identified as an opportunity to develop a campground in the long-range future.

A summary of land classification changes and justification is provided in Table 8-2 on the following page.

Table 8-2 Land Classification Change Justifications

Land Classification	Totals (acreage)	Justification
Project Operations	1997: 178 2018: 78	Under the new land use classification criteria, Project Operations is limited to land provided direct support to the operations of the project's primary missions. Although the mission-support areas of the project have not changed since the 1997 Master Plan, the land fitting the new criteria totals 78 acres.
High-Density Recreation	1997: 450 2018: 74	Under the new criteria, areas developed specifically to support recreation activities meet the intent of the high-density recreation classification. The new guidance offers a more conservative definition of recreation areas, thus the decrease in total acreage from the previous Master Plan.
Multiple Resource Management Land—Low Density Recreation	1997: 3,357 2018: 22	The previous classification of low-intensity recreation is comparable to the intent of low density recreation, but excludes areas designated as vegetation and wildlife management areas. When applying this new, more conservative definition to the land classification, a large portion of this acreage is reduced to leave only areas with minimal development to support passive recreation use, i.e. primitive camping, hunting, trails, wildlife viewing, etc.
Multiple Resource Management Land—Vegetative Management	1997: 0 2018: 2,782	This classification was not considered in the previous Master Plan. Under the new 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.
Multiple Resource Management Land—Future Recreation Area	1997: 0 2018: 65	Three key areas, totaling 65 acres, were identified in this Master Plan Update to support future recreation development. The three areas include the Big Bend recreation area downstream of the dam, a boat-in primitive camping area on Peninsula B, and a potential (long-range) campground on Hogback Ridge.
Water Surface, No Wake	1997: 0 2018: 18	This change reflects new classification criteria: No actual change in water use. This area applies to the vicinity of the Howell Run Boat Launch.
Water Surface, Restricted	1997: 0 2018: 12	This change reflects new classification criteria: No actual change in water use. This area includes the vicinity of the intake tower and spillway.
Water Surface, Open Recreation Area	1997: 0 2018: 938	This change reflects new classification criteria: No actual change in water use. This area includes all remaining water surface area outside of the restricted and no wake zones.

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9 Appendices

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APPENDIX A: ACRONYMS AND ABBREVIATIONS

ac	Acres
ACS	American Community Survey
ADA	Americans with Disabilities Act
CENAB	Baltimore District, Corps of Engineers
cfs	Cubic Feet Per Second
CRMP	Cultural Resources Management Plan
DNR	Department of Natural Resources
ECL	Environmental Conservation Law
EOPs	Environmental Operating Principles
EP	Engineering Pamphlet
ER	Engineering Regulation
EIS	Environmental Impact Statement
FERC	Federal Energy Regulatory Commission
ft	Feet
GIS	Geographic Information Systems
HDC	Hydroelectric Design Center
MLPRP	Maryland Land Preservation and Recreation Plan
MRML	Multiple Resource Management Lands
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
NGVD	National Geodetic Vertical Datum
NOAA	National Oceanic and Atmospheric Administration
OMP	Operations Management Plan
SCORP	Statewide Comprehensive Outdoor Recreation Plan
UFC	Unified Facilities Criteria
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
VEPCO	Virginia Electric Power Company

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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 the USAHEC and USAG-Carlisle Barracks DPW. 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.

Bureau of Business and Economic Research. 2018. Population Projects for the State of West Virginia and Counties. 2030 Projections. West Virginia University.

Maryland State Data Center. 2018. Population Projections for the State of Maryland and Counties. 2030 Projections. Maryland Department of Planning.

Quinn, Kathleen and William Gardner. 1979. Bloomington Lake Reservoir Cultural Resources Reconnaissance. Thunderbird Research Corporation.

USACE. 1984. Bloomington Lake Pre-Impoundment Study. USACE, Baltimore District.

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USACE. 2001. Jennings Randolph Lake Cultural Resource Management Plan. USACE, Baltimore District.

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Jennings Randolph Lake Master Plan Update Data Gathering Site Visit

3225 Shallowford Rd NE
Suite 830
Marietta, GA 30062
Telephone 770.321.4040

TO: MAJ Terrence Harrington, USACE-Baltimore District, Planning Division
Tarrie Ostrofsky, USACE-Baltimore District, Planning Division
Ken Fernandez, JRL Operations Project Manager

CC: Rick D'Arienzo, JG&A
Patrick West, JG&A

FROM: John Minter, JG&A
22 August 2018

ACTIVITY: Site Visit Kickoff Meeting
DATE/TIME: 13 August 2018 / 0800 hrs
LOCATION Jennings Randolph Lake—Ranger Office
ATTENDEES Ken Fernandez, Bill Donelin, Gary Kalbaugh, MAJ Terrence Harrington, John Minter, Rick D'Arienzo, and Patrick West

The planning team met with United States Corps of Engineers (USACE) and Jennings Randolph Lake (JRL) representatives to discuss the intent of the JRL Master Plan Update. Key points from the introductory discussion are presented below:

- Construction of the dam began in 1971 and was completed in 1982. It took approximately 11 months to achieve sufficient water level.
- The Town of Shaw sat on the banks of the original river prior to the creation of JRL. Shaw residents were displaced prior to construction activities.
- Camp site season is 155 days, reservations through NRS online Reservation System.
- Typically, peak visitation periods at JRL occur during weekends and holidays. Site is underutilized during the week; not many weekday visitors.
  - There is always an observed increase in visitation upon opening a new recreation feature.
  - Shaw Beach and the Howell Run Picnic Area are typically full on the weekends.
- The Robert Craig Campground features 65 usable camp sites, out of 68 total.
  - 50/60% average occupancy, but max capacity on holidays. 50-60 sites are occupied on average weekend, Holidays sites are generally sold out.
- Campground site was redeveloped in 2015 by the JRL maintenance team to provide features requested by campers, such as enlarging some stalls and clearing brush from canopy-side areas.
  - Average use increased approximately 300%.
  - Removed useless sites (in traffic areas, etc, sites with no electricity).

    - Sites were originally made for tents, not oversize RVs in frequent use today.
- Rangers maintain a personal relationship with campers and receive frequent feedback on areas for potential improvement.
- The campground features two contracted park attendants permanently stationed at the campground.
    - Contracted to run the online reservation system and assist campers utilizing the park.
- JRL staff have a good feel for future development needs of the lake based on institutional knowledge of how the site operates and through persistent feedback from visitors.
- Mission of Dam is primarily flood control and water quality. Water release is maintained at 56 degrees to accommodate fish population. Record trout was caught in this area.
- Fishing and white water rafting are major recreational uses on river. Fishermen and white water groups coexist but do have some conflicts from time to time.
- Summer pool elevation is normally 1456'; 1468' or higher represents flood-conditions; beach closes at 1452' elevation.
    - Lake water level constantly fluctuates according to rainfall and required releases.
    - Lake surface elevation can change dramatically (30'-50') in one night.
- JRL staff has determined there is no demand or desire for cabin development around the lake.
    - The intent for future development at JRL is to enhance existing development areas and recreational features instead of expanding development.
- Hiking is a big draw for visitors, second only to camping.
- Reservations for picnic shelters typically are full on the weekends -Friday through Sunday.
- Electricity and water expansion at the picnic area is a big initiative. Currently only Shelter #2 has running water.
- Desire to add fishing pier and boat ramp near Shaw beach and picnic area. Would have impact on park utilization.
- Extending the Howell Run Boat Ramp is desired but would be an expensive endeavor.
    - The boat ramp is regularly unusable due to a drop in water level.
    - The Howell Run Boat Ramp is the only public boat ramp on the WV side of the lake. When it is unusable, boaters must use the ramp on the MD side which is about a 45-minute ride and costs $5.
    - The Howell Run Boat Launch is free to use.
- The Sarbanes Trail is a new trail that runs from the MD overlook access road to the area south of the dam. Popular route for trout fishermen to access prime trout fishing areas.
    - JRL recently relocated the dam restricted area gate to allow patrons to access JRL north of the Dam on the MD side and also allow a shorter path down the Sarbanes Trail to the trout fishing areas south of the dam.
        - Prior to the gate relocation, patrons had to walk a mile downhill and couldn't easily hike out.
- There is a desire to enhance the shoreline fishing / beach area between the dam and the spillway
    - Shaw Beach becomes overcrowded during weekends and holidays. An additional beach area would be a draw for overflow days and provide options for visitors.
    - There would be a need to pave the access road and increase parking.
- A campground was proposed for Hogback Ridge in 1977 but was never pursued due to lack of access to the site and other variables.
- The area south of the dam is commonly referred to as Big Bend Recreation Area. This area is a huge draw for Trout Fishermen.
    - Access to this area is currently provided by the Sarbanes Trail or by hiking upstream from the Barnum Camping area, where cabins are available for rent.
        - Fishermen parking in the Barnum area and hiking upstream can get stranded when releases are increased from the Dam.

        - There is a desire to build a pedestrian swing bridge over the stream in this vicinity to alleviate this issue and provide safe access across the river in heavy flow conditions.
    - No sirens exist downstream to alert anyone in the vicinity of increases in releases.
- A hydroelectric system is coming to the dam and expected to be constructed within the next two years.
    - This system will piggyback the existing dam infrastructure and is not expected to impact dam operations.
    - The system will generate approximately 65 ohms.
    - System will power up to 6,500 homes.
    - There are some perceived benefits to regulating water temperature, which is critical for downstream habitats.
    - 404 permit has been issued -- postponed for a year.
    - Lake will have to drop down to 1420' elevation during construction, which does not present a problem as long as there are no construction delays.
- The fish promulgation area below the dam has been moved back 900-feet toward the dam. A catch and release policy exists for the area within the promulgation area line and the dam.
- There is no water source serving the campground -- the holding tank exists, and water lines have been recently replaced.
    - A 30,000-gallon water tank is refilled regularly by JRL maintenance staff; very labor intensive. Water is hauled from Elk Garden 2-3 day per week by staff.
    - Two wells penetrating 600-700' previously constructed, but both failed due to coal seams
    - Possibility of pumping water from the reservoir but would take several pump stations to reach the elevation of the campground.
- Utilities:
    - Electricity is unreliable. Even slight inclement weather can interrupt power to the lake.
    - Communications is unreliable and has been a persistent problem for quite a while.
        - Reliable power and comms are high-priority requirements at JRL.
- Safety issues permeate the area in many areas.
    - Power issues and comms issues combine to occasionally create unsafe conditions.
    - No warning system in tower to signal a power outage.
- Friends Group is very active and typically meets every week. They should be consulted as this project moves forward. The Mineral County Parks & Recreation Department must also be involved.
- WVA and MD police patrol the lake. Neither has jurisdiction in each other's state but generally patrol the entire lake.
- Fire and rescue service is provided by local communities with very good response time. There are problems with communication between different departments and lack of repeater for adequate radio communications to agencies off-site.

ACTIVITY: Site Tour
DATE/TIME: 13-15 August 2018
LOCATION Jennings Randolph Lake
ATTENDEES Ken Fernandez, Bill Donelin, Gary Kalbaugh, MAJ Terrence Harrington, John Minter, Rick D'Arienzo, and Patrick West

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:

- Barnum Cabin Rentals
- Big Bend Recreation Area

- Shaw Beach
- JRL dam and emergency spillway
- MD Overlook #1
- MD Overlook #2
- MD DNR Boat Launch
- Dragon Head fishing area
- Control Tower
- Maintenance Facility
- WV Overlook Facility
- Robert Craig Campground
- Kalbaugh Pond
- Mountain Meadow Overlook
- Archery Range
- Overflow parking area
- Howell Run Picnic Area
- Howell Run Boat Launch
- Miss Jones' Service Station

An excellent boat tour was also provided to allow the planning team to view experience each of the coves and to view each of the locations listed above from a different perspective.

ACTIVITY: Hot Wash
DATE/TIME: 15 August 2018 / 1430-1530 hrs
LOCATION Jennings Randolph Lake
ATTENDEES Ken Fernandez, Gary Kalbaugh, MAJ Terrence Harrington, John Minter, Rick D'Arienzo, and Patrick West

The planning team met with USACE and JRL representatives to discuss initial ideas and thoughts relating to future improvements and projects. Below is a summary of potential projects identified for either the short- or long-range future:

1. Infrastructure Upgrades (Power / Communications / Water)
    a. Reliable power and comms
        - Address safety concerns
    b. Local water source -- pump up to campground
2. Barnham - Big Bend Recreation Development
    a. Hike in camping area – consider permanent yurts
    b. Swing bridge to cross North Branch Potomac River (similar to Savage River Reservoir)
3. Robert Craig Campground
    a. Overflow parking improvements
        - Fence / sound barrier
    b. Primitive camping area
        - Fire ring / water source / tree lantern / path to camp shop
    c. Existing campground improvements
        - Leach field improvement
        - Water tank source solution

- Road buckling improvements
- Camper space improvements (canopy opening clearing)

d. Archery range area
- Mountain bike trail
- Indoor nature center
- Archery trail improvements?

4. Dragon Head Beach:
   a. Improve beach area
   b. Pave road with more gradual “switchback” design
   c. Expand parking
   d. Security fence
5. Mountain Meadow Overlook:
   a. Improve parking (add pull-off parking)
   b. Add view deck / railing
   c. Viewing scopes
   d. Add informational grapics depicting points of interest in valley
6. Howell Run Boat Launch:
   a. Rebuild to extend boat ramp
7. Howell Run Picnic Area:
   a. Power / water to all three pavilions
   b. Lighting improvements to the site, pavilions, and restroom
   c. Add primitive campsites along nearby shoreline
8. Shaw Beach Area:
   a. Expand parking
   b. Add fishing pier and dock
   c. Improve beach area (tiered gathering area)
9. WV Overlook:
   a. Admin/Visitor Center
      - 2-story building with uses separated
   b. Maintenance building improvements
      - 2-story building -- offices on second floor and heighten high-bay vehicle storage
10. Sarbanes Trail Entry / Overlook:
    a. Improve parking to asphalt
    b. Improve growth deficient area
    c. Maintain vegetation to keep view to lake from being overgrown
11. Peninsula B
    a. Provide boat-in beach access with dock
    b. Provide 10-15 primitive campsites
    c. Negotiate emergency vehicular access easement with property owner
12. Hogback Ridge
    a. Consider campground development and/or an Enhanced Use Lease (EUL) lodge
    b. Provide deep run fishing access near the end of the nearby cove

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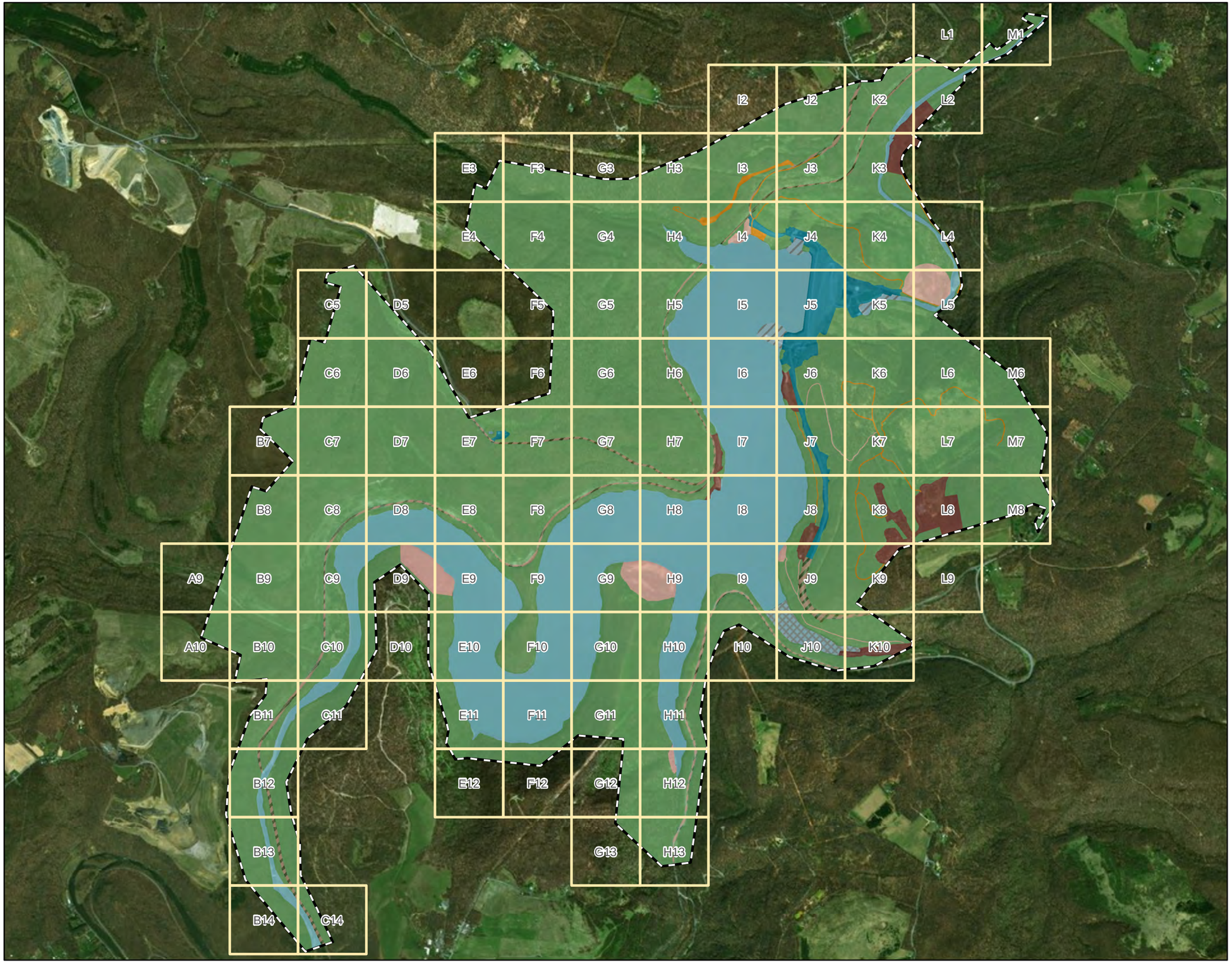
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

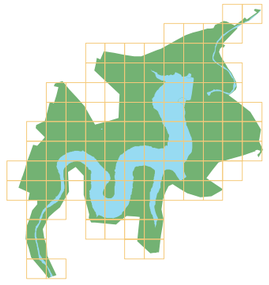


Legend

- Grid
- JRL Site Boundary

Land Classification

- High Density Recreation
- Multiple Res Mgmt Lands - Future Recreation Area
- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management
- Project Operations
- Water Surface - Open Recreation
- Water Surface - Restricted
- Water Surface - No Wake
- Owned by Other Entities



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0 2,800 5,600 Feet

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Jennings Randolph Lake Master Plan Update

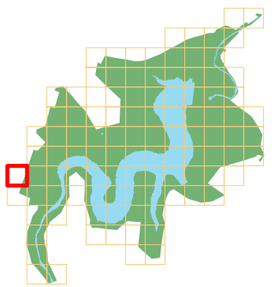
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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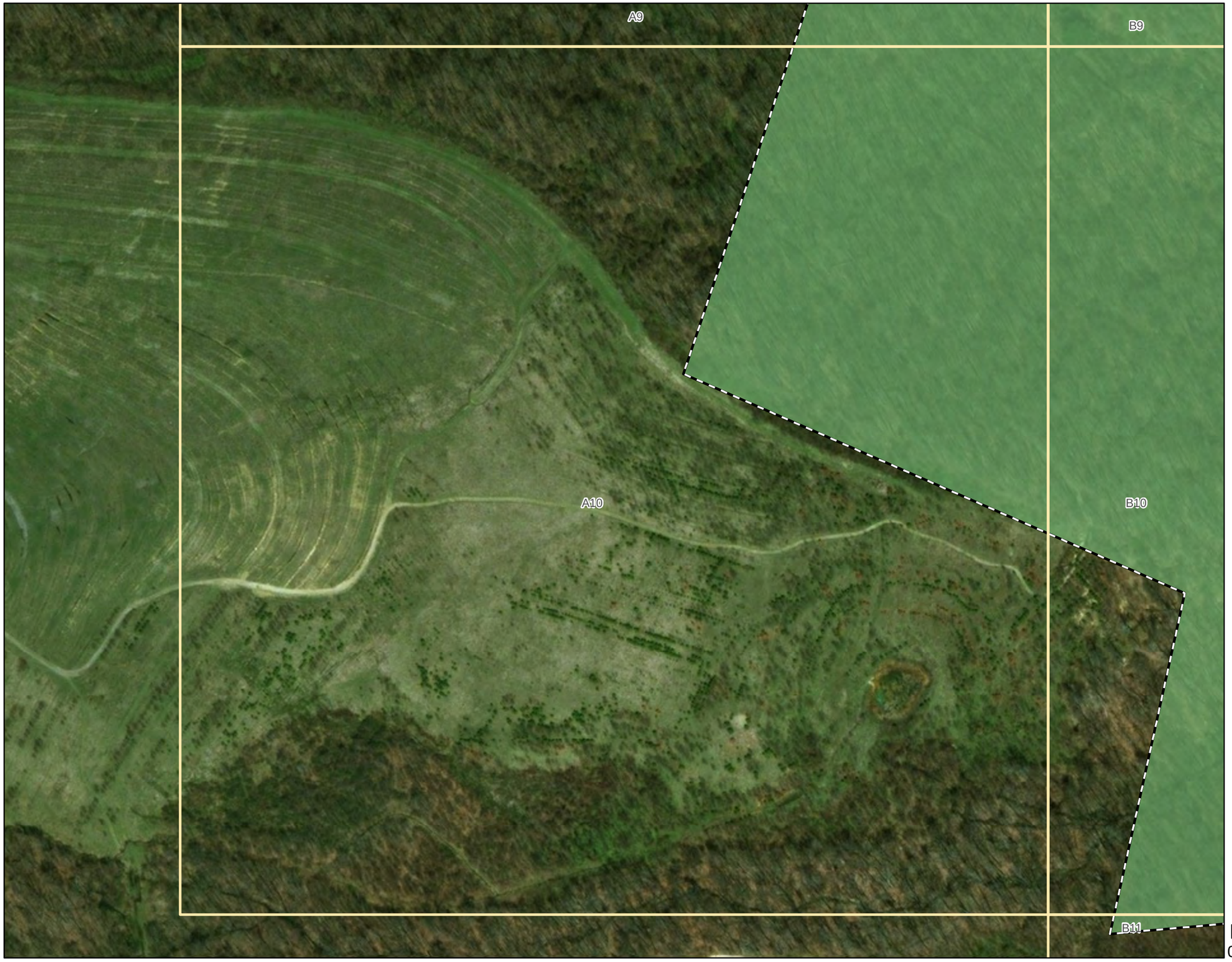
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View



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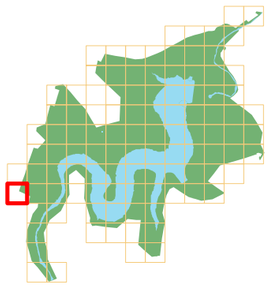
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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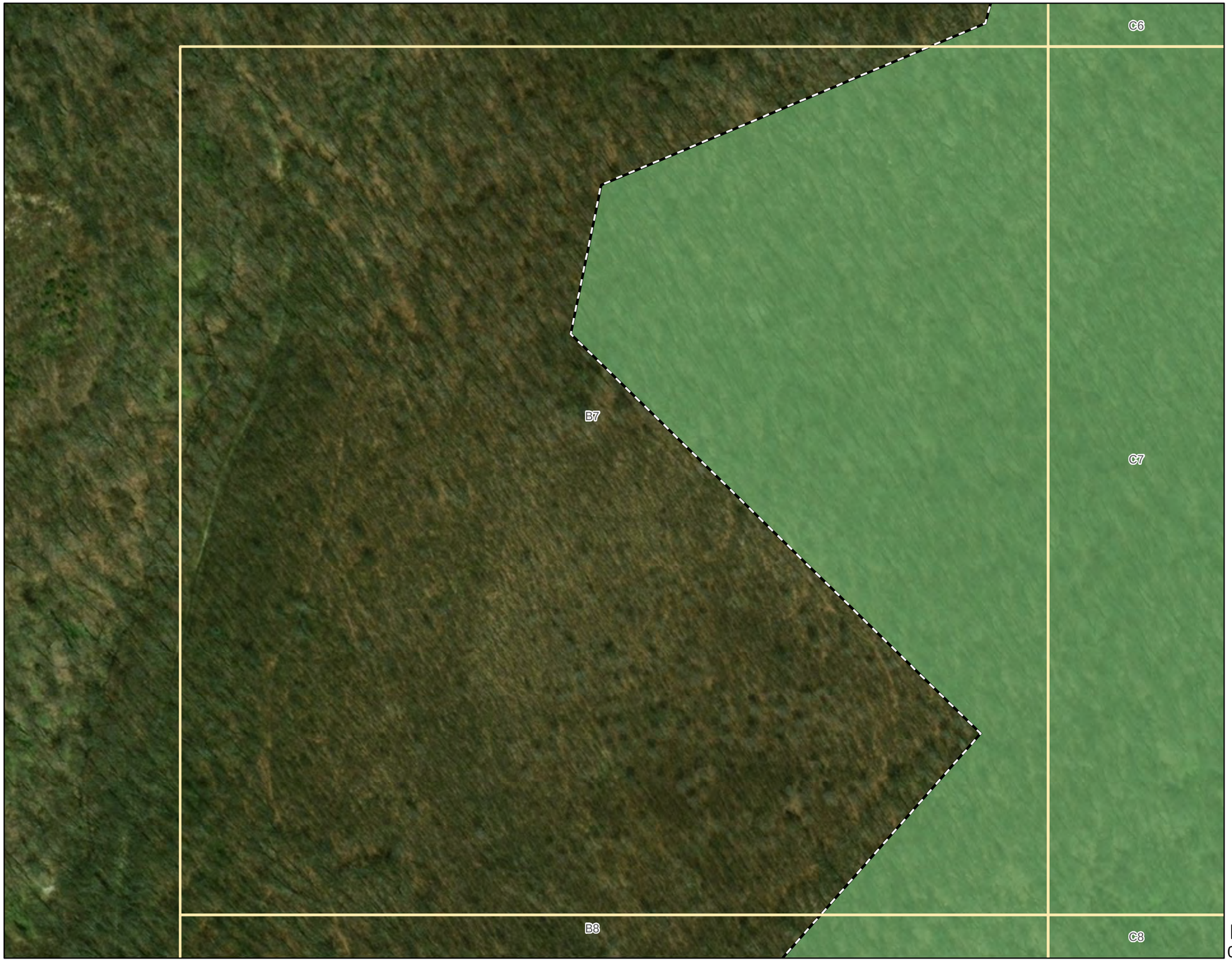


Jennings Randolph Lake Master Plan Update

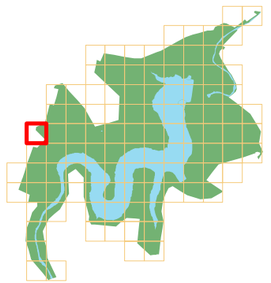
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

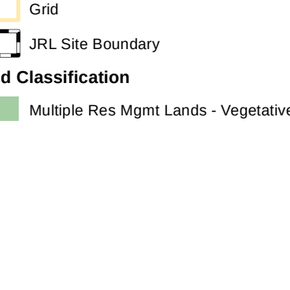
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

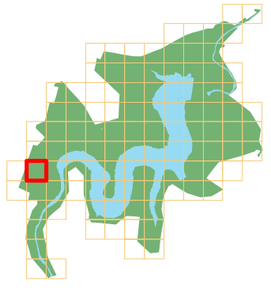
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



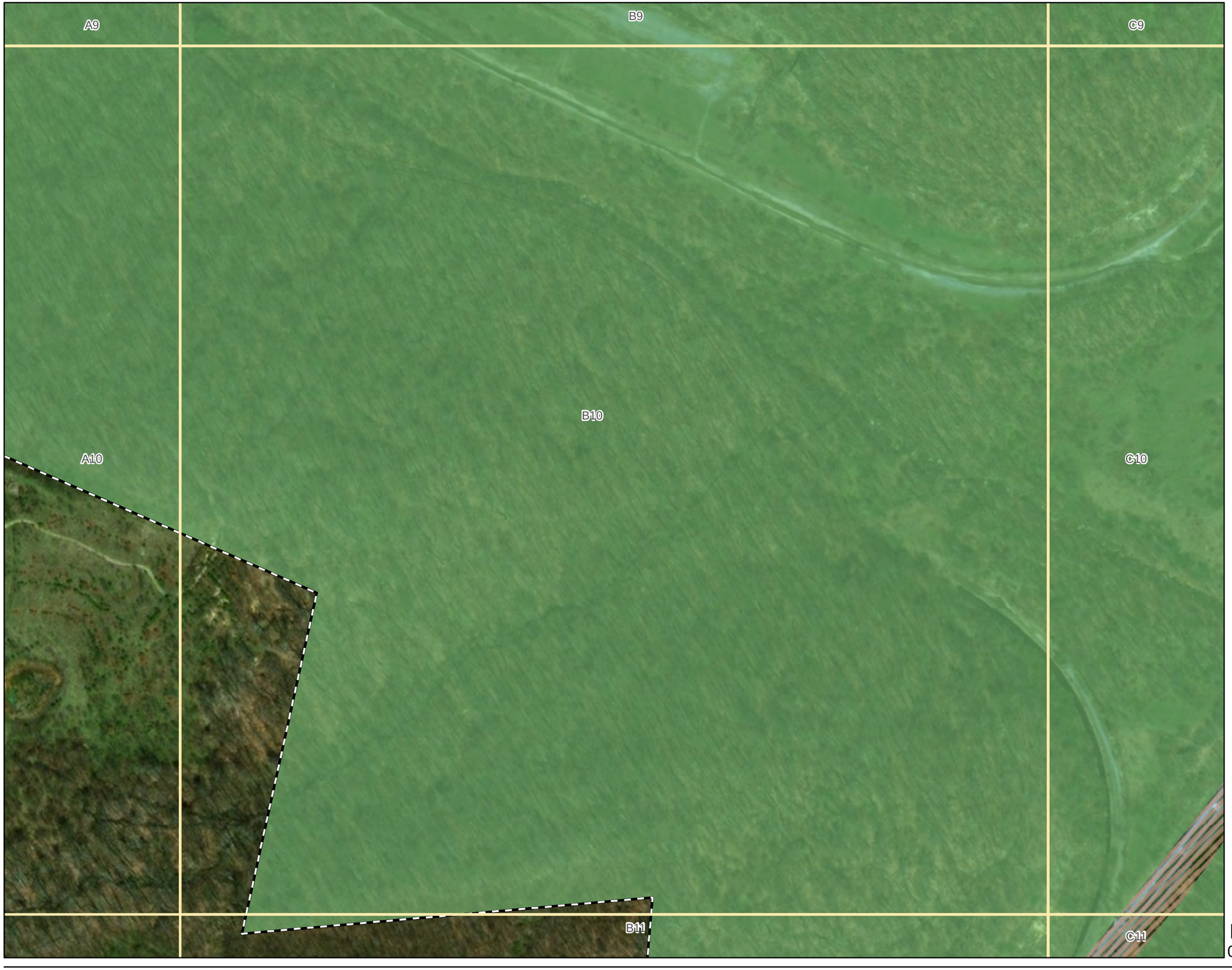
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

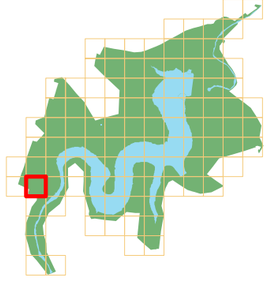


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Owned by Other Entities



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

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

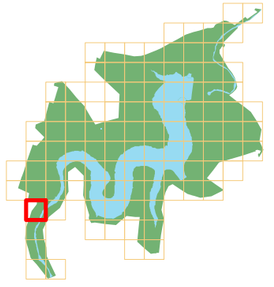
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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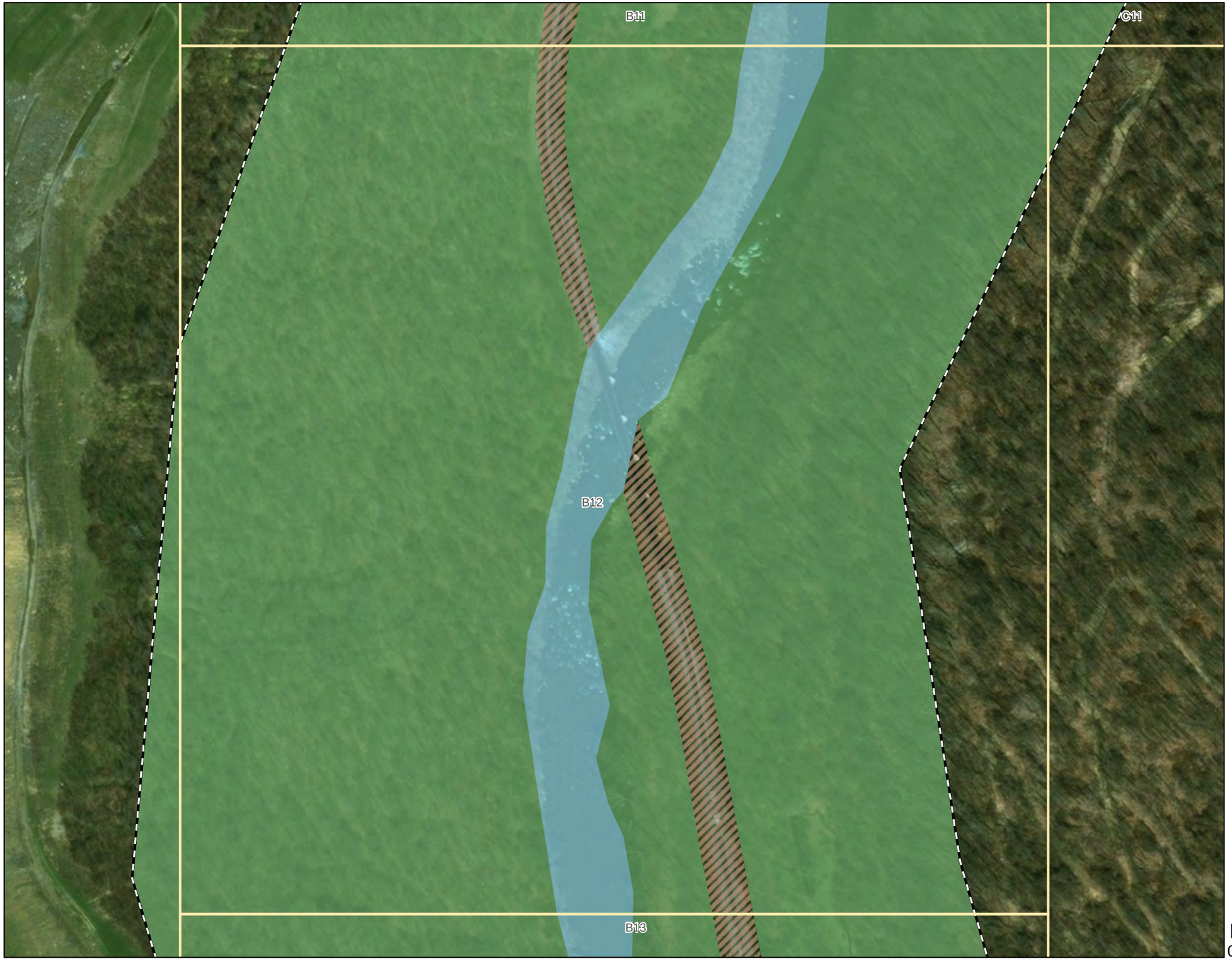

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities

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0 225 450 Feet

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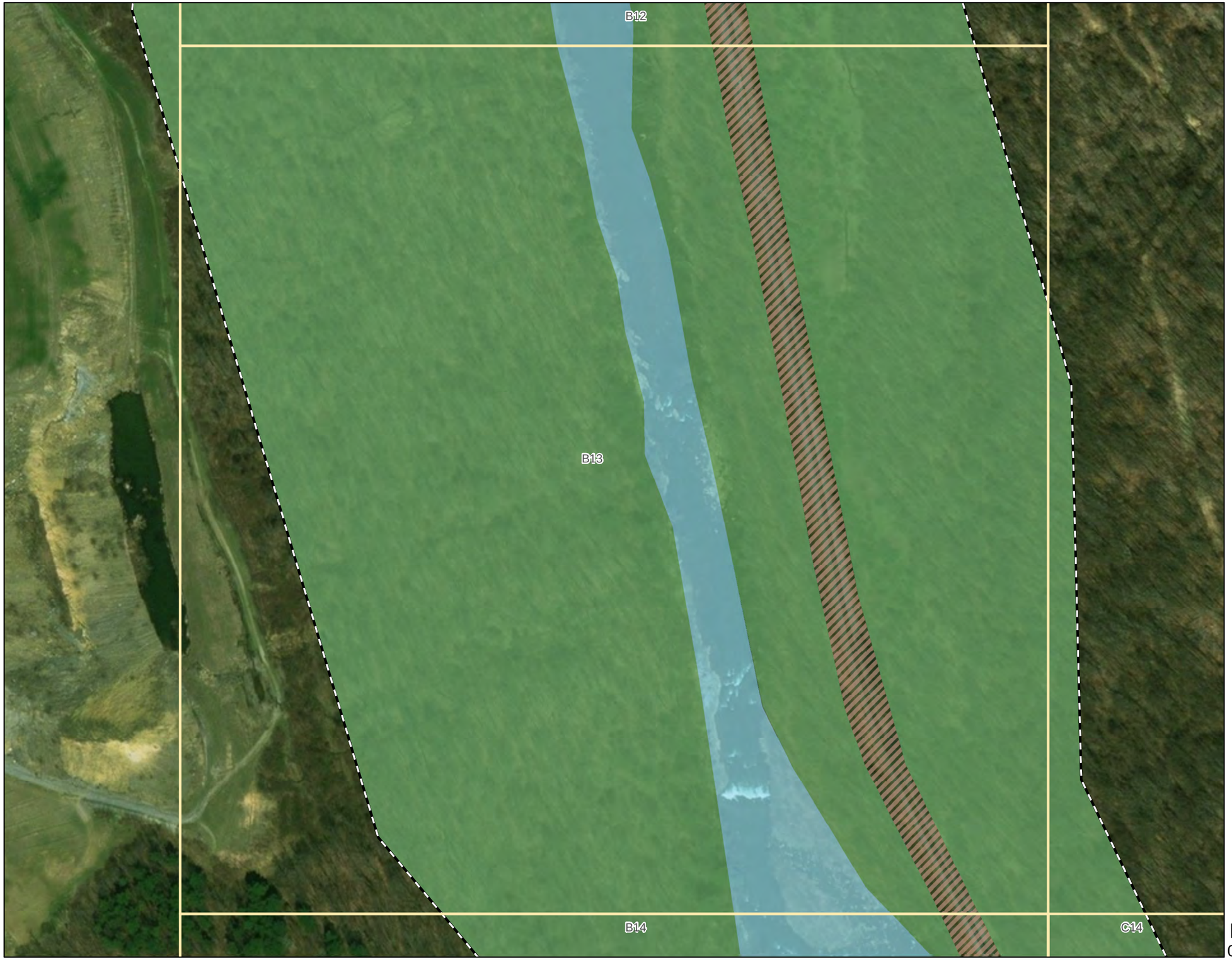
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

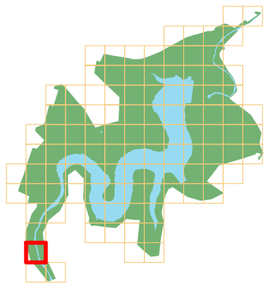


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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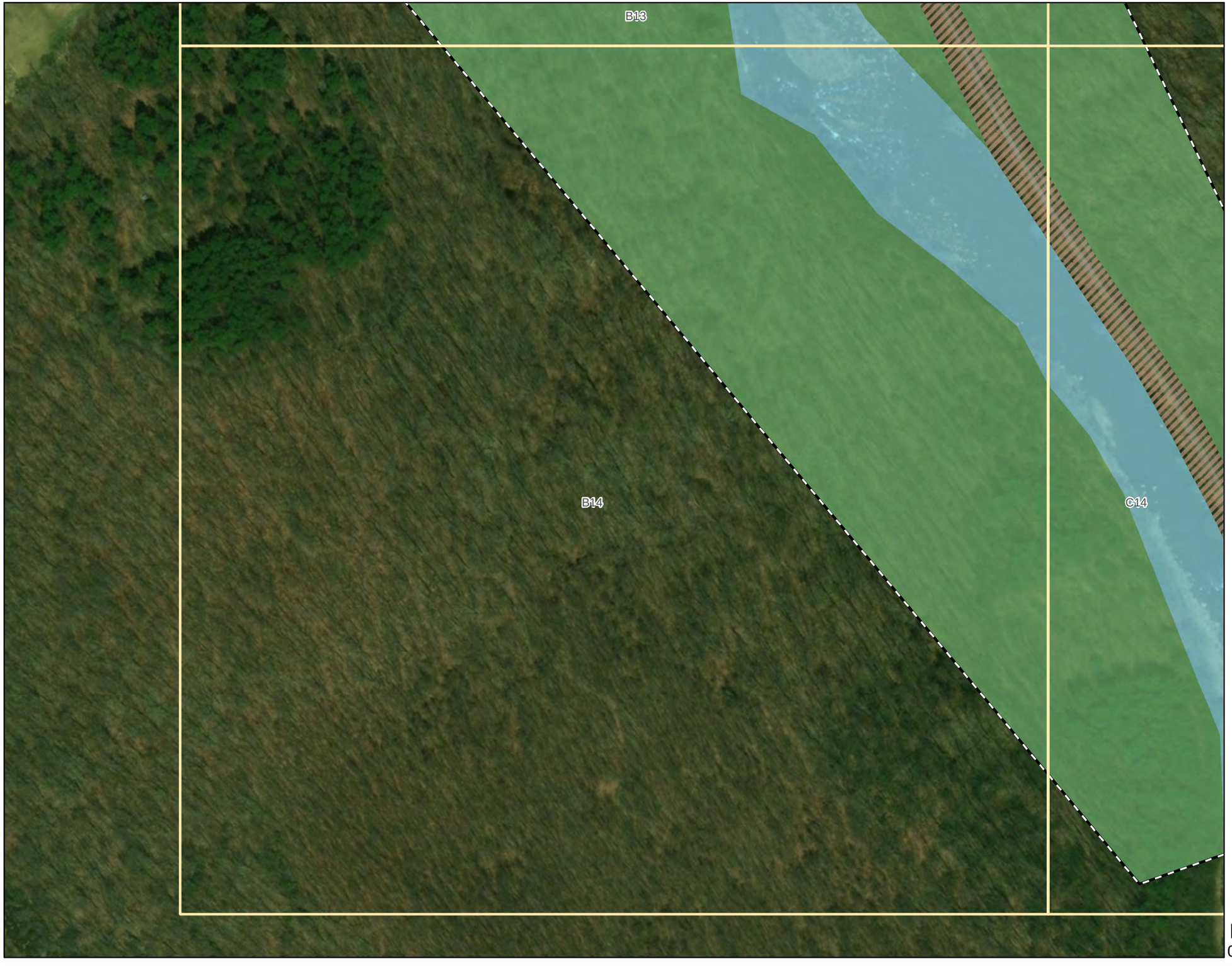

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

Legend

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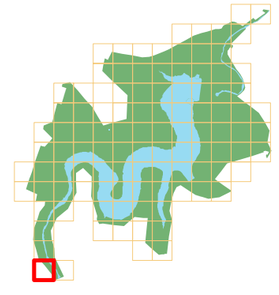
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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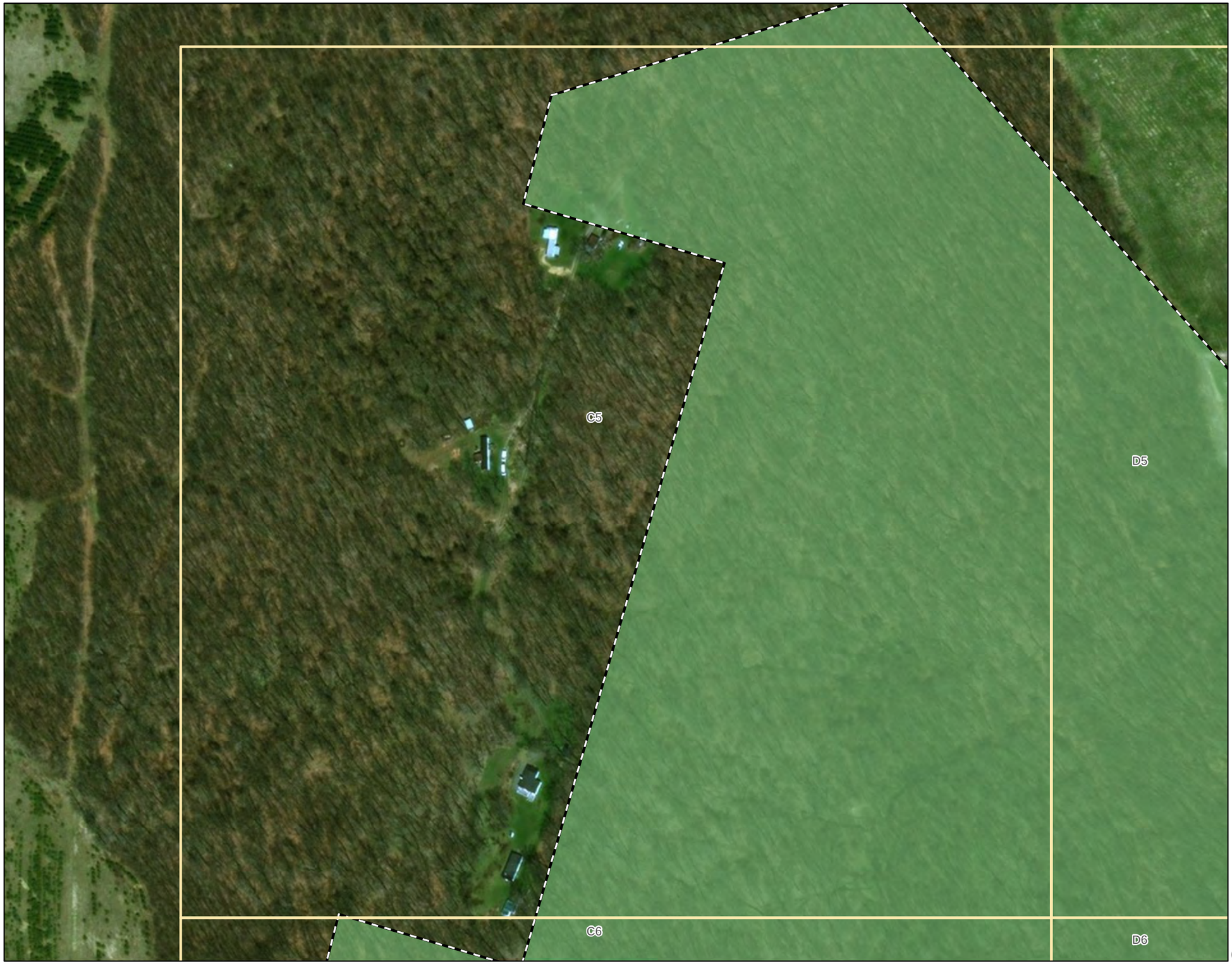
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

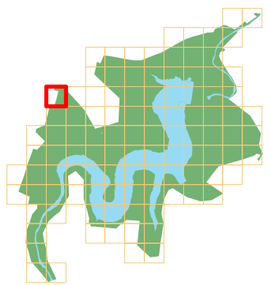


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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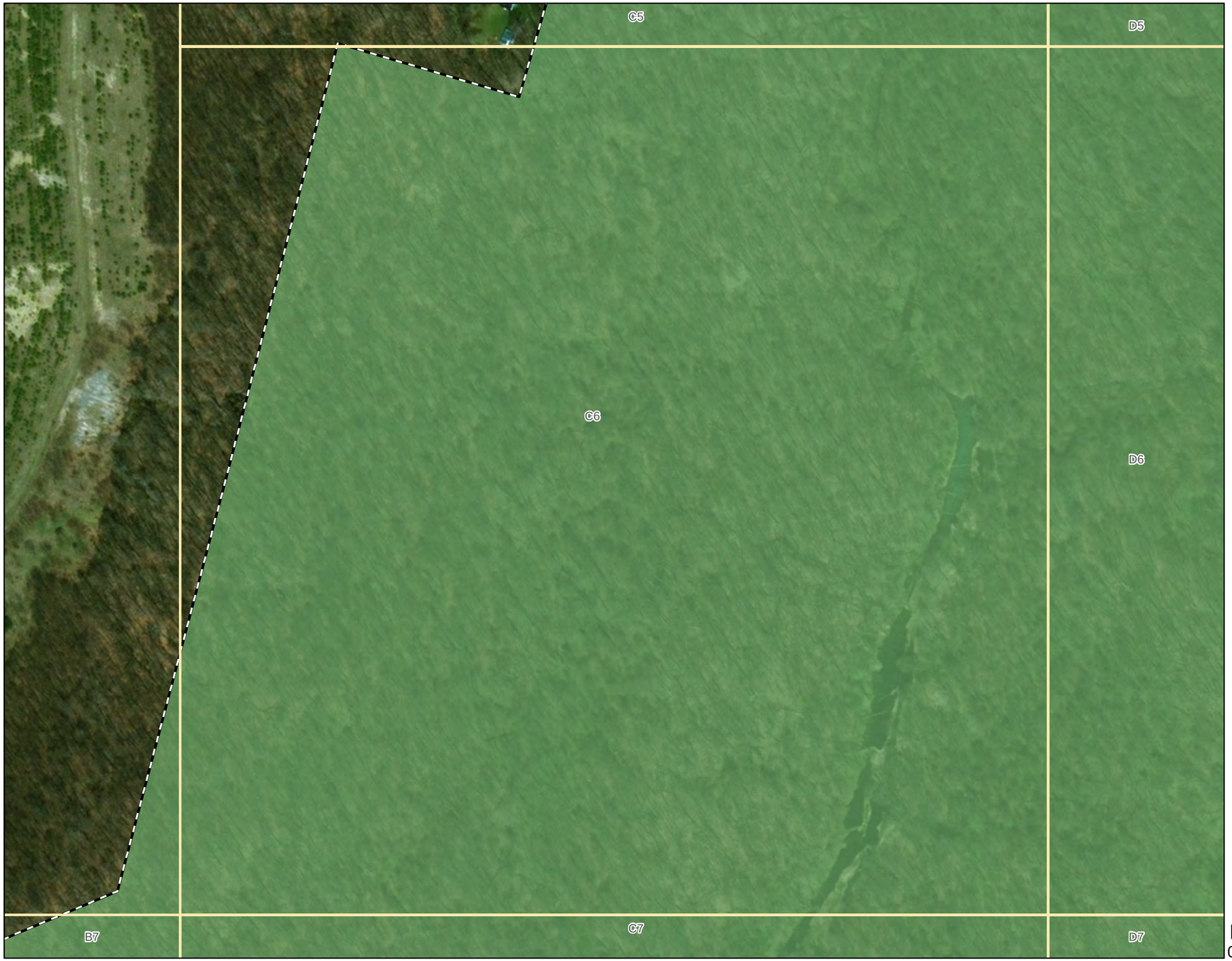
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

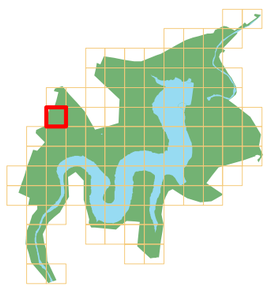


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

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Land Classification

- Multiple Res Mgmt Lands - Vegetative Management

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0 225 450 Feet

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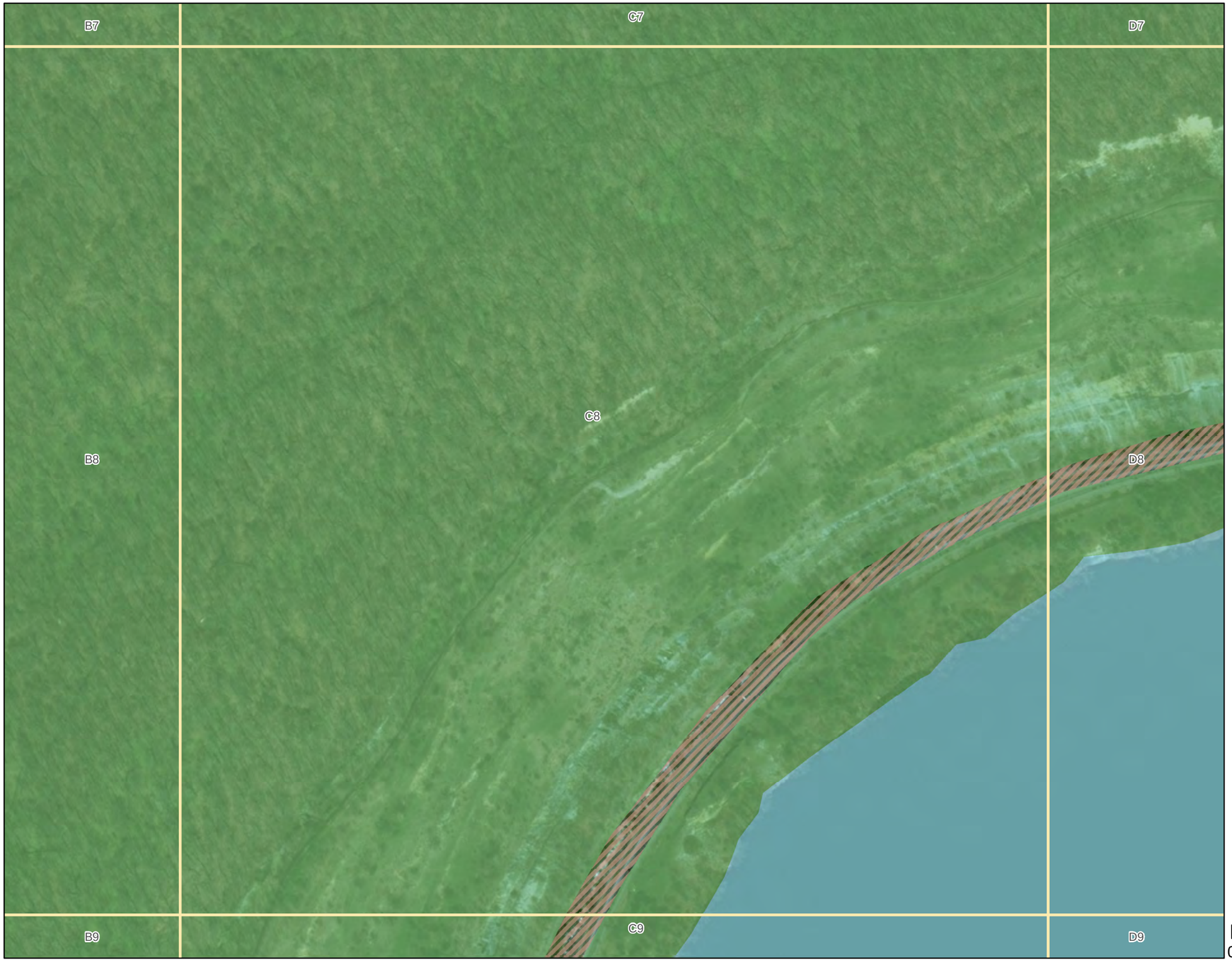
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

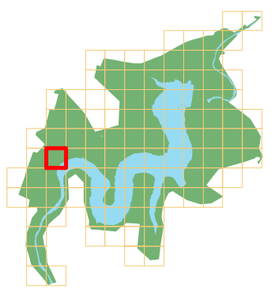


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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

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Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

Legend

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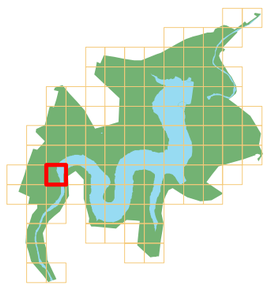
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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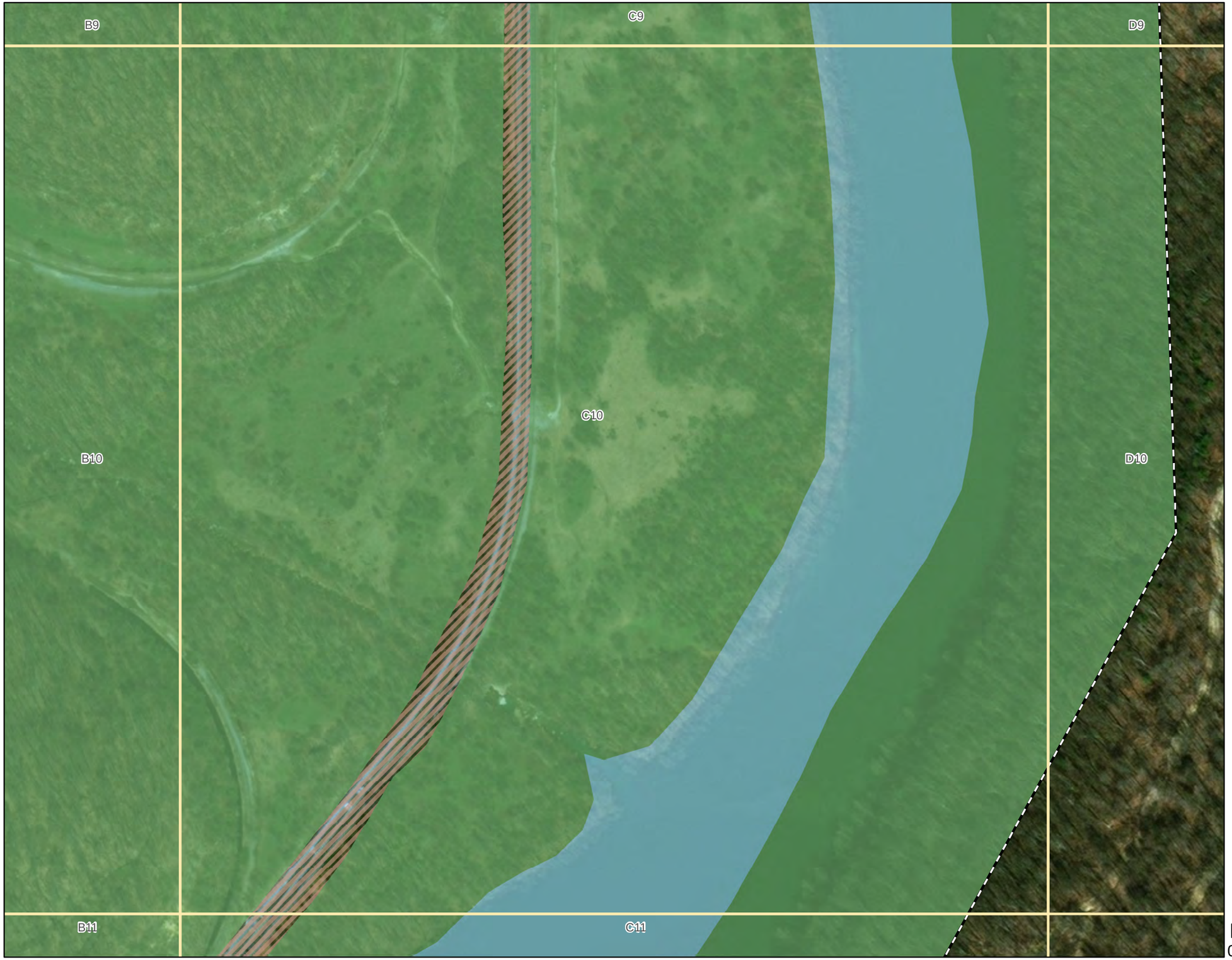
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

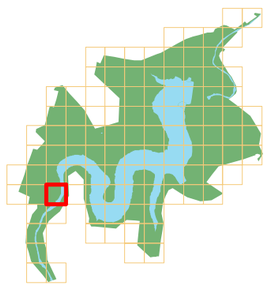


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

Legend

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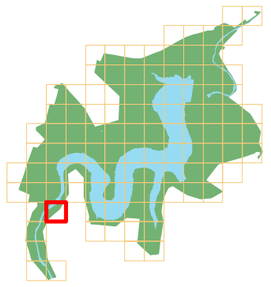
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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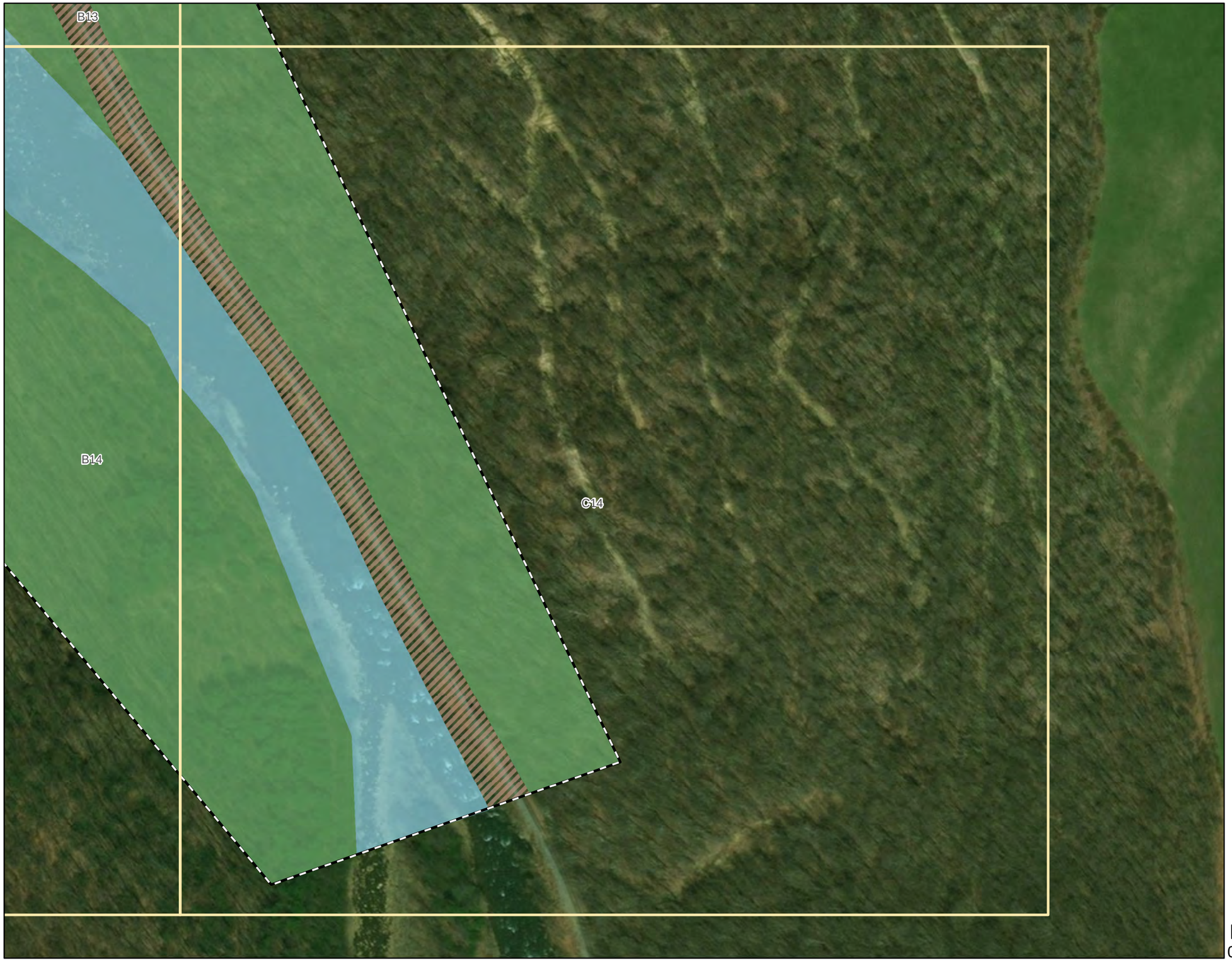


Jennings Randolph Lake Master Plan Update

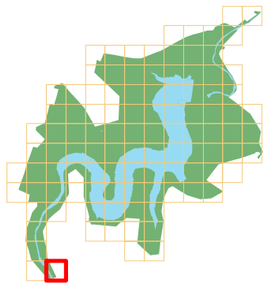
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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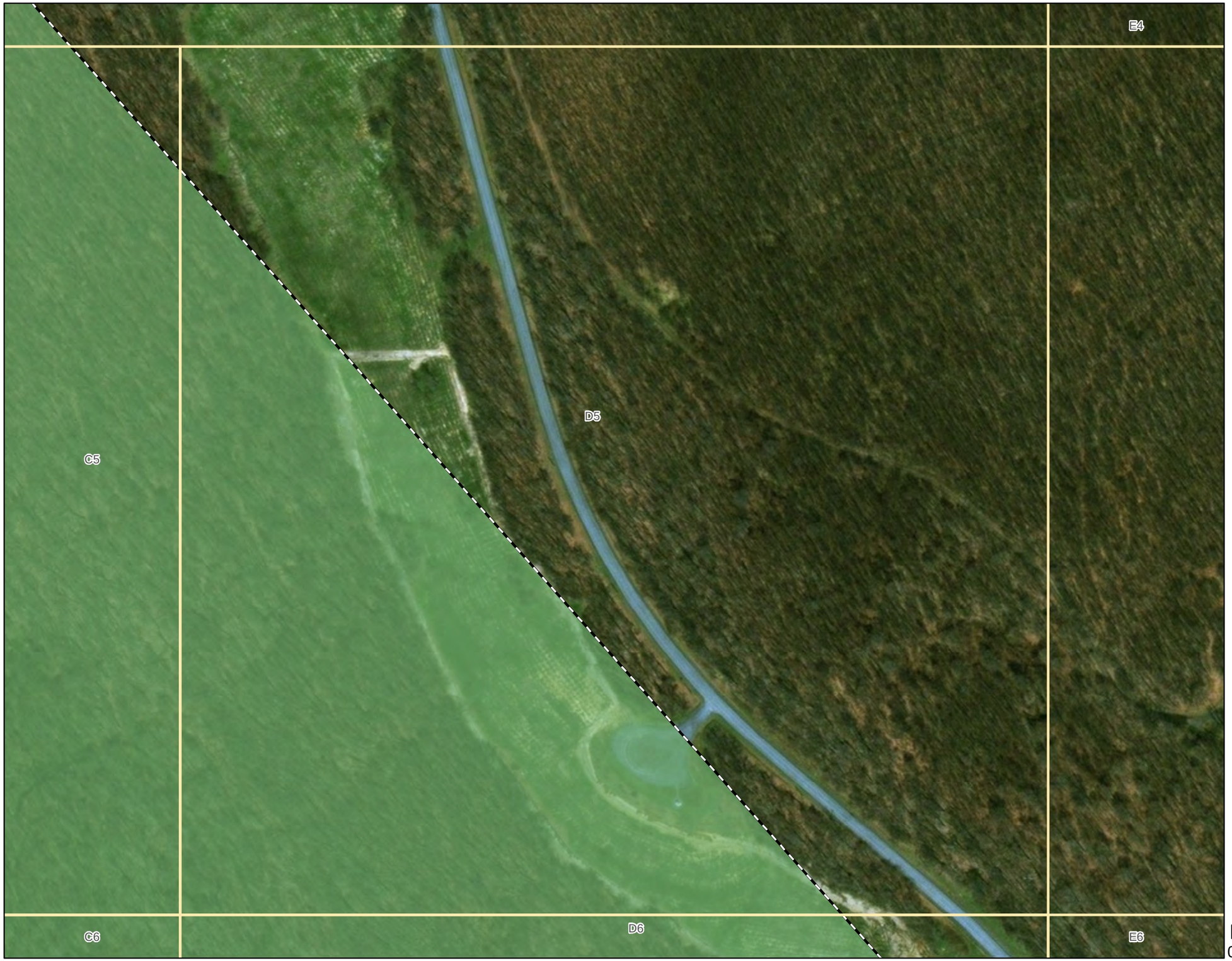
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

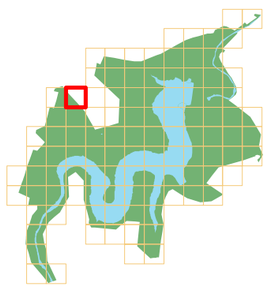


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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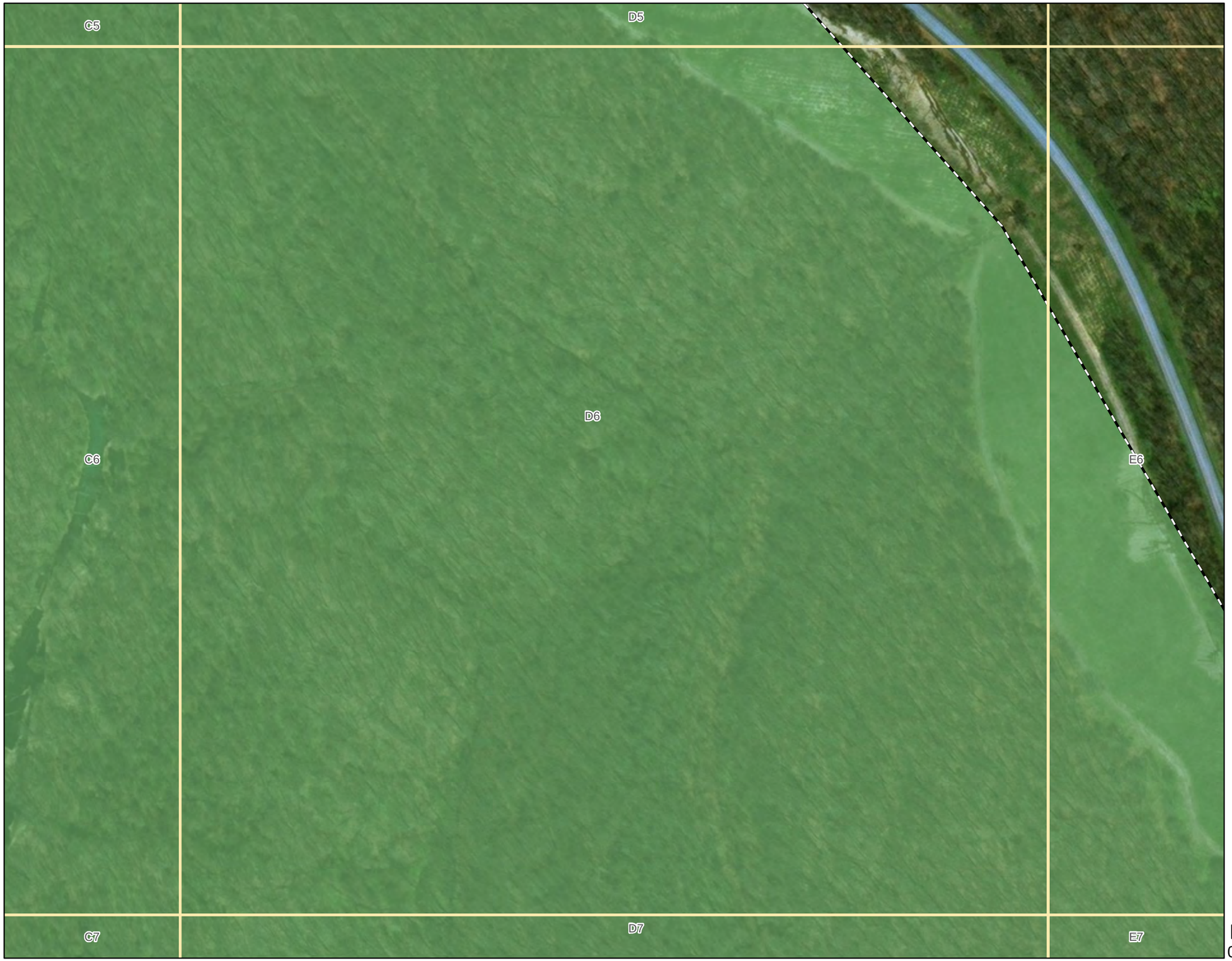


Jennings Randolph Lake Master Plan Update

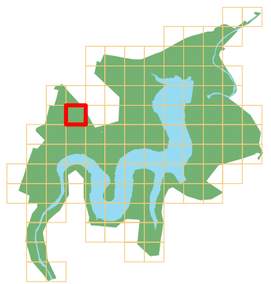
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management

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0 225 450 Feet

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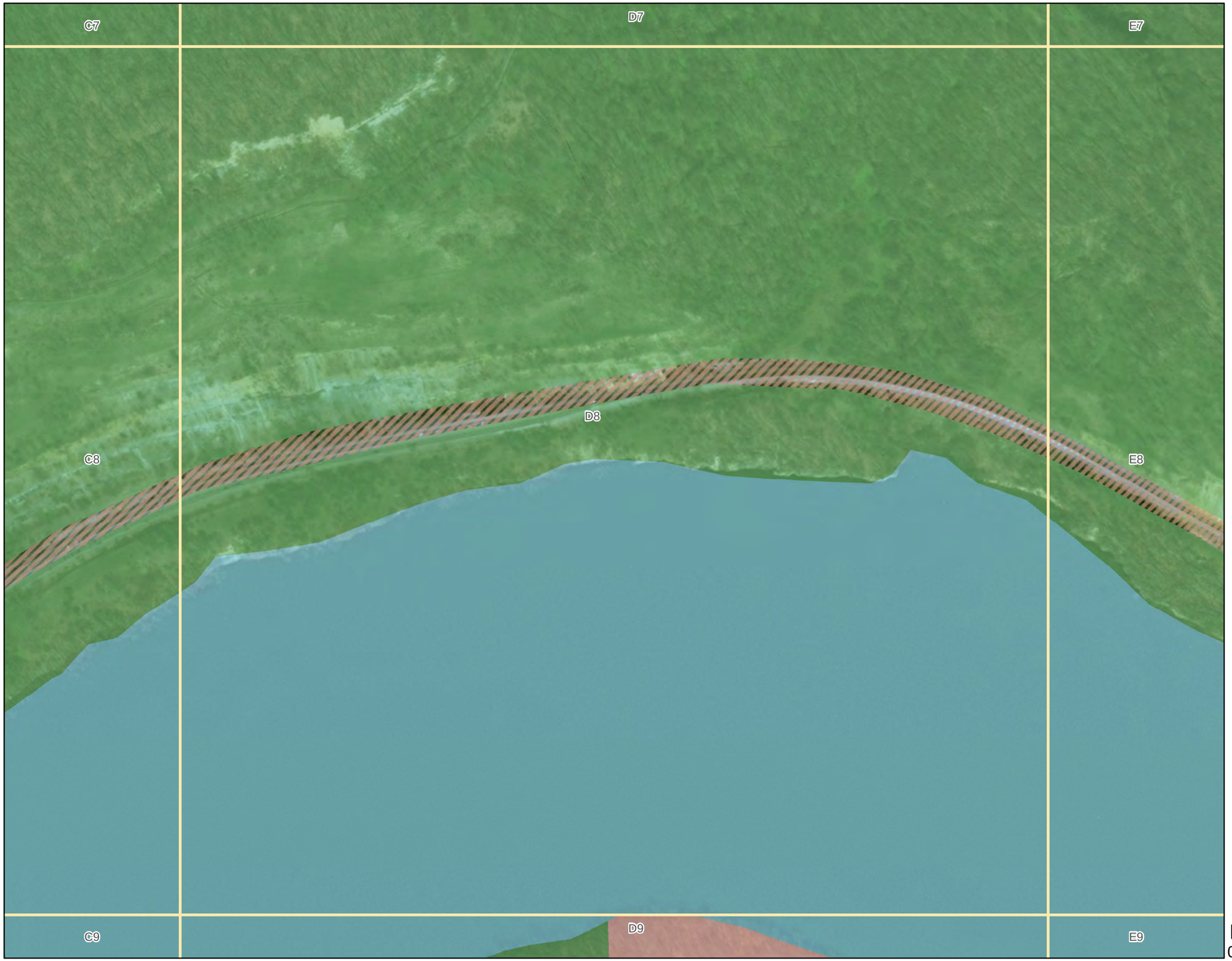
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

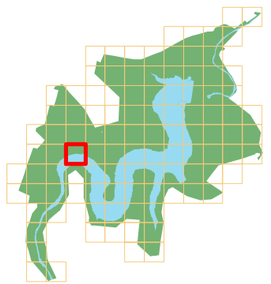


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Future Recreation Area
- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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0 225 450 Feet

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Jennings Randolph Lake Master Plan Update

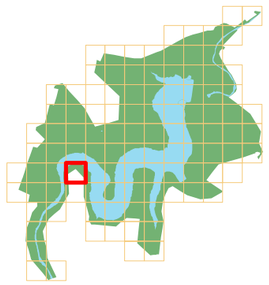
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Future Recreation Area
- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation



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0 225 450 Feet

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Jennings Randolph Lake Master Plan Update

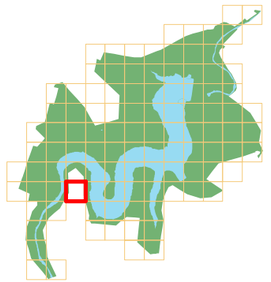
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation



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Jennings Randolph Lake Master Plan Update

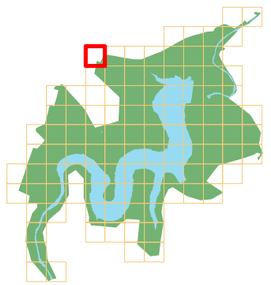
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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Jennings Randolph Lake Master Plan Update

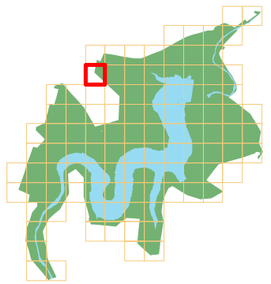
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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Jennings Randolph Lake Master Plan Update

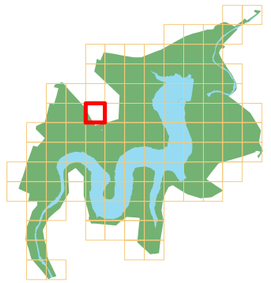
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Project Operations
- Water Surface - Open Recreation
- Owned by Other Entities

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

0 225 450 Feet

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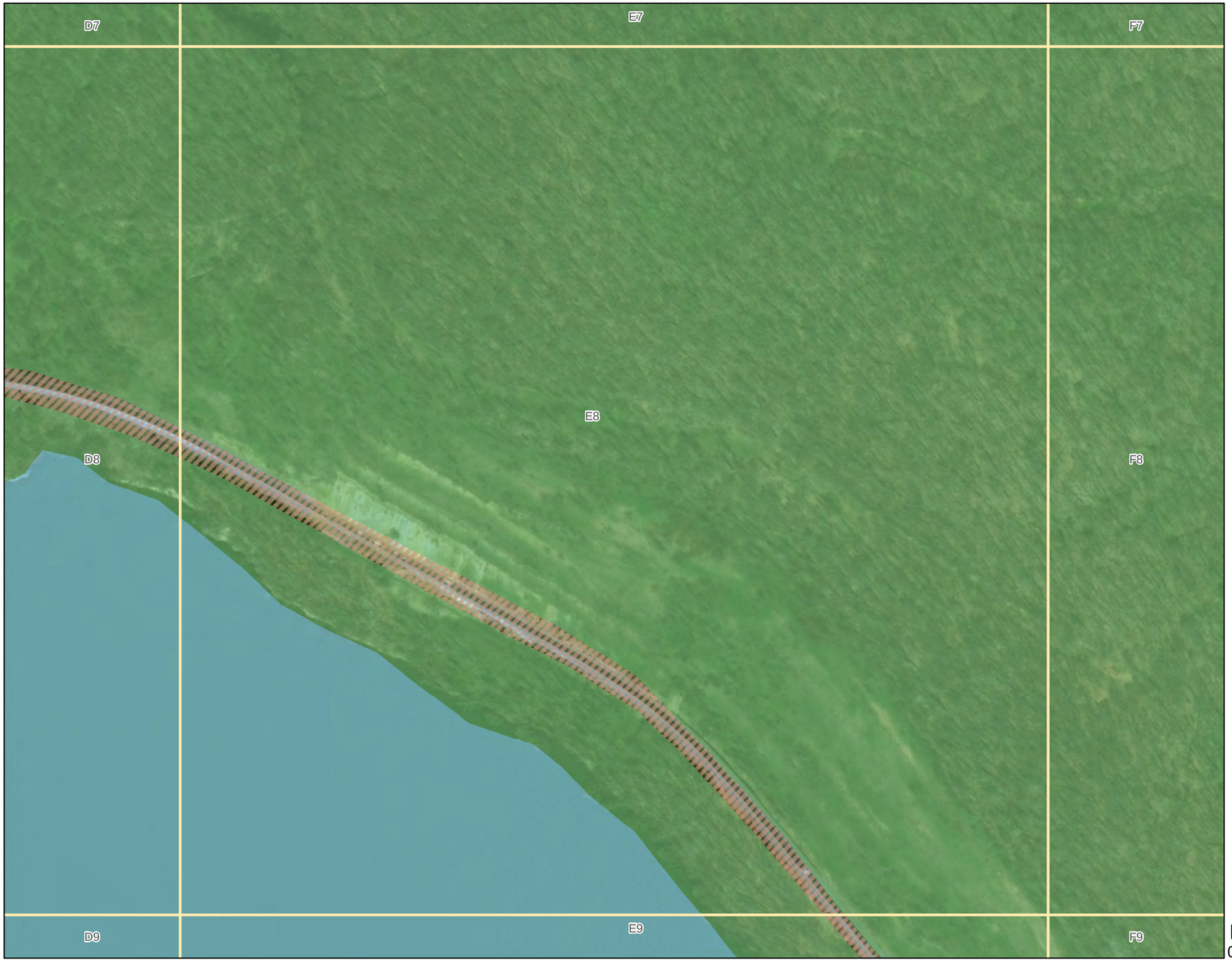
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

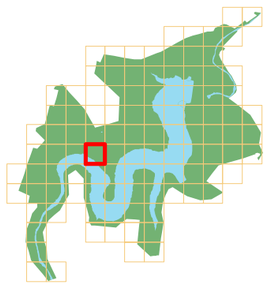


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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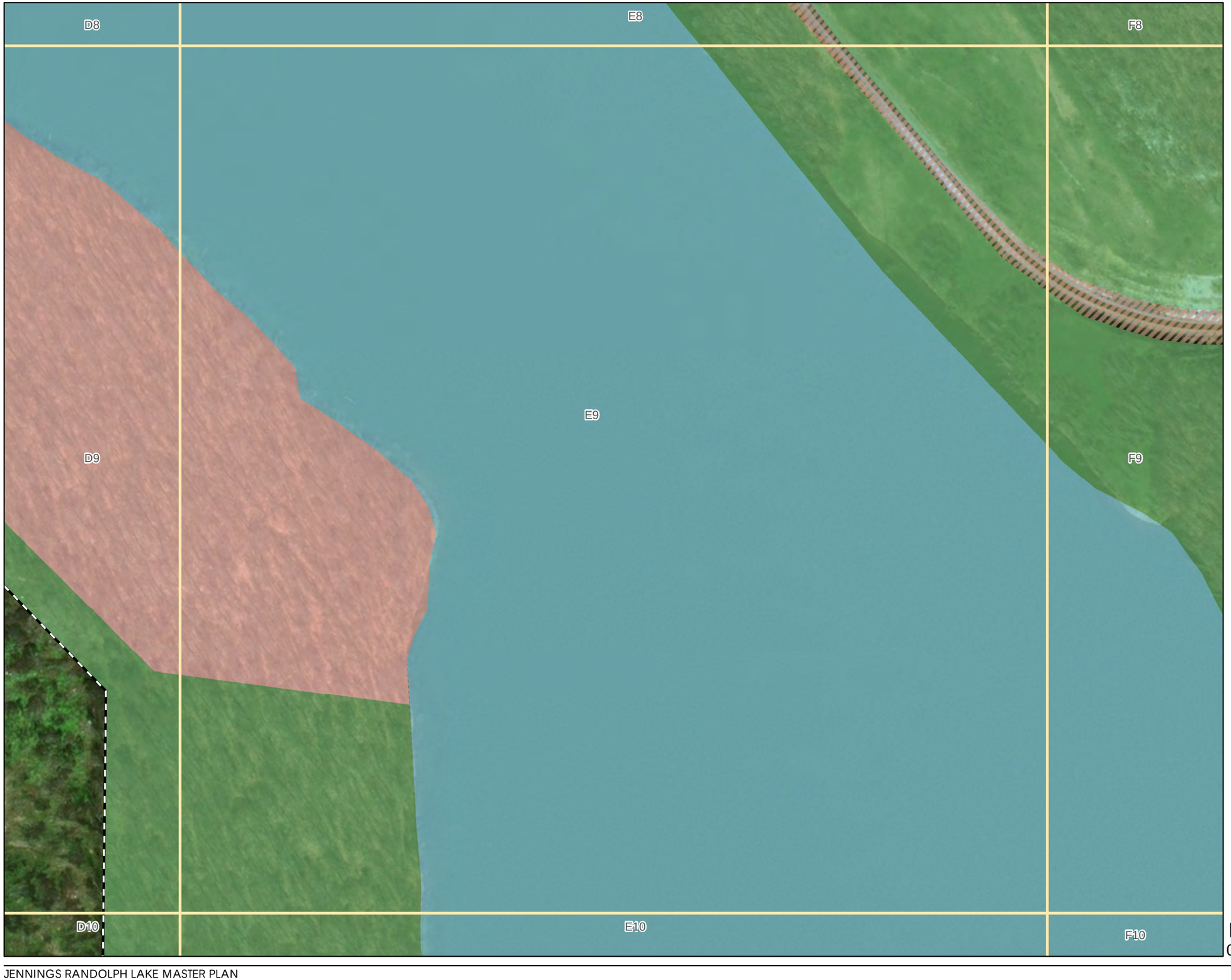
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

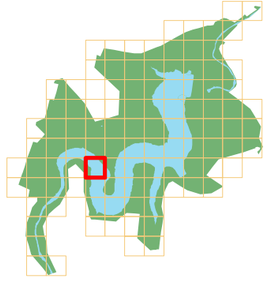


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Future Recreation Area
- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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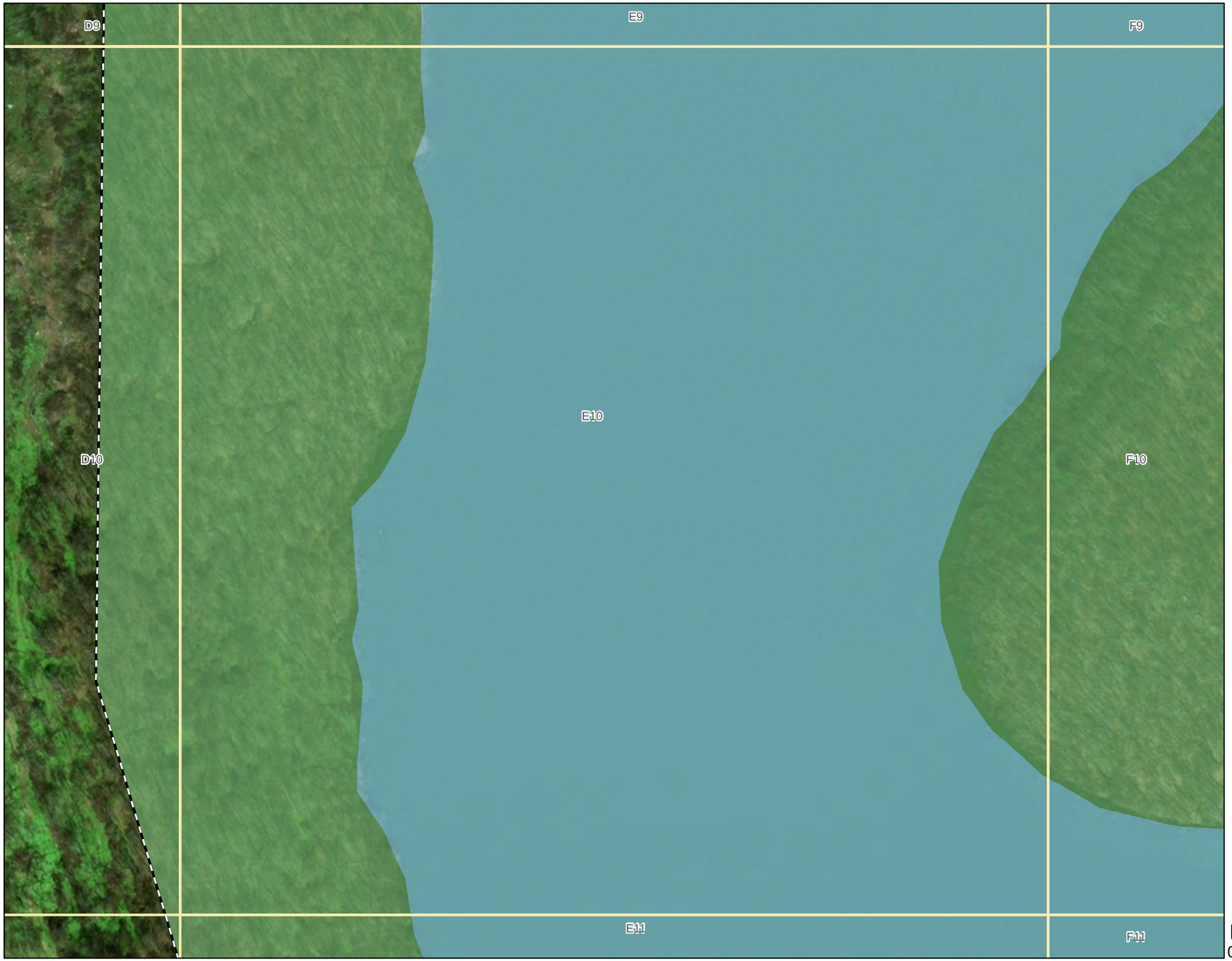
0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

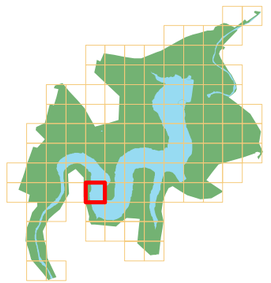


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation



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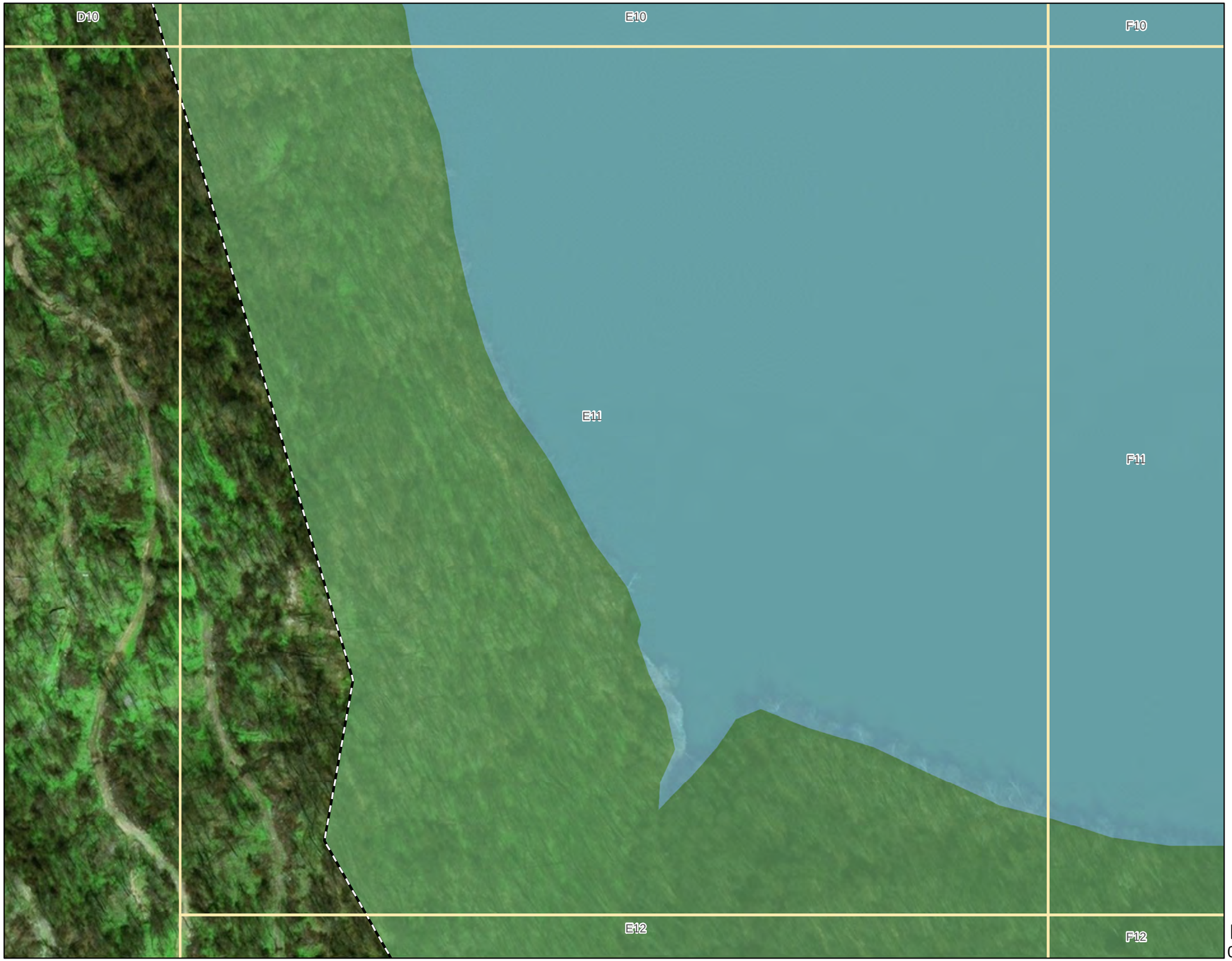


Jennings Randolph Lake Master Plan Update

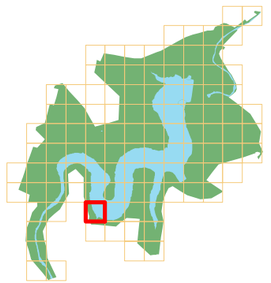
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation



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

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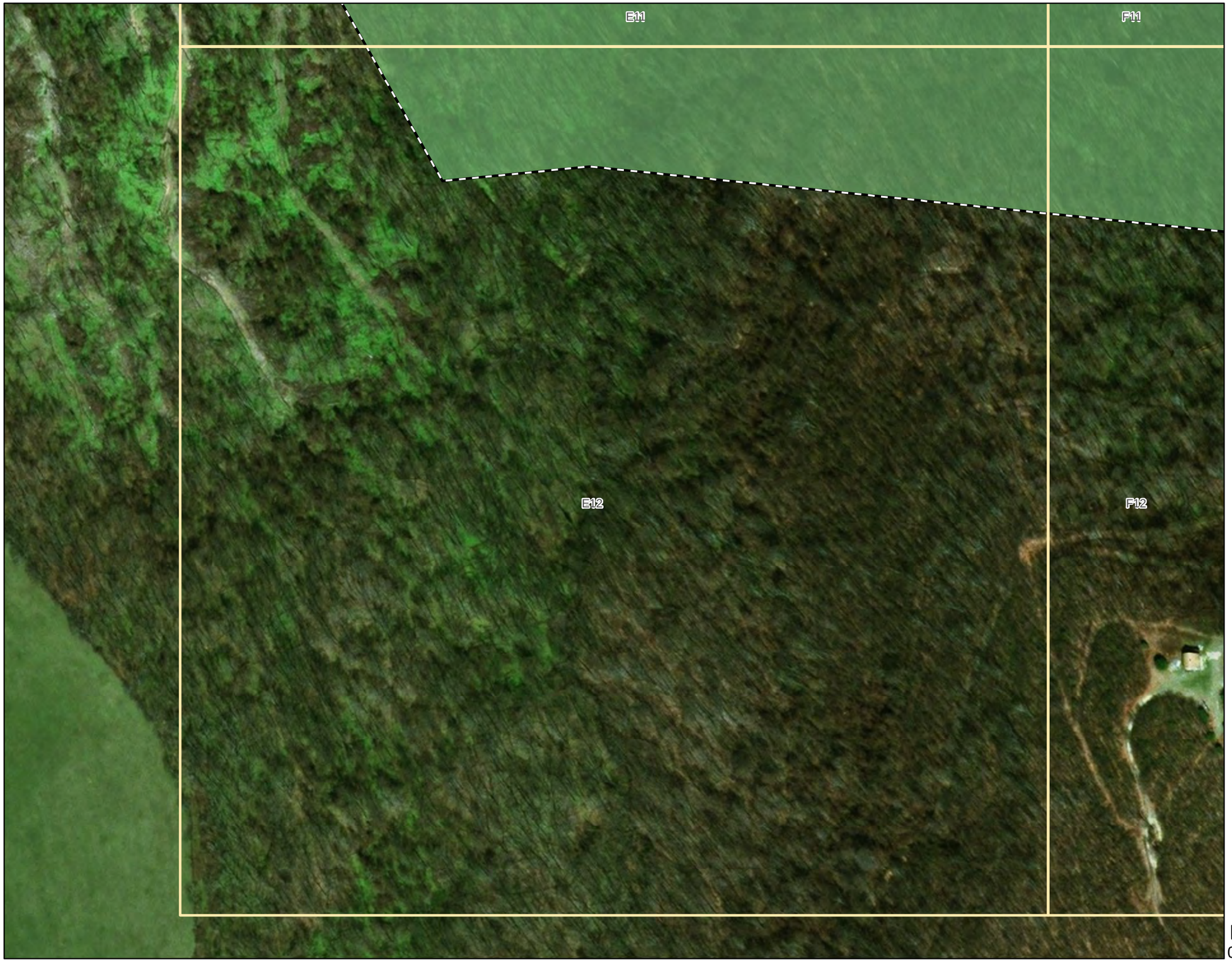


Jennings Randolph Lake Master Plan Update

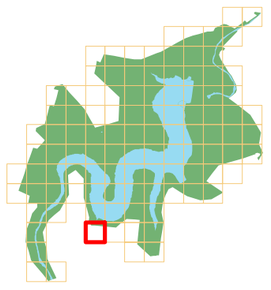
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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

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Jennings Randolph Lake Master Plan Update

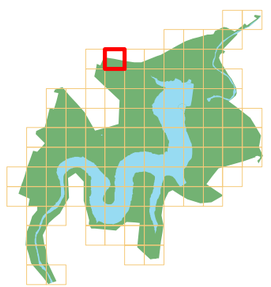
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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

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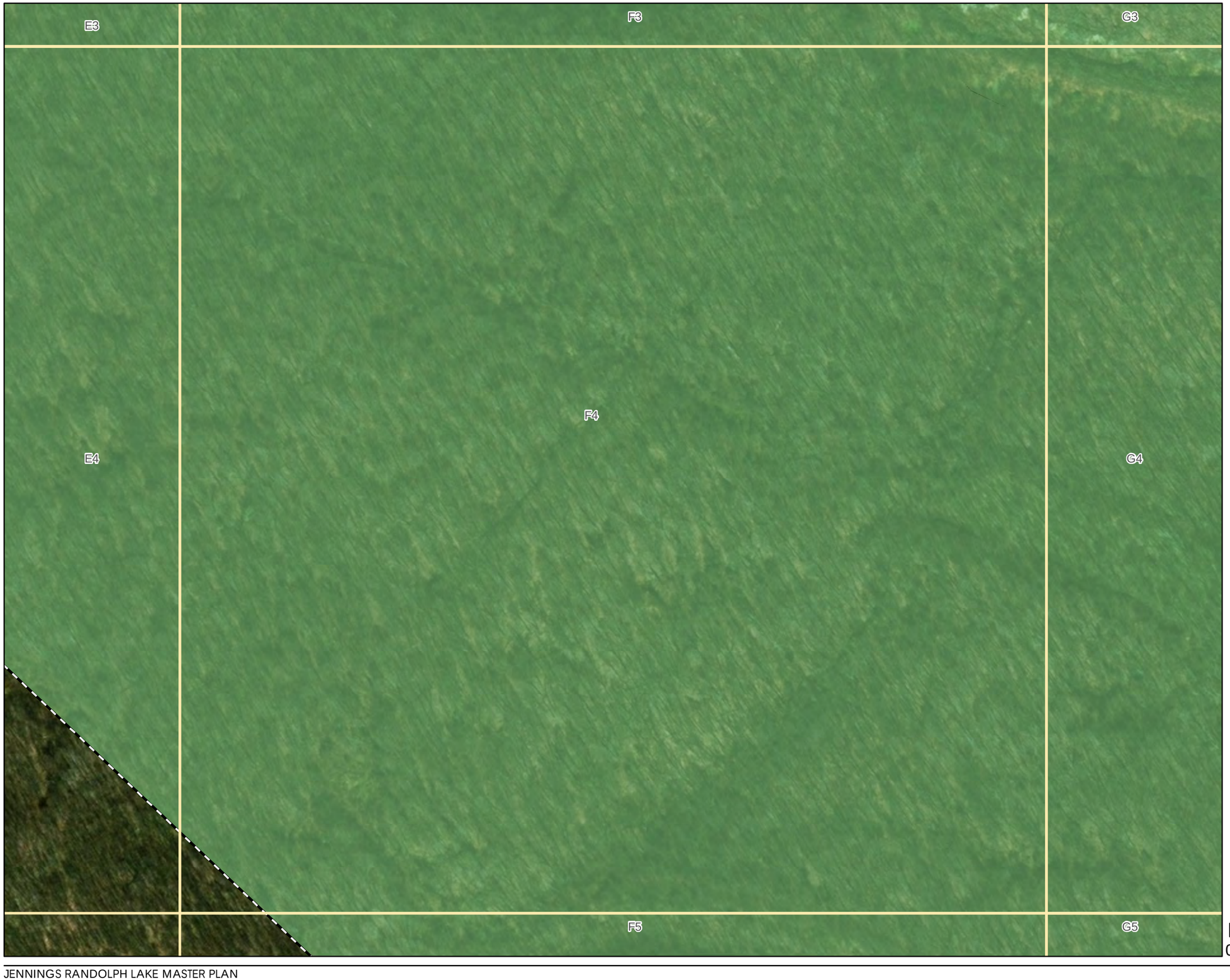


Jennings Randolph Lake Master Plan Update

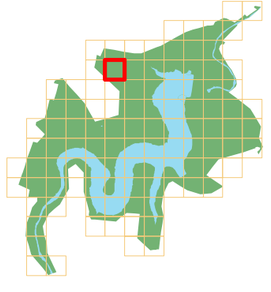
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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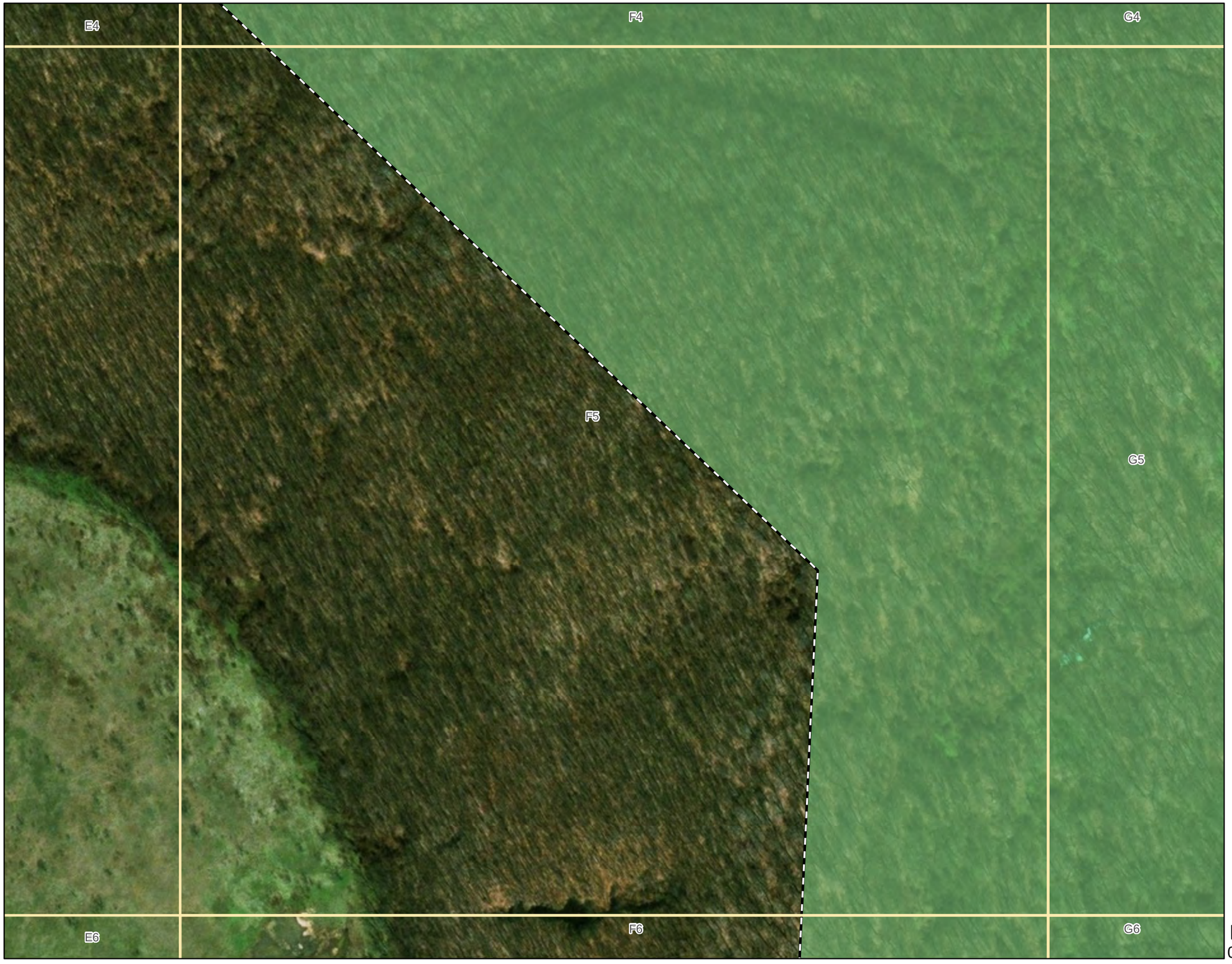


Jennings Randolph Lake Master Plan Update

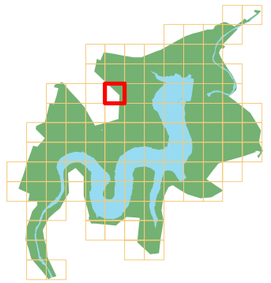
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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Jennings Randolph Lake Master Plan Update

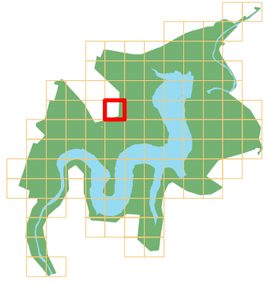
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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

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Jennings Randolph Lake Master Plan Update

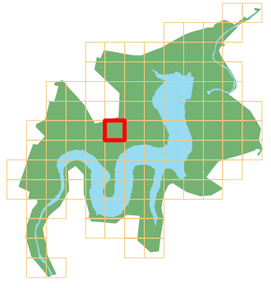
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Project Operations
- Water Surface - Open Recreation
- Owned by Other Entities



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

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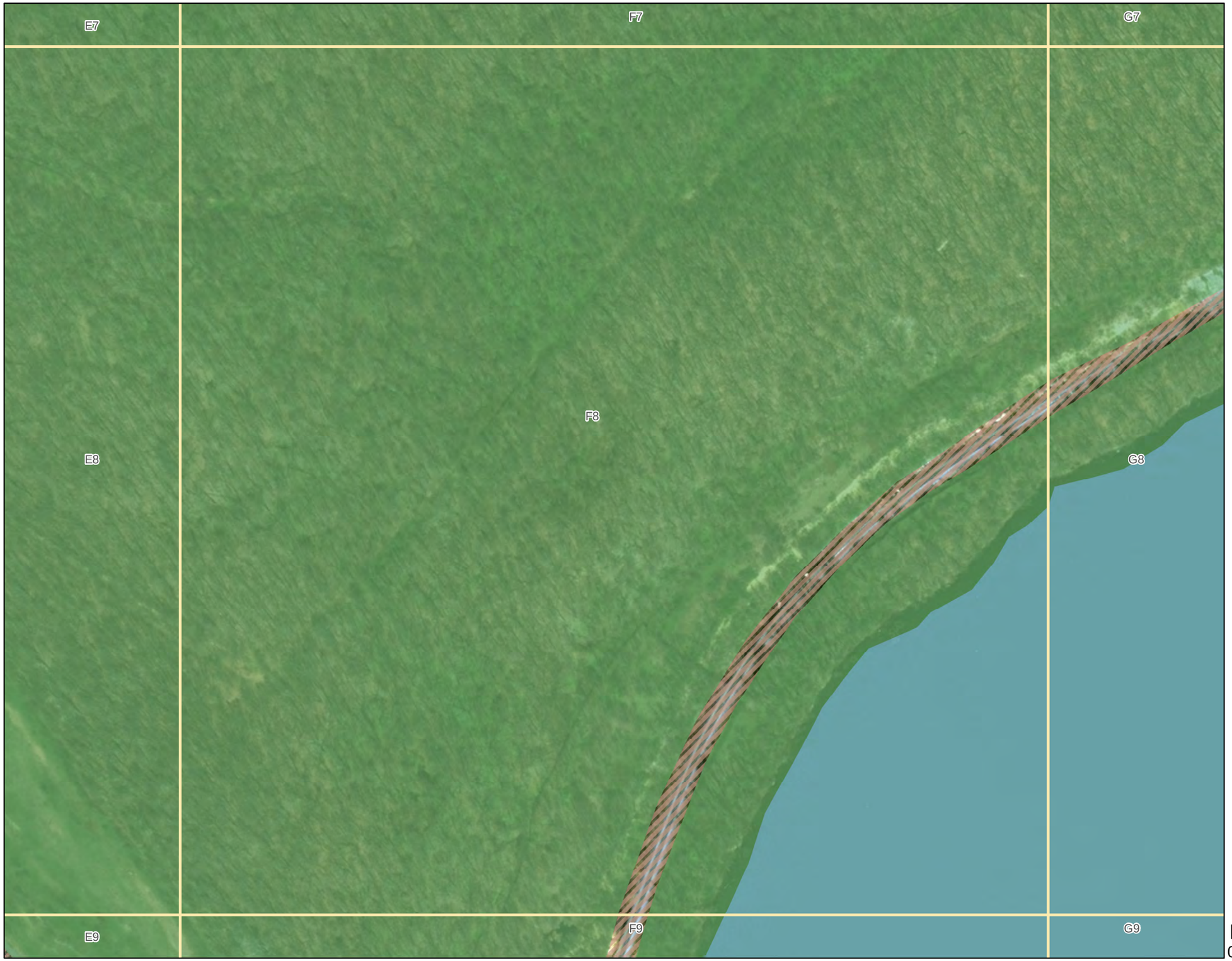
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

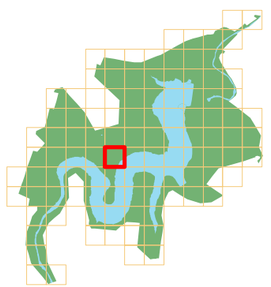


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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

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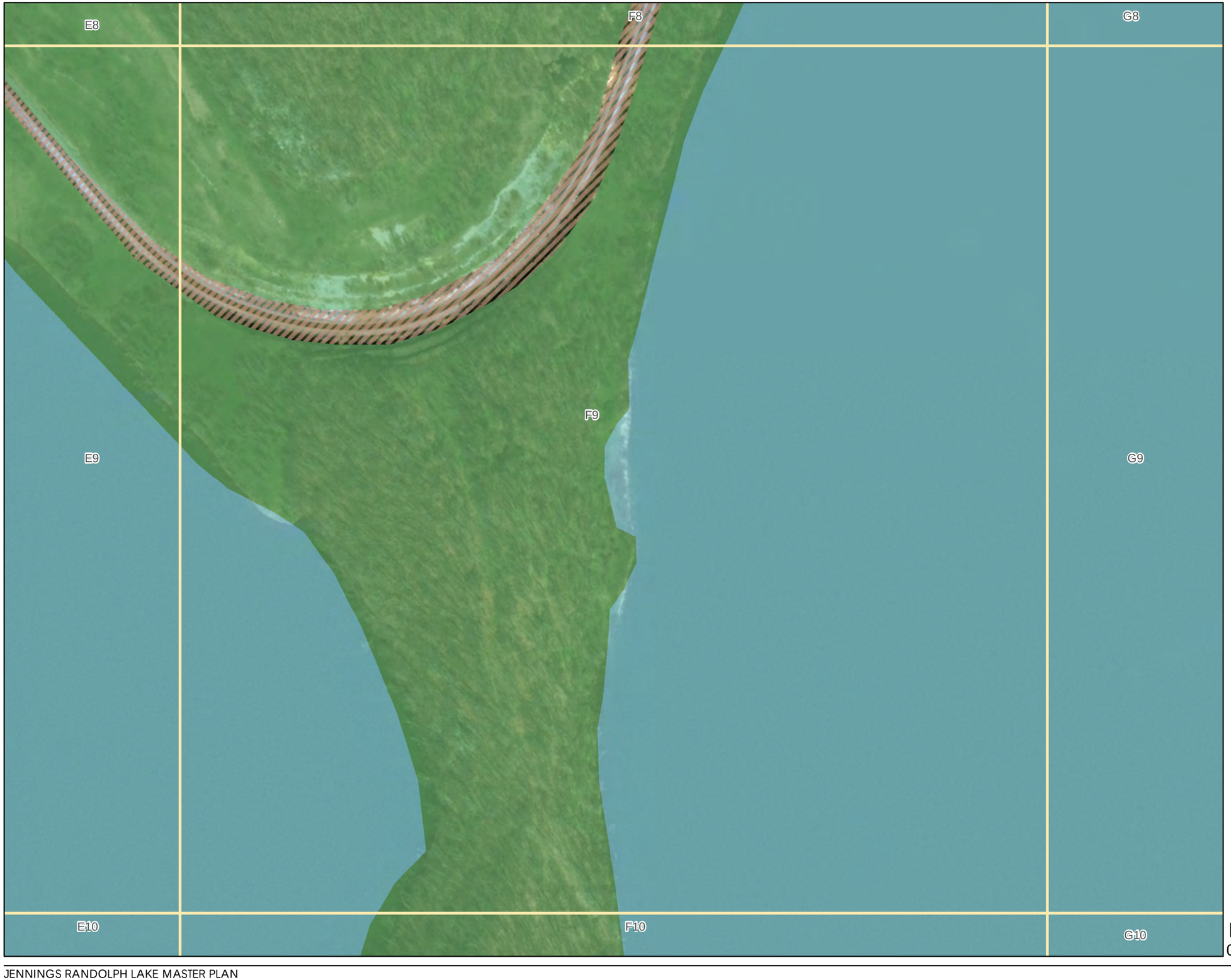
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

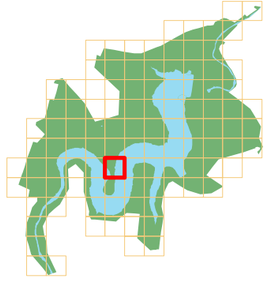


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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

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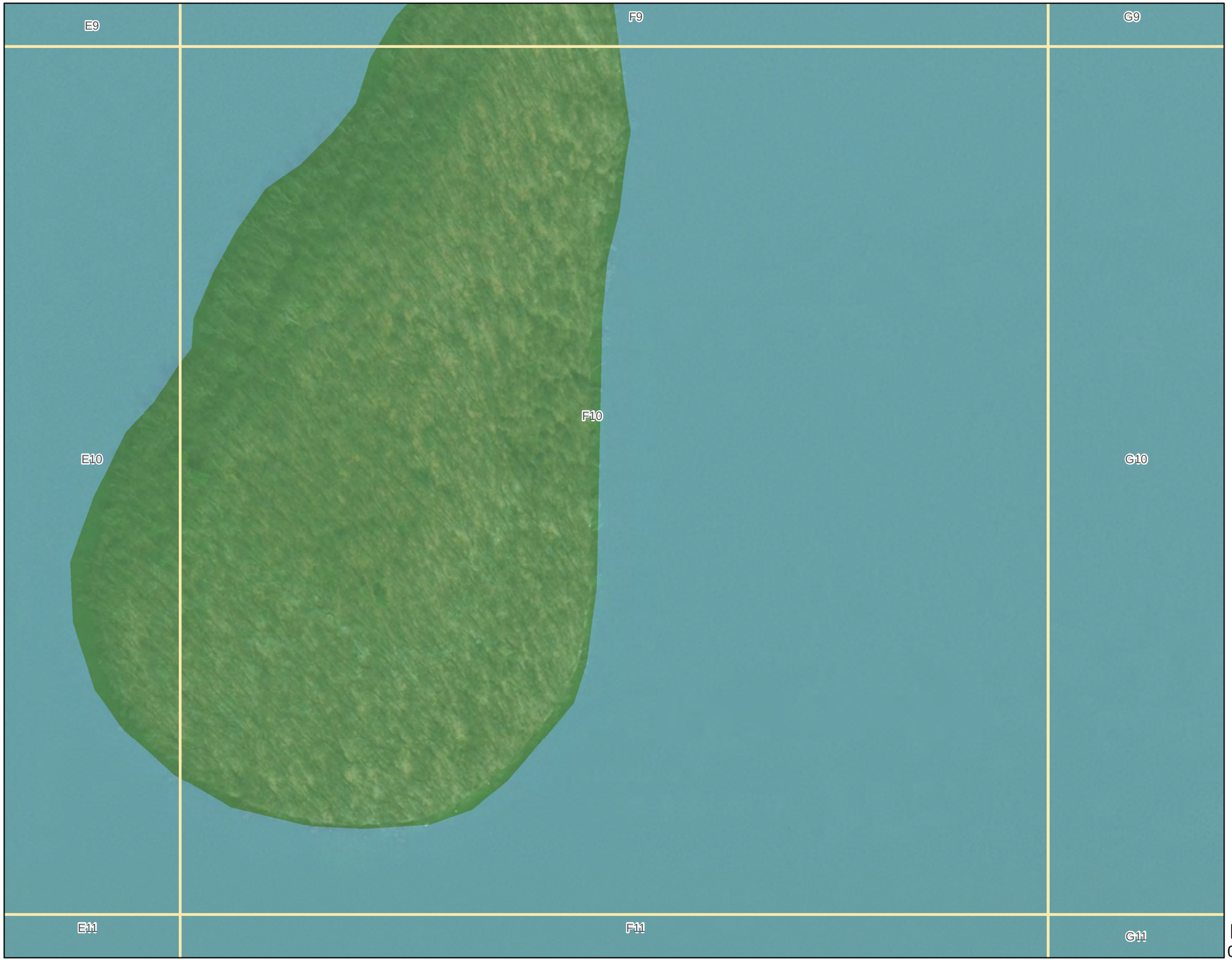
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

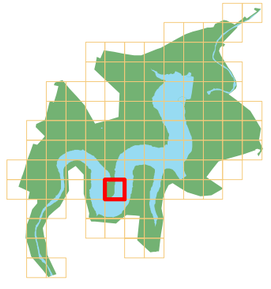


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation



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

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Jennings Randolph Lake Master Plan Update

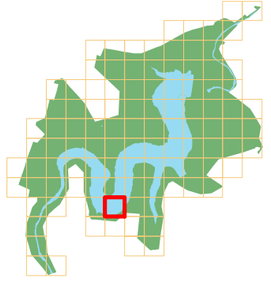
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation



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

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Jennings Randolph Lake Master Plan Update

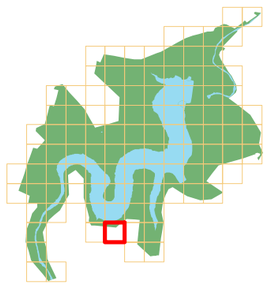
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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

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Jennings Randolph Lake Master Plan Update

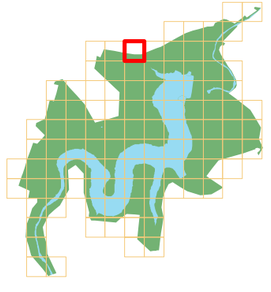
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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

0 225 450 Feet

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Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management

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

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

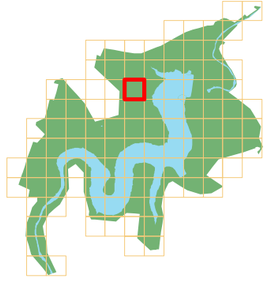
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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

0 225 450 Feet

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Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management

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

0 225 450 Feet

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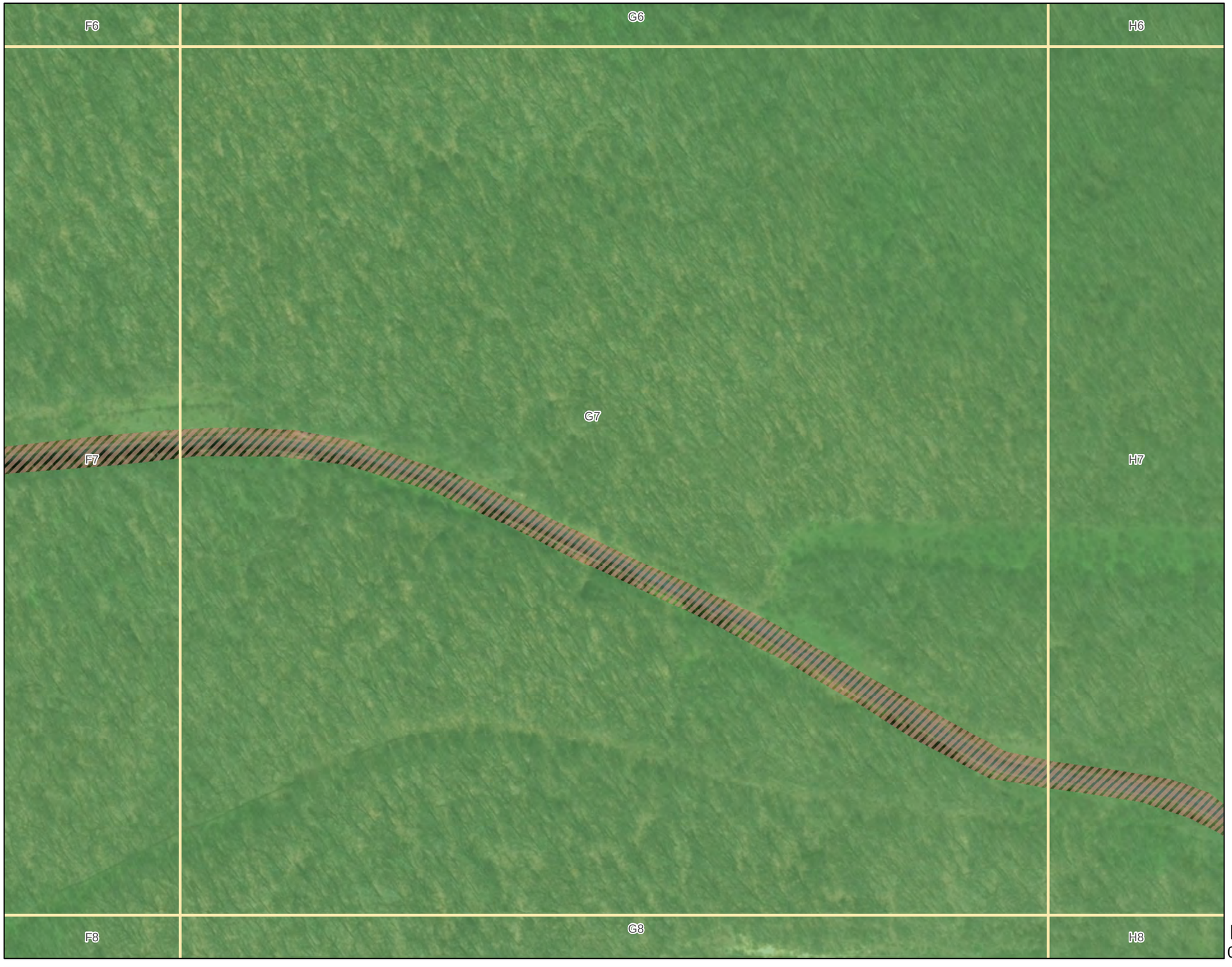


Jennings Randolph Lake Master Plan Update

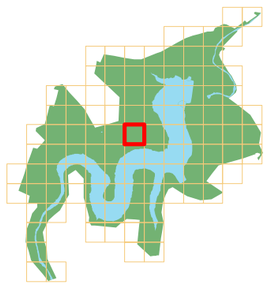
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Owned by Other Entities



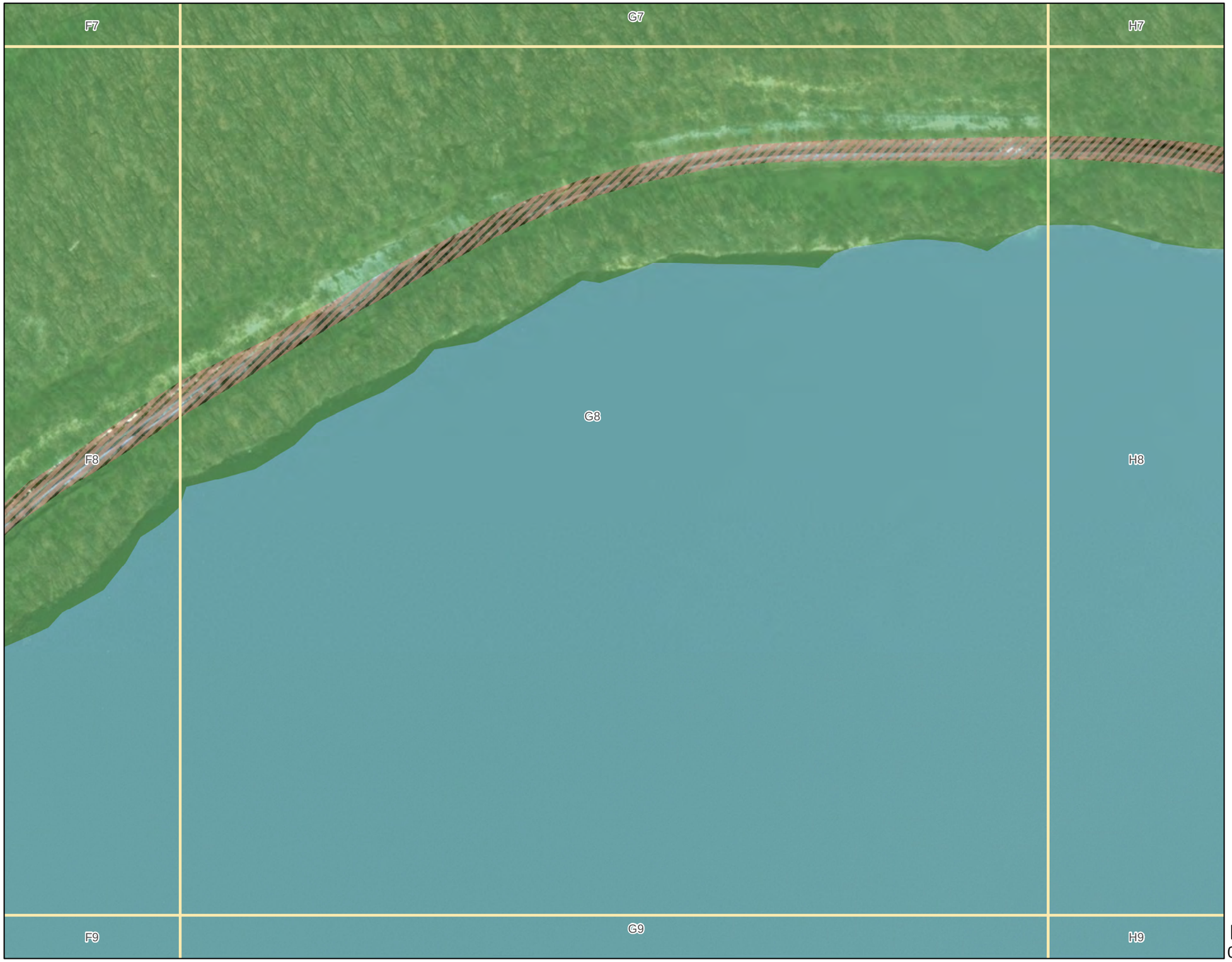
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

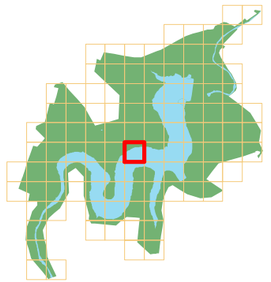


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

F8 G8 H8

F9 G9 H9

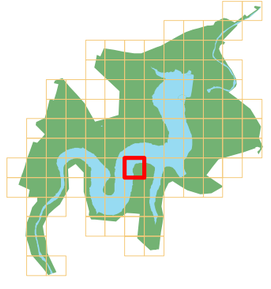
F10 G10 H10

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Future Recreation Area
- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation



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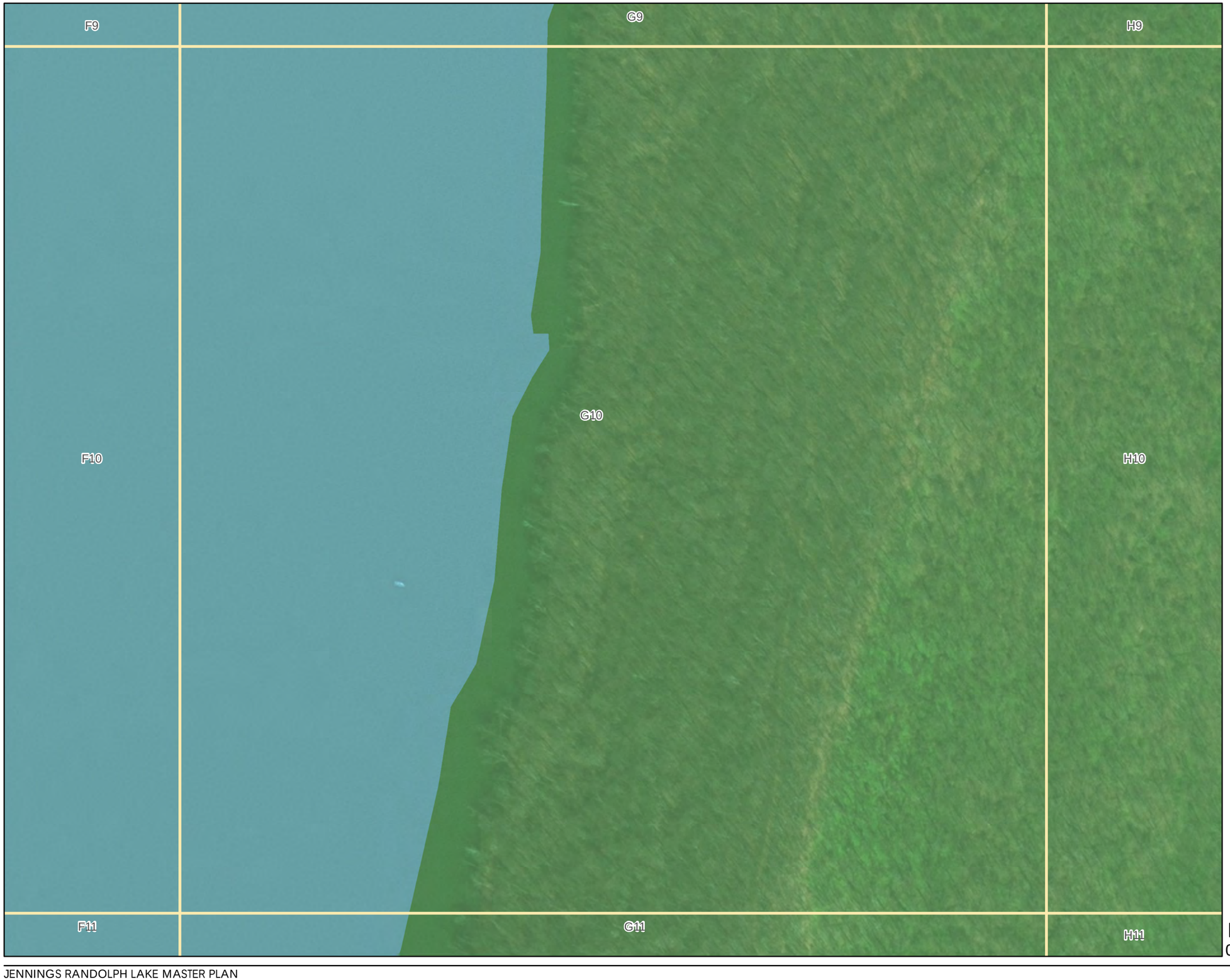


Jennings Randolph Lake Master Plan Update

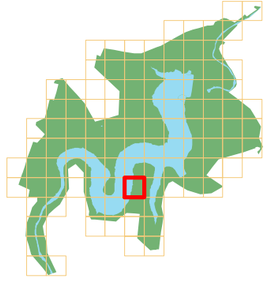
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation



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

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

F10 G10 H10

F11 G11 H11

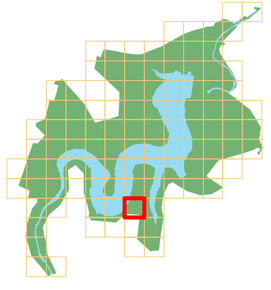
F12 G12 H12

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation



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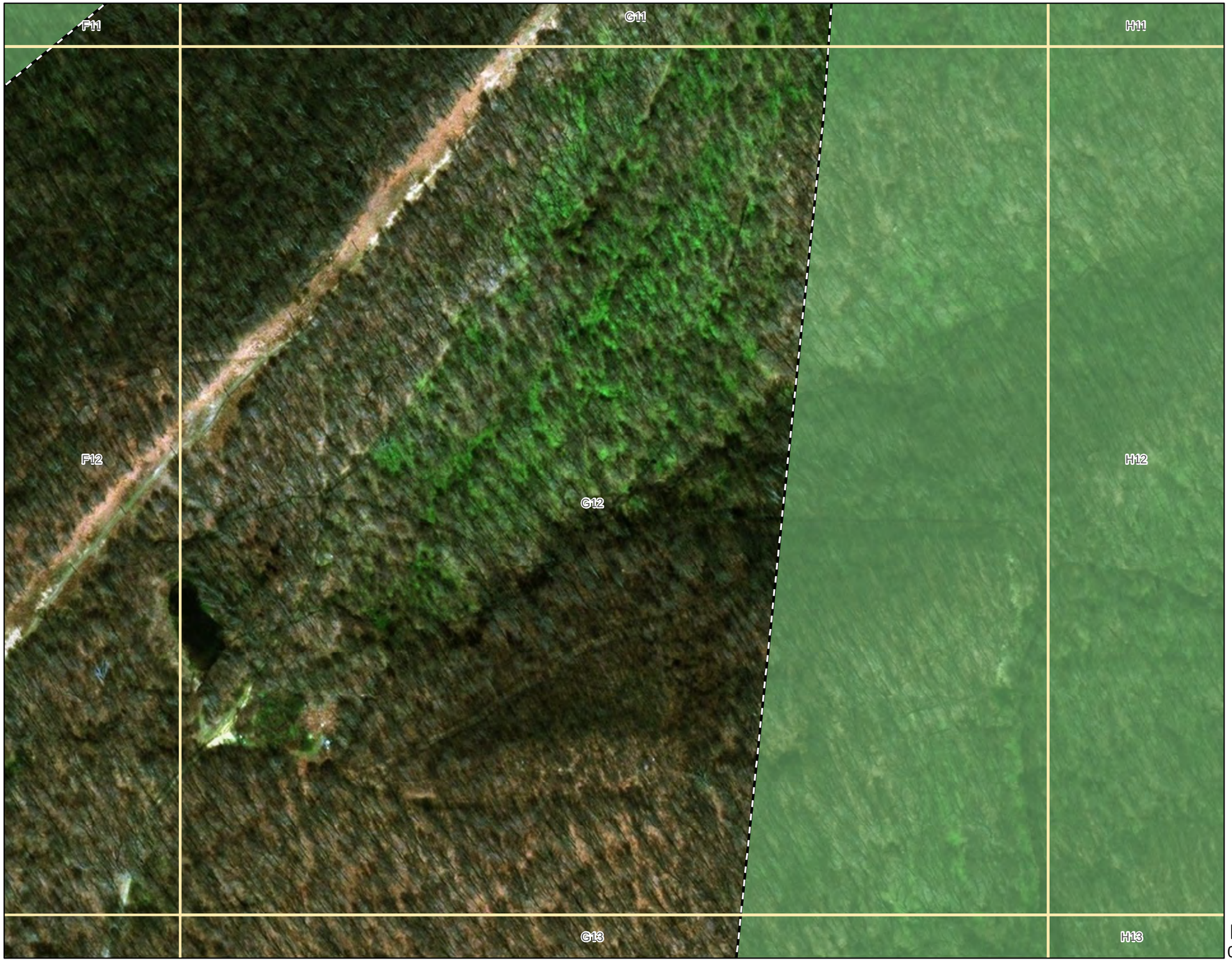


Jennings Randolph Lake Master Plan Update

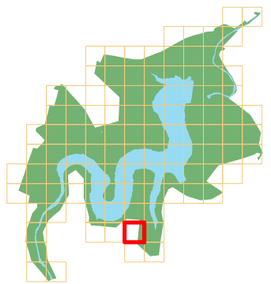
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



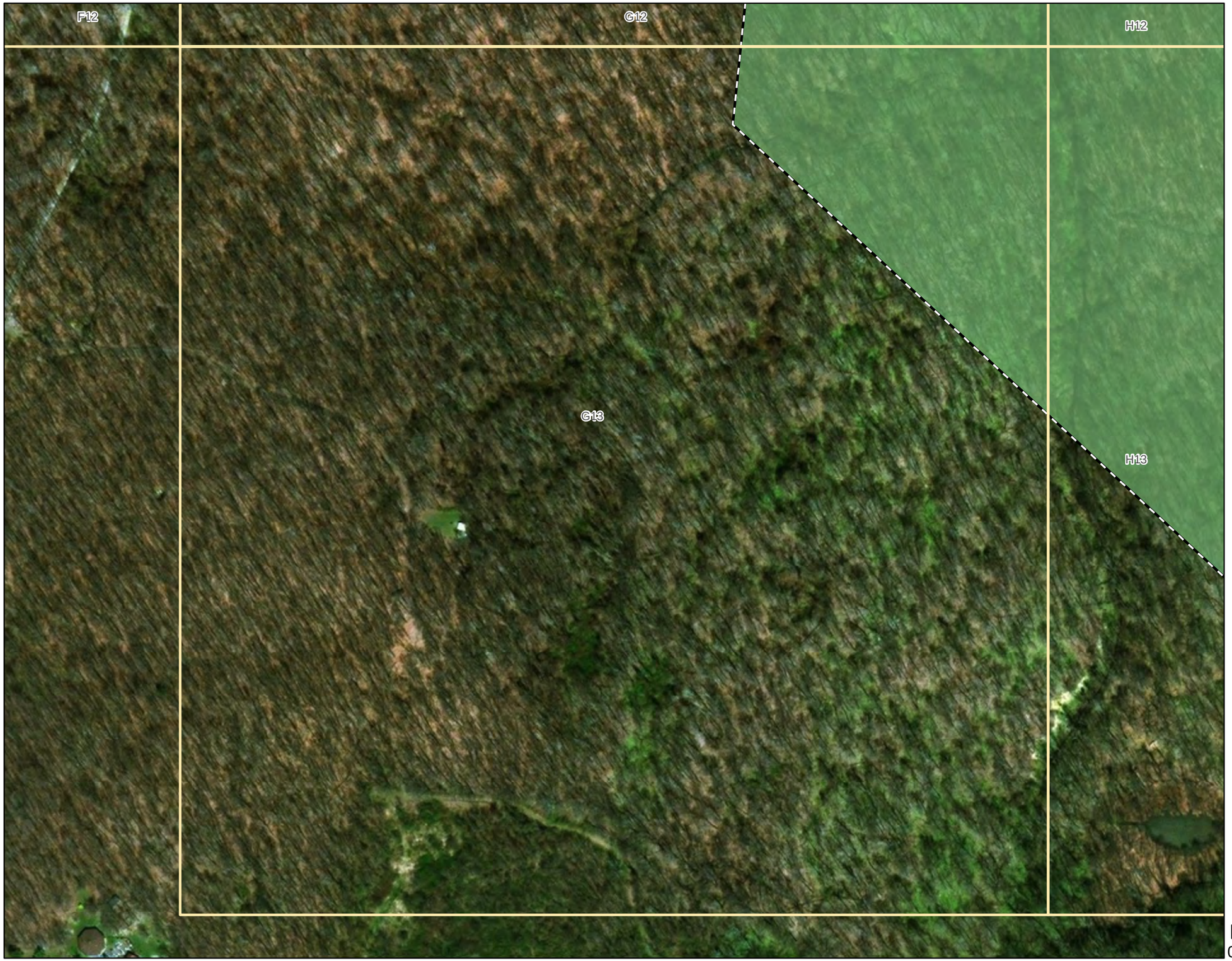
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

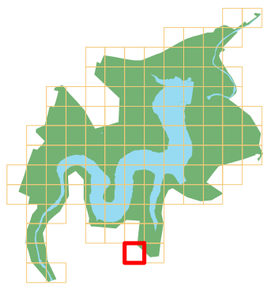


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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

0 225 450 Feet

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Jennings Randolph Lake Master Plan Update

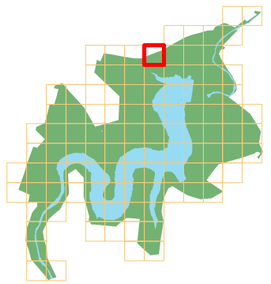
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



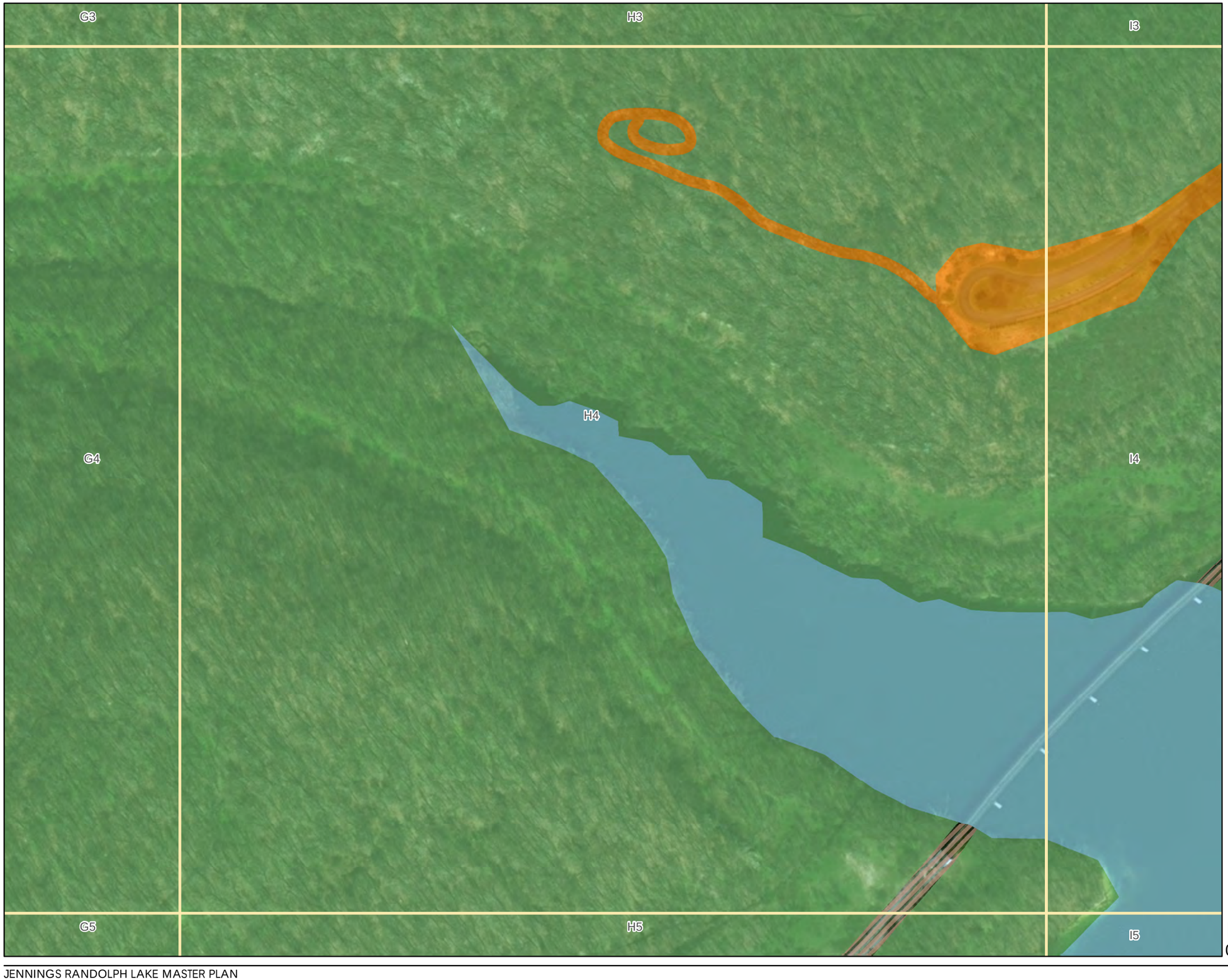
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

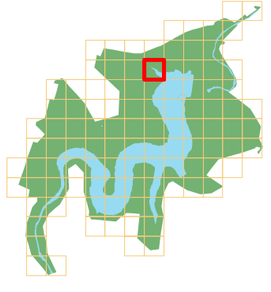


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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

0 225 450 Feet

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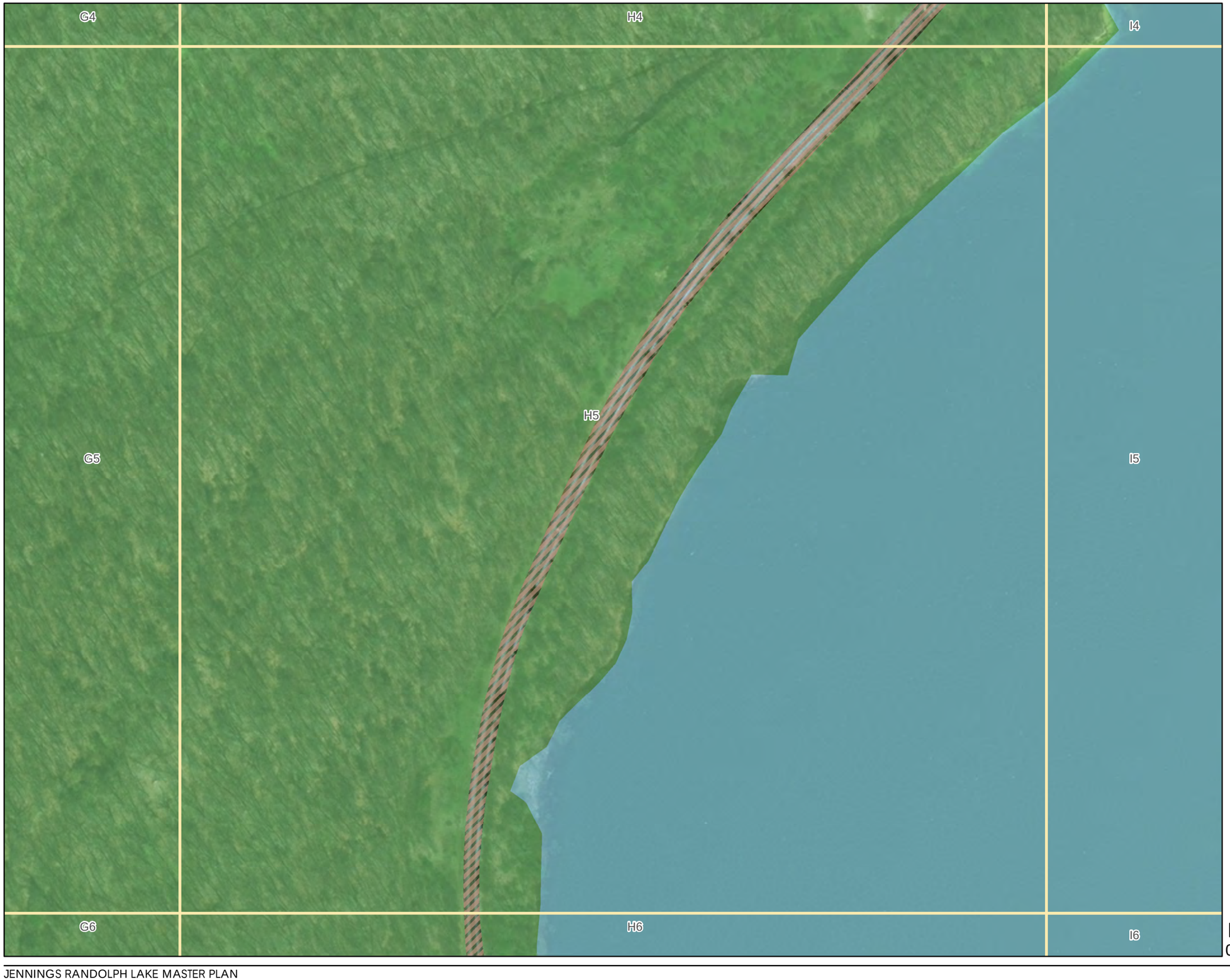
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

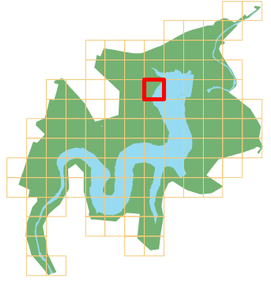


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



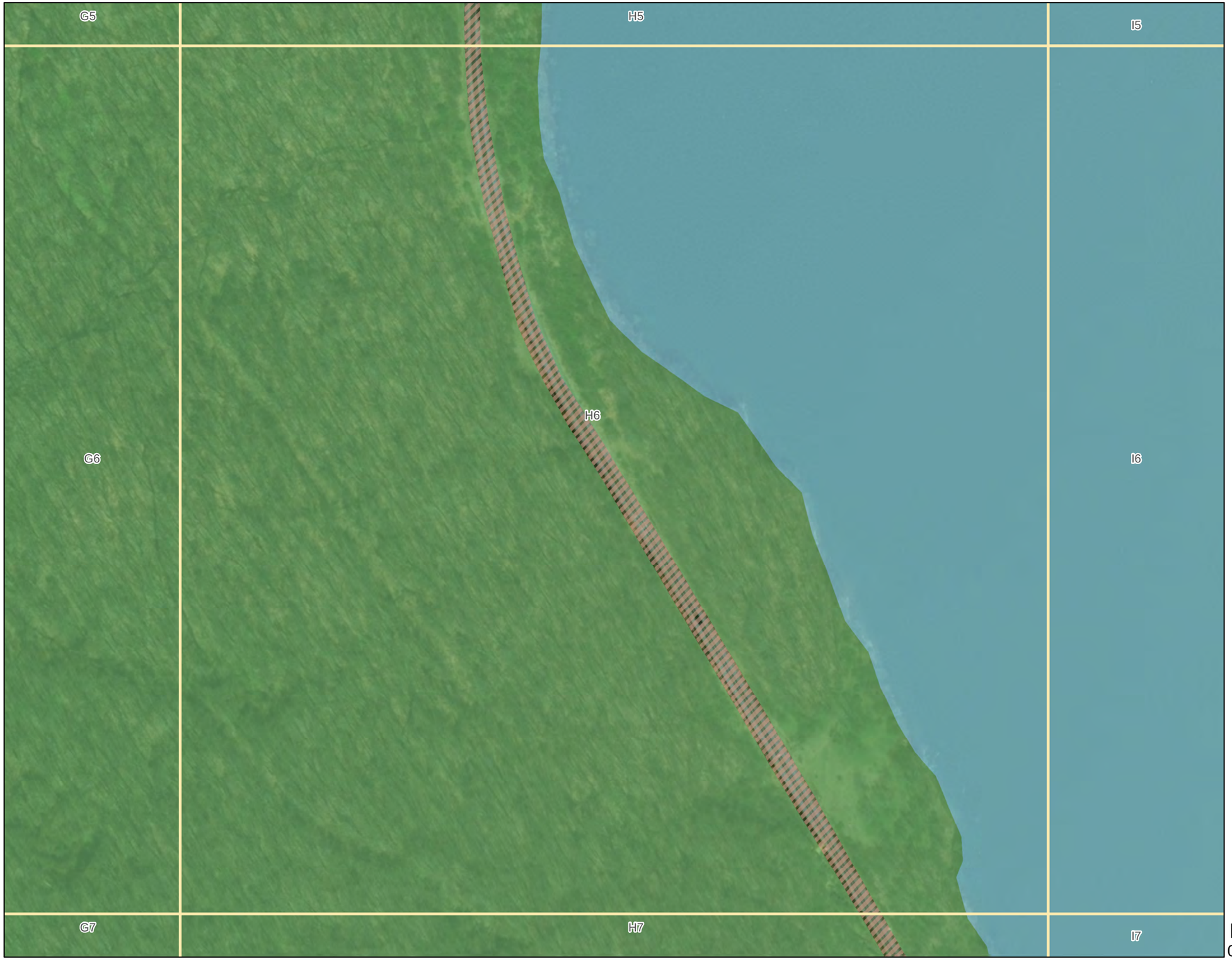
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

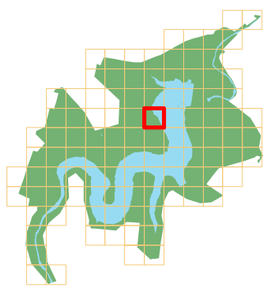


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- High Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities

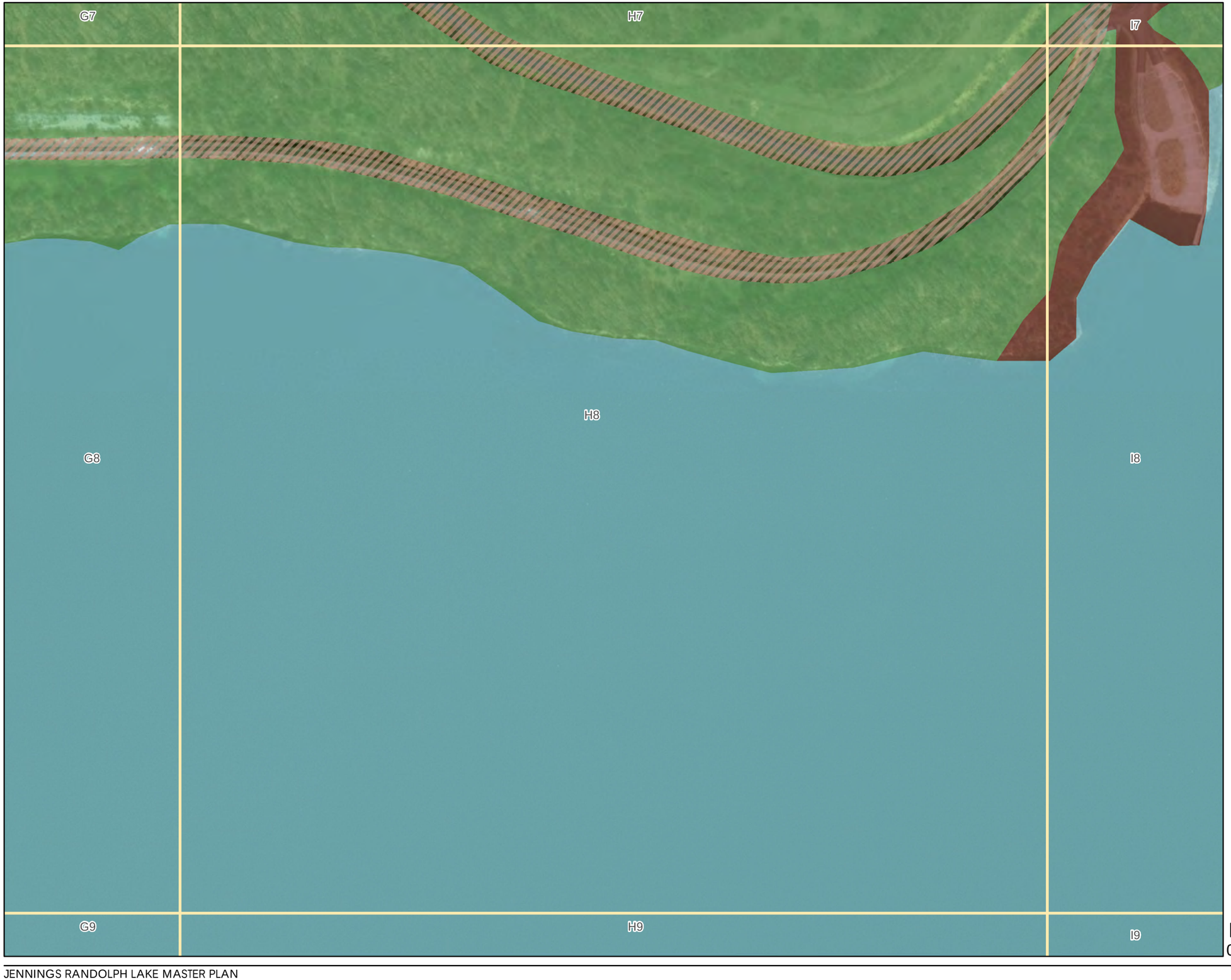
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

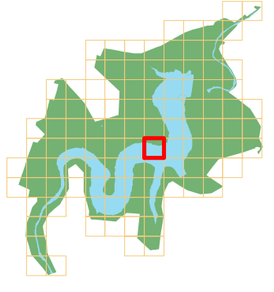


Legend

- Grid
- JRL Site Boundary

Land Classification

- High Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



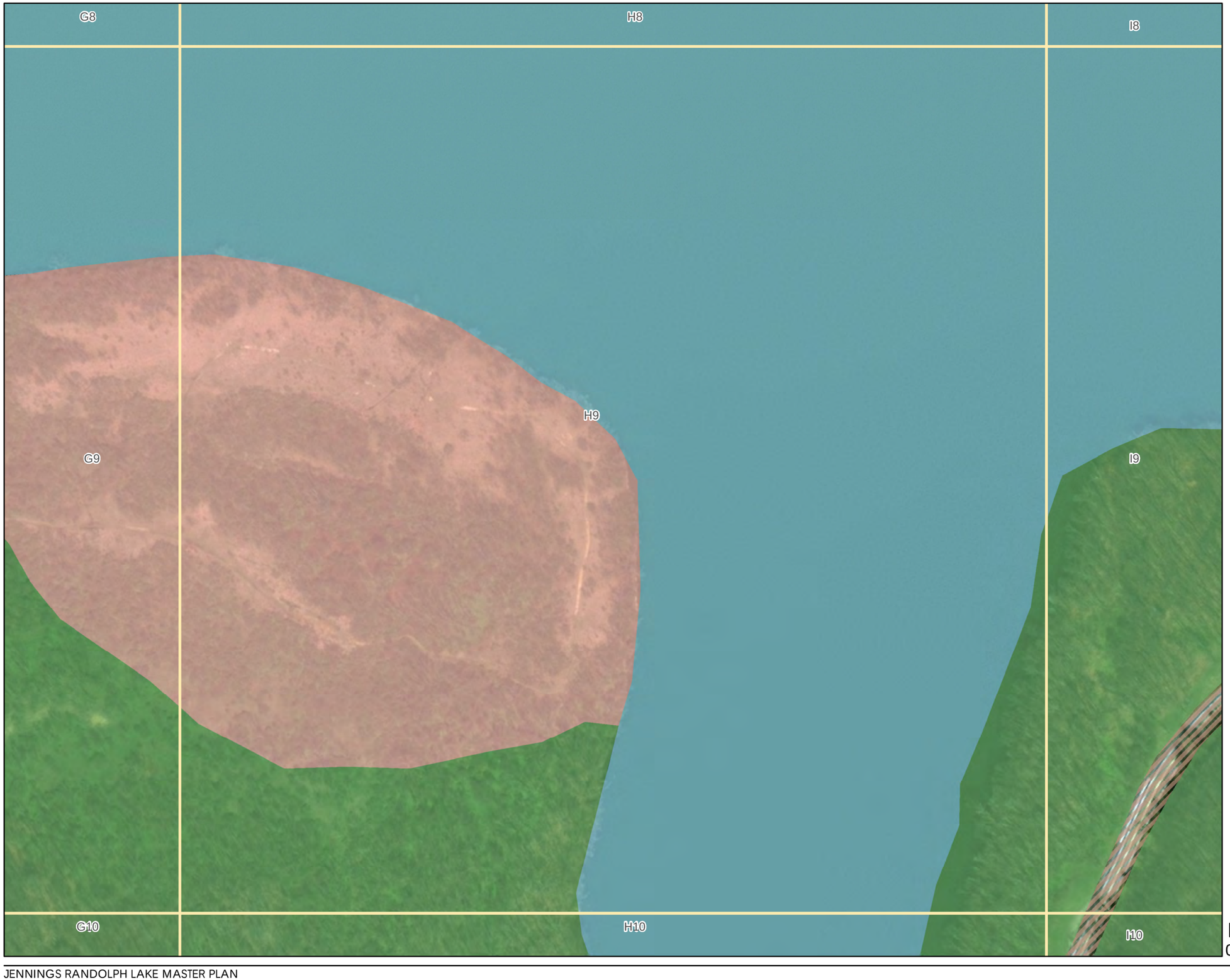
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

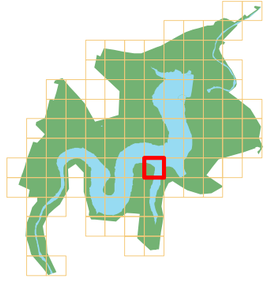


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Future Recreation Area
- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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

0 225 450 Feet

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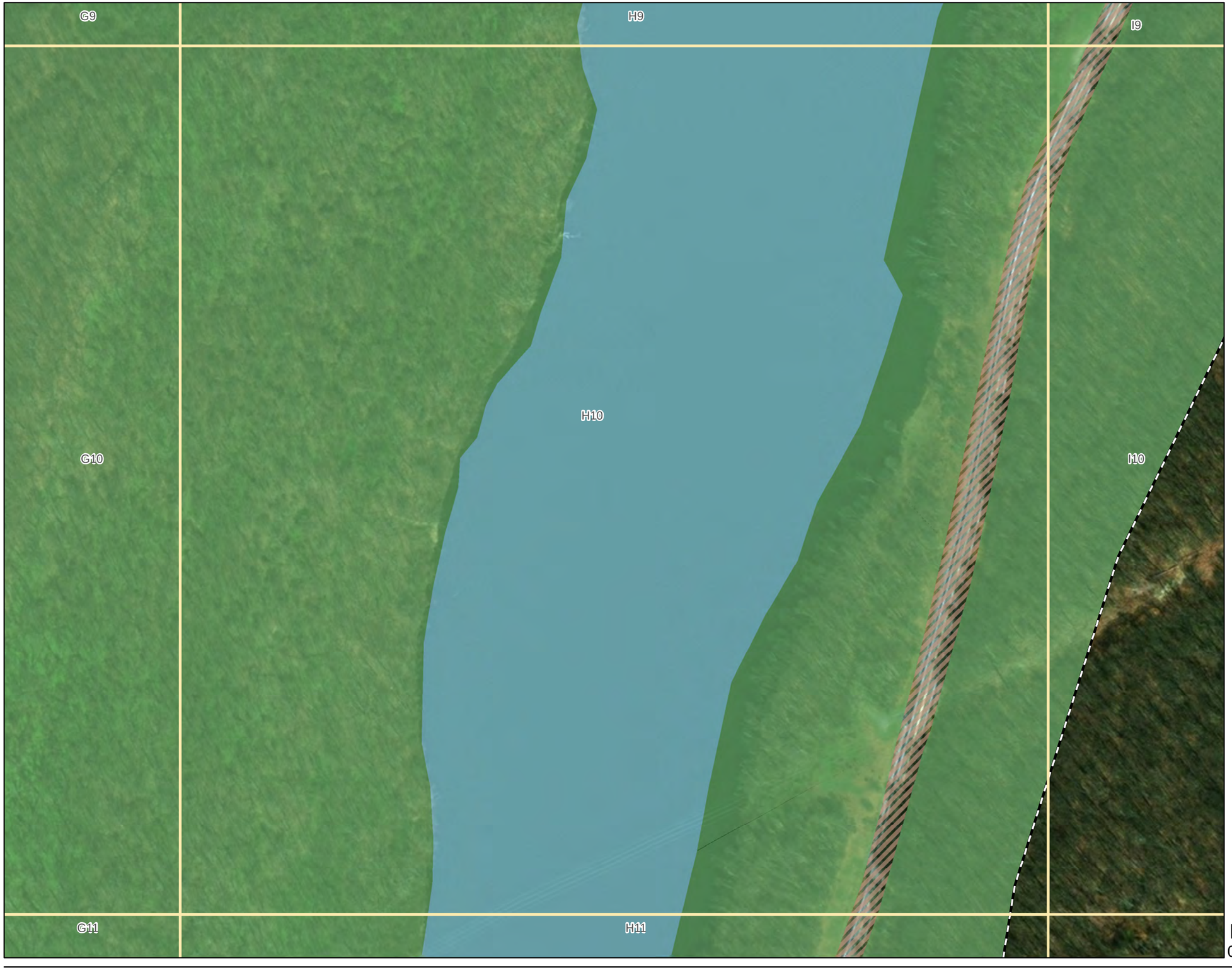


Jennings Randolph Lake Master Plan Update

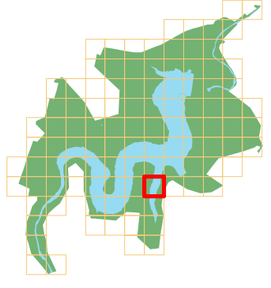
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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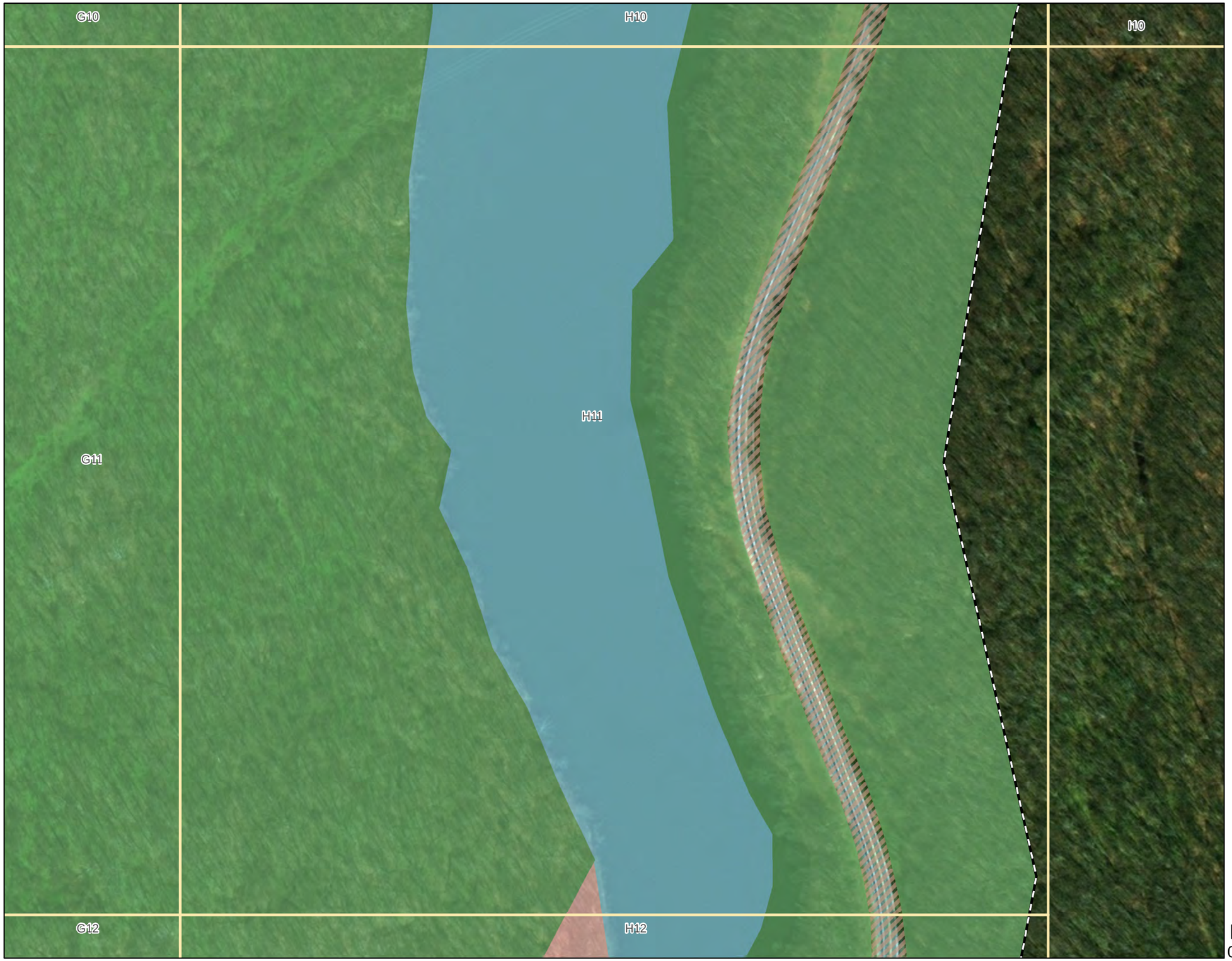
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

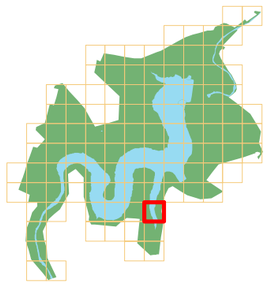


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Future Recreation Area
- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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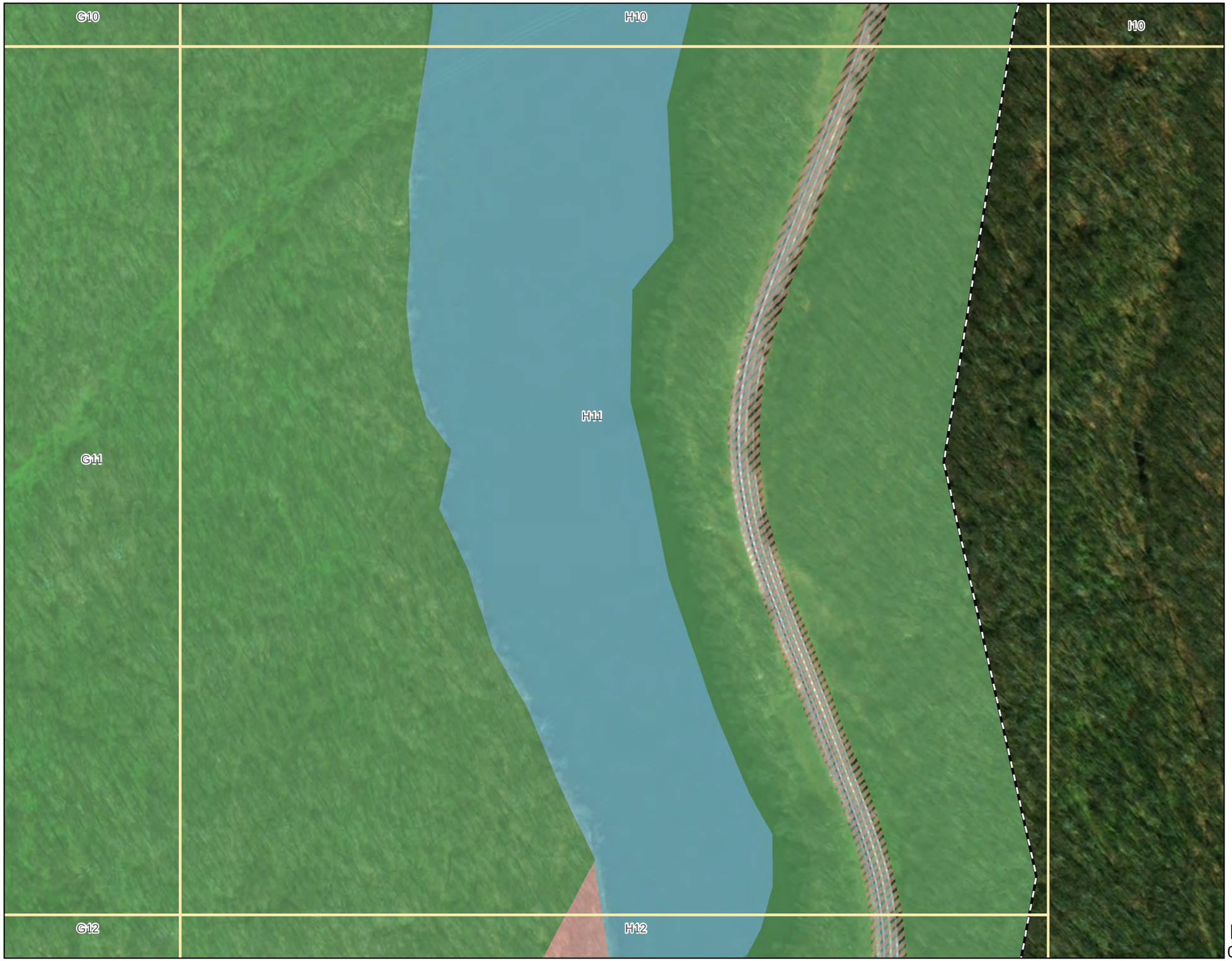

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

Legend

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Land Classification

- Multiple Res Mgmt Lands - Future Recreation Area
- Multiple Res Mgmt Lands - Vegetative Management
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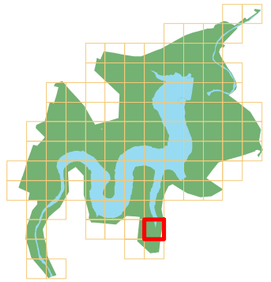

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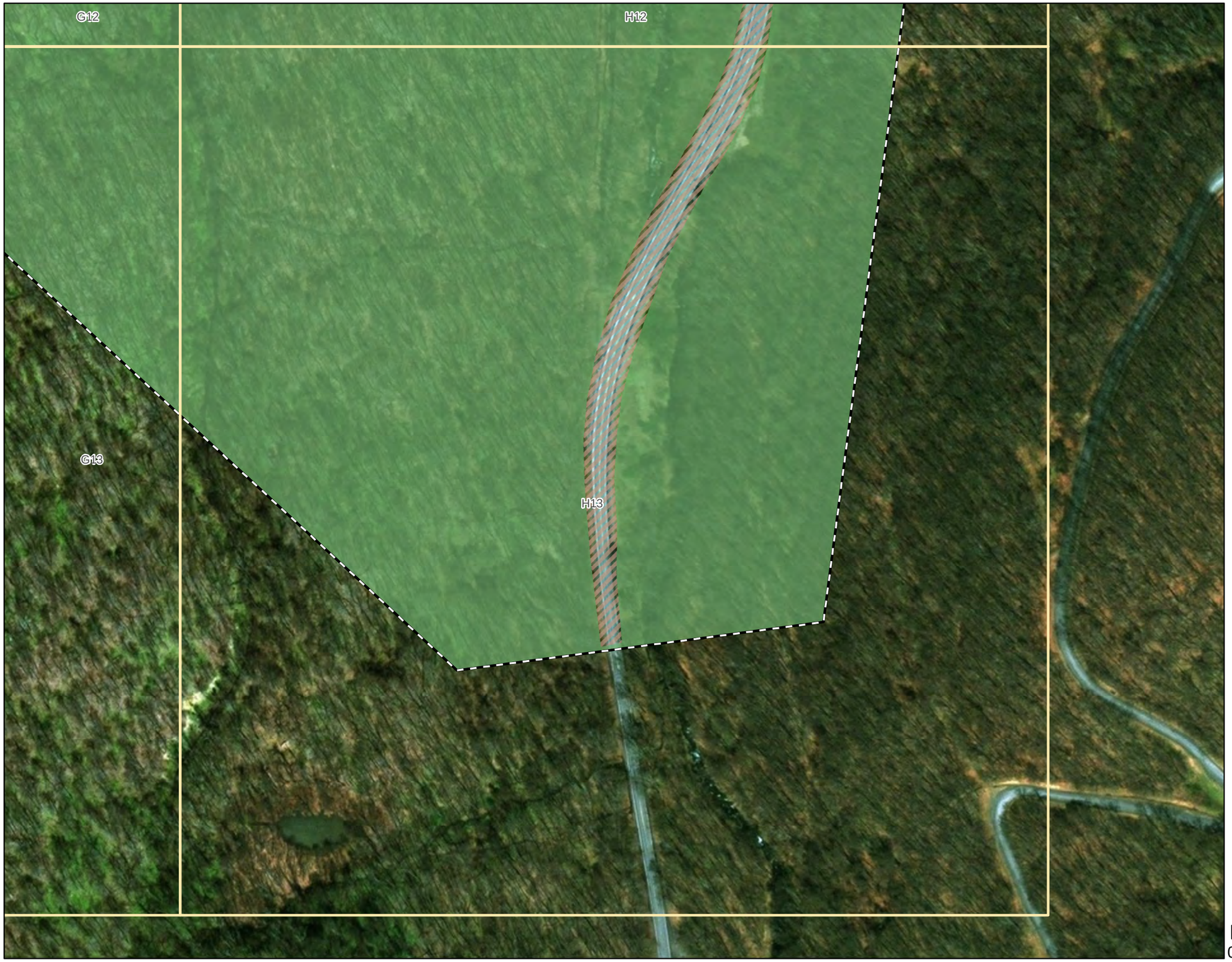
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

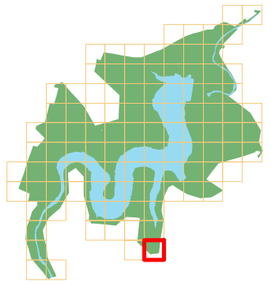


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Owned by Other Entities



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Jennings Randolph Lake Master Plan Update

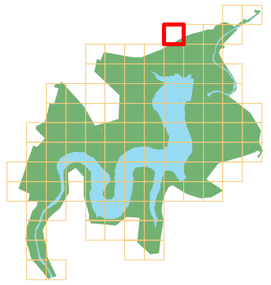
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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0 225 450 Feet

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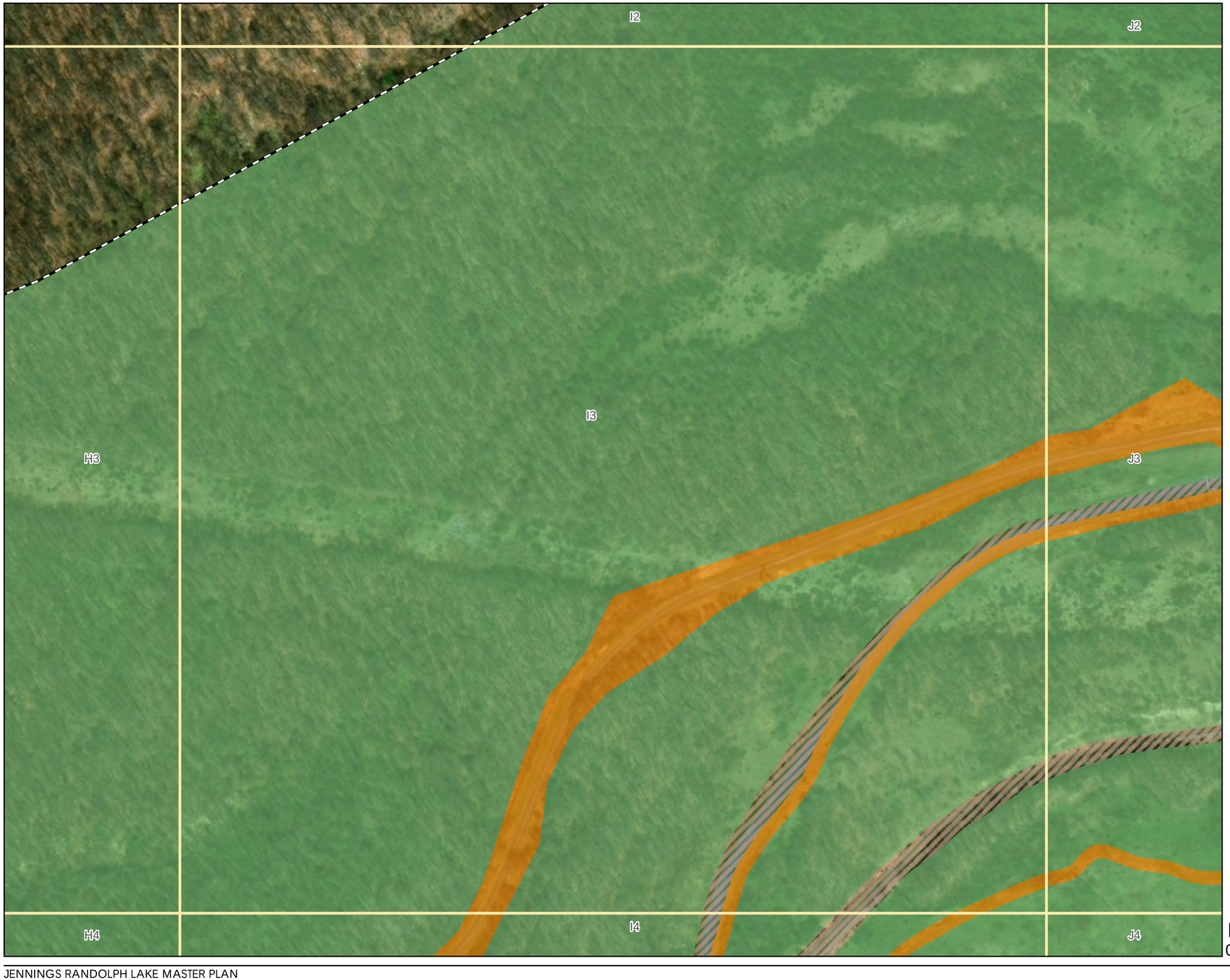
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

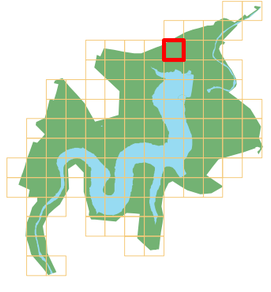


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management
- Owned by Other Entities



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0 225 450 Feet

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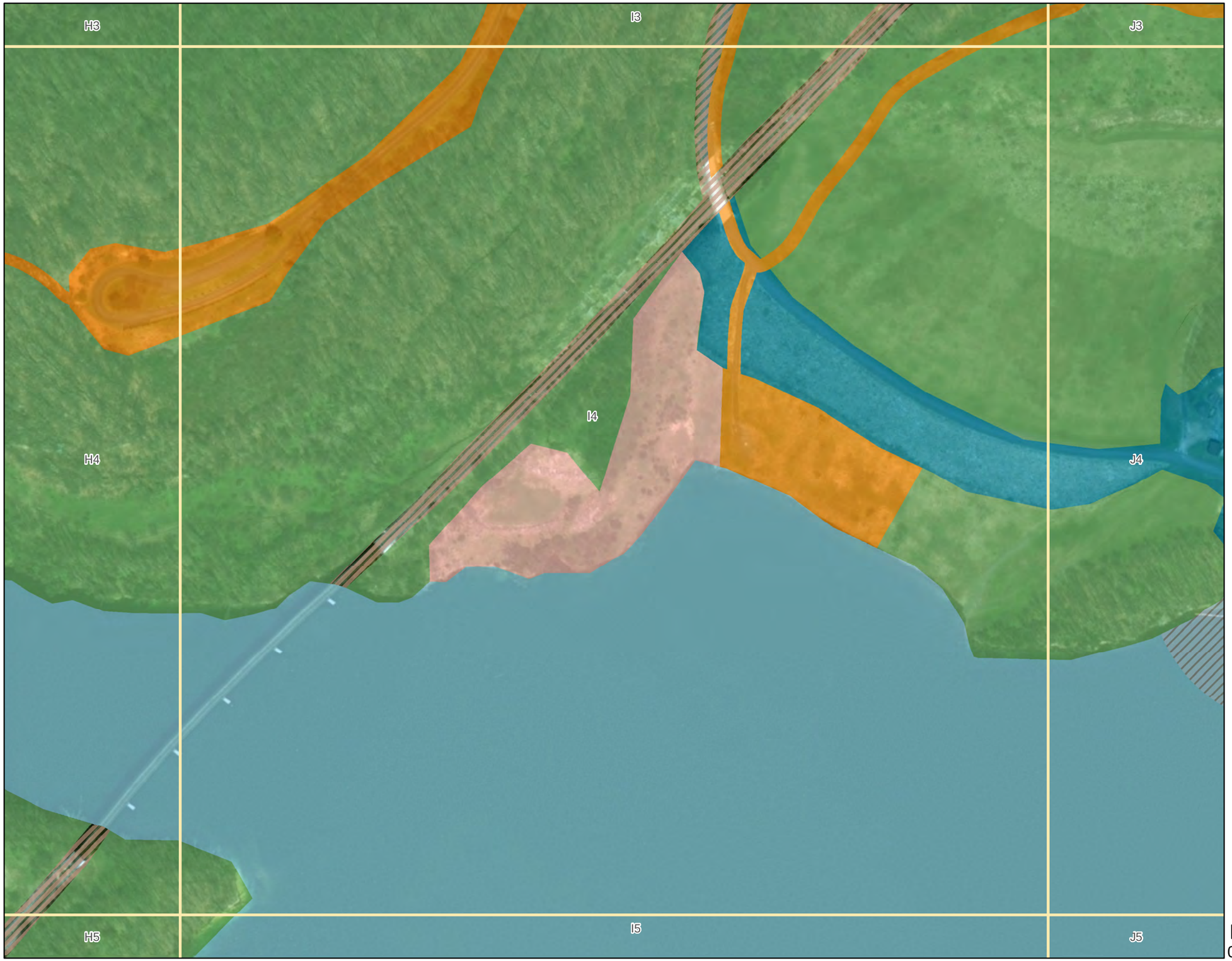
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

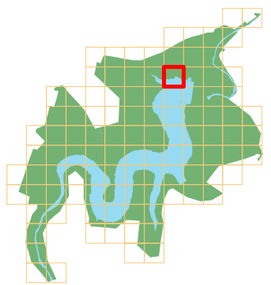


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Future Recreation Area
- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management
- Project Operations
- Water Surface - Open Recreation
- Water Surface - Restricted
- Owned by Other Entities



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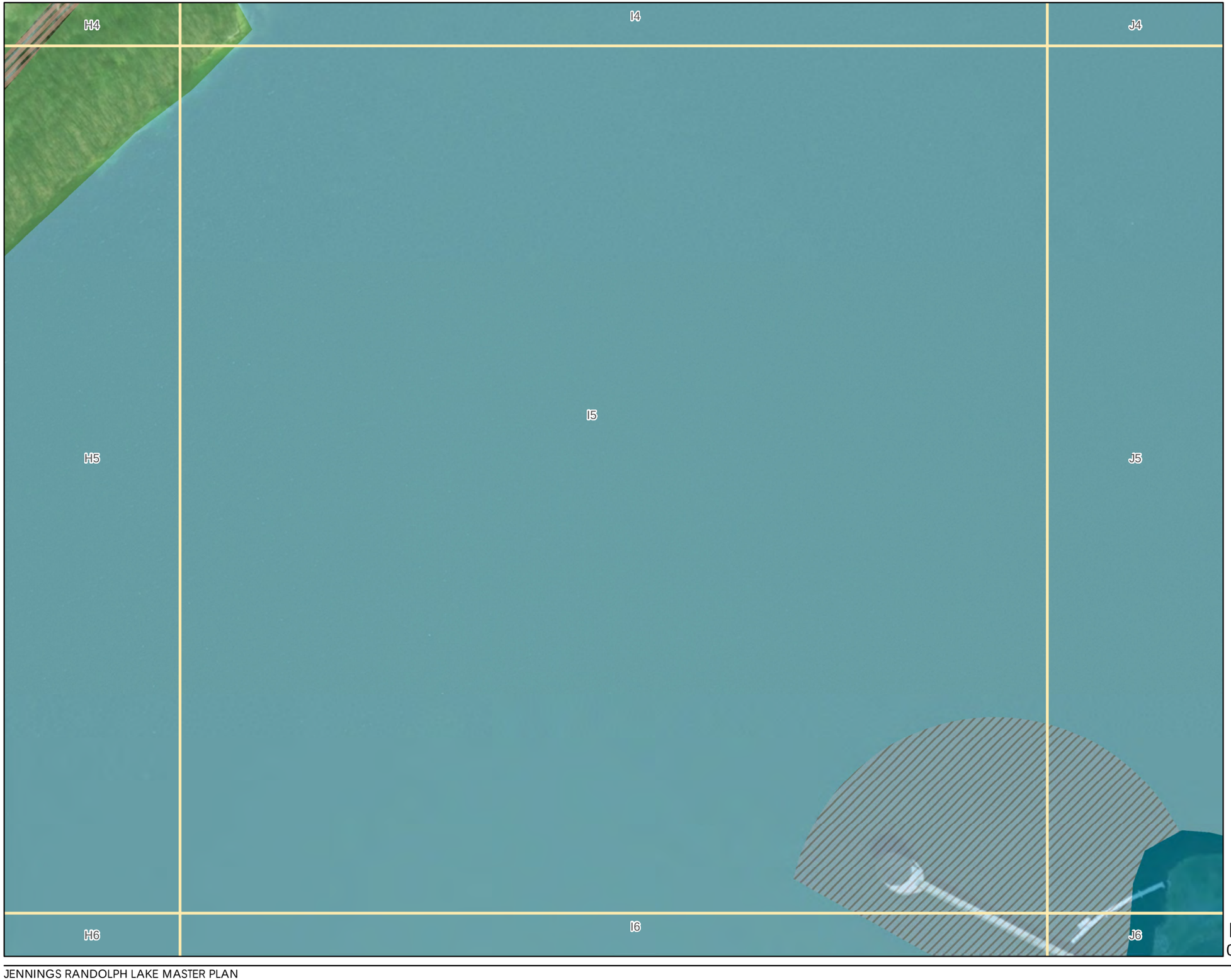
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View



Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Project Operations
- Water Surface - Open Recreation
- Water Surface - Restricted
- Owned by Other Entities

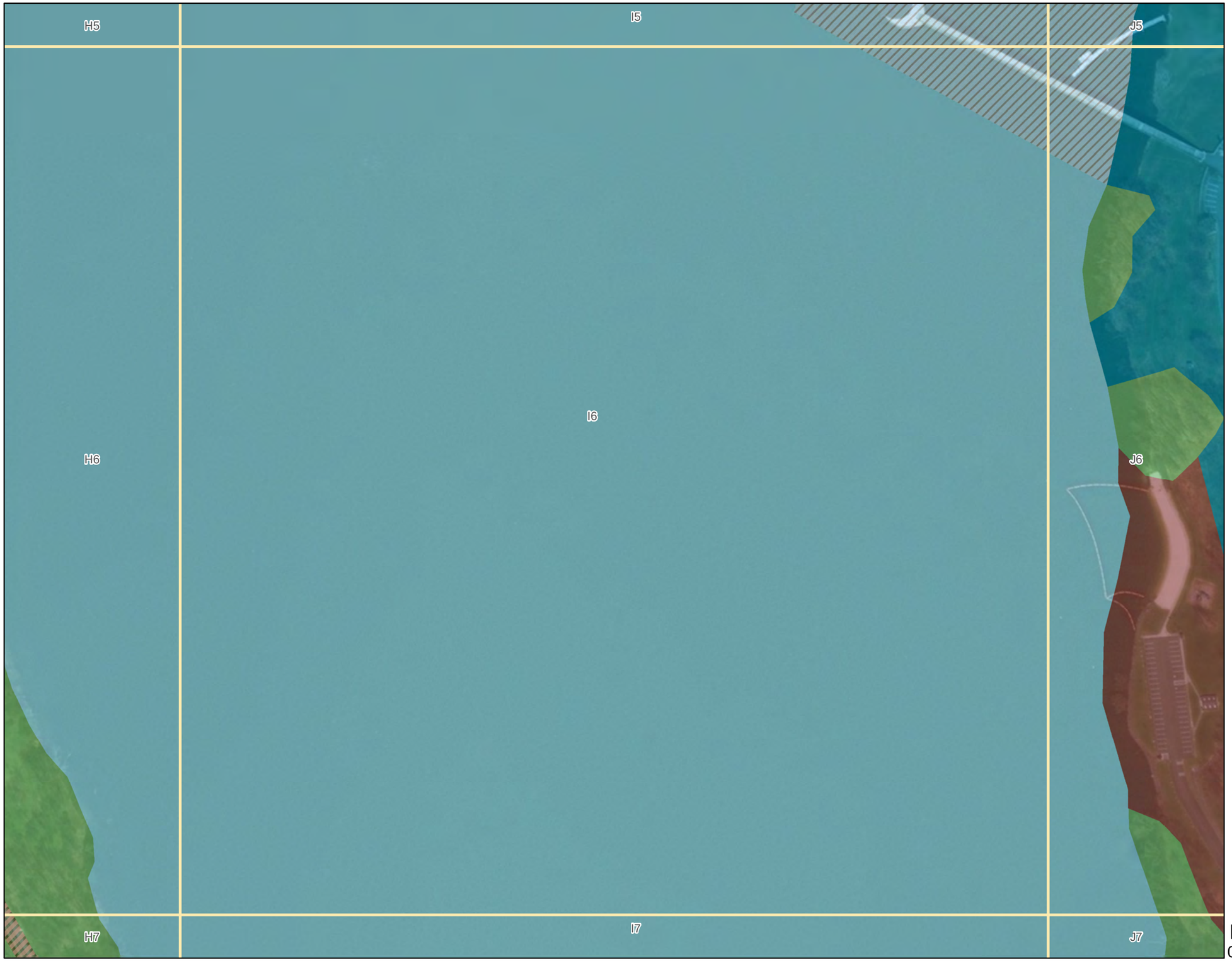
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

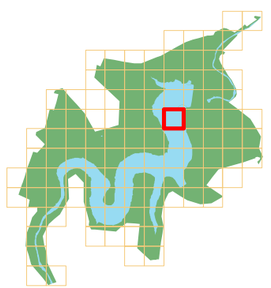


Legend

- Grid
- JRL Site Boundary

Land Classification

- High Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management
- Project Operations
- Water Surface - Open Recreation
- Water Surface - Restricted
- Owned by Other Entities



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0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

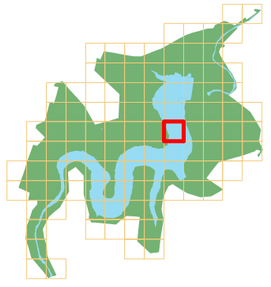
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- High Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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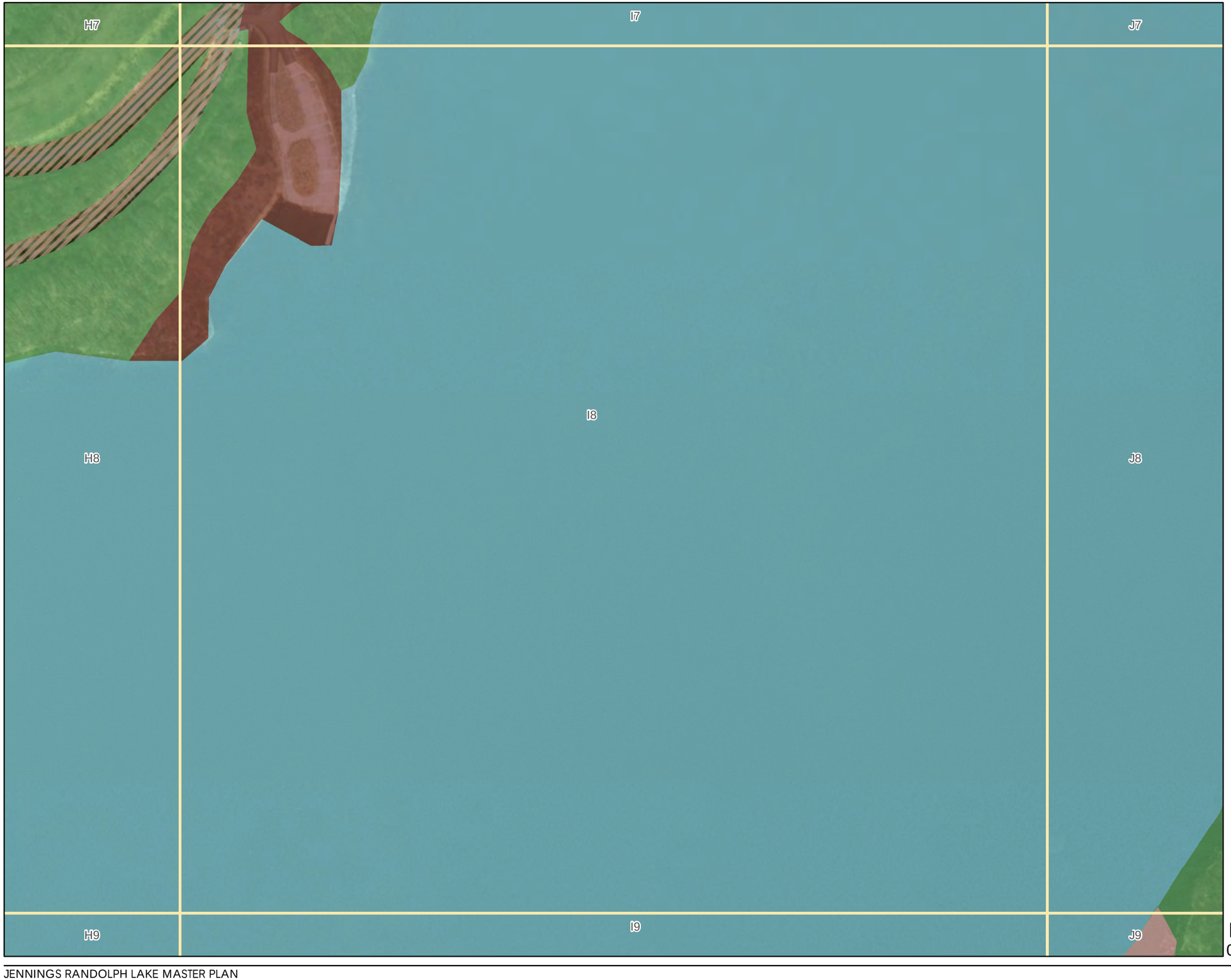
0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

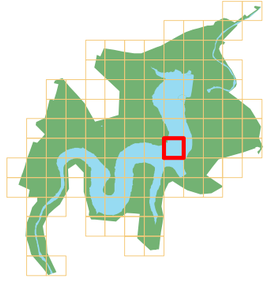


Legend

- Grid
- JRL Site Boundary

Land Classification

- High Density Recreation
- Multiple Res Mgmt Lands - Future Recreation Area
- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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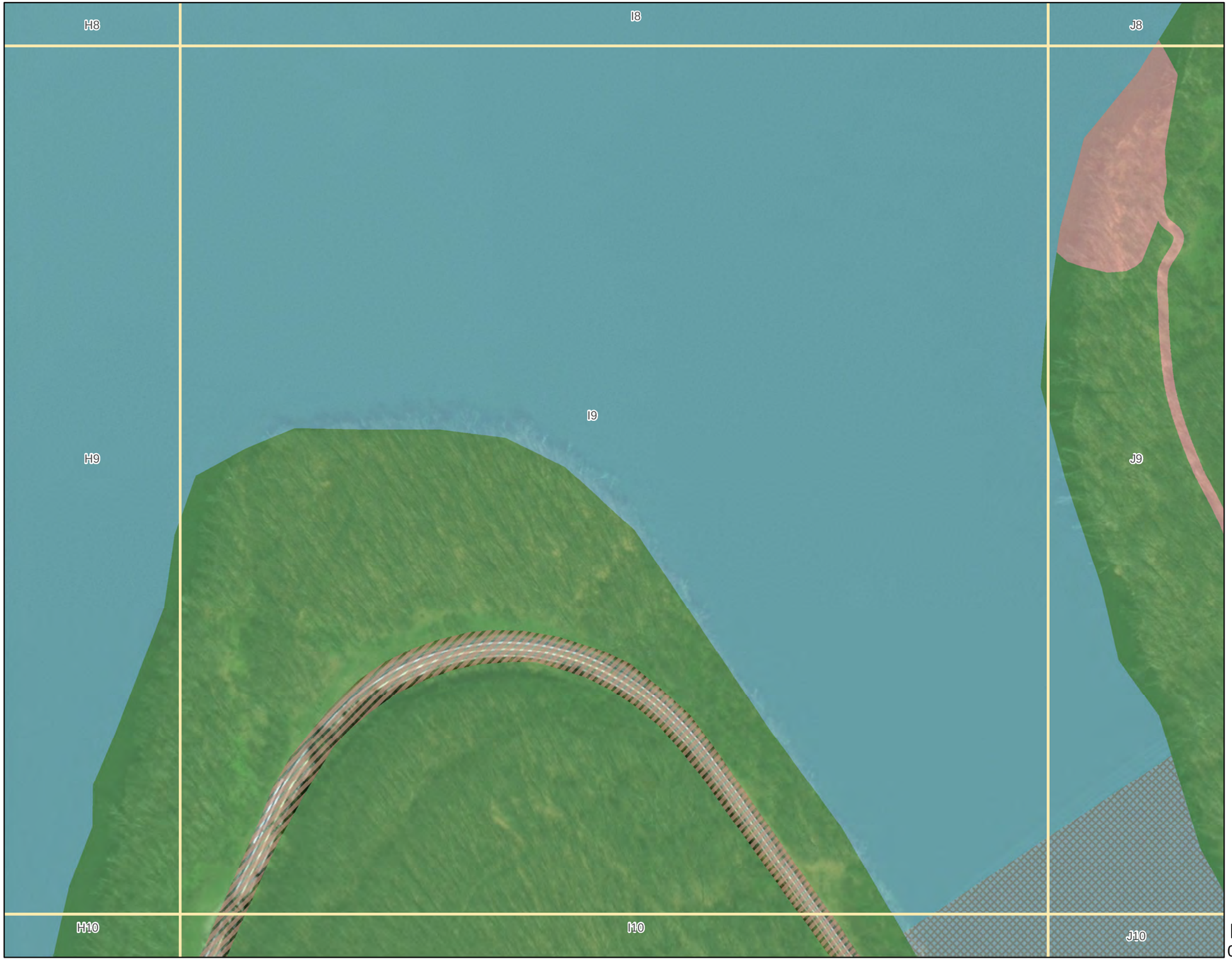
0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

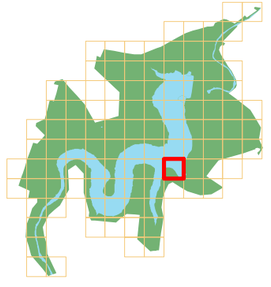


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Future Recreation Area
- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Water Surface - No Wake
- Owned by Other Entities



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

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

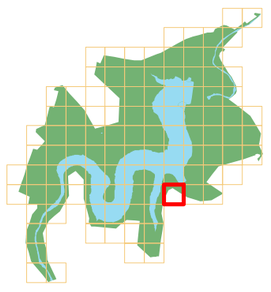
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Water Surface - No Wake
- Owned by Other Entities



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0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

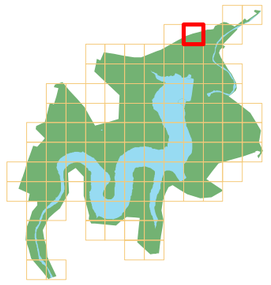
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



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0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

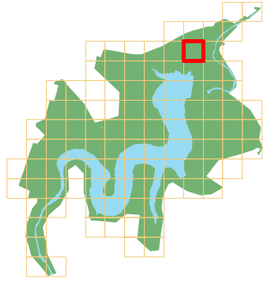
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management
- Owned by Other Entities



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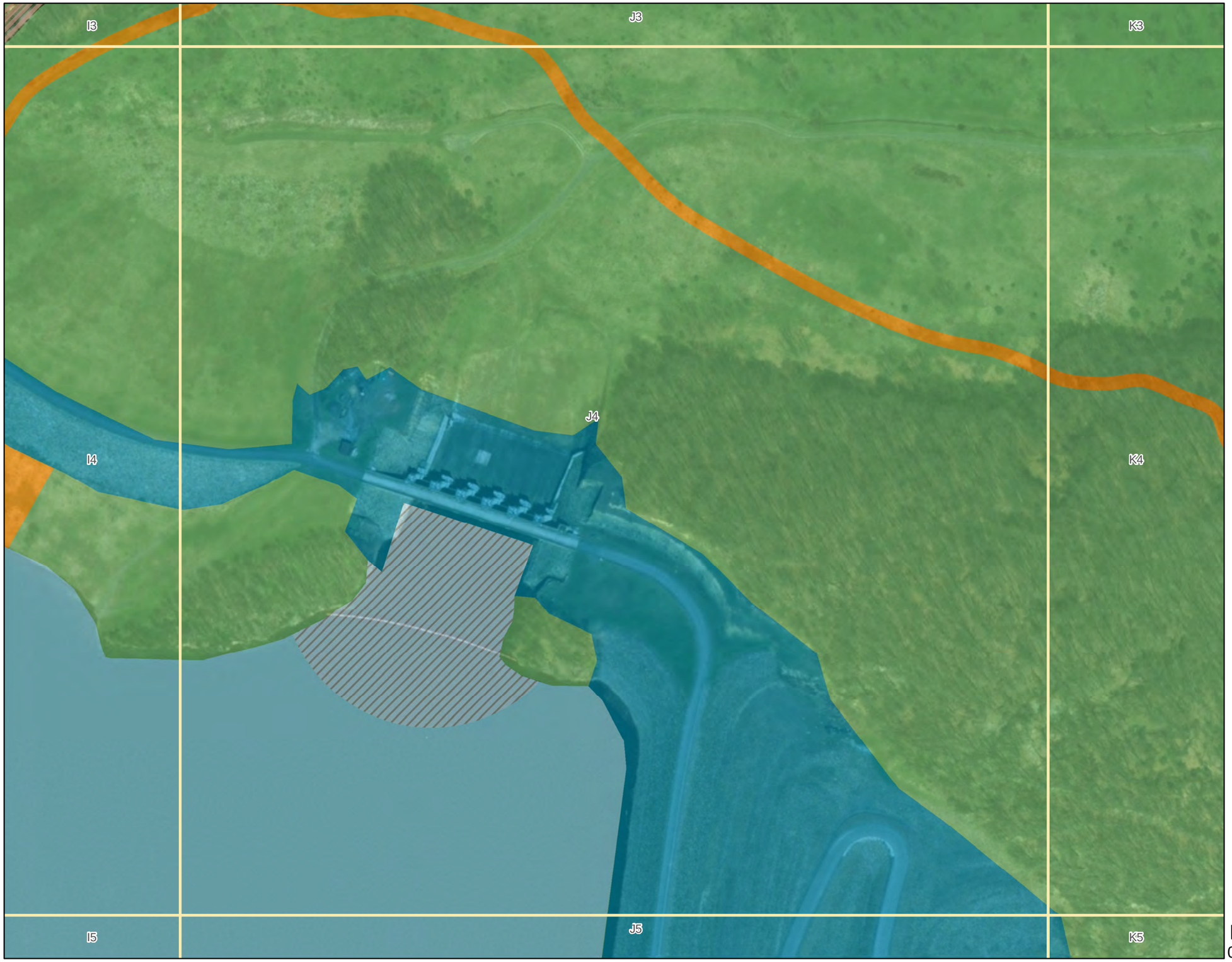
0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

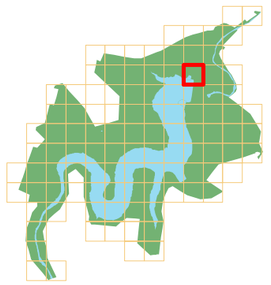


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management
- Project Operations
- Water Surface - Open Recreation
- Water Surface - Restricted
- Owned by Other Entities



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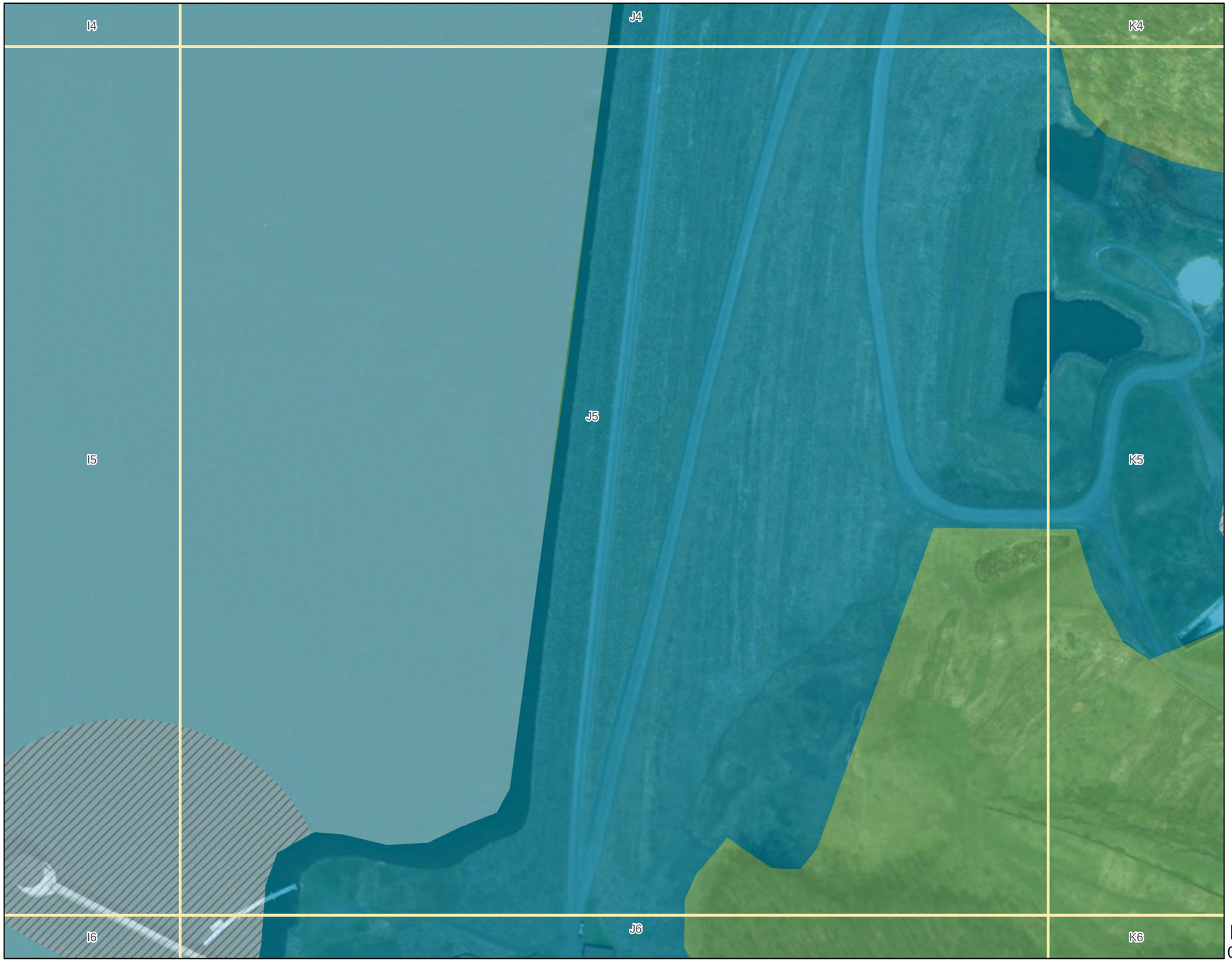
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

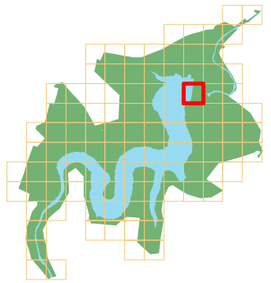


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Project Operations
- Water Surface - Open Recreation
- Water Surface - Restricted



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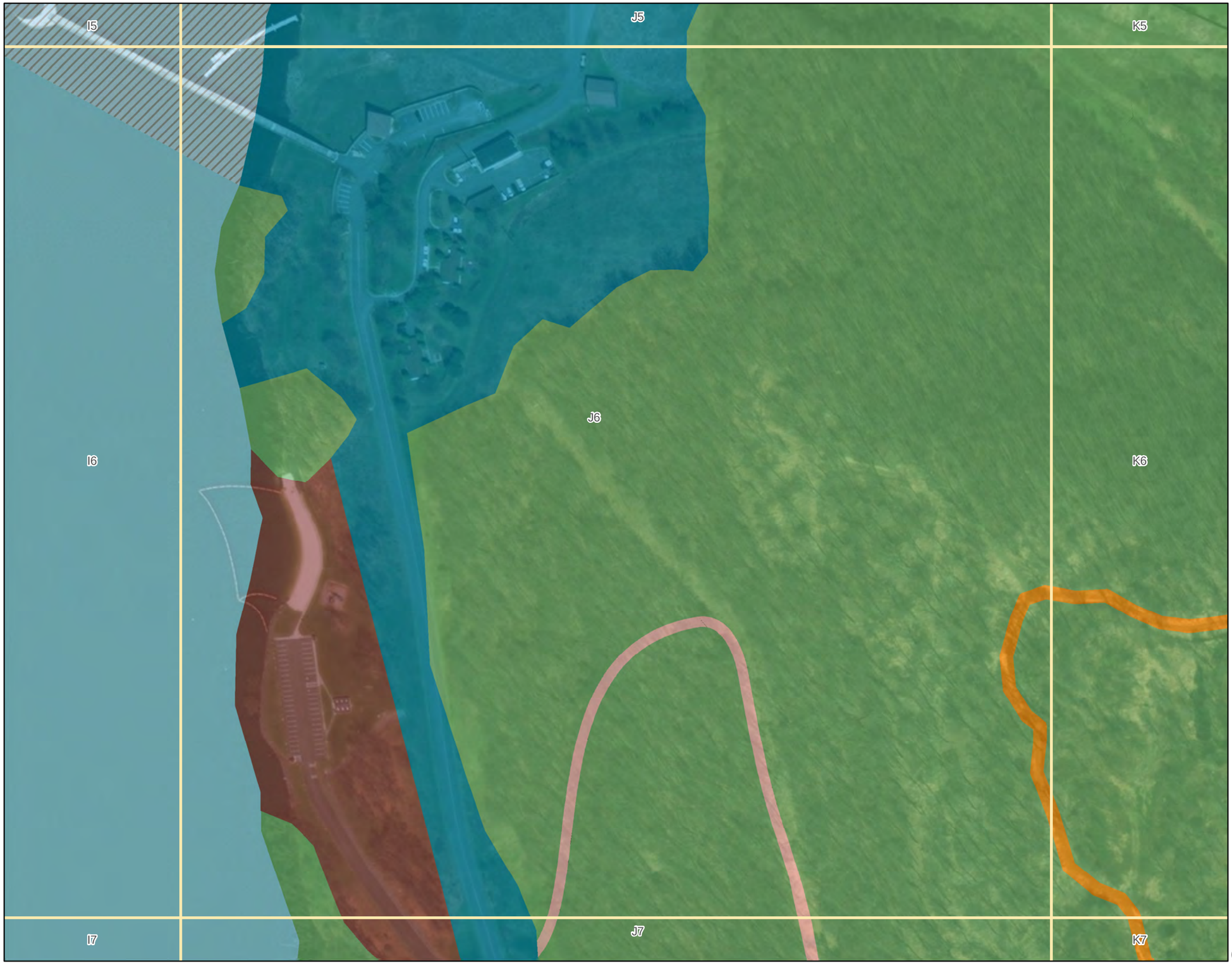
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View



Legend

- Grid
- JRL Site Boundary

Land Classification

- High Density Recreation
- Multiple Res Mgmt Lands - Future Recreation Area
- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management
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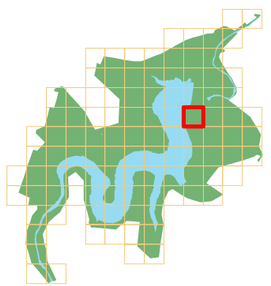
- Water Surface - Restricted



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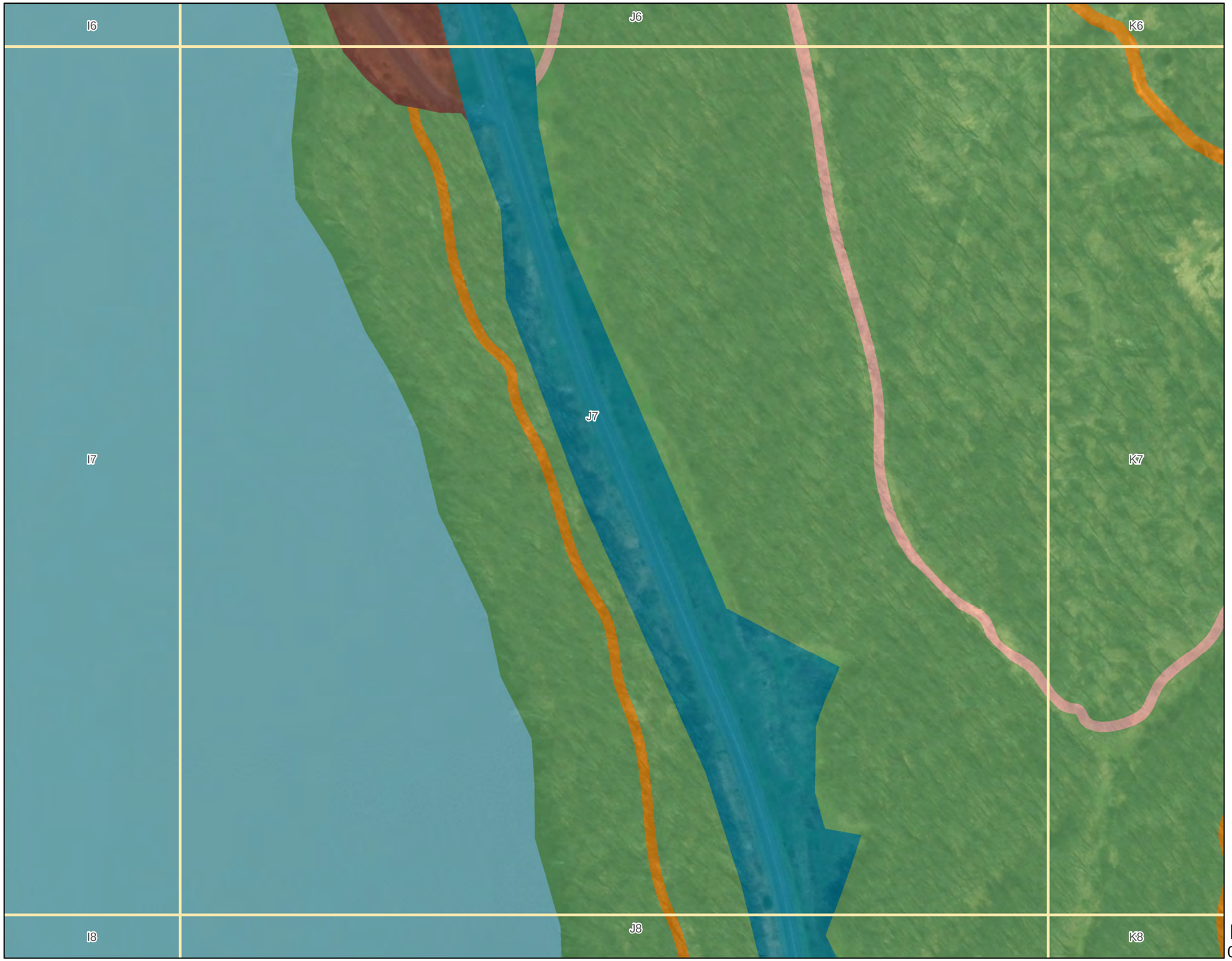
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View



Legend

- Grid
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Land Classification

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- Multiple Res Mgmt Lands - Future Recreation Area
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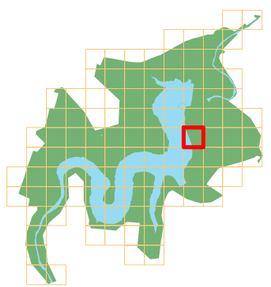
- Multiple Res Mgmt Lands - Vegetative Management
- Project Operations
- Water Surface - Open Recreation



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Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

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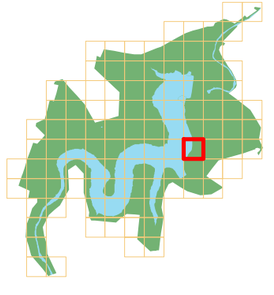
- Multiple Res Mgmt Lands - Vegetative Management
- Project Operations
- Water Surface - Open Recreation



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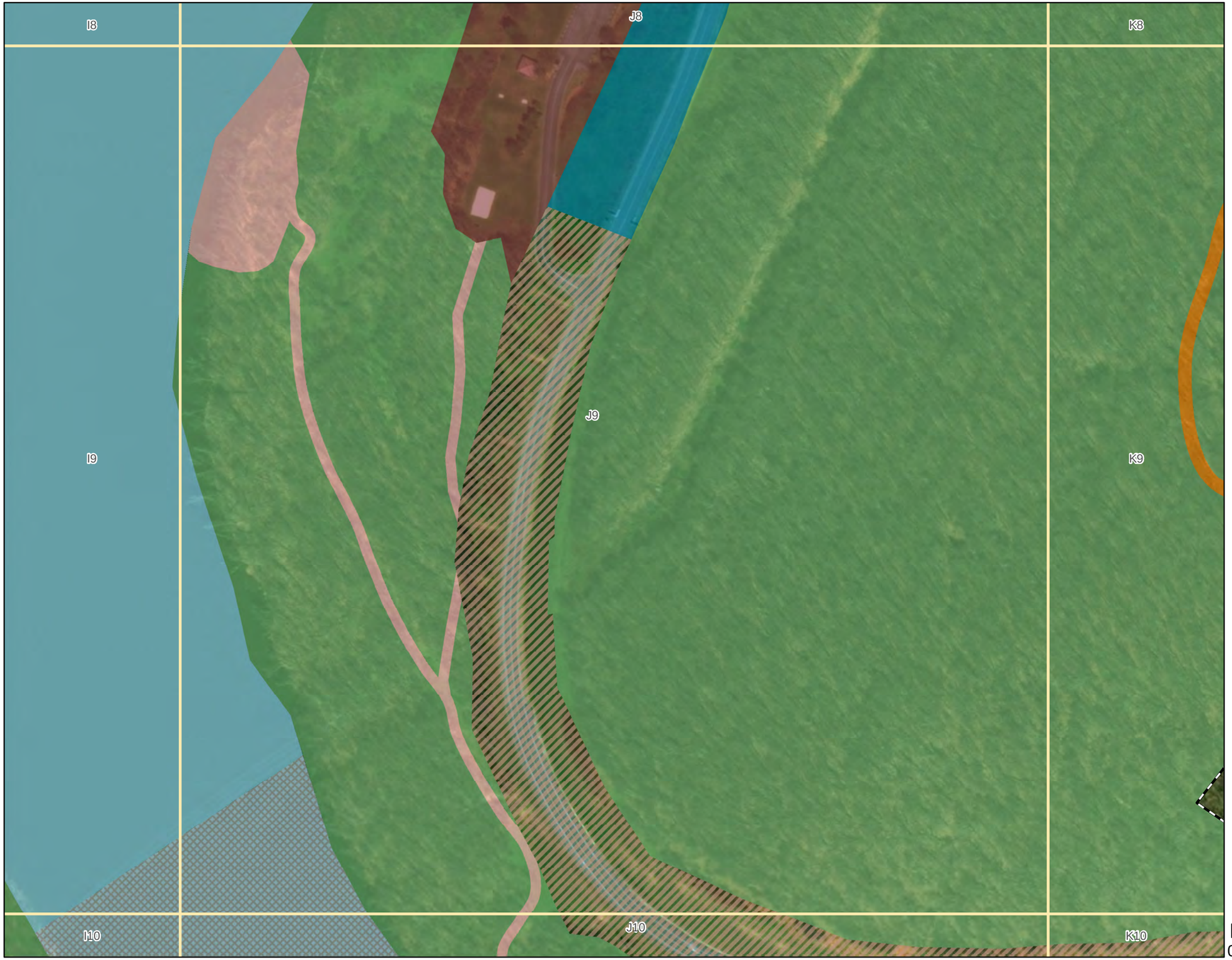
Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

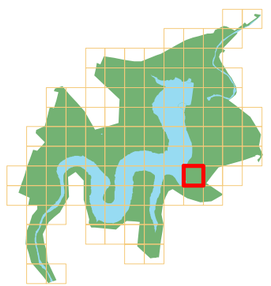


Legend

- Grid
- JRL Site Boundary

Land Classification

- High Density Recreation
- Multiple Res Mgmt Lands - Future Recreation Area
- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management
- Project Operations
- Water Surface - Open Recreation
- Water Surface - No Wake
- Owned by Other Entities



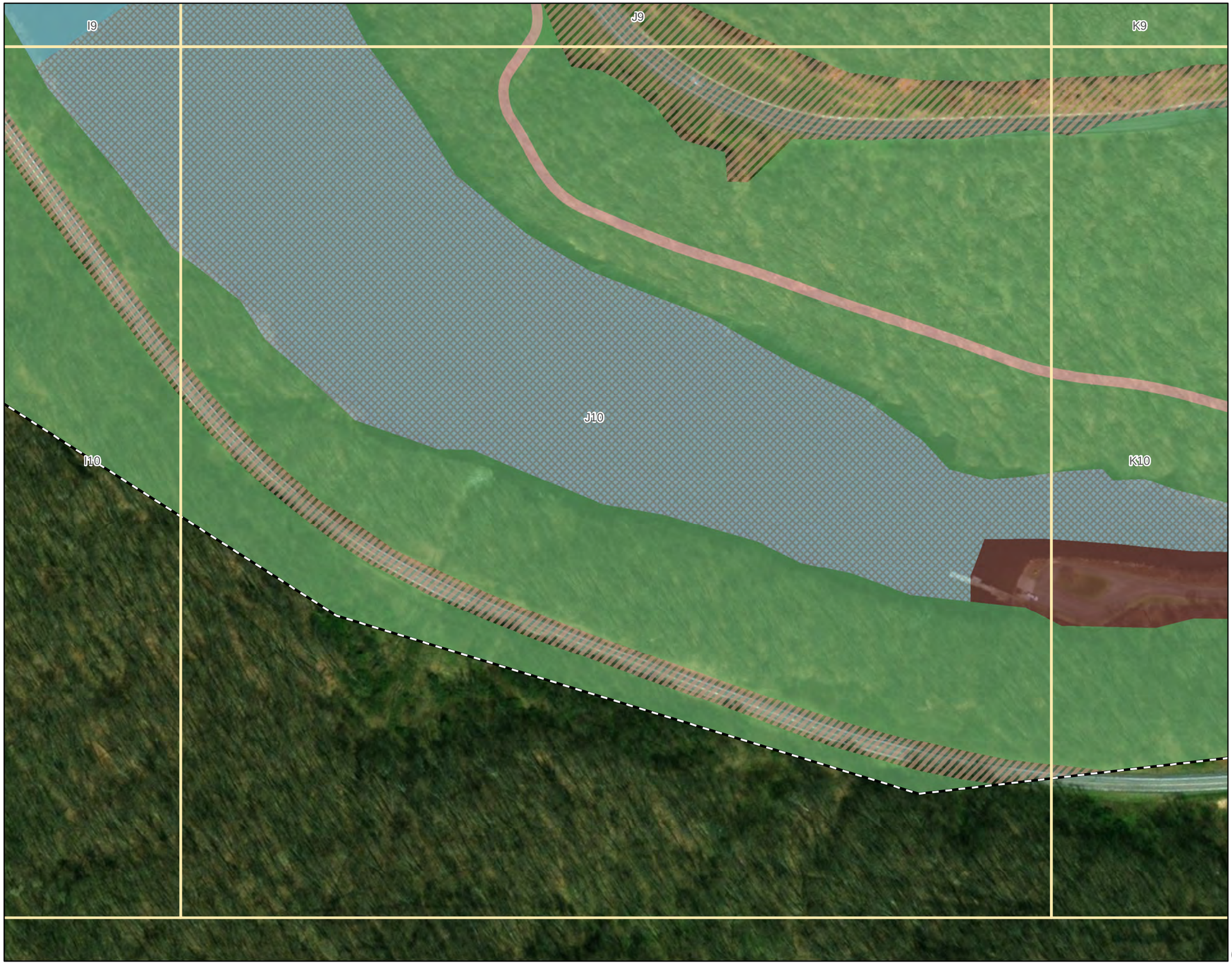
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

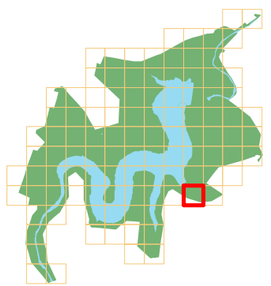


Legend

- Grid
- JRL Site Boundary

Land Classification

- High Density Recreation
- Multiple Res Mgmt Lands - Future Recreation Area
- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Water Surface - No Wake
- Owned by Other Entities



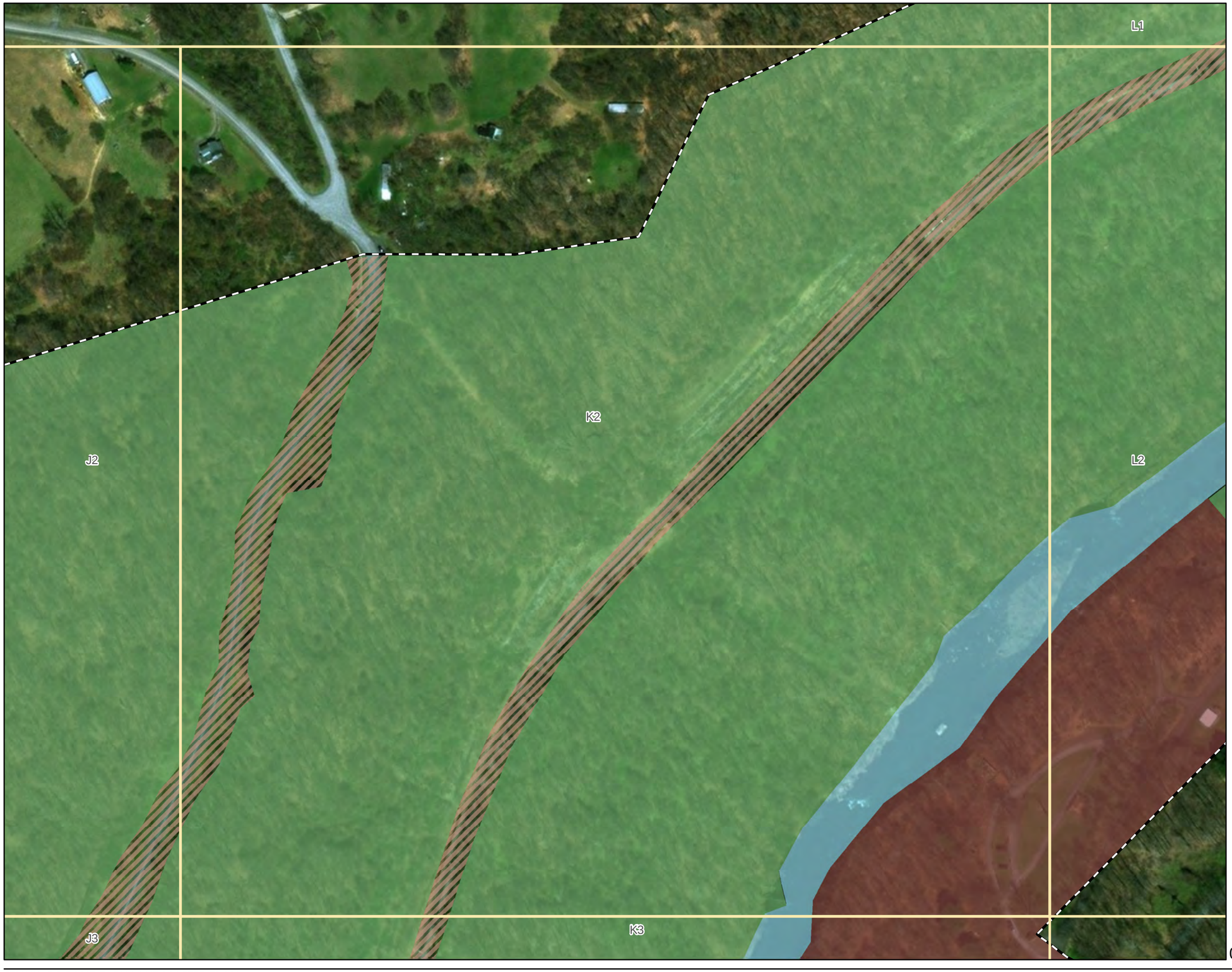
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

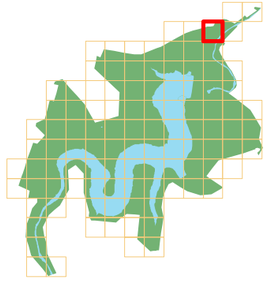


Legend

- Grid
- JRL Site Boundary

Land Classification

- High Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

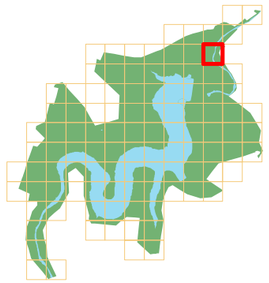
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- High Density Recreation
- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



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

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

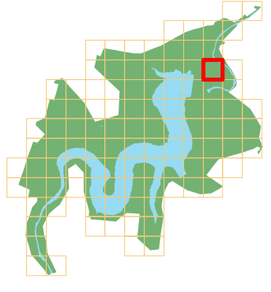
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Future Recreation Area
- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management
- Project Operations
- Water Surface - Open Recreation



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

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Future Recreation Area
- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management
- Project Operations
- Water Surface - Open Recreation
- Water Surface - Restricted

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

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

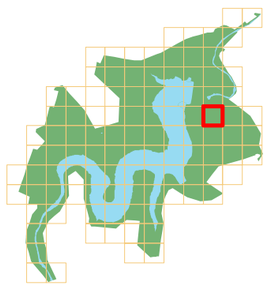
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management



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

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

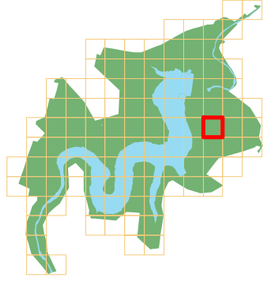
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Future Recreation Area
- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management



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

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

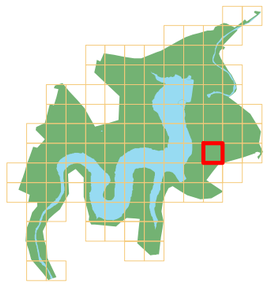
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- High Density Recreation
- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management



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

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

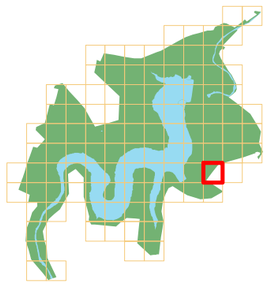
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- High Density Recreation
- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management



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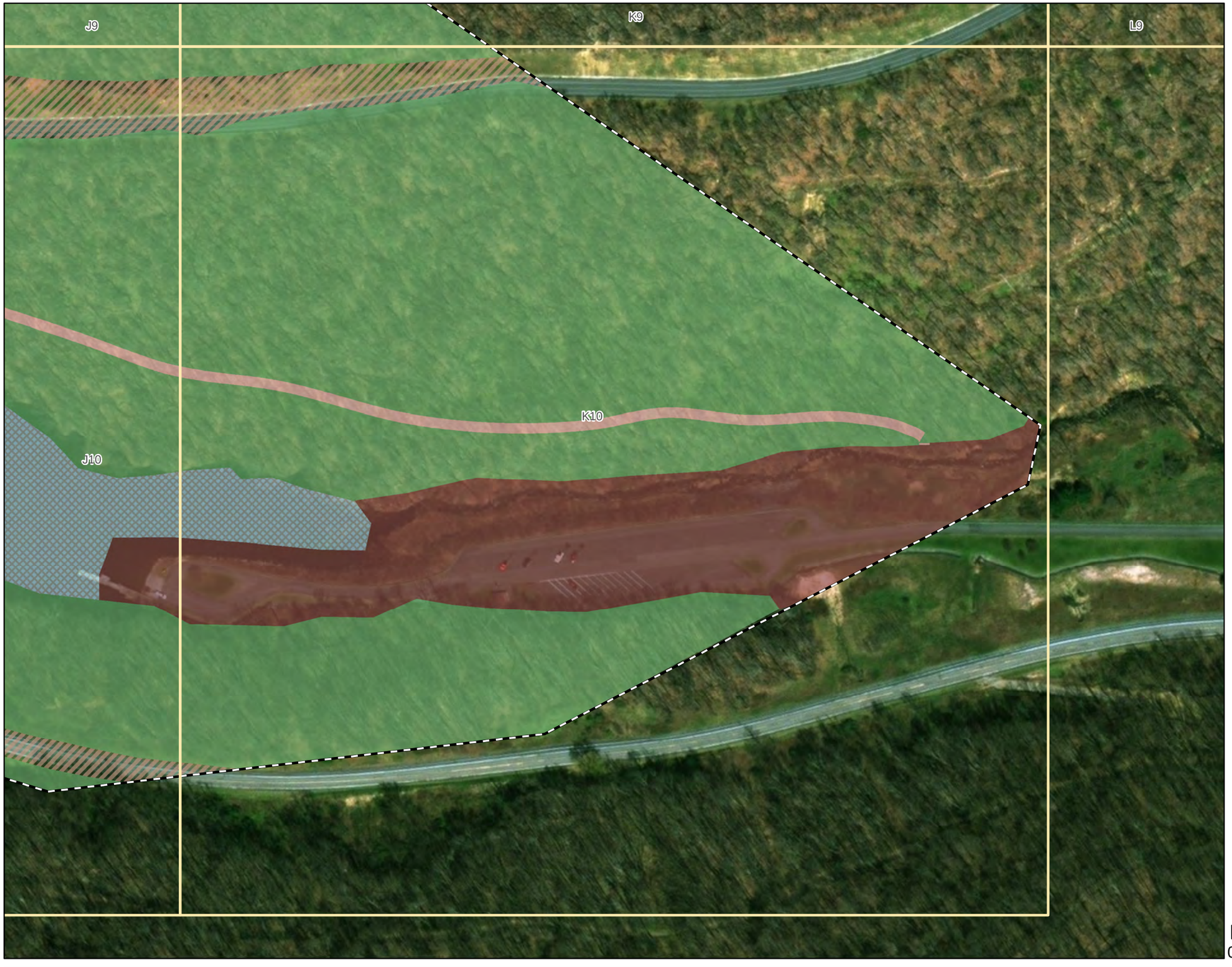


Jennings Randolph Lake Master Plan Update

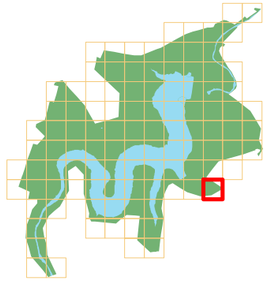
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- High Density Recreation
- Multiple Res Mgmt Lands - Future Recreation Area
- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - No Wake
- Owned by Other Entities



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

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

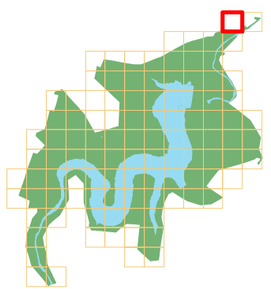
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation
- Owned by Other Entities



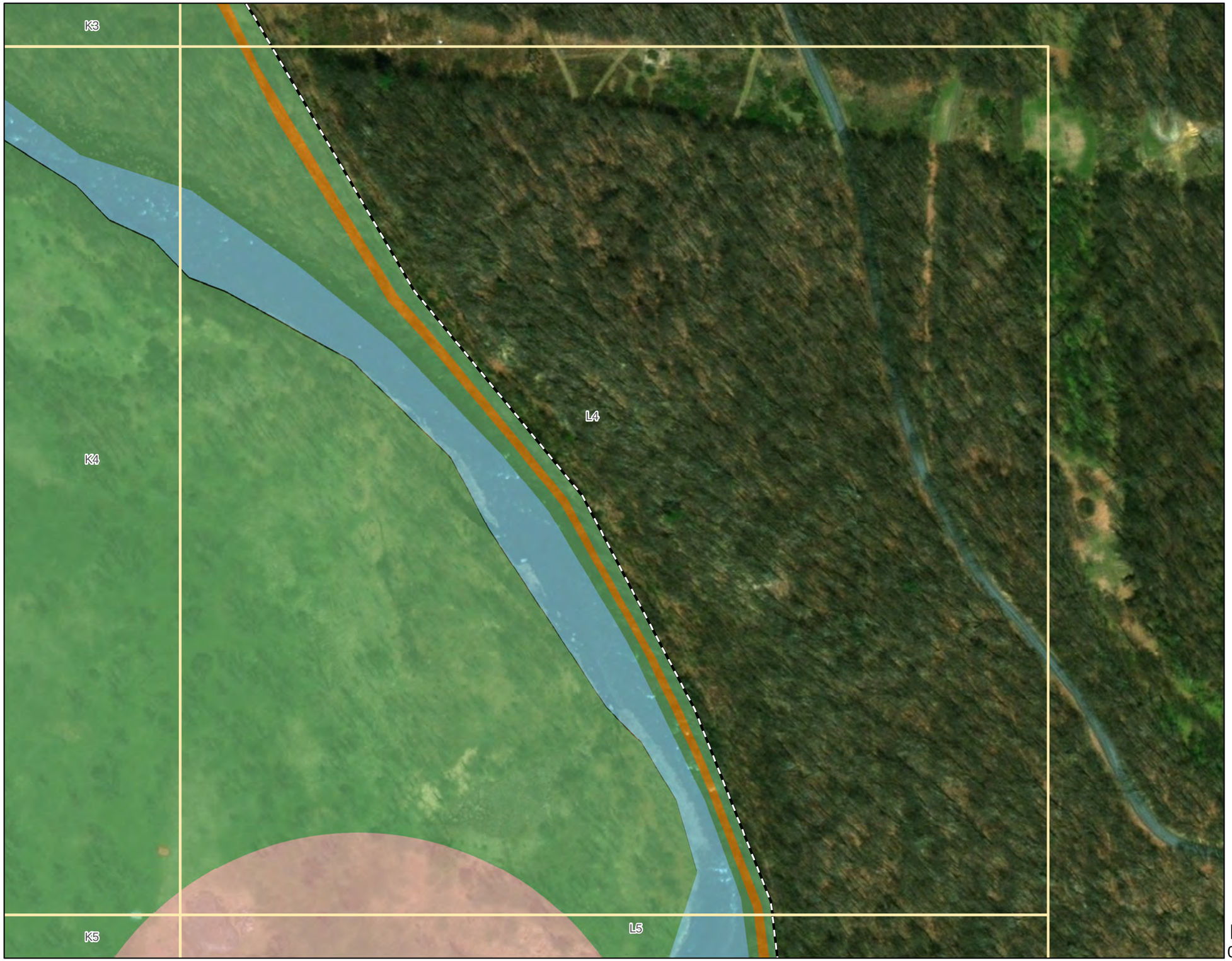
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

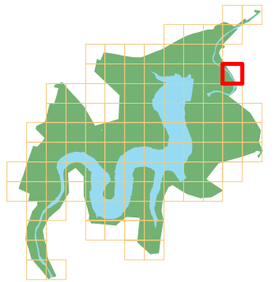


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Future Recreation Area
- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation



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0 225 450 Feet

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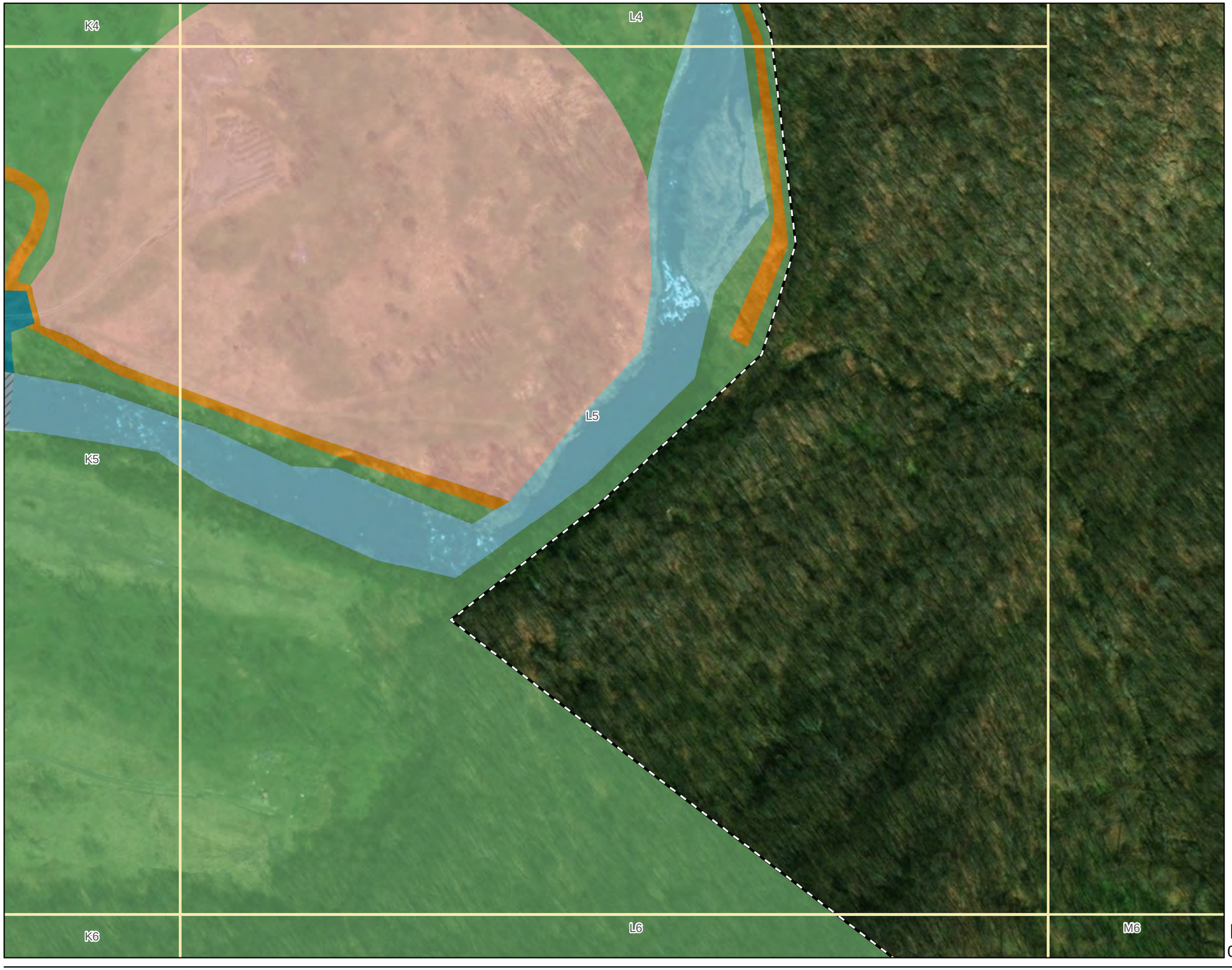


Jennings Randolph Lake Master Plan Update

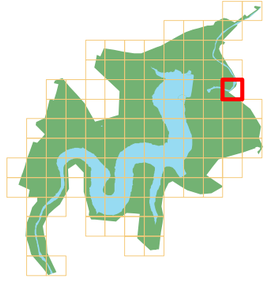
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Future Recreation Area
- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management
- Project Operations
- Water Surface - Open Recreation
- Water Surface - Restricted



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0 225 450 Feet

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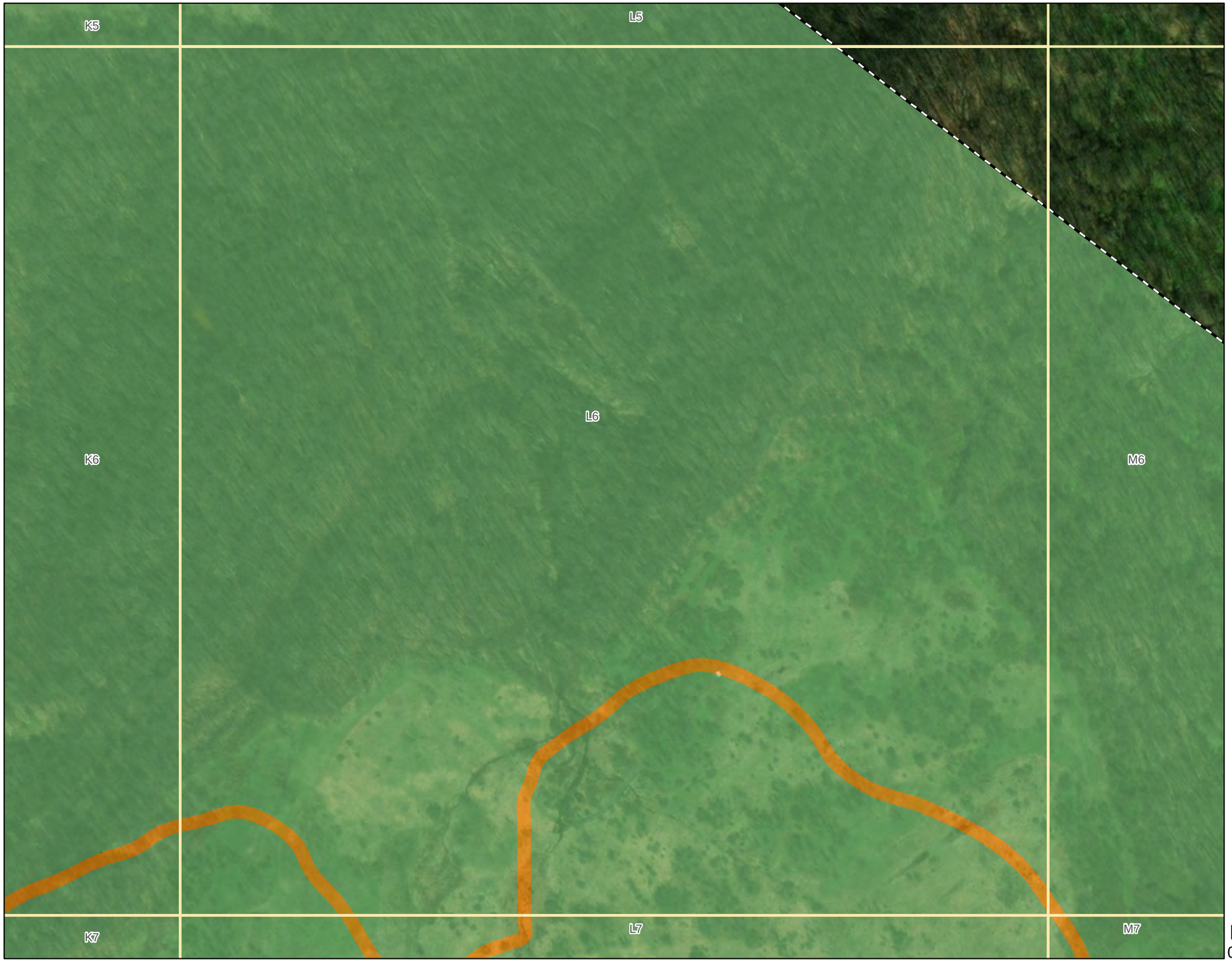


Jennings Randolph Lake Master Plan Update

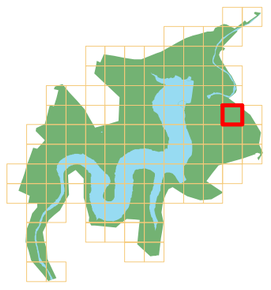
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management



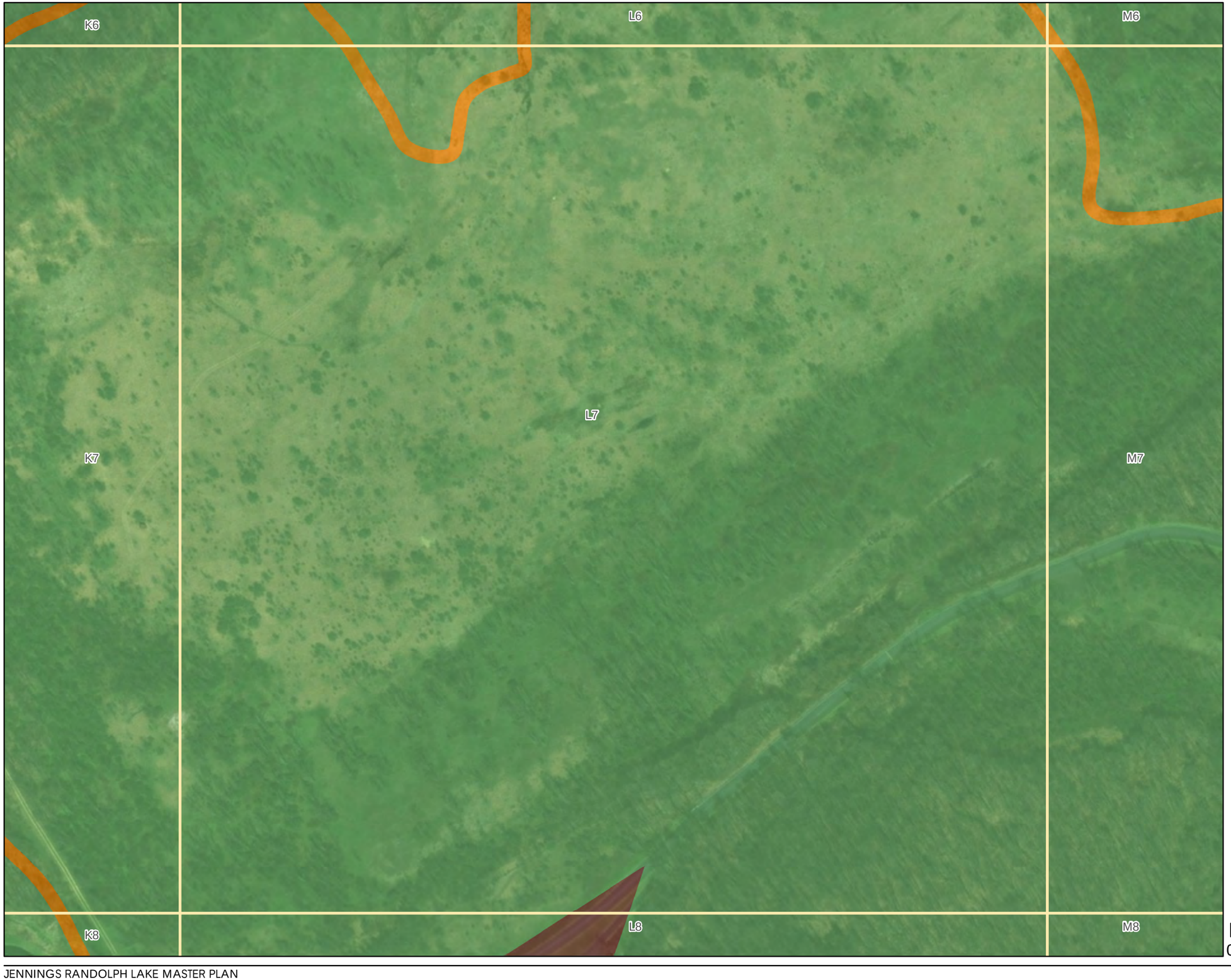
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

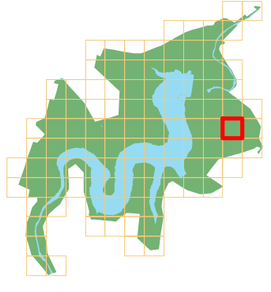


Legend

- Grid
- JRL Site Boundary

Land Classification

- High Density Recreation
- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management



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

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

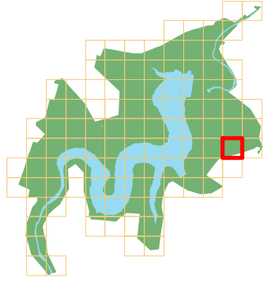
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- High Density Recreation
- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management



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0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

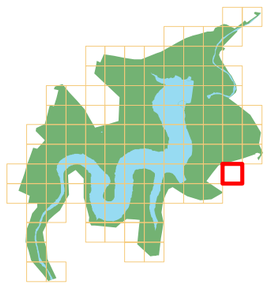
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- High Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management



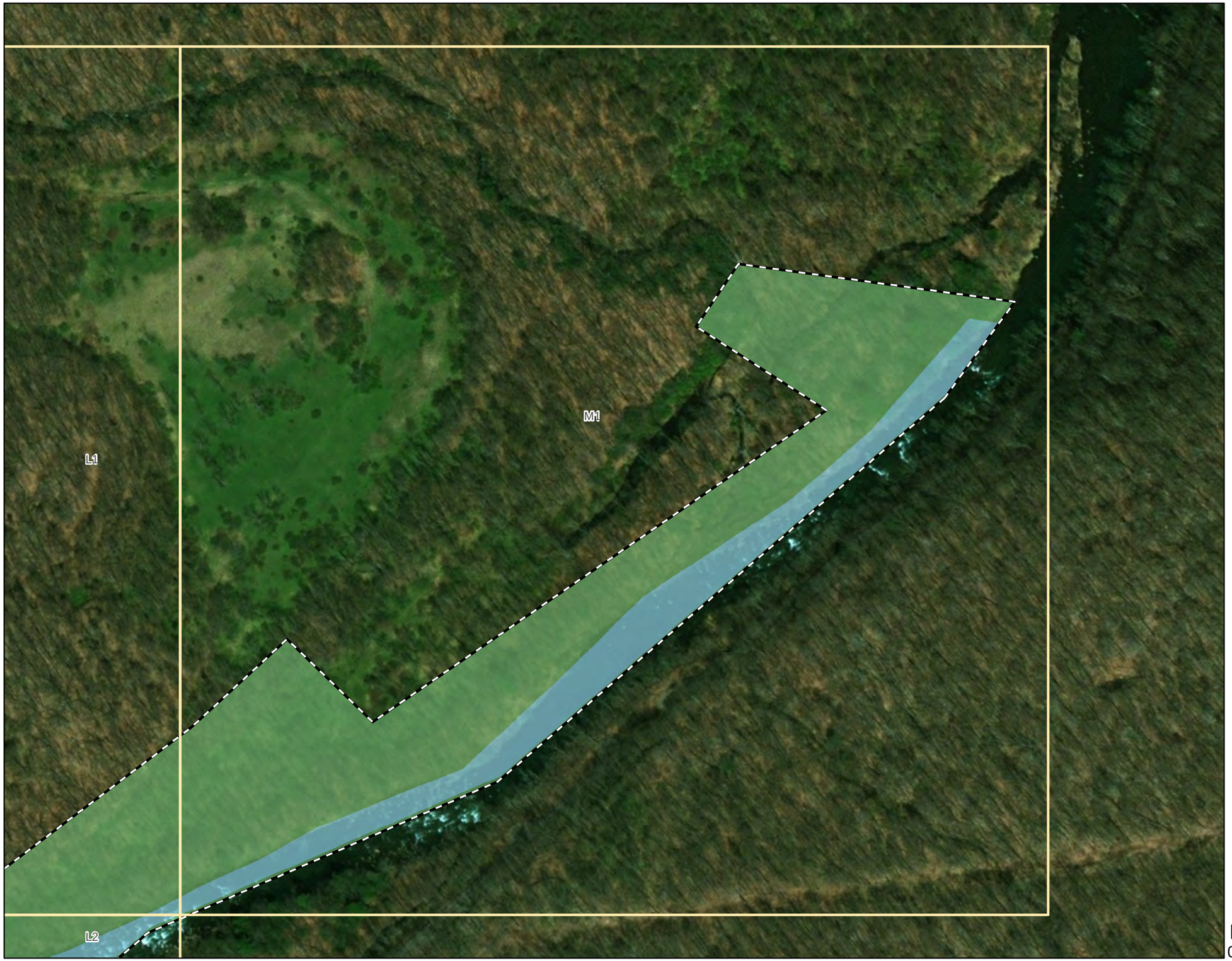
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

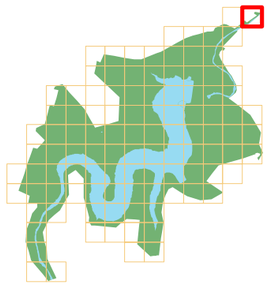


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management
- Water Surface - Open Recreation



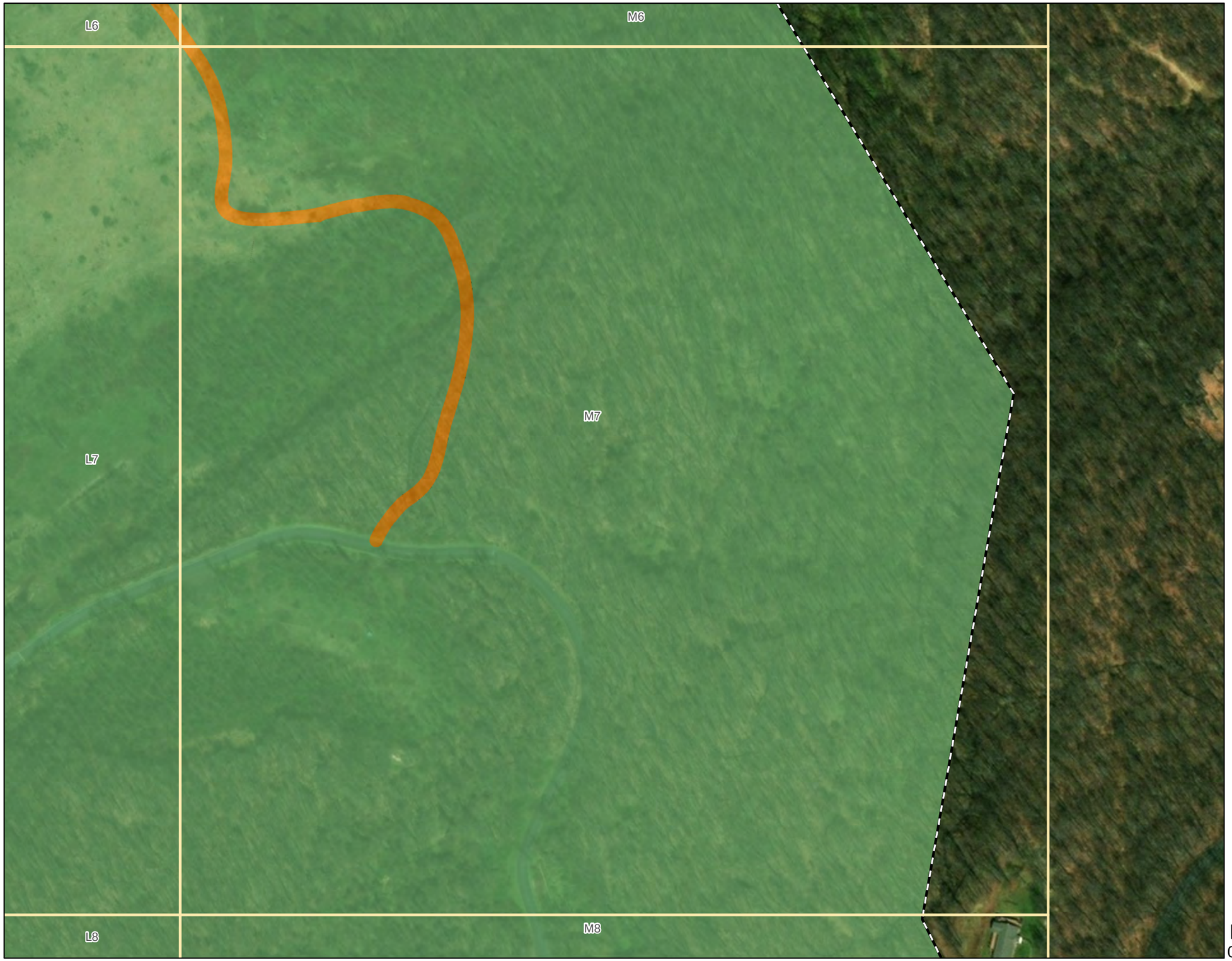
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Land Classification | Grid View

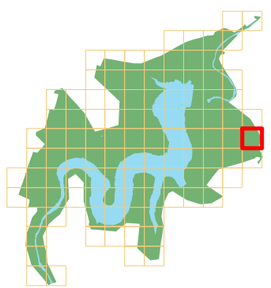


Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Low Density Recreation
- Multiple Res Mgmt Lands - Vegetative Management



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0 225 450 Feet

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Jennings Randolph Lake Master Plan Update

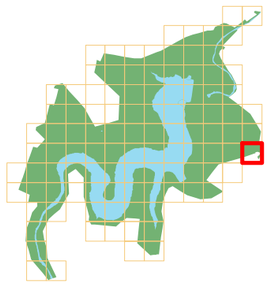
Land Classification | Grid View

Legend

- Grid
- JRL Site Boundary

Land Classification

- Multiple Res Mgmt Lands - Vegetative Management



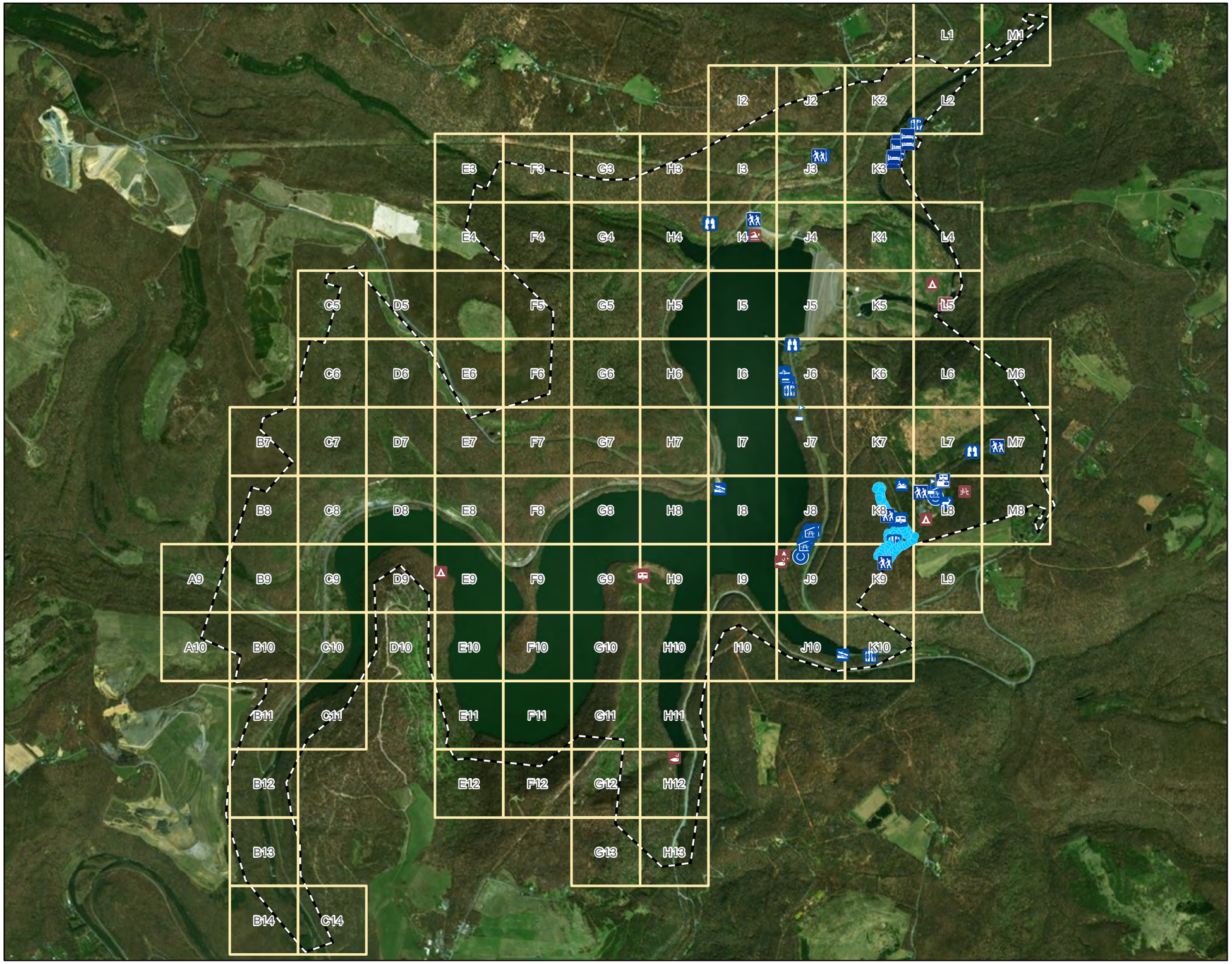
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Recreation Assets | Grid View



Legend

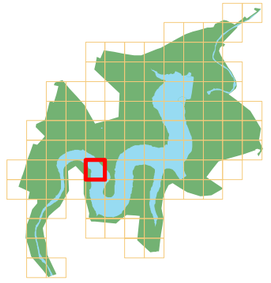
- Grid
- JRL Site Boundary

Proposed Recreation Amenities

- Campground
- Mountain Bike Trail
- Primitive Camping Area
- Shoreline Fishing
- Swim Beach
- Trail Head

Existing Recreation Amenities

- Campground
- Archery Range
- Boat Launch
- Fishing Dock
- Kayak Launch
- Park Entrance
- Picnic Pavilion
- Playground
- RV Dump Station
- Recreation Court
- Rental Cabin
- Restrooms
- Scenic Overlook
- Swim Beach
- Trail Head
- Camp Site



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

0 2,800 5,600 Feet

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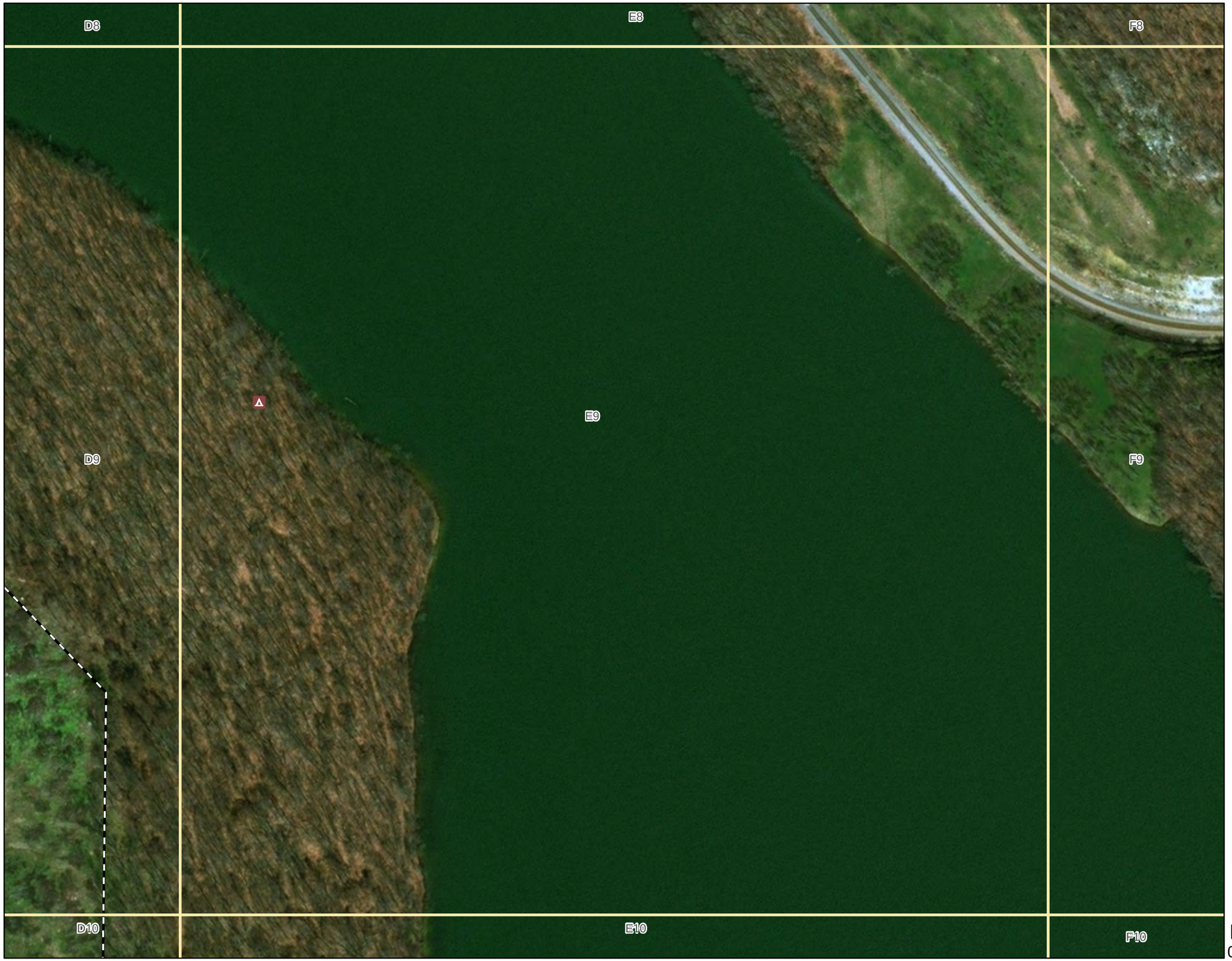


Jennings Randolph Lake Master Plan Update

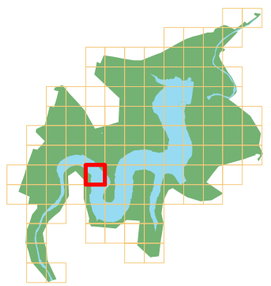
Recreation Assets | Grid View

Legend

- Grid
- JRL Site Boundary

Proposed Recreation Amenities

- Primitive Camping Area



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

0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

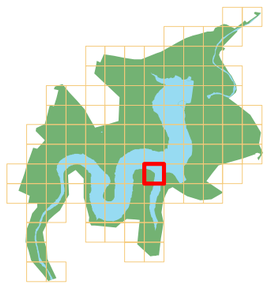
Recreation Assets | Grid View

Legend

- Grid
- JRL Site Boundary

Proposed Recreation Amenities

- Campground



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0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

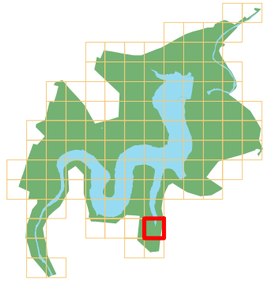
Recreation Assets | Grid View

Legend

- Grid
- JRL Site Boundary

Proposed Recreation Amenities

- Shoreline Fishing



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0 225 450 Feet

N

Jennings Randolph Lake Master Plan Update

Recreation Assets | Grid View

Legend

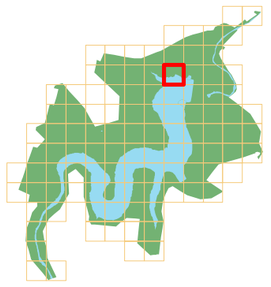
- Grid
- JRL Site Boundary

Proposed Recreation Amenities

- Swim Beach

Existing Recreation Amenities

- Kayak Launch
- Scenic Overlook
- Trail Head



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0 225 450 Feet

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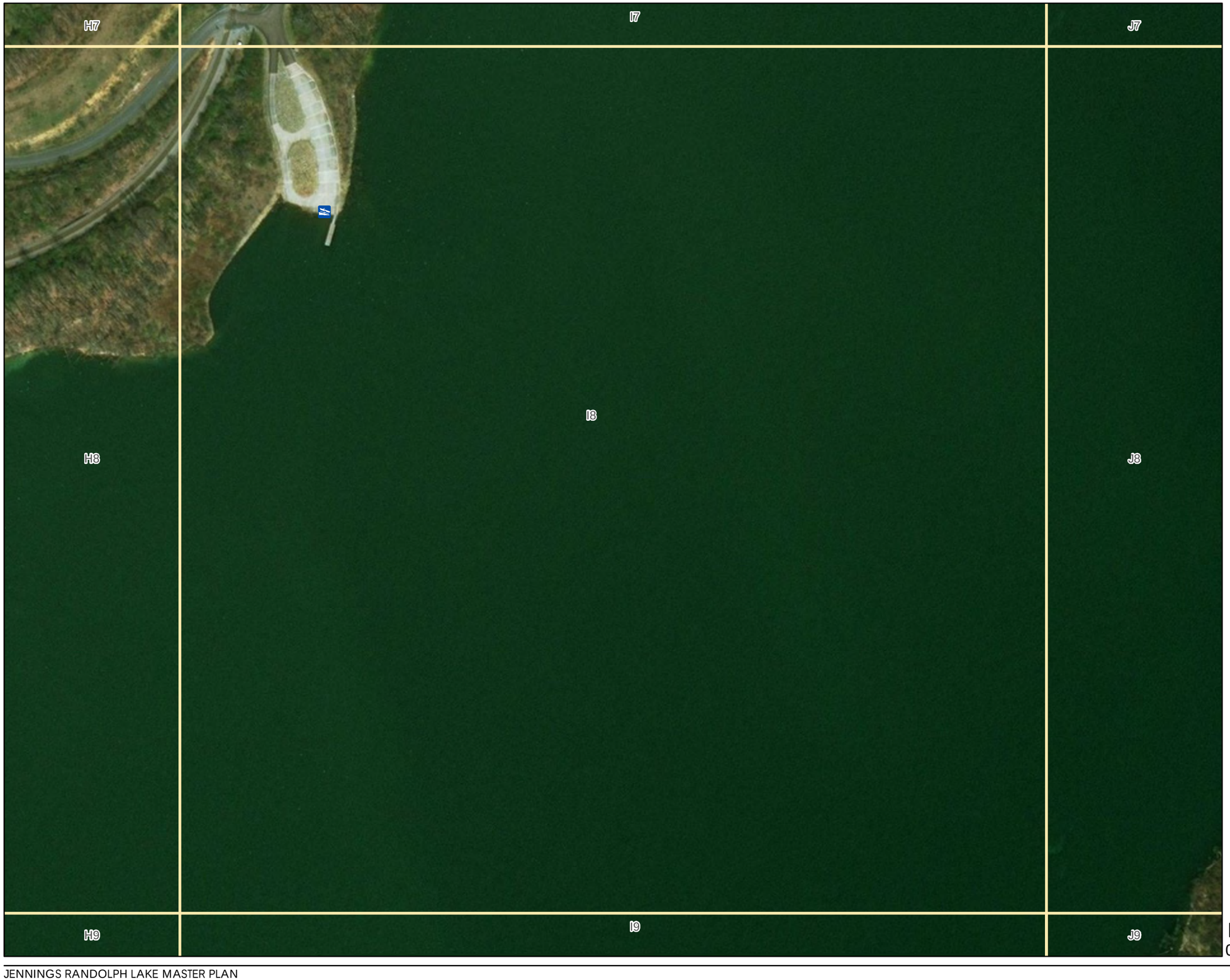


Jennings Randolph Lake Master Plan Update

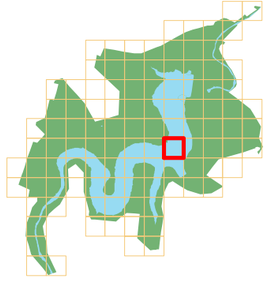
Recreation Assets | Grid View

Legend

- Grid
- JRL Site Boundary

Existing Recreation Amenities

- Boat Launch



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Jennings Randolph Lake Master Plan Update

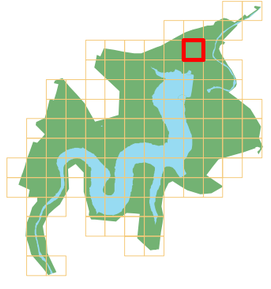
Recreation Assets | Grid View

Legend

- Grid
- JRL Site Boundary

Existing Recreation Amenities

- Scenic Overlook
- Trail Head



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Jennings Randolph Lake Master Plan Update

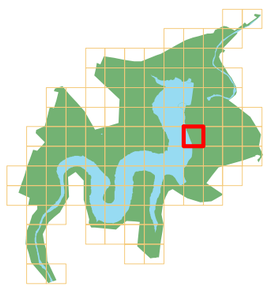
Recreation Assets | Grid View

Legend

- Grid
- JRL Site Boundary

Existing Recreation Amenities

- Park Entrance



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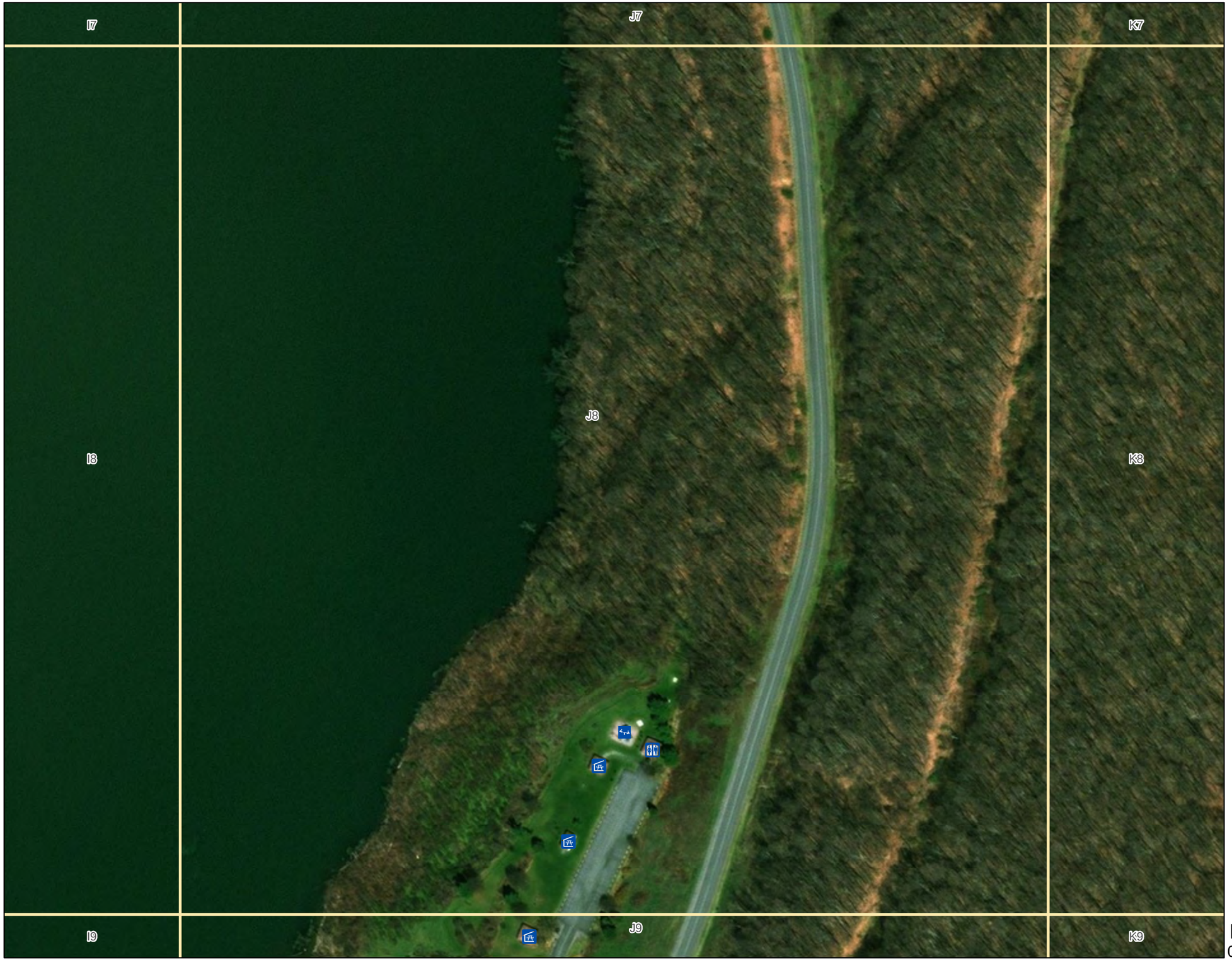
Jennings Randolph Lake Master Plan Update

Recreation Assets | Grid View

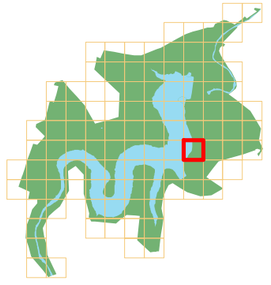


Legend

- Grid
- JRL Site Boundary

Existing Recreation Amenities

- Picnic Pavilion
- Playground
- Restrooms



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Jennings Randolph Lake Master Plan Update

Recreation Assets | Grid View

Legend

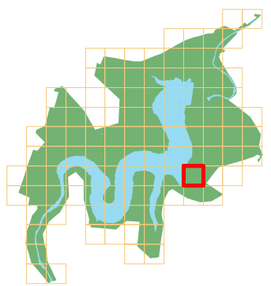
- Grid
- JRL Site Boundary

Proposed Recreation Amenities

- Primitive Camping Area
- Shoreline Fishing

Existing Recreation Amenities

- Picnic Pavilion
- Recreation Court



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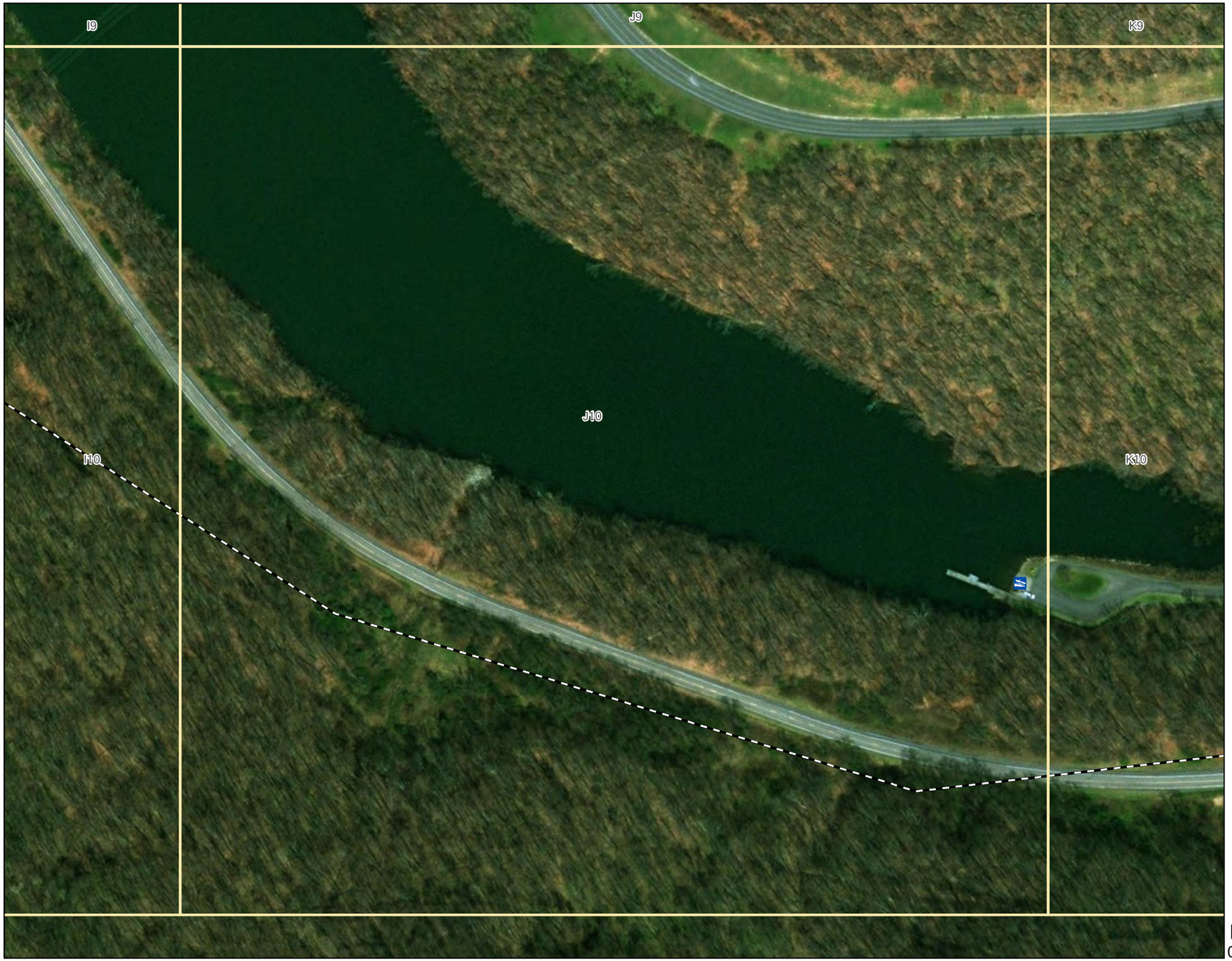
Jennings Randolph Lake Master Plan Update

Recreation Assets | Grid View

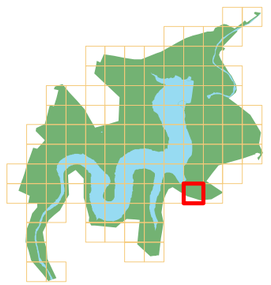


Legend

- Grid
- JRL Site Boundary

Existing Recreation Amenities

- Boat Launch



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Jennings Randolph Lake Master Plan Update

Recreation Assets | Grid View

Legend

- Grid
- JRL Site Boundary

Existing Recreation Amenities

- Park Entrance
- Rental Cabin

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Jennings Randolph Lake Master Plan Update

Recreation Assets | Grid View

Legend

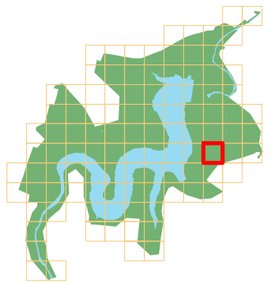
- Grid
- JRL Site Boundary

Proposed Recreation Amenities

- Primitive Camping Area

Existing Recreation Amenities

- Campground
- Fishing Dock
- Playground
- Restrooms
- Trail Head
- Camp Site



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Jennings Randolph Lake Master Plan Update

Recreation Assets | Grid View

Legend

- Grid
- JRL Site Boundary

Existing Recreation Amenities

- Restrooms
- Trail Head
- Camp Site

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Jennings Randolph Lake Master Plan Update

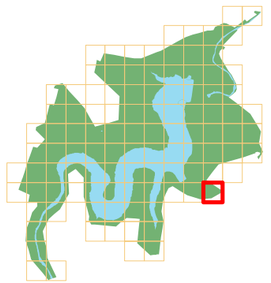
Recreation Assets | Grid View

Legend

- Grid
- JRL Site Boundary

Existing Recreation Amenities

- Boat Launch
- Restrooms



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Jennings Randolph Lake Master Plan Update

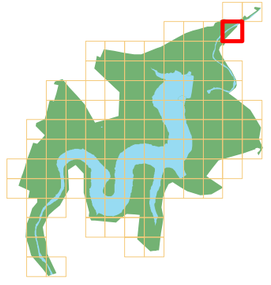
Recreation Assets | Grid View

Legend

- Grid
- JRL Site Boundary

Existing Recreation Amenities

- Park Entrance
- Rental Cabin
- Restrooms



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Jennings Randolph Lake Master Plan Update

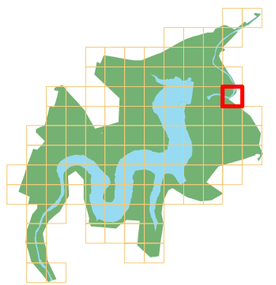
Recreation Assets | Grid View

Legend

- Grid
- JRL Site Boundary

Proposed Recreation Amenities

- Primitive Camping Area
- Trail Head



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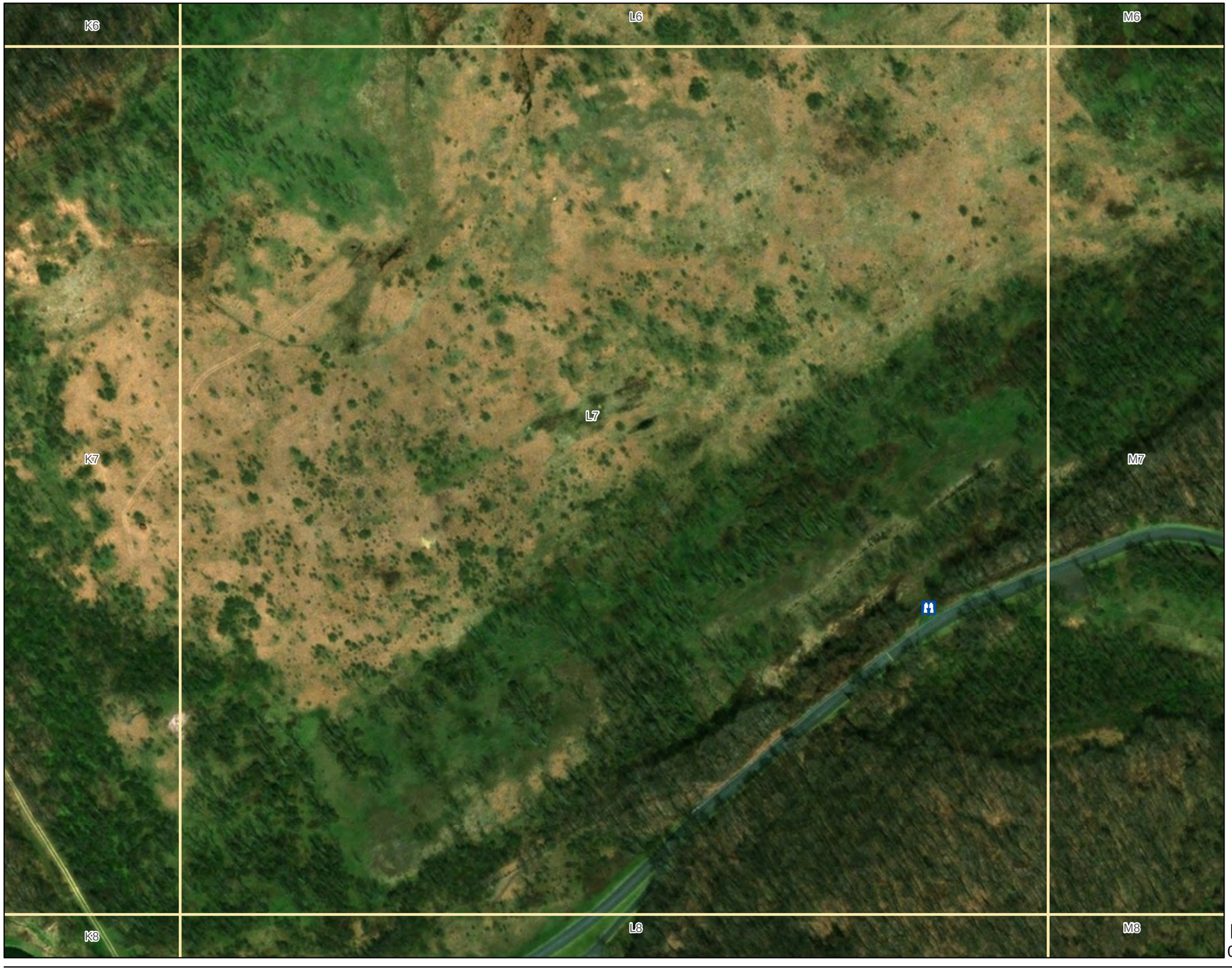
Jennings Randolph Lake Master Plan Update

Recreation Assets | Grid View

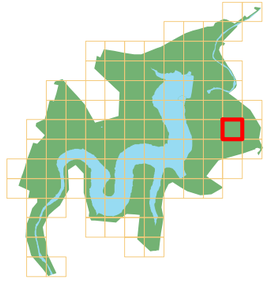


Legend

- Grid
- JRL Site Boundary

Existing Recreation Amenities

- Scenic Overlook



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Jennings Randolph Lake Master Plan Update

Recreation Assets | Grid View

Legend

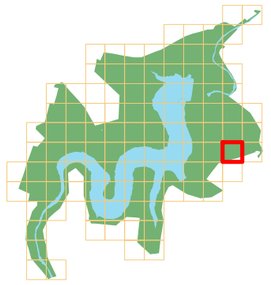
- Grid
- JRL Site Boundary

Proposed Recreation Amenities

- Mountain Bike Trail
- Primitive Camping Area

Existing Recreation Amenities

- Campground
- Archery Range
- Fishing Dock
- Park Entrance
- Picnic Pavilion
- RV Dump Station
- Recreation Court
- Trail Head
- Camp Site



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Draft Submittal
January 2019