

# Ohio Department of Natural Resources

## Division of Parks and Recreation

### Five Year (2012-2016) Forest Resource Management Plan

For

### Lake Hope State Park

***Prepared Cooperatively:***

ODNR- Division of Forestry  
&  
ODNR – Division of Parks and  
Recreation  
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## I. PURPOSE

The purpose of this plan is to provide the framework for implementation of active forest resource management on the forest in Lake Hope State Park. The recently passed House Bill 153 gave enabling authority to the Ohio Department of Natural Resources (ODNR), Division of Parks and Recreation to provide for long-term forest management stewardship of the renewable timber resources in appropriate state park areas. Forest management will be under the guidance of foresters and forest managers from the ODNR Division of Forestry. The Division of Forestry manages over 200,000 acres of sustainably managed state forests and has multiple personnel trained to implement forest resource management on public lands. Although the specific management activities will be unique to conditions at each area, the Division of Forestry will draw on its existing framework in developing plans for each state park. Local state park managers and staff will contribute to each plan and activity, and ultimately will have the final planning decisions.

## II. PARK HISTORY

*Land Acquisition:* Prior to the 1800's, dense forest of oak-hickory and associated species covered Vinton County. In the early 1800's, the refinement of native iron ore in charcoal furnaces became a flourishing industry. Between 1818 and 1873, 69 furnaces were built in this region, one of which was a furnace financed by a French nobleman named Count Zaleski. In 1862, an agent from Cincinnati interested in producing iron came to Zaleski to look for land adequately endowed with limestone, timber and iron ore (the materials necessary for the production of iron). Although he located appropriate land in Vinton County, he lacked the finances to establish a facility. Through personal ties and concerted endeavors, he located the funds in Europe. The Zaleski Land Company, which initially purchased 393 acres in the Northeastern portion of the county and erected a furnace, was established through the financial backing of Count Zaleski. Production at this furnace, as at other furnaces in the area, proceeded unrestricted for a number of years because of the proximity of resources. However, as timber reserves and other resources were depleted, transportation costs for raw materials forced the furnaces to close. As the furnaces became abandoned, much of the timber-exhausted land was put into cultivation and pasture. But the characteristic steep terrain and the thin residual soils of the area proved agriculturally unproductive. By 1910, erosion and depleted fertility made the land not conducive to farming and agriculture. With no feasible alternative employment, tax delinquency increased and a population exodus occurred (1880-1930).

In 1935, under the direction of the US Department of Agriculture and the Ohio Division of Forestry, the Zaleski Land Utilization Project was established. This 46,000-acre project in Vinton County was part of 2,000,000 acres in southeastern Ohio that was designated an economic problem area by the federal government. The objective of the Zaleski Project was to return the land to its most productive capacity by generating a forest community, aiding flood control and preventing soil erosion and by so doing, establishing an economic base to maintain a rural population.

In 1931, the State of Ohio acquired 3,400 acres of the Strong Estate, which included land previously owned by the Zaleski Company. The federal government, through the Resettlement Administration, acquired 19,000 acres of land within the Zaleski Land Utilization Project and transferred its administration to the Ohio Division of Forestry. This included control of an area south of U.S. 50 known as Raccoon Forest. In all, the Division administered 22,000 acres of forest-recreation area, then called Zaleski Forest-Park.

Through the effort of the Works Progress Administration (WPA), many developments and improvements were accomplished. Over 14,250 acres, some of which is now Lake Hope State Park, received timber stand improvement in the form of salvage cutting, thinnings and weed tree and vine removals. A 125-acre dam and lake, now the showcase of the park, was constructed. 14 vacation cabins were built, 35 miles of roads and trails and 21 miles of fire breaks were completed, a fire tower was erected, wildlife habitat improvements were initiated, a game refuge was established and numerous waterholes were built.

In 1949 the Ohio Department of Natural Resources was created. As part of its inception, many "forest-parks", like Zaleski, were split into two divisions of ODNR. Thus Lake Hope State Park was born. The focus of the state park system was narrowed to focus on creating outdoor recreation opportunities while the state forest system was to focus on multiple-use resource management.

Since the creation of the Division of Parks and Recreation the facilities at Lake Hope have been continually improved. Numerous cabins and campsites have been developed. In 2006 a tragic fire saw Hope Dining Lodge destroyed. ODNR is now instituting its reconstruction. The state park contains over 20 miles of hiking and mountain bike trails. Park staff provide nature programs throughout the year to both children and adult park visitors.

*Past Land Management/Uses:* Before and around the turn of the century, this area was extensively mined for coal, iron ore, farmed and cut for charcoal for the iron ore furnaces. In response to the degraded shape the land was left, during the 1930's, a mass reforestation project lead by the Civilian Conservation Corps (CCC) and WPA planted thousands of trees on Zaleski and other state properties for erosion control.

### **III. FOREST DESCRIPTION**

#### **A. General**

*Property Location Description:* Lake Hope State Park is located in the hill country of central and southeastern Ohio, six miles northeast of McArthur and twenty miles west of Athens. This area is referred to as the "Southern Unglaciaded Allegheny Plateau Section of the Eastern Broadleaf Forest Province"<sup>1</sup> This province is characterized as a maturely dissected plateau of high hills, sharp ridges and narrow valleys. The approximately 2600-acre park is located exclusively in Brown Township in Vinton County. The park is generally bounded by State Route 278 to the south and Long Ridge Road to the north. Two drainages, Little Sandy Run and Stoney Hollow, form most of the west and east boundary respectively. The park headquarters is located off State Route 278, a few miles north of the town of Zaleski.

*Soils:* The most common soil association found at Lake Hope State Park is the Steinsburg-Gilpin Association. This soil is characterized as 55% Steinsburg and 20% Gilpin with 25% other components. This soil is fairly shallow with an average of 22 inches to bedrock and 40-70% slopes.

*Water Resources:* Lake Hope is lies totally within the Raccoon Creek Watershed. Raccoon Creek drains into the Ohio River at Gallipolis. Although Raccoon Creek is troubled in many of its feeder streams from acid-mine drainage - a relic of early coal mining in the state, Lake Hope provides good water quality to the stream.

*Access Issues/Transportation:* State Route 278 is the primary access corridor, running along the southern boundary of the park. Access roads in the park and Zaleski State Forest that service the park include Long Ridge, Cabin Ridge, Lake Ridge, and Furnace Ridge roads.

*Potential Productivity:* There are multiple ways to measure forest productivity. The Site Index Value is a common measurement in feet of how well a certain tree species grows in the place where it is found, thus defining productivity of the tree species. It is highly correlated to available moisture and soil type. Site indices vary at Lake Hope from 90+ Black Oak (base age 50) to <50 Black Oak. A broad average for the entire forest is approximately 75 feet.

*Overstory:* Lake Hope lies within the oak-history forest type, and contains a heterogeneous composition of forest species referred to as the Central Hardwoods. Mixed oak species are located on upper slopes and ridges, with mixed mesophytic trees of more shade tolerant and later climax species located in the hollows and low areas. Principal species include red, white and black oak, red and sugar maple, various hickories, beech, yellow-poplar and ash, with occasional walnut and scattered other species. Plantations of conifers are also found in the park. Principal species include white and red pine. The vast majority of the overstory at the park originated from the end of the iron producing period at Hope Furnace. There are numerous canopy gaps throughout the park, a result of white oak decline in the last decade. Declines and insect infestations are common in overstocked stands and/or forests lacking in age or species diversity.

*Understory:* The understory layer is often as diverse as the overstory with a large number of species occurring. These species may be site or aspect oriented and the current stage of succession can dictate which species will be present. However, it is often a plant's tolerance for shade that dictates its ability to survive in the understory. Shade tolerant species such as maple, beech, hemlock, blackgum, and basswood may exist in the understory for many years. These species will strive for a position in the overstory once an opening in the canopy occurs. Other understory species such as flowering dogwood, spicebush, redbud, witch hazel, pawpaw, hawthorns, and others remain in the understory.

*Herbaceous Layer:* The herbaceous layer at Lake Hope is typical of Upland Central Hardwoods. Black cohosh, ginseng, various orchids and native wildflowers grow in fertile cove areas. On drier sites, grasses, forbs and some wildflowers are common.

*Habitat Components and Wildlife Populations:* The majority of the area in Lake Hope State Park consists of mature oak-hickory forests with associated vegetation and wildlife habitat. In addition, there is aquatic habitat in and around the lake. This habitat draws in different groups of birds and is a focus area for some mammals as well, like beaver.

Historically wildlife management practices in Lake Hope State Park have been limited to:

1. Restrictions on hunting
2. Providing food for birds to increase viewing opportunities

One condition that has been limiting in the last few decades has been early successional forest habitat. A mature forest condition may be good for some interior forest dwelling species, however it is limiting to others. Many species require multiple habitat types, many times in close proximity. Historically the land management program on Zaleski State Forest has provided that habitat. However, there will be value in creating some of this habitat in Lake Hope State Park itself.

The park zoning system, detailed in exhibits 1-3 will guide the types of silviculture prescribed in a given area. Each silvicultural system has an impact on wildlife. Management strategies that favor site-appropriate, native species shall be emphasized. In general, uneven-aged systems will favor late-successional wildlife and even-aged systems will favor earlier successional wildlife. It is worth noting that many species typified as late-successional actually require some early-successional habitat for part of their life cycle. Likewise many species categorized as early-successional need some habitat components that are most typical in late-successional forests. Therefore management may benefit nearly all forest dwelling species in some fashion.

The intent in forest cover manipulation is not to directly control or manipulate wildlife. Rather, the intention is to manage primarily for a diversity of habitat types and thereby maximize biological diversity.

*Invasive Concerns:* Invasive plant species found in the state park include Ailanthus, multiflora rose, Japanese stilt grass, and Japanese honeysuckle. Potential spread of invasive species will be identified at the stand level in the cruise reports. All logging equipment will be cleaned by the contractor prior to project implementation as part of any timber sale contract.

One other interesting invasive is the wild boar. Boar populations have not yet been found on Lake Hope State Park but they are nearby enough to cause concern. Problems will be reported to the Division of Wildlife for further investigation.

## **B. Sustained Yield and Forest Level Growth**

No complete forest inventory of Lake Hope State Park has been conducted. Future inventory plans are listed under Section IV. It is reasonable to consider that growth information would be similar to the surrounding Zaleski State Forest, which has recently been calculated to 270 board feet per-acre per-year based on a strata-level cruise on most of the state forest system.

For further comparison, average growth rates for surrounding counties in southeast Ohio was calculated using the Forest Inventory and Analysis (FIA) data set compiled by the US Forest Service. The FIA data set is a statewide inventory data set that is maintained long-term and provides baseline data for the current and historic conditions of Ohio's forests.

The purpose of these calculations is to provide evidence that future harvests from Lake Hope State Park are sustainable and well within the calculated growth.

Lake Hope State Park

Total Inventory (board feet)	Total Park Acres	Zones C and D only	Growth Bd F / Yr (Considering only Zone C and D)	FIA Data Average Growth Bd Ft / Yr (for comparison)
Unknown	2,675	1,584	427,680	348,480

### C. Landscape Level Information

*Adjacent Forests:* Vinton County is more than 70% forested. Lake Hope itself is surrounded almost completely by Zaleski State Forest. The current forest inventory for Zaleski indicates an average volume of approximately 11,675 board feet per acre, more than 71% greater than the county average of 6,800 board feet/acre. Lake Hope State Park almost certainly has a higher volume of timber per-acre than does Zaleski State Forest.

Other nearby publicly owned forestlands include Waterloo Wildlife Area, Vinton Furnace State Experimental Forest, and Wayne National Forest.

*Local Social and Economic Conditions:* According to 2010 US Census Bureau Data, the population of Vinton County is 13,435, which is the lowest population in any county in the State of Ohio. The median household income was \$34,275, which ranks Vinton County as one of the poorest counties in the state.

Lake Hope State Park helps provide a low-cost recreation option for the surrounding community. Miles of trails, a public beach, and a large lake for fishing are all free to the public. The state park staff provide hours of nature programs that give educational opportunities.

*Climate:* Most of Ohio lies within a climatic region classified as Humid Continental, warm summer phase, with predictable general changes. The mean annual temperature for the Vinton County area is 54 °F, with season averages of 71 °F in summer and 32 °F in the winter. Annual precipitation averages 40.3 inches of total precipitation with 59% of precipitation falling from April to September. The average snowfall is 21 inches.

*Geology:* Lake Hope State Park lies entirely within the un-glaciated portion of the Appalachian Plateau. Topography of the forest ranges from rolling hills, found in central Vinton County, to steep hills found in the western and eastern portions of the county. Streams and valleys penetrate the forest, which is typified by narrow ridges, steep valley slopes and level valley floors.

Surface strata are composed of residual soils formed by the weathering of bedrock and are composed predominantly of calcareous sandstone and shales, except for a small portion formed on limestone and limy shale. Most soil is generally light colored and well drained due to the steep, sloping relief. The deepest, richest soils are located within the valley bottoms. However, most of the soil is low in natural fertility and organic matter.

*Cultural, Historical, & Archeological:* The Zaleski region has a rich history of Native American use. The most noticeable use was by the Adena group, 1500 to 2500 years before present. A notable example of their presence is the "Ranger Mound" found on Zaleski State Forest near the park. The mounds of this period, ranging in height up to 20 feet, were used for burial and signaling purposes. Similar mounds can be found scattered throughout southeastern Ohio. The use of the area in this period is likely connected to an ancient trail passing from present day Marietta to Chillicothe. This road continued to be used through the European settlement period.

One of the most visible reminders of the settlement era is the Hope Furnace, located in the southeast corner of the park. This furnace is one of several remnants of the iron producing industry that was once strong in the Hanging Rock region of Ohio.

## IV. LAND MANAGEMENT GOALS & OBJECTIVES

The overall objective of active forest management in Ohio's State Park system is to provide greater diversity of wildlife habitats and to ensure the natural resources of the State of Ohio are managed responsibly. To accomplish this goal, a system for managing the timber resource while protecting other values in the park will be developed. Zoning classifications will guide potential management in a given park. Zoning will designate areas where harvesting is not appropriate and thereby continue to be managed as they have in the past. Protection of cultural resources and other sensitive areas will be primary considerations. Benefits of this sustainable resource program include not only improved wildlife habitat and biodiversity, but also providing income to the operating budget of the state park system.

*Forest Zoning:* Management objectives are guided and designated by zone classifications. The descriptions are described in detail in Exhibit 1. Exhibit 2 lists acreages for each zone class in the park.

*Cultural Areas:* Cultural areas include Adena Mounds, early settlement, and old homestead sites. These sites are designated for protection through forest zoning and/or a preactivity assessment done for known historical sites. Site assessments may be made by Division of Forestry and Division of Parks and Recreation staff.

*Sensitive Areas:* Visually and environmentally sensitive areas are common features of state parks. Visual management is guided both by zoning and aesthetic forest management guidelines. Environmentally sensitive areas are managed through Best Management Practices (BMP's) for forest management operations, park zoning, streamside management zones, and pre-activity assessments listed under Section V. Site assessments will also be made by Division of Forestry and Division of Parks and Recreation staff.

*Public Recreation and Tourism:* Forests are an important aspect of outdoor recreation in Ohio. The ODNR 2008 Statewide Comprehensive Outdoor Recreation Plan (SCORP) shows that there are 3,638 forest-based recreational sites in Ohio. It further shows that Ohio ranks low nationally for per capita outdoor recreation acreage. The SCORP shows that forest-based recreational sites are the most popular; including camping, niche recreation, and trail-based recreation. Due to the potential for negative impact on recreational sites, all planned timber management activities will:

- Have an assessment to determine the season(s) of least likely impact
- Seek to minimize impact to existing trails and facilities
- Where possible, improve trails, wildlife viewing, access roads, and public parking opportunities

*Inventory Goals:* Since no data currently exists for forests in state parks, an organizational process must first guide future inventories. Using existing knowledge, park zoning, remote sensing data, and topographic features stands will be delineated in the park. Over the next ten years, stands with potential for timber management will be inventoried and the data collected will guide future management.

The data the Division of Forestry foresters collect along with forest zoning will determine whether to harvest and the type of harvest to take place. This inventory is commonly referred to as a "cruise". During these cruises, the trees are statistically sampled to give the foresters numerical data that assists in detailing the prescription for that particular area. Tree health, forest health, wildlife and aesthetic values, and tree reproduction are just some of the other important assessments that are made during the cruise. Other areas may be cruised on an as-needed basis to respond to changing forest conditions.

Once the forested stand has been cruised, analyzed, and prescriptions are written, the areas to be harvested are then prepared for the actual harvest operation. This entails painting boundaries around the sale, flagging skid trails and haul roads that will be utilized, and depending on the type of sale, individual trees may be painted as either leave trees or harvest trees. These preparations will guide the loggers in performing the harvest according to the prescription.

Once the area has been cruised, appropriate prescriptions have been written, timber volumes have been estimated and the trees have been marked, the sale is publically advertised and sold based on a competitive bid process. For efficiency, the Division of Forestry may combine sections of timber sales in state parks with planned sales in state forests. Combining sales will make them more attractive to potential buyers and can take advantage of the geographic proximity between state forests and state parks.

*Harvest Restrictions:* Harvest restrictions are generally determined by the park zoning, cultural or sensitive areas present, and adjacent uses. These restrictions will be assessed during timber sale preparation.

Harvest restrictions that may be assessed contractually include season of harvest, type of equipment to be used, procedures to distribute logging slash, and rehabilitation guidelines.

A Wet Weather Logging Policy has been designed to protect water quality, public infrastructure, and soil productivity during the harvesting of Ohio state forest timber sales and will also be utilized for guidance in state parks. This policy restricts logging during various states of wet weather conditions to provide better resource protection.

In all cases, BMPs shall be followed as listed in BMPs for Erosion Control on Logging Roads in Ohio, ODNR - Division of Forestry.

*Harvest Amounts:* Harvest amounts will never exceed the annual growth listed in Section III-B. In all likelihood the annual harvest rate will be significantly lower than this figure. Harvest rates will be evaluated annually.

*Special Concerns:* Forest zoning is designed to identify areas of special concern. Zone A is designed to protect high value conservation forests due to natural features and historical values. The area surrounding Lake Hope is designated zone A for both watershed and recreation protection and protection of the historic Hope Furnace.

For zone descriptions and more detailed information for the special management considerations for each zone, please see Exhibit 1.

Future defoliation events caused by the gypsy moth caterpillar and the potential arrival of sudden oak death in the eastern United States are of particular concern to the oak resource in Ohio. Emerald ash borer, a lethal pest found in Ohio, will increase ash mortality in both urban and forested landscapes. Fortunately, there is very little mature ash in Lake Hope State Park so the impact of this invasive pest will be minimal.

Movement of firewood around the state has the potential to spread invasive forest pests, such as the emerald ash borer, gypsy moth, and Asian longhorned beetle. Signs around the campground at Lake Hope warn users against transporting firewood from distant areas.

*Threatened/Endangered Species:* The identification, conservation and enhancement of rare, threatened, and endangered species is of the utmost importance to the Ohio Department of Natural Resources. The Department has a legal obligation to comply with applicable federal and state regulations and a moral obligation to use the tools at our disposal for the conservation of these species. The Division of Forestry will employ several mechanisms to aid in the identification, conservation, and enhancement of rare, threatened, and endangered species on Ohio State Park land that are discussed below.

#### Pre-Activity Assessment

Prior to any site-disturbing activities, the Division of Forestry conducts an assessment using the most up-to-date relevant data sources available. These data sources include the Ohio Biodiversity Database, formally known as the Natural Heritage Database, administered by the ODNR Division of Wildlife Biodiversity Program. This data is used to plot the actual suspected or known locations of rare, threatened, and endangered species. The results of our reviews can be used by the Biodiversity Program to update the data set. The staff of Biodiversity Program will be consulted about any conflicts and the techniques for mitigation.

#### Review by Relevant Specialists

Prior to any site-disturbing activities, all reviews that note a positive "hit" of a possible sensitive species is offered to a relevant specialist for a ground survey. All potential timber sales will also have consultation with a rattlesnake biologist regardless of the biodiversity program data. A botanist, naturalist, or a biologist is asked to review the site on the ground for species identification and for their recommendation or concerns. Mitigation and recommendations are communicated in the pre-activity assessment documents.

#### Commitment and Partnerships

ODNR has several Conservation Plans that are applicable to all public forests. The relevant conservation plans are listed below

- The Conservation Plan for the American Burying Beetle
- The Strategic Plan for the Management of Ohio's Black Bear Population
- The Conservation Plan for the Timber Rattlesnake
- The ODNR Indiana Bat Management Strategy

These plans outline specific objectives, goals and strategies for the recovery, management, and habitat requirements for these species. The Department is committed to complying with the recommendations of these plans. Further, over the next five years the Division of Forestry will:

- Ensure all relevant state forest personnel responsible for management plan implementation of timber management on state parks are trained and have an understanding of these plans and strategies.
- Maintain an active role as a partner in the composition and review of these plans.
- Commit to management efforts to provide restoration possibilities on state parks as budgets allow.
- Commit to the review of our activities by various partners of these plans.
- Promote and enhance our educational efforts for the protection of rare, threatened, and endangered species through landowner education, brochures, trade shows, and public websites.

#### Consultation with Other Experts and Interested Citizen's

The Department actively solicits the input of various experts from academia, non-government organizations, and other partners. Their input on the identification and conservation of the sensitive species is valuable to our work. The Division of Parks and Recreation communicates to the public through an open-door policy at each state park, active website, social media, support of local "friends of the park" groups and consultation from the Ohio Parks and Recreation Council.

For the next five years, the Division of Parks and Recreation will:

- Commit to continued solicitation of comments and input from local experts
- Commit to enhancing and refining methods for online communication
- Commit to annual open houses, open meetings, and/or online notification and consultation for any proposed management activities.

*Desired Future Conditions:* Through future management activities, the Ohio Division of Parks and Recreation looks forward to maintaining and improving a healthy forested environment composed of mixed species stands containing exemplary specimens of representative forest types. Through proper long-term management strategies, the forest will become less susceptible to catastrophic fire and should have a reduced probability of insect infestation and pathogen infection. The forest will also provide adequate cover, forage, and habitat for the various species of wildlife associated with the area. Along with sustaining viable populations of wildlife, the forested areas will be maintained in a manner that continues the aesthetic quality and environmental integrity of the property. Improving the health of these forests will better promote vigorous vegetation, provide wonderful wildlife viewing opportunities, create healthier watersheds, and will produce an enjoyable place for public recreation.

*Awareness and Education:* The Division of Parks will make an effort to raise public awareness of all projects in the state park. This will be accomplished through informational signage and naturalist programs.

VI. **MONITORING**

Monitoring and evaluation of activities is a continuous process.

The Division of Forestry state forest manager responsible for overseeing resource management programs on state parks will have his annual performance review tied in part to his individual effectiveness in implementing this plan. In addition, all Division of Forestry employees will be evaluated on their appropriate portions of the plan.

District and Columbus staff of the Division of Forestry will review inventory reports and marking reports to ensure policies are followed. To ensure objectives are achieved and consistency is maintained, district staff will conduct final timber sale inspections.

Finally, chiefs from the Division of Parks and Recreation and the Division of Forestry shall meet at least annually to review the program, this plan, and any necessary modifications.

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## Exhibit 1 – Description of Zones for Ohio State Parks

Zone A - Natural and Cultural Protection Focus Zone – Areas will not be considered for commercial timber harvest due to the sensitivity of the environmental resource. Examples are buffers around large lakes, wetlands, or areas with large numbers of listed species. Individual trees may need to be removed due for safety concerns or infrastructure improvements. Logs produced from these operations could be sold at the discretion of the park manager in cases of high value, but in most situations will decompose near where they originate or be utilized for firewood.

Zone B – Visual Focus Zone - These areas are adjacent to high use recreation areas, park buildings and infrastructure, public roads, and camping facilities. Timber management will not be considered a goal here except where access may be needed or where a timber harvest may improve public safety, enhance viewing opportunities, allow for infrastructure improvements, or to salvage timber damaged through insects, disease, or weather events. Any harvests in these areas will be primarily for state park user safety.

Zone C – Late Successional Forest Habitat Focus Zone - These areas will be considered for timber production with the goal of creating and maintaining an uneven-aged stand. Single-tree selection will be the dominant silvicultural method to obtain this condition, but small group selections may also be used. Exceptions will be allowed in cases of enhancing habitat for rare and threatened species, vista openings, and stands of planted conifers. The overarching goal for this zone shall be to maintain a well-stocked stand of healthy trees and prevent the loss of a valuable timber resource. There may be trails within these areas; operations around them will be managed on a case-by-case basis.

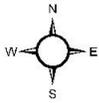
Zone D – Early Successional Forest Habitat Focus Zone - These areas contain no trails or public roads. If increasing biodiversity within a state park is a goal, then harvests may be done to create early successional habitat, regenerate shade intolerant tree species, and create improved viewing opportunities. Appropriate silvicultural systems may be single-tree selection, group selection/openings (up to 2.5 acres), deferment harvests, and shelterwoods.

**Exhibit 2 – Zone acres for Lake Hope State Park**

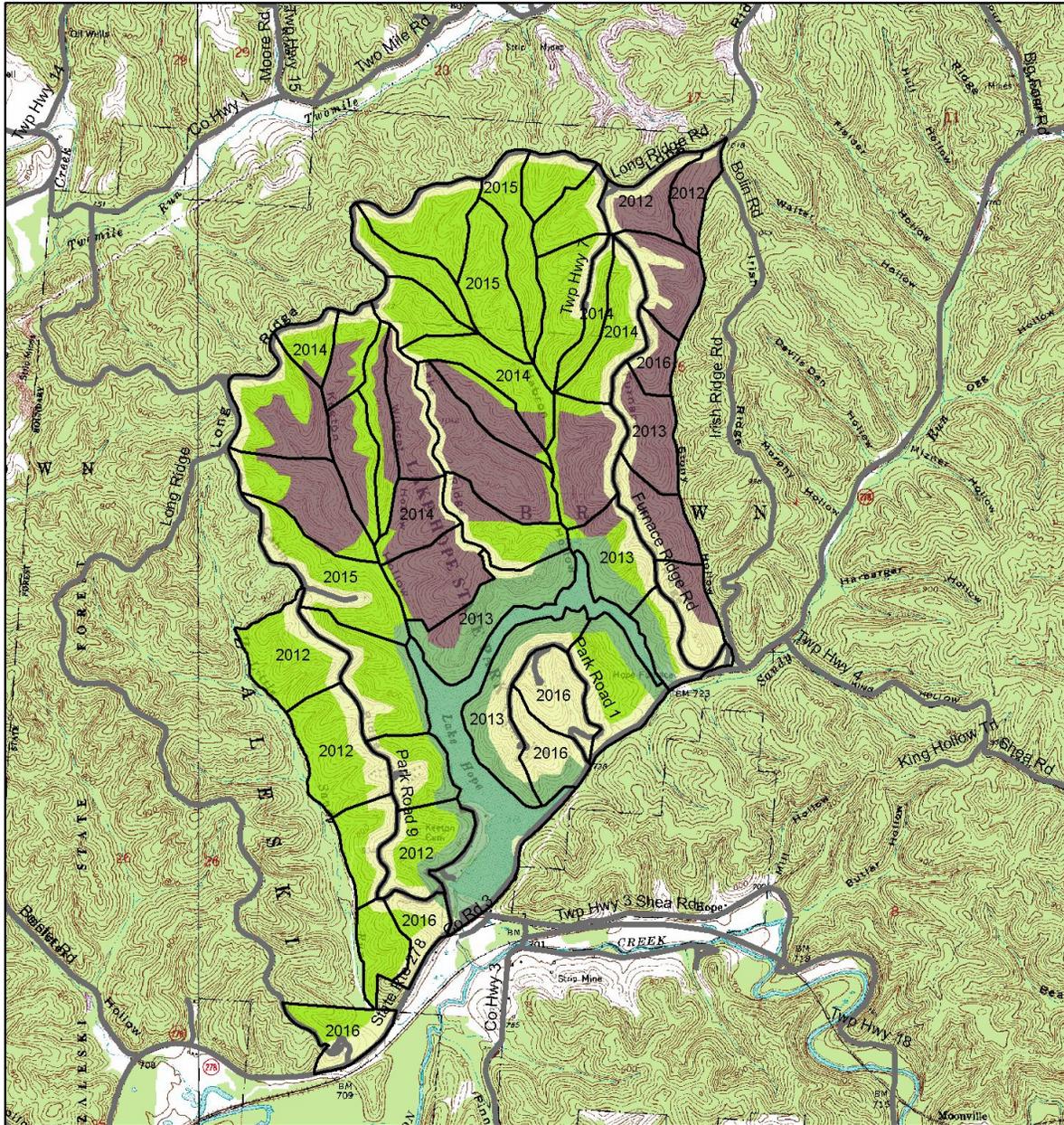
Zone	Acres
A	391
B	608
C	1008
D	667
Total	2674

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Exhibit 3 – Zone Map for Lake Hope State Park (not to scale)



# Lake Hope State Park Forest Management Zoning and Stand Cruise Cycle



**Legend**

- State\_Park\_Stands **Zone**
- Roads
- A
- B
- C
- D

