

Ohio Department of Natural Resources

Division of Forestry

Five Year Forest Management Plan

For

Richland Furnace State Forest



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Table of Contents

	Page
I. Strategic Plan	1
Summary of Goals and Objectives	
II. Forest History	2
Land Acquisition History	
Past Land Management/Uses	
III. Forest Description	2
A. <u>General Description</u>	
Property Location Description	
Soils	
Water Resources	
Access Issues/transportation considerations	
Potential Productivity	
Overstory	
Understory	
Herbaceous Layer	
Habitat Components	
Wildlife Populations	
Invasive Concerns	
B. <u>Sustained Yield & Forest Level Growth</u>	
C. <u>Landscape Level Information</u>	
Description of the Forests in Adjacent Counties	
Local Social and Economic	
Statewide Social and Economic Impact Evaluation and Monitoring	
Climate	
Geology	
Identify & Protect Cultural, Historical & Archeological Resources	
IV. Management Objectives	8
Zoning and Special Areas	
Forest Services	
V. Land Management Goals	10
Inventory Goals	
Harvest Restrictions	
Harvest Amounts	
Special Concerns	
Threatened and Endangered Species Protection	
Desired Future Condition(s)	

VI. Fire Management	13
History	
Fire Suppression Objectives	
Prescribed Fire	
Fire Prevention	
Other Fire Program Issues	
VII. Recreation	13
History	
Strategic Goals/Opportunities	
Maintenance Goals (volunteers)	
VIII. Public Awareness	14
Strategic Goals	
IX. Law Enforcement	14
History	
Strategic Goals	
Other Enforcement Issues	
X. Facility Maintenance and Infrastructure	15
Building/Infrastructure	
Roadway Maintenance Program	
Boundary Maintenance	
XI. Budget/Staffing	15
Maintenance	
Personnel	
Equipment	
XII. Monitoring and Environmental Assessments	16
XIII. Exhibits (maps, etc)	16

Note: This plan covers the time period of Fiscal Year 2011 – Fiscal Year 2015 and will be updated in Fiscal Year 2016.

OHIO DIVISION OF FORESTRY

I. **STRATEGIC PLAN** *(Effective 2008)*

Our Vision: Ohio's state forests will be the best managed forest lands in the country, and will be widely recognized as such.

To fulfill this vision, the Ohio Division of Forestry commits to meeting five objectives.

We will:

- Manage forests to ensure the health and sustainability of forest systems
- Produce high-quality forest products that contribute to local communities
- Provide recreational opportunities that require a large forest land base
- Provide unique forestry education sites and promote outreach and long-term research
- Maintain a highly trained and well equipped work force

To fulfill these objectives, the Division of Forestry will develop and implement strategies and plans that allow us to accomplish the following goals by 2011:

- Manage forests to ensure the health and sustainability of forest systems
 - *Implement a proven, verifiable approach to sustainable management*
 - *Manage for site-appropriate, native forest systems and species*
 - *Maintain long-term forest productivity through conservation of soil, water, and forest resources*
 - *Retain or promote stand- and landscape-level wildlife habitat*
 - *Assess the distribution and impact of non-native invasive species*
- Produce high-quality forest products that contribute to local communities
 - *Base State Forest harvest volumes on the goals and guidelines for each forest system, current stand and forest-wide inventories, and science-based silviculture*
 - *Develop marketing strategies to capture the maximum value of forest products*
- Provide recreational opportunities that are compatible with sustainable forest management
 - *Develop a comprehensive recreation plan for the state forest system*
 - *Build recognition for unique and varied recreation opportunities on state forests*
- Provide unique forestry education sites and promote outreach and long-term research
 - *Support forest research with an emphasis on sustainable forest management (silviculture, prescribed fire, native systems, etc.)*
 - *Develop opportunities to showcase forest management practices to the general public, private landowners, and forest industry*
- Maintain a highly trained and well equipped work force
 - *Develop a training, continuing education, and/or certification standard for all division staff*
 - *Inventory and evaluate equipment and facilities and develop maintenance and replacement schedules*
 - *Develop equipment and facilities budgets based on current and projected needs*
 - *Ensure all staff have appropriate health and safety training*

The Division of Forestry, complying with Governor Ted Strickland's Directive dated October 25, 2007, desires to achieve certification to the principles and criteria of The Forest Stewardship Council (FSC) and the Sustainable Forestry Initiative (SFI). Upon the completion of this certification process the forest will then have met their requirements for being recognized as a forest properly managed for sustainability.

Divided into compartments, a 20-year schedule is used to monitor the health and sustainability of the forest. After cruising prescriptions have been written, recommendations follow requiring some silvicultural action be taken to maintain the health of the forest. Wood products are derived from the recommended management actions that support the local economy as monies from the sale of the products are returned to the local school districts, county and townships. By maintaining a healthy, sustainable forest these wood products will continue to be available and, managed appropriately, the results will be a quality-produced product.

In this era of forest management producing a quality wood product is not enough. The forest is a renewable resource that provides food and cover for wildlife, protection of soil and water values, aesthetics, and an environment for both outdoor recreation and learning opportunities. Providing interpretive sites, trails, diverse habitats, are all part of the overall forest plan in meeting a multitude of uses.

Improving employee's knowledge, skills and abilities is a priority objective within the Division. The Division recognizes a knowledgeable work force translates into one that works more effectively and efficiently. Today this is even more important as the Division has seen its work force reduced greatly from years past. Training and educational opportunities are offered and made available to each employee annually.

II. FOREST HISTORY

Land Acquisition: Richland Furnace State Forest is named for the town of Richland, a now extinct company town that serviced the Richland Iron Furnace. This furnace was typical of those in the "Hanging Rock Region" of Ohio. Much of the land presently comprising Richland Furnace State Forest was purchased through the efforts of a State Representative from Jackson County by the name of Ballard. House Bill No. 496, sponsored by Ballard, authorized the purchase of 1,908 acres from the Florence Poland Estate. Acquisition for this original tract was completed on November 17, 1948 at a cost of \$20.00 per acre. During the 19th century Richland was a company town in the heart of the Hanging Rock Iron Region, the second largest producer of iron ore in the nation. The native hardwood tree resource was cut and used to make charcoal to fire the Richland iron furnaces in the late 1800's. Richland Furnace State Forest encompasses a total of 2,528 acres. Richland Furnace State Forest is open to public hunting and contains one of the four All-Purpose Vehicle areas operated by the Division of Forestry.

Past Land Management/Uses: During the iron era all the vegetation was continually harvested for the production charcoal. This allowed for direct sunlight to reach the forest floor and regenerate species that require full sunlight to reproduce. The railroad located on the north and east part of the forest played a significant role in the present composition and condition of the forest, because the engines did not have spark arrestors. Many wildfires were started due to the railroad and this has resulted in the present day species composition of oak-hickory stands.

III. FOREST DESCRIPTION

A. General

Property Location Description: Richland Furnace State Forest is located in the rolling hills of Southern Ohio. The forest lies just east of Byer in Washington Township of Jackson County. The forest is accessible by State Route 327 traveling northwest from Wellston.

Soils: Soils of the major portion of Richland Furnace State Forest consist of the Rarden-Clymer-Gilpin association. This association occurs on moderately steep and steep side slopes throughout the watershed. It usually occupies the area between the ridge tops and either terraces or flood plains except where the side slopes become very steep (25-40%). The Rarden soils are formed in acid clay shale and are well to moderately drained. These soils have very high clay content and are slowly permeable.

Clymer soils are well drained and have formed in soft sandstone. The depth of the sandstone bedrock is usually within 40" to 50". However, depth of sandstone can be as shallow as 20". Coarse fragment percent (5%) is quite low due to this soft sandstone. The permeability of the Clymer soils is moderate to moderately rapid. Gilpin soils are formed in either shale or siltstone and have an abundance of coarse fragments in solum. These soils are prone to erosion, are relatively shallow to bedrock, and have low agricultural productivity capacity. They are predominantly suited to woodland and permanent pasture.

Water Resources: Richland Furnace State Forest lies entirely within the Pigeon Creek drainage. This small watershed drains parts of northern Jackson County and southwestern Vinton County and is part of the larger Scioto River watershed.

Access Issues/Transportation: Access to Richland Furnace is through State Route 327 as well as several county and township roads. However access points are limited and land acquisition efforts should focus on improving access.

Potential Productivity: There are multiple ways to measure forest productivity within a defined land area, such as Richland State Forest. The site index value is a measurement 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 soil type, aspect, and available moisture. Due to its broad growth range in association with multiple tree species, Black Oak is often used to get a general site index value. The average site index value of Black Oak (base age 50) is 80.

Overstory: The forest is part of the overall Central Hardwood Region. The main forest type present is oak-hickory, as well as small stands of other forest types spread throughout the forest.

The main hardwood species include scarlet, chestnut, white, black and northern red oaks, yellow poplar, pignut, shagbark and mockernut hickories and sassafras. Native conifers include Pitch, Virginia and shortleaf pines.

The coves, depending on site class and aspect, support high quality hardwoods such as yellow poplar, black walnut, white ash, black cherry, and red oak.

Conifers, growing naturally or in plantations, comprise an insignificant proportion of the timber resource. Native pine is scattered and of poor quality, with little potential for improvement and is managed as a part of the hardwood stand within which it is growing. Pine plantations are primarily composed of white and red pines.

Richland Furnace, prior to state ownership, was subject to many uncontrolled fires. The legacy of these fires is clearly displayed by timber quality deficiencies in stands where uncontrolled fire was most common.

Understory: Sugar maple, red maple, blackgum, and ash make up the majority of the understory depending on aspect. Red maple is prevalent on the more xeric sites while sugar maple is more prevalent on more mesic sites. The dominance of maple species in the understory will have an increasing influence on the species composition of large-diameter trees. Without active management activities the existing oak-hickory stands will evolve into a more northern hardwood cover type.

Herbaceous Layer: As with the overstory and understory, many factors will determine the types of species found in the herbaceous layer. This layer is often the most diverse and includes many different species of forbs and grasses. The forest management and variety of land uses also contributes to a further diversifying of the herbaceous layer.

Wildlife Populations and Habitat Components: Forest management increases our ability to create and maintain a high level of diversity and interspersions of habitats necessary for the maintenance of a great variety of native fish and wildlife, including non-game, as well as game species. One of the goals of state forest multiple use management is to provide a variety of vegetative covers (both in species and age classes). This should provide as great a variety of native flora and fauna as practical and produce levels of native fish and wildlife that are compatible with the environment and other forest uses.

On Richland Furnace State Forest, habitat management objectives shall be accomplished through normal silvicultural practices. In relation to other forest practices, wildlife management should receive the same emphasis given to, soil, water, recreation, aesthetics, and timber.

Proper BMP's can significantly benefit wildlife. All TSA's shall follow BMP recommendations when sale activities are occurring.

The Forest Wildlife Management Objectives for this forest are:

1. To develop and maintain abundant and diverse wildlife resource representative of the Central Hardwood Forest. This will be accomplished through the application of sound silvicultural practices and, to a lesser extent, through the use of specialized wildlife habitat practices.
2. Sustain and improve populations of federal and state threatened and endangered species. Use the best science and consultation available to accomplish this goal.
3. To provide quality wildlife-related recreational experiences in the forest consistent with wildlife resource needs. Quality will be maintained by limiting recreational use, principally through controlled access and regulation

Historically, specific wildlife management practices on the forest have been associated with the following areas:

1. Old field plantations of conifers.
2. T.S.I. work on the forest including that on select and regeneration cuts.

Each silvicultural system has an impact on wildlife. Management strategies that favor site-appropriate, native species shall be favored. Specifically, silviculture that promotes the regeneration and maintenance of Oak/Hickory native associations shall be favored.

All silvicultural practices applicable to the forest types should be employed to provide for a mosaic of habitat types. This should include zoning variability to provide for differing management strategies, regeneration harvests, single-tree selection and group tree selection harvest methods, timber stand improvement projects, and other types of thinning.

The intent in forest cover manipulation on state forests is not to control or manipulate wildlife. Rather, the intention is to manage primarily for multiple benefits and maximize biological diversity.

Invasive Concerns: Common invasive species located at Scioto Trail State Forest include the following but not limited to: *Ailanthus altissima* (Tree of Heaven), *Lonicera japonica* (Japanese Honeysuckle), *Rosa multiflora* (Multiflora Rose). Compared to many state forests, invasive species are not a significant issue at Richland Furnace.

Recently the Division of Forestry received a grant from the U.S. Forest Service to develop an Ohio Woodland Job Corps for the control of invasive plants within the State Forests System. From this grant 10-12 people will be employed, temporarily, to work on invasive plant control and timber stand improvement while receiving job-training skills. These two crews are responsible for taking care of the invasive species problems at Scioto Trail, Richland Furnace, and Tar Hollow State Forests. Division staff will identify areas to control throughout the year by utilizing the project proposal process.

B. Sustained Yield and Forest Level Growth

In 2009, the Division of Forestry procured the services of LandMark Systems to provide a comprehensive inventory of the 8 largest state forests (Brush Creek, Hocking, Pike, Richland Furnace, Scioto Trail, Shawnee, Tar Hollow, and Zaleski). The purpose of this project was to provide decision support for forest management activities, to update our current inventory database, and provide forest inventory information for the public. To meet these requirements, a stratified forest inventory was conducted in the spring of 2009. The inventory used proprietary techniques to extrapolate a field sample consisting of 2,209 plots across all the acres of the project area. This approach provided a forest-level inventory estimate within the allowable budget and statistics.

While the Division of Forestry desires a stand-level inventory, lack of resources to perform such a detailed inventory was not possible at the current time. LandMark Systems proposed to leverage a number of remotely acquired data sources (imagery, etc) to arrive at a level of detail that is more refined than a regular stratified-level inventory. The result was an inventory data set that is between a stratified-level and a stand-level approach. For this project, LandMark Systems provided color-infrared imagery and other data sets that were used to model certain stand characteristics based on the data produced from the 2,209 plots.

The inventory results were then modeled for growth & yield using the Forest Vegetation Simulator (FVS) Northeast Area TWIGS variant. FVS is a publicly available growth and yield model produced by the US Forest Service. For over 400 different stands that contained plot data, growth rates were established according to site conditions. Net growth rates incorporated in-growth and mortality and were evaluated for a 10-year period. Net growth rates were summarized and averaged for each stratum that occurred on the state forest project area.

For each state forest, the inventory and the net growth rates were calculated based on the data output from the FVS model and applied to the entire state forest. This calculation is noted in the table below as the "Total" growth rate. However, each state forest has a system of management zones that define the management options for those areas. Several zones provide for limited or restricted management. Therefore, the calculation of growth & yield is also provided for only zones 3B and 3C where forest management is active. This calculation is noted in the table below as the "Constrained" growth rate.

For further comparison, average growth rates for counties where state forest occur 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 the harvest and removal of forest products from state forests are sustainable and well within the calculated growth of the forest. Also provided in the table below is the average harvest level over the last ten years for comparison.

Richland Furnace State Forest

Total Inventory (board feet)	Productive Acres	Total Growth Bd Ft / Yr	Zone 3B and Zone 3C Acres Only	"Constrained" Growth Bd F / Yr	FIA Data Average Growth Bd Ft / Yr (For Comparison)	Average Harvest - Last 10 Years	Harvest as % of Growth
28,762,834	2,430	643,561	2,383	631,609	523,756	93,285	15%

C. Landscape Level Information

Adjacent Forests: Much of the adjacent private land is in small farms, and is expected to remain in this condition. The presence of the forest enhances the value of surrounding private land. The forest is located in Jackson County. Jackson County is 58% forested. The county averages approximately 4158 board-feet per-acre according to the most recent FIA data. The current forest inventory for Richland Furnace indicates an average volume of approximately 11,834 board feet per acre, more than 180% greater than the county average. These statistics indicate that Richland Furnace provides significantly more late, successional habitat than the surrounding forests.

Nearby publicly owned forest lands include Wellston and Superior Wildlife Areas, Lake Alma State Park, and Lake Katherine State Nature Preserve. Nearby State Forests include Zaleski, Scioto Trail, and Dean State Forests. An additional nearby property, the Raccoon Ecological Management Area, is currently being purchased by the Department of Natural Resources and will be managed by the Division of Forestry.

Local Socio-Economic: Currently it is estimated that the wood products industry in Ohio is a 15-billion dollar per year industry. This industry is dependent on sustainable managed forestlands throughout the state. State Forests provide an important function of demonstration for long-term sustainable management that can be applied to private lands. This is an indirect economic benefit to all forests in the state. Indirect benefits also result from the sale of approximately 500,000 board feet per year that contributes to the local wood products community. Direct economic benefits are created when the proceeds from the sale of stumpage, through the timber sale program, are shared with the State of Ohio General Revenue Fund, as well as counties, townships, and school districts where the sales are located.

The Forest and its staff also provide many informational and educational opportunities. Forest employees often lead local students, interested forest visitors, and other clubs and groups on informational tours. There are also many special use permits issued for independent research projects and recreational uses. The APV trails often draw out of town and out of state visitors. When these forest visitors utilize the resources available at Richland State Forest, they are also contributing to the community both economically and socially.

Statewide Social and Economic Impact Evaluation and Monitoring: The evaluation, incorporation, and monitoring of social and economic impacts of forest management is conducted by the Division in several ways. Data used in our evaluation of social and economic impacts comes from several sources including the Ohio Statewide Forest Resource Assessment and Strategy (FRAS) and a suite of particular programs and efforts specific to state forest management.

A. FRAS

The Food, Conservation, and Energy Act of 2008 (the 2008 Federal Farm Bill) requires each state to complete a *Statewide Forest Resource Assessment and Statewide Forest Resource Strategy* to continue to receive funds under the Cooperative Forestry Assistance Act. The Division completed a document titled "Ohio's Statewide Forest Resource Assessment and Strategy" (FRAS). The purpose of the FRAS document is to provide a basis upon which future strategic directions and actions can be evaluated and selected. It is to be used by the Division of Forestry as well as existing and potential partners to marshal limited resources towards addressing identified forest issues and threats. One of the criteria used in the FRAS, Criterion 6, is the Maintenance and Enhancement of Long-Term Multiple Socioeconomic Benefits to Meet the Needs of Societies. *The results of the FRAS and the associated strategies to deal with the identified threats is a significant source for state forest managers on our understanding and incorporation of social and economic impacts of state forest management.*

The 2010 Statewide Forest Resource Strategy for Ohio is a strategic planning document that will guide all state forestry activities by the Division of Forestry, including programs with funding from USDA Forest Service State and Private Forestry grants. The State Strategy is framed around the key issues identified in the FRAS, as well as the important benefits and services that Ohio forests provide. Stakeholder input was a critical component of the assessment process and, in particular, the identification of key threats and opportunities for Ohio's forests.

An important role for all stakeholders is to increase public awareness of the benefits forests provide and the role that all Ohioans play in sustaining those benefits. This has been identified as one of the major issues facing Ohio's forests. The Division has several programs, including state forest management, which are listed and committed to accomplishing this goal. Public outreach and educational efforts are identified in each state forest Annual Work Plan.

B. State Forest Efforts - evaluation and monitoring of Social and Economic Impacts

A suite of particular programs and efforts specific to state forest management contribute to our evaluation and monitoring of social and economic impacts. These activities happen at a local or regional level.

- *Civic Activities* – Division staff are members of and associated with various clubs, organizations and civic groups. This is an important way, especially for local forest managers, to stay in touch with their community.
- *Indigenous Peoples Consultation and Cooperation* - The Division works closely with the Hopewell National Historic Park and the OSU-Newark Earthworks Center on training for staff on the significance and protection of cultural resources. Further, the Division extends an offer of cooperation to tribal contacts who may have an interest on providing input into our management.
- *Forest Industries Program* – This program works cooperatively with government agencies and industrial associations to enhance Ohio’s domestic and international wood products marketing opportunities.
- *State Forest Timber Sale Revenue Distribution to Local Governments* - Through the “Trees to Textbooks” program, administered by the Ohio Department of Natural Resources (ODNR) Division of Forestry, a percentage of the revenues generated from state forest management activities go to the county, township, and school district in which the activity took place. Over \$21 million has been distributed since 1983 to some of the most economically disadvantaged counties in Ohio.
- *State Fire Assistance* – The Division has multiple programs to educate local communities on wildfire risks and to provide necessary training, equipment, and suppression assistance to rural volunteer fire departments.
- *Recreation Program* - The recreation program administers all of the recreation facilities, grants, and special uses of our state forests. The division collaborates with a number of not-for-profit recreation organizations on special projects that are compatible with the division’s mission. All state forests are open to public recreation.
- *Public Participation and Consultation* – The Division has several means by which citizens’ may have a voice to our management of the forests. There is an appointed Forest Advisory Council, annual open houses, public meetings, an open records law, and a friendly open door policy.
- *Other working groups and partnerships* – The Division is involved in a host of working groups, committees, and partnerships that focus on a variety of issues from forest health, Emerald Ash Borer, Logger Training, and many others.

C. Plan for Evaluation and Monitoring over the next 5 years.

The FRAS is a document that is updated every 5 years with new information. The FRAS serves as one type of monitoring since it incorporates social as well as economic data sets in the results. The Division’s plan for the incorporation of the FRAS data into our management is as follows:

1. *Training* – The FRAS is an assessment of present and future forest conditions and trends on all ownerships in the state and a strategy document to deal with identified threats. All relevant state forest staff will receive training on the assessment and associated strategies and these strategies will be incorporated into our annual work plans for each forest.
2. *Commitment to Participation in the Strategies* – The FRAS identifies 6 key issues with associated objectives and strategies to mitigate those issues. For each issue, agencies and programs are identified as being key factors towards mitigation. State Forests will commit to playing a key role in the Division’s efforts to mitigate the threats and capitalize in the opportunities identified through FRAS. These efforts, identified in the FRAS strategies include:
 - a. Implementation of the Division’s strategic communications plan
 - b. Public awareness campaigns reaching citizens living in the wildland-urban interface and the small family forest owners.
 - c. Maintaining a supply of quality forest products and forest services from State Forest indefinitely into the future.
 - d. Provide diverse recreational opportunities.
 - e. Enhance Ohio’s diverse markets for forest products and services.

- f. Improve the quality of urban life through proper urban forest resource management.
3. *Commitment to Participation in the monitoring and update of the FRAS* – State Forest will play a key role in the update and monitoring of the items of the FRAS assessment.

For local or regional Division and State Forest efforts, the Division will attempt to gather data for evaluation and continue monitoring efforts. Specifically, the following activities will be planned for the next five years.

1. Timely reporting for programs or efforts listed above relating to social and economic impacts.
2. Voluntary user registration will be maintained and enhanced. Data from voluntary registration will be summarized for determining trends in use. These trends will be incorporated into the activities identified in the annual work plan.
3. Catalogue public comments are received at public meetings and open houses
4. Catalogue disputes and records requests.
5. Commit to participate in civic activities at each unit location.
6. Commit to the partnership efforts important to state forests and report as needed.
7. Continue to strengthen outreach and education programs.
8. Broaden the scope of our consultation efforts.

All of these monitoring efforts are reviewed at least once per year by the Integration Committee for the Division. The Integration Committee determines the responses and/or actions that need to be taken to address the results of the monitoring. Recommended actions or adjustments to policies or procedures will be considered for inclusion into our policy documents. The results of monitoring will be incorporated in our strategic plan, 5-year management plans, and annual work plans.

Climate: The temperate climate of the area is characterized by an annual average precipitation of 36 inches that is nearly distributed evenly throughout the year. Annual snowfall averages 20 inches with minimal accumulation. Seasonal temperatures average 75° F. in the summer and 36° F in the winter months.

Geology: Richland Furnace State Forest is located in the unglaciated region of Southern Ohio. The bedrock consists mainly of acidic sandstone with some shale present. It is this parent material that has developed into the present day acidic forest soils.

Cultural, Historical, & Archeological: Native Americans used Richland Furnace and surrounding lands for millennia prior to European settlement. Flint outcrops in the forest provided material for tools. One significant archeological site, an Adena mound, is known to be within forest. A stone remnant of the old Richland iron furnace stands on private property just north of the Richland Furnace State Forest. Remnants of past subsistence agriculture and small farmsteads are still present in the forest.

IV. MANAGEMENT OBJECTIVES

Zoning and Special Areas

Forest Zoning: Forest management objectives are guided by designated zone classifications. The descriptions are described in detail in the Division's Land Management Manual. Currently the manual and all zone classifications are undergoing revision. Exhibit 1 contains the current zone map for Richland Furnace State Forest. Exhibit 2 lists acreages for each zone class in the forest.

Research Areas: Numerous research projects have been conducted and are on-going at Richland Furnace State Forest. Research collaborators with the Division include The Ohio State University, Ohio University, and the USDA – Forest Service Research. Topics of research are currently prescribed fire and oak regeneration. Much of this research is long-term in nature such as the Fire and Fire Surrogate sites that are part of a national research program. All requests for research are reviewed through the special use permit process.

Cultural Areas: These are primarily early settlement and old homestead sites. These sites are designated for protection through forest zoning and/or a special sites zoning layer referenced prior to any forest management activities. As sites are found this layer is updated to reflect current knowledge.

Sensitive Areas: Both visually and environmentally sensitive areas are present at Richland Furnace State Forest. Visual management is guided both by forest zoning and aesthetic forest management guidelines. Environmentally sensitive areas are managed through BMP's for forest management operations, forest zoning, and streamside management zones.

Forest Services

In developing this 5-year forest management plan, the Division recognizes the important public benefits and services that our State Forests provide. These services include but are not limited to soil and water resources, municipal watersheds, aquatic life, wildlife, carbon storage, and recreation and tourism. These services are considered in our management of state forest and the development of our management plans. It is the intent of the Division to maintain and/or enhance these services through proper forest management.

Soil Quality: The Ohio Statewide Forest Resource Assessment and Strategies, 2010 (FRAS) include criteria and strategies dealing with soil quality for Ohio's forests. The FRAS report includes data from FIA and other soil data that show that the Soil Quality Index (SQI) for Ohio's forest soils is superior to that of neighboring states. The higher SQI is attributed to greater cation exchange capacity and a more desirable calcium-aluminum ratio. Low calcium-aluminum ratios are indicators of acid deposition. The average amount of soil carbon in the top 20 cm of mineral soil is 22 tons per acre and similar to neighboring states indicating the importance of protecting the top 20 cm of mineral soil. Certain forest management practices can increase carbon sequestration. The FRAS assessment cites that although Ohio's forests are maturing, the amount of carbon stored per unit area has changed little over the past 6 years. Over the next 5 years the Division will take the following actions to maintain or enhance soil quality on state forests:

- Continue to require and promote the use of Best Management Practices for logging practices to control erosion.
- Develop guidelines for acceptable working conditions for logging during times wet weather to prevent sedimentation and minimize rutting.
- Develop guidelines for the retention of biomass in the forest including live tree and snag retention.
- Promote carbon sequestration tree plantings on state forests.
- Conduct training for all relevant state forest staff on BMP's and biomass retention.
- Commit to the strategies outlined in the FRAS strategies document.

Water Quality: The Ohio Statewide Forest Resource Assessment and Strategies, 2010 (FRAS) include criteria and strategies dealing with water quality in Ohio's forests. This assessment cites that the amount of forest within a watershed is a very important factor on infiltration rates and timing of surface runoff that reaches a stream. The Ohio EPA data shows that despite this fact the water quality of the most heavily forested watersheds in Ohio varies. These data show that the principle cause of impairment of Ohio's forested watersheds is related to landscape modifications from agriculture and urban development. Specifically, the pollutants that enter streams in these impaired watersheds are from 1) human or livestock sewage, and agriculture chemicals, and 2) sediment from agriculture or urban development. Acid mine drainage is also cited as a factor. The Ohio EPA has also designated many Superior High Quality Waters and Outstanding State Waters based on a number of factors including aquatic life. Several of these streams are located on Ohio's State Forests. Over the next 5 years the Division will take the following actions to maintain or enhance water quality on state forests:

- Continue to require and promote the use of Best Management Practices for logging practices to control erosion.
- Develop and analyze our pesticide use policy on state forests with the intent of limiting pesticide use to only directed applications mostly for invasive species control.
- Continue to implement a "Streamside Management Zone" (SMZ) policy on all harvests.
- Review our current state forest zones and Ohio EPA high quality water locations for possible gaps with the intent to maintain and protect the current high quality status of those streams.
- Conduct training for all relevant state forest staff on BMP's, SMZ's, and EPA water quality data.

- Commit to the strategies outlined in the FRAS strategies document.

Public Recreation and Tourism: Forests are an important aspect of outdoor recreation in Ohio. All State Forests managed by the Division of Forestry are open to public recreation and the Division maintains a Recreation program to administer those recreational uses of the forest. 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. The Division maintains a large network of trails for horse riding, hiking, biking, and ATV riding. Over the next 5 years the Division will take the following actions to maintain or enhance public recreation on state forests:

- Maintain our backcountry recreation resources for all state forests.
- Build recognition for unique and varied recreation opportunities on state forests.
- Develop trail standards for maintenance and seek funding for activities.
- Build partnerships with recreational user groups.

V. **LAND MANAGEMENT GOALS**

A more complete description of the Land Management Practices and Processes on State Forests can be found in the Division of Forestry's Land Management Manual. Silviculture is the art of cultivating stands of trees, including their establishment, tending, perpetuation and harvest to produce a forest of distinctive form. Systems of silviculture are broadly classified according to methods of harvest cutting employed in reproducing a stand of trees. A multitude of silvicultural applications, both pre-commercial and commercial are utilized to accomplish the above management objectives. The Division policy and forest zoning generally govern the application of the various methods and practices. Foresters weigh these factors with current stand conditions to determine the appropriate silvicultural practice for a given site.

Inventory Goals: In order to determine if an area should be harvested and to also determine what type of harvest should take place; land management foresters conduct an inventory and analysis of the forest stands in questions. These inventories are scheduled on a rotation in which each compartment (a geographic block of forest) is visited every 20 years. 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. On average 350 to 700 acres are cruised per year.

Currently the Division is analyzing data from the forest inventory that will be used to develop a new inventory system based on a growth and yield model. This will change the historic 20-year schedule sometime in the near future.

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 trails and 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 publicly advertised and sold based on a competitive bid process.

Harvest Restrictions: Any method of logging other than by means of animals, motor trucks, farm or crawler tractors, hydraulic tree shears and rubber tired four-wheel-drive skidders may be employed only with the advance approval of the Timber Sale Administrator in charge of the harvest. Tracked cut-to-length harvesters and forwarders are commonly used, and may be contractually required, for pine harvests. More specialized equipment or techniques may be necessary to limit harvesting impacts. In such a case this will be identified on the marking transmittal and will become part of the timber sale contract.

A Wet Weather Logging Policy has been designed to protect water quality, public infrastructure, and soil productivity during the harvesting of State Forest timber sales. This policy restricts logging during various states of wet weather conditions to allow for 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: As a result of harvest and growth analysis the Division will create a harvest target based upon 40% of growth. The growth is calculated from only those acres zoned III-B and III-C, which comprise the bulk of harvesting on state forests. A synopsis of the analysis performed is located in a table in section III, subsection B. The target is conservative and will continue to be evaluated throughout the period of this plan.

Special Concerns: Forest zoning is designed to identify areas of special concern.

Zone III-B, is designated as an Aesthetic Area. This zone encompasses areas that may be adjacent to developed forest recreation areas, State Parks, or areas affected by high-density public use. Management in these areas is primarily directed toward maintaining healthy viable trees. Many areas along SR 327 are zoned as III-B.

For zone descriptions and more detailed information for the special management considerations for each zone, please see the full narrative in the Division of Forestry's Land Management Manual.

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. It will likely cause significant financial cost to municipalities, property owners, and the forest products industries as it spreads through the state.

Movement of firewood around the state has the potential to spread invasive forest pests, such as Emerald Ash Borer and Gypsy moth and also could spread other agents, such as the Asian Longhorned beetle.

Threatened/Endangered Species: The identification, conservation and enhancement of rare, threatened, and endangered species is of the utmost importance to the Division of Forestry. The Division has a legal obligation to comply with laws of this country and state and a moral obligation to use the tools at our disposal for the conservation of these species. The Division of Forestry employs several mechanisms to aid in the identification, conservation, and enhancement of rare, threatened, and endangered species on State Forest land that are discussed below.

Pre-Activity Assessment

Prior to any site-disturbing activities, the Division 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 Ohio DNR – Division of Wildlife, Biodiversity Program. This data is used to plot the actual suspected or known locations of rare, threatened, and endangered species. The Division seeks to review all compartments, harvests, and prescribed fires using this data. Over the next five years, the Division is expected to review dozens of compartments using this data. Further, the results of our reviews can be used by the Biodiversity Program to update the data set.

These reviews are used to map locations of species or sites and used as a planning tool for the layout of activities. The Division of Wildlife staff offers recommendations on the life history of the species found as well as mitigation efforts to be considered.

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. A botanist or a biologist is asked to review the site on the ground for their recommendation or concerns. Mitigation and recommendations are communicated in the pre-activity assessment documents.

Commitment and Partnerships

Ohio has several Conservation Plans that the Division of Forestry references in our management of the state forests. These plans are put together by various partnerships that the Division is active in one form or another. The relevant conservation plans are listed below:

- The Conservation Plan for the Karner Blue Butterfly
- 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 Division is committed to complying with the recommendations of these plans. Further, over the next five years the Division will:

- Ensure all relevant state forest personnel 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 restoration efforts on state forests as budgets allows.
- 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 website.
- Achieve and maintain forest certification

Consultation with Other Experts and Interested Citizen's

The Division actively solicits the input of various experts from academia, NGO's and other partners. Their input on the identification and conservation of the sensitive species is valuable to our work. The Division promotes our Pathway's to Participation program whereby citizen's can have a voice, through and open house process and various public meetings, on items that we should consider in our management. For the next five years, the Division will:

- Commit to continued solicitation of comments and input from local experts
- Commit to enhancing and refining our Pathway's to Participation program
- Commit to annual open houses
- Commit to public meetings for new efforts

Desired Future Conditions(s): Through past, current, and future management activities, Richland State Forest looks forward to maintaining and improving a healthy forested environment composed of mixed species stands and of 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 reduce 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.

The Forest Inventory and Analysis program of the U.S. Forest Service provides current condition of Ohio's forests. Through this program, Ohio's forests are inventoried annually, and every 10-15 years the data are summarized in a comprehensive report. The newest report was published in 2009, and in addition to describing the current state of our forests, it also describes how the forests have changed during the 15 years since the last report was released. From these data, several trends have been identified:

- Forest land in private ownership is being subdivided at an alarming rate. Compared to the early 1990s, Ohio has 500,000 fewer acres in parcels between 50 and 500 acres and 30,000 more landowners who hold less than 10 acres of forest.
- Oak-hickory forest types make up the majority of Ohio's forests, but the proportion of oaks in small and intermediate size classes has declined since the early 1990s. In the current inventory, oaks

represent more than one-third of the trees 20 inches and larger in diameter, but only 5 percent of trees in the 2- and 4-inch diameter classes.

- Ohio's forests are maturing, and there are fewer early successional, or young, forests on the landscape today than in the early 1990s. Only 10% of the forests in the state are less than 20 years old.
- Forests where the overstory trees are greater than 100 year old are a small proportion of Ohio's forests, making up 5% of the total acreage. Oaks are the dominant canopy species in the larger and older size classes.

Further, the Division of Forestry's current inventory data for State Forest's show the following current condition:

- 75% of State Forest stands are classified as Oak/Hickory.
- 76% of State Forest are in the sawtimber or large sawtimber size class.
- Less than 10% of State Forest acres are under 20 years old; 90% of State Forest acres are between 20 and 80 years old.
- 82% of State Forest acres are between 76% - 100% crown closure.
- Approximately 16,000 acres of State Forest have been identified as High Conservation Value Forests. These areas not managed for resource extraction.

The conservation of biological diversity is a critical component of the sustainable management of state forests. The management of state forests is consistent with the biodiversity goals and strategies outlined in the statewide Forest Resources Assessment and Strategies 2010 (FRAS). The three goals outlined below, based on part of the FRAS 2010 project, are specific to some of the key threats to biological diversity in Ohio's state forests. These biodiversity goals and strategies were developed from consultation with a host of partners and finalized with the input of stakeholders and the public at-large. The biodiversity goals are the results of the analysis of the key threats in Ohio as determined by the FIA project, Wildland-Urban Interface data, the Division of Wildlife, The Nature Conservancy, NatureServe, Landfire, 2007 State of Birds Report, the Ohio Bird Conservation Initiative, and the Appalachian Mountains Joint Venture to name a few.

Guided by these trends, and in a manner consistent with our commitment to sustainability, the Division of Forestry has adopted the following Desired Future Condition objectives:

1. Maintain and promote regeneration of oak-hickory forests

- Enhance oak regeneration in appropriate forest types in zone 3.
- Favor oak and hickory in precommercial treatments
- At a minimum, preserve an oak component in oak-hickory stands where oak regeneration is unlikely.

2. Protect Ohio's unique or rare forest plant species and biological communities

- Protect high conservation value forests by either prohibiting extraction or by restoration efforts.
- Assess potential impacts to unique or rare forest plant species and communities for each forest management activity and mitigate as necessary.

3. Maintain habitat for a diversity of forest-associated wildlife

- Manage for a diversity of forest wildlife by maintaining a sustainable distribution of successional stages.
- Increase the area of early-successional forest habitat (age class < 20 years old in zone 3) and old forests (over 100 years old in High Conservation Value Forests)
- Ensure that critical habitat requirements for rare forest wildlife species are being met

These objectives are consistent with the Statewide Forest Resources Assessment completed by the Division of Forestry in 2010. The strategies that will be employed to accomplish the Desire Future Condition objectives outlined above include:

- Timber harvesting levels will be at sustainable rates and substantially less than the current annual growth as determined by appropriate inventory data.
- Intermediate treatments shall focus on improving forest health and timber quality.

- Rotation ages in managed zones will be between 80 and 120 years, except for pine stands.
- Regeneration harvests will be based on sound silvicultural science and employ regeneration techniques to promote oak regeneration. Prescribed fire and /or herbicide treatments will be employed where possible to promote oak regeneration.
- Impact assessments will be completed and mitigation opportunities will be identified prior to any activity in managed zones.
- As a general rule, High Conservation Value Forests will not be managed for resource extraction and will be allowed to develop through natural succession.
- A percentage of High Conservation Value Forests may receive timber harvesting and/or prescribed fire activities with the purpose of restoration.

VI. FIRE MANAGEMENT

History: Wildfire protection in Ohio had its origins in Southern Ohio in the early 1920s. Division of Forestry Fire Wardens had the responsibility to reorganize fire crews, keep hand tools and equipment ready, and enforce burning regulations.

When a wildfire occurs today, its suppression falls mostly to the local fire department. Within the Forest Fire Protection District of the state, the ODNR Division of Forestry has cooperative agreements with over 300 rural volunteer fire departments (VFDs). Many of these departments are located within the Richland Furnace State Forest Fire Protection Area.

Each year an average of 800 wildfires burn approximately 4500 acres of forest and grasslands within Ohio's Forest Fire Protection Area, which corresponds mostly to the state's unglaciated hill country. These fires are attributed primarily to the careless burning of debris and household litter and arson and result in untold damage to trees and landscape, water quality, improvements such as fences and outbuildings, and place people and their homes at significant risk.

The Division has also offered training to firefighters ranging from basic wildfire instruction to specialized courses to improve skills necessary in the complex and dangerous business of wildland firefighting.

Fire Suppression Objectives: The Division of Forestry has the statutory authority for fire suppression and protection within the designated forest fire protection area of the state. Scioto Trail State Forest Staff, which serve as maintenance staff for Richland Furnace, are responsible for these duties in Jackson and Gallia County. Division employees serve as initial attack resources within the forest boundaries and assist VFD's outside the forest boundaries, when requested. Most requests involve the use of heavy equipment.

Prescribed Fire: Prescribed fire can be an excellent management tool and is practiced on the state forest annually. Prescribed fire will be utilized as a management tool for oak regeneration while reducing fuels. Many large-scale burns have been conducted on Richland Furnace State Forest in the recent past, primarily associated with research activities. The actual number of fires per year will be dependent upon workloads and weather conditions.

Fire Prevention: Each fire season, the majority of wildfires are human caused and the most common cause is from debris burning. In order to promote wildfire prevention and awareness the Forest Manager will work with the District Forest Manager and Columbus staff to coordinate media activities such as interviews with the local press for television and newspaper articles. Timing critical releases with high danger fire weather will be critical in increasing public awareness.

Other Fire Program Issues: (FEPP, FFP, Training, etc.) The Federal Excess Personal Property (FEPP) program is a program administered by the Division of Forestry which loans equipment to fire departments for their use in fire control. Division staff inspects this equipment a minimum of once each year. The Fundamentals of Wildland Fire course will be taught in each county at a minimum once per a year. The Forest Officer will attend at least one VFD Association meeting in the protection area each month. Annually the Officer will contact each department and update the Division's VFD contact information forms.

VII. RECREATION

History: Developed recreational opportunities have a relatively short history at Richland Furnace compared to many state forests. The only trail system, used for APVs, were designated in the 1970's primarily on retired township roads within the forest. The Division of Forestry has long focused on dispersed recreational opportunities that require a large land base.

Strategic Goals/Opportunities: Provide recreational opportunities that are compatible with and highlight sustainable forest management. This will be done by implementing the comprehensive recreation plan for the State Forest System and building recognition for unique and varied recreation opportunities on state forests.

APV Trails: Richland Furnace contains one of four designated APV areas in the State Forest System. There are currently eight miles of trails suitable for all legal riders.

Hunting: Richland Furnace State Forest is open to public hunting under the direction of the Division of Wildlife's rules and regulations. This area provides hunters with a very large continuous public hunting area with an abundance of many wildlife species. Common game species include whitetail deer, wild turkey, ruffed grouse, squirrel, and several other common species. In addition, appreciation of both game and non-game wildlife has been recognized as an important part of the forest visitor experience. While many individuals purposely take to the woods to see and/or photograph wildlife, many wildlife encounters are coincidental to driving the forest roads or hiking the trails. In either case, contact with wildlife is essential to either fulfill or enhance the forest visit. The following are planned:

- a. A diverse and abundant wildlife resource will be maintained following as much as feasible, with the guidelines provided by the DOW, to maximize both consumptive and appreciative opportunities.
- b. Hunter parking areas will be provided where needed as part of the timber management program by dressing and defining timber sale/operation entrance areas to accommodate several cars. Areas requiring frequent service access will not be developed for parking.

Maintenance: Due to current staffing levels minimizing staff time on recreational projects is essential. Therefore, in the future, partnerships with external stakeholders will be an integral part for maintaining quality recreational experiences. In general no recreation expansion will be considered without funding and possibly maintenance provided by an external partner. Mechanized equipment will be utilized for maintenance of the trail system. Trails will be maintained as needed throughout the year to ensure user safety. Recreational Trail Project (RTP) grants will be actively sought for trail improvements, maintenance, and erosion control measures.

VIII. PUBLIC AWARENESS

Strategic Goals: Public awareness is an important aspect of the Division's mission of informing the public and landowner's of sustainable forest management and opportunities. To further the Division's goals in public awareness several items will be emphasized.

- Increase signage at recreation sites about adjacent forest management activities
- Continue to foster educational outreach to primary and secondary educators
- Continue to partner with volunteer fire departments on wildfire danger awareness messages
- Use available opportunities with school systems to speak about Sustainable Forest Management
- Use opportunities on the existing trail system to highlight past research and active forest management.
- Use available opportunities with local media to highlight Sustainable Forest Management

IX. LAW ENFORCEMENT

History: In 1967 legislation established the position of Forest Officer in the Division of Forestry. In 1974 rules and regulations governing state lands were adopted that forest officers were responsible for

enforcing. In 1985 OPOTA Certification Law Enforcement Training became mandatory for all officers and weapons were issued to those commissioned.

State Forests currently have ten commissioned law enforcement officers and three commissioned managers. The purpose of the positions is to enforce the forest rules depicted in the Ohio Revised Code. One very important aspect of the program is resource protection. Forest Officers protect property boundaries from encroachment, recreation resources from undesignated uses, and guard against timber theft. Specific law enforcement policies and procedures are delineated in the Division's Law Enforcement Manual.

Program Expectations:

- Enforce all Forest Rules, Ohio Revised Code
- Priorities for patrol will be established utilizing the following criteria:
 1. Responding to emergencies and help requests with jurisdiction
 2. Protect and assist visitors through routine patrol of all facilities and incident investigation
 3. Issue warnings and citations for violations
 4. Assist in special projects with other forests and agencies
- Investigate wildfires in Jackson and Gallia counties. Prepare wildfire reports for violations.
- Maintain equipment, including patrol vehicles. Law Enforcement Officers are also responsible for communicating and collaborating with the Forest Manager pertaining to equipment and uniform necessities.
- Well-trained Forest Officers are necessary in order to effectively and safely perform their law enforcement duties. Officers will maintain current qualifications and will attend law enforcement trainings.
- Special Projects are scheduled as needed. Potential projects may be holiday horse camp security and trail patrol, and an illegal APV use detail.

Other Enforcement Issues:

Forest Officers will:

- Seek opportunities to increase public awareness and forest education through visitor assists and other information and education opportunities.
- Issue verbal warnings and citations when needed.
- Investigate problems on forest property including:
 - Dumping (trash, methlabs)
 - Encroachments (Timber sales, boundary disputes)
 - Vandalism (state structures, state property)
 - Theft (forest signs, timber, state property)

X. FACILITY MAINTENANCE AND INFRASTRUCTURE

Building/Infrastructure Maintenance: Facilities at Richland Furnace are limited but include: APV area parking lot, loading dock, picnic shelter, and restroom. These facilities are maintained in a safe and sanitary condition for both public and the employees.

Roadway Maintenance: There are no forest roads. There exists one emergency access road that is graveled and is roughly 1.5 miles long. This road is graded once a year, culverts checked on a regular basis, and new gravel put down as needed.

Boundary Maintenance: Richland Furnace State Forest is encompassed by roughly 25 miles of boundary. Current rotation for painting entire boundary is four years as such approximately six miles, more or less, will be painted to meet the goal. The state boundary is blazed with yellow paint.

XI. BUDGET/STAFFING

Maintenance: Refer to Scioto Trail State Forest Plan

Personnel: Refer to Scioto Trail State Forest Plan

Equipment: Refer to Scioto Trail State Forest Plan

XII. MONITORING AND ENVIRONMENTAL ASSESSMENTS

Monitoring and evaluation of activities is a continuous process.

The Forest Manager's Annual Performance Review will be tied in part to his effectiveness in implementing his Forest Plan. In addition all employees will be evaluated on their appropriate portions of the plan. Statistical reports will be completed monthly to track items accomplished.

District and Columbus staff reviews cruise reports and marking reports. The District staff, to ensure objectives is achieved and consistency throughout the District, will conduct final timber sale inspections. Equipment and facilities will be reviewed for maintenance monthly and for potential replacement annually.

XIII. EXHIBITS

Exhibit 1: Richland Furnace State Forest Zoning Map

Exhibit 2: Richland Furnace State Forest Zones by Area

Exhibit 2

Richland Furnace State Forest

	Zone	Acres
1A - HCVF Natural Area		
1B - HCVF Cultural Historic		
1C - Shawnee Wilderness		
1D - HCVF Restoration		
2 - Reserved Lands		
3A - Resource Protection		
3B - Aesthetic Area		525
3C - Timber Wildlife		1,972
4A - Intensive Recreation		
4B - Admin Areas		5

Total Zoned 2,502