

## **Chapter 1**

### **State Forest Management Authority**

Relevant Natural Resource Laws, Treaties, and Agreements.

#### **A. International**

The Convention on Wetlands is an intergovernmental treaty which provides a framework for international cooperation for the conservation of wetlands. Specific sites are designated as globally significant wetlands for conservation. The United States ratified the convention on 4/18/1987.

There is currently one designated site in Ohio, the Wilma H. Schiermeier Olentangy River Wetland Research Park on The Ohio State University Campus. The Division of Forestry is not currently involved with any management or research on this facility. Wetlands are additionally regulated in Section 404 of the Clean Water Act.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora, (CITES) is an international agreement between Governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. CITES lists specific plants and animals that are protected, whose collection and transport is regulated by the convention. The United States ratified the convention on 1/14/1974. A few examples of prominent species in Ohio include: bald eagle, peregrine falcon, bobcat, and Indiana bat.

The Ohio Division of Wildlife has the statutory authority to enforce all wildlife regulations and cooperates with the United States Fish and Wildlife Service through the Lacey Act. River otters that are trapped in the state are required to receive a CITES tag within 72 hours of trapping. Special permits must be obtained by trappers to trap on state forests. Such permits have been previously issued for beavers (non-CITES species) but never for river otter. Taking of fish and wildlife in state forests must follow Division of Wildlife regulations which are in compliance with CITES. Taking of plant species in state forests is prohibited without a special-use permit from the Chief of the Division of Forestry. This forest rule is vigorously enforced by forest officers.

The Migratory Bird Treaty with Canada adopted a uniform system of protection for certain species of birds which migrate between the United States and Canada, in order to assure the preservation of species either harmless or beneficial to man. Since 1918, similar conventions between the United States and [Mexico](#) (1936), [Japan](#) (1972) and the Union of Soviet Socialist Republics (1976, now [Russia](#)) have been incorporated into the MBTA. This treaty sets certain dates for closed seasons on migratory birds and prohibits hunting of insectivorous birds. These treaties were legislatively enacted through the Migratory Bird Act of 1918.

Most waterfowl and woodland birds found in Ohio are protected under this law. Examples include the great blue heron, Kentucky warbler, Cerulean warbler, and ruby

throated hummingbird. Under the treaty hunting is allowed for specified migratory game birds if hunting is consistent with their population status and long term conservation. The Ohio Division of Wildlife, in cooperation with the USFWS, sets dates for game bird harvest in Ohio.

The Western Hemisphere Convention (Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere) is a 1940 treaty between the United States and 17 other western hemisphere republics. It was ratified by the United States in 1973. The signed parties expressed their wish to "protect and preserve in their natural habitat representatives of all species and genera of their native flora and fauna, including migratory birds" and to protect regions and natural objects of scientific value. The treaty recognizes that many birds share territories between countries in North and South America. The treaty's goals are achieved through the Endangered Species Act and associated Executive Orders.

The Great Lakes Treaty was a product of the Convention on Great Lakes Fisheries in 1954 between the United States and Canada. The Convention was concluded in order to recognize that joint and coordinated efforts between the two governments are essential to determining the need for and type of measures which will make possible the maximum sustained productivity in Great Lakes fisheries of common concern. The Convention established a Great Lakes Fishery Commission with specified functions related to formulation and coordination of research programs including a comprehensive program for sea lamprey control, and publication of scientific and other information. The treaty was ratified in 1955 and achieved implementation in 1956 through the Great Lakes Fishery Act.

The Ohio Division of Wildlife appoints a staff member in an advisory role to the Great Lakes Fisheries Commission. The Division of Forestry has no role in the commission and manages no land directly adjacent to Lake Erie.

## **B. Federal Laws**

The Endangered Species Act of 1973 was designed to protect critically imperiled species from extinction as well as the ecosystems on which they depend. The Act authorizes the listing of species as endangered or threatened, prohibits unauthorized taking, possession, sale, and transport of endangered species, provides authority to acquire land for the conservation of listed species using land and water conservation funds, authorizes establishment of cooperative agreements, grants aid to States that establish and maintain programs for endangered and threatened wildlife and plants, authorizes assessment of criminal and civil penalties for violators, and authorizes rewards for anyone furnishing information leading to the arrest of violators.

The State of Ohio enacted chapter 1518 of the ORC, Endangered Species, to regulate all federal as well as state threatened and endangered plant species. The act explicitly includes all federal listed species as well as those deemed by the Chief of the Division of

Natural Areas to be in need of protection in the State of Ohio. The ORC chapter 1531.25 protects animal species in the State. This chapter also explicitly includes all species listed federally as well as those the Chief of the Division of Wildlife deems as requiring protection in Ohio. The ORC restricts taking and possession of any endangered or threatened species. Specific species and their level of protection are listed in the Ohio Administrative Code, 1501:18 for plant species and ORC 1501:31 for animal species.

Federally endangered species that are most relevant to state forest management in Ohio includes the Karner blue butterfly, Indiana bat, running buffalo clover, and American burying beetle. The Division of Forestry has previously participated in a department level working group that wrote the department's "Indiana Bat Management Strategy" which complies with recommendations from the USFWS's draft Indiana Bat Recovery Plan. The Division of Forestry participates in Karner Blue Butterfly Ohio Recovery Plan through providing potential recovery sites in Maumee State Forest and being active participant in the "Oak Openings Working Group", which is a group concerned with habitat management and conservation of the Oak Openings ecosystem. Running buffalo clover and the American burying beetle are not known to exist in Ohio's State Forests. The Division of Forestry's cooperation with the Division of Natural Areas and Preserves and the Division of Wildlife on other listed species is listed under the state law section.

The [Clean Water Act](#) is the primary [federal law](#) in the [United States](#) governing [water pollution](#) and protection of all significant bodies of water. The Act delegates responsibility of enforcement to the USEPA and Army Corps of Engineers. The primary articles that are relevant to non-point source pollution are sections 208 and 404. Section 208 requires all states to access sources of non-point source pollution and generate regulatory or non-regulatory programs to control them. The Ohio EPA is the agency with this task in Ohio. The current plan was written by the Ohio Water Resources Council, a group chaired by both the Ohio EPA and Ohio DNR. The resulting plan termed "Getting the Point about Nonpoint".

The Division of Forestry staff members took a leadership role in the latest revision of "[BMPs for Erosion Control for Logging Practices in Ohio](#)". Through active timber sale administration on State Forests the Division's sale administrators seek to minimize all potential pollution from silvicultural activities. The Division also supports the Ohio Master Logger Program through training and personnel support.

Section 404 of the Clean Water Act allows for normal silvicultural activities on wetlands that will not affect the long-term hydrology of the site. However Division of Forestry does not typically log sites that would be considered wetlands as defined by the Army Corps of Engineers.

The [Occupational Safety and Health Act](#) (OSH) is the primary [federal law](#) which governs [occupational health and safety](#) in the private sector and federal government in the [United States](#). Its main goal is to ensure that employers provide employees with an environment free from recognized hazards, such as exposure to toxic chemicals, excessive noise

levels, mechanical dangers, heat or cold stress, or unsanitary conditions. This act created the O

As a state agency the Division of Forestry's facilities are inspected biannually by the Bureau of Workman's Compensation as part of the Public Employee Risk Reduction Program. Compliance with state and federal occupational safety regulations is a focus of the inspection. Facilities not in compliance are required to remedy all unsafe items. In addition safety training is regularly offered to all Division employees.

The Americans with Disabilities Act (ADA) is a law that was enacted by the U.S. Congress in 1990. The ADA is a wide-ranging civil rights law that prohibits, under certain circumstances, discrimination based on disability. It affords similar protections against discrimination to Americans with disabilities as the Civil Rights Act of 1964.

Offices of ODNR that the public is likely to frequent are compliant with the ADA. The Division of Forestry has a few trails that are wheelchair accessible at Maumee and Hocking State Forests. The Division of Parks and Recreation and the Division of Natural Areas and Preserves provides many more opportunities for wheelchair accessible recreation, often adjacent to State Forests.

The National Historic Preservation Act of 1966 created an historic register of sites of national significance and provided a mechanism for their protection. Sites include both.

The Division of Forestry has one known National Historic Place, the Ranger Station Mound on Zaleski State Forest. This site is managed to protect its historic nature. The Division manages no National Historic Landmarks.

The Wild and Scenic Rivers Act of 1968 established a national system of wild and scenic rivers. It describes procedures and limitations for control of lands in federally administered components of the system and for dealing with disposition of lands and minerals under Federal ownership. Rivers are classified as wild, scenic or recreational, and hunting and fishing are permitted in components of the system under applicable Federal and State laws.

In 1998 the State of Ohio was donated over 1100 acres which became Beaver Creek State Forest. Little Beaver Creek, a National Wild and Scenic River, flows through the property. Much of the property adjacent to the river is zoned as a high conservation value forest.

The Plant Protection Act is administered by the Animal and Plant Health Inspection Service (APHIS) of the USDA. APHIS's role is to protect the agricultural health of the United States and that of our trading partners. APHIS uses its Plant Protection and Quarantine (PPQ) program to ensure the successful movement of pest free commodities into and out of the United States.

Current plant pest quarantines that are relevant to Ohio's State Forests include the emerald ash borer, hemlock woolly adelgid, gypsy moth, pine shoot beetle, and sudden oak death. The Ohio Division of Forestry follows all APHIS quarantine regulations and contractually requires the same from contractors. The Division attempts to notify all contractors when a quarantine violation is a realistic possibility – such as movement of ash logs from stumpage sales.

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) is a federal law that set up the basic U.S. system of [pesticide](#) regulation to protect applicators, consumers and the [environment](#). It is administered by the [Environmental Protection Agency \(EPA\)](#) and the appropriate environmental agencies of the respective states. In Ohio, the Department of Agriculture (ODA) is delegated the statutory authority over all pesticides. ODA sets rules that comply with both the FIFRA as well as state law.

The Division of Forestry, as a public agency, is required to have personnel with commercial pesticide licenses to supervise application of herbicides. This is true even if herbicides are not restricted use products. Pesticide storage in State Forest facilities meets or exceeds federal and state standards. In addition all application of herbicides on state lands by other parties (primarily utility contractors) is by permit only. The Division scrutinizes all herbicide application on its property. Records of application are retained for 3 years at the unit, district, and central staff office.

The Mineral Leasing Act of 1920 is a [United States federal law](#) that authorizes and governs leasing of [public lands](#) for developing deposits of [coal](#), [petroleum](#), [natural gas](#) and other [hydrocarbons](#), [phosphates](#), and [sodium](#) in the United States.

In Ohio several State Forests' lands were transferred to the Ohio with only surface rights. The mineral rights on these lands are retained by the federal government and leased to private entities by the Bureau of Land Management.

The Surface Mining Control and Reclamation Act of 1977 is the primary federal law that regulates the environmental impact of coal mining at a federal level. The law requires permitting prior to mining, inspections, bonding, standards of performance, and land restrictions. It also requires reclamation of a site after mining and setup a fund to pay for the reclamation of mine lands prior to the 1977 law. This law and associated programs are primarily administered in Ohio by the Department of Natural Resources - Division of Mineral Resources.

In 1972 Ohio updated ORC 1513 to mandate reclamation very similarly to the eventual federal law. Ohio's State Forest includes many areas reclaimed under current standards as well as areas mined prior to 1972 and not properly reclaimed. Mining on State Forests is extremely rare but if done compliance with state and federal statutes is of paramount importance.

The Lacey Act, amended in 2008, regulates interstate and transnational transport of certain plant, fish, and wildlife species. Under this law, it is unlawful to import, export,

sell, acquire, or purchase fish, wildlife or plants taken, possessed, transported, or sold in violation of U.S., Indian, State, or foreign law. The law covers all fish and wildlife and their parts or products, and plants protected by the Convention on International Trade in Endangered Species and those protected by State law.

The Division of Wildlife in Ohio has authority to enforce the Lacey Act under an agreement with the United States Fish and Wildlife Service. Forest Officers enforce forest rules on State Forests, which limit harvesting any type of plant without a special-use permit.

The Great Lakes Basin Compact is a federal law that established the Great Lakes Basin Commission, an advisory body to the States on regional water resources matters, including comprehensive water use, economic development, and maintenance of high-quality environment. Member states include: Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin. The Canadian provinces of Ontario and Quebec are associate members.

The Director of Ohio DNR currently serves as the chair of the Ohio delegation. The Division of Forestry has no direct relationship with the Commission, only a small portion of state forest land is part of the Lake Erie watershed.

The State of Ohio is part of the Mid-Atlantic Interstate Forest Fire Protection Compact (MAIFFPC). This interstate compact was authorized through the United States Congress in 1956. The purpose of the MAIFFPC is to promote effective prevention and control of wildfires in the Mid-Atlantic region by developing and integrating forest fire plans, developing and maintaining effective wildfire suppression programs in each of the member states, providing mutual aid for fire suppression and training efforts, acting as a liaison between various fire control agencies and by facilitating the mobilization of fire fighting resources during periods of national emergencies. The compact includes the states of Delaware, Maryland, New Jersey, Ohio, Pennsylvania, Virginia, and West Virginia. All member states have subsequent state legislation that authorizes involvement in the compact.

The Division of Forestry represents Ohio in the compact. The Division of Forestry has equipment and personnel available for fire protection to member states by request on a cooperative basis. The Division of Forestry also participates in training activities, both by sending students and providing trainers.

### C. State Law

The Ohio Revised Code chapter 1503 sets forth the responsibilities and duties of the Division of Forestry. This chapter includes all duties of the division including private land assistance, urban forestry, nurseries, fire protection, as well as the development and management of state forests. The chapter gives the Chief of the Division the authority to sell timber on state forests, enter into agreements with other governmental and non-profit agencies, commission forest officers and fire wardens, and enter into lease agreements

with private entities for concessions. The revenue distribution formula for timber sales is detailed in the chapter. It also includes the legal framework for the Forest Advisory Council and Mid-Atlantic Fire Compact. The Shawnee Wilderness Area's location is defined and its statutory rules are also listed in this chapter.

The Ohio Administrative Code chapter 1501.3 sets forth all of the “forest rules” by which visitors may recreate on state forest land. 1501.3 details the rules for visitation, camping, special use permits, concessions, signage, firearms, and motor vehicles. The details of the APV area use rules are also in this section of code. All state forest managers and law enforcement should be well trained on this section of code.

The Ohio Fence Law, ORC 971, establishes rules and definitions for fences that serve also serve as property lines. The Ohio DNR is subject to the rules of equal shares for building and maintaining line fences. Property owners adjoining a state forest may file a formal request with the Division of Forestry to build or maintain a line fence. Formal legal agreements are then recorded that specify the responsibilities of both parties.

Commonly referred to as the Ohio Ditch law, ORC 6131 allows for a process that a ditch can be altered and maintained for agricultural or other uses. Although the law is statewide, currently the only affected state forest is Maumee. Ditches in northwest Ohio were constructed in the late 19<sup>th</sup> and early 20<sup>th</sup> century to drain marshy areas and allow for crop production. Construction of these ditches took place entirely prior to state ownership. Construction involved straightening and deepening the stream channel. Property owners, including the State of Ohio, within a watershed are levied by the county government as needed for maintenance. Maintenance involves removing woody debris, maintaining a straight channel at a specified depth, and spraying to remove woody plants from the stream banks. Property owners are required to maintain approximately 20-30 feet of grass on at least one side of the ditch to allow for maintenance. Several of these ditches were likely small ephemeral channels prior to their construction.

Ohio Revised Code Chapter 1518 codifies protection to state and federally listed threatened and endangered botanical species. Threatened and endangered plant species are protected from being willfully destroyed or removed from the site on which they grow. The ODNR - Division of Natural Areas and Preserves is listed as the agency responsible for designating specific plants as threatened or endangered and enforcing the penalties associated with non-compliance.

The Division of Forestry works with the best available data (currently the Ohio Diversity Database) prior to implementing all silvicultural activities, including commercial timber sales and precommercial stand improvement. When potential conflicts are identified the Division consults with experts to identify specific areas where plants occur and identify impacts that a given activity may have. Planned activities may continue, be modified, or be cancelled depending upon the results of consultations.

Ohio Revised Code Chapter 1531.25 codifies the responsibilities of the ODNR – Division of Wildlife with respect to threatened and endangered animals. Taking of

threatened or endangered animals is only legal in Ohio with a permit from the Chief of the Division of Wildlife for scientific or education purposes. In addition anyone pursuing such activities on State Forests requires a special use permit from the Division of Forestry.

The Ohio Diversity Database (formerly the Natural Heritage Database) includes records for both plant and animal species that are state or federally listed. When the Division's activities may impact animal species the Division of Forestry consults with experts to identify what impacts the activities may have and potential ways to mitigate those impacts. Examples of mitigation include altering roads to protect rattlesnake den sites or designating large buffers to ensure protection of threatened salamander populations.

Ohio Revised Code 921 details the pesticide laws in the State of Ohio. Responsibility for enforcement and rule-making for pesticide regulations rests with the Director of the Ohio Department of Agriculture. The chapter sets requirements for commercial applicators, pesticide registration, and record-keeping. All pesticide storage facilities, including government facilities, are subject to inspection by the Department of Agriculture. All units of government in Ohio are required to have employees with a commercial applicator licenses if applying pesticides even if products are not identified as restricted-use.

Pesticide storage in State Forest facilities meets or exceeds federal and state standards. In addition all application of pesticides on state lands by other parties (primarily utility contractors) is by permit only. The Division scrutinizes all herbicide application on its property. Records of application from all parties are retained for 3 years at the unit, district, and central staff office.

The Ohio Department of Agriculture (ODA), through its rule-making power, has regulation and quarantine powers that are separate and different from the APHIS. These regulations are listed in the Ohio Administrative Code, Chapter 901. Regulations most applicable to forest management in Ohio include the emerald ash borer, gypsy moth, and hemlock woolly adelgid.

The Ohio Division of Forestry follows all ODA quarantine regulations and contractually requires the same from contractors. The Division attempts to notify all contractors when a quarantine violation is a realistic possibility – such as movement of ash logs from stumpage sales in a quarantined county.

Ohio Revised Code 1509 details requirements for oil and gas drilling in Ohio. Included in the law are requirements for location of surface wells, permitting requirements, bonding requirements, and reclamation standards. The ODNR – Division of Mineral Resources Management is the responsible government entity for enforcement and rule-making.

Ohio has several state forests with active oil and gas wells. All contractors and companies drilling on state forests are required to follow regulations in ORC 1509.

Forest managers or district staff members are responsible for on-site inspections. All sites are also subject to inspection by the Division of Mineral Resources Management as part of the Division's field inspection program.

Ohio Revised Code 1513 codifies requirements for coal surface mining in Ohio including permitting and inspections. Ohio's State Forest includes many areas reclaimed under current standards as well as areas mined prior to 1972 and not properly reclaimed. Mining on State Forests is extremely rare but if done compliance with state and federal statutes is of paramount importance.

Ohio Revised Code 149.51 sets a penalty for desecrating any known prehistoric or historic Native American landmark in the state. The Ohio Historical Society is tasked with developing a listing of all known Native American landmarks.

A geographical listing of the landmarks is located in the Ohio Preservation Office internet map server. This application is used by the Division of Forestry to check prior to all commercial silvicultural activities that may impact a site. In the past the Division has assisted the Ohio Historical Society in finding likely prehistoric sites on state forests. The Division has also inquired about potential impacts to these sites and taken steps to ensure employees of the Division and contractors protect these sites.

#### **D. Division Authority and Commitment**

The Chief of the Division of Forestry has broad authority to manage state forestlands for multiple purposes. The Ohio Revised Code, sections 1503.03, 1503.04 and 1503.05 empowers the Chief to "...acquire land suitable for forestry purposes . . . expend funds for the management, development and utilization of such lands . . . plant such trees as he deems expedient and take such measures as are necessary to bring about a profitable growth of timber. . ." The Chief "... has entire custody of such forest lands and . . . may sell timber and other forest products from the state forests whenever he considers such sale desirable. . . may grant easements and leases on portions of state forest lands . . . and may grant mineral rights on a royalty basis."

In addition to this authority, the Chief receives advice from the **Forestry Advisory Council** (FAC). The FAC is a legally authorized body composed of eight members representing forest-based research activities, small private forestland owners, large private forest landowners, the pulp and paper industry, other forest industries, soil science, forest recreation and the public. "The Council may advise and make recommendations to the chief of the Division of Forestry concerning forestry practices and programs in the State, and may assist the division in promoting cooperation on forestry practices and programs with other agencies, political subdivisions, and private interest." (ORC 1503.40).

Further direction was given on October 25, 2007 by Governor Strickland to the Division of Forestry on the management of the state forests. Governor Strickland signed a

directive titled, “Attaining Certification of Ohio’s State Forests in Order to Promote Good Forest Management Practices.” This directive requires the Division of Forestry to begin the process of third party certification of management practices of the state forest system. The Sustainable Forestry Initiative and Forest Stewardship Council certification programs were specified. A copy of Governor Strickland’s directive appears at the end of this chapter.

Certification of Ohio’s State Forests demonstrates to our stakeholders and markets that our management practices are sound and comprehensive. It maintains markets for state forest timber, and continues our ability to promote long-term forest and ecosystem health. Certification promotes not only efficiencies in our organization but also the environmental protections we apply to state forests as well.

It shall be the policy of the Division of Forestry that any identified conflicts between laws, regulations, and the FSC Principles and Criteria shall be brought to the attention of the Certifying Body (Scientific Certification Systems and NSF-ISR) as soon as practical after the conflict has been identified. A request by the Division of Forestry shall be made to the Certifying Body to evaluate the conflict, on a case-by-case basis, for compliance with the FSC standard.

It shall be the policy of the Division of Forestry to notify the Certifying Body of any significant changes in ownership and/or management planning within 90 days of such a change. An example of this would be the purchase or sale of property intended to be managed as a state forest. The District shall notify the Land Management Administrator of such as change prior to closing on the property. The Land Management Administrator shall serve as the direct contact with the Certifying Body.

## **E. State Forest Management Philosophies**

### **Introduction**

Ohio is fortunate to have a moderate amount of forestland. Of the State's 26.2 million acres, 7.86 million acres or 30% of the total land area is forested. Of this area, 7.57 million acres are considered productive forestland according to US Forest Service Surveys. Within a state where agriculture represents an overwhelming percentage of the land use, this figure is significant. Of even more significance however, is the distribution of public and private forestland ownership. Approximately 93% of all forestland in Ohio is owned privately while the remaining 7% is owned by various public organizations. The Division of Forestry manages 191,145 acres or 2.3% of Ohio’s forestland. Private forestlands are usually characterized by small, unmanaged or little managed parcels used for any single or variety of reasons with no coordination among parcels. Public forests on the other hand are generally extensive areas of forest cover with management objectives delineated and continuous throughout the ownership.

Within this public ownership category, which represents only a small portion of the forested land in Ohio, the state forest system provides:

- A unique opportunity to demonstrate forest management;
- A great variety of forest benefits including water, wildlife, timber, recreation, and minerals;
- A continuity of management over space and time;
- A dedication to multiple-use management.

**Our Vision is that Ohio’s state forests will be the best managed forest lands in the country, and will be recognized as such and therefore state forest resource management is based on the following philosophies:**

- The purpose of the state forest system shall be for the practice, promotion, protection and demonstration of forestry and silviculture.
- Demonstrate our commitment to the principles and objectives of the Sustainable Forestry Initiative and the Forest Stewardship Council.
- The concept of stewardship and multiple use shall be within the context of all of the land owned and managed by the Ohio Department of Natural Resources.
- Managed recreational opportunities shall be focused on “backcountry” opportunities.
- State Forests shall be sustainably managed for native forest vegetation, promoting biodiversity, while protecting sensitive attributes and long-term productivity.
- The promotion and management of Oak-Hickory forest systems will yield the greatest benefit to all other attributes of the forest.
- Large, continuous blocks of forestland with a minimum of boundary divisions between public and private land provide benefits and opportunities that are rare in Ohio. Opportunities are greater and uses more readily optimized by eliminating private holdings within or between public tracts. Further, as the demand for consumptive and nonconsumptive forest uses increases, the land base must also increase to meet the needs.

## **F. Strategic Plan 2008**

Based on the preceding philosophies, the Chief of the Division of Forestry, in consultation with internal experts and external constituents, offers the following strategic plan as a focus for activities during the next 3-5 years.

### Manage forests to ensure the health and sustainability of forest systems

- Implement a proved, verifiable approach to sustainable forest management
  - Achieve Certification of our state forests using the standards of The Sustainable Forestry Initiative and The Forest Stewardship Council by 12/31/10.

- Maintain commitment to SFI and FSC by meeting annual requirements.
- Manage for site-appropriate, native forest systems and species
  - Review and revise state forest-specific land management objectives, goals, and zoning for forest management by 2009, and utilize appropriate silvicultural guidelines to promote site appropriate native species.
  - Address conifer plantation management by establishing a conifer plantation management policy by 2009.
- Maintain long-term forest productivity through conservation of soil, water, and forest resources
  - Review harvest standards for water quality, soil conservation, utilization, and monitoring and incorporate needed changes into harvest planning and timber contracts by 2009
  - Review SMZ standards and adjust for consistency with FSC-SMZ guidelines.
  - Review Wet Weather Logging policy and implement needed changes by 2009.
- Retain or promote stand- and landscape-level wildlife habitat
  - Request the development of stand- and landscape-level habitat guidelines specific for Ohio forests from the Division of Wildlife, and implement into our harvest planning process.

Produce high-quality forest products that contribute to local communities

- Base harvest volumes on the goals and guidelines for each forest system, current stand and forest-wide inventories, and science-based silviculture
  - Establish a base-line inventory for all state forests by first formulating specifications for the level of intensity and criteria for data collection in the next 6 months; followed by a plan of action to accomplish the project.
  - Implement and test Growth & Yield model to calculate Annual Allowable Harvest in the next two years.
  - Review our current policies on forest inventories for prescription cruising and adjust or develop new harvest schedules/policies accordingly. The land management staff of the Division of Forestry will be charged selecting a system that will most efficiently and accurately prescribe harvest schedules by 2010.
  - Establish a plan to accomplish a Pre-commercial Silvicultural Activities in order to nurture young stands into quality, healthy, mature stands.
- Develop marketing strategies to capture the maximum value of forest products
  - Immediately identify sales to conduct a pilot merchandized product sale in 2008, from logs harvested from various state forests. Merchandizing and marketing efforts located in Scioto Trail State Forest and shall utilize contract logging services and in-house logging. Evaluate the results of project compared to traditional stumpage timber sales.
  - Add value by exploring utilization options, alternative markets, niche markets, and low-grade material markets.
  - Implement a Timber Sale Administration training program to maximize our return from stumpage sales. Task to be accomplished by seasoned administrators by 2008.

- Review and revise Land Management Manual to adjust business practices for consistency by 2009.
- Improve and publicize a firewood program on state forests by 2009.

Provide recreational opportunities that require a large forest land base

- Develop a comprehensive backcountry recreation plan for the state forest system
  - Inventory Recreational Opportunities on each state forest
  - Ensure User Safety
  - Ensure Resource Protection
  - Evaluate User Satisfaction (Quality of Experience)
- Build recognition for unique and varied recreation opportunities on state forests
  - Emphasize backcountry (or back to basics) experience
  - Work with DOF Communication Team to develop strategies to accomplish this goal

Provide unique forestry education sites and promote outreach and long-term research

- Develop opportunities to showcase forest management practices to the general public, private landowners, and forest industry
  - Establish, maintain and promote demonstration sites at state forests
  - Utilize and improve existing outreach programs to promote forest management to targeted audiences (students, woodland owners, media, recreational users, policy makers).
  - Utilize new technology as a communications tool
  - Promote the historical conservation legacy of the state forest system as part of the Division’s strategic communications
  - Integrate state forest management into the Division’s strategic communications efforts
  - Support forest research with an emphasis on sustainable forest management (silviculture, prescribed fire, native systems, etc.)
  - Establish a forest research review team

Maintain a highly trained and well equipped work force

- Develop a training, continuing education, and/or certification standard for all division staff
  - Maintain a master training schedule for the DOF
  - Develop a training guide for DOF employees
  - Select and maintain a database to track employee training and certifications
  - Establish training requirements by job classification
  - Create and implement a new employee “mentor” program
- Inventory and evaluate equipment and facilities and develop maintenance and replacement schedules
  - Establish written equipment replacement standards and schedule with a field request procedure
  - Select and maintain a master facility and equipment database

- Establish a facility and equipment maintenance schedule and inspection procedure
- Conduct a facility and equipment needs assessment
- Develop equipment and facilities budgets based on current and projected needs
  - Create a dedicated facilities budget separate from the regional maintenance and operating budget
  - Develop the equipment budget to account for projected scheduled replacements
  - Explore alternative funding sources
  
- Ensure all staff has appropriate health and safety training
  - Determine what training is required by law, policy and position
  - Establish an inspection procedure for equipment and facilities
  - Ensure safety and health training is a priority
  - Improve safety awareness that is job specific

## **G. Forest Management Plans and Annual Work Plans**

Forest Management Plans are plans written that explain the work expectations for a five-year period. The plans are guided by the principles set forth in the strategic plan and responsibilities delegated to the Division in the Ohio Revised and Administrative Codes. Annual work plans give more detailed work assignments for a given fiscal year. Individual forest managers are responsible for developing these plans with assistance from district and central support staff. They shall be presented to the public at the first available opportunity, typically at the annual open house.

### Forest Management Plans

The Forest Management Plan will heavily reference principles set forth in the strategic plan to set the priorities for the five-year period. The purpose of the Forest management plan is to set forth the individual unit's goals that will guide the development of specific projects.

The Forest Management Plans shall explain in detail an individual State Forest's history and a description in terms of specificity and importance the general management objectives at the forest level. The intent is to provide more specific information about the land management, fire management, law enforcement, recreation, and operations programs. These plans may be as specific as necessary but do not need to state work at a project level.

Forest Management Plans will also incorporate inventory and Growth and Yield data and calculations in order to determine sustainable harvest levels.

### Annual Work Plans

The annual work plan should be written primarily from information contained in the forest management plan. Program areas detailed include resource management, recreation, law enforcement, maintenance, wildland fire, employee development, public outreach, and budgets. These plans are more specific and task oriented than are the

forest management plans. The plans are intended to be used internally to set work priorities and personnel goals.

The annual work plans will list specific projects, such as cruising compartment A-1, marking a 25-acre shelterwood harvest in compartment G-3, presenting fire prevention messages in 3 parades, or rerouting 3 miles of the XYZ trail, etc.

## H. Management Review

### Background

SFI Objective 13. To promote continual improvement in the practice of sustainable forestry and monitor, measure, and report performance in achieving the commitment to sustainable forestry.

SFI Performance Measure 13.1. Program Participants shall establish a management review system to examine findings and progress in implementing the SFI Standard, to make improvements in programs, and to inform their employees of changes.

FSC Principle 8. Monitoring shall be conducted – appropriate to the scale and intensity of forest management – to assess the condition of the forest, yields of forest products, chain of custody, management activities and their social and environmental impacts.

FSC C8.2.d.1. Monitoring is conducted to ensure that site specific plans and operations are properly implemented, environmental impacts are minimized, and that harvest prescriptions and guidelines are effective.

FSC C8.4. The results of monitoring shall be incorporated into the implementation and revision of the management plan

### Management Review Committee (aka The Integration Committee)

The Management Review Committee (Integration Committee) is established as a feedback loop to facilitate a systematic process for gathering information regarding improvement in forest management practices, to reporting that information to management, and provide for a formal management review. The review includes regularly scheduled meetings – usually quarterly – to evaluate the results of monitoring of state forest operations, evaluate the effectiveness of policies, procedures, and prescriptions, to clear and SFI and FSC CAR's and formulate responses, and to determine changes and improvements necessary for continued conformance to the SFI and FSC standards.

There are **three phases** to the management review process that will be part of the Management Review committee meetings.

*1. Internal Monitoring.* Once per year, each state forest program administrator shall compile a monitoring report detailing the accomplishments and effectiveness of the previous year's activities. Each district shall also compile a monitoring report of forest-

level activities and effectiveness for the previous year. Results from program and district internal monitoring efforts shall be reported on and provided to the Management Review Committee at least once per year.

2. *Annual Management Review.* The Management Review Committee shall meet on a quarterly basis. At least one meeting per year, the Committee shall review the following:

- Internal monitoring reports – evaluate internal monitoring reports for possible non-conformance issues.
- Annual forest cert audits – evaluate annual forest certification audit reports and formulate a response to all CAR
- Review of Plans – review and evaluate all forest management plans and annual work plans for division priorities and conformance with the standards
- Review all public comments and formal disputes – evaluate, consider, incorporate, and respond to formal comments from open houses and public meetings. Consider and resolve formal disputes.

3. *Implementing improvements from the Management Review Committee*

The Management Review Committee shall recommend changes, efficiencies, or revisions to policy. These improvements shall be implemented in the following ways:

- Immediate changes may be necessary to remedy identified non-conformances. These changes shall be communicated directly to the District Managers.
- The Management Review Committee shall also recommend to the Certification Committee necessary strategy for implementation of policy revisions and document updates. The Certification Committee is responsible for on-going management review implementation and recommending actions to be taken to improve sustainable forest management
- The Management Review Committee shall also make recommendations to the Chief of the Division for certain written communication to all employees.

## **I. The Certification Committee**

In October of 2007, Governor Ted Strickland issued a directive for the ODNR-Division of Forestry to begin the process of attaining certification. In November of 2007, the Division of Forestry established a committee to oversee the coordination of all certification activities. The Certification Committee is tasked not only with the responsibility of attaining certification on state forests but also for procurement and administration of the certification services contract and for overall forest management policy formulation.

The responsibilities of the Certification Committee are as follows:

- Coordination of all certification activities.
- Land Management Manual revisions and updates.
- Provide input on all other division manuals that are pertinent to state forest management.
- Compose, revise, and update all certification documents and registers.
- Organize and facilitate all public input process relating to state forests.

- Procurement and administration of the certification services contract.
- Serve as the Division liaison with DAS for the certification contract.
- Organization of all audits and field visits.
- Writing and revising all CAR responses.
- Oversee the implementation of all Management Review committee decisions.

The Certification Committee membership may include the following members:

- The Land Management Administrator – Chair of the Committee
- Northern District Forester
- Southern District Forester
- One Forest Manager or Forester from the Northern District
- One Forest Manager from the Southern District
- The Land Management Program Administrator for the Southern District
- The Information and Education Program Administrator
- The GIS Administrator
- The Utilization and Marketing Program Administrator
- One Service Forester for private lands

Other program administrators may be asked to serve temporarily on the committee to resolve CAR's or for formulating policy.

## Chapter 2 State Forest Management Zones

### Introduction

All state forests are zoned. *Zones are spatially defined areas for which the management and use of those areas is clearly outlined.* Zones are intended to be used by foresters, forest managers, and program managers in their decision making process. Zones are designed to protect unique features, to promote silviculture, to promote recreation, and to preserve aesthetic qualities of the forest. The current zoning of state forests has developed based on the suitability, capability, history, and appropriateness of any given use to an area.

### CLASS 1 ZONE – High Conservation Value Forests

This zone is intended to protect and maintain specific natural areas that are environmentally, historically, or culturally special. High Conservation Value Forests possess one or more of the following attributes:

1. globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia), including RTE species and their habitats;
2. globally, regionally or nationally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance;
3. are in or contain rare, threatened or endangered ecosystems;
4. areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control);
5. areas fundamental to meeting basic needs of local communities (e.g., subsistence, health); or,
6. Areas critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

This zone contains three sub zones: Natural Areas, Cultural/Historical, and Wilderness Areas.

Areas that fall within Class 1 zone –were selected based on an assessment process. The results of the assessment process are outlined in the DOF HCVF Assessment document. The assessment process was developed on the following three factors.

- Consideration of areas that had already fallen into the Class 1 zone historically by the Division of Forestry. These areas were re-evaluated to determine the presence of HCV's.
- Areas recommended (both currently and historically) to be zoned as a Class 1 zone through consultation regional and local experts and partners such as the Forest Advisory Council, the ODNR-Division of Wildlife, ODNR-Division of Natural Areas and Preserves, The Nature Conservancy, The USFS-Northern Research Station, and Academia. These areas were evaluated for the presence of HCV's and were largely accepted as a Class 1 zone.
- Other candidate areas were considered that were nominated by stakeholders during public meetings and open houses. During this review, stakeholders may also propose new areas as well as propose the management options for the Class 1 zone. (Clarification: a process

is already in place by code to update and review the Shawnee wilderness plan – Zone Class 1C – and therefore the Shawnee Wilderness Area already meets the intent of this assessment process.)

#### **A. Natural Areas:**

The purpose of this sub zone is to designate and protect unique natural resources for their environmental, ecological, and educational values. Natural Areas will be managed in order to maintain or enhance significant resource features. Passive outdoor recreation (nature study, interpretation, etc.) may be permitted in these areas. Public awareness and use of Natural Areas will be limited, however, and will be allowed based on each area's ability to sustain appropriate uses without being degraded.

Examples of Natural Areas include: forest types listed by Nature Serve as critically endangered, endangered, or vulnerable (G1-G3, N1-N3, and S1-S3); exemplary natural communities; forested wetlands or glades; unusual geologic features; or other areas identified through consultations that possess natural characteristics of recognized and demonstrable significance. This sub-zone contains mostly areas containing HCV 1 and some HCV 3.

The size of individually designated Natural Areas will vary and may be as small or large as necessary to protect the values unique to the area. In particular cases, boundaries may be drawn to include entire watersheds to insure adequate protection.

##### *Natural Area: Management Guidelines*

##### Recreation

No intensive recreational use will be permitted within this zone; however, passive, non-motorized uses will be permitted. The types and levels of public use will be guided by the sensitivity of the area's natural features. Appropriate uses may include nature interpretation, bird watching, photography, and solitude. Specific recreation guidelines may be developed in cooperation with the appropriate experts. No new bridle trails should be developed in this zone except to reroute an existing trail to correct an environmental problem.

##### Visual Resources

Visual resource management will consist of retaining the area in its natural state. No new public utility and transportation corridors will be permitted within this zone. A Natural Area may, however, be bounded by such corridors.

##### Wildlife Management

Wildlife habitat manipulation and/or management will not be allowed in Natural Areas unless specifically designed to maintain or promote rare or otherwise desirable animal species. Plant or animal species that are not native to the site will not be introduced to the area or its environs.

### Transportation

No new roads will be constructed in these areas. Low impact "Nature trails" for interpretive purposes or to direct public use may, however, be established. Existing roads or trails may be maintained at present levels as long as they do not threaten or degrade the significant resources.

### Vegetation

Cutting of vegetation in this zone will not be permitted. However, invasive plants are continually threatening the forest ecosystems. Invasive plants can and do change the site conditions making it difficult, if not impossible, for the natural plant communities to be sustainable. To promote the continued health and longevity of unique ecosystems or rare and endangered species population it may be necessary to employ targeted and directed application of herbicide to control non-native invasive species. Other invasive species control methods may also be considered such as manual maintenance, hack-and-squirt, or basal spraying. Broadcast application of herbicide will not be permitted. Partners and other experts will be used to make recommendations on invasive species treatment options.

### Silviculture

The intent of this zone is for protection. Timber harvesting is not permitted in zone 1A, unless otherwise ordered by the Chief of the Division due to catastrophic weather, wildfire, or other natural events. Outside consultations will be held to assist in determining any timber harvest prior to the recommendation of any timber harvest. Research may be permitted with the approval of the Division.

### Facilities

No new construction will be allowed except as needed for the protection of unique features.

### Resource Protection

Top priority will be given to the protection and enhancement of unique natural resources in this area.

## **B. Cultural/Historical areas:**

The purpose of this sub zone is to recognize and provide for the protection of an area's cultural or historic features. Cultural/Historical Areas will be managed in such a way as to protect these features. Public awareness and use of these areas will be limited and will be allowed based on each area's ability to sustain appropriate use without degradation of the cultural or historic feature. Examples of Cultural/Historical Areas include archaeological sites, historic sites, historic landscape ruins, homesteads, etc. The main public uses of Cultural/Historical Areas will generally revolve around interpretative activities.

Because most such areas will be small in nature and encompass small acreages, this sub zone will be delineated by numbers of sites and not by acreage. This sub-zone contains mostly HCV 6 areas.

### *Cultural/Historical Areas: Management Guidelines*

#### Recreation

Only passive recreation will be allowed in this subzone. Recreation will be discouraged on or near sites where possible, which could be adversely impacted. Recreation will be allowed in the vicinity of historic or cultural sites only in instances when it will not adversely impact on site.

#### Visual Resources

Custodial management (such as mowing lawns, maintaining structures, planting shrubs, cutting brush, etc.) will be undertaken as necessary to maintain or enhance the historic value of the site.

#### Wildlife Habitat

No formal wildlife habitat management activities will be undertaken in this zone.

#### Vegetation

Vegetation management will be allowed so long as it is consistent with the historical/cultural values of the area. Targeted and directed application of herbicide may be needed for non-native invasive species control. Archaeological sites in natural settings will be managed similarly to Natural Areas.

#### Transportation

All roads and trails will be located to avoid impacting known cultural/historical sites. Existing roads or trails may be maintained at present levels as long as they do not threaten or degrade the cultural/historical resources.

#### Silviculture

Timber harvesting is prohibited in all of zone 1B, unless otherwise ordered by the Chief of the Division due to catastrophic weather or natural events. Silviculture operations in the vicinity of a known cultural/historical site will give due consideration to maintaining the integrity of the site. No timber should be removed from such sites if by doing so the area is damaged.

#### Facilities

No new construction will be allowed unless part of a formal site protection or restoration plan.

#### Resource Protection

Top priority will be given to the protection and restoration of unique cultural or historical resources in this zone. Cultural/Historical sites will be left in the condition discovered. Wells, which pose a threat to safety, will either be fenced or filled in accordance with

ODNR policy (an assessment of their historic significance should be done prior to filling). Sites will identified and communicated within ODNR-DOF but kept confidential to general forest visitors where possible to avoid disturbance to the sites.

### **C. Shawnee Wilderness Area:**

The Division of Forestry believes that the designated Wilderness Area within Shawnee State Forest qualifies as a High Conservation Value Forest due to its secure protection under Ohio Revised Code. While this area does not meet the ecological definition of old-growth due to the fact it contains roads and has had historic timber harvesting over many years; it will remain protected in perpetuity and therefore will likely exhibit future old-growth characteristics. This sub-zone contains only one area and it meets HCV 3.

The Shawnee Wilderness Plan shall serve as the management plan for this sub-zone. The plan is located at the central office, the district office, and the Shawnee state forest office.

### **D. HCV Restoration Area:**

This sub-zone of Zone 1 is designated for areas of state forest that are contain one of more of the six HCV's, especially HCV 1 and HCV 3, however, these lands are in critical need of intensive management activities in order to restore and maintain their HCV. In the Division's current zoning designations, it is not appropriate that these lands be put into sub-zone 1A or 1B, since timber harvesting is prohibited except for invasives plant management. Consequently, it is necessary to designate these areas of HCV as zone 1 sub-zone D, in order to communicate to foresters, staff, and partners, of the Division's intent to rehabilitate and restore these areas to a healthier, historical state. An example is certain areas of Maumee State Forest which lies in the Oak Openings Region.

*Restoration Area: Management Guidelines:*

#### Silviculture

All appropriate silviculture and prescribed fire activities are allowed in sub-zone 1D, provided that restores, enhances, rehabilitate, and maintains the particular HCV that is of interest on that site. For example, aggressive harvesting and burning in the closed canopy forest of the Maumee State Forest may be needed to restore oak savanna conditions.

### **Special Sites or "point" features**

Special sites that are less than 5 acres in size are to mapped on the Division's "Special Sites" GIS layer. Special sites include Indian mounds, cemeteries, historical structures, cave entrances, hibernacula, etc.. A special site is a generally a point feature and would not adequately be protected if lumped into a zone. Therefore, it is necessary to map this features separately.

Special sites fall under the management guidelines for Zone 1. No specific activities are recommended except non-native invasive plant species control.

The “Special Sites” GIS layer will be used as an assessment data set for the prescribed and conducting of site disturbing activities.

**CLASS 2 ZONE - Reserved Lands.**

The purpose of this zone is to designate lands whose present use is uncertain due to land acquisition, administrative or technological constraints. Examples of such areas would include a new property acquisition, potential recreational development sites, or real estate parcels. Larger areas of adverse possession may be placed into this zone until such time as ownership rights are resolved.

The intent of this zone is to act as a temporary “holding” zone. Lands in the zone should only be held in this zone for 2 years or less. Forest managers should list all of their zone 2 lands in their annual work plan for evaluation purposes. Zone 2 lands should be evaluated for their best use, protection, sensitive resources, and public use.

*Reserved Lands: Management Guidelines*

Recreation

In accordance with existing conditions and with regard to future use of the site, opportunities for extensive recreation activities may be provided.

Other activities

No specific activities will occur in Zone 2 until the area can be evaluated and re-classified into an appropriate zone.

## **CLASS 3 ZONE – Intensive Management**

This zone encompasses all areas where intensive cultural practices and vegetative manipulation will occur. Areas in this zone are used to determine allowable harvest calculations. The zone is further subdivided into areas whose management guidelines are directed toward fulfilling primary resource objectives i.e. aesthetics, soil and water, wildlife and timber.

### **A. Resource Protection Area:**

This area is intended to offer protection to sensitive soil, water, and other natural resources which may suffer significant damage by inappropriate management or use. Typically, this zone is designed for land which is sensitive for a specific reason: severely erodible soils, bottomland, wetlands, etc. Protection implies environmental sensitivity and requires controlled management and use. The goal of this area is to protect the major natural resource elements of the land to which irreparable damage could be done.

#### *Resource Protection Area: Management Guidelines*

##### Recreation

Backcountry recreational uses will be permitted such as interpretation, hiking, cross-country skiing, hunting, horseback riding, scenic viewing, etc., if such uses do not adversely affect any of the specific resources. In the SMZ of a permanently flowing or intermittent stream, new trails will be discouraged, except as a perpendicular crossing, and existing trails and facilities will be re-located as budgets, time and work schedules permit. Intensive, development dependent recreation will not be permitted in this area. Where an intensive recreation site is adjacent to an SMZ, efforts will be made to limit stream access to defined access points where damage can be mitigated.

##### Visual Resources

Visual resource management will consist of doing minimal vegetative control to enhance visual considerations without damaging protected values. Future Public utility and transportation corridors will not be permitted within this area, except for on-site use, without a resource protection plan.

##### Wildlife Habitat

High priority will be given to maintaining wildlife habitat. Any project within this zone will follow the wildlife habitat guidelines.

##### Vegetation

Vegetation Management will be allowed that are consistent with sensitive nature of this zone. Adequate control measures will be employed as to not damage or degrade the land in this zone.

##### Transportation

Passage through this area will be permitted on existing, stable roadbeds or trails except in the SMZ where roads and trails will be re-located as budgets, work schedules, and time permits. New trail or road construction to gain access to otherwise inaccessible areas will be permitted if the construction is limited to stable areas and outside of the SMZ, or to

cross the SMZ at right angles. Trails and roads should be designed and routed to minimize soil disturbance.

### Silviculture

Timber harvesting will be allowed in this zone so long as all sensitive resources can be protected through mitigation practices. Where protection of soils and/or water is especially critical, the strictest standards will be used in road developments for harvesting.

Prescriptions shall be consistent with Division policy and further shall employ appropriate and strict guidelines for the use of harvest roads and skid trails in order to protect soil and water resources. Even-aged silvicultural systems may be used in this sub-zone, however, *there will be no clearcut regeneration harvesting in zone 3a*. Tree retention in zone 3a shall be consistent with protecting soil and water resources. Partial harvests that focus on individual or single-tree management are preferred in 3a.

### Facilities

No new buildings will be permitted in this zone. Small scale, passive facilities, such as interpretive exhibits, primitive campsites and picnic areas will be allowed except in the SMZ of a permanently flowing stream without a resource protection plan.

### Fire

Any prescribed fire or presuppression work, such as closing areas during dry periods, maintaining firebreaks, maintaining transportation systems, fuel management and conducting hazard reduction burns, may be carried out in this zone with the intent to give maximum protection to sensitive soil and water resources.

## **B. Aesthetic Area:**

This sub zone encompasses areas adjacent to developed forest recreation areas, State Parks, or areas affected by high density public use where primary consideration is given to visual and non-consumption values. Management will be directed toward maintaining healthy viable stands of trees.

### *Aesthetic Area: Management Guidelines*

#### Recreation

All backcountry recreational activities as allowed on State forest land may occur in this area.

#### Visual Resources

Special consideration will be given to retaining and enhancing those tree species that provide special aesthetic benefits, as well as the maintaining the presence of large, mature trees.

Openings from silvicultural operations may be created to enhance visual qualities.

### Wildlife

Wildlife habitat will be given special consideration in all management practices. Such practices as retention of den trees and mast producing trees, opening maintenance, etc. will be given special consideration in all resource management activities. Abandoned main logging roads and landings will be seeded to suitable grasses and legumes to provide food and cover for wildlife.

### Transportation System

Guidelines shall be consistent with those outlined in sub zone IIIC.

### Silviculture

Silviculture systems used in this area shall consider that the intent of this sub zone is to protect sensitive visual resources. Prescriptions shall be consistent with Division policy. Even-aged management is allowed, however, clearcut harvests shall not be used. Group openings / Patch cuts are allowed and will generally be 2.5 acres or less, openings between 2.5 and 5 acres require additional approval as a means of developing diverse forest cover for a variety of wildlife species. These openings should be located where timber conditions are poorer, on less productive sites or where regeneration to oak is more likely.

No timber stand improvement (TSI) operations will be carried out in stands with a black oak site index below 60.

### Fire

Any prescribed fire or pre-suppression work, such as closing areas during dry periods, maintaining firebreaks, maintaining transportation systems, fuel management and conducting hazard reduction burns, may be carried out in this zone

### Facilities

Facilities relating to recreation activities that are normally allowed on Division lands may be developed in this area.

## **C. Timber Management Area:**

This area is designed for land, which can appropriately provide sustained yields of all forest products, but most importantly timber. There are several special sub-zones that are unique to certain forests that fall under Zone 3C. They all have some unique considerations; however the overall principles are the same. Examples of these are the Grouse sub-zone, the Turkey sub-zone, and the Backcountry Management Area sub-zone.

### *Timber Management Area: Management Guidelines*

### Recreation

Opportunities for extensive recreation (hiking, cross-country skiing, snowmobiling,

picnicking, hunting, fishing, swimming, primitive camping, nature studying, etc.) will be provided by using the transportation system created from on-going timber management activities. The Division will avail itself of every reasonable opportunity to utilize on-the-ground management activities as a public demonstration of sound, practical resource management. Roads serving active logging operations during periods of heavy use will be maintained in a condition suitable for the safe passage of users by keeping the roadway free of debris and posting signs to warn forest visitors of the hazards present.

#### Facilities

Small-scale facilities such as gravel parking areas and picnicking areas will be permitted in this area. Major developments will not be appropriate.

#### Visual Resources

The size, shape, and placement of clearcuts will be consistent with Aesthetics/visual chapter of this manual. Utility corridors will be permitted in this zone provided they are designed to minimize adverse visual impacts. The opening of vistas and maintenance of open fields and clearings will be given priority in this sub zone.

#### Wildlife

A balance of wildlife habitat diversity shall be encouraged in this sub-zone. High priority will be given to maintaining critical or unique wildlife habitats in a productive condition. Special or unique habitats will be maintained, such as abandoned apple orchards, conifer "islands" within hardwood stands, and abandoned agricultural lands in early successional stages. Where appropriate, diverse wildlife habitat will be maintained through the use of proven silviculture techniques. Wildlife habitat development and maintenance will be considered in all silvicultural plans and operations. Consideration such as the retention of den trees, snags, development of diverse cover along streams, and seedlings of grasses and legumes suitable for wildlife on closed out harvests will incorporate into specific compartment harvest plans. Since forest management naturally creates small herbaceous openings on roads and landings, no new herbaceous openings will be created or maintained beyond what is created from timber harvesting.

#### Transportation

Layout, maintenance and closure of all skid and haul roads will follow guidelines as shown in the Timber Management Manual, Chapter VI and the publication, BMP's for Erosion Control on Logging Jobs.

#### Vegetation

Non-silvicultural vegetation management will be permitted to open up vistas, improve pedestrian access, and encourage native plant and wildlife species.

#### Silviculture

Even-aged silviculture systems will be utilized to secure adequate natural regeneration of species adapted to the site that have high multiple-use, commercial, or ecological value. Any silvicultural systems proposed other than even-aged management must be part of a long-term prescription and must receive *additional review* by appropriate staff. Inventory

data and growth and yield models will guide harvest levels and scheduling and be outlined in each forest-specific management plan.

Silviculture systems used in this subzone will be appropriate for the site and be consistent with Division policy and will be based on scientific peer-reviewed research. Harvests shall be consistent in size and shape as the natural disturbance pattern for the Appalachians. Where clearcutting is used, harvest openings with no live tree retention shall be limited to 10 acres. The live-tree retention target will be defined as 20 square feet of basal area of greater than 4 inch live trees. Live-tree retention can be in the form of deferment overstory trees, tree islands, or randomly scattered trees. Live-tree retention can also include the SMZ or other special areas adjacent to the harvest unit. A rationale is provided in the prescription if the live-tree retention target is not met. For pine plantation clearcut harvests, no retention of pine trees is preferred, therefore it is acceptable to not meet the 20 BA threshold for pine clearcut harvests.

There will be no restriction on harvest unit size where stands are heavily degraded, have been previously high-graded by a previous land owner, or in a salvage situation due to a stand failure. These situations must be noted in the harvest prescription and approved by the land management administrator and district forester. The goal of these areas is restoration and therefore, for the sake of restoration, there may be suitable reasons to have retention at a lower level.

#### Green-Up Requirement

A stand cannot be harvested using a final regeneration harvest (Clearcut, Deferment Cut, or the Overstory Removal of a Shelterwood Cut) until the adjacent stands contain at least 435 trees per acre of desirable species that are at least 5 feet tall. Adjacency shall be defined as having greater than 10% of the perimeter touching a stand that is not “greened-up”. Any harvest having less than 10% of its perimeter touching a stand that is not “greened-up” is acceptable.

#### Timber Stand Improvement

T.S.I. will be used to improve the quality and vigor of timber stands. Precommercial T.S.I. operations will be carried out only in stands on high yield sites. Priorities will be developed and utilized for scheduling T.S.I. activities based on the relative rate of return on the investment. Highest priority will be given to treatments that assure regeneration of preferred species in areas being regenerated. This work will be carried out by utilizing the most efficient means available within sound environmental constraints.

#### Fire

Pre-suppression work, closing areas during dry periods, maintaining firebreaks, maintaining transportation system, fuel management and conducting hazard reduction burns, shall be carried out in this area. In the event of an uncontrolled fire, the Division and local volunteer fire departments will respond with appropriate means to minimize any loss to the resource. Prescribed fire is an acceptable management tool and shall be used extensively in this sub zone. Prescribed fire shall be consistent with Division policy

and based on scientific peer-reviewed research.

#### Cultural/Historical

All sites identified to have Cultural/Historic value within this area will be maintained for such values. Careful discretion will be used with any resource management activity adjacent to these sites. Where necessary activity plans will be amended to give site protection the highest priority.

#### Streamside Management

See Zone 3 A Resource Protection Area for additional restrictions within the shade/filter strip of permanently flowing and intermittent streams.

### **D. Plantation Management Area:**

This sub zone is used for areas that have been designated as plantations, seed source, and seed production areas for both angiosperms and gymnosperms. As our forests grow older a lot of our conifer plantations reverted to hardwoods. In other areas, early successional conifer species are disappearing from the landscape, as well. During the 1980's the division operated a seed improvement program where several outplantings of know genetic strains of various species were developed as seed production and seed source areas. These areas need to continue to be managed as such.

The Division of Forestry recognizes that plantations can be an important aspect of the forested landscape. Their presence across the landscape can provide many benefits, such as:

- Maintaining biological diversity and thermal wildlife cover.
- Maintaining scenic quality in many high use areas.
- Continue the legacy of the Division of Forestry's soil conservation efforts.
- Demonstrate plantation management to private landowners.

#### Recreation

All backcountry recreational activities that are permitted on state forests may occur in this area.

#### Visual Resources

Special consideration will be given to managing and regenerating plantations in areas where there is an established aesthetic benefit. Regeneration methods will incorporate aesthetic value techniques to minimize the unsightliness of management disturbances. When Zone III-C surrounds a plantation, management aesthetics will not be as high of a priority as management efficiency and productivity. Plantation management does not have to be buffered for visual reasons.

#### Wildlife

Wildlife habitat will be given special consideration in the overall landscape level forest management determinations / decisions. Considerations will be given to maintaining

existing plantations for winter thermal wildlife cover. Any roads that are established for management purposes will be seeded with an approved wildlife seed mixture.

### Transportation

All guidelines listed in the Timber Management Area apply to this sub zone.

### Silviculture

There are a number of management strategies and philosophies that will be incorporated into all silvicultural activities and are as follow:

- The overall acreage target for plantations shall not exceed 5% of the total state forest land base. We should strive for a minimum of 3% of the forest land base in plantations for each forest.
- Sites that are currently in native hardwoods will not be converted to plantations. New plantations may be established on new acquisitions that contain fields.
- Plantations are encouraged on forests that contain mine lands that are not succeeding back to native forest cover.
- When adjacent to Zone III-C, a certain amount of intensive silviculture should be practiced to demonstrate plantation management that maximizes fiber production of high value forest products.
- Species composition shall be determined based on site conditions with the encouragement of native species that are not subject to existing disease and insect problems.
- Only the very minimum amount of herbicides and pesticides will be used in plantation management. Fertilization will not be used without an exemption or policy variance from the Chief of the Division of Forestry.
- Regeneration survival should be a least 65% survival or a minimum of 300 stems per acre.

Plantation Silviculture will be through an even-aged system. Artificial regeneration will be used when there is inadequate or unacceptable hardwood regeneration.

Intermediate treatments are permitted and shall be guided by acceptable silviculture techniques (i.e. row thinning, free thinning, mechanical thinning, and other methods to favor dominate crop trees).

Regeneration will be through even-aged methods such as clearcuts and shelterwood cuts. Regeneration will occur upon maturity or for forest health or salvage reasons. No pine tree retention is necessary in pine clearcut harvests, however, hardwood retention is desirable if appropriate. It is acceptable to be below the retention standard on pine clearcut harvests.

### Fire

Generally, fire will be excluded from plantation management activities unless it is for a specific purpose to enhance the plantation.

### Facilities

Facilities that are normally allowed on Division lands may be developed in this sub-zone.

## **CLASS 4 ZONE – Recreation and Administrative Areas**

This zone is designed for areas that are suitable for development and public use as an intensive recreation area. This zone has two sub zones: Intensive Recreation Areas and Administration Areas.

### **A. Intensive Recreation Areas:**

The purpose of this sub zone is to designate land areas capable of providing high quality outdoor recreation and sustaining relatively large numbers of participants at one time.

#### *Intensive Recreation Areas: Management Guidelines*

##### Recreation

Appropriate uses for this zone include camps, rifle ranges, trailhead parking areas, vistas, rock climbing and rappelling areas, fire tower sites, picnic areas, lakes etc. Sites shall be a minimum size of 1-acre and may include a 100-ft buffer around each site.

##### Visual Resources

Visual management in this zone should give consideration to the high level of use these areas receive. All slash and debris should be managed to minimize visual impact to forest visitors. Utility corridors will be permitted in this area provided they are designed and maintained to minimize adverse visual impact. A diversity of forest stand structures may be created to improve visual interest.

##### Wildlife Habitat

All snags and den trees not posing a hazard to user safety will be retained. Particular emphasis will be given to maintaining existing vegetation having high wildlife values such as mast producing trees and shrubs. Small scale wildlife habitat improvements to improve habitat diversity and nesting opportunities may be undertaken where they do not conflict with the primary recreational use of the site. Landscape plantings will consist of native materials. Only when unusually severe growing conditions prevail and native species are deemed unsuitable will exotic plant materials be used. The value of a particular species to wildlife will be an important consideration in its selection for planting.

##### Vegetation

Vegetation management will be encouraged to control non-native or invasive species where practical, open up views, improve pedestrian access, and improve the quality of existing native vegetation.

##### Transportation

All main roads and bridges will be constructed according to Division of Engineering standards. New roads will be carefully designed to complement the visual characteristics of the site.

### Silviculture

Silvicultural treatments will be carried out to; (a) halt or slow the progress of insects or disease; (b) enhance the recreational environment; (c) provide small-scale interpretive forest management demonstration areas; or (d) provide minor improvements to non-game wildlife habitat.

### Fire

Prescribed fire should generally only be used if incidental to a larger resource management burn. Uncontrolled fire will be suppressed as detailed for Zone III.

### Facilities

The highest priority for facilities in this area is to maintain high quality backcountry recreation opportunities while minimizing negative impacts on the site. Any new facilities should be planned considering these goals.

## **B. Administrative Areas:**

The purpose of this sub zone is to designate and provide land areas and facilities for the efficient administration of State Forests. Administration buildings, fire towers, state forest residences, utility corridors, airports, helicopter pads, and communication towers may be located in this sub zone.

### *Administration Area: Management Guidelines*

#### Recreation

Recreational uses are generally not part of this sub zone. However in some cases recreational uses are incidental to other facilities. An example is historic fire towers near existing state forest offices. In that case those small areas can be managed as sub zone 4-A.

#### Visual Resource Management

Efforts will be made to minimize visual impacts of developed facilities by retaining or planting trees, shrubs, or grass.

Buildings will be designated to blend in as much as possible with the surrounding landscape. Use of native building materials and traditional architectural styles is encouraged.

#### Wildlife Habitat Management

Trees and shrubs for wildlife will be maintained when their presence does not interfere with efficient administration.

#### Vegetation

Vegetation management will be encouraged for aesthetic purposes to screen utility buildings from view, open up scenic views, improve pedestrian access, and improve the quality of existing native vegetation.

### Transportation

All main roads and bridges will be constructed according to standards given from the Division of Engineering.

### Silviculture

No conventional timber sales will be conducted in these areas. Diseased, defective, or hazardous trees may be removed as necessary.

### Facilities

Construction of administration buildings, maintenance areas, storage facilities, parking lots, transportation centers, utility lines and all other major operational structures will be located in this area.

The location and design of all facilities should be compatible with existing landscapes and facilities, and should be situated to minimize environmental and visual impacts.

A physical master plan should be prepared with the Division of Engineering for areas where major new construction is planned.

## **State Forest Zone Zone Revision Policy**

Zoning provides for the consistency necessary in the long-term management of our state forest resources that transcends changes in administrations or state forest staff. However, zone revisions will become necessary to adequately address the management of an area if there are new and sensitive features noted during monitoring activities or for a new acquisition.

The following procedure shall be utilized to expedite modifications in the zoning of a state forest:

1. Forest Managers who propose zone changes must first have them approved by the District Manager. The District Manager shall propose the zone change to the Land Management Administrator. The Land Management administrator shall evaluate the zone change and, if recommended, shall provide the change to the Chief of the Division for review.
2. All zone changes that are greater than 10 acres or are deemed to have a significant impact on forest management or stakeholders reviewed by the Forest Advisory Council at the next regularly scheduled meeting. The rationale for the proposed changes will be presented to the Forestry Advisory Council. The Forest Advisory Council's comments shall be submitted to the Chief.
3. All zone changes that are greater than 10 acres or are deemed to have a significant impact on forest management or stakeholders shall be offered for public comment / consultation. Comments are to be solicited from the public at the next convenient time such as during a state forest open house or from an on-line posting of the changes.
4. Comments from the Forest Advisory Council and the public shall be reviewed by the Management Review Committee. Comments shall be addressed and changes made to the zone description or the spatial locations of the zones. If changes are not made then a publicly-available rationale shall be provided. The Management Review Committee, in consultation with the Forest Manager, shall review all public comments and recommendations and incorporate changes into the zoning. If changes are not made then a rationale is provided to interested stakeholders.

### Special Zoning

State Forests, such as Mohican-Memorial State Forest, will not be zoned by the above zones as described earlier in this chapter. The descriptions of the zones for these areas will be kept at the local office and at the central office.

## **Chapter 3**

### **Inventory and Prescriptions**

This chapter establishes minimum requirements and work flow for inventory and prescriptions at the stand level integrating the compartment review process. Data collection methods and calculations will be standardized over time with the advent of handheld computers and software, while also allowing for a transition time due to training, and implementation. The intent of this chapter is to standardize the process and philosophy while leaving room for units to implement their inventory operations to suit their needs.

#### **A. Historic cover surveys and compartment organization**

In mid 1970, cover surveys of most state forests were completed to assist in initiating resource management programs. Future cover surveys will be made as needed to account for land acquisition or disposal and unusual changes in forest cover.

The first stage of a cover survey is the division of the land into workable management areas called blocks, compartments and management units.

Compartment boundaries will be established along readily recognized features of topography, or relatively permanent man-made features such as roads, and will vary in size generally being 200-400 acres and will be designated numerically. Compartments will be subdivided into management units based on forest size classes and/or potential productivity and will be designated alphabetically, lower case. To maintain consistency of management and record keeping, blocks and compartment designations shall remain permanent; but, management unit designations (stands) may change to reflect changes in management objectives. For location purposes on large forests, blocks of compartments will be delineated and identified alphabetically, upper case. Compartment numbering within a block will begin with 1. Example: C18b means block C, compartment 18, management unit (stand) b.

For new lands or for lands never delineated: after compartmentalization, a reconnaissance cruise of each compartment will be conducted as scheduled, the basic function of which will be, to provide stand size class information including acreage, location, timber types and a brief assessment of cultural needs.

#### **B. 2009 Inventory Project**

In 2009, 155,000 acres of the 8 largest state forests were inventoried. The purpose of this inventory was to give an accurate forest inventory at the stand level on 8 state forests that can be used as a decision support tool for forest planning using growth and yield modeling, timber production, and forest certification.

Key components of project included:

- Mapping: stratification, stand polygon delineation with associated inventory attribution

- Inventory: design of a stratified-inventory sampling system, field data collection, and analysis of data.
- Reporting: summary reports for each forest as well as strata, and data configuration to facilitate population of the Division of Forestry’s integrated forest information system (Resources, Cengage Solutions, Inc., Vancouver, BC – Canada).
- An inventory that supports forest planning using Growth & Yield Modeling in a format compatible with the USDA Forest Service’s Forest Vegetation Simulator.
- An inventory that will allow the calculation of an annual allowable harvest.
- An inventory that will support the DOF timber sale program.
- An inventory that is usable to analysts and field foresters alike.
- An inventory that will support decision-making on silvicultural activities including prescribed burning.

To meet these requirements, a stratified forest inventory was conducted in spring of 2009. The inventory used proprietary techniques to extrapolate a field sample consisting of 2,209 plots across all the acres of the eight forests. This approach provided a forest level inventory estimate within the allowable budget. As per the project requirements, statistics at a 90% confidence level were calculated for key inventory variables: board feet and tons. This indicates that each variable can be predicted to fall within upper and lower limits shown 90% of the time. At a 90% confidence level, the table below indicates the true population mean (75.9 tons/acre and 10,188 board feet/acre) lies between the lower and upper limit as denoted by the range bars.

Since the Ohio DOF desires a stand-level inventory, but like most organizations, both public and private, lack the resources to perform such a detailed inventory, the LandMark Team (LandMark Systems, Sanborn Solutions and Forest Resource Services (FRS)) proposed to leverage a number of remotely acquired data sources to arrive at a level that would be more refined than a regular stratified-level inventory. This process, called stand parameterization, results in an inventory that could be classified as a stratified inventory with adjustments made at the stand and sub-stand level. It could also be referred to as a process somewhere between a stratified and stand-based inventory, whereby the stand-level results are more refined than a strata-based inventory, but not as refined as one purely stand-based.

### **C. Compartment Review**

The Division of Forestry uses a 20-year compartment review or “cruise cycle” to evaluate stands within compartment for management. A secondary function is to monitor the effects of past land management activities on the stand. There are over 600 compartments on state forests resulting in approximately 30 compartments of 200-400 acres that will be reviewed each year for management opportunities. This is roughly 9,000 acres per year that will be reviewed.

Each state forest will have all of the compartments on the forest placed on a schedule with equal number of somewhat randomly selected compartments per year for 20 years.

For each year, the compartments to be reviewed by the land management staff at each forest will be listed. The land management team shall review and update as-necessary the compartment review schedule to account for acquisitions and divestitures.

Compartment boundaries are fixed and do not change. Compartment boundaries were put into place several decades ago. Years of prescriptions, recommendations, and historic activities are located in the compartment file at each forest. Compartment boundaries shall be used as a reference layer in Genus to determine the locations of stands that will be up for review in any given year. Going forward, our Genus information system shall serve as the primary compartment file with the paper compartment file serving as the backup. All compartments scheduled for review will be tagged in Genus.

#### Parameters for stand selections and review

All stands from the LandMark inventory that lie mostly within a compartment are eligible for review in the compartment review. However, not all stands need or should be reviewed based on operational limitations. On an as-needed basis, the land management staff working with the Chief will decide on the parameters to select stands within compartments for review. Foresters and land management staff will pre-select the stands to be reviewed for prescriptions based on the LandMark inventory in Genus.

#### Stand-level prescription cruising

Upon determining which stands will be reviewed, the forester shall plan and design a prescription cruise based on the pre-determined cruise methodology set by the land management staff for each stand. All sampled stands will be tagged in Genus. Data collection methods and calculations will be standardized over time with the advent of handheld computers and software, while also allowing for a transition time due to training, and implementation. An appendix at the end of this chapter shall detail the cruising specifications and data collection methodology.

#### SILVAH OAK

All collected data will be analyzed with the best available peer-reviewed science including tools such as SILVAH OAK. The forester shall determine the treatments for those sampled stands and complete a stand-level prescription for review by the forest manager, land management, and the district. Any prescription not consistent with SILVAH OAK must contain additional rationale and be approved by the district. All prescriptions and cruise reports will be put into Genus and into the compartment file.

#### Non-sampled stands

Stands not sampled during the compartment review process will consist of stands that are pre-commercial or non-productive forestland, or have artificial constraints that prohibit management. However, recommendations may be made by the forester based on ocular estimates. Foresters are encouraged and advised to make ocular recommendations as to TSI, grapevine control, and invasive treatments. Should the forester discover significant differences on the ground, the forester shall elect to sample stands that are not selected

and may include them in the review. All prescriptions and recommendations will be put into Genus.

### **Pre-Harvest/Pre-Burn Assessment**

During the compartment review process, the forester shall initiate an impact assessment. The impact assessment shall be conducted for those stands / management units that the forester is recommending silvicultural treatments for. The impact assessment shall include the following steps:

1. The *Ohio Biodiversity Database* (formally the “Natural Heritage Database) will be checked for any rare, threatened or endangered (RTE) species in or near the compartment being cruised so the silvicultural treatments can be adjusted to protect or enhance any existing population.
2. The *Ohio Historical Society Database* will be checked for the locations of any archeological or historic site located in or near the compartment being cruised so that those features can be mapped and protected during any silvicultural recommendations.
3. The local forester will consult with *Division of Wildlife - biologists* on their recommendations for feedback on the potential positive or negative impacts to wildlife species. Consultation with biologist may be facilitated during annual open houses or direct contact from the unit or the district. Other experts such as the DOW rattlesnake biologist shall be contacted for any silvicultural recommendations at Shawnee State Forest.
4. The *Web Soil Survey and/or the Soil Data Mart* shall be consulted for the type and nature of the soil resources and any potential impact that soil disturbance activities will have on soil resources. The local Soil and Water Conservation District is available to offer assistance with recommendations.

It is preferred that these consultations be made during the compartment review process, however, the complete suite of impact assessments and consultations may be completed during the marking and layout phase of timber sale or prescribed fire depending on circumstances. A matrix of impact assessments guidelines is available in Chapter 4 Timber Harvest Preparation.

### **Approvals**

Approval can be given by the District Forest Manager signing the individual prescription cruise reports &/or the cruising report cover sheet. Send copies of the approved stand analysis to the State Land Management Administrator for review. Any recommendations exceeding or out of line with Division policy must be approved by the Chief of the Division of Forestry via the Policy Variance Request Form. If for any reason any part of an approved recommendation is changed, appropriate documentation will be reissued through the same approval and review process. It is highly desirable that cruise reports be approved/disapproved within thirty (30) working days. Approved prescription cruise reports generate activities. Upon receiving an approved prescription cruise report, forest managers and foresters shall immediately schedule those approved stands for treatment

and mark them during the next available marking season. See the timber sale preparation chapter and the pre-commercial chapter for more details.

#### Policy Variance Request Form

This form provides a procedure for deviating from policy. It also documents why a policy may need to be modified to accomplish this activity, informs staff and sets up a process for the proposed policy variance. Examples of policy variance may be zoning changes, size of harvests, or sales of state forest products. The policy variance request form should be submitted as the situation warrants. Normally the policy variance request form will be submitted with the prescription cruise reports. Blank copies of these forms are located on pages # at the end of this chapter.

#### **D. Post-harvest inventory**

In general 75% of state forest timber sales are partial harvests and have residual timber volume on the stand. It is the intent of the Division of Forestry to maintain, in perpetuity, a comprehensive stand-level forest inventory. In order to accurately calculate inventory and growth for each state forest, these residuals must be part of the inventory. Following any silvicultural activity where timber volume is removed and a residual timber volume exists (greater than 20BA of sawtimber); foresters shall inventory those stands and import the compiled cruise data into Genus. Cruise specifications and methodology will be detailed in an appendix at the end of this chapter. Operationally, foresters may elect to do the post-harvest cruise during timber sale administration. Or they may do this activity at the most appropriate time determined by operational priorities. This post-harvest cruise activity can be prescribed in Genus and will likely lead to 2000-2700 acres of inventory each year.

#### **E. Growth and Yield and Annual Allowable Harvest Calculations**

It is the intent of the Division to use Growth and Yield modeling as a decision support tool in the determination of sustainable harvest levels. The Genus information system has the functionality and the framework already built to be able to catalog inventory data export to the Model. At this time the Division will be using FVS Northeast Variant. However, future circumstances may dictate adjusting or using a different model. Regardless, our system is highly configurable. Cruise data that will be exported to the model will be all stand-level inventory data, including LandMark stand and modeled data and post-harvest cruises. Prescription cruises awaiting an activity or sale cruises will not be used. Inventory data will be constrained at the forest-level based on zones and other environmental factors. Data and calculations will be incorporated into 5-year Forest Management Plans. Growth and yield models will be monitored and audited to for accuracy to ensure reliable estimates.

#### **F. Real Estate Timber Appraisal**

The Department of Natural Resources, when considering the purchase of land to add on to the State Forest system, will request a timber appraisal. The purpose of this appraisal

is to determine the amount and value of existing timber and to identify any existing problems (i.e., trash dumps, existing facilities, etc.) which will be considered in the price of the property.

The Department will request this information from the State Land Management Administrator; who will then relay it to the District Forest Manager. The request will be for either a “ballpark” or a “Detailed” appraisal. The District is only to provide the quality and volume information for the timber. All volumes shall be expressed using the Doyle log rule. Leave all value columns blank. The State Land Management Administrator will determine the value figures.

If an ocular estimate, or “ballpark” appraisal is requested the “Quick” timber Appraisal Worksheet shall be used. This type of appraisal is to be based on a walk-through, “quick” estimate and five to ten randomly located variable radius ten-factor prism plots; depending on the size and variability of the property. Volume information for the entire area should be rounded to the nearest 10 MBF, with the quality rated as excellent, good, fair, or poor. The per acre estimate for volume is to be rounded to the nearest 500 BF/acre. The level statistical accuracy is not required for this type of appraisal due to the walk-through nature of the process.

If a “detailed” appraisal is requested, the Detailed Timber Appraisal Worksheet shall be used. For the detailed appraisal, the estimate is to be based on sufficient randomly located variable plots (with a minimum of 10 plots), to be 95% confident that your average sawtimber basal area on the sample plots is within +/- 5% of the mean basal area. Tracts with variable cover may need to be stratified to achieve this.

In any real estate cruise is requested, the Factors Affecting Value report form is to be filled in. As the parcel is being traversed noted anything which, in your judgment, will negatively or positively affect the value of the property (i.e., trash dumps, waterfalls, homesteads, etc.). Then list the findings under the appropriate category on the report form.

## **G. Regeneration Guidelines**

The following guidelines shall serve as a basis for judging the adequacy of natural regeneration following harvesting. Judging adequate regeneration is a necessary step in determining the timing of a Overstory Removal cut of a Shelterwood and also the success of a clearcut in achieving regeneration.

*Ag Handbook 355* calls for 400 good stems/acre of hardwood species.

*Ag Handbook 405* provides a discussion of different cutting methods and their impact on regeneration. In all sites discussed, more than adequate regeneration was achieved with over 10,000 stems/acre. However, clearcutting produces more yellow-poplar and undesirable species as apposed to shelterwood and partial harvesting which had a higher percentage of oaks and other desirable species.

*Central State Oak Guide (Sander et al, 1976)* based on 4.3' radius plots, requires 59% of plots to contain one 4.5' tall or larger stem (or smaller based on probability of success) per plot to be stocked. If fewer than 59% stocked, can be supplemented with stump sprouts by calculating potential sprouts/ac from stems 2" and larger.

*Allegheny Hardwood Guide (Gottschalk 1983, Marquis et al, 1992)* based on a 6' radius plots, requires 70% of the plots to have one 4.5' tall or larger oak stem to be considered stocked. In addition, 25 stems/plot smaller than 4.5 ft. is considered adequate.

*Gypsy Moth Handbook* uses these two above, sums the two up basically to say 430 stems/ac. Considering these recommendations will result in stands 60% or more in oak.

### **Conclusions**

Our management of state forest provides for more than adequate regeneration post-harvest. Based on the SILHAH Oak approach, foresters should be vigilant to identify and classify oak competitive sources of oak regeneration prior to a final harvest or to use shelterwood harvesting and prescribed fire to promote oak regeneration. On mesic sites, clearcut harvesting sufficiently produces regeneration however the species composition is different than on xeric sites.

**QUICK TIMBER APPRAISAL WORKSHEET**

Land Owner \_\_\_\_\_

Telephone-Home \_\_\_\_\_.

Address \_\_\_\_\_

Office \_\_\_\_\_

\_\_\_\_\_

Tract Location: County: \_\_\_\_\_

Total Acres \_\_\_\_\_ Wooded Acres \_\_\_\_\_

Township: \_\_\_\_\_

Total Volume \_\_\_\_\_.

Total Value \_\_\_\_\_.

Quality \_\_\_\_\_.

Per Acre Volume \_\_\_\_\_.

Per Acre Value \_\_\_\_\_.

Comments \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Estimator(s) \_\_\_\_\_.

Date \_\_\_\_\_.

(Map attached)

**DETAILED TIMBER APPRAISAL WORKSHEET**

Land Owner \_\_\_\_\_ Telephone-Home \_\_\_\_\_  
 Address \_\_\_\_\_ Office \_\_\_\_\_  
 \_\_\_\_\_ Tract Location: County \_\_\_\_\_  
 Total Acres \_\_\_\_\_ Wooded Acres \_\_\_\_\_ Township \_\_\_\_\_

Tree Species	Volume/ Acre (Doyle)	\$Value/ MBF-Ton	Acres	Total Species Volume (Doyle)	Total Value
<b>TOTALS-B.F.</b>	0			0	\$0
<b>Tons</b>	0			0	

Confidence Limits \_\_\_\_\_

Major Factors Affecting Value: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Estimator(s) \_\_\_\_\_

Date \_\_\_\_\_

(Map attached)

Land Owner \_\_\_\_\_.  
Cruiser(s) \_\_\_\_\_.  
Appraisal Date \_\_\_\_\_.

**FACTORS AFFECTING VALUE**

**Access** \_\_\_\_\_  
\_\_\_\_\_

**Topography** \_\_\_\_\_  
\_\_\_\_\_

**Site Quality** \_\_\_\_\_  
\_\_\_\_\_

**Timber Quality** \_\_\_\_\_  
\_\_\_\_\_

**Fire Damage** \_\_\_\_\_  
\_\_\_\_\_

**Past Logging History** \_\_\_\_\_  
\_\_\_\_\_

**Future Potential** \_\_\_\_\_  
\_\_\_\_\_

**Logging Chance** \_\_\_\_\_  
\_\_\_\_\_

**Aesthetics** \_\_\_\_\_  
\_\_\_\_\_

**Other** \_\_\_\_\_  
\_\_\_\_\_

**POLICY VARIANCE REQUEST FORM**

Forest \_\_\_\_\_ Compartment \_\_\_\_\_ Mgt. Unit/Plant. \_\_\_\_\_ ACRES \_\_\_\_\_

Manual \_\_\_\_\_ Page # & Title \_\_\_\_\_

Existing Policy

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Reason For Variance Or Change \_\_\_\_\_

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Submitted By \_\_\_\_\_

Location

Comments \_\_\_\_\_

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Approved By \_\_\_\_\_

Comments \_\_\_\_\_

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**CHIEF, DIVISION OF FORESTRY**



## **Chapter 4**

### **Timber Harvest Preparation and Marking**

Timber marking is directed toward the harvest of standing trees (stumpage) by private buyers and forest units as a step in the planned management of state forests. This chapter will describe the standard procedure for timber harvest layout and tree marking. Harvest layout and marking will follow approved cruise and marking procedures.

All timber sales regardless of the type of payment or marketing method will be marked and cruised the same as all other sales.

If a timber harvest will be a partial harvest whereby a residual volume will remain, individual trees will be selected, estimated for volume, and marked. If clearcutting is prescribed, trees are not usually marked and volume is estimated by accurate volume cruising techniques. Shelterwood or deferment type harvests will be marked for leave trees and volumes estimated by accurate volume cruising techniques.

#### **A. Sale Boundaries**

The sale area will be delineated on the ground utilizing either distinct physical features, or painted boundary lines. Boundary lines will consist of painted spots located 5 to 6 feet above ground level on selected trees surrounding the sale area. These painted spots will face into the sale area, and sale boundary trees will not be marked for removal. State boundary line trees will also not be marked for removal, but they may be a part of the sale boundary.

A timber sale area will consist of one or more operating units, called cutting sections. Their size will be based on more or less equal product value, volume, and logging opportunity in consideration with topographic features. Cutting section boundaries will be marked in the same way as sale boundaries, (i.e. painted spots of the same color used in painting sale boundary.) Logging operations shall be by cutting section control, whereby the purchaser must pay for, log, and completely close-out one cutting section before be permitted to log another cutting section. Logging by cutting section control results in the Division having more control of cutting and logging, potentially less problem areas, smaller lump-sum payments which are beneficial to the purchaser, fewer delinquent operators, and will be used on all applicable sale areas. Separate tallies will be made for each cutting section.

#### **B. Review for T&E Species, Special Sites, or Environmental Impacts.**

Review of the Biodiversity Database, the Ohio Historical Society Database, and review form appropriate biologists is to be completed during the compartment review process. However, depending on circumstances, a complete review or updates to a previous review will be completed during timber sale layout process. Results of the reviews will be kept in the timber sale file. Mitigation to the results of the reviews shall be noted on the “Marking Estimate” and incorporated in the sale or cutting section boundaries.

### C. Pre-Harvest Assessment and Mitigation Process

Upon completion of the impact assessment based on data from the Biodiversity database, the Ohio Historical Society Database, and relevant biologists, mitigation may be necessary in order to mitigate impacts to the sensitive resources. The following matrix shall serve as guide to understanding the next steps in a mitigation situation.

Source or Feature	Process	Contact
Legacy Trees	Found “legacy” trees or possible “Old Growth” trees or groups of legacy trees shall be <i>designated as retention trees</i> and noted on the Marking Estimate and mapped in the Division’s Special Sites layer. If legacy or old growth trees are found after contract award or during harvesting they shall be reviewed by the district for possible contract modifications and mitigation	District Land Management Administrator and District Manager.
Ohio Historical Database	All timber sales shall be reviewed against the OHPO database. If a positive “hit” is found in the database, the forester shall attempt to <i>locate the site and protect from soil disturbance</i> by buffering the site appropriately. If the feature does not exist anymore, no further action is necessary. If there is no positive “hit”, but a previously unknown site is found, the forester shall <i>locate the site and protect from soil disturbance</i> and buffer the site appropriately. Locations of known and previously unknown sites shall be mapped in the Division’s Special Sites GIS layer and noted on the “Marking Estimate”.	District Staff and/or Land Management Administrator. District or LMA follow-up with OHPO and/or Newark Earthworks Center or Hopewell NPS for recommendation to mitigation.
Biodiversity Database	The Biodiversity database shall be reviewed (preferably during the compartment review process) directly at the unit level. If there is a positive “hit” found in the database for the site in question, then it shall be communicated to the district for <i>consultation with the Biodiversity Program</i> . When needed consultation may require a botanist review or site-visit for presence/absence. For aquatic or vertebrate species, consultation may be in the form of additional recommendations made to the timber harvest. If there is no positive “hits”, but RTE species are suspected or are found, then it shall be communicated to the district for <i>consultation with the Biodiversity Program or the Endangered</i>	District Staff and/or Land Management Administrator. District or LMA follow-up with Biodiversity Program or Endangered Species Program at the Division of Wildlife for recommendation to mitigation.

	<i>Species Program.</i> Results of the Biodiversity database review shall be noted on the “Marking Estimate” and locations shall be mapped on the Division’s Special Sites GIS layer	
Biologist Review	All compartment prescriptions, timber sales, and prescribed fires shall be offered for biologist consultation on an annual basis usually during the State Forest open houses. Local, direct biologist consultation is encouraged for any activity that may have direct impact. The annual consultation or the local consultation may require a site visit from the biologist. The biologist shall offer any recommendations to the forester. The forester shall communicate the recommendations to the appropriate district or central office staff. All site disturbing activities at Shawnee State Forest shall be reviewed for rattlesnake impact and mitigation recommendations. Mitigation is noted on the “Marking Estimate”.	Unit Staff, District staff and/or Land Management Administrator. Annual consultation with Division of Wildlife Forest-Wildlife Specialist. Direct local contact with the Forest-Wildlife Specialist is encouraged. DOW rattlesnake biologist consultation required at Shawnee.
Web Soil Survey and Soil Data Mart	All compartment prescriptions and timber sales shall be referenced against soil data found in the Web Soil Survey and/or the Soil Data Mart. Foresters shall provide a brief description of the potential impact and mitigation based the soil data review including maps. The local SWCD is available to offer recommendations. Any mitigation shall be noted in the “Marking Estimate” and / or Compartment Prescription.	Unit Staff, District Staff, SWCD.

**D. Streamside Management Zones**

Timber sale impacts to Streamside Management Zones must be considered during sale preparation. The Division shall employ two buffering methods to limit water quality impacts and provide for wildlife habitat – filter strips and no-cut zones.

Filter strips are areas where mechanized logging equipment should not venture. Filter strips may have some harvesting activity. No-cut zones are areas immediately adjacent to perennial streams where maintaining a solid canopy and streambank integrity are the primary value.

Both perennial and intermittent streams will be buffered from normal timber sale activities. Perennial streams are defined as solid blue lines on 7.5’ USGS topographic quadrangles and intermittent streams are defined as blue dashed lines on the same map scale.

Perennial streams have a designated filter strip of a distance specified in the chart below based on slope from the high water mark. Tree harvesting inside the buffer is allowed over 25 feet from the streambank on perennial streams as long as 75% canopy cover is maintained. Twenty-five feet from the high water mark no harvesting shall take place except to salvage an occasional high quality tree.

Intermittent streams shall have a filter strip of a minimum of 50 feet or larger depending on slope. Trees may be harvested up to the streambank of an intermittent stream but at least 75% canopy cover shall be maintained.

In some cases it may be necessary to have equipment inside of a streamside management zone. This should occur only when positioning equipment outside of the SMZ would cause more resource damage or is operationally impractical. Any equipment within the SMZ must have written approval from the Timber Sale Administrator. Precautions should be taken to mitigate any negative impacts prior to their occurrence. For suggested and approved mitigation practices, please refer to “BMP’s for Erosion Control for Logging Practices in Ohio”.

Upon catastrophic stand failures salvage operations will be permissible inside the streamside management zone. In such situations it may be impossible or impractical to retain the targeted canopy cover. Live trees will be retained in these operations and some snags shall be left for wildlife habitat. Equipment restrictions in these areas shall still follow the designated policy.

In addition, any harvests within the streamside management zone shall comply with the Department’s current Indiana Bat Management Strategy.

In addition to intermittent and perennial streams, ephemeral streams may be targeted as tree retention areas depending on objectives for specific units. Ephemeral streams are defined as streams that typically only hold water after precipitation events and are not designated on USGS 7.5’ quadrangles.

<b>Minimum Width of SMZ</b>			
<b>Includes No-cut Zone and Filter Strip</b>			
<b>Average Slope Measured from Streambank</b>			
	<b>Perennial</b>	<b>Intermittent</b>	
Slope			
0-20%	100’	50’	
21-30%	130’	60’	
31-40%	135’	70’	
41%+	165’	80’	

**E. Log Decks, Haul Roads, Skid Roads, and Skid Trails**

Haul roads and skid roads shall be laid out in accordance with the current BMP's for Erosion Control for Logging Practices in Ohio. The Timber Sale Administrator is responsible for haul road, skid road, and log deck placement throughout the sale area. Landings and skid roads should be flagged on the ground prior to the start of harvest operations and preferably prior to the pre-logging meeting with the contractor. At a minimum, the landings and transportation must be delineated on the map. The forester shall consider soils information in the design and location of landings and skid roads/trails to minimize potential erosion problems.

## **F. Retention Trees**

Retention trees provide biological legacies that will “lifeboat” species more dependent on older growth forests. When chosen in groups these trees may also provide microhabitats that meet the needs of understory flora and fauna that could not be met in an open stand. Retention trees should be selected to meet ecological and/or silvicultural goals.

For Deferment or Shelterwood harvests, the *designated leave trees shall serve as the retention trees*. In Deferment or Shelterwood harvests, leave trees shall be of preferred species only – oak and hickory if possible – and shall be healthy enough to predictably live 10 or more years. They shall be co-dominant (or some dominant) in crown class so as to potentially provide seed and shelter to the next stand. Intermediates and suppressed shall not be used in Deferment or Shelterwood harvests. In the overstory removal phase of a shelterwood, the 20 basal area retention guideline does not apply, however, snags and other retention trees based on the guidelines below shall be left.

For other partial harvests such intermediate harvests, *no specific retention guidelines are needed* since the residual stand will be of suitable stocking.

For clearcutting, harvest openings with no live tree retention shall be limited to 10 acres. For harvests over 10 acres, the *live-tree retention target* will be defined as 20 square feet of basal area of greater than 4 inch live trees over the entire acreage of the harvest. Live-tree retention can be in the form of deferment overstory trees, tree islands, or randomly scattered trees. Live-tree retention can also include the SMZ or other special areas adjacent to the harvest unit. Retention trees in clearcuts need not be dominant or co-dominant unless they are legacy trees or Indiana Bat Trees, but there should be a diversity of species selected. A rationale is provided in the prescription if the live-tree retention target is not met. For pine plantation clearcut harvests, no retention of pine trees is preferred; therefore it is acceptable to not meet the 20 BA threshold for pine clearcut harvests.

### Retention Tree Characteristics

- Legacy trees;
- Trees that meet characteristics defined the ODNR – Indiana Bat Management Strategy;
- Trees that have or could provide wildlife dens or cavities;
- Large snags if they do not pose a safety hazard to the logger. (Snags do not count

- towards the 20 basal area target, but should be left for wildlife values);
- If few snags exist in the stand then low value or cull trees in poor health for future snag recruitment;
  - Boundary trees and SMZ trees.

#### Poor Retention Tree Characteristics

- Aspen;
- Cottonwood;
- High Value Veneer Trees.

### **G. Cutting of Cull Trees**

When preparing a timber sale marking report, it should include a recommendation as to whether or not all marked cull trees should be cut or girdled by the logger. If the contractor is required to cut or girdle all culls, the person administering the sale should see that the culls are cut as logging progresses.

To fulfill wildlife management needs, any cull tree with active dens should be left if at all possible. Where den trees are not abundant leave 2 cull trees or dead trees per acre that may eventually produce dens.

### **H. Cutting of Dead Trees/Snags**

A small proportion of dead trees in a forest can provide beneficial wildlife habitat. In general they will not be part of any timber harvest. However where stand failures result in a large proportion of dead trees they may be salvaged, but all guidance documents must be followed (e.g. ODNR Indiana Bat Management Strategy).

For safety concerns and OSHA compliance snags may be felled during a timber harvest with approval of the Timber Sale Administrator.

### **I. Utilization of Down Trees**

If trees are on the ground at the time of marking, and they are merchantable, they may be marked and included in the tally as “down trees”. The Land Management Administrator will note this volume in the bid prospectus as separate from standing volume.

If un-marked or un-designated trees go down after the timber sale has been advertised for sale, the timber sale administrator shall mark them after logging begins and offer to sell the merchantable trees to the purchaser at the price shown in the most recent "Ohio Timber Price Report."

Down trees not removed by the purchaser/logger may be utilized by the forest after logging is complete and the timber sale agreement is closed.

### **J. Tree Marking**

In partial intermediate silvicultural harvests, all trees to be harvested shall be marked with paint. In shelterwood or deferment harvests all leave trees not to be harvested shall be marked with paint. In clearcut harvests and on pine thinnings, only the boundary needs to be marked and not individual trees. Marking will follow approved prescription cruise recommendations.

If a tree will likely be damaged when felling a "cut" tree, then choose between either marking both trees or leaving both trees. All merchantable trees within a skid road right-of-way will be marked and estimated.

The tree marking code system and definitions follow:

Sawtimber Tree - marked with a slash (/); minimum 14" D.B.H. to a minimum top D.I.B. of 10" with a minimum usable length of 8` feet.

Pulpwood Tree - marked with a spot (.); minimum 6" D.B.H. to a top minimum D.I.B. of 4" with a minimum usable length of 10 feet.

Cull Tree - marked with an X; a tree being marked for removal not meeting the above minimums or a tree with a merchantable volume loss of 50% or more.

Leave Trees – marked visibly on two sides of the tree, example –  
Slashes on both sides of the tree or a solid band around the bole.

The marks should be applied on the uphill D.B.H. level and at below stump level on the downhill side. The downhill mark is for identification after a tree is cut and should be low enough to assure that it remains when the tree is cut.

For ease of field identification, trees in each adjacent cutting section may be marked with a different color of paint.

#### **K. Volume Estimates from Cruising**

When a stand of timber is to be clear-cut, or where there are too many trees to make individual tree marking practical, a volume estimate can be made by using volume cruising techniques.

Volume figures shall be net, with volume loss to defect or "cull" being deducted. When needed, standard U.S. Forest Service conversions can be used, i.e., cords to tons, etc. Trees per acre and average D.B.H. can be computed when trees are tallied by D.B.H. as well as height.

Volumes will be broken down by tree species. Only minor species may be combined with other minor species for less statistical error. Do not combine major commercially important timber species. A separate tally will be kept for each species and/or product

and by individual point sampling if accuracy is to be determined. Cull trees are to be tallied by species and D.B.H.

Hardwood sawtimber volumes should be calculated by board feet from normal volume tables with appropriate form classes, or by volume functions as directed from the Land Management Program Administrator. The Land Management Program Administrator will provide direction on which board foot rule to use.

When estimating softwood volume, estimates may be reported by either board feet or tonnage figures. The Land Management Program Administrator will provide direction depending on size class of material and current markets. To ensure consistency conversion factors should be standard across the state forest system.

Cordwood from sawtimber tops shall be estimated for all timber sales. The Land Management Program Administrator shall provide appropriate conversions.

#### **L. Volume Estimates for individual tree measurement (100% Mark and Tally)**

For marked cutting sections, 100% of the individual trees will be estimated. The timber sale volume estimates and tree count will be determined by individual tree measurement. Usually, both D.B.H. and merchantable height will be measured/estimated in the field and then standard volume tables applied. Separate tallies will be kept for each species and/or product. Cull trees will be tallied separately.

Hardwood sawtimber volumes should be calculated from normal volume tables with appropriate form classes, or by volume functions as directed from the Land Management Program Administrator.

When estimating softwood volume, estimates may be reported by both board feet and tonnage figures. The Land Management Program Administrator will provide direction depending on size class of material and current markets. To ensure consistency conversion factors should be standard across the state forest system.

Cordwood from sawtimber tops shall be estimated for all timber sales. The Land Management Program Administrator shall provide appropriate conversions.

Normally, cull is not determined for cordwood trees. If other than cord volume is desired, use appropriate U.S. Forest Service conversion tables.

#### **M. Value Estimation**

The value of standing timber will be different for each prospective buyer. The value that will be computed by the Division of Forestry is an average value and should be used only for setting a timber sale deposit amount and for an indication of what can be expected in competitive bidding.

The forester should determine general quality of marked timber by species while marking and obtain the most recent "Ohio Timber Prices" report.

#### **N. Timber Sale Information Packet**

Upon completion of marking and calculations, the following will be prepared for district review and approval and sent to the Land Management Program Administrator for action:

- Approval/comment cover sheet
- Timber marking transmittal sheet
- Sale summary (estimate of marked timber)
- Estimate of marked timber for each cutting section
- Sale maps
- Fact Sheet
- Checklist

Forms or templates for each of these documents shall be supplied by the Land Management Program Administrator. Copies will be retained for district and forest files.

The cover sheet and transmittal sheet are self-explanatory (1+2). The sale summary (3) is the consolidation of all cutting section information. The estimate of marked timber for each cutting section (4) is obtained from volume estimation and value estimation figures. Sale maps (5) may be paper maps or may be created electronically from data entered into the Division's geodatabase. Fact Sheets (6) contain specific information about a sale and are written for interested outside parties. They should follow a designated standardized format. The Checklist (7) contains items that should be considered and documented prior to sale activity. Responsible parties should be identified for each item. Some items may be taken care of prior to the sale starting and may be left blank, however the responsible party should still be designated.

## **Chapter 5**

### **Wildlife Habitat Management Philosophies and Objectives**

Forest management increases our ability to create and maintain a high level of diversity and interspersed habitats necessary for the maintenance of a great variety of native 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 species that are compatible with the environment and other forest uses

On State Forests, habitat management objectives shall be accomplished through normal silvicultural and other forest management 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 Timber Sale Administrators shall follow BMP recommendations when sale activities are occurring.

#### **A. Guidance Documents**

- The Division of Wildlife's "Guidelines for Management of Forestland Habitats" shall serve as the overall guideline for wildlife management on State Forests.
- The Division of Wildlife and the Division of Forestry entered into a MOU for cooperative forest management in order to further each division's objectives on both divisions land holdings.
- The Division of Wildlife's Strategic Plan and Forest Habitat Tactical Plan also play a supporting role and offer guidance to state foresters on habitat management.
- The Division of Wildlife's Publication 356 details all species that are of special concern in Ohio and shall serve as reference for state foresters.
- The ODNR Indiana Bat Strategy also supports our wildlife habitat decisions and offers guidance on management of Indiana Bat habitat.
- BMP's for Erosion Control for Logging Practices in Ohio shall serve as a supporting document as proper BMP's play an important role in wildlife habitat.

#### **B. Silvicultural Systems**

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.

Uneven-aged System - Single Tree Selection and Group Selection

This system provides necessary habitat components for wildlife species preferring closed canopy forest. In this management system, a variety of age classes are represented in the canopy including some mast producing, den producing, and insect producing trees. This system of management favors shade tolerant tree species. This method is least beneficial for wildlife species, which use forest openings and transition zones between habitat types.

#### Even-aged System - Deferment, Shelterwood, Seed Tree.

These methods encourage desirable shade intolerant tree species. Both the species of trees removed and the species of trees remaining will impact the wildlife benefit of each silvicultural process. Harvest planning favoring preferred wildlife foods can provide benefits for forest dwelling wildlife species and, in the regenerated portions, for those wildlife species normally associated with early successional stands. One important feature of these silvicultural practices is the creation of vertical diversity of vegetation attractive to many woodland/old field associated species.

#### Even-aged System - Clearcut for natural regeneration

This method encourages vigorous growth of understory and regenerated vegetation necessary for food production, brood cover, and escape cover. According to current research, the mainstay of hard mast production, the shade intolerant oaks, are best reproduced using regeneration cutting as the harvest technique. Species requiring early successional habitat are benefited.

- All exfoliating bark hickory should be saved in clearcuts.
- Hickory should be saved in islands or along the edges of cuts.
- Live den trees should be saved, if present, according to DOW Guidelines (attached).
- All large snags shall be left, if present, according to DOW Guidelines (attached), provided they do not pose an immediate safety hazard to the contractor.
- All SMZ guidelines shall be followed. When selecting individual trees from the stream corridor for retention, favor those that have wildlife food value, as well as those providing cover and nesting sites (wolf trees and den trees).

#### Intermediate Treatments

Generally, all intermediate treatments and prescribed fire may increase sunlight penetration to the forest floor, which stimulate understory growth and create additional vertical structure, food and cover for wildlife.

#### Pre-commercial treatments and Timber Stand Improvement

The detrimental effect of grapevines on hardwood timber is well documented and control methods are usually effective. However, the fact that the wild grape is high on the preferred food list of many wildlife species should receive some consideration when performing TSI operations. In order to achieve balance in multiple use management and meet the needs of timber and wildlife production, some grapevines should be allowed to grow where those vines exist in a restricted zone or an aesthetic area.

### **C. Temporary Wildlife Openings**

Logging decks should be designed to allow necessary space for the harvest operation. With proper planning during initial layout, decks can also provide semi-permanent or permanent openings in the forest stand. Proper placement of the deck is essential to an efficient harvest and ideally this area should be used in the future when the management unit is logged again. Herbaceous wildlife openings shall follow DOW's guidelines (attached).

#### **D. Special Wildlife Management Areas**

Areas may be designated in the forest to encourage the propagation of one or more specific wildlife species. Generally, these are delineated as special sub-zones on the forest and fall under Zone 3C. The management recommendations for this area should be a joint effort between the Division of Forestry and the Division of Wildlife, and should be reviewed periodically. Other conservation groups may be involved, such as the Ruffed Grouse Society, and shall be consulted on management activities.

#### **E. Biologist Review and Consultation**

The Division of Wildlife, as part of our MOU and partnership, will provide biologist consultation on forest management activities and recommendations for mitigation of any. Biologist review will occur at least once per year – generally at the state forest open house. Other local, direct interaction with the Division of Wildlife's Forest-Wildlife Specialist is encouraged for local reviews. Recommendations from the Division of Wildlife shall be communicated to the District and addressed in the Marking Estimate.

For RTE species concerns, the DOW Biodiversity Program and the Endangered Species Program should be consulted for recommendations. Site disturbing activities at Shawnee State Forest shall also require consultation for rattlesnake mitigation.

## **Chapter 6**

### **Forest Aesthetics**

The Division of Forestry is committed to addressing the visual impact of management operations (especially timber management) through the consideration of forest aesthetics. DOF also intends to fulfill the requirements of SFI and FSC certification by including forest aesthetics as part of its management process.

#### **A. Aesthetics Management**

On state forests, aesthetic management will be focused at the individual harvest-unit level. Each individual harvest will have its own unique set of issues and challenges. Therefore, foresters shall use this chapter on a harvest-by-harvest basis and note any considerations or mitigation in the Timber Sale Information Packet.

#### **B. Aesthetics Defined**

Forest aesthetics concern the visual appearance or view shed of forest scenery from a landscape perspective and is considered from one point of view. Aesthetics as considered for State Forest Land Management includes a combination of forest aesthetics, logging aesthetics, landscape management and BMP's. Detailed definitions of each of these disciplines can be found in the reference library found at the end of this chapter.

#### **C. Aesthetics Quality**

Visual quality aesthetics can be managed by first determining the sensitivity level of a particular site based on the type of use and the number of visitors that will experience the visual appearance of the area.

##### Visual Sensitivity Levels

- ***Least Sensitive***: Applies to low-volume travel routes and recreation areas where visual quality is of less concern to typical users.
- ***Moderate Sensitivity***: Applies to travel routes or recreation areas where visual quality is of moderate concern to typical users.
- ***Most Sensitive***: Applies to travel routes and recreation areas where significant public use occurs, and where visual quality is of high importance to typical users.

Please reference Ag Handbook 462 pages 18 to 21 to determine the sensitivity level of a particular location. Also see the Forest Aesthetics guide, page 3 for detailed descriptions of the various levels of sensitivity.

Foresters shall note the visual sensitivity level on the marking estimate and on logging inspection forms.

#### **D. Planning**

Visual impact considerations must be incorporated into the state forest management planning process and cannot be effectively done after the harvest begins. Aesthetic concerns will be included as an integral element of the Timber Sale Information Packet. It will be much more difficult and expensive to incorporate visual quality improvements into the harvest once the timber is sold and harvesting begins.

The aesthetics planning process will consider the following elements for timber sales.

- Leave islands of uncut trees to block the view of cut areas. (See Retention Tree guidelines in Chapter 4 – Timber Harvest Preparation).
- Screen landings from use area or travel-way with dog-leg haul roads.
- Leave buffer strips along roadways, for a visual screen.
- Avoid notches on ridge tops in clearcut harvests where no trees are left in the notch.
- Follow land form contours when laying out cutting sections.
- Consider viewing position(s) of state forest visitors for a harvest site and resulting viewshed.
- Consider viewing time determined by the speed of passing vehicles.
- Be aware of the time of year the area will be seen and user activity.
- Avoid cutting when users are present.
- Reduce height of slash to improve appearance.
- Retain flowering trees.

#### **E. Log Landings, Haul Roads, Skid Road and Skid Trails**

Carefully planning layout, construction and maintenance of skid trails, haul roads and landings is critical to the long term and short term aesthetics of a harvest site. Goals to be considered when planning are described below.

- Cut and remove trees on right of way before bulldozing begins.
- Avoid long steep grades
- Consider using geotextile, bridges, culverts and mud mats.
- Avoid wet weather logging.
- Locate landings on well drained sites.
- Keep mud off of public roads.
- Follow BMP's as detailed in OSUE, FS bulletin 916: BMP's for Erosion Control for Logging Practices in Ohio.

#### **F. Residual Stand Damage**

In partial harvests (thinnings, select cuts, or shelterwoods), the contractor should avoid large tree length drags of logs that will result in “barking” the base of trees and roots. At the discretion of the Timber Sale Administrator, the logger shall top trees prior to

skidding in partial harvests. The Timber Sale Administrator shall consider designating “bumper” trees to guide logs and keep them on skid trail.

- Trees and wood that have already been cut in a harvest should be utilized to the fullest extent possible (provided that markets and economics allow removal).
- Under-utilized wood left on site in a visible location is negatively viewed by forest visitors.
- Loggers should remove badly damaged trees at the end of the harvest.
- The Timber Sale Administrator shall encourage the use of directional felling techniques to minimize residual stand crown damage.
- When possible loggers shall be required to push root balls and stump to an upright position to improve appearance and encourage sprouting.
- Loggers should avoid leaving high stumps and slash.

### **G. Special Considerations**

The Timber Sale Administrator shall consider all appropriate wildlife guidelines as they generally have positive aesthetic benefits such as leaving wildlife trees such as Indiana bat trees and wildlife den trees. Foresters shall consider the impact that harvesting operations may have on recreational activities. Foresters shall protect special or historic sites, wetlands and areas of special interest that are better left undisturbed.

### **H. Forest Aesthetics Reference Library**

All foresters shall complete training on the following documents and this chapter. Foresters should note aesthetics considerations in their Timber Sale Information Packet. The “Forestry Aesthetics Guide” shall serve as the primary resource for our state forest aesthetics management.

- Forestry Aesthetics Guide, Image and Opportunity- FRA/AF&PA.
- A Guide to Logging Aesthetics Guide- NRAES-60
- Landscape Management Workshop handout
- National Forest Landscape Management Volume 2, Chapter 1, The Visual Management System. USDA Forest Service Ag Handbook Number 462.
- BMP’s for Erosion Control for Logging Practices in Ohio- OSUE FS Bulletin 916

## **Chapter 7**

### **State Forest Timber and Product Sales**

Under Chapter 1503.05 of the Ohio Revised Code, the Chief of the Division of Forestry ". . . may sell timber and other forest products from the state forest whenever he deems such sale desirable . . ." Such sale includes timber sold on the stump by agreement, logs, lumber, and other miscellaneous products produced from State Forest Operations.

Other than the authority provided through Chapter 1503.05 to sell forest products, there are no laws or promulgated rules and regulations governing sales procedure. As such, all sales procedures are governed by Division policy subject to legal review and approval by the Department. There are two main types of timber sales: stumpage sales and product sales. Both will be discussed in this chapter.

#### **A. Stumpage Sales**

Stumpage sales are sales of standing trees. Stumpage sales will form the bulk of state forest timber sales. Revenue from stumpage sales is distributed to the local county, township, and school district from which the timber sale is located. This revenue is important to local governments and the Division is committed to providing this revenue to them.

There are three main types of contract stumpage sales and each will be used as necessary based on the appropriate business practices and economic considerations.

1. Lump Sum Stumpage Timber Sale - for all sales with an estimated value over \$10,000.00; these sales will be scheduled and sold by competitive bid, by the Land Management Administrator. Purchasers shall bid a lump sum for all advertised products.
2. Pay-As-Cut Stumpage Sale – this method is the same as above however the bidder offers a price per scaled or weighed product instead of a lump sum. This method is appropriate for pine thinnings and other sales where exact removals are not known.
3. Negotiated Stumpage Sale – discussed below. Sale estimated value may vary; not sold by competitive bid.

#### **Bid Deposit and Performance Bonds**

By policy, a bid deposit will be required on all stumpage sales as an insurance for the signing of the timber sale agreement. The bid deposit money is submitted with the bid form and is applied toward the first sale payment. The amount of the bid deposit will be adjusted over time to match economic conditions, and is \$5,000.00. Bids received without the bid deposit will be rejected at the time of bid opening. The unsuccessful bid deposits will be returned promptly.

A performance bond is required to guarantee compliance with the terms of the Timber Sale Agreement. The amount of the performance bond shall be 25 percent of the value of

the highest value cutting section as determined by the amount of the successful bid, and shall be in conformance with ORC 1503:05.

### Advertising

All stumpage or forest product sales requiring competitive sealed bids will be advertised through mailings to state forest timber buyers or forest product buyers. Each time a sale is advertised, a copy of the bid prospectus will be sent to each person or company on the Division's buyers list.

Each sale will be advertised as a public notice for two (2) consecutive days in the nearest major newspaper with daily circulation. This will serve to notify timber buyers not on the list and will advise the general public of impending sales.

Each forest should plan to notify local governments of upcoming open houses, at which time a list of anticipated timber sales will be available for the local official. Each district may elect to put in place procedures to deal with local government notices to timber sales.

### Bidding

Bidding is the process whereby a price is placed on the value of the products being sold. It's the Division of Forestry's intention to keep the process as fair and unbiased as possible and therefore, employs a competitive sealed bid process. To accommodate the bidding process, potential bidders are provided a bid prospectus, map, blank bid form, and self-addressed envelope for submitting bids.

**Bid Prospectus** - The bid prospectus encompasses a description of the products being sold and contains information on sale conditions. The bid prospectus is also part of the contract. The prospectus will contain, as a minimum, the following information depending on products being sold: Date bid is sent out; Date, time, and place of sealed bid opening; Name and location of forest, compartment, and and/or plantation; Sale number; Acreage involved (if applicable); Volumes by species and products; Methods of sale - lump sum, weight, etc.; Marking scheme of trees, boundaries; State the need for a performance bond; Dollar amount of Bid Deposit; All necessary and special operating conditions; i.e., restrictions, road requirements, special cutting conditions; Agreement duration; Statement that the State reserves the right to refuse any or all bids; Policy statement on bidder's inability to sign an agreement. (Retention of Bid Deposit); Policy statement regarding future considerations for purchaser who fails to complete a contract sale; The name, address, and telephone number of the Forest on which the sale is occurring; The name of the Timber Sale Administrator; The terms regarding payment for damaged timber.

**Bid Form** - The bid form will be included with the bid prospectus. The bid form will contain the following information: Timber sale agreement number; Date and time of bid opening; Amount of bid deposit; - Performance bond statement; Blanks for the lump sum bid amount; Percent of bid amount required prior to logging each cutting section; Order that cutting sections will be worked if the Division desires the cutting sections harvested

in a specified order; Worker's Compensation Risk No., if applicable; Number of employees; Bank reference; Taxpayer Identification Number or Social Security Number; Blanks for bidders name or corporation, bidding agent, address, and telephone number; Blank for indication of incorporation status and state where incorporated.

Bid Map - Attached with the bid will be a map of the area for stumpage sales. For other product sales, a map is optional. The map will be the same as that turned in with the marking transmittal. A map submitted should contain the following information: Specific sale area location with sale and cutting section boundaries; Major roads near the sale with road names or numbers; Skid/haul roads and decking areas; State forest boundaries; Map legend (use same symbols as described in chapter V).

Bid Envelope - All parts of the bid prospectus will be attached and sent out with a self-addressed return envelope. Information indicating the Timber Sale Agreement Number will be noted on the front of the envelope. The bid will be sent out the day the prospectus is dated. Bids will be received periodically up to the bid opening time. As each bid is received, the envelope shall be marked with a Division stamp indicating the date of receipt. The bid shall then be placed in a safe or secured compartment. Bids may be accepted only to the opening time. Any bid received after the opening time shall be rejected.

#### Bid Opening

The bid opening should take place as near as possible after the specified bid opening time. Bidders are welcome to attend the opening. The bid opening should take place with two representatives of the Division of Forestry present. One representative will act as the bid opener and recorder; the other will serve as a witness. As each bid is opened, the bidder name and bid amount will be recorded on the Bid Opening form. After all bids are opened, the land management administrator will determine the successful bidder who will under most circumstances be the highest bidder. A bid submitted by a purchaser who has defaulted on a previous agreement within the last year will be rejected. The State reserves the right to refuse any or all bids. Upon decision, the bid opener will notify the successful bidder of the sale award either by phone or letter and will indicate time, date, location, and other conditions necessary for contract signing. All other bidders will be notified by phone or letter indicating the results of the bid opening. Bid deposit check(s) shall be returned promptly, to unsuccessful bidders, after bid opening.

In most cases, the successful bid will be at a value higher than the appraised value of the products. In the event that the high bid is lower than the appraised value, the products may still be sold. The decision to accept or reject the high bid will be made with recommendations from the District Forest Manager to the Land Management Administrator. If accepted, the sale shall proceed. If the bid is rejected, a decision will then be made to readvertise at a later date or to reject the sale proposal completely.

#### Timber Sale Agreement

A timber sale agreement will be written covering the conditions of the sale. The Department legal office will advise on the appropriateness, terms, and conditions, of

agreements. The Department and Divisions staff shall update the agreement as necessary in order to facilitate the mutual needs of the parties involved.

### Agreement Signing

Agreement signing will take place within the time specified on the bid, normally 15 working days or as indicated. An extension of seven working days duration may be added to this period to accommodate scheduling or other needs between the Division and the purchaser. At the time of signing the agreement, only the bidder or a representative legally designated to sign for the bidder may sign the agreement. The purchaser must indicate who will do the harvesting. The logger must be an Ohio Forestry Association Certified Master Logging Company. If waiting for certification, proof of certification must be provided before logging. The agreement must be reviewed with the purchaser for any potential conflicts. The purchaser shall be aware that no work may begin in the sale area until the Director of the Department of Natural Resources signs the agreement.

A total of two agreement forms will be signed with original signatures and forwarded to the Columbus Forestry Office for review and contract approvals by the Department.

### Payment

Payment for the entire sale or for the first cutting section to be worked will take place prior to logging. Payment may be made with a personal or company check or with cash or money order. The check should be made out to the Division of Forestry. At the time of signing the Agreement, the performance bond shall be presented to the Division of Forestry representative Timber Sale Administrator. Payment shall then be processed according to the current Department fiscal procedures. The bid deposit shall be applied to the first sale payment.

The sale payment must be processed in a timely and orderly manner and by law is not to remain in the receiving office for longer than a 48 hour period. As soon as checks are received in Columbus, they will be processed for payment by the Fiscal Officer.

### Timber Buyer's List

A list of prospective timber sale purchasers will be maintained by the Land Management Administrator. Any purchaser wishing to be on the buyer's list may request so by contacting any state forest office. Purchasers who default on a timber sale will be removed from the list.

### Ohio Forestry Association Certified Master Logging Companies

While the Division of Forestry will accept bids from any individual, company, or corporation, only Ohio Forestry Association Certified Master Logging Companies may harvest timber on state forest property.

The Division of Forestry's Land Management Administrator will provide a sign measuring approximately 2' X 3' to the Timber Sale Administrator to be posted by the logger at the harvest site. The sign will contain the name of the Master Logger harvesting the timber, the Division of Forestry's logo, the District Office phone number

the Ohio Forestry Association's logo and the OFA's telephone number. The Bid Prospectus and Timber Sale Agreements will contain statements about Master Loggers and the appropriate method of displaying the sign.

#### Negotiated Stumpage Sales

Under certain circumstances, a negotiated timber sale may be advantageous to the Division. The following policy applies to sales sold through a negotiated price basis:

- Considering general administrative costs, costs to administer the sale, and advertising, any sale of less than \$10,000.00 anticipated stumpage value may be sold on a negotiated basis.
- On any bid sale that was offered once and received no bids or bids were well below the minimum anticipated value as defined by the most recent Ohio Timber Price Report, the sale may then be negotiated following the attempted bid.
- On any bid sale that was offered and successfully bid, but the purchaser failed to perform his duties as defined by the timber sale agreement and subsequently defaulted on all or a portion of the sale; the remaining portion of the sale in its entirety may be negotiated with another purchaser.
- A sale requiring highly unusual equipment (i.e., cable logging equipment, or helicopter) or having unusual sale circumstances such that only one known contractor can conduct the sale then the sale may be negotiated. It must be verified ahead of time that only one known potential contractor is available. In all circumstances, every effort should be made to obtain the going rate for the product offered with necessary adjustments for the special circumstances.
- A sale of timber damaged or destroyed from natural disturbances or an "act of God" event where time is of the essence in order to salvage the timber before the value is lost. Examples of such disturbances are ice storm events, rotational wind events, massive insect or disease outbreaks, or catastrophic wildfire.

The following conditions shall be met prior to the negotiation of a timber sale. The intent of the Division is that negotiated timber sales shall be a last resort.

- Negotiated sales may be done only after being reviewed by and approved by Forest Manager and/or the District Forest Manager, the Land Management Administrator, and the Chief.
- All situations listed above must be interpreted in their strictest meaning.
- Every effort should be taken to offer a negotiated sale to more than one potential purchaser.
- Justification for the negotiated sale must be placed on file with the Land Management Administrator

## **B. Product or Merchandising Sales**

Any forest product not sold on the stump is considered a manufactured product. There are three main types of product sales and each will be used as necessary based on the appropriate business practices and economic considerations.

- *Local Sales* – a sale of logs generally less than \$10,000.00 under a unique circumstance such as a storm clean-up.
- *Merchandising Sales* – a program to increase revenue through the sale of bucked and sorted logs.
- *Firewood Permits* – a permit available to local residents to remove firewood for a small fee.

### Local Sales

Some situations involving the sale of small volumes or low value stumpage may be more feasible to handle advertising and selling on a local basis by the Forest Manager. Forest Managers may sell stumpage according to the following conditions and procedures.

Each sale will be limited to a maximum \$10,000.00 expected gross income.

The sale proposal must be approved in writing by the District Forest Manager and will be prepared under the guidance of the District Land Management Forester or in accordance with the Land Management Manual. All procedures for Local Sales will be the same as that for sales handled out of Columbus. The following differences apply:

All advertising (including mailing), bid opening and timber sale agreement signing procedures will be handled by the Forest Manager. Agreement duration should not exceed than one year. As many local buyers, but not fewer than three, who may be interested will be notified of sale in writing and provided the bid prospectus and form. The advertising period should last a minimum seven (7) calendar days. The timber sale agreement must be signed by the Director of ODNR before it becomes active. Copies of all forms must be sent to the District Office and Columbus.

### Merchandising Sales (sale of bucked and sorted logs)

Most forest products will be sold through contract stumpage sales. However, there are necessary circumstances where products must be sold in a manufactured form.

All manufactured forest products removed from state forests will be sold without use of a timber sale agreement. Log sales from the merchandising program will be sold on a sealed competitive bid. If logs are not sold after one attempt at bidding them the Land Management Administrator shall negotiate the sale of the logs. An attempt shall be made to get the best price for state forest products.

The Division may employ one or more service contractors to harvest and/or buck and sort the logs into product lots. Lots will be scaled by forest staff and advertised by either the Land Management Administrator or the local Forest Manager. Lots will be sold by

competitive bid. Bidders may bid on one or more lots. The purpose of merchandising shall be to maximize the revenue by focusing attention on higher value products such as veneer.

Timber harvested in a merchandised sale must comply with the Division's "Stump to Gate" procedure for merchandised logs. This procedure is in the appendix of this manual.

### Firewood Permits

The primary purpose of this program is to provide a means for Forest Managers to accomplish specific objectives while providing a local public service. Developing additional income is not a goal. The permit will be available only so long as wood is available. Unless specially directed by the Chief of the Division of Forestry, no unit is required to sell firewood.

Firewood available in this program will be incidental to the regular work program. Firewood will be a byproduct of other forest operations, with the intention to minimize costs in the program.

Individuals with firewood permits may only cut wood designated by the Forest Manager, and **may not in any circumstances** cut standing trees..

Use the firewood permit form at the end of the Chapter. The form should be filled out completely. The expiration date and permit-processing fee are most critical. Permits will be given as either one-day or multi-day (seasonal) permits. The processing fee will vary according to the length of permit as follows:

One day - \$10.00. A person who cuts for one day will be charged the single day fee. As much firewood as possible may be cut, whatever is available, or as much as the Manager designates, in that day.

Multi-day (seasonal) - \$50.00. The multi-day permit will last for as long as designated by the Forest Manager. It can be two days or it can be for the entire season, but not longer than six months. If available wood is exhausted before the permit expires, there is no obligation to provide more. We are not charging on a unit basis for wood removed, but are essentially charging only a fee for our costs involved in providing the wood. The price structure selected is simply a convenient average. Permittees are not technically buying wood, but rather being permitted to cut firewood.

The permittee must sign both sides of the permit. If not signed on both sides, it will not be valid. Each person operating a chain saw must sign the permit. If a minor wants to cut wood, then he/she must have the signature of at least one guardian on the waiver form. A system to keep track of issued permits should be maintained at the forest office. Other conditions may be listed on the permit which must be followed by the permittee.



## **Chapter 8**

### **Timber Sale Administration**

Timber sale administration is the most critical segment of the State Forest timber harvest program and had the greatest potential for mitigating environmental impact. It is a responsibility that cannot be compromised to fulfill any other job requirements except for emergency situations. Proper timber sale administration insures that logging and other woods operations are performed in accordance with the Timber Sale Agreement, that Division policies and procedures are applied consistently and fairly, and that prescribed management objectives are attained.

#### **A. Responsibility**

The person in charge of a timber sale shall be referred to as the *Timber Sale Administrator (TSA)*. The TSA shall be designated by the Forest Manager.

The designated Timber Sale Administrator (TSA) is the individual solely responsible for the on-the-ground sale activity and for insuring compliance with all timber sale agreement conditions. The TSA should have some level of involvement with sale set up, especially logging road and deck layout.

The TSA shall work directly with the purchaser/logger. Under normal circumstances there will be only one TSA on each sale. If the timber sale is active and the TSA is unavailable due to leave or other circumstances, the Forest Manager shall appoint an interim TSA and notify the purchaser/logger. If at all possible, the TSA will be at the agreement signing with the purchaser/logger.

#### **B. Timber Sale Administrator Qualifications**

To be named as the designated Timber Sale Administrator (TSA) on a State Forest timber sale, the employee must be approved as a TSA by the District Manager or his designee. At a minimum a TSA shall have completed an appropriate level of BMP and chainsaw training.

Upon completion of each timber harvest, the affected area(s) shall be inspected by the District Forest Manager or his designee for approval and to provide constructive feedback to the TSA.

The intent of the Division is to mentor TSA's with an apprenticeship program that will be the goal in future years. Detailed qualifications for TSA's may be listed as an appendix to this chapter.

#### **C. The Pre-Harvest Meeting**

It is extremely important for the TSA to establish a harmonious, cooperative and businesslike relation with the purchaser/logger. Before logging begins, the TSA should arrange a meeting with the logger to discuss the terms of the agreement and how the

terms will be enforced. The TSA should review the agreement point by point with any logger who has not previously cut State timber. This meeting should occur at least 2 business days prior to the beginning of logging activities.

Some of the more critical areas for review are:

- Boundaries - how they are designated and possible changes in location.
- Logging debris - keeping perennial streams, roads and trails open and keeping debris within state forest boundaries.
- Timber damage - policy on charging for (1) damage or cutting of unmarked trees, (2) damage from natural causes, and (3) necessary removal of trees along skid roads, haul roads, skid trails and decking areas.
- Restoration - skid trails, skid roads, decking areas, ditches, haul roads, water bars, etc.
- Communication - exchange of telephone numbers and addresses.
- Best Management Practices - shall be utilized. Completion of a Notice of Intent/Timber Harvest Plan (NOI/THP) plan at the pre-logging meeting will help insure compliance with Agricultural Pollution Abatement Law (ORC Chapter 1511). A copy of the completed NOI/THP plan shall be sent to the State Land Management Administrator, the District Office, the Purchaser/Logger, the Forest Manager and the original shall be sent to the appropriate county SWCD office. The TSA shall sign as landowner on the NOI/THP plan.

#### **D. Timber Sale Inspections**

Timber sale inspection provides a critical link in the timber management process. It is necessary to insure that harvest operations, which fulfill management goals, are completed in an orderly manner without causing unnecessary damage to the forest resources.

Effective communication between the TSA and the purchaser or his representative is the essential ingredient in the inspection. It's important from the start to maintain an open line of communication. Though it's helpful to have the buyer, or his representative, accompany the TSA on the inspection, it's not mandatory. However, if a serious problem with agreement compliance is identified, then the buyer or his representative should accompany the TSA to view the problem and have it abated or corrected.

A Cutting and Logging Inspection report will be used to record the results of each inspection. These reports serve the following:

- A communication record for the District Office and the Central Office.
- To provide a written record of discussions with, instructions to and the performance of the logger.
- As a base for recommending return or retention of the performance bond. The inspection forms are self-explanatory and should be filled out accordingly. The following items are required:

- The report should be sent in promptly following inspections (see Inspection Frequency on next Page).
- Agreement number shall be shown at the top of the Cutting & Logging Inspection Report.
- For all inspections of active sales, the report should be filled out completely, including payment number, agreement number and date.
- If a sale was inactive during the month, a report should be sent in but the only information that needs to be indicated is the Forest, Comp., Mgt., Unit, Purchaser/Logger, and a check in the Inactive box, including inspector name and date inspected.
- The final inspection report indicating release of bond should be filled out completely.

The timing and frequency of timber sale inspections will vary based on a number of factors, most important of which are the experience of the operator and his familiarity with Division agreements and requirements, the size of the sale and how much of it has been completed and the speed with which it is being worked. It's difficult to be explicit on when a sale must be inspected. The combination of all factors, in conjunction with the TSA's experience and judgment will decide inspection frequency.

As a minimum, if a sale is active, there should be at least *one inspection including a Cutting and Logging Inspection Form every week for any type of timber sale*. Submit copies to the appropriate offices and individuals as indicated at the bottom of each copy of the inspection form.

#### **E. Timber Sale Agreement**

*The Timber Sale Agreement* essentially serves two purposes; (1) to delineate the conditions of the sale, and (2) to establish procedures for handling agreement infractions. *The Timber Sale Agreement is a legally binding contract*. Proper enforcement of the timber sale agreement will insure compliance and a minimum of infractions.

Throughout the sale administration process, the TSA should always keep in mind the objectives and purposes of the timber sale. Through timber sales, the Division fulfills its forest management objectives. The sale allows the forest resource to be manipulated to fulfill its multiple goals. At the same time it must be remembered that the sale could not be accomplished without the logger. The TSA is the person who through experience, judgment, and the use of the timber sale agreement, sees the Division's objectives accomplished in an environmentally sound manner while ensuring the successful operation for the purchaser.

While it is expected that the timber sale agreement will be followed and administered precisely, it's recognized that flexibility in agreement application must also be exercised from time to time. The TSA is given that flexibility. However, Division standards, regulations, and laws must still be attained and maintained.

## **F. Cutting Section Control**

The purpose of establishing cutting sections in a sale is to maintain stronger control on sale administration while allowing the logger to make periodic payments for the sale. In most sales involving 2 or more cutting sections, unless indicated otherwise, the logger has the option to choose the order in which the cutting sections will be harvested with the approval of the TSA.

Before any timber is cut in any cutting section, payment must be received for that cutting section. Also as per agreement condition, each cutting section must be completed, including all road closeout work, before entering the next.

Some sales such as pine harvests may be bid on a pay as cut basis. With this type of sale payments will be required no later than the end of the second week from the start date. Payments will then be required on a weekly basis thereafter. Movement between cutting sections will be done only after each cutting section is completed, including all road closeout work. Extra attention will be needed with this type of sale to ensure that load records are recorded accurately and are accounted for in the payments. Weight slips will be submitted with each payment and load records will be collected at the end of each week.

If it does become necessary and advisable to move into another section, the following procedure must be used.

- Contract Change Order form shall be completed and approved.
- The entire cutting section being moved into must be paid for ahead of time.
- If movement is due to wet conditions, cutting may proceed in the next section only until conditions in the previous section improve. Once conditions are better, the logger must move back to the previous section to complete the area. Grading and waterbarring must be done to the satisfaction of the TSA before leaving the cutting section.

*Exception:* Contractors may use additional cutting sections for transportation purposes or skidding. It may even be necessary to cut incidental trees in those sections for transportation. This situation is not considered as an active operation in those cutting sections and therefore does not necessitate a change order.

## **G. Period of Agreement/Agreement Extensions**

The agreement completion date as specified in the contract is the date at which all work is to be completed on the sale. Logging is allowed so long as the Division's Wet Weather guidelines are met. There are instances, however, where a purchaser will need an extension to complete an agreement. When it is beneficial both to the Division and to the purchaser to finish a sale, the Division will grant extensions to timber sale agreements based on the circumstances surrounding the request for extension. Generally, two situations apply as follows:

Circumstances beyond purchasers control will generally include force majeure events, illness, fires, labor disputes, etc. (It does not include circumstances relating to regular weather conditions.) If such circumstances occur, it will be the purchaser's responsibility to notify the TSA in writing as soon as possible that something has happened to interrupt logging activity. If at the time of agreement expiration, the purchaser's situation has not changed or if so, it has slowed his ability to complete the sale, an agreement extension may be granted.

Circumstances under the purchaser's control generally include situations where poor management is exercised: over-commitment of harvesting activity elsewhere, failure to work during good weather, etc. In such cases an agreement extension may be granted, by the Chief, so long as the following conditions are met:

- The sale must be paid in full (including all cutting sections that remain)
- The sale has been actively worked in the last 3 months.
- The purchaser may be required to forfeit a portion of his performance bond. This will be deciding o a case-by-case basis.
- The purchaser immediately begins working the sale, and works until the sale is finished, weather conditions permitting.

In either case as described above the purchaser must submit in writing a request for agreement extension 15 days before the sale expiration date. The TSA shall initiate the Contract Change Order Form. The length of extension shall be determined by the Chief with recommendation from the forest.

## **H. Violation Procedure**

The objective of administration is to prevent all violations or to at least stop them as soon as they occur. This will lessen the chance for long-term environmental impact. Most violations may be done unintentionally on the part of the logger. Some, however, may be done in open disregard for the agreement. Regardless of the type of violation, each must be dealt with fairly and quickly to prevent further problems.

The TSA is the individual responsible for initiating and handling all violation procedures. Depending on the type of violation, different courses of action will be taken. If the violation is serious in nature, the TSA may immediately suspend the logging operation. Any violation shall be documented on the inspection form and properly distributed. Repeated documented violations may constitute justification for suspension of logging operations. Upon suspension of logging, the District Forester Manager and Land Management Administrator shall be notified. Operations may be resumed only after written approval of the TSA.

If violations are persisted in, or in the opinion of the TSA and District Forest Manager, are severe enough in nature, they shall be brought to the attention of the Land

Management Administrator who shall notify the Chief who shall determine the appropriate course of action in accordance with the Timber Sale Agreement.

### **I. Timber Damage**

Damage to unmarked or undesignated trees can be expected to occur during logging operations, including felling, skidding, road and deck construction and use, etc. The Division must be compensated for damage to the residual stand. Damage trees must be accounted for and noted on the Cutting and Logging Inspection and timber damage worksheet.

The TSA in charge will determine which trees to salvage and in accordance with the terms and conditions. Trees displaying one or more of the following types of damage will be considered for salvage:

- Broken off or severely damaged crowns.
- Broken off or fractured stems.
- Uprooted or severely root sprung.
- Skidding damage that severely negatively affects the future health or value of the tree.

### **J. Salvage Options**

The TSA has the option of determining the best means of selling unavoidably damaged timber. Options include:

- Requiring the logger to fell and deck for removal by forest crews.
- Selling such trees to the logger as per the language in the Timber Sale Agreement.

Avoidably damaged trees, undesignated cut trees, and the volumes of unavoidably damaged trees over the limit allowed in the agreement will be sold to the purchaser at twice the price as per the language in the Timber Sale Agreement.

Unavoidably damaged high quality trees will be felled and decked by the logger then removed and sold by Forest crews or sold to the logger as per the language in the Timber Sale Agreement.

### **K. Damage Payment Procedure**

The worksheet at the end of this chapter is to be used to record damaged trees. Each damaged tree should be clearly marked and numbered with paint. The tree species, DBH, and merchantable length should be recorded. A running tally of all trees damaged by cutting section or sale will be maintained. Before each cutting section is closed, a copy of the itemized list will be sent to the purchaser, upon which the purchaser will make payment for the damaged trees at the end of each cutting section or at end of sale as determined by TSA.

This list will also be used to determine if damaged trees exceeds 10% of the marked volume in the stand or if undesignating trees are cut.

The TSA, with approval, has the option of charging a penalty to regeneration or pre-commercial stems if the TSA deems that the contractor is damaging pre-commercial trees un-necessarily. The TSA shall make this recommendation on the logging inspection form.

All damage payments must be received by the Division before final closeout of the sale and return of performance bond.

#### **L. Haul Roads, Skid Road, Skid Trails, and Log Decks**

One of the more important concerns in any sale involves the use and maintenance of the road system. A skid road is defined as a path along which logs are skidded where mineral soil is exposed by excavation. A skid trail, on the other hand, is a path along which logs are skidded and very little mineral soil is exposed. Nearly all soil erosion on a sale comes from the road system while most skidding damage to residual trees happens to trees left along trails. In all cases, wet weather policy and BMP's shall be followed as listed in BMP's For Erosion Control on Logging Roads in Ohio, ODNR - Division of Forestry.

The following procedures/guidelines should be used on all State forest sales:

- BMP's for Erosion Control for Logging Practices in Ohio shall be followed.
- Haul roads and skid roads should be planned, laid out, and constructed to be a permanent part of the forest landscape. Haul roads, skid roads and decks should be laid out to give the best long-term access to the area where practical.
- All haul roads, skid roads, and decks shall be located and flagged/painted in before harvest operations begin by Division of Forestry personnel.
- Truck crossings at live streams should be accomplished by means of culverts or bridges.
- Stream has hard bottom or can be hardened.
- Stream can be crossed at as close to right angles as conditions allow.
- Proper bank stabilization can be applied and surface runoff abated.
- Skidding through live streams shall not be permitted.
- To do an adequate job of road location, maintenance and rehabilitation, it is important to have as much knowledge as possible about local soil conditions. The TSA should obtain county soil survey information for the forest area, if such information is available. If not the TSA should contact the local NRCS office to get as much local information as possible.

#### **M. Road Maintenance/Temporary Sale Closure**

Most erosion and damage from a sale occurs while the sale is in progress. During sale activity, roads must be adequately maintained and administration must be directed toward

minimizing damage and impact. When the ground is dry or frozen, erosion hazard is usually minimal. The greatest problems occur during periods of wet and saturated soils.

*TSA's shall use the Wet Weather Logging policy* (see appendix to this chapter) as a guide for temporary and semi-permanent shutdown procedures to protect the site during times of wet weather.

There will be no active logging during the Ohio Deer Gun Season week except with written permission from the TSA. The TSA may also restrict logging on weekends or holidays. It is preferred that these conditions be noted in the "Marking Estimate" in order to be included in the Timber Sale Agreement.

#### **N. Road Closeout**

The Division will employ all necessary and recommended erosion control practices as specified in "BMP's for Erosion Control for Logging Practices in Ohio" in log road closeout. Guidelines and specifications as shown in this publication are adopted for use on state forest lands.

The primary objectives of road closeout practices are to stabilize soil for erosion control. However, additional objectives are to improve wildlife habitat and aesthetics. Road closeout practices are aimed primarily at mitigating damages but there is opportunity to do enhancement practices for other forest resources at the same time. Non-timber resource enhancement practices should be done on timber sales whenever possible.

All haul roads and skid roads shall be stabilized according to BMP specifications as directed by the TSA. Downed trees, treetops, and other logging debris may be placed on roads for soil stabilization in addition to water-barring at the discretion of the TSA.

The TSA shall direct the logger to drag logging debris back onto the road areas or have the logger fell low quality or non-merchantable trees onto the roads prior to sale closeout. The TSA can also direct them to pile brush on trails and at trailheads and access routes. These practices not only stabilize soils but also deter any unlawful use of trails or forest access roads. Aesthetics shall be considered. All decking areas shall have debris windrowed, removed, or scattered with soils graded and smoothed to the satisfaction of the TSA.

Seeding should be done on most areas that have exposed mineral soil as a result of a logging operation. The objective is to have 50% vegetative cover one year after sale closeout in these areas. The sooner seeding can take place after sale closure, the better and easier the chance of accomplishing site re-vegetation. Soils should be fresh and loose to insure adequate seed germination. The very best option is to seed as the roads are being graded and waterbarred. Seedbed preparation with specialized equipment may be necessary in compacted soils.

Lime and fertilizer are often required to insure adequate vegetative growth. Be familiar with your local soil properties to make sound judgments.

Mulch is used in any area particularly subject to erosion or where shading is required to maintain moisture conditions for good seed germination. For the most part, any exposed soil area in an intermediate cut or a selection harvest will not need mulch to insure seed germination. Any area that will receive direct sunlight that quickly dries out should be mulched. Roads and decks in even-aged regeneration areas will have the greatest need for mulch. As minimum standards, mulch should be applied in the following situations:

- All deck areas (unless sufficiently shaded).
- All road areas exceeding 20% slope.
- All haul roads (unless sufficiently shaded).
- Any skid road or trail within clearcut cutting sections per the discretion of the TSA.

#### **O. Change Orders to the Timber Sale Agreement**

The only person given authority to change the Timber Sale Agreement is the Chief. If any change that directly conflicts with agreement language is required, the purchaser must make the request, in writing to the TSA who will make comments and recommendations and who will forward it to the Forest Manager. The Forest Manager will send the request along with recommendations to the District Forest Manager. Once approved, the District Forest Manager will send the request along with recommendations to the Land Management Administrator for final disposition. When approved, or disapproved, the Chief will notify all affected parties of the decision. A Contract Change Order Form has been designed to expedite this process. A copy of this form is included at the end of this chapter.

#### **P. Timber Sale Agreement Closure**

When the sale is successfully completed, the TSA must initiate closure processes for return of performance bond. This should be done with the final inspection form. After all equipment is removed, roads satisfactorily closed, and all payments received for damaged timber, the final inspection form should be distributed properly. Make sure this form is filled out completely including a list of all payments made on this sale. Once the TSA has indicated that the sale was completed successfully the Land Management Administrator shall release the bond. When the district office receives the final inspection form, the District Forest Manager or a designated representative should inspect the sale with the TSA and/or the Forest Manager. If in the opinion of the District Forest Manager, or his representative, the sale was not satisfactorily completed then arrangements shall be made internally to rehabilitate the site.

If the sale was never satisfactorily completed, even with extensions, and there was previous written contact by the TSA, then the sale agreement should be terminated.

Immediately following completion date, the TSA should complete a final inspection form indicating the status of the sale along with recommendations for closure. The District Forest Manager should review the status and make recommendations on whether to retain the performance bond. Once determined, it should be indicated on the final inspection form and forwarded to the Land Management Administrator to initiate sale closure. A letter will be sent by the Chief to the purchaser informing them of bond forfeiture.

## **Q. Biomass Harvesting and Retention**

The difference between traditional timber harvesting and biomass harvesting is that biomass harvesting potentially removes more woody material from the forest and may include dead wood. Removal of large volumes of woody biomass could potentially reduce soil nutrients and wildlife habitat as well as increase soil compaction. The objective of these guidelines is to ensure that woody biomass remains a sustainable forest product and that its removal does not compromise long term forest productivity. These guidelines are applicable to any site or type of harvest regardless of the end use of the material being harvested. It is also recommended that these guidelines be used in addition to any silvicultural, forest management and best management practices (BMP's) guidelines.

For the purposes of this manual woody biomass is broken into two categories, course woody material (CWM) and fine woody material (FWM). CWM is defined as dead wood such as stumps, roots, trunks and limbs (logging slash) of more than 6 inches in diameter at the large end. FWM is defined as dead wood such as tops, limbs and woody debris less than 4 inches at the large end and includes forest floor litter including the duff layer.

### **1. Course Woody Material**

Course woody material that is already on site prior to a harvest should be retained. Biomass harvests should not include pre-existing CWM. It may be necessary to move stumps or root systems for site preparation but they should not be removed. No less than 10% of the CWM that is created as the result of a timber harvest should be retained and distributed on site. Retention and snag guidelines are address in this and other chapters.

### **2. Fine Woody Material**

Fine woody material contains a higher amount of nutrients on a weight basis as compared to CWM. Retaining FWM helps keep a large portion of nutrients on site and helps maintain soil productivity. For this reason FWM that was present before the harvest as well as material that developed as a result of the harvest should be retained on site and not removed. FWM should be distributed across the site and should be communicated with the logger during TSA duties. FWM piled at the landings should be discouraged.

### 3. Other Considerations

Some sites may lack woody debris, consideration should be given to retaining additional CWM and FWM on these sites in order to improve soil nutrient levels, protect water quality and benefit plant and animals.

## Chapter 9

### Pre-commercial Silvicultural Activities

The objectives of timber stand improvement (T.S.I./artificial regeneration are to:

- Maximize the timber productivity and quality on a site while reaching the land management goal for the stand in the shortest time possible. This is done by reducing or eliminating undesirable trees, shrubs, or vines interfering with the growth of commercially valuable trees
- Artificially regenerate trees in areas that have little or no natural regeneration due to the severity of the site conditions.
- Protect the site productivity by continually eliminating invasive plant species which prevent the natural vegetation from reestablishing on disturbed sites. This would include invasive vegetation on the site in addition to the potential seed sources in the surrounding area. This will be important since several of the invasive species alter the productivity of the soil by phytotoxicity, such as Ailanthus.

#### A. Responsibility

The decision to perform T.S.I./artificial regeneration is largely based upon economics and land management zones and goals. The Division's policy will be to concentrate on:

- Invasive plants, including grapevines, are to be managed on all sites. The invasives in the area surrounding the treated site, which are potential seed sources for the reestablishment of the invasives, should also be eliminated, if possible.
- Crop-tree release and cull reduction to areas with a black oak site index of 60 and higher.
- Artificial regeneration, as needed, to establish a preferred natural forest cover on open areas or, as described under FSC, where artificial regeneration is required for establishing extirpated species or enhancing naturally occurring species. FSC forest conversion to plantations or no-forest land uses shall not occur, except in circumstances where conversion:
  - Entails a very limited portion of the forest management unit; and
  - Does not occur on high conservation value forest areas; and
  - Will enable clear, substantial, additional, secure, long term conservation benefits across the forest management unit.

#### B. Pesticide Use

The Division of Forestry's pesticide management direction is in agreement with FSC's statement: "Management systems shall promote the development and the adoption of environmentally friendly non-chemical methods of pest management and strive to avoid the use of chemical pesticides. World Health Organization Type 1A and 1B and chlorinated hydrocarbon pesticides; pesticides that are persistent, toxic, or whose

derivatives remain biologically active and accumulate in the food chain beyond their intended use; as well as any pesticides banned by international agreement, shall be prohibited. If chemicals are used, proper equipment and training shall be provided to minimize health and environmental risks.”

This will be guided by “FSC Guidance Document FSC Pesticides Policy: Guidance on Implementation, FSC-GUI-30-001 Version 2-0 EN, May 5, 2007 shall be used for clarification.

The following two main issues are addressed in the existing FSC Pesticides Policy:

- Systems for integrated pest management;
- Monitoring of long term health and environmental effects.
- In consideration of the issues above, the Division of Forestry has adopted a consistent best practice integrated chemicals management approach by certified operations, which ensures:
  - That chemical application remains site specific, and eliminates significant downstream and adjacent effects;
  - That there a full declaration of chemical usage – quantities; types; frequency; and protocols;
  - The adoption of procedures and mechanisms to avoid, mitigate and provide fair compensation for negative impacts of pesticide use on workers, local communities, and the environment;
  - The monitoring of, and reporting on, such safety, health and quality controls;
  - Managers having to demonstrate the results of efforts they have made to avoid or reduce pesticides use;
  - The demonstrable ongoing investigation into, and evaluation of, chemical free alternatives to pest control;
  - The active provision of information to local communities and workers about use and application of pesticides.
- An updated list of pesticides which will be permitted to be used on State Forest lands, based on FSC guidelines, is provided in the appendix. This list should be reviewed and updated annually to assure compliance with the FSC guidelines.

If the TSI operation or site preparation for tree planting requires a pesticide application, whether by State Forest personnel or a commercial applicator, the “RECORD OF PESTICIDE APPLICATION” form is to be completed each day for any pesticide; restricted-use or not. Records of all applications of pesticide use on State Forest lands are to be kept at the forest headquarters for three years.

Under certain circumstances pesticides will have to be used to effectively meet the treatment goals for a TSI operation. The label is to be followed at all times. The requirements under ODNR Rule #00-10 ”PESTICIDE USE” for the Division of Forestry (appended) are to be met for all pesticides used on State Forests. In other words the same

rules apply for both restricted-use and unrestricted-use pesticides. The rules also are required for either State Forest personnel or private commercial vendors.

Because of differing manpower, equipment and financial capabilities among forests, decisions on and establishment of priorities for accomplishment of T.S.I. will be the responsibility of the District Forest Manager/Forest Manager.

The following are the approved chemicals for use on State Forest Land. Any proposed variance from this list shall follow the Pesticide Use policy statements included in this chapter.

- Metsulfuron methyl
- Triclopyr
- Imazapyr
- Glyphosate
- Picloram
- Tank mixes of the above, according to label instructions.

### **C. Operations**

Improvement activities will concentrate mainly on managing cull trees, crop tree release, grapevines, eliminating invasives, and the promotion of oak with allowance for wildlife shelter and food. Other activities such as thinnings will be concentrated on pole sized stands and larger. There is, however, no limit to the types of stand improvement activities that may be demonstrated on state forests.

The TSI recommendations, including both vegetation manipulation and tree planting, will be made in the compartment prescription report and/or in the timber marking transmittal when timber is to be harvested. The recommendation along with the details of what is required and the purpose/goal of the treatment are to be included.

### **D. Reporting**

The “Pre-Commercial Project Proposal and Prescription”, “Environmental Impact Checklist”, “Project Inspection” reports will be used for the initiation and completion of field projects including T.S.I., tree planting or other non-commercial cultural operations. Upon completion of improvement operations, the report will be filed at the forest and district headquarters, and a copy sent to the Land Management Administrator.

A plantation record form should be started and incorporated into the appropriate forest and district compartment files if the planted stand will be managed as a plantation. If the planting objective is to fill in openings to enlarge a surrounding stand or to reinforce a more productive species composition in an existing stand the information can be reported on the “Pre-Commercial Project Proposal and Prescription”. Accurate records should include the nursery of origin as well as the seed source. The plantation record form shall be completed.



# #00- PESTICIDE USE

Division of Forestry

~ <b>Effective</b>	November 2009
<input checked="" type="checkbox"/> <b>Purpose</b>	To establish operating procedure for pesticide use on Division of Forestry lands
 <b>Authority</b>	ODNR Pesticide Use Directive
 <b>Reference</b>	OAC Chapter 901 and ORC Chapter 921 (ODA) USEPA Federal Insecticide, Fungicide and Rodenticide Act ODNR Mosquito Control Directive
 <b>Resource</b>	Forest Health Administrator

**NOTE:** Forms or attachments referenced are accessible in electronic form for both hard copy and/or on-screen use at M:Intranet/Forms/Forestry

## **OPERATING PROCEDURE FOR PESTICIDE USE**

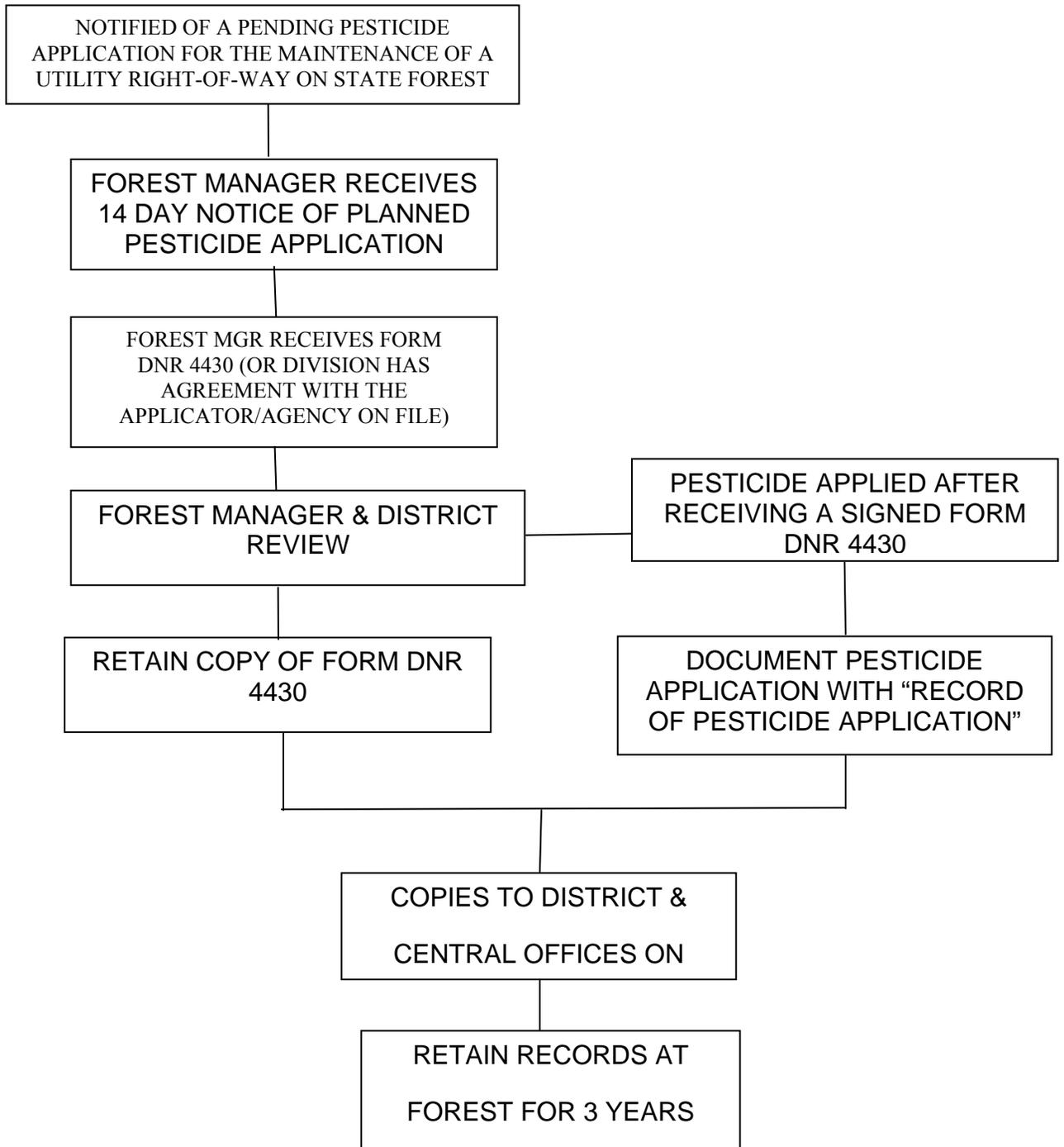
### **ON DIVISION OF FORESTRY LANDS**

November 2009

1. The use of Integrated Pest Management (IPM) techniques to control pest problems shall be encouraged wherever feasible on Division lands.
2. Persons applying pesticides to state forest land must be licensed by the State of Ohio or supervised during the application of pesticides by someone who holds an Ohio pesticide license. Persons not holding a license, but applying pesticides under the supervision of a license holder, must receive pesticide safety training that includes reading and signing the “Safety Training Guide for Trained Servicepersons” manual. Training and licensing of Division employees engaged in pesticide use shall be evaluated at least every two years to ensure that adequate numbers of personnel are fully licensed and certified by the Ohio Department of Agriculture to properly apply (or supervise the application of) pesticides on state lands. These persons shall be termed “commercial applicators”.
3. The selection, purchase, transportation, handling, use, storage, application, and disposal of pesticides shall comply with all applicable federal and state laws and regulations.
4. Whenever feasible, pesticide purchases shall be limited to the quantity necessary for a particular job or for projects planned for the current year and stored at the forest unit where they will be used in dry, ventilated and well secured areas.
5. Each individual forest shall be notified by utilities or agencies not acting as an agent of ODNR of intended pesticide applications on Division lands at least fourteen (14) days in advance of work. Pesticide formulations, application sites, and proposed dates of application shall all be specified by the applicator. Utilities or other pesticide applicators not acting as an agent of ODNR shall provide forest managers completed copies of Form DNR 4430, “Application for Pesticide Use on State Forest Lands”, before commencement of pesticide applications on Division lands or waters.
6. The District Forester and Forest Manager shall both review **all proposed** applications of pesticides on Division lands or waters by **non-Division** persons, **in advance** of any applications of pesticides. Written authorization must be obtained from the District Forester by other agencies, companies, or individuals who wish to apply pesticides on Division lands or waters (unless the Division has another written agreement with this applicator/agency). Copies of this authorization shall be kept on file in the Forest, District, and Columbus offices.

7. Complete records of **all** pesticide applications, **including those made by persons not employed by the Division**, on lands and waters managed by the Division, shall be kept for at least three years at the forest level, as required by the Ohio Department of Agriculture Regulation 901:5-11-07. These records shall include information on: applicator's name (or company), application sites, date, host, pest, number of acres treated, total amount and rate of pesticide used, pesticide product, including EPA regulations number and lot number, mode of application, starting and stopping times, and wind direction and velocity. (Form F-FPC-77-7-rev.10/09 can be used for this purpose). Applicators not employed by the Division (utilities, other agencies, contractors, etc.) can submit their application records to the forest manager in lieu of F-FPC-77-7-rev.10/09 if all required information is included in the records. The forest manager can also secure the required information from the application and submit Form F-FPC-77-7-rev.10/09 for the applicator.
8. Pesticide applications are **prohibited** in designated state natural areas without the approval of the Director of the Ohio Department of Natural Resources or his/her designee.
9. Pesticide applications on lands or waters managed by the Division containing known threatened or endangered plants or animals shall be completed when necessary to protect forest resources from invasive pests. Responsible consideration of treatment options for these areas should include selection of pesticides and/or methods that are both effective and minimize risk to non-target species.
10. Prior to application of any pesticide, consideration shall be given to the potential effects of the pesticide on non-target species and properties bordering state-owned lands.
11. The Division's Pesticide Spill or Accident Contingency Plan shall be accessible through posting in a conspicuous place(s) in forestry facilities and placement in the glove box of vehicles. Appropriate phone numbers shall be entered and the plan shall be followed in the event of a pesticide spill or accident.
12. OSHA-required Material Safety Data Sheets (MSDS) shall be obtained for each pesticide or hazardous chemical used or stored at each forest or work location, and kept on location for reference. In most cases, a copy of the pesticides' full label is satisfactory in this regard.
13. Every effort shall be made to dispose of all unusable or unwanted pesticides and/or hazardous chemicals as promptly as possible, in accordance with all state and federal regulations.
14. All companies, agencies, or individuals applying pesticides to an agricultural crop on state lands shall comply with all Federal (U.S. EPA) requirements under the Worker Protection Standard for Agricultural Pesticides.

**UTILITY RIGHT-OF-WAY MAINTNENCE  
ON STATE FOREST LAND  
DIVISION OF FORESTRY PROCEDURES  
FOR PESTICIDE APPLICATION**



## RECORD OF PESTICIDE APPLICATION

INFORMATION	APPLICATION	APPLICATION	APPLICATION	APPLICATION
(1) <b>Public Operator</b>				
(2) <b>Client</b>				
(3) <b>Date; Re-entry</b>				
(4) <b>Host(s)</b>				
(5) <b>Pest(s)</b>				
(6) <b>Acres; Plants</b>				
(7) <b>Location</b>				
(8) <b>Pesticide; EPA Reg. No; Lot No.</b>				
(9) <b>Amount</b>				
(10) <b>Rate; Concentration</b>				
(11) <b>Equipment</b>				
(12) <b>Start; Stop</b>				

<b>(13) Wind dir.; Velocity; weather</b>			
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APPLICATION FOR PESTICIDE USE  
ON STATE FOREST LAND

Prepared by:	Telephone:	Date:
Applicator (Company Name & Address)		
Applicators Name & Address		
State Forest Unit	Address:	
Location of Area to be Treated	Acres to be treated	
Proposed Date(s) of Treatment		
Purpose of Treatment		
Pesticide (Common or Trade Name)		
	Manufacturer	
	Active Ingredients	
	Ohio EPA Registration Number	
	Form (dust, granular, emulsion, etc.)	
Date of Application		
Method of Application		
Special Precautions to be taken		
Other		

.....  
**FOR USE BY DIVISION OF FORESTRY ONLY:**

Application received and reviewed:		Application received and approved:
Date		Date
By		By
(Forest/Program Manager)		(District Forester)
If Disapproved – Reason for disapproval		

District : Send copies to Forest/Program Manager

Columbus Pesticide Coordinator

OHIO DEPARTMENT OF NATURAL RESOURCES, DIVISION OF FORESTRY

3/89 DNR 4430

**ODNR Division of Forestry  
Record of Pesticide Application**

Forest: \_\_\_\_\_ Location: \_\_\_\_\_ Date: \_\_\_\_\_

Date of Re-entry: \_\_\_\_\_ Acres Treated: \_\_\_\_\_

Application Start Time: \_\_\_\_\_ Application Ending Time: \_\_\_\_\_

Wind Direction: \_\_\_\_\_ Wind Speed: \_\_\_\_\_ Temp.: \_\_\_\_\_

Atmospheric Conditions: \_\_\_\_\_ (Describe cloud cover conditions)

**Vehicle parked at least 100 feet from a stream?**       yes     no

**Equipment inspected for leaks?**       yes     no

**Check appropriate box(s) for pest treated:**

Ailanthus     Paulownia     autumn olive     bush honeysuckle

Japanese honeysuckle     multiflora rose     privet     grapevine

Other pest: \_\_\_\_\_

**Pesticide Used:**     AGS 203 (20% Garlon 4 Ultra, 3% Stalker, 77%Ax-it)  
                           Pathway (Picloram)  
                           Garlon 3A (Triclopyr)  
                           Glyphosate (41% AI)  
                           Other(s): \_\_\_\_\_

**Amount Applied:** \_\_\_\_\_ gallons (total quantity used)

**Rate of Concentration:**     Pre Mixed (used full strength)     Other: \_\_\_\_\_

**Application Type:**     Foliar     Basal Bark     Cut Stump     Frill

Other: \_\_\_\_\_

**Equipment Used or On Site:**     Backpack Sprayer     Hand Held Sprayer

Hand Tools     Chainsaw     Spill Kit

Other Equipment \_\_\_\_\_

**Protective Equipment used:**  Gloves  Eye Protection  Hardhats

Chaps  Other: \_\_\_\_\_

**Container Handling (describe how containers were rinsed and/or disposed of):**

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Actual Treatment Description – Note any deviation from proposal and indicate specific techniques, chemicals, or equipment used. List all dates the project was active.

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***\*\*List applicator names on reverse side***

Applicator 1: \_\_\_\_\_

Applicator 2: \_\_\_\_\_

Applicator 3: \_\_\_\_\_

Applicator 4: \_\_\_\_\_

Applicator 5: \_\_\_\_\_

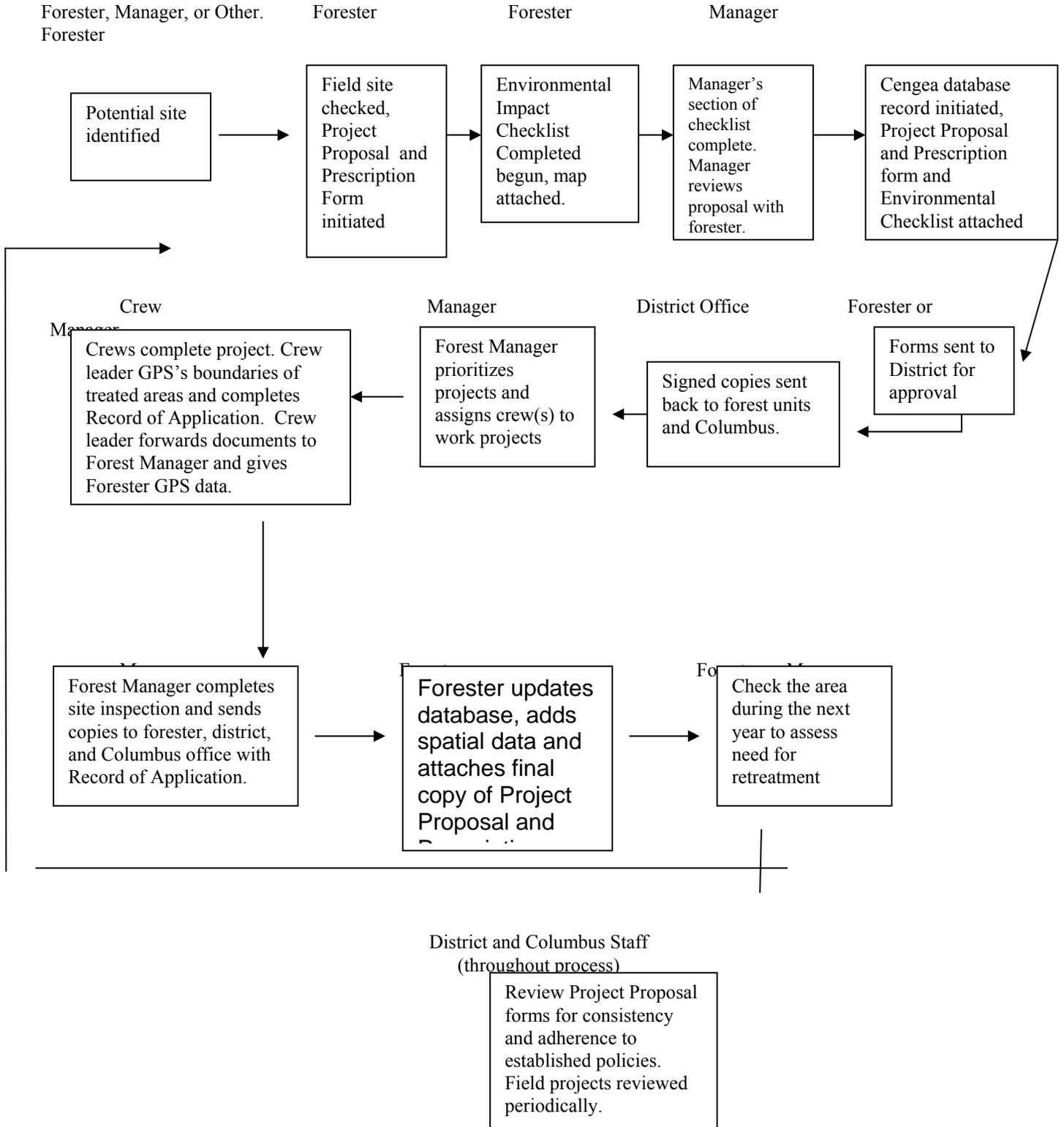
Applicator 6: \_\_\_\_\_

<b>Herbicide</b>	<b>EPA Reg. Number</b>
<b>Garlon 4 Ultra</b>	<b>62719-527</b>
<b>Stalker</b>	<b>241-398</b>
<b>Ax-It</b>	
<b>Pathway</b>	<b>62719-31</b>
<b>Garlon 3A</b>	<b>62719-37</b>

**Project Totals**

Person-hours \_\_\_\_\_  
(crew)  
Materials \_\_\_\_\_  
Travel Time \_\_\_\_\_

# Procedures For A Pre-Commercial Project





# PreCommercial Project Proposal and Prescription



Forest	Compartment	Local Name	County	Township	Zone
--------	-------------	------------	--------	----------	------

## Unit Description

Stand Type	Location	Aspect	Size Class	Stand Acres	GPS
------------	----------	--------	------------	-------------	-----

				0	
--	--	--	--	---	--

Prescription Type	Invasive Type	Size of Invasives	Treat Acres	Stocking
-------------------	---------------	-------------------	-------------	----------

			0	
--	--	--	---	--

## Priority

--	--	--	--	--

## Prescription

Chemical(s)	Tank Mix	Target	Chemical Ounces / Gals	Water Gallons
-------------	----------	--------	---------------------------	------------------

## Comments:

Prepared By: \_\_\_\_\_

Date: \_\_\_\_\_



**Project - Environmental Impact Checklist**

Forest	Compartment	Local Name	County	Township	Zone
0	0	0	0	0	0
Stand Type	Location	Aspect	Size Class	Stand Acres	
0	0	0	0	0	

	Responsible Party (initial)	Date (mm/dd/yy)	Comments:
<b>Forester</b>			
Adjoining/Adjacent Landowner Concerns			
Private boundary lines identified			
No-Spray buffer on private boundary			
Cultural / Historical Area on Site			
DNAP Heritage Database			
Scenic Rivers			
Trails/Recreation/Facility			
Domestic water impacted?			
SMZ or other aquatic habitat buffered			
<b>Manager</b>			
Records for Public Inspections			
All employees with PPE on site			
Licensed Applicator on site			

**Sensitivity Level**

**Other Impacts or Comments:**



**Proposed By:** \_\_\_\_\_  
**District:** \_\_\_\_\_

**Date:** today... \_\_\_\_\_  
**Date:** \_\_\_\_\_



## Project - Inspection



Forest	Compartment	Local Name	County	Township	Zone
0	0	0	0	0	0
Stand Type	Location	Aspect	Size Class	Stand Acres	
0	0	0	0	0	0
Prescription Type	Invasive Type	Size of Invasives	Treat Acres	Stocking	
0	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
			0	0	0

		Yes/Acceptable	No/Unsatisfactory	Comments
<b>Environmental Impact</b>				
	Riparian areas buffered			
	Domestic water protected			
	Parking/Mixing near riparian areas			
	Special sites buffered			
<b>Prescription Admin</b>				
	Job completed			
	Job performance			
	Prescription followed			
<b>Crew Performance</b>				
	Foreman			
	Crew			
	Overall Rating			

Comments

\_\_\_\_\_

Inspection By: \_\_\_\_\_  
PLANTATION PROJECT

Date: today....

### Completion Report

Forest \_\_\_\_\_ Plant No. \_\_\_\_\_ Compartment \_\_\_\_\_ Acres \_\_\_\_\_

Tree Species \_\_\_\_\_ Age of Plantation \_\_\_\_\_

Project Description \_\_\_\_\_

Products Removed, size, quantity and value. \_\_\_\_\_

Total Value \_\_\_\_\_

Cost of Project

**State Forest Money**

**Federal Program Money – Type Program**

Labor \_\_\_\_\_

Labor \_\_\_\_\_

Other \_\_\_\_\_

Other \_\_\_\_\_

Total \_\_\_\_\_

Total \_\_\_\_\_

Total Cost \_\_\_\_\_

Cost per acre \_\_\_\_\_

\* Inspected and Submitted by \_\_\_\_\_

Date \_\_\_\_\_

Final Inspection by \_\_\_\_\_

Date \_\_\_\_\_

Residual Stand: B.A./Acre \_\_\_\_\_

No. Trees/Acre \_\_\_\_\_

Trees Pruned/Acre \_\_\_\_\_

Other \_\_\_\_\_

Remarks \_\_\_\_\_

Approved by \_\_\_\_\_

\* At completion of project send one copy this report to District Office.

## **Chapter 10**

### **Forest Protection**

The intended objective of State Forest protection activities is to monitor, and report on the health of State Forests. To improve long-term forest health, productivity and economic viability by protecting the forest from agents such as damaging fire, invasive plants, insects and disease.

#### **A. Fire Protection Program**

The mission of the Division of Forestry Fire Management Program is to provide leadership in wildfire management by providing training, equipment and technical assistance.

##### **1. Ohio Revised Code**

The authority for the fire management program originates in the Ohio Revised Code. Detailed information regarding the Division of Forestry and its authority to operate can be found by visiting. <http://codes.ohio.gov/orc/1503>

##### **2. Fire Manual**

An additional reference that details the established policy, procedures, directives and guidance for planning and implementation of forest fire management activities of the Division can be found on the intranet at the following location - M:\DOF Policy\FIRE MANUAL.

##### **3. Wildfire Monitoring and Reporting**

Detection and surveillance of wildfires has varied and evolved throughout the years due to many factors, including technology, funding, population dynamics, land use, and development. Forest fire lookout towers, aerial detection, vehicle patrols, and local citizen reporting have been and will continue to be employed and relied on for the reporting of wildfire.

The use of aircraft services for scouting or surveillance of wildfires shall be requested through the Columbus office and will generally be performed as may be arranged through the ODNR Division of Wildlife.

##### **4. Wildfire Response**

The Division role in initial attack varies and is a reflection of local and regional influences and interagency cooperation. Initial attack response on wildfires by the Division within the fire protection area is determined in consideration of one or more of the following criteria:

- Fire on or threatening State Forest land.

- Fire on or threatening other ODNR lands.
- Fire within unprotected jurisdictions.
- Multiple and/or large ongoing fires.
- Severity of wildfire behavior conditions (past or predicted).
- Per prior arrangement/agreement and/or confirmed request of fire service agency/official.

Initial attack response consistent with firefighter and public safety and values to be protected, may include a variety of actions:

- Dispatch to scene to size up fire.
- Provide overhead and technical assistance to manage fire.
- Provide qualified personnel and/or specialized equipment to assist in fire suppression.

The above provides guidance and flexibility for each district and forest to develop specific operational procedures.

## **B. Forest Health Program**

The Forest Health Program of the Division is committed to assist in protecting state forests from insects, diseases, and other factors, as well as providing assistance to private landowners on forest health issues through information and education. The focus of the Forest Health Program on state forests are monitoring and management of Emerald Ash Borer, Gypsy Moth, White Oak Decline, Invasive Plants, as well as other pests as needed.

### **1. Emerald Ash Borer**

The quarantine boundaries regarding the Emerald Ash Borer change as the range of the insect changes. In order to find the most up to date information and quarantine regulations visit the following Ohio Department of Agriculture web site:

<http://www.ohioagriculture.gov/eab/plnt-eab-regulations.stm>

EAB is very new, and there are no tried and tested silvicultural recommendations. The objectives are two-fold. One is to capture the value in mature ash trees as the market allows. These trees will eventually be prone to attack and have a high probability of mortality; therefore capturing the value is a legitimate objective. A second objective is to reduce the number of ash trees in the stand to reduce the stand's vulnerability to EAB attack and may reduce the magnitude of infestations due to reduced basal area of ash trunks for EAB reproduction.

A study by researchers at Michigan State University indicates that the strategy of removing trees greater than 10 inches DBH will reduce the surface area available for EAB infestation by 65% in average forest stands. Trees smaller than 10 inches DBH can be infested by EAB, but the smaller trees cannot support the production of as

many EAB as larger trees. This means that the harvest of merchantable ash trees form a forest will reduce the forest's capacity to produce large numbers of EAB during an infestation, even if the smaller trees are still growing in the forest stand. There are no suppression efforts for EAB.

## 2. Gypsy Moth

The goal of gypsy moth management can either be suppression or eradication, depending on the geographic location within the state of Ohio. The DOF manages gypsy moth according to ODA's designation as suppression, slow-the-spread or eradication zone. If the DOF discovers a gypsy moth infestation on state forest land, an egg mass survey is done in order to evaluate the severity (egg masses/acre) and extent (total acres involved) of the infestation. If the survey indicates that the severity and extent meet ODA's threshold criteria for treatment, then plans are made for an appropriate treatment. Insecticides may be used for treatments provided they are not an FSC banned chemical. In an eradication area, APHIS pays for treatment and the objective is complete removal of the infestation. In a slow-the-spread area, the treatment is paid for by ODA through a USFS grant. The objective is elimination of "hot spot" infestations to reduce the growth and spread of relatively new infestations. A variety of treatments are used for this purpose. In a suppression zone, DOF works cooperatively with ODA to voluntarily (landowner request) treat the infestation with an insecticide aimed at controlling gypsy moth populations enough to protect tree foliage and thus minimize impacts to tree/stand health. Cooperative suppression treatment costs are split 50/50 between DOF and ODA.

State timber sales in quarantined areas are subject to quarantine regulations. Bidders are made aware of this, so they can plan accordingly. If egg masses are found in a state timber sale it is either treated before the harvest to eliminate egg masses, or egg masses are removed by the logger before removing logs from the site. The logger is trained (usually by APHIS) in this "self-inspection" process and the process is monitored by the Timber Sale Administrator during the sale.

Gypsy moth silviculture has been studied and modified for many years. The main objectives have remained to reduce the proportion of preferred host species (particularly oaks) in the stand to lessen the stand's susceptibility to attack and to remove poor vigor trees in order to reduce the stand's vulnerability to mortality during gypsy moth defoliation events. Often these objectives can be accomplished together and still maintain appropriate stocking levels.

## 3. White Oak Decline

The Forest Health Program also monitors defoliations from the Common Oak Moth, and other stressors, that lead to the decline of White Oak in several southern Ohio counties. The hardest hit state forests thus far have been Scioto Trail State Forest and Shawnee State Forests. A high percentage of white oak mortality exists on both forests due to repeated defoliations, drought, and phytophthora root rot.

Management of White Oak mortality areas shall be to salvage trees that may have value in the market.

#### 4. Invasive Plants

Damaging invasive plants will be reported to the Forest Health Program Administrator according to standard protocol procedures. Appropriate information will be shared with other agencies as needed.

Invasive plant infestations will be controlled and reduced as needed during ongoing forest management activities by mechanical and chemical means.

Non-native, invasive species represent a major threat to Ohio's forest resources. Nationwide these plants are estimated to cause \$120 billion annually in damage to the environment, forestry, agriculture, industry, recreation and human health. Invasive plants in public and private forests suppress native vegetation, reduce the growth rates of valuable timber species, and reduce the quality and quantity of wildlife habitat. A concerted effort to address this issue on state forest lands will be implemented and may include use of intermittent crews.

Invasive plants will be controlled by application of mechanical and chemical treatments. All personnel applying herbicides will be trained in the safe use of herbicides and will be licensed commercial pesticide applicators through the state of Ohio, or working under the direct supervision of a license holder. Management prescriptions will be developed and followed for each site requiring treatment and herbicides carefully selected and applied to minimize non-target and other environmental impacts.

In 2008, the Division of Forestry hired an Invasive Species Forester to work with private landowners in southeast and south central Ohio to address the issue of invasive plants. Landowners within the 22-county project area are eligible to receive incentive funds through the Natural Resource Conservation Service (NRCS) to control woody invasive plants in their woodlands. Landowners with properties adjacent to public land such as a State Forest, State Park, or National Forest land receive extra points in the scoring of their incentive application.

The Division also received funding through the American Recovery and Reinvestment Act for the development of a Woodland Job Corp. The goal of the job corp. is to provide conservation-based training to under-employed individuals. On-the-job training is carried out on State Forest lands. Workers receive training in chainsaw safety, pesticide application, identification of native and non-native plants, first aid and CPR. Their newly acquired skills are then applied towards the improvement of State Forests. Two groups of 66 Job Corp members will be hired and trained, and each individual will work a total of 1000 hours. At the end of the program these highly trained individuals may continue with this type of work and become independent contractors who work for private landowners. This will be very

beneficial as there is currently a paucity of contractors available to assist private landowners that are unwilling or physically unable to complete much needed invasive plant control or other timber stand improvement practices on their property.

#### 5. Other Pests of interest

Butternut (*Juglans cinerea*) is declining and dying throughout its native range from damage inflicted by a canker causing fungus of unknown origin. Butternut is considered a valuable timber species, but is not found growing in great numbers anywhere within natural forest stands. This species is also valuable from a biodiversity standpoint, especially in eastern forest ecosystems. Butternut trees are being considered for threatened/endangered status by the U.S. Fish and wildlife Service because of the canker disease, which attacks them. Due to the potential disappearance of viable butternut trees from our woodlands, the Ohio Department of Natural Resources Division of Forestry endeavors to protect healthy *Juglans cinerea* in order to preserve any genetic resistance to the disease found in native trees.

USDA General Technical Report NC-165 will serve as the standard guide for determining the health of individual trees for forest management purposes. In general the 70-20-50 rule will be used to determine which butternut trees should be retained during management or harvesting operations. This rule is explained on page 3 of the Publication, but generally states:

- Retain all trees with more than 70% live crown and less than 20% of
- the combined circumference of the bole and root flares affected by
- cankers.
- Retain all trees with at least 50% live crown and no cankers on the
- bole or root flares.
- Dead or poor vigor butternut trees may be cut and removed.

These guidelines should be adhered to when managing forests or marking timber sales on state lands. Private land owners should be encouraged to follow the guidelines when managing their woodlands.

Butternut trees that are healthy and canker free or have successful calloused over cankers, growing within 100 feet of cankered/diseased butternut trees, at least ten inches DBH, and owned by someone willing to allow collection of scion wood and/or nuts may be reported to the Forest Health Administrator.

#### C. Forest Health Monitoring

Aerial surveys of state forests will take place on an annual basis in June of each year. Planes and their pilots are to be supplied by the Ohio Department of Transportation or the Division of Wildlife. The surveys will be performed by trained observers who are responsible for the digitized mapping of areas of concern. Ground checks of damaged areas will be performed to identify the cause. Survey results will be forwarded to the

Forest Health Program Administrator for consideration. Appropriate information will be shared with other agencies as needed.

Ground surveys for emerging exotic pests of concern such as Gypsy Moth, Hemlock Woolly Adelgid and the Emerald Ash Borer will be performed in an ongoing passive manner. Discoveries will be reported to the Forest Health Program Administrator. Appropriate information will be shared with other agencies as needed.

#### Detection Protocol and Evaluation

When damage to state forests is detected (pest, storms, invasive plants etc.) the observer reports the damage and any information that can be collected about the location, causal agent, extent (acres), and severity of the damage to the Forest Health Program Manager for the DOF. The damage will then be evaluated to determine the existence of patterns similar to other forest damage in the state. The evaluation process will also include whether an opportunity for a research effort exists and if so, identify the logical partner to investigate the problem. The results of the evaluation and any research that is completed will be used to develop strategies to mitigate the problem, protect the forest resource, and sustain healthy forest conditions. Two current examples of evaluations and research include the white oak mortality evaluation and research project in southern Ohio and the evaluation of the white pine decline and mortality event occurring state-wide. As the results of these evaluations are realized, management strategies can be developed and implemented to protect surviving trees and/or encourage the growth of the next productive forest.

During the evaluation/research phase, salvage operations may be necessary to avoid waste of usable material and to mitigate build-up of hazardous wildfire fuel loads in the forest. Salvage operations will be planned and accomplished with strong consideration of future silvicultural prescriptions and management strategies for the forest. Proposed salvage operations will require the approval from the forest manager, the District, and the Land Management Administrator. Salvage operations are “time-sensitive”, therefore may have an accelerated time line on approvals, notice, and advertising. Foresters must designate all salvage sales with “SALVAGE” on the timber sale transmittal.

## **Chapter 11**

### **Prescribed Fire on State Forests**

Prescribed fire is a pre-planned management action to use fire as a tool to achieve defined land and resource management objectives. A prescribed fire can be ignited by fire managers acting within the direction of an approved prescribed fire plan that establishes parameters necessary to achieve stated objectives. A prescribed fire is determined to be a wildfire if conditions become such that the fire exceeds, or is projected to exceed, the pre-defined parameters. Once classified as a wildfire, it remains a wildfire until it is extinguished.

The Fire Management section of the Division of Forestry is responsible for providing technical advice, training and assistance to division personnel utilizing prescribed fire as a management and/or research tool. This same assistance is encouraged to be utilized by other divisions and agencies. Use of prescribed fire serves a dual benefit by providing a valid resource management tool and a setting to sharpen fire behavior, incident management, and suppression skills. The Division of Forestry, Division of Wildlife, Division of Natural Areas and Preserves, the Nature Conservancy, and USDA Forest Service are currently utilizing fire as a management tool. Many other divisions and agencies have expressed interest in using this tool in the future.

#### **A. Procedure**

Prescribed fire conducted by division personnel on division owned land shall be accomplished in accordance with the following procedure:

1. Conduct a Pre-Fire Assessment
2. Prepare a prescribed burn plan (Appendix J)
3. Submit plan to District for approval
4. District submit to Columbus for review and/or approval (by both state forest land and fire management)
5. Apply and receive all necessary permits (EPA, waiver of 6-6 ban)
6. Notify all local officials, fire departments, and adjoining landowners affected by burn
7. Conduct burn
8. Evaluation of burn

Qualified division personnel have and are encouraged, upon request, to assist other agencies with prescribed fires. Approval for participation of qualified personnel resides with the appropriate District Forester.

#### **B. Pre-Fire Assessment**

Prior to completion of a burn plan, the forester/manager shall conduct a Pre-Fire Assessment. The Pre-Fire Assessment shall consider the short- and long-term potential impacts of a prescribed fire. The following matrix shall serve as a guide to understanding the necessary steps in completing a Pre-Fire Assessment. The forester/manager shall

document the results of the assessment in the burn plan and mitigation steps in the “Fire Sensitive Areas” section of the burn plan.

Source or Feature	Process	Contact
Water and Soil Resources	Forester / Manager shall note that all BMP’s shall be used in the construction and rehab of new fire dozer lines. Forester / Manager shall note any significant riparian areas where heavy equipment will be prohibited from line construction (except for suppression efforts on wildfire).	Forester / Unit Manger
Ohio Historical Database	All prescribed shall be reviewed against the OHPO database. If a positive “hit” is found in the database, the forester shall attempt to <i>locate the site and protect from soil disturbance</i> by buffering the site appropriately. If the feature does not exist anymore, no further action is necessary. If there is no positive “hit”, but a previously unknown site is found, the forester shall <i>locate the site and protect from soil disturbance</i> and buffer the site appropriately. Locations of known and previously unknown sites shall be mapped in the Division’s Special Sites GIS layer and noted in the “Burn Plan”.	District Staff and/or Fire Supervisor. District or Fire Supervisor follow-up with OHPO and/or Newark Earthworks Center or Hopewell NPS for recommendation to mitigation.
Biodiversity Database	The Biodiversity database shall be reviewed (preferably during the compartment review) directly at the unit level. If there is a positive “hit” found in the database for the site in question, then it shall be communicated to the district for <i>consultation with the Biodiversity Program</i> . When needed, consultation may require a botanist review or site-visit for presence/absence. For aquatic or vertebrate species, consultation may be in the form of additional recommendations made to the prescribed fire. If there is no positive “hits”, but RTE species are suspected or are found, then it shall be communicated to the district for <i>consultation with the Biodiversity Program or the Endangered Species Program</i> . Results of the Biodiversity database review shall be noted on the “Burn Plan” in the “Fire Sensitive Areas” section and locations shall be mapped on the Division’s Special Sites GIS layer	District Staff and/or Fire Supervisor. District or Fire Supervisor follow-up with Biodiversity Program or Endangered Species Program at the Division of Wildlife for recommendation to mitigation.
Biologist Review	All compartment prescriptions, timber sales, and prescribed fires shall be offered for biologist consultation on an annual basis usually during the	Unit Staff, District staff and/or Fire Supervisor. Annual

State Forest open houses. Local, direct biologist consultation is encouraged for any activity that may have direct impact. The annual consultation or the local consultation may require a site visit from the biologist. The biologist shall offer any recommendations to the forester. The forester shall communicate the recommendations to the appropriate district or central office staff. All site disturbing activities at Shawnee State Forest shall be reviewed for rattlesnake impact and mitigation recommendations. Mitigation is noted on the “Burn Plan”.

consultation with Division of Wildlife Forest-Wildlife Specialist. Direct local contact with the Forest-Wildlife Specialist is encouraged. DOW rattlesnake biologist consultation required at Shawnee.

In addition, prescribed burns will comply with the ODNR-Indiana Bat Management Strategy. Documentation of Indiana Bat mitigation will noted in the “Fire Sensitive Areas” of the “Burn Plan”.

#### **B. EPA Open Burning**

Since 1972, the OEPA has regulated open burning, which is considered to be the burning of any material that causes air pollutants from the combustion process to be sent directly into the outside air. Any burning permission granted by the Division of Forestry does not waive or alter necessary compliance with any open burning regulations of OEPA or local burning ordinances. Permission must be granted by Ohio EPA prior to the ignition of a prescribed burn in Ohio.

#### **C. Prescribed Burning Waivers of 6-6 Ban**

Prior to burning, the burn boss must request a waiver of ORC 1503.18 that bans opening burning between 6 a.m. – 6 p.m. during March, April, May, October and November. These requests will only be granted to individuals currently certified as an Ohio Certified Prescribed Fire Manager. The waiver will require that the Certified Prescribed Fire Manager that received the waiver be on-site during the prescribed burning. All requests for waivers will be made using the Ohio Division of Forestry Certified Prescribed Fire Manager Program Request for Waiver of ORC 1503.18 form.

#### **D. Prescribed Fire Qualifications and Experience**

The Division of Forestry will recognize one position for prescribed fire, Certified Prescribed Fire Manager. Additional personnel involved on prescribed burns will all meet the Division of Forestry requirement of successful completion of S-130 (Basic Fire Suppression) and S-190 (Basic Fire Behavior).

The training standard for this position is:

*Certified Prescribed Fire Manager: S-130 (Basic Fire Suppression), S-190 (Basic Fire Behavior), I-100 (Introduction to Incident Command System), and Ohio Certified Prescribed Fire Manager training course.*

The experience required for these positions:

*Certified Prescribed Fire Manager: At least ten experiences as a firefighter prior to attending the Certified Prescribed Fire Manager training course.*

Grandfathering of Personnel: The Division will be able to “grandfather” competent personnel who have demonstrated good judgment and an understanding of prescribed fire. Only personnel having past prescribed fire or suppression experience should be considered.

#### **E. The Prescribed Burn Plan**

A written prescribed burning plan is the cornerstone for all prescribed fire activities. A written prescribed burning plan will be required for each prescribed burning unit. This plan should be completed prior to the burning season with sufficient time for review. Maps of the burning unit should also accompany this plan. These maps should indicate burn boundaries (including reference points), adjacent landowners, topography, control lines, smoke sensitive areas, and the firing sequence.

The management goals as well as measurable specific objectives for the prescribed burn must be clearly spelled out in the burn plan. These management goals must be coordinated with other planned management activities that are planned for the burn unit and directly support the goals of the State Forest Strategic Plan. The Burn Plan will also contain an impact assessment based on review of appropriate data for RTE species, Historical Sites, and other consultations.

Burn plans that do not clearly identify a land management goal or measurable specific objectives will not be approved. Typical management goals include the reduction of competition from red maple and other thin barked tree species improving the competitive advantage of oak and hickory seedlings and saplings, the use of fire to reduce hazardous fuel loadings, ecosystem restoration, and research.

#### **F. Prescribed Burn Unit Preparation**

Prior to ignition the prescribed unit preparation must be completed. All units must have control lines established around the prescribed fire unit that are sufficient to hold the expected fire behavior during the burn.

Along these control lines, reference points must be marked on the ground as well as on the maps in the burn plan. These reference points should be marked at a minimum of every 1000 feet but can be marked at shorter intervals if desired by the prescribed fire manager. These markings should be made in a manner that they are visible to all fire

personnel involved on the burn. Typical markings are numbers painted on trees within the burn unit with the point captured by GPS and displayed on the prescribed burn maps.

Prescribed burn units must be closed off to the public to ensure that no one is located inside of the burn unit during the ignition. Closing the area can be conducted by the posting of closure signs as well as visual inspection by Division personnel. Roads leading to the burn sign should be closed, if possible, the day or night before the burn is planned to occur.

#### **G. Prescribed Burn Unit Data Capture**

All boundaries of burn units will be captured through the development of a GIS layer of the unit boundary. All reference points will be captured by GPS and a GIS layer of these points will be developed as well. All GIS information will be provided to the Division's Fire Management Section for entry into the Division's prescribed fire database as well as the GENUS system.

Weather observations during the burn will be captured through the use of a belt weather kit, the Division portable RAWS or weather data collected by a fixed RAWS located on the state forest being managed. This data will be archived for future analysis and documentation purposes. Additionally, this data will be used to determine if the burn is within prescription.

#### **F. Fire Line Rehab**

After the burn has been conducted, all fire lines shall be rehabbed according to appropriate BMP's for erosion control.

## **Appendix**

### **Prescribed Fire Background**

Wildland fire is a historical component of healthy forests. Fire plays an important role in most of Ohio's diverse forest ecosystems. The Ohio Department of Natural Resources, Division of Forestry works hard to manage wildland fire so that it safely benefits Ohio's valuable natural resources. The benefits of wildland fire are far reaching. When managed properly, fire can:

- Promote Native Vegetation
- Improve Forest Health
- Revitalize Ecosystems and Create Critical Wildlife Habitat
- Reduce Dangerous Forest Fuels

The native vegetation of Ohio's State Forests is made up of forest types that all have Oak species as a major component. In the presettlement forests of Ohio, mixed-oak dominated much of the unglaciated Allegheny Plateau of southeastern Ohio (Gordon 1969; Dyer 2001). These forests were maintained in an open, park-like condition through burning by Native Americans inhabiting the area. Many researchers have discussed the extent to which the Native American used fire. Information on presettlement fire frequency varies but is generally accepted to be in the 5 to 20 year range (Abrams 2005). The adaptations to fire of upland oak species of eastern North America allowed the oaks to thrive under a recurring fire regime while suppressing fire sensitive, non-oak tree species (Abrams 2003).

Fire was the influencing disturbance agent effecting the structure and composition of Ohio's forests. Fire kept the fire-sensitive species from spreading out of areas that were sheltered from fire such as coves and bottomlands. Fire kept the mid-story open, providing enough light for acorns to germinate, as well as preparing a proper seedbed. Oaks fire adaptations of deep and extensive rooting and vigorous sprouting ability allow for oaks to persist in the understory until a canopy gap occurs allowing for significant height growth to occur.

The historical impacts of fire on the oak dominated forest ecosystems of the eastern United States, including Ohio, were dramatically changed in the early 1900's as fire suppression efforts began. These actions removed the disturbance that kept competitive fire-sensitive species in the coves, bottoms and other areas of the landscape that were sheltered from fire. These species began to spread out from these sheltered areas and became abundantly established in the understory (Signell et al., 2005). Continued fire suppression throughout the decade resulted in the establishment of competitive understory vegetation layer of red maple, blackgum, and other fire intolerants that has caused a failure in the oak regeneration process. Oak seedlings are unable to survive under shaded conditions once their acorn energy reserves have been depleted due to the oak species low to intermediate tolerance of shade (Signell et al., 2005).

The recently published *Ohio's Forests*, a summary of USDA Forest Service Forest Inventory and Analysis data, further supports this research finding and discusses the dramatic increase in non-oak species across the state of Ohio. Ohio has experienced a decrease in the number of small oak trees between 1991 and 2006, the two most recent years of inventory data. The number of oak trees has decreased in the 2-, 4-, 6-, 8-, 10-, and 12-inch diameter classes. Non-oak species increased in all of these classes except the 2- and 4-inch classes. The report also states that the decline of oaks in the small diameter classes will significantly impact future oak resources in the state (Widmann et al., 2009)

The importance of fire in oak dominated forest types of the eastern United States has been addressed in scientific literature for many years prior to the application of prescribed fire occurring in the late 1980's and early 1990's. Several studies (Brown 1960 and Swan 1970) of wildfires in eastern oak forests showed that burned areas experienced greater oak reproduction and higher proportions of oaks than unburned control sites. This evidence along with many tree ring analysis and witness tree studies as well as concern of the lack of successful oak regeneration in eastern Oak forests led to studies on the direct application of fire through prescribed burning (Signell et al., 2005, McEwan et al., 2007).

Many early prescribed fire studies have shown little benefit to oak regeneration (Wendell and Smith, 1987, Arthur et al., 1998, Hutchinson et al., 2005). This failure of prescribed fire alone to benefit oak is due to the sprouting ability of red maple and other competitors. The proportion of oaks to oak competitors of sprouting size was very low. Additionally, the decades of fire suppression has provided the fire sensitive species time to grow to larger sizes than historically encountered and they have become resistant to single low to moderate intensity surface fires and do not suffer great enough mortality to provide the light needed for widespread oak regeneration to occur (Hutchinson et al., 2005).

Due to the findings that single, low to moderate intensity fires did not change the understory and midstory structure of the oak dominated stands sufficiently to provide conditions conducive for successful oak establishment, additional research was conducted. Brose and Van Lear (1999a, 1999b) conducted studies that combined shelterwood harvests with prescribed fire to regenerate oak stands. These studies successfully demonstrated how the use of harvesting and prescribed fire can regenerate oak. This method is used when there is adequate oak advance regeneration already present in the stand.

In situations where oak regeneration is absent, as is the case throughout many of Ohio's state forests, a three-stage shelterwood and burning prescription is recommended by Dey (2008) to regenerate and sustain oak advance regeneration. Fire is used in years proceeding a good acorn crop to reduce the density of the mid- and understory decreasing competition to future oak seedlings. Light harvesting is also recommended in preparation to release the crowns of oak, allowing them to expand and produce greater amounts of acorns, as well as remove seed producers of competing species such as red maple and yellow poplar. This reduction of the

overstory also increases the light that reaches the forest floor. Fire is withheld from the stand until the oak seedlings have grown to the size in which they have good sprouting capacity after burning. Oak seedlings are deemed competitive and will resprout when their root collar diameter is 0.75” or they are greater than 3 feet tall (Brose 2007).

The use of prescribed fire on Ohio State Forests is guided by extensive research conducted throughout the oak-dominated areas of the eastern United States. This research, including much research conducted in Ohio on state forest land, provides compelling arguments for the use and need for fire reintroduction into these forests. The Division of Forestry will continue to use fire as a management tool to promote oak recruitment, provide conditions favorable for oak regeneration, and ensure the sustainability of oak species into the future.

The research on fire, oak and the reintroduction of fire into the oak-dominated forest systems of the eastern United States is extensive. In additions to the citations noted in this document, there is a current listing of several sources of additional research that will aid those interested in fires role in the oak-dominated forest systems attached to this document (Appendix A). These papers are used by Ohio state forest managers to determine where, when, why, and how the oak-dominated state forests are managed. As additional research is published, the findings will be used to further enhance the management of Ohio’s state forests.

### **Citations:**

Abrams, M.D., 2003. Where has all the white oak gone? *Bioscience* 53, 927-939.

Abrams, M.D., 2005. Prescribing fire in eastern oak forests: is time running out? *Northern J. Appl. For.* 22, pp. 190–196.

Arthur, M.A., Paratley, R.D., Blankenship, B.A., 1998. Single and repeated fires affect survival and regeneration of woody and herbaceous species in an oak-pink forest. *J. Tor. Bot. Soc.* 125, 225-236.

Brose, P.H., Gottschalk, K.W., Horsley, S.B., Knopp, P.D., Kochenderfer, J.N., McGuinness, B.J., Miller, G.W., Ristau, T.E., Stoleson, S.H., Stout, S.L. 2008. Prescribing regeneration treatments for mixed-oak forests in the Mid-Atlantic region. Gen. Tech. Rep. NRS-33. U.S. Department of Agriculture, Forest Service, Northern Research Station, Newtown Square, PA.

Brose, P., Van Lear, D., Cooper, R. 1999a. Using shelterwood harvests and prescribed fire to regenerate oak stands on productive uplands sites. *For. Ecol. Manage.* 113, 125-141.

Brose, P.H., Van Lear, D.H., Keyser, P.D., 1999b. A shelterwood-burn technique for regenerating productive upland oak sites in the Piedmont Region. *Southern J. Appl. For.* 23(3), 158-163.

Brown, J.H., 1960. The role of fire in altering the species composition of forests in Rhode Island. *Ecology* 41, 310-316.

Dey, D. C., Fan, Z., 2009. A review of fire and oak regeneration and overstory recruitment. In: Hutchinson, Todd F., ed. Proceedings of the 3rd fire in eastern oak forests conference; 2008 May 20-22; Carbondale, IL. Gen. Tech. Rep. NRS-P-46, 2-20. U.S. Department of Agriculture, Forest Service, Northern Research Station, Newtown Square, PA.

Dyer, J.M., 2001. Using witness trees to assess forest change in southeastern Ohio. *Can. J. For. Res.* 31, 1708-1718.

Gordon, R. B., 1969. The natural vegetation of Ohio in pioneer days. *Bulletin of the Ohio Biological Survey, New Series* 3(2), Ohio State University, Columbus, OH.

Hutchinson, T.F., Sutherland, E.K., Yaussy, D.A., 2005. Effects of repeated prescribed fires on the structure, composition, and regeneration of mixed-oak forests in Ohio. *For. Ecol. Manage.* 218, 210–228.

McEwan, R.W., Long, R.P., Ford, R.D., Hutchinson, T.F., McCarthy, B.C., 2007. Temporal and spatial patterns of fire occurrence during the establishment of mixed-oak forests in eastern North America, *J. Veg. Sci.* 18, 655–664.

Signell, S.A., Abrams M.D., Hovis, J.C., Henry, S.W., 2005. Impact of multiple fires on stand structure and tree regeneration in central Appalachian oak forests. *Forest Ecol. Manage.* 218, 146–158.

Swan, F.R., 1970. Post-fire response of four plant communities in south-central New York State. *Ecology* 51, 1074-1082.

Wendell, G.W., Smith, H. C., 1986. Effects of prescribed fire in a central Appalachian oak-hickory stand. NE-RP-594. U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station, Broomall, PA.

Widmann, R. H., Balsler, D., Barnett, C., Butler, B.J., Griffith, D.M., Lister, T.W., Moser, W. K., Perry, C.H., Riemann, R., Woodall, C.W., 2009. Ohio forests: 2006. *Resour. Bull. NRS-36*. U.S. Department of Agriculture, Forest Service, Northern Research Station, Newtown Square, PA.

Appendix A: Literature Sources of Information on interaction of fire in the oak-dominated forest systems of the eastern United States.

Conference Proceedings:

Dickinson, M. B., ed. 2006. Fire in eastern oak forests: delivering science to land managers. Fire in eastern oak forests: delivering science to land managers, proceedings of a conference; 2005 November 15-17; Columbus, OH. Gen. Tech. Rep. NRS-P-1. U.S. Department of Agriculture, Forest Service, Northern Research Station, Newtown Square, PA.

Hutchinson, T.F., ed. 2009. Proceedings of the 3rd fire in eastern oak forests conference; 2008 May 20-22; Carbondale, IL. Gen. Tech. Rep. NRS-P-46. U.S. Department of Agriculture, Forest Service, Northern Research Station, Newtown Square, PA.

Loftis, D.L., McGee, C.E., eds. 1993. Proceedings. Oak Regeneration: Serious Problems Practical Recommendations. Gen. Tech. Rep. SE-84. U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station, Asheville, NC.

Spetich, M.A., 2004. Upland oak ecology symposium: history, current conditions, and sustainability. Gen. Tech. Rep. SRS-73. U.S. Department of Agriculture, Forest Service, Southern Research Station, Asheville, NC.

Yaussy, D., ed. 2000. Fire, people, and the central hardwood landscape. GTR NE-274. USDA Forest Service, Washington, DC.

Yaussy, D.A., Hix, D.M., Long, R.P., Goebel, P.C., eds. 2004. Proceedings. 14th Central Hardwood Forest Conference. 2004 March 16-19; Wooster, OH. Gen. Tech. Rep. NE-316. U.S. Department of Agriculture. Forest Service. Northeastern Research Station, Newtown Square, PA.

Individual Papers:

Abrams, M.D., 1992. Fire and the development of oak forests in eastern North America; oak distribution reflects a variety of ecological paths and disturbance conditions. *Bioscience* 42, 346–353.

Abrams, M.D., 1996. Distribution, historical development and ecophysiological attributes of oak species in the eastern United States. *Ann. Sci. For.* 53, 487-512.

Abrams, M.D. 1998. The red maple paradox. *BioScience* 48:355–364.

Abrams, M.D. 2000. Fire and the ecological history of oak forests in the eastern United States. Pages 46-55 in Yaussy, D.A. ed. Gen. Tech. Rep. NE-274. Proceedings: workshop on fire,

people, and the central hardwoods landscape. 12-14 March 2000, Richmond, KY. U.S. Department of Agriculture. Forest Service.

Abrams, M.D., 2003. Where has all the white oak gone? *Bioscience* 53, 927-939.

Abrams, M.D., 2005. Prescribing fire in eastern oak forests: is time running out? *Northern J. Appl. For.* 22, pp. 190–196.

Abrams, M.D., Copenheaver, C.A., 1999. Temporal variation in species recruitment and dendroecology of an old-growth white oak forest in the Virginia Piedmont, USA. *For. Ecol. Manage.* 124:275–284.

Abrams, M.D., Downs, J.A., 1990. Successional replacement of old growth white oak by mixed mesophytic hardwoods in southwestern Pennsylvania. *Can. J. For. Res.* 20, 1864–1870.

Abrams, M.D., McCay, D.M., 1996. Vegetation-site relationships of witness trees (1780–1856) in the presettlement forests of eastern West Virginia. *Can. J. For. Res.* 26:217–224.

Abrams, M.D., Nowacki, G.J., 1992. Historical variation in fire, oak recruitment, and post-logging accelerated succession in central Pennsylvania. *J. Tor. Bot. Soc.* 119, 19–28.

Abrams, M.D., Orwig, D.A., Dockry, M.J., 1997. Dendroecology and successional status of two contrasting old-growth oak forests in the Blue Ridge Mountains, USA. *Can. J. For. Res.* 27, 994–1002.

Abrams, M.D., Ruffner, C.M., 1995. Physiographic analysis of witness-tree distribution (1765–1798) and present forest cover through north central Pennsylvania. *Can. J. For. Res.* 25, 659–668.

Albrecht, M.A., McCarthy, B.C. 2006. Effects of prescribed fire and thinning on tree recruitment patterns in central hardwood forests. *For. Ecol. Manage.* 226, 88-103.

Anderson, R.C., Brown, L.E., 1983. Comparative effects of fire on trees in a Midwestern savannah and an adjacent forest. *Bull. Torrey Bot. Club* 110, 87-90.

Arthur, M.A., Paratley, R.D., Blankenship, B.A., 1998. Single and repeated fires affect survival and regeneration of woody and herbaceous species in an oak-pine forest. *J. Tor. Bot. Soc.* 125, 225–236.

Baker, W.L., 1994. Restoration of landscape structure altered by fire suppression. *Conserv. Biol.* 8, 763–769.

Barnes, T.A., Van Lear, D.H., 1998. Prescribed fire effects on advanced regeneration in mixed hardwood stands. *South J. Appl. For.* 22, 138-142.

- Black, B.A., Abrams, M.D., 2001. Analysis of temporal variation and species–site relationships of witness tree data in southeastern Pennsylvania. *Can. J. For. Res.* 31, 419–429.
- Blankenship, B.A., Arthur, M.A., 2006. Stand structure over 9 years in burned and fire-excluded oak stands on the Cumberland Plateau, Kentucky. *For. Ecol. Manage.* 255, 134–145.
- Blake, J.G., Schuette, B., 2000. Restoration of an oak forest in east central Missouri. Early effects of prescribed burning on woody vegetation. *For. Ecol. Manage.* 139, 109–126.
- Brose, P.H., Van Lear, D.H., 1998. Responses of hardwood advance regeneration to seasonal prescribed fires in oak-dominated shelterwood stands. *Can. J. For. Res.* 28, 331–339.
- Brose, P., Van Lear, D., Cooper, R., 1999. Using shelterwood harvests and prescribed fire to regenerate oak stands on productive upland sites. *For. Ecol. Manage.* 113, 125–141.
- Brose, P.H., Van Lear, D.H., Keyser, P.D., 1999b. A shelterwood-burn technique for regenerating productive upland oak sites in the Piedmont Region. *Southern J. Appl. For.* 23(3), 158–163.
- Brose, P., Schuler, T., Van Lear, D., Berst, J., 2001. Bringing fire back—the changing regimes of the Appalachian mixed-oak forests. *J. For.* 99, 30–35.
- Brose, P.H., Gottschalk, K.W., Horsley, S.B., Knopp, P.D., Kochenderfer, J.N., McGuinness, B.J., Miller, G.W., Ristau, T.E., Stoleson, S.H., Stout, S.L. 2008. Prescribing regeneration treatments for mixed-oak forests in the Mid-Atlantic region. Gen. Tech. Rep. NRS-33. U.S. Department of Agriculture, Forest Service, Northern Research Station, Newtown Square, PA.
- Brown, J.H., 1960. The role of fire in altering the species composition of forests in Rhode Island. *Ecology* 41, 310–316.
- Buell, M.F., Buell, H.F., Small, J.A., 1954. Fire in the history of Mettler’s Woods. *J. Tor. Bot. Soc.* 81, 253–255.
- Burns, R.M., Honkala, B.H., 1990. *Silvics of North America*, vol. 2. Hardwoods, USDA Forest Service, Washington, DC.
- Cho, D.S., Boerner, R.E.J., 1991. Canopy disturbance patterns and regeneration of *Quercus* species in two Ohio old-growth forests. *Vegetation* 93:9–18.
- Clark, J.S., Royall, P.D., 1996. Local and regional sediment charcoal evidence for fire regimes in presettlement northeastern North America. *J. Ecol.* 84, 365–382.
- Cogbill, C.V., Burk, J., Motzkin, G., 2002. The forests of presettlement New England, USA: spatial and compositional patterns based on town proprietor surveys. *J. Biogeogr.* 29, 1279–1304.

- Collins, R.J., Carson, W.P., 2004. The effects of environment and life-stage on *Quercus* abundance in the eastern deciduous forest, USA: are sapling densities most responsive to environmental gradients? *For. Ecol. Manage.* 201, 241–258.
- Cottam, G., 1949. The phytosociology of an oak woods in southwestern Wisconsin. *Ecology* 30, 271–287.
- Crow, T.R., 1988. Reproductive mode and mechanism for self replacement of northern red oak (*Quercus rubra*): a review. *For. Sci.* 34, 19–40.
- Delcourt, H.R., Delcourt, P.A., 1997. Pre-Columbian native American use of fire on southern Appalachian landscapes. *Cons. Biol.* 11(4):1010–1014.
- Delcourt, P.A., Delcourt, H.R., 1998. The influence of prehistoric human-set fires on oak-chestnut forests in the southern Appalachians. *Castanea* 63, 337-345.
- Delcourt, P.A., Delcourt, H.R., Webb III, T., 1984. Atlas of mapped distribution of dominance and modern pollen percentages for important tree taxa of eastern North America. American Association of Stratigraphic Palynologists Foundation, Dallas, TX.
- Delcourt, P.A., Delcourt, H.A., Ison, C.R., Sharp, W.E., Gremillion, K.J., 1998. Prehistoric human use of fire, the eastern agricultural complex, and Appalachian oak-chestnut forests: paleoecology of Cliff Palace Pond, Kentucky. *Am. Antiquity* 63, 263-278.
- Dey, D. C., Fan, Z., 2009. A review of fire and oak regeneration and overstory recruitment. In: Hutchinson, Todd F., ed. Proceedings of the 3rd fire in eastern oak forests conference; 2008 May 20-22; Carbondale, IL. Gen. Tech. Rep. NRS-P-46, 2-20. U.S. Department of Agriculture, Forest Service, Northern Research Station, Newtown Square, PA.
- Dey, D.C., Guyette, R.P., 2000. Anthropogenic fire history and red oak forests in south-central Ontario. *For. Chron.* 76, 339–347.
- Dorney, C.H., Dorney, J.R., 1989. An unusual oak savanna in northeastern Wisconsin: the effects of Indian-caused fire. *Am. Midl. Nat.* 122. 103-113.
- Dyer, J.M. 2001. Using witness trees to assess forest change in southeastern Ohio. *Can. J. Bot.* 31:1708–1718.
- Franklin, S.B., Robertson, P.A., Fralish, J.S., 2003. Prescribed burning effects on upland *Quercus* forest structure and function. *For. Ecol. Manag.* 184, 315-315.
- Ford, W.M., Menzel, M.A., McGill, D.W., Laerm, J., McCay, T.S., 1999. Effects of a community restoration fire on small mammals and herpetofauna in the southern Appalachians. *For. Ecol. Manage.* 114, 233–243.

- Goebel, P.C., Hix, D.M., 1996. Development of mixed-oak forests in southeastern Ohio: a comparison of second-growth and old-growth forests. *For. Ecol. Manage.* 84, 1-21.
- Gordon, R. B., 1969. The natural vegetation of Ohio in pioneer days. *Bulletin of the Ohio Biological Survey, New Series* 3(2), Ohio State University, Columbus, OH.
- Guyette, R.P., Dey, D., 1995. A history of fire, disturbance, and growth in a red oak stand in the Bancroft District, Ontario. Ontario Forest Research Institute, Forest research Information paper No. 119. 14.
- Guyette, R.P., Dey, D.C., Stambaugh, M.C., 2003. Fire and human history of a barren-forest mosaic in southern Indiana. *Am. Midl. Nat.* 149, 21-34.
- Guyette, R.P., Muzika, R.M., Dey, D.M., 2002 Dynamics of an anthropogenic fire regime. *Ecosystems* 5, 472-486.
- Harmon, M.E., 1984. Survival of trees after low-intensity surface fires in Great Smoky Mountains National Park. *Ecology* 65, 796–802.
- Harrod, J.C., Harmon, M.E., White, P.S., 2000 Post-fire succession and 20<sup>th</sup> century reduction in fire frequency on xeric southern Appalachian sites. *J. Veg. Sci.* 11, 465-472.
- Hengst, G.E., Dawson, J.O., 1994. Bark properties and fire resistance of selected tree species from the central hardwood region. *Can. J. For. Res.* 24, 688-696.
- Hutchinson, T.F., 2004. Prescribed fire effects on understory vegetation across a topographic moisture gradient in oak forests. Ph.D. Dissertation. Ohio State University, Columbus, OH.
- Hutchinson, T.F., Sutherland, E.K., Yaussy, D.A., 2005. Effects of repeated prescribed fires on the structure, composition and regeneration of mixed-oak forests in Ohio. *For. Ecol. Manage.* 218, 210-228.
- Hutchinson, T.F., Boerner, R.E.J., Sutherland, S., Sutherland, E.K., Ortt, M., Iverson, L.R., 2005. Prescribed fire effects on the herbaceous layer of mixed-oak forests. *Can. J. For. Res.* 35, 814-822.
- Kline, V.M., Cottam, G., 1979. Vegetation response to climate and fire in the driftless area of Wisconsin. *Ecology* 60, 861–868.
- Kruger, E.L., Reich, P.B., 1997. Responses of hardwood regeneration to fire in mesic forest openings. I. Post-fire community dynamics. *Can. J. For. Res.* 27, 1822-1831.
- Kuddes-Fischer, L.M., Arthur, M.A., 2002. Response of understory vegetation and tree regeneration to a single prescribed fire in oak-pine forests. *Nat. Areas J.* 22, 43–52.

- Lafon, C.W., Hoss, J.A., Grissino-Mayer, H.D., 2005. The contemporary fire regime of the central Appalachian Mountains and its relation to climate. *Phys. Geogr.* 26, 126-146.
- Larsen, D.R., Metzger, M.A., Johnson, P.J., 1997. Oak regeneration and overstory density in the Missouri Ozarks. *Can. J. For. Res.* 27, 869-875.
- Leitner, L.A., Jackson, M.T., 1981. Presettlement forests of the unglaciated portion of southern Illinois. *Am. Mid. Nat.* 105, 290-304.
- Loftis, D.L., 1990. A shelterwood method for regenerating red oak in the southern Appalachians. *For. Sci.* 36, 917-929.
- Loftis, D.L., 2004. Upland Oak Regeneration and Management, pp. 163-167 in Upland oak ecology symposium: history, current conditions, and sustainability. Spetich, M.A. ed. Gen. Tech. Rep. SRS-73, U.S. Department of Agriculture, Forest Service, Southern Research Station, Asheville, NC.
- Lorimer, C.G., 1981. Survival and growth of understory trees in oak forests of the Hudson Highlands, New York. *Can. J. For. Res.* 11, 689-695.
- Lorimer, C.G., 1984. Development of the red maple understory in northeastern oak forests. *For. Sci.* 30, 3-22.
- Lorimer, C.G., 1985. The role of fire in the perpetuation of oak forests. P. 8-25 in *Challenges in oak management and utilization*. Johnson, J.E.(ed.). Cooperative Extension Service, University of Wisconsin, Madison, WI.
- Lorimer, C.G., 1993. Causes of the oak regeneration problem. In: *Oak Regeneration: Serious Problems. Practical Recommendations*, Knoxville, TN.
- Lorimer, C.G., 2001. Historical and ecological roles of disturbance in eastern North American forests: 9,000 years of change. *Wild. Soc. Bull.* 29, 425-439.
- Lorimer, C.G., Chapman, J.W., Lambert, W.D., 1994. Tall understory vegetation as a factor in the poor development of oak seedlings beneath mature stands. *J. Ecol.* 82, 227-237.
- McEwan, R.W., Hutchinson, T.F., Ford, R.D., McCarthy, B.C. 2007. An experimental evaluation of fire history reconstruction using dendrochronology in white oak. *Can. J. For. Res.* 37, 806-816.
- McEwan, R.W., Long, R.P., Ford, R.D., Hutchinson, T.F., McCarthy, B.C., 2007. Temporal and spatial patterns of fire occurrence during the establishment of mixed-oak forests in eastern North America, *J. Veg. Sci.* 18, 655-664.

Nowacki, G.J., Abrams, M.D., 1992. Community, edaphic, and historical-analysis of mixed oak forests of the ridge and valley province in central Pennsylvania. *Can. J. For. Res.* 22, 790–800.

Nowacki, G.J., Abrams, M.D., Lorimer, C.G., 1990. Composition, structure, and historical development of northern red oak stands along an edaphic gradient in northcentral Wisconsin. *For. Sci.* 36, 276–292.

Orwig, D.A., Abrams, M.D., 1994. Land-use history (1720–1992), composition, and dynamics of oak pine forests within the piedmont and coastal-plain of northern Virginia. *Can. J. For. Res.* 24, 1216–1225.

Orwig, D.A., Abrams, M.D., 1995. Dendroecological and ecophysiological analysis of gap environments in mixed-oak understories of northern Virginia. *Funct. Ecol.* 9, 799–806.

Parshall, T., Foster, D.R., 2002. Fire on the New England landscape: regional and temporal variation, cultural and environmental controls. *J. Biogeogr.* 29, 1305–1317.

Patterson, W.A., Sassaman, K.E., 1988. Indian fires in the prehistory of New England. In *Holocene human ecology in northeastern North America*. Nicholas, G.P. ed. Plenum Press, New York. 107-135.

Pubanz, D.M., Lorimer, C.G., Guries, R.P., 1989. Effects of understory control on survival and vigor of red oak seedlings beneath a shelterwood. In: *Seventh Central Hardwood Conference*, Carbondale, IL.

Rebertus, A.J., Burns, B.R., 1997. The importance of gap processes in the development and maintenance of oak savannas and dry forests. *J. Ecol.* 85, 635-648.

Rentch, J.S., Favjan, M.A., Hicks, R.R.J., 2003. Oak establishment and canopy accession strategies in five old-growth stands in the central hardwood forest region. *For. Ecol. Manage* 184, 285–297.

Rodgers, C.S., Anderson, R.C., 1979. Presettlement of two prairie peninsula counties. *Bot. Gaz.* 140, 232–240.

Ruffner, C.M., 1995. Early plant succession following wildfire in Pennsylvania's mixed oak forests. Masters Thesis. The Pennsylvania State University, University Park, PA.

Sander, I.L., 1971. Size of Oak Advance Reproduction: Key to Growth Following Harvest Cutting. R NC-79. USDA Forest Service, North Central Forest Experiment Station.

Schnur, G.L., 1937. Yield, Stand, and Volume Tables for Even-Aged Upland Oak Forests. Technical Bulletin 560. U.S. Department of Agriculture.

- Schuler, T.M., McClain, W.R., 2003. Fire history of a Ridge and Valley oak forest. USDA For. Serv. Northeastern Res. Sta. Res. Pap. NE-274. 9 p.
- Shumway, D.L., Abrams, M.D., Ruffner, C.M., 2001. A 400-year history of fire and oak recruitment in an old-growth oak forest in western Maryland, USA. *Can. J. For. Res.* 31, 1437–1443.
- Signell, S.A., Abrams M.D., Hovis, J.C., Henry, S.W., 2005. Impact of multiple fires on stand structure and tree regeneration in central Appalachian oak forests. *Forest Ecol. Manage.* 218, 146–158.
- Smith, K.T., Sutherland, E.K., 1999. Fire-scar formation and compartmentalization in oak. *Can. J. For. Res.* 29, 166–171.
- Stephenson, S.L., Adams, H.S., Lipford, M.L., 1992. The impacts of human activities on the upland forests of western Virginia. *Virginia J Sci.* 43:121–131.
- Sutherland, E.K. 1997. History of fire in a southern Ohio second-growth mixed-oak forest. P. 172–183 *in* Proc. 11th Central Hardwood Forest Conference, Pallardy, S.G., R.A. Cecich, E.H. Garrett, and P.S. Johnson (eds.). USDA For. Serv. Gen. Tech. Rep. NC-188.
- Swan, F.R., 1970. Post-fire response of four plant communities in south-central New York State. *Ecology* 51, 1074–1082.
- Van Lear, D.H., Watt, J.H., 1993 The role of fire in oak regeneration. In: Loftis, D., McGee, C.E. eds *Oak regeneration: Serious problems, practical recommendations*, pp. 66-78. USDA Forest Service, Gen. Tech. Rep. SE-84. Southeastern Research Station, Asheville, NC.
- Webb, T., 1988. Glacial and Holocene vegetation history: eastern North America. In: Huntley, B., Webb, T. (Eds.), *Vegetation History*. Kluwer Academic Publishing, Amsterdam, The Netherlands, pp. 385–414.
- Weigel, D.R., Johnson, P.S., 1998. Stump Sprouting Probabilities for Southern Indiana Oaks. TB-NC-7. USDA Forest Service, North Central Research Station.
- Wendell, G.W., Smith, H.C., 1987. Effects of a Prescribed Fire in a Central Appalachian Oak-Hickory Stand. NE-RP- 594. USDA Forest Service, Northeastern Forest Experiment Station.
- Widmann, R. H., Balsler, D., Barnett, C., Butler, B.J., Griffith, D.M., Lister, T.W., Moser, W. K., Perry, C.H., Riemann, R., Woodall, C.W., 2009. Ohio forests: 2006. *Resour. Bull. NRS-36*. U.S. Department of Agriculture, Forest Service, Northern Research Station, Newtown Square, PA.
- Whitney, G.G., DeCant, J.P., 2003. Physical and historical determinants of the pre- and post-settlement forests of northwestern Pennsylvania. *Can. J. For. Res.* 33, 1683–1697.



## **Chapter 12**

### **Monitoring Program**

Monitoring is a critical component of our management of state forests. The intent of this chapter is to summarize portions of other chapters and procedures into one discussion of the myriad of monitoring activities that are vital to our understanding of the forests and our management thereof. The list of monitoring activities below is the responsibility of the state forest units and state forest programs.

#### **A. Forest Conditions**

*Compartment Review* – The compartment review process is discussed in Chapter 3 of this manual. The compartment review process serves not only as a mechanism for prescribing silvicultural activities but also as a mechanism to monitor changes in species composition, volumes, stocking, regeneration, stand composition and structure, and timber quality. The results of the compartment review are summarized in the compartment review report and loaded into Genus. Foresters, Managers, and Program Administrators shall use the compartment review results in planning. The compartment review is a long-term mechanism to monitor the condition of the forest.

*Logging and Pre-Commercial Activity Inspections* – The logging inspection and the pre-commercial activity inspection procedures are outlined in Chapters 8 and 9 respectively. These inspections serve not only as a mechanism to assess contract compliance and treatment efficacy, but also as a monitoring mechanism to assess BMP effectiveness, overall contract compliance, overall quality of the treatment, impact of the treatment, and also the effectiveness of the prescription. Inspections are done on an as-needed basis at least once per week (usually more frequently) and document BMP's, damage to the residual, soil disturbance and other indicators. Upon completion of the activity, a final inspection is necessary and must be approved by the District and the Land Management Administrator. Logging and pre-commercial inspections can be summarized at the end of the fiscal year to determine trends in BMP compliance and contractor performance. It is the responsibility of the forester to complete accurate inspections in a timely fashion.

*Inventory and Growth and Yield* – The inventory and growth and yield are discussed in Chapter 3 of this manual. Maintaining an inventory database and the use of growth & yield models are central to providing evidence of sustainable forest management. Activities such as post-harvest cruising are the responsibility of the forester. Larger projects such as the LandMark inventory and the growth & yield are the responsibility of the Land Management Administrator. Over time, the FVS model will be adjusted to fit the actual data observed from our inventory and compartment review efforts. Future projects that involve inventory completion of the northern forests are also an important aspect of the inventory database. Finally, the FIA program plays a role in determining trends and conditions that guide our management. The GIS program plays a central role in the analysis of the inventory data.

*Zoning and HCVF* – Zoning and HCVF monitoring are discussed in Chapter 2 of this manual and in the HCVF assessment document. Zones are relatively static and shall remain in place

unless results of compartment reviews, biodiversity database, or HCVF assessment determine otherwise. The Biodiversity Database is a cornerstone of our designation of zones and serves as another type of monitoring.

## **B. Yield of Forest Products**

*Stumpage Timber Sales* – The stumpage program is outlined in Chapter 7 of this manual. For all timber sales the estimated volume is tracked in the revenue database along with the associated financial data. This data is used for the calculation of revenue distribution to local governments. This data is also important for trends in annual harvest levels and comparison to growth calculations. The harvest trends are analyzed in the Integration Committee and the Forest Advisory Council for incorporation into strategic and forest plans.

*Chain of Custody for Product Sales* – There are currently two situations where the Division sells forest products: 1) Product production of boards and/or lumber from the Zaleski State Forest sawmill; or 2) Product production of bucked and sorted roadside sawlogs and paperwood. It is imperative that these products are not mixed with non-certified logs and lumber.

***Lumber Production:*** To ensure that the Zaleski State Forest mill produces only certified lumber, the following procedures and processes will be followed.

- To ensure that only certified logs enter the mill, all raw materials will be severed by the State Forest logging crew. They only work on state forest land and this will ensure that all logs produced are from certified lands.
- Logs received from other state forests will also be severed by state forest crews from certified lands only.
- If materials are received from other State Agencies desiring to saw salvaged material a designated area will be established to store both the logs and finished lumber.
- All lumber produced will be branded with the FSC and SFI logos.
- When logs are produced on a state forest, the Forest Manager will scale each load and record the information listed below on a load ticket that will then be filed in the appropriate databases and given to the Zaleski Mill Manager and District Office for their records.

Information Required on State Forest Load Tickets: Forest, County, Township, Compartment Designation, Management Unit/Cutting Section, date, general description of the location, and an accurate tally of each log based on dib (small end) and length to obtain volume, and the species.

***Merchandized bucked and sorted roadside logs:*** The second method the Division utilizes to produce forest products is the log merchandising program where a competitive bid process is used to hire a certified Master Logging Company to sever and transport tree length logs (stringers) to a central location for a given rate per ton or MBF. Once these stringers are received, state forest crew workers buck, sort, and prepare competitive bid log sales by log grade. Each year the Division plans to merchandize roughly 1 to 1.5

MBF of sorted sawlogs. To ensure that there is no mixing of non-certified logs with certified logs, no logs will be received into any state forest merchandising yard unless they are severed from a certified state forest land base. This will be ensured through the following stump-to-gate process.

- To ensure that only certified logs enter into any state forest merchandising yard, only raw materials produced by the contract logging company will be received.
- To ensure that all logs are from the certified land base, each load must be accompanied with a load ticket. Once a truck is loaded at the logging site and before the truck moves, the operator is required to complete all information on the load ticket with the exception of the load weights.
- To ensure compliance the Forest Manager and/or Sale Administrator is required to stop any loaded truck as it starts to leave the logging site and review the load ticket for completeness. If load tickets are not being completed properly, it will be considered a breach of contract.
- All loads must be weighed at a Division of Forestry approved certified scale.
- When the contractor has the load weighed the scale master must record the truck/trailer weight, gross weight and the total product weight on the load ticket.
- When the load is received at the merchandizing yard the load tickets must be given to the Forest/Yard Manager for verification and payment. Payment to the contractor shall be once per week.
- Loaded trailers will not be permitted to stay overnight on any property other than state forest property and shall not be permitted to stop at any intermediate location prior to arrival at the log yard. Loaded trailers must move directly from the logging site, to the scale, and then to the log yard. If the contractor needs to move a loaded trailer to any other location prior to arriving at the log yard, he shall notify the Sale Administrator prior to moving. The Sale Administrator shall mark all logs on the load with state forest paint and record the piece count. The Yard Manager shall verify its arrival at the log yard. Any breach of this condition shall be considered a breach of contract.
- When logs are sold, each log will be numbered on the ends with permanent marking paint by lot number. This will enable the mill operator to know which logs are certified logs once they leave the state forest log yard.
- Each log buyer will be given a letter stating that the logs purchased are certified logs and the letter will be accompanied by a detail listing of the painted log number, dib (small end), length, species, and volume.

Information Required on State Forest Merchandising Load Tickets: Forest, Compartment Designation, Management Unit/Cutting Section, date, truck or trailer plate number, name of scales used, truck empty weight, truck gross weight, the load weight, and the scale master signature or initials.

### C. Program Monitoring

State Forest programs such as Fire, Land Management, Law Enforcement, Recreation, and Forest Health all have various ways of monitoring and reporting. Forest Health and Fire monitoring is discussed in Chapter 10 of this manual. The data captured during these monitoring activities is cataloged, tracked, and reported on at least once per year. These reports are analyzed by our Division administration and also the Integration Committee. Abbreviated reports are cataloged in the Division's annual report. Program monitoring is a key aspect on determining whether plan objectives are being fulfilled.

### D. Social and Economic Impacts

The evaluation, incorporation, and monitoring of social and economic impacts of forest management is conducted by the Division in several ways. These items are discussed in this chapter. The evaluation of social and economic impacts primarily gathered from several sources. One significant source of social and economic evaluation is the Ohio Statewide Forest Resource Assessment and Strategy (FRAS). Other efforts of social and economic evaluation are included in the suite of particular programs and efforts specific to state forest management. This Chapter will explain the FRAS process and the efforts specific to state forest and the linkage of these evaluations to our understanding and monitoring of social and economic impacts

#### FRAS introduction and methodology

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 Assessment will help ensure that resources are being focused on important landscape areas with the greatest opportunity to address shared management priorities and achieve meaningful outcomes.

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.

The FRAS covers:

- An analysis of present and future forest conditions and trends on all ownerships in the state, including analysis of market and non-market forces.
- Identify threats to forest lands and resources in the state consistent with national priorities (listed below).
- Identify forest related benefits and services.
- Delineate priority forest landscape areas in the state across themes and programs, ownerships, and the urban to rural continuum, to be addressed by the Statewide Forest Resource Strategy.
- Delineate any multi-State areas that are a regional priority.

The USDA Forest Service has identified three national priorities that are to be addressed through an assessment process. These priorities are: 1) Conserve and Manage Working Forest Landscapes for Multiple Values and Uses, 2) Protect Forests from Threats, and 3) Enhance Public Benefits from Trees and Forests.

Forest conditions and trends for the State of Ohio were assessed using a framework of criteria and indicators that was developed to assess the sustainability of forests in the northeastern United States. The criteria and indicators used in this assessment were developed from the Montreal Process, which is a larger system of criteria and indicators that assesses forest sustainability of temperate and boreal forests at the global scale (The Montreal Process 2009). 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 one of the sources that state forest managers incorporate into our understanding of social and economic impacts of state forest management.

#### FRAS Criterion 6 Results

For FRAS Criterion 6: Maintenance and Enhancement of Long-Term Multiple Socioeconomic Benefits to Meet the Needs of Societies, there are six indicators. These indicators are:

1. Wood and wood products production, consumption, and trade
2. Outdoor recreational participation and facilities
3. Investments in forest health, management, research, and wood processing
4. Forest ownership, land use, and specially designated areas
5. Employment and wages in forest-related sectors

The complete set of results and discussion of each indicator can be found in the FRAS document.

#### FRAS strategies

The 2010 Statewide Forest Resource Strategy for Ohio is a strategic planning document that will guide all state forestry activities by the Ohio Department of Natural Resources Division of Forestry, including programs with funding from USDA Forest Service State and Private Forestry grants. It supports the Division's mission to promote and apply management for the sustainable use and protection of Ohio's private and public forest lands. The State Strategy is framed around the key issues identified in the Statewide Forest Resource Assessment, 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

A combination of these threats and opportunities were considered when developing the list of six key forest issues for Ohio.

#### **The State of Ohio's Forest Issues:**

*State Issue 1:* Sustainable forest management on all forest lands

- State Issue 2:* Public benefits from Ohio's forests
- State Issue 3:* Conservation of soil & water resources
- State Issue 4:* Conservation of biological diversity (plants and animals)
- State Issue 5:* Health and vitality of Ohio's forests
- State Issue 6:* Forest fragmentation and land use conversion

*State Issue 2:* Public benefits from Ohio's forests

Many different programs, organizations, and stakeholders play a role in sustaining benefits from forests. One 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. The Ohio Division of Forestry (Ohio DOF) has a strategic communication plan and communications committee that is focused on increasing public awareness and communications with its partners. While public awareness campaigns should reach citizens across the continuum from urban to rural areas, two key groups will be those living in the wildland-urban interface, where a unique mix of urban and rural issues occur, and the large group of family forest owners who are currently not receiving advice from natural resource professionals.

Another critical group to reach with any public awareness program is children, and Project Learning Tree is an active program in Ohio with that focus. Urban areas and communities across the state will continue to receive technical support from the Ohio DOF on a variety of urban forest management topics that will improve the quality of urban life. The Ohio DOF's Urban Forestry program focuses on providing community officials and allied agencies with the organizational and technical ability to effectively manage the trees along streets, within parks, and on public grounds. On the topic of forest recreation, the Statewide Comprehensive Outdoor Recreation Plan (SCORP) serves as a planning and reference document, and complements existing strategic plans or management documents guiding recreation programs at land management agencies and organizations.

Of the wide range of economic benefits that forests provide, the greatest contribution to Ohio's economy comes from the wood products industry. Quantifying the value of ecosystem services from forests is more difficult, but with growing pressures on natural resources from threats like development, invasive species, and climate change, the importance of ecosystem services cannot be overlooked. Sustaining or enhancing forest benefits, including forest products and other ecosystem services, will require a mix of approaches from a variety of partners, including technical support and research from state and federal forestry agencies and state universities, administrative support and training by professional organizations, and in some cases, targeted grants or programs to facilitate growth opportunities. Another key strategy in sustaining Ohio's forest benefits is maintaining a supply of quality forests products and services from Ohio woods indefinitely into the future. State Issue 1 addresses that need directly. Finally, achieving success in meeting the diverse objectives related to this State Issue, as well as the overall Statewide Strategy, will require enhanced partnerships among stakeholders, increased funding from a variety of sources (including competitive grants), and effective leveraging of existing funds.

State Forest Social Impact Monitoring Efforts

*Civic Activities* - Many Division staff are members of or participate in various clubs, organizations, and civic activities. This is an important way, especially for local forest managers, to stay in touch with their community. While it is difficult to categorize and evaluate the feedback our staff receives from their involvement in civic activities, some assumptions can be made that aid our evaluation of social impacts. Significant comments or input received by staff from involvement in civic activities is usually communicated through the chain of command for action or consideration.

*Utilization / Marketing* - The Utilization and Marketing Program's ultimate charge is to conserve Ohio's timber resources. Staff works cooperatively with government agencies and industrial associations to enhance Ohio's domestic and international wood products marketing opportunities. This program is also responsible for the following:

- Biennial timber price surveys and publishing the Ohio Timber Price Report.
- Partner with agencies to facilitate wood products research
- Partner with agencies on research and publications relating to timber products output and BMP's
- Facilitate and act as Division lead program on statewide Biomass efforts.

*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. There are 19 counties, and dozens of townships and school districts that receive a portion of 65% of the net revenue from state forest timber sales. Since 1983, the Division has distributed over \$21 million to some of Ohio's most economically disadvantaged counties, townships, and school districts. The average distribution for the last five years is over \$1.5 million per year. This distribution is codified in Ohio law. Therefore, there is a long-term direct benefit to local governments and communities of our state forest timber sales.

*Recreation Program* - The Division has a Law Enforcement and Recreation Program with associated staff. The recreation program administers all of the recreation facilities, grants, and special uses of our state forests. All state forests are open to public recreation. Most recreation is in the form of trails, hunting, and hiking. However, other facilities such as gun ranges, rock climbing, and campgrounds exist. The recreation program also is developing a backcountry recreation management plan. Participation is tracked through voluntary user registrations at trailheads and campgrounds. While this data contains limitations since it is voluntary, trends of use can be discerned from monthly and year reports. The recreation program also works closely with partners and user groups. These groups serve as a consultation conduit for activities. They also serve as a sounding board for new initiatives.

*Public Participation and Consultation* - The Division has active participation and consultation efforts. The "Pathways to Participation" documents serves to educate the public on their means to have a voice with the Division. The Division has a Governor-appointed Forest Advisory Council who represent many different sectors of the public and forest industry. The Division has annual open house and public meetings as needed to solicit

comment and input on plans and activities. The Division actively works with advocacy groups and has held several tours and meetings to address local concerns. The Division notifies neighbors of activities and promotes open dialogue with citizens. Comments and input received from the public are considered and address in quarterly Management Review committee meetings. These comments and input are considered and actions are evaluated and incorporated into our management. Ohio has an open records and public meetings law. All of our records are available to the public upon request. The Division attempts to satisfy all records request in a timely fashion – usually within 2 weeks – in order to serve the public better.

#### **E. Incorporation of Monitoring Results into Management Planning.**

The results of monitoring efforts are used at various levels to make management decisions. Compartment reviews, activity inspections, and inventory are used at the forest, district, and program levels. Growth & Yield and harvest levels are used at management levels to evaluate sustainability. Monitoring results are analyzed at by the Division administration and the Integration Committee for compliance and effectiveness. The administration and the Integration Committee make policy and procedural recommendations back to the forest and district level based on the results of monitoring.