United States
Department of
Agriculture

Forest Service

Eastern
Region

2006
Land and Resource Management Plan
(2006 Forest Plan)

January 2006

Wayne National Forest

Caring for the Land and Serving People

This document is available in large print.
Contact the Wayne National Forest Supervisor's Office
1-740-753-0101

TTY 1-800-877-8339

Final Revised Land and Resource Management Plan

Wayne National Forest

Athens, Gallia, Hocking, Jackson, Lawrence, Monroe, Morgan, Noble, Perry, Scioto, Vinton and Washington Counties, Ohio

USDA Forest Service

Eastern Region

Milwaukee, Wisconsin

January 2006

Responsible Official

Randy Moore, Regional Forester
626 E. Wisconsin Ave. Suite 800
Milwaukee, WI 53202
414-297-3600

For further information contact

Forest Planner
Wayne National Forest
13700 Highway 33
Nelsonville, OH 45764-9880
740-753-0101

Abstract

This **2006 Final Revised Land and Resource Management Plan (2006 Revised Forest Plan**) was prepared according to Department of Agriculture 1982 forest planning regulations (36 CFR 219) which are based on the Forest and Rangeland Renewable Resources Planning Act (RPA), as amended by the National Forest Management Act of 1976 (NFMA). This plan was also developed in accordance with regulations (40 CFR 1500) for implementing the National Environmental Policy Act of 1969 (NEPA).

A detailed **final environmental impact statement** (FEIS) has been prepared as required by NEPA and 36 CFR 219 and is available from the Wayne National Forest.

Table of Contents

Appendices

* - Revised on 10/16/2008 per Administrative Correction # 3

[1] Name of Appendix H corrected 10/16/2008 by Administrative Correction # 1

Chapter 1

Introduction

Location and History

The Wayne National Forest (WNF), located in 12 counties of southeast Ohio, is the state's only national forest. The Forest's proclamation boundary encompasses approximately 875,000 acres, of which the Forest Service owns and manages over 238,000 acres. The hills of southeast Ohio, the unglaciated region of the state, lie within the Ohio River Basin. Ecologically, this area is considered part of the Southern Unglaciated Allegheny Plateau, which reaches into western Pennsylvania, southeast Ohio, western West Virginia, and a part of eastern Kentucky.

The WNF is situated in the core of the hill country, the most heavily forested part of the state. Just 200 years ago, most Americans viewed this region of the Allegheny Plateau as part of a vast wilderness. It had been inhabited by various Native American cultures for thousands of years prior to the arrival of immigrant settlers in the 18th and 19th centuries. Ongoing research conclusively shows that Native Americans had extensive impacts on their environment, even if those effects are no longer obvious.

Many people still view the Wayne as a remnant of the forest primeval. But the impacts of industry and agriculture over the past 200 years have left indelible marks upon the land. Virtually all the forests that covered Ohio when non-native immigrants arrived were cut for timber and firewood and to make way for farms and settlements. Mining for iron ore, limestone, coal, and clay scarred hillsides and polluted many streams. As factories closed and farms failed in the 1930s, the Forest Service began to acquire and restore what were once dubbed "the lands that nobody wanted."

Purpose of the Forest Plan

This Final Revised Land and Resource Management Plan (Forest Plan) will guide all natural resource management activities for the Wayne National Forest for the next 10 to 15 years. It describes desired resource conditions, resource management practices, levels of resource production and management, and the availability of suitable land for resource management.

The purpose of the Forest Plan is to provide management direction to ensure that ecosystems are capable of providing a sustainable flow of beneficial goods and services to the public. More specifically it establishes:

- How the Forest should look if the Forest Plan is successfully implemented (Goals and Desired Future Conditions)
- Measurable, planned results that contribute to reaching desired conditions (Objectives)
- Required action or resource status designed to meet desired future conditions and objectives (Standards)
- Preferable action used to reach desired future conditions and objectives (Guidelines)
- Management direction to be applied Forest-wide
- Management direction to be applied only to specific management areas
- Monitoring and evaluation requirements
- Designation of land as suitable or not suitable for timber production and other resource management activities.

Land use determinations, standards, and guidelines constitute a statement of the Forest Plan's management direction; however, the actual outputs, services, and rates of implementation will depend on annual budgets.

Revising the 1988 Forest Plan

The previous Forest Plan was issued in 1988. National Forest Management Act regulations require that forest plans be revised every 10 to 15 years (36 CFR 219.10). To meet that requirement, the WNF began Forest Plan revision efforts in 2002. This Revised Forest Plan is a result of that process.

The Revised Forest Plan is based on the alternative identified by the Regional Forester as the selected alternative in the *Final Environmental Impact Statement (January 2006)* (FEIS).

The revision is a result of extensive analyses and considerations described in the accompanying FEIS. The FEIS refers to or explains the planning process and the analytical procedures used to develop the Final Forest Plan. The FEIS also summarizes other alternatives for the Forest Plan considered in the planning process.

Forest Service Planning Rules

This Forest Plan revision was conducted under the 1982 version of the Forest Service planning rules as stated in 36 CFR 219. In January 2005 the Forest Service released a new set of final planning rules. The transition language in the 2005 planning rules allow national forests which had already started a plan revision (as had the Wayne) to complete their revisions under the 1982 rules. Subsequent revisions or amendments to the Forest Plan will be developed under planning rules applicable then.

Relationship of the Plan to Laws and Other Documents

Numerous laws and regulations provide direction for management of the Forest. The following paragraphs highlight a few of these laws, regulations, and direction.

Organic Administration Act

The Organic Administration Act authorized the creation of what is now the National Forest System. The law established forest reserves "to improve and protect the forests within the boundaries, or for the purpose of securing favorable water flows, and to furnish a continuous supply of timber for the use and necessities of citizens of the United States…."

Multiple-Use Sustained Yield Act

In this act, Congress again affirmed the application of sustainability to the broad range of resources over which the Forest Service has responsibility. This act confirms the authority to manage the national forests "for outdoor recreation, range, timber, watershed, and wildlife and fish purposes."

National Forest Management Act

The National Forest Management Act requires that National Forest System land be managed for a variety of uses on a sustained basis to ensure in perpetuity a continued supply of goods and services to the American people. Regulations implementing the act also establish analytical and procedural requirements for developing, revising, and amending forest plans. This Forest Plan revision embodies the provisions of the National Forest Management Act and regulations on forest plan implementation.

National Environmental Policy Act

The National Environmental Policy Act ensures that environmental information is made available to public officials and citizens before decisions are made and before action is taken. This disclosure helps public officials make decisions based on an understanding of environmental consequences and take actions to protect, restore, and enhance the environment. Essential to this process are accurate scientific analyses, expert agency input, and public involvement, all of which have been part of the revision process.

The revised Forest Plan has been analyzed and the potential effects have been disclosed in the accompanying FEIS. The Act also requires environmental analysis and disclosure for some site-specific actions implemented under the Forest Plan.

Endangered Species Act

One purpose of the Endangered Species Act is to conserve the ecosystems upon which endangered or threatened species depend. The Act requires Federal agencies to carry out programs for the conservation of endangered and threatened species in consultation with the U.S. Fish and Wildlife Service.

Forest Service Directives

Management direction in the Forest Service Directive System, including the Forest Service Manual (FSM) and the Forest Service Handbook (FSH), is part of forest plan management direction and is not repeated in this Forest Plan. Management direction also includes applicable laws, regulations, and policies, although they may not be restated in the Plan.

Direction for managing National Forest System land comes from a variety of levels. National and regional direction includes laws, executive orders, regulations, and Forest Service policy. The hierarchy of management direction is illustrated below, beginning with national and regional direction at the highest level and ending with site-specific, project-level direction when the Forest Plan is implemented.

Hierarchy of Management Direction for National Forests

- **National Management Direction**
  Federal Laws
  Code of Federal Regulations
  Executive Orders
  Forest Service Manual
  Forest Service Handbook
  Interim Directives
  Letters of Direction
  - **Regional Management Direction**
    Regional Supplements to Forest Service Manual or Handbook
    Letters of Direction
    - **Forest Plans**
      - **Forest-wide Management Direction**
        Goals
        Objectives
        Standards and Guidelines
        - **Management Area Direction**
          Desired Condition
          Standards and Guidelines
          Allowable Management Practices
          - **Project-level Direction**
            Project Decision Documents (for instance, Decision Memos, Decision Notices and Records of Decision)

Environmental Impact Statement for This Forest Plan

A Final Environmental Impact Statement (FEIS) related to this Revised Forest Plan has been prepared in accordance with the National Environmental Policy Act. The FEIS documents the analysis of seven alternatives for management of the Wayne National Forest. The FEIS also discloses the effects of each of the seven alternatives.

This Final Revised Forest Plan is a detailed plan for implementing the selected alternative from the FEIS.

Wayne National Forest Fire Management Plan

The WNF Fire Management Plan is an implementation plan for the management direction for wildland fire, prescribed fire, and hazardous fuels, found in the Forest Plan.

The Fire Management Plan provides an overview of fire management programs on the Forest and serves as a reference document of operational procedures for WNF personnel. The Fire Management Plan must be consistent with the Forest Plan. The Forest Plan does not repeat the information in the Fire Plan.

Management Direction

Management direction is guidance for managing resources and uses on National Forest System (NFS) land.

Management direction in the Forest Plan has been developed for resources (e.g., wildlife and vegetation) on a Forest-wide basis and for management areas. Chapter 2 contains management direction that applies Forest-wide. The more specific direction for management areas is in Chapter 3.

Some management direction refers to “existing conditions”. Existing conditions are those found at the time of Forest Plan revision.

Goals, Desired Future Conditions, and Objectives

Goals and desired future conditions are broad statements that describe the environmental, social, or economic conditions that the Forest Service will strive to achieve. They are generally timeless and may not be measurable. Goals and desired future conditions describe the ends to be achieved, rather than the means of doing so. They provide a narrative description of the land and other resources expected when objectives and their associated standards and guidelines are fully met.

Goals can be found in Chapter 2 of the Forest Plan. Desired future conditions describe what the Forest should look like in the future and can be found in the management area descriptions of Chapter 3.

Objectives are measurable steps taken within a specific timeframe to move towards a desired future condition. They can be found in Chapter 2. Objectives are generally achieved by implementing site-level projects or activities.

Standards and Guidelines

Standards and guidelines give specific technical direction for managing resources. They provide another link in moving toward the desired conditions. Standards and guidelines that apply Forest-wide are found in Chapter 2 of this Forest Plan. Standards and guidelines that apply to specific management areas are found in Chapter 3.

Only measures specific to the WNF are included in the standards and guidelines. Laws, regulations, and directives that apply to the entire National Forest System are not reiterated in standards or guidelines. In addition, desired conditions and objectives that have a prescriptive component are not repeated in standards or guidelines.

Standards set limits for management activities. These limitations are designed to help the Forest attain desired conditions and fulfill objectives. Standards also ensure compliance with laws, regulations, executive orders, and policy direction. Deviations from standards must be analyzed and documented in Forest Plan amendments.

Guidelines are preferred limits to management actions and are expected to be followed. They help the Forest to reach the desired conditions and fulfill objectives, but in contrast to standards, guidelines permit some operational flexibility to respond to variations needed for specific situations. Deviations from guidelines must be analyzed during project-level analysis and documented in a project decision document. However, these deviations do not require a Forest Plan amendment.

Implementation

Implementing the Forest Plan

The Revised Forest Plan provides a framework and context that will guide the Forest's day-to-day resource management operations (See "Hierarchy of Management Direction for National Forests"). It is a strategic, programmatic document and does not make project-level decisions.

The National Forest Management Act requires that "permits, contracts and other instruments for use and occupancy" of NFS land be "consistent" with the Forest Plan (16 U.S.C. 1604(i)). In the context of a revised Forest Plan, the National Forest Management Act specifically conditions this requirement in three ways:

- These documents must be revised only "when necessary"
- These documents must be revised as "soon as practicable"
- Any revisions are "subject to valid existing rights."

Basic Management Principles for the Wayne National Forest

A set of fundamental principles guides management of the Wayne National Forest. Direction in the Forest Plan adds to and qualifies these basic principles.

Principle 1

The Forest Service will follow laws and regulations as well as policies in Forest Service Manuals and Handbooks that relate to managing National Forest System land. The Forest Plan is designed to supplement, not replace, direction from these sources.

Principle 2

The Forest Service will coordinate management activities with the appropriate local, State, or tribal governments as well as with local, State and other Federal agencies.

Principle 3

The Forest Service will actively consult and collaborate with interested agencies, organizations, groups, and individuals.

Principle 4

The Forest Service will manage the Wayne National Forest for multiple uses. The WNF is open for any legal public activity or management action, unless specially restricted in law, policy, or the Forest Plan. While allowed, such activities and actions may require administrative review and authorization before they are implemented.

Adaptive Management

Adaptive management is a strategy that views decision making as part of an on-going process. As projects and treatments are implemented and vegetation changes across the landscape, scientific findings and the needs of society may indicate some practices are more effective than others. Monitoring the results of actions will provide a flow of information that may indicate the need to change or adapt the types and combination of treatments.

Site-specific Projects

"Implementing the Forest Plan," means developing and implementing site-specific forest management projects to move towards the desired conditions established in the Forest Plan.

Goals and desired future conditions help form the purpose and need for site-specific projects. For a specific area, the difference between the existing condition and Forest Plan goals or desired future conditions may identify a need for change. Proposing a site-specific project is identifying a possible practice that would move the site-specific area from its existing condition towards the desired future condition, or in some cases, the possible practice would prevent the existing condition from moving further away for the desired future condition.

Project-level compliance with the National Forest Management Act is primarily concerned with consistency with the Forest Plan and the act's regulations.

Compliance with the National Environmental Policy Act (NEPA) involves the environmental analysis of a specific proposal, documentation of the analysis, and public disclosure of analysis including the effects of the specific proposal following the direction in Forest Service manuals and handbooks and direction from the Council on Environmental Quality.

Environmental analyses of site-specific projects will use as its foundation, the data and evaluations in the FEIS for the Forest Plan and direction located in the Forest Plan.

The following are examples of project-level decisions that may require additional environmental analyses and disclosure as the Revised Forest Plan is carried out:

- Wildlife habitat improvement and restoration projects
- Timber harvest
- Prescribed burn projects
- Watershed improvement projects

- Trail or road construction.

Operational Activities Exempt from the NEPA Procedures

Resource inventories, budget projections, action plans, and schedules do not require additional environmental analysis and disclosure at the project level.

The following are examples of operational activities that do not constitute site-specific decisions and, therefore, are exempt from NEPA procedures:

- Developing five-year wildlife action plans
- Developing fire-situation reports
- Conducting monitoring activities that are not ground disturbing
- Conducting timber stand examinations
- Scheduling maintenance for developed recreation sites
- Preparing land ownership adjustment plans.

Budgets

Annual Forest budget proposals are based on the activities and actions required to achieve the desired conditions and objectives of the Forest Plan.

The National Forest System appropriation from the U.S. Congress provides funds for stewardship and management of all 192 million acres of NFS land and the natural ecosystems on that land across the country. Portions of those funds are allocated to the Eastern Region of the Forest Service. Funding for the Eastern Region is then divided among specific units, one of which is the WNF. These appropriated funds are key for translating the desired conditions and objectives stated in the Forest Plan into on-the-ground results.

Upon receipt of the budget, the Forest annually prepares work plans to fund specific programs and projects. This budget is a result of program development, annual work planning, and monitoring processes. These processes supplement the Forest Plan and make the annual adjustments and changes needed to reflect current national, regional, and local priorities within the overall management direction contained in the Forest Plan. Therefore, the funding distribution between program components, and the intensity or level of activities in those programs, is a reflection of the Forest Plan as well as priorities established by the U.S. Congress.

The final determining factor in carrying out the intent of the Forest Plan is the level of funding, which dictates the rate of implementation of the Forest Plan.

Forest Plan Amendments

This Revised Forest Plan is adaptable. As the Plan is implemented, unanticipated situations or circumstances may arise. The directives that guide forest planning outline procedures for changing direction by amending forest plans.

Most proposed activities will be consistent with direction in the Forest Plan. When proposed management actions are found to be inconsistent with Forest Plan direction or site-specific analysis shows an error in the Forest Plan, the Plan or the proposal must be adjusted according to the analysis. Adjusting the Forest Plan may require a Forest Plan amendment.

The need to amend management direction may result from a number of circumstances or situations. Some examples include:

- Changes in physical, biological, social, or economic conditions
- Recommendations of an interdisciplinary team based on the results of monitoring and evaluation
- Determination by the Forest Supervisor that existing or proposed projects, permits, contracts, cooperative agreements, or other instruments authorizing occupancy and use are appropriate, but not consistent with elements of the Forest Plan management direction
- Errors in planning found during implementation.

Conflicts may be identified between different sections of management direction. For instance, there could be discrepancies in the selected alternative map and the narrative description of the selected alternative. The Forest Plan does not prioritize management direction; therefore, a discrepancy would need to be resolved by determining the management intent using a variety of information, such as the planning record, FEIS, and the Forest Plan.

The decision level for Forest Plan amendments lies with the Forest Supervisor. The Forest Supervisor will determine whether a Plan amendment is needed, and if so, what level of NEPA analysis is required based on the planning and NEPA regulations then in effect.

Forest Plan Revision in the Future

The Forest Supervisor is required to review conditions of the land at least every five years to determine if the Forest Plan needs revision. If monitoring and evaluation indicate that immediate changes are needed, and these needed changes cannot be handled by amendment, then a Forest Plan revision would be in order. The National Forest Management Act prescribes that Forest Plans be revised at least every 15 years.

Chapter 2

Forest-wide Direction

Introduction

As a strategic management document, a forest plan establishes land allocations as well as goals, desired conditions, objectives, and standards for a national forest. Some direction may apply only to a particular management area of a national forest while other direction pertains forest-wide. This chapter outlines management direction that is to be applied consistently across the entire Wayne National Forest. Direction specific to management areas is covered in Chapter 3.

Management direction is organized around the physical, biological, and social resources of the Forest as well as the major issues identified in coordination with citizens who helped develop this 2006 Forest Plan.

Goals

Forest Plan goals are broad statements that describe desired characteristics to be achieved or maintained forest-wide or in a specific management area. Whenever specific management area direction is silent regarding a specific resource activity, the forest-wide direction applies. Forest Service planning rules defines a goal as "a concise statement that describes a desired condition to be achieved sometime in the future. It is normally expressed in broad, general terms and is timeless in that it has no specific date by which it is to be completed. Goal statements form the principal basis from which objectives are developed". (36 CFR 219.3[1]) Goals also reflect the agency's national strategic plan, helping tie Forest Plan goals to national goals. While projects undertaken by the Forest Service will strive to attain national and Forest Plan goals, goals may not be fully realized during the life of a forest plan.

Objectives

For purposes of forest planning, an objective is defined as "a concise, time-specific statement of measurable planned results that respond to pre-established goals. An objective forms the basis for further planning to define the precise steps to be taken and the resources to be used in achieving identified goals". (36 CFR 219.3[1])

[1] 1982 Planning Regulations. See Chapter 1, page 1-3, Forest Service Planning Rules

Attainment of objectives can reasonably be expected during the 10 to15 year life of a forest plan. Their progress can be measured, monitored, and evaluated. Not all goals require a quantifiable objective however.

Standards and Guidelines

While goals and objectives define what condition is envisioned, standards and guidelines are rules to be followed in getting there. Standards or guidelines often preclude, or impose limitations on, management activities or resource uses, generally for environmental protection or public safety. Compliance with standards is mandatory. A forest plan amendment is required to make an exception to a standard. To make an exception to a guideline, the rationale must be disclosed in the project decision documents. Compliance with standards and guidelines, and progress in accomplishing objectives, will be monitored (see Chapter 4 - Monitoring and Evaluation).

Both standards and guidelines are listed together with a unified numbering system. Forest-wide standards begin with the prefix SFW, while Forest-wide guidelines begin with GFW. The first three-letter prefix is followed by an abbreviation that indicates the management program involved.

Table 2 - 1. Program area names and abbreviations.

Program Area	Abbreviation
General	GEN
Watershed Health	WSH
Aquatic and Riparian Resources	ARR
Wildlife and Plants	WLF
Endangered, Threatened, and Sensitive Species	TES
Vegetation	VEG
Forest Health	FH
Fire Management	FIRE
Air Quality	AIR
Minerals	MIN
Recreation	REC
Scenery Management	SCEN
Heritage	HERT
Land Ownership	LAND
Special Uses	SPEC
Range	RANGE
Facilities and Transportation System	TRANS
Public Health and Safety	SAFE

Numbering restarts with each management program. Standards and guidelines in each numbered section relate generally to the resource heading of the section (e.g., Air Quality, Recreation, etc.); there is no attempt to relate or group the standards and guidelines to specific objectives under each resource section.

Other Requirements

In addition to standards and guidelines found in the Forest Plan, Forest Service activities must adhere to applicable laws, executive orders, and regulations. Government manuals and handbooks are to be followed during site-specific project analysis. New scientific information, on-the-ground conditions, and public attitudes and values should also be considered.

Monitoring

The results of projects and other activities taken to accomplish objectives, including compliance with standards and guidelines, will be evaluated by the Forest's Monitoring Plan.

This page left blank for notes.

Forest-wide Goals, Objectives, Standards, Guidelines

1 – General

Goal 1.1 – Collaborate with Partners

Work with our partners – the public, local communities, non-profit non-governmental organizations, the private sector, and other public agencies – in a collaborative effort to promote education, scientific study of Forest resources, safety, conservation, sustainable ecological management practices, and local community economic development and sustainability.

Goal 1.2 – Safety

Emphasize public and employee safety as a fundamental agency value in all work activities and facilities.

2 – Watershed Health

Goal 2.1 – Maintain/restore water quality and soil productivity

Restore water quality and soil productivity to improve health of watersheds impaired by past land use practices and mining activities. Manage activities on NFS land to maintain or enhance water quality and soil productivity.

Objective 2.1a – Restore the dimension, pattern, and profile of streams where channel and floodplain morphology has been altered.

Objective 2.1b – Enhance water quality in the Monday Creek, Sunday Creek, Raccoon Creek, Symmes Creek, and Pine Creek watersheds by reducing acid mine discharges and decreasing sediment loads.

Objective 2.1c – Restore positive drainage in watersheds where surface runoff is restricted topographically and drains into underground mine complexes.

Standards/Guidelines for Watershed Health

General

GFW-WSH-1: Water should not be diverted from streams, lakes, or springs when in-stream flow needs or water-level assessments indicate that diversion would adversely affect stream processes, aquatic and riparian habitats and communities, or recreation and aesthetic values.

GFW-WSH-2: Sewage lagoons, disposal plants, or landfills should not be constructed in floodplains.

GFW-WSH-3: When conducting watershed restoration or improvement projects, give priority to:

- Watersheds with higher percentages of NFS land
- Watersheds with existing aquatic life or suitable habitat conditions
- Watersheds with potential for partnership opportunities
- Watersheds that present a health and safety concern.

GFW-WSH-4: Favor watershed restoration/improvement project design that requires minimal or no maintenance.

GFW-WSH-5: For activities affecting streams, consider natural channel design principles to restore channel morphology.

Managing Disturbed Areas

SFW-WSH-6: Ensure that seed mixes or cultivated plants used to restore disturbed areas on NFS land contain no species on the Forest's Non-native Invasive Species (NNIS) list or NNIS species identified by the State of Ohio or its neighboring states to the east and south (i.e., Kentucky, Pennsylvania, and West Virginia).

GFW-WSH-7: When restoring disturbed areas, prevent non-native invasive plant invasion or spread by utilizing the following measures:

- Use weed-free mulch when feasible
- Allow natural re-vegetation for small-sized disturbances (e.g., utility rights-of-way, firelines), where the threat of erosion or sedimentation and NNIS spread is limited.
- When seeding is necessary to accomplish re-vegetation, prioritize the composition of the seed mix as follows:
    - Native species with local genotypes (locally adapted)
    - Native species with non-local genotypes (not locally adapted)
    - Desirable non-native species that are non-aggressive and non-persistent (annuals).
    - Encourage the use of locally grown/adapted native plant materials.

GFW-WSH-8: When stabilizing disturbed areas, give priority to stabilizing areas that are discharging soil into watercourses, especially in municipal and recreational impoundment watersheds. Techniques may include:

- Placing straw bales in ditch lines and small drainages
- Leaving berms in road embankments during construction
- Constructing diversion ditches
- Hand placing slash and unmerchantable logs across slopes and trails
- Installing check dams and ditch lines
- Excavating sediment detention basins.

Old Water Wells and Cisterns

GFW-WSH-9: Old water wells and cisterns should be filled or plugged, while protecting historical values and wildlife habitat.

Soil Resources

GFW-WSH-10: Modify resource management practices according to soil characteristics and slope to protect soil productivity and minimize erosion and sedimentation. Refer to soil map unit descriptions and appropriate interpretive tables in the Wayne National Forest Soils Inventory (based on the USDA County Soil Surveys).

GFW-WSH-11: Plan and implement erosion control measures for management activities that create bare mineral soil conditions. Stabilize disturbed areas based on direction in SFW-WSH-6, and GFW-WSH 7 and GFW-WSH-8.

Reclamation of Abandoned Mine Land

GFW-WSH-12: Seed wildlife openings with a mixture of native or desired non-native grasses, legumes, and shrubs for wildlife habitat and erosion control.

SFW-WSH-13: If waterholes and other impoundments with suitable water quality for aquatic organisms are destroyed by mining operations, they are to be replaced with equal or larger-sized impoundments.

GFW-WSH-14: Coordinate construction of reclamation impoundments with the Ohio Division of Mineral Resource Management. Require Forest Service approval of reclamation-type dams larger than 6 feet in height or

10 acre-feet of impoundment. Whenever possible, design impoundments with irregular shorelines, peninsulas, and/or islands. Encourage the placement of some large boulders in lakes and ponds and on their shorelines to provide fish and wildlife cover and enhance aesthetic qualities.

GFW-WSH-15: Use a variety of native or desired non-native tree species, including major mast-producing species, when trees are planted for reclamation.

GFW-WSH-16: Leave mining features, such as high-wall cliffs or banks or open mine portals if they are providing, or have the potential to provide, special wildlife habitat features (e.g., bat roosting or bird nesting sites), where such features are consistent with public safety and overall reclamation objectives.

3 – Aquatic and Riparian Resources

Goal 3.1 – Sustain favorable riparian and aquatic habitat conditions

Promote healthy riparian and aquatic ecosystems that sustain ecological processes and functions and a variety of plant and animal communities, including viable populations of native and desired non-native species.

Objective 3.1a – Restore wetland habitat where wetland hydrology, soils, or vegetation have been modified by past land uses.

Objective 3.1b – Improve habitat along streams for aquatic and riparian-dependent species.

Objective 3.1c – Reduce sedimentation and improve passage for aquatic and semi-aquatic organisms at Forest development roads and Forest Service recreation trail crossings.

Objective 3.1d – Improve aquatic habitat in ponds and lakes.

Standards/Guidelines for Riparian Corridors

General

GFW-ARR-1: Prior to implementing any project activity, establish the site-specific boundaries of the riparian corridor. The riparian corridor includes the riparian area and upland areas within the flood-prone area, or 100 feet from the edge of the aquatic ecosystem or wetland, whichever is greater.

GFW-ARR-2: Manage the riparian corridor to maintain habitat diversity for aquatic and riparian-dependent species; management strategies may include:

- Maintaining water temperatures within prescribed ranges for native aquatic and semi-aquatic species
- Promoting recruitment of large woody debris
- Producing nutrients and organic matter for the aquatic ecosystem
- Promoting natural streambanks
- Maintaining or restoring habitat diversity for aquatic and riparian-dependent species

GFW-ARR-3: Resolve land use conflicts in favor of riparian-dependent resources.

GFW-ARR-4: Where possible, do not construct new facilities (such as roads, trails, campsites, and buildings) within riparian areas. Where such

facilities must be located in riparian areas, construct and maintain them to minimize adverse impacts to ecological function.

Filterstrips

GFW-ARR-5: Where earth-disturbing activities expose mineral soil, establish filterstrips along water bodies.

- Filterstrip width along perennial water bodies should be a minimum of 100 feet, measured horizontally from the edge of the aquatic ecosystem.
- Filterstrip width along intermittent streams should be a minimum of 75 feet, measured horizontally from the edge of the aquatic ecosystem.
- Filterstrip width along ephemeral water bodies should be a minimum of 50 feet, measured horizontally from the edge of the aquatic ecosystem.

GFW-ARR-6: Earth-disturbing activities that expose mineral soil may occur within the filterstrip only if effective sediment control measures that minimize and/or mitigate any detrimental effects are employed.

Road Stream Crossings

SFW-ARR-7: Design mitigation measures (e.g., sizing culverts to match the drainage area) into crossings of perennial, intermittent, or ephemeral streams to meet site-specific needs.

GFW-ARR-8: Design stream crossings to be at right angles.

GFW-ARR-9: Design and construct new permanent stream crossings (ephemeral, intermittent, and perennial streams) to maintain upstream and downstream passage of aquatic and semi-aquatic organisms.

SFW-ARR-10: Do not allow roads, trails, or log skidding within streambeds except at designated crossings.

SFW-ARR-11: If stream crossings are removed, restore banks and channel to a natural dimension and shape.

GFW-ARR-12: Improve existing crossings to ensure passage of aquatic organisms when maintenance and reconstruction activities are scheduled.

Oil/Gas Pipeline Stream Crossings

SFW-ARR-13: Pipelines of nine-inch diameter or larger that cross streams on NFS land must be reviewed by the Ohio Public Utilities Commission and the Federal Energy Regulatory Commission.

GWF-ARR-14: Avoid the use of heavy equipment in flowing streams. Alternatives may include concentric pipe (double pipe) and plowing.

GWF-ARR-15: Encourage the location of pipelines at existing bridges.

GWF-ARR-16: When a pipeline crosses a stream on NFS land, the following should apply:

- Encourage the use of boring to locate pipeline crossings beneath Forest streams where topography, soil, and stream bottom conditions permit.
- Stabilize disturbed soil and protect streamside banks as work progresses.

SWF-ARR-17: Require appropriate technology on all pipelines that cross streams so that supply and flow can be shut off upon detection of a leak.

Removal of Materials from Streams

GFW-ARR-18: Prohibit removal of sand, gravel, or other materials from streams except for:

- Excavation of deep holes in stream channels to improve fisheries or other wildlife habitat
- Incidental excavation operations for culverts, bridges, fords, dams, or other new or existing facilities
- Restoration to a more natural or stable stream channel that has been filled by sediment from strip mines or other land disturbing activities
- Removal of materials from sediment basins that have been installed to trap sediment flowing from upstream activity
- Administrative use.

GFW-ARR-19: Allow modification or removal of beaver dams only to:

- Open passage for sensitive aquatic organisms
- Meet objectives for fish habitat management
- Protect ecologically sensitive areas
- Reduce effects of flooding on improvements
- Reduce impacts to private property.

SFW-ARR-20: When removing beaver dams or other channel obstructions from streams, control hydrologic discharge to minimize the potential for downstream flooding, sedimentation, and associated impacts to channel morphology and habitat.

GFW-ARR-21: Do not leave logging debris in stream channels unless planned to benefit aquatic and/or riparian-dependent resources.

GFW-ARR-22: Remove large woody debris from streams only if it poses a risk to water quality, degrades habitat for aquatic or riparian-dependent species, impedes recreational watercraft, or when it poses a threat to private property or infrastructure. Where it impedes passage for recreational watercraft, restrict removal to the minimum amount necessary for safe passage.

Wetlands

GFW-ARR-23: Avoid adverse impacts to ephemeral wetlands during ground-disturbing activities.

GFW-ARR-24: Maintain existing wetland levees and outlet works to minimize erosion and ensure continued functioning of wetland facilities.

GFW-ARR-25: Enhancement of wetland habitat may occur to enhance local biodiversity. Wetland construction should not occur on existing wetlands unless the added values of construction outweigh the biodiversity values of the existing wetland.

GFW-ARR-26: Incorporate water level controls when enhancing wetland habitat. Incorporate islands and peninsulas into wetland design.

GFW-ARR-27: Incorporate existing wildlife cover into the design of wetland enhancement project. Examples include vegetation on shorelines and within wetland pool areas; large living and dead trees and brushland near shorelines, on islands, and within pool areas; and emergent brush piles, logs, or limbs.

GFW-ARR-28: Water levels in wetlands may be manipulated periodically to manage for a variety of native aquatic plants and to eliminate fish populations.

Springs

GFW-ARR-29: Prohibit vegetation management or ground disturbing activities within 100 feet of perennial springs, unless the activity is designed to protect water quality of the spring or integrity of the surrounding area.

Ponds and Lakes

GFW-ARR-30: Use natural materials (e.g., brush piles, rock reefs, shoreline tree drops) in projects to enhance habitat complexity of ponds and lakes.

GFW-ARR-31: Maintain integrity of pond and lake dams by removing woody vegetation using methods appropriate to the site such as cutting, mowing, prescribed fire, and spot treatment with herbicides.

GFW-ARR-32: Consider the following when constructing new impoundments:

- Size of small lakes generally range from 2 to 25 surface acres; 5 acres or larger is preferred.
- As a general rule, the entire watershed of a prospective fishing impoundment and the lands needed for access and to protect aesthetic quality of lake surroundings, including mineral rights, should be in National Forest ownership before the impoundment is constructed. Exceptions may be made where activities on other lands are not expected to have unacceptable adverse effects on water and recreation qualities.
- Small lakes should be developed and managed to provide quality fishing experiences and a highly productive aquatic habitat.
- Creation of fishing impoundments in conjunction with borrow pits and fills made in road construction, strip mining sites, and other activities.
- Ability to draw a lake down to a small pool should be incorporated in the design.
- Islands and peninsulas should be created whenever possible.
- Retention and placement of emergent and submerged covers, such as standing trees and brush piles, should be jointly planned prior to lake construction.
- When streams capable of supporting fish are impounded, conduct a pre-impoundment fisheries survey. If necessary, undesirable fish may be eradicated.

This page left blank for notes

4 – Wildlife and Plants

Goal 4.1 – Sustain Favorable Terrestrial Habitat Conditions

Promote healthy terrestrial ecosystems that sustain a variety of plant and animal communities, including viable populations of native and desired non-native species.

Objective 4.1a – Provide adequate habitat to support viable populations of Management Indicator Species. (See Table 2 - 2)

Objective 4.1b – Promote restoration and maintenance of the oak-hickory ecosystem by improving conditions for oak regeneration in the HF and HFO Management Areas.

Objective 4.1c – Encourage the establishment of all-aged hardwood forest and hardwood-pine forest communities with structurally diverse canopy layers to maintain forest health and increase structural diversity.

Objective 4.1d – Create early successional hardwood or hardwood-pine habitat, interspersed within mid- and late-successional forest habitat to:

- Provide breeding habit for shrubland-dependent species
- Increase production of wildlife foods such as soft and hard mast and insects.

Objective 4.1e – Regenerate existing native pine and pine-hardwood mixed communities.

Objective 4.1f – Annually, improve or maintain 5 to 10 percent of the existing grassland and grassland/shrubland habitat acreage in the Grassland Management Area.

Objective 4.1g – Establish and maintain permanent forest openings (herbaceous vegetative cover or mix of herbaceous vegetation and shrubs) on a variety of sites, including ridge tops, mid-slope benches and valley bottoms, preferably where access by machinery is possible.

Objective 4.1h – Construct waterholes and ephemeral wetlands to supplement limited water sources, enhance local biodiversity, and enhance aquatic insect production.

Objective 4.1i – Install artificial nesting or roosting structures to supplement natural cavities or snags when they are short in supply or to enhance wildlife-viewing.

Table 2 - 2. Management Indicator Species and Habitats

Species/Habitat	General Habitat Description	Related Objective(s) or Goal	Related Management Area Prescription*
Mixed-oak Forest	Forest stands dominated by oak and hickory species	4.1b, 4.1d	HF, HFO, FSM, FSMO
Early Successional Hardwood Forest	Hardwood stands under 20 years of age	4.1d	FSM, FSMO
Pileated Woodpecker	Mature to overmature hardwood forest with snags and coarse woody debris on the forest floor	4.1b, 4.1c	DCF, DCFO, FOF, FOFM, HF, HFO
Cerulean Warbler	Open to semi-open mature mixed oak forest, with a heterogeneous canopy layer	4.1b, 4.1c	DCF, DCFO, HF, HFO, FOF, FOFM
Worm-eating Warbler	Hardwood and pine-hardwood forest on hillsides, with a dense understory and coarse woody debris on the forest floor	4.1c	DCF, DCFO, FOF, FOFM
Louisiana Waterthrush	Riparian corridors along headwater streams	4.1c, 3.1, 3.1b, 3.1c	DCF, DCFO, FOF, FOFM, RC
Pine Warbler and Native Pine Forest	Pine and pine-hardwood forest	4.1c, 4.1e	FSM, FSMO, DCF, DCFO, HF, HFO
Ruffed Grouse	Mosaic of early- mid- and late-successional hardwood forest	4.1b, 4.1d	FSM, FSMO, HF, HFO, GFM
Yellow-breasted Chat	Early successional forest habitat	4.1d	FSM, FSMO, GFM
Henslow's Sparrow	Extensive grasslands on reclaimed mine lands	4.1f	GFM

* Management areas and their acronyms are listed in Chapter 3.

Standards/Guidelines for Terrestrial Wildlife and Plants

General

GFW-WLF-1: Develop and maintain mast-producing stands on a variety of sites, including lowlands, mid-slopes, and ridge-tops.

GFW-WLF-2: When using prescribed fire as a management tool, encourage mosaic pattern burning.

Permanent Forest Openings

GFW-WLF-3: When considering the need for permanent openings, take into account similar habitat provided by ephemeral openings (e.g.,

resulting from even-aged regeneration harvests, group selections), large grasslands in the Grassland Forest Mosaic Management Area, prairie remnants and barrens, and utility rights-of-way.

GFW-WLF-4: Coordinate with utility companies, when possible, to manage utility corridors by selective treatment of vegetation or by appropriate mowing regimes to provide quality permanent opening habitat.

GFW-WLF-5: Give high priority to developing permanent forest openings on old fields and homesites. Emphasize maintaining clusters of openings near the edges of large tracts of continuous forest cover rather than scattered throughout the large tract.

GFW-WLF-6: When oil and gas well developments meet, or can be made to meet, the objectives of permanent forest openings, designate them accordingly so they may also contribute to herbaceous habitat objectives.

GFW-WLF-7: Permanent forest openings should be larger than one acre in size, unless necessary to meet the needs of a site-specific species.

GFW-WLF-8: Conduct permanent forest opening maintenance (mowing) during early fall (October and November) to minimize disturbance to flowering plants and nesting birds, unless early spring mowing is necessary to maintain suitable habitat for summer-flowering species.

SFW-WLF-9: Use rotational maintenance regimes when mowing permanent forest openings to ensure adequate habitat is available for herbaceous/shrub mix-dependent species.

GFW-WLF-10: When using prescribed fire to maintain or improve habitat in permanent openings for site-specific plant or animal species, burn only part of the area annually to avoid extirpation of localized populations.

GFW-WLF-11: In conjunction with opening development and maintenance, retain existing snags and create additional ones, unless they pose a safety hazard.

GFW-WLF-12: Manage approximately half of each opening as a shrubby edge or thicket where possible. Retain a variety of native shrubs and small growing trees. Shrub thickets should be scattered in irregular clumps or on the periphery of openings.

GFW-WLF-13: Develop and maintain approximately half of each forest opening in openland cover of native forbs and grasses. Avoid monotypic stands of legumes, fescue or other dense, domesticated grasses in permanent openings. Plant annual, non-invasive species in some openings to benefit certain species.

Large Woody Debris

GFW-WLF-14: Place cover logs or brush piles in forest stands in conjunction with timber harvest and other activities involving tree felling. Edges of woodlands, brushland, and openland cover, especially near water and wetlands, are preferred sites for brush piles. Leave unused logs on the ground for various wildlife species. To reduce fire hazard and protect visual quality, do not leave large woody debris immediately adjacent to roads, trails open to motorized travel, railroad rights-of-way, or near buildings.

Upland Waterholes

GFW-WLF-15: Prohibit stocking of fish in waterholes.

GFW-WLF-16: Design, construction, and maintenance of waterholes and ephemeral wetlands should consider the following:

- Size may vary, but should generally be 0.1 to 0.25 acres in size.
- Locate where the watershed ratio does not exceed 5:1 (generally on ridges or upper slopes). The slope of the fill should be 5:1 on both the water and the back sides. After settling, freeboard should be approximately 6 inches above a seeded or sodded spillway.
- Portions of waterholes should have a minimum depth of at least 3 feet to maintain some permanent water during dry periods of the year; 12 inch depth for ephemeral wetlands.

5 - Endangered, Threatened and Sensitive Species

Goal 5.1 – Recover Federally Listed Threatened and Endangered species

Goal 5.1.1 – Retain or develop Indiana bat roosting and foraging habitat; protect all known Indiana bat hibernacula.

Objective 5.1.1a – If additional Indiana bat hibernacula are discovered on NFS land, install bat-friendly gates to prevent unauthorized entry.

Goal 5.1.2 and Objective 5.1.2a – (Moved under Goal 5.2 due to de-listing of Bald Eagle; see Note 1 on page 2-24). [1]

Goal 5.1.3 – Cooperate in efforts to reintroduce the American burying beetle.

Goal 5.1.4 – Actively manage known populations of running buffalo clover to maintain appropriate habitat conditions.

Objective 5.1.4a – Maintain partial to filtered sunlight over and adjacent to occupied running buffalo clover habitat.

Objective 5.1.4b – Conduct annual monitoring of known running buffalo clover populations and adjacent areas to identify potential risks or management needs.

Goal 5.2 – Conserve Regional Forester Sensitive Species

Promote conservation activities that protect, restore, or enhance habitat for Regional Forester sensitive species.

Goal 5.2.1 – Protect bald eagle communal night roosts, daytime concentration sites, and occupied breeding territories. [1]

Objective 5.2.1a – Conduct a minimum of three annual winter searches to locate any previously unknown communal night roosts or bald eagle concentrations. [1]

Standards / Guidelines for Threatened, Endangered, and Sensitive Species (See also Appendix D.)

Federally Listed Species

Indiana Bat Hibernacula

SFW-TES-1: Deter human access to areas surrounding known hibernacula by closing or relocating trails that lead to, or pass within, easy viewing distance of hibernacula.

SFW-TES-2: Establish a one-quarter mile buffer around all known hibernacula. Within this one-quarter mile buffer:

- Prohibit new trail and road construction.
- Do not conduct prescribed burning during the fall swarming period (generally mid-August to mid-October) or during the hibernation period (September 15 through April 15).

[1] Goal and Objective for Bald eagle changed 10/16/2008 by Administrative Correction # 3.

- Do not permit surface occupancy for exploration or development of Federally owned minerals.
- Implement vegetation management only to maintain or improve Indiana bat roosting, swarming, or foraging habitat.

GFW-TES-3: Establish a one quarter-mile forested buffer around all mine openings that are known Indiana bat fall swarming sites, but where actual Indiana bat hibernation has not been established. Reduce or eliminate human disturbances within the buffer. Implement vegetation management only to maintain or improve Indiana bat roosting, swarming, or foraging habitat.

SFW-TES-4: Develop prescribed burning plans that specify weather conditions that would prevent smoke dispersal into known hibernacula.

SFW-TES-5: Before backfilling any mine openings, such as portal entrances or subsidence depressions with developed openings, conduct surveys for potential bat presence during the fall swarming period (generally mid-August to mid-October).

GFW-TES-6: Conduct pre-gating and post-gating mist net surveys at mines where bat-friendly gates are installed.

Indiana Bat Roosting and Foraging Habitat

SFW-TES-7: When even-aged regeneration methods are used, retain forested flight corridors within and between early successional habitat patches. These flight corridors may include forested corridors along ephemeral, intermittent, and perennial streams (see GFW-ARR-2); and where present, clumps of snags and trees of varying size classes in the early successional habitat. When present, leave larger-sized trees on the edges of early successional patches for future maternity roosts.

SFW-TES-8: Within hardwood cutting units with uneven-aged vegetation management prescriptions, maintain an average of at least 60 percent canopy cover.

GFW-TES-9: Retain all shagbark and shellbark hickory trees $\geq$ 6 inches dbh, unless removal is necessary to protect human safety or to avoid adverse impacts to steep slopes, erodible soils, floodplains or wetlands.

SFW-TES-10: During the non-hibernation season (April 15th-September 15th), do not cut, unless they are a safety hazard:

- Trees of any species 6 inches dbh or more that are hollow, have major splits, or have broken tops that provide maternity habitat.
- Snags 6 inches dbh or more that have Indiana bat roost tree characteristics. Consider any tree with less than 10 percent live canopy to be a snag.

When removal of hazard trees is necessary in a recreation area during the non-hibernation season (.e.g., developed recreation sites, access roads, trails), conduct emergence surveys at the identified hazard trees that possess the characteristics identified above, and at any hazard trees that possess large areas of loose bark providing maternity habitat.

SFW-TES-11: Schedule any summer prescribed burning after August 15 to reduce potential effects on Indiana bat reproduction.

SFW-TES-12: With all hardwood timber harvests, retain a minimum of 12 live trees per acre (averaged over the cutting unit) of any species that are six inches or more dbh with large areas of loose bark, unless they pose a safety hazard.

In addition to these, retain live preferred roost trees, when present, to provide a supply of future roost trees (i.e., large, overmature trees). See Appendix D for list of tree species preferred as roost trees by Indiana bats. See Table 2-3 for preferred tree sizes. Consult with U. S. Fish and Wildlife Service regarding exceptions that may be needed to minimize adverse effects to other resources or human health and safety.

Table 2 - 3. Indiana Bat Preferred Roost Tree Size Class.

Indiana Bat Preferred Roost Tree Size Class	Number of live trees to retain (number per acre averaged across the cutting unit)
>20 in (dbh)	3*
>11 in (dbh) and < 20 in (dbh)	6

*If there are few or no live Indiana bat roost trees > 20 inches dbh in the stand, retain three live trees >16 inches dbh and < 20 inches dbh per acre (averaged across the cutting unit). If there are no live trees > 16 inches dbh, retain nine additional live trees > 11 inches dbh and < 16 inches dbh per acre (averaged across the cutting unit).

SFW-TES-13: Prohibit the cutting of standing dead trees for firewood.

GFW-TES-14: Provide water sources that promote aquatic insect production and provide drinking sources for Indiana bats along suitable flight paths, especially in upland areas, and off/away from recreation sites, and designated trails and roads.

Bald Eagle Management

SFW-TES-15 - 20: Moved to SFW- TES-37 – 42 due to delisting of Bald Eagle; see Note 1 on page 2-24. [2]

American Burying Beetle (ABB)

GFW-TES-21: Discourage use of bug zappers by campers in dispersed and developed recreation sites within 10 air miles of known occupied ABB habitat.

[2] Changed 10/16/2008 by Administrative Correction # 3

GFW-TES-22: Limit ground compaction to the minimum area possible during major earth disturbing activities (including, but not limited to new road and trail construction, mineral resource exploration and development, or new facilities) that occur in suitable ABB habitat within 10 air miles of known occupied ABB habitat.

GFW-TES-23: During the ABB activity period, use bait-away methods prior to and during the implementation of major earth disturbing activities that occur in known occupied ABB habitat.

GFW-TES-24: In occupied ABB habitat, design new roads with the minimum safe width necessary for planned use of the road.

GFW-TES-25: Within 10 air miles of known occupied ABB habitat, keep ground disturbance to a minimum during the reconstruction and maintenance of existing roads. Limit width of road, ditches, and surface materials to the minimum necessary for the planned use.

GFW-TES-26: Restrict the use of insecticides within known occupied ABB habitat.

Running Buffalo Clover (RBC)

SFW-TES-27: Implement measures to protect RBC populations during prescribed fire activities. These may include, but are not limited to wetting down the occupied area, raking off fuels from the occupied area, or constructing firelines around the occupied area.

SFW-TES-28: Avoid mechanical construction of firelines in known occupied RBC habitat. Mechanical fireline construction adjacent to known RBC populations must maintain appropriate light conditions in known occupied habitat.

GFW-TES-29: Restrict the application of herbicides within 25 feet of known RBC populations.

SFW-TES-30: Protect and maintain known RBC populations during road and trail construction, reconstruction, and maintenance by locating ground disturbance outside the occupied habitat. The appropriate light conditions must be maintained in the occupied habitat during such activities.

GFW-TES-31: Conduct surveys for running buffalo clover in suitable habitat prior to implementing ground or canopy disturbing activities.

Regional Forester Sensitive Species

SFW-TES-32 Protect and improve occupied Regional Forester sensitive species habitat.

Page changed 10/16/2008 by Administrative Correction # 3

SFW-TES-33: Do not conduct vegetation management within a 50-foot radius of rock shelters, or within 50 feet of the base and 50 feet of the top (measured horizontally) of naturally occurring, large rock faces or outcrops, unless designed to enhance the site characteristics for a Federally listed species or a known population of Regional Forester sensitive species. Large rock faces or outcrops are defined as rock outcrop areas 15 feet or more in height and 100 feet or more in length. These rock outcrop habitats are not limited to solid "cliffs" and may include discontinuous rock faces, if the outcrop area is predominantly rock faces.

SFW-TES-34: Avoid vegetation management within 50 feet of the base and 50 feet of the top of smaller rock faces (approximately 15 feet or more in height and less than 100 feet in length).

SFW-TES-35: Do not permit collection of Regional Forester sensitive plant or animal species, except for scientific or educational purposes. Require a permit for such collecting.

GFW-TES-36: Localized removal of vegetation to reduce woody encroachment (e.g., mowing, brush removal in the understory, selective thinning of the overstory, or grazing) may be used to maintain or improve habitat for Regional Forester sensitive species.

Bald Eagle Management

SFW-TES-37: Focus winter bald eagle searches in areas that eagles are known to frequent or where concentrated food sources occur near NFS land. Conduct searches during early-, mid-, and late-winter. Follow search criteria outlined in the Northern States Bald Eagle Recovery Plan.

SFW-TES-38: Protect any bald eagle communal night roosts and concentrations (including nests) discovered during winter surveys or during any additional field surveys of proposed project areas, following guidelines outlined in the Northern States Bald Eagle Recovery Plan.

SFW-TES-39: Report discovery of bald eagle nests immediately to the U. S. Fish and Wildlife Service (Reynoldsburg Field Office) and the Ohio Department of Natural Resources, Division of Wildlife.

SFW-TES-40: Protect super-canopy trees, or other identified congregation roost trees, along major river corridors and lakes in addition to following Forest-wide riparian standards and guidelines.

SFW-TES-41: Allow no prescribed fire within one-half mile of occupied bald eagle sites. Consider all bald eagle communal night roosts, daytime concentration sites, or occupied breeding territories as occupied sites. To prevent smoke inversion from occurring at occupied bald eagle sites, and to minimize smoke drifting toward them from prescribed fires outside the one-half mile radius of occupied sites, require burn plans to take account of wind direction, speed, and mixing height as well as transport winds.

Page changed 10/16/2008 by Administrative Correction # 2

SFW-TES-42: If the bald eagle is found nesting on the Wayne National Forest, monitor populations according to the recovery plan. At such time as the bald eagle is de-listed, use the de-listing monitoring plan.

Note 1: On August 8, 2007 the U.S. Fish and Wildlife Service, removed (delisted) the bald eagle (*Haliaeetus leucocephalus*) in the lower 48 States of the United States from the Federal List of Endangered and Threatened Wildlife due to the successful recovery of the species. The bald eagle continues to be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. These Acts require some measures to continue to prevent bald eagle "take" resulting from human activities. The bald eagle will be on the Regional Forester's Sensitive Species list for at least the next five years (FSM 2670, R9 RO Supplement 2600-2000-1). Because of this, the protections in the 2006 Forest Plan will remain, but be moved from the Threatened and Endangered Species section to the Regional Forester Sensitive Species section of the Plan. (Wayne NF, 2006 Forest Plan Administrative Correction #3, 9/29/2008)

Page changed 10/16/2008 by Administrative Correction # 3

6 – Vegetation

Goal 6.1 – Meet Habitat Needs

Provide forest vegetation characteristics, from understory layers to the tree canopy, that meet the habitat needs of desired native and non-native plant and animal species. (See Wildlife Habitat Objectives 4.1a through 4.1g.)[1]

Objective 6.1a - Use all available silvicultural treatments, including pre-commercial and commercial thinning, regeneration harvesting, prescribed fire, shelterwood harvests, site preparation, and improvement cutting to promote the maintenance and restoration of the oak-hickory ecosystem.

Objective 6.1b - Use commercial timber sales and stewardship contracts to accomplish wildlife habitat objectives.

Goal 6.2 – Improve Fire Regime Condition Class

Reintroduce fire into fire-adapted ecosystems to conserve biodiversity and promote ecosystem structure and function closer to the historic range of variability.

Objective 6.2a – Use prescribed fire to conserve fire-adapted plant and animal biodiversity and to maintain and restore mixed oak and native pine ecosystems.

Objective 6.2b – Use prescribed fire and mechanical treatments to modify current fuel composition, and fire frequency, severity and pattern.

Objective 6.2c – Use prescribed fire and mechanical treatments to maintain a current fire regime condition class that represents the historic range of variability.

Goal 6.3 – Special Forest Products

Provide opportunities for the collection and use of special forest products. Manage removal of special forest products and monitor this use to sustain viable populations and future yields. Increase public awareness of special forest product harvesting impacts on populations and their ecosystems.

Standards/Guidelines for Vegetation

Timber Management

SFW-VEG-1: Employ silvicultural methods for regeneration harvests that will result in adequate restocking within 5 years of a harvest.

GFW-VEG-2: Locate even-aged, final regeneration harvests in time and space so that temporary openings are at least 500 feet apart. Regenerated stands following even-aged timber regeneration harvest, such as clearcuts, two-aged cuts, and shelterwood harvests, will no longer be considered openings when trees in the new stand have reached a height of 20 feet.

[1] Reference to Wildlife Objectives corrected 10/16/2008 by Administrative Correction # 1

GFW-VEG-3: Plan the creation of temporary openings to be of irregular, natural appearing shape arranged to meet wildlife objectives. Feather the edges of clear-cuts and two-aged openings (see GFW-SM-13).

GFW-VEG-4: Limit skid trails to a maximum sustained gradient of 35 percent.

GFW-VEG-5: Permit operation of heavy equipment only when the soil is not saturated, or when the ground is frozen deep enough to support equipment without causing excessive rutting.

SFW-VEG-6: Require approval by qualified Forest Service personnel of locations of roads, skid trails, and landings prior to their construction.

GFW-VEG-7: Adequate tree stocking should generally result from regeneration harvests through natural regeneration (sprouting, release of seedlings, and establishment of seedlings). Where tree planting is necessary to achieve adequate stocking or establish different species, consider site conditions, habitat objectives, and economic factors in determining site preparation and species selection.

SFW-VEG-8: Ensure quality control by monitoring the adequacy of pesticide application procedures and the accomplishment of objectives.

GFW-VEG-9: Regeneration harvests may be implemented in immature timber stands when necessary to meet wildlife habitat objectives.

GFW-VEG-10: Base wildlife habitat objectives for age-class distributions on NFS land ownership only, because future habitat provided on privately owned land is not predictable. However, consider vegetative conditions on adjacent private land when planning vegetation management projects (e.g., to avoid locating a clearcut on NFS land next to a recent clearcut on private land).

GFW-VEG-11: Under two-aged regeneration harvests, leave approximately 15 to 30 square feet of basal area per acre uncut. Select leave tree species and distribution to meet wildlife habitat objectives.

GFW-VEG-12: In two-aged regeneration harvests, clearcut and shelterwood harvests, leave dogwood, redbud, and other low growing flowering and fruiting trees and shrubs, unless the amount to be left would inhibit natural regeneration of desired tree species.

GFW-VEG-13: When available, use planting stock of species native to the area from known seed sources and from the same climatic zone in which they will be planted.

GFW-VEG-14: Treat stand understories prior to and/or after timber harvest to develop advanced reproduction of desired tree species and to control grapevines where necessary to meet regeneration objectives. Such treatments may include the use of prescribed fire and/or chemical control of understory species and soil scarification to regenerate native pines. Leave adequate grapevines to meet wildlife needs. Do not remove pigeon grapes.

GFW-VEG-15: Pre-commercially thin regenerated stands to favor desired species and improve health, vigor, and growth.

GFW-VEG-16: When conducting crop tree release treatments, girdle (rather than felling) trees which could serve as future snags.

GFW-VEG-17: Manage vegetation in areas of concentrated use, such as picnic areas, campsites, trailheads, and concentrated use to enhance visitor safety, prevent soil erosion, and protect or enhance scenic quality.

Special Forest Products

SFW-VEG-18: Require a permit for all commercial collection of special forest products, and for collection of special forest products for personal use (i.e., medicinal plants, firewood). A permit is not required for personal use of berries, nuts, and pine cones.

SFW-VEG-19: Prohibit collection of Federally listed or Regional Forester sensitive species.

SFW-VEG-20: Implement rotational area or Forest-wide closure orders to prevent over-harvesting of plants and allow stressed populations of plants to recover, when such populations are identified.

This page left blank for notes.

7 – Forest Health

Goal 7.1 – Protect Vegetation and Wildlife from Insects, Diseases and Wildfire

Limit the effects of insects, diseases, and wildfire on forest vegetation and wildlife to within the range of disturbances that occurred in forest ecosystems prior to the arrival of non-native insects and diseases. Manage non-native invasive species (NNIS) populations using prevention, suppression, and restoration techniques to protect and restore natural communities on the Forest.

Objective-7.1a – Maintain an inventory of NNIS insects and diseases affecting or potentially affecting NFS resources.

Objective-7.1b – Cooperate with the ODNR and the State and Private Forestry Division of the Forest Service to suppress insect populations to:

- Retard advance of the gypsy moth
- Eradicate NNIS species that are present but not yet well established, such as the emerald ash borer
- Prevent the spread of non-native species currently lacking natural controls
- Protect populations of, or habitat for, endangered, threatened, or sensitive species
- Protect rare communities likely to be severely impacted by insect outbreak
- Prevent extensive tree mortality or defoliation in developed recreation areas and other areas where maintaining visual quality is a major objective
- Prevent spread onto land or into high value areas of the Forest (e.g., rare communities, developed recreation areas)
- Prevent the introduction and spread of Sudden Oak Death Syndrome.

Objective-7.1c – Protect the forest from wildfire by:

- Treating hazardous fuels that present a risk of wildfire.
- Treating hazardous fuels to move the forest closer to desired fire regime condition class and desired future condition.
- Maintaining areas that are at the desired fire regime condition class.

Goal 7.2 – Control NNIS Plants

Manage NNIS populations using prevention, suppression, and restoration techniques to protect and restore natural communities. Emphasize prevention of spread and early detection of and rapid response to new infestations. Improve effectiveness of NNIS prevention practices through public and inter-agency NNIS awareness and education.

Objective 7.2a – Maintain and update an inventory of NNIS plant populations on NFS land. Include information on adjacent lands as gathered in cooperation with neighboring landowners.

Objective 7.2b – Treat and reduce populations of non-native invasive plant species with high potential for spread. Implement control treatments of infestations that threaten priority resources. Prioritize treatment areas based on risk of spread, threat to resources, likelihood of successful control/containment, and partnerships.

Goal 7.3 – Control NNIS Aquatics

Use prevention, suppression, and restoration techniques to protect and restore natural communities in NFS waters. Emphasize prevention of spread and eradication of small populations/areas of infestation. Improve effectiveness of NNIS prevention practices through public and inter-agency NNIS awareness and education.

Goal 7.4 – Promote Disease-Resistant Species

Re-establish populations of native vegetation (e.g., American chestnut, American elm), as disease resistant varieties become available.

Standards/Guidelines for Forest Health

General

SFW-FH-1: Incorporate NNIS risk assessments in project planning, and include NNIS prevention and treatment in project development, analysis, and implementation.

SFW-FH-2: Emphasize integrated pest management to control NNIS, including silvicultural treatments, maintenance of species diversity, mechanical and pesticide treatments, and introduction of diseases and insect predators or parasites specific to the target pest.

GFW-FH-3: Prioritize NNIS prevention and control to:

- Prevent new infestations
- Protect known Federally listed endangered and threatened and Regional Forester Sensitive Species plant and animal sites
- Protect special areas and research natural areas from new invasions and treat established infestations in these areas

- Treat new (small) infestations
- Contain and control established NNIS infestations with the greatest probability to spread (e.g., gravel pits, trailheads, recreation areas).

Insect/Disease Control

GFW-FH-4: Emphasize integrated pest management to control insects and diseases, including silvicultural treatments, maintenance of species diversity, and introduction of insect predators or parasites.

GFW-FH-5: Apply restricted-use pesticides only under the direct supervision of a certified applicator. Other pesticides may be applied by a qualified applicator or by a certified applicator. Require permitted users to meet the same environmental standards that apply to Forest Service activities.

Vegetation Management

GFW-FH-6: Use commercial thinning of timber stands to promote growth of crop trees and to maintain forest health.

GFW-FH-7: When planting areas with tree seedlings, consider planting a mixture of species to:

- Reduce insect and disease susceptibility
- Increase visual variety
- Add habitat diversity.

NNIS Plants

SFW-FH-8: Forest contracts and permits shall include appropriate clauses for the prevention and/or treatment of NNIS.

GFW-FH-9: Reduce the spread of NNIS by cleaning off-road Forest Service equipment after fieldwork.

SFW-FH-10: Ensure that seed mixes or cultivated plants used for restoring disturbed areas or landscaping on NFS land do not include any species on the Forest's NNIS list or NNIS species identified by the State of Ohio or its neighboring states (i.e., Kentucky, Pennsylvania, Michigan, Indiana, and West Virginia).

GFW-FH-11: When restoring disturbed areas, prevent NNIS plant invasion or spread by using the following measures:

- Use weed-free mulch and forage when available.
- Use natural re-vegetation of native species for small-sized disturbances (e.g., utility rights-of-way, firelines) where the threat of erosion and sedimentation is limited.

- When seeding is necessary to accomplish re-vegetation, prioritize the composition of the seed mix as follows:
    - Native species with local genotypes (locally adapted)
    - Native species with non-local genotypes (not locally adapted)
    - Desirable non-native species that are non-aggressive and non-persistent (annuals)
    - Encourage the use of locally grown/adapted native plant materials.

GFW-FH-12: Consider NNIS situations on adjacent lands when planning and conducting management activities.

GFW-FH-13: Use only NNIS-free forage and mulch on NFS land.

GFW-FH-14: Encourage recreational riders and livestock permittees to use weed-free forage for stock.

GFW-FH-15: Encourage the construction and use of NNIS cleaning stations at trailheads.

GFW-FH-16: Work with local nurseries and other partners to educate the public on the use of native species instead of NNIS.

Pesticide Use

SFW-FH-17: Train workers who apply pesticides to ensure their safety, minimize adverse environmental impacts, and maximize effectiveness.

SFW-FH-18: Follow label directions and guidelines for pesticide mixing, application methods, rates, and timing to protect human, wildlife, and environmental safety.

SFW-FH-19: Do not clean application equipment, pesticide containers, clothing worn during treatment, or skin in open water or wells. Mixing and cleaning water must come from a public water supply.

SFW-FH-20: Allow only pesticides approved for aquatic use within riparian areas.

GFW-FH-21: In areas undergoing herbicide treatment, create buffer zones around threatened and endangered species and Regional Forester sensitive species.

SFW-FH-22: Do not conduct prescribed burning after herbicide application until the herbicide has had time to be effective and residues are no longer present.

GFW-FH-23: To minimize human exposure to pesticides, schedule treatment of high visitor use areas, such as recreational areas, during low-use periods, or when the areas are temporarily closed and signed.

GFW-FH-24: Sign areas of human use prior to and after pesticide application.

GFW-FH-25: Emphasize selective treatments (e.g., cut surface, basal stem, foliar spray and soil spot) over broadcast treatments (manual/mechanical broadcast and aerial).

GFW-FH-26: Monitor effectiveness of treatments to ensure that goals of treatment are met and to allow for adaptive measures to improve management efficiency and effectiveness.

This page left blank for notes.

8 – Fire Management

Goal 8.1 – Integrated Fire Prevention

Safely implement the fire and fuels program of the Wayne National Forest. Promote State and Federal interagency cooperation in wildland fire and fuels management.

Objective 8.1a – During any fire or fuel management activity, give highest priority to safety of employees, cooperators, and the public.

Objective 8.1b – Safely extinguish wildland fires using ground and/or air resources.

Objective 8.1c – Reduce hazardous fuels within communities at risk in cooperation with local, State, and Federal agencies.

Objective 8.1d – Modify wildland fire behavior to reduce adverse effects, such as reduction of soil productivity and mortality of large diameter trees by reducing the stocking of small trees, creation of fuel breaks, and prescribed fire to reduce fuel loading. Move toward fire-resilient stands, maximizing the retention of larger diameter trees.

Objective 8.1e – Provide training to local volunteer fire departments in wildland fire suppression.

Objective 8.1f – Facilitate treatment of private land where hazardous fuels pose a threat to National Forest System land (Stephens Funding).

Table 2 - 4. Wildland Fire Suppression Direction

Management Area Direction	Wildland Fire *Unplanned Ignitions*						Prescribed Fire Planned Ignitions
	Wildland fire use authorized in fire management units with approved plans	Must be managed as unwanted wildland fires if either human caused and approved fire use plan does not exist OR when fire presents unacceptable threat to human safety or values to be protected					May be implemented by management action authorized by approved burn plans
		STRATEGIES AND TACTICAL OPTIONS					
		Perimeter Strategy	Area Strategy		ME	AR	Prescription Strategy
		Control	Confine or Contain	Monitor			
Candidate Areas	X	X	X	X	X[1]	X[1]	X
Developed Recreation		X			X[1]	X[1]	X
Diverse Continuous Forest	X	X	X	X	X	X	X
Diverse Continuous Forest w/OHV	X	X	X	X	X	X	X
Forest and Shrubland Mosaic	X	X	X	X	X	X	X
Forest and Shrubland Mosaic w/OHV	X	X	X	X	X	X	X
Future Old Forests		X	X	X	X	X	
Future Old Forest w/ Mineral Activity		X	X	X	X	X	
Grassland and Forest Mosaic	X	X	X	X	X	X	X
Historic Forest	X	X	X	X	X	X	X
Historic Forest w/OHV	X	X	X	X	X	X	X
Research Natural Areas	X	X	X	X			X
River Corridor	X	X	X	X	X[1]	X[1]	X
Special Areas	X	X	X	X	X[1]	X[1]	X
Timbre Ridge Lake		X	X	X	X[1]	X[1]	X

X = Allowed

[1] = District Ranger approval

ME = Mechanized equipment (such as dozers, graders, etc) allowed

AR = Aerial retardant application

OHV = Off-highway vehicles

Fire Management

SFW-FIRE-1: Every wildland fire requires an appropriate suppression response, as outlined in Table 2 - 4. Base wildland fire prevention, detection, and suppression on the Forest-wide risk assessment. Base value-at-risk on the following criteria:

- Ignition probability
- Proximity to urban interface/intermix
- Density of structures within the Forest Protection Boundary
- Response times
- Fuel models
- Proximity to sensitive resources.

SFW-FIRE-2: In cooperation with other agencies, define suppression action plans that are compatible with management area objectives.

GFW-FIRE-3: Consider local resource management goals and objectives when developing suppression plans.

GFW-FIRE-4: Consider wildland fire use (i.e., transition from wildfire to prescribed fire) where burning conditions are favorable and there is no unusual risk to the public, firefighters, or improvements.

GFW-FIRE-5: Do not conduct prescribed burning within developed recreation sites when they are open to public use.

GFW-FIRE-6: Include smoke management and mitigation in all prescribed burning plans. Use best available smoke management practices and control measures to assure that prescribed fires do not adversely affect public health, public safety, or visibility. Conduct prescribed burning in, or adjacent to, counties with forecasted high Air Quality Index (AQI) values (AQI = Orange or higher) only if meteorological conditions ensure that smoke will be carried away from the high AQI area. Minimize impact of smoke from any prescribed fire by identifying smoke-sensitive areas, monitoring smoke impacts, informing adjoining landowners prior to prescribed fire ignitions, and following applicable guidance.

GFW-FIRE-7: Use existing natural or man-made barriers – such as drainages, cliffs, streams, roads, and trails – instead of constructed firelines for fire suppression when the value-at-risk is low and where practical and safe for firefighters and the public. Do not disk, blade, or plow firelines within stream channels, including ephemeral channels. Use stream channels as natural firebreaks. Provide the same suppression strategies as on NFS land, unless suppression measures are specifically qualified by the protection agreement.

GFW-FIRE-8: Allow growth of existing on-site vegetation to revegetate soils disturbed by constructed firelines.

GFW-FIRE-9: Monitor burned areas (wildfire and prescribed fires) to determine effects on presence and spread of non-native invasive plants.

GFW-FIRE-10: Avoid constructing firelines in recreation sites and known heritage sites.

GFW-FIRE-11: Cut or remove as necessary standing dead trees that constitute a safety hazard for the public or for safe fire suppression operations.

GFW-FIRE-12: Implement adequate erosion control measures (water bars, rolling dips, etc.) on all constructed fire lines where necessary to reduce the amount of sediment leaving a given area. Erosion control should occur as soon as possible after suppression activity is complete.

GFW-FIRE-13: When using heavy equipment for fire suppression, cross stream channels at right angles. Stabilize and/or re-vegetate the crossing as soon as possible after the fire is controlled. (See also GFW-WSH-6, 7 and 8.) Do not apply chemical fire retardants directly over water bodies unless needed for firefighter or public safety.

GFW-FIRE-14: Prescribed fire treatments in areas that currently qualify as old growth should be planned to maintain or contribute to the restoration of old growth characteristics.

9 – Air Quality

Goal 9.1 – Protect air quality

Ensure that Forest management activities comply with Federal and State laws protecting air quality.

Standards/Guidelines for Air Quality

General

GFW-AIR-1: Coordinate management activities with air quality regulatory authorities and with research activities on the impact of air pollution on Forest resources.

GFW-AIR-2: Coordinate with air quality regulatory authorities and with research activities on preventative practices to control any significant air pollution emissions resulting from National Forest management activities.

GFW-AIR-3: Conduct management activities (including permitted activities) in a manner that does not contribute significantly to violations of National Ambient Air Quality Standards or violations of applicable provisions in the State Implementation Plan.

GFW-AIR-4: The Forest Supervisor will advise the Regional Forester on the potential effects of proposals by the State of Ohio to modify air quality standards or attainment areas and the identification of present and potential impairment of Forest resources attributable to air pollution.

This page left blank for notes.

10 – Minerals

Goal 10.1 – Provide mineral commodities

Provide a supply of mineral commodities for current and future generations, while protecting the long-term health and biological diversity of ecosystems. Facilitate the orderly exploration, development, and production of mineral and energy resources on land open to these activities.

Objective 10.1a – Coordinate with the Bureau of Land Management to offer leases of Federally owned minerals.

Objective 10.1b – Process plans of operation/applications for permit to drill on Federal leases in a timely manner.

Goal 10.2 – Respect owners' rights and protect surface resources

While respecting privately held mineral rights, negotiate operating terms and conditions and mitigation measures to protect other Forest resources.

Objective 10.2a – Process plans of operation (and applications for major modifications) for privately owned minerals (reserved and outstanding rights) within 60 days.

Objective 10.2b – Restore lands disturbed by minerals exploration and production when the minerals activity is completed.

Objective 10.2c – Plug wells when production ceases.

Standards/Guidelines for Minerals

Federally and Privately Owned Minerals

SFW-MIN-1: Prevent or eliminate occupancy that is not reasonably incident to, or required for, legitimate mineral operations.

SFW-MIN-2: Require that all proposed surface-disturbing mineral activities have an approved operation and reclamation plan before the activity begins.

SFW-MIN-3: Require that operators conduct activities and maintain equipment to prevent the discharge of oil or brine onto the ground or into surface waters.

SFW-MIN-4: Upon discovery or notification of an accidental spill of crude oil or brine that discharges, or threatens to discharge, into surface waters, notify the Ohio Environmental Protection Agency Emergency Response and Special Investigations unit in Columbus.

SFW-MIN-5: The operator, as directed by Ohio EPA, is responsible for remedial action for cleanup of soil and water resources and timely repair of damaged wells, pipelines, or tanks.

GFW-MIN-6: Do not permit mineral development within 50 feet of recreation trails.

SFW-MIN-7: Evaluate the potential for mineral development prior to committing substantial Forest Service capital investments, such as for recreation developments.

SFW-MIN-8: Require owners and lessees to plug oil and gas wells when production ceases. Work with cooperating agencies to plug abandoned non-producing wells without identified owners.

Federally Owned Minerals

SFW-MIN-9: Apply the No Surface Occupancy (NSO) stipulation to new Federal leases in the following Management Areas:

- Future Old Forest
- Developed Recreation
- Timbre Ridge Lake
- Special Areas
- Research Natural Areas
- Candidate Areas.

(See Appendix H for a complete list of standard notifications and stipulations for Federal leases).

SFW-MIN-10: Within management areas where surface occupancy is generally permitted, apply the No Surface Occupancy stipulation for new Federal leases where the following conditions occur:

- Slopes in excess of 55 percent and areas prone to mass soil movement
- Areas within ¼ mile of Indiana bat hibernacula
- Cultural resource sites of known significance.

SFW-MIN-11: Within management areas where surface occupancy is generally permitted, apply the Controlled Surface Use stipulation for new Federal leases where the following conditions occur:

- Riparian areas and wetlands
- Managed wildlife openings
- Developed recreation sites (located outside the Developed Recreation Management Area)
- Areas of land with a Scenic Integrity Objective of ‘High’ or ‘Moderate’
- Known locations of Federally listed species

- Known locations of Regional Forester Sensitive Species
- Portions of floodplains outside riparian areas
- Slopes between 35 and 55 percent.

SFW-MIN-12: Consider approval of plans of operation based on applicable regulations and analysis of:

- Surface/subsurface resources
- Any restrictions and mitigations determined by an environmental analysis
- Road construction standards
- Standard BLM lease stipulations
- Appropriate lease-specific oil and gas notifications and stipulations (See Appendix H – Lease Specific Oil and Gas Notifications/Stipulations).

SFW-MIN-13: Make mineral materials available for administrative, commercial, or personal use only where surface disturbance can be mitigated.

SFW-MIN-14: Allow the public to collect small quantities of rocks, minerals and invertebrate fossils for non-commercial purposes (scientific, educational, and recreational, including recreational gold panning). Such collecting is prohibited in archeological sites, caves, and abandoned mines to protect these sensitive resources. Prohibit gold panning in specific stream segments where needed to protect aquatic habitat for species such as mussels.

Require a special-use permit for:

- Collecting for commercial use
- Activities involving motorized excavation
- Collecting activities that cause movement of more than incidental amounts of sediment into or within streams.

Privately Owned Minerals

SFW-MIN-15: Administer private mineral rights so that their activities/operations are consistent with:

- Rights granted by deed
- Best management practices to mitigate surface disturbances
- Applicable Federal and State regulations.

SFW-MIN-16: Ensure that land management decisions do not preclude the reasonable exploration and development of privately owned minerals, as defined by deed and applicable Federal and State regulations.

SFW-MIN-17: Require that owners and lessees of mineral rights provide the Forest with satisfactory evidence of authority to exercise reserved and/or outstanding mineral rights.

SFW-MIN-18: Coordinate with owners and lessees of mineral rights so that they provide the Forest with at least 60 days advance written notice of surface occupancy by submitting a proposed operating plan, or for any major modification of a mutually agreed upon operating plan.

SFW-MIN-19: Work with operators to ensure compliance with operating plans, including implementation of mitigation measures, in the development of reserved and outstanding mineral rights.

SFW-MIN-20: The exercise of all reserved and outstanding mineral rights are subject to applicable State and Federal laws and regulations pertaining to mining, real property, and environmental protection, including the Surface Mining Control and Reclamation Act with regard to coal.

SFW-MIN-21: Provide the Bureau of Land Management (BLM) with lease-specific stipulations, when term private leases are non-competitively converted to Federal leases in accordance with the Comprehensive National Energy Policy Act of 1992.

11 – Recreation

Goal 11.1 – Provide broad range of recreation

Provide a broad range of developed and dispersed outdoor recreation opportunities and experiences within the ecosystem's acceptable limits of change. Manage recreation facilities and opportunities to respond to public demands and promote local economic development. Emphasize recreation opportunities which can be better provided on the Forest than on private or other public land.

Objective 11.1a – By the end of this planning period, add at least one camping facility for OHV use and one for equestrian use. This could be accomplished by the Forest Service or concessionaire on NFS land or by the private sector on adjacent private property.

Objective 11.1b – Provide quality wildlife-based recreational opportunities to the public, including hunting, fishing, and wildlife viewing.

Objective 11.1c – Use interpretive and education services and programs to increase public understanding of Forest Service management, develop public interest and understanding of the Forest's natural and cultural environment, and educate the public on the safe and legal use of the Forest.

Goal 11.2 – Provide Safe, Quality Trails

Construct and maintain trails and associated facilities to provide a safe quality experience within the capabilities of the land and appropriate to the management area.

Objective 11.2a – Cooperatively manage the North Country National Scenic Trail with the USDI National Park Service and the North Country Trail Association per the established Memorandum of Understanding (as amended).

Objective 11.2b – By the end of this planning period, relocate/re-construct five miles of the North Country Trail where the trail is currently located on roads.

Objective 11.2c – Maintain and administer the Forest's motorized trail system to provide safe/enjoyable trail riding opportunities and reduce resource impacts.

Objective 11.2d – Where maintenance methods prove ineffective and monitoring confirms unsafe conditions or unacceptable resource damage, close and rehabilitate and/or re-locate/reconstruct sections of OHV trails.

Objective 11.2e – Reduce, and strive to eliminate illegal OHV use by:

- Prohibiting cross-country travel or riding on undesignated user-created trails
- Prohibiting riding trails designated for other uses.
- Prohibiting riding on designated trails during closed seasons.
- Closing at least 20 miles of illegal off-highway vehicle trail within the next decade to:
    a) Protect Federally listed species
    b) Protect Regional Forester's sensitive species
    c) Improve watershed health

Objective 11.2f – Maintain the Forest's non-motorized trail system to provide safe/enjoyable trail hiking, horseback riding, and biking opportunities with minimal resource impacts.

Objective 11.2g – Construct new trails during the next 10 to 15 years within the ranges and densities shown in Table 2 - 5.

Table 2 - 5. Trail Construction Objectives

Type of Trail	New Trail Construction[2] (Miles)	Current Trail (Miles)	Trail Density Limit (Miles per Sq. Mile)
OHV	50 - 124	116	2.4 – 3.5
Hiking	5 – 30	81	Up to a total of 2.5 mi /sq mi (this figure includes all types of non-motorized trails)
Horseback	5 – 50	75	
Mountain Bike	15 - 30	0	

Standards/Guidelines for Recreation

Developed Recreation

GFW-REC-1: Develop and manage Forest Service roads to conform to the appropriate Recreation Opportunity Spectrum (ROS) class.

SFW-REC-2: Operate and maintain existing and new recreation facilities to meet all current mandatory critical standards. If public health and safety cannot be reasonably ensured, close developed sites until this critical standard is met.

[2] New trail construction miles are based on the primary trail use. Newly constructed multi-use trails will only be counted as new trail construction for the primary use.

SFW-REC-3: Prepare comprehensive, detailed site plans prior to recreation facility and site construction or reconstruction in accordance with Forest Service policy.

SFW-REC-4: When choosing location of recreational developments, give priority to:

- Correcting health and safety problems
- Protecting the environment
- Complementing prescribed recreation opportunities
- Meeting public demand
- Availability of suitable access
- Cost of construction, operation, and maintenance.

GFW-REC-5: Consider adjacent State or local recreation facilities, their uses and long-term objectives, before proposing any new recreation development.

GFW-REC-6: Remove hazard trees within developed recreation sites as needed to provide for public safety.

SFW-REC-7: Clearly mark and sign the boundaries of all developed recreation sites.

SFW-REC-8: Prohibit hunting, shooting, and bow fishing within the boundaries of developed recreation sites.

GFW-REC-9: Limit regulation, constraint, and supervision of recreation use to the minimum necessary for resource protection, visitor satisfaction, and public and employee safety.

GFW-REC-10: Annually update the Forest's developed recreation sites, concentrated use areas (CUAs), and trails information in the appropriate forest service corporate databases to improve data accuracy.

GFW-REC-11: When constructing new campgrounds, maintain larger mast producing trees to enhance wildlife viewing opportunities, provide shade and screening, and enhance scenic quality.

Dispersed Recreation

GFW-REC-12: Allow only manually-powered watercraft or those powered by electric trolling motors on the Forest's lakes and ponds.

SFW-REC-13: To protect populations of Regional Forester sensitive species, allow rock climbing and rappelling only at designated sites.

SFW-REC-14: Allow geo-caching with the following restrictions:

- Require special-use authorization for any geo-caching activity.
- Prohibit motorized vehicles use off of roads or trails to access geo-cache sites.
- Explosives, flammable materials, drugs, and other items that may pose a public health or safety risk are prohibited. Include a list of prohibited geo-cache materials in the special use authorization.
- Prohibit geo-caching on developed recreation sites, heritage resource sites, research natural areas, special areas, and candidate areas.
- Allow no soil disturbance on the Forest for geo-cache placement. Caches must be covered with leaves or woody debris if the geo-cacher chooses to screen the cache at the site.
- To minimize resource impacts, require geo-cachers to remove their cache if the site receives a large number of visits by others, as evidenced by a well-worn trail or path.
- After one year, regardless of site activity, geo-caches must be moved to a new location or removed from the Forest.

SFW-REC-15: Prohibit cross-country travel by ATVs, OHMs, mountain bikes, horses, or other pack stock. These uses shall be restricted to designated trails only. **Exception:** Cross-country travel is permitted for administrative purposes and/or during emergency search and rescue missions approved by a Forest line officer.

Trails

SFW-REC-16: OHV, mountain bike, and horse trails are open (unless posted closed) for riding from April 15th through December 15th. Close these trails (except for foot travel) during the winter period (December 16th through April 14th) to minimize environmental impacts and maintenance costs. **Exception:** Trails may be used for administrative purposes and operation/maintenance of approved oil and gas facilities.

GFW-REC-17: Manage the North Country National Scenic Trail and adjacent Forest lands according to standards incorporated in the act establishing the trail and in accordance with the NCT's Memorandum of Understanding (as amended).

GFW-REC-18: Follow the USDI National Park Service's North Country NST – Trail Design, Construction, and Maintenance Handbook for the support structure design, construction, and maintenance of the North Country Trail.

GFW-REC-19: Construct, maintain, and sign trails to Forest Service standards and in accordance with the Forest's sign plan.

GFW-REC-20: Manage trails to comply with the management area's Recreation Opportunity Spectrum objective.

GFW-REC-21: Unless a site is interpreted, plan location of trails so that known heritage sites are not readily visible from the trail corridor.

SFW-REC-22: Allow pedestrian travel throughout the Forest except where prohibited and signed.

SFW-REC-23: Allow wheelchair use in designated non-motorized areas as long as the wheelchair meets the definition as in Title V Section 507c (2) of the American with Disabilities Act: "a device designed solely for use by a mobility impaired person for locomotion, that is suitable for use in an indoor pedestrian area."

SFW-REC-24: Prohibit motorized vehicle use in designated non-motorized areas. Except for:

- Wheelchairs as defined under Title V Sections 507c (2) of the American with Disabilities Act
- Administrative purposes
- Search and rescue missions
- Operation/maintenance of approved oil and gas facilities.

GFW-REC-25: Require a special use authorization for any proposed competitive racing or other organized trail riding event. Consider possible environmental impacts and impacts on other users.

SFW-REC-26: Allow mountain bikes and horses on hiking trails only where designated and signed.

SFW-REC-27: Construct and maintain trails and associated facilities to be cost-effective and minimize user conflicts.

GFW-REC-28: After abandoned mine lands have been reclaimed 10 years or more, consider them for the development of trails and associated recreation facilities.

GFW-REC-29: Discourage construction of new trails within riparian areas. Where trails are located in riparian corridors, construct and maintain them to minimize adverse impacts to the ecological function of the area.

GFW-REC-30: Maintain hiking and mountain bike trail tread with natural surfacing to a width of 18 to 24 inches.

GFW-REC-31: Maintain horse trail tread to an average width of 36 inches.

GFW-REC-32: Allow horse, mountain biking, and hiking trails to cross motorized trails/areas. Sign crossings in accordance with the Forest's sign plan for trails.

GFW-REC-33: Favor loop and two-way trails for hiking, horse, and mountain bike trails.

Off-Highway Vehicles (OHV)

SFW-REC-34: Limit ATV and OHM use to designated trails in specific management areas:

- Diverse Continuous Forest with OHVs (DCFO)
- Historic Forest with OHVs (HFO)
- Forest/Shrubland Mosaic with OHVs.

SFW-REC-35: Except for administrative purposes and/or for oil and gas maintenance operations, prohibit motorized vehicles greater than 50 inches wide on trails.

SFW-REC-36: Allow motorized OHV use in designated non-motorized areas only for:

- Search and rescue
- Forest management activities
- Operation and maintenance of approved oil and gas facilities.

OHV Trail Construction and Maintenance

SFW-REC-37: OHV trails are designed, constructed, and maintained in accordance with Forest Service standards.

SFW-REC-38: Locate OHV trails to obtain the minimum safe sight distance for the designed speed. Apply this requirement when locating trail intersections. Use appropriate STOP and YIELD signs.

SFW-REC-39: Install approved signing needed at trailheads and junctions and for on-trail guidance before a trail is considered complete and ready for traffic.

4-wheel Drive and High-clearance Vehicles

SFW-REC-40: Do not construct new roads specifically for recreational 4-wheel drive use.

SFW-REC-41: Prohibit recreational uses that are incompatible with Forest Plan objectives or where environmental damage could not be mitigated.

SFW-REC-42: Before permanent closure of roads, consider for possible use by high-clearance/four-wheel drive vehicles.

12 – Scenery Management

Goal 12.1 – Maintain scenic resources

Maintain or enhance the quality of scenic resources to provide desired landscape character. See management area scenery objectives in Chapter 3, and Appendix I.

Standards/Guidelines for Scenery Management

General

GFW-SM-1: Resource management activities should not reduce scenic integrity levels below the prescribed objective for a given area or Concern Level 1 or 2 travelway or use area, except in the case of specific resource rehabilitation activities to meet management area objectives and desired future condition. In such cases, a viewshed rehabilitation plan should be included in the overall project plan.

GFW-SM-2: Guidelines for high and moderate scenery integrity objective (SIO) areas should be met within one full growing season after the completion of a project. Guidelines for low SIO areas should be met within two full growing seasons following the completion of a project.

Existing projects and areas not currently meeting scenic integrity objectives should be rehabilitated based on the following criteria:

- Relative scenic value of the seen area and the amount of deviation from the scenic integrity objectives
- Length of time needed for restoration and natural processes to reduce visual impacts
- Benefits to other resource management objectives to accomplish scenic integrity rehabilitation.

GFW-SM-3: Concern Level 1 and 2 use areas and travelways (corridors ½ mile each side of centerline or ½ mile from the outside perimeter of a use area or any seen area if less than ½ mile from a travelway or use area) should adopt the landscape theme of the management area in which they occur. Manage the areas seen from these Concern Level 1 and 2 use areas and travelways according to the Forest's scenic integrity objectives map.

GFW-SM-4: Minimize, remove, or clean up any evidence of temporary activities (such as staking, paint, flagging, equipment maintenance, and/or staging areas) immediately after project completion.

Facilities

GFW-SM-5: All structures and materials, including signs, bridges, fish and wildlife improvements, and other facilities, should be consistent with the guidelines developed in the Built Environment Image Guide and the Forest Service Sign Guide.

GFW-SM-6: New structures should be compatible with valued cultural features in the landscape such as historic structures. See the landscape character description for identification of the valued cultural features and the Built Environment Image Guide.

GFW-SM-7: Material selection, color, and shape of administrative and recreation facilities should minimize contrasts and blend with natural surroundings and landscape character.

GFW-SM-8: Emphasize the use of native materials.

GFW-SM-9: Use plants native to southeast Ohio as much as possible when landscaping. Plants listed on the Forest's NNIS list, as well as Ohio and other neighboring states' NNIS lists should not be used for landscaping.

GFW-SM-10: Use "landform grading" techniques (naturalized contours) when regrading areas disturbed by construction or other activities such as mining. Replant with native species wherever possible. Do not use plants listed on Federal or State NNIS lists.

Openings

GFW-SM-11: Shape openings created by vegetation management to blend with the adjacent landscape and achieve a natural appearance that mimics natural openings found in the adjacent plant community.

GFW-SM-12: Avoid straight-line boundaries even where the scenic integrity objective is low. Vary opening size and shape to avoid uniformity of appearance.

GFW-SM-13: To create a natural appearing edge and reduce the sharp contrast of openings, feather the height of remaining trees along opening boundaries to transition gradually from the full-crowned trees in the undisturbed adjacent stand. Also, thin the edges of the adjacent stand in order to soften the transition from the new opening to the undisturbed adjacent stand.

GFW-SM-14: Take advantage of existing natural openings when creating vistas or enhancing views.

Utilities

GFW-SM-15: Bury new utility lines and use existing rights-of-way whenever possible.

GFW-SM-16: Ensure that utility corridor maintenance agreements allow some regrowth of native vegetation prior to periodic maintenance to help reduce the visual impact of the corridor.

GFW-SM-17: For high voltage transmission lines, encourage use of polymer insulators, non-reflective wire, and acid-washed towers or paint them a flat, dark color; e.g., such as flat black (3 parts) mixed with meadow green (2 parts). Also use these guidelines when replacing existing insulators, wire, or towers during routine maintenance or repairs.

GFW-SM-18: Allow native vegetation to regenerate as long and as high as possible before removing for necessary maintenance. Where possible and appropriate, explore alternatives to lattice steel towers.

GFW-SM-19: Wherever possible, use techniques that reduce the visual impact of cellular antennas. Avoid use of lattice steel towers when possible.

GFW-SM-20: Avoid the construction of a greater number of towers by requiring towers to serve multiple purposes (e.g., cellular phone, radio, etc.) and be shared among different service providers. (e.g., more than one cell phone company to share a single tower).

GFW-SM-21: Avoid the need for lighted towers, particularly in locations visible from a lake or in the viewshed of a Concern Level 1 or 2 travelway or use area.

GFW-SM-22: When technically feasible, make every effort to use the shortest possible tower in a given location. Give consideration to a series of shorter, strategically placed, non-lighted towers rather than constructing a tall, lighted tower (i.e., towers should be less than 200 feet above ground level).

GFW-SM-23: Reduce visual impact of current and future obstruction lighting requirements as much as technology and FAA and FCC requirements will allow.

GFW-SM-24: Reduce visual impact by using such techniques as, but not limited to, directional lighting, tilting, shields, etc.

GFW-SM-25: Maximum intensity of lighting shall be the minimum required by FAA and/or FCC. Unless otherwise required by the FAA, only white (preferable) or red strobe lights should be used at night, and these should be the minimum number and intensity, with the minimum frequency of flashes (maximum duration between flashes), as required by the FAA.

High SIO Areas

GFW-SM-26: Locate new overhead utility structures, cellular towers, and right-of-way clearings out of view of the traveling or recreating public unless no other feasible options exist.

Moderate SIO Areas

GFW-SM-27: Minimize the visibility to the traveling or recreating public of new overhead utility structures, cellular towers, and right-of-way clearings.

Low SIO Areas

GFW-SM-28: New overhead utility structures, cellular towers, and rights-of-way clearings may be located adjacent to roads and other travel corridors.

Shorelines, Riparian Areas, and within Streams

GFW-SM-29: Configuration of in-stream structures should appear natural and not impede or pose a hazard to motorized and/or non-motorized use (where applicable).

GFW-SM-30: Anchors used to submerge fish habitat structures should not be visible.

GFW-SM-31: Shoreline and in-stream installations should maintain the appearance of the natural lake edge or stream meander.

GFW-SM-32: Revegetation of exposed areas (including bank/slope stabilization, excavation, etc.) should include the following:

- Stockpile native topsoil and scatter on exposed slopes/areas in conjunction with seeding and planting.
- Plant grass-seed mix and seedlings within one year of completion.
- Plant a mix of small (3 feet tall) trees and shrubs of the same species in the surrounding area.
- Minimize “manicured appearance” of slope and revegetation.

Signs

GFW-SM-33: All signs should conform to the Forest Service Sign Guide, especially in regard to size and color.

GFW-SM-34: Metal signs (especially those used on roads and trails) should be painted the same color on the back as the front. This is to avoid the aluminum glare that could hinder visibility to oncoming traffic.

GFW-SM-35: Use natural materials and colors for markers and sign posts to the extent practical.

Roads/Trails / Obliteration and Closure

GFW-SM-36: Where feasible, use natural appearing barriers such as large rocks or vegetated berms to effectively block roads/trails and re-vegetate.

GFW-SM-37: Limit the use of tank traps to block roads/trails. Seed tank traps. Encourage the use of slash, large rock boulders, or other natural materials to block roads/trails.

GFW-SM-38: When practical (i.e., along visually sensitive areas), plant a mix of vegetation, (3-feet tall or higher) from edge of clearing to edge of travelway where needed to blend closure with existing edge vegetation.

GFW-SM-39: When feasible, use natural appearing drainage control measures.

GFW-SM-40: Scarify roadbed/trailbed, and if necessary, plant with seed mix. Plant seedlings on side slopes, especially in areas readily visible from an open road, trail, or use area.

GFW-SM-41: Roads and trails to be permanently closed should be graded to blend with the surrounding topography. If grading is not feasible, round transition of cuts and fills and/or vegetation to lessen visual impacts.

GFW-SM-42: Where possible, conceal abrupt and visible edges in resource management practices (i.e., mowing, prescribed burns, and fencing) from prominent viewing areas.

High and Moderate SIO Areas

GFW-SM-43: Round cut-and-fill slopes to approximate original contours and use landform grading to naturalize contours.

GFW-SM-44: Stockpile native topsoil to re-vegetate cut-and-fill slopes.

GFW-SM-45: Within one year, plant a mixture of small (3-feet tall or higher) native trees and/or shrubs to cover 50 percent or more of the area, 50 feet back from the vegetation line at road intersections.

GFW-SM-46: When possible, minimize the use of gates. Use natural barriers, such as boulders.

Culverts / High and Moderate SIO Areas

GFW-SM-47: Ensure that culvert ends match the angle of the adjacent slopes, or use rocks or other natural-appearing materials to help culverts blend into the landscape.

New Roads / Trails / High and Moderate SIO Areas

GFW-SM-48: For guardrails, use natural materials and colors that blend with the surrounding landscape. (Avoid shiny steel guardrails and jersey barriers.)

GFW-SM-49: Whenever possible, use naturalized contours for cut-and-fill slopes rather than straight lines.

GFW-SM-50: Re-vegetation of exposed areas (including bank/slope stabilization, excavation, etc.) should include the following:

- Stockpile native topsoil to scatter on exposed slopes/areas, where this can be accomplished without increasing the area of disturbance.
- Plant grass-seed mix and/or native tree or shrub seedlings within one year of completion.

GFW-SM-51: When possible, new roads and trails should be located along the periphery of large open areas to maximize opportunities for scenic views from trails and recreation sites.

Minerals and Geology / New Projects

GFW-SM-52: Reclaim land disturbed by mining activities or facilities as soon as possible.

GFW-SM-53: Reclamation work should reflect the landscape character of the surrounding landscape, which includes grading to the natural landform/contour and revegetation.

GFW-SM-54: Native soil should be removed and stockpiled before ground disturbance.

GFW-SM-55: Provide appropriate natural screening from mining operations and production facilities adjacent to travelways (open roads and designated trails), recreation sites, navigable streams/rivers, lakes/ponds, and private property.

GFW-SM-56: Reclamation measures should ensure that the project area would meet the area's SIO as soon as practicable.

Vegetation Management

GFW-SM-57: Review guidelines for constructing temporary openings and managing slash on a project-by-project basis with integrated resource management input. Guidelines should strive to minimize the seen area or apparent size of temporary openings and maximize the natural appearance of the opening.

GFW-SM-58: If the objective is to create a scenic vista, manage the project area to maximize the seen area.

GFW-SM-59: Vegetation management visible from Concern Level 1 and 2 travelways, use areas, and water bodies should strive to:

- Enhance views, create vistas, feature natural openings
- Retain canopies over travel routes
- Encourage vegetative diversity and seasonal color contrast

- Feature big tree appearance
- Avoid straight lines and even spacing.

GFW-SM-60: Vegetation management which creates temporary openings should strive to:

- Feather heights of clearing edges; leave full-crowned trees as leave trees.
- Feathering is the partial cutting of trees along the cutting unit boundary to create transition in vegetation height and/or density between the opening and adjacent forest canopy. Feathering is appropriate in all zones high scenic integrity objectives and is required in all Concern Level 1 areas. Feathering is accomplished by using several different techniques singly or in combination. Possible techniques include:
    - Leaving the existing understory just inside the cutting unit boundary
    - Thinning the overstory canopy along the interior edge of the cutting unit boundary
    - Leaving vegetation of progressively greater height from the interior of the cutting unit to the boundary.

  The technique used depends heavily on site conditions and should be determined on a case-by-case basis. The width of the feathered edge should at a minimum equal the height of adjacent uncut stand.
- In Concern Level 1 and 2 travelways and use areas, treat slash resulting from harvest or other management activity so it is no higher than 2 feet above the surface of the ground at least 100 feet from edge of road, trail, or use area, by lopping, chopping, crushing, burning, chipping, or removal, or a combination of these methods.
- Highlight and maintain character trees, such as large-diameter trees, “wolf trees,” open-grown trees, mast-producing trees, etc.
- Keep temporary openings 500 feet apart with a stand of trees at least 20 feet tall.

GFW-SM-61: After trees in the re-established stand reach 20 feet in height, openings created by even-aged timber regeneration harvest, such as clear-cuts, two-aged cuts, and shelterwood harvests, should be considered closed.

GFW-SM-62: Address specific rehabilitation and enhancement needs and opportunities for the scenery resource during project planning.

GFW-SM-63: Screen log landings as viewed from Concern Level 1 and 2 travelways and use areas and water bodies. Rehabilitate log landings after project completion to mimic natural openings.

GFW-SM-64: Strive to schedule mechanized activities along Concern Level 1 and 2 travelways, use areas, and water bodies to occur during low-use periods to alleviate noise and visual impacts.

GFW-SM-65: Locate furrows, trenches, plantations, etc., to reduce linear appearance as viewed from travel routes, use areas, and water bodies.

GFW-SM-66: Design natural-appearing edges rather than straight edges. Avoid straight lines and even spacing and strive for random spacing in tree planting projects.

GFW-SM-67: Retain and protect mid-story and understory species with desirable flowering characteristics.

GFW-SM-68: Allow no more than 30 contiguous acres of a clear-cut or seed-tree regeneration area with a leave-tree basal area of less than 10 square feet per acre to be visible from the travel-way (open road or trail).

GFW-SM-69: Avoid numerous even-aged regeneration areas in close proximity (no closer than 500 feet) during the same planning cycle.

GFW-SM-70: Retain groups of trees or large single trees within cutting unit boundaries. Retain trees in accordance with the management area's desired future condition.

High SIO Areas

GFW-SM-71: Human interventions may only repeat the form, line, color, and texture found in the natural or natural-appearing landscape. The high scenic integrity objective excludes human alteration or management activity that will be visually evident.

GFW-SM-72: Use even-aged regeneration to create spatial diversity, mimic natural processes, or facilitate restoration of wildlife habitat or natural plant communities. Give priority to shelterwood as the even-aged regeneration method for areas with a high scenic integrity objective.

GFW-SM-73: No more than 15 contiguous acres of a clear-cut or seed-tree regeneration area should be visible from any given point on a travelway.

GFW-SM-74: Temporary openings (including log landings) should be infrequent and should strongly mimic the size, shape, and edge characteristics of natural openings or natural disturbance processes. Once ground cover is established, an opening should resemble a natural occurrence within one growing season after project completion.

GFW-SM-75: Slash should be reduced to 24 inches in height within 200 feet of a Concern Level 1 travelway or use area. Use mechanical methods (e.g., roller chopping, lopping), or prescribed burning to lower or reduce slash height.

GFW-SM-76: Stumps should be cut within one foot of the ground if within 50 feet of a Concern Level 1 travelway or use area.

GFW-SM-77: Do not pile or windrow slash adjacent to the treatment zone. The treated zone should extend 200 to 600 feet beyond the edge of the travelway's cleared right-of-way; the actual width is to be determined on a case-by-case basis or in consultation with a landscape architect.

GFW-SM-78: Complete slash treatment within one year of slash production. In the most sensitive areas, such as within developed recreation sites, more intense treatment may be required, such as chipping and scattering or outright removal.

GFW-SM-79: Within the boundaries of developed recreation sites and other highly sensitive locations, use cut-tree marking. If leave tree marking should be used, obliterate by over-painting with dark gray paint within one year after the timber sale is closed.

GFW-SM-80: Locate all log landings out of sight in travelways with a high scenic integrity objective.

Moderate SIO Areas

GFW-SM-81: Human interventions may repeat form, line, color, and texture of landscape elements normally found in the natural-appearing landscape character being viewed. Interventions may also introduce form, line, color, and texture that are found infrequently or not at all in the landscape character, but these new scenic attributes should remain subordinate to the visual strength of the natural or natural appearing landscape character being viewed and consistent with the landscape character goal.

GFW-SM-82: Intermediate/thinning and regeneration prescriptions are appropriate in this area.

GFW-SM-83: Temporary openings and harvest activities may be more evident or frequent, but they should continue to mimic the size, shape, and edge characteristics of natural openings or natural disturbance processes. Once ground cover is established, the opening should look like a natural occurrence within one growing season after project completion.

GFW-SM-84: Slash within 100 feet of a Concern Level 2 travelway or use area should be reduced to 24 inches in height. Use mechanical methods (e.g., roller chopping, lopping) or prescribed burning to lower or

reduce slash height. Complete treatment within one year of the slash-producing activity.

GFW-SM-85: Minimize the number of log landings visible from a travelway.

Low SIO Areas

GFW-SM-86: In lands with a low scenic integrity objective, human alterations and management activities dominate the original scenic attributes of the natural or natural appearing landscape character. They borrow from naturally established design attributes – form, line color, and texture.

GFW-SM-87: Areas with a low scenic integrity objective are most appropriate for large regeneration prescriptions. In areas of rehabilitation and restoration, temporary openings should generally have a natural appearance. However, these openings may appear larger than openings in other SIO areas.

GFW-SM-88: Temporary openings and harvest activities are most evident and most frequent in low SIO areas. As much as possible, however, they should continue to mimic the size, shape, and edge characteristics of natural openings in the landscape or natural disturbance processes. Two growing seasons (after project completion) may be needed to achieve this natural appearance.

GFW-SM-89: These openings may include slash and coarse woody debris to achieve other resource goals.

GFW-SM-90: Do not pile or windrow slash adjacent to the treatment zone. The treated zone should extend at least 50 feet beyond the edge a travelway's cleared right-of-way. Complete treatment within one year of the slash producing activity.

GFW-SM-91: Minimize the number of log landings visible from a travelway.

Fuels Management

GFW-SM-92: When possible, limit the number of newly constructed fuelbreaks; utilize existing natural or man-made barriers as fuel breaks. Locate fuelbreaks to reduce linear appearance as viewed from travel routes, use areas, and water bodies.

GFW-SM-93: Revegetate newly constructed fuelbreaks upon project completion.

GFW-SM-94: Limit the number of high intensity fires (unless prescribed) to reduce long-term charring and scarring of trees.

Recreation Areas

GFW-SM-95: Enhance visitor experience by locating new recreation sites and trails at or near large attractive trees (for shading), unique topographic features, scenic vistas, cultural sites of interest, and/or large bodies of water.

GFW-SM-96: Utilize natural materials and colors when constructing new or maintaining existing recreation sites/facilities.

This page left blank for notes.

13 – Heritage

Goal 13.1 – Identify, Manage Heritage Resources

Provide current and future generations the opportunity to experience and appreciate the Forest's diversity of human history and the relationship between people and the land.

Objective 13.1a – Increase awareness and appreciation of the cultural heritage of the National Forest through interpretation and public education programs.

Objective 13.1b – Promote the scientific study of Forest heritage resources through partnerships with universities, heritage organizations, and government agencies.

Objective 13.1c – Reduce the backlog of heritage sites that require formal evaluation for eligibility to the National Register of Historic Places.

Objective 13.1d – Develop management plans for the long-term preservation of heritage resources that are either listed on or eligible for the National Register of Historic Places.

Standards / Guidelines for Heritage Resources

Heritage Resource Inventory

SFW-HERT-1: Conduct heritage resource inventories on scheduled project areas (defined as an "undertaking" in the National Historic Preservation Act) prior to any activity that could adversely impact heritage resources.

SFW-HERT-2: Use only professionally qualified archaeologists and archaeological technicians, or certified archaeological paraprofessionals under the guidance of a professionally qualified archaeologist, to conduct heritage inventories. Utilize volunteers only under the supervision of a qualified archaeologist.

SFW-HERT-3: Identify any site, district, building, structure, sacred site, traditional cultural property, or object that is included in or potentially eligible for inclusion on the National Register of Historic Places when conducting heritage inventories.

SFW-HERT-4: Develop a list of areas likely to harbor significant heritage resources to establish priority of need; then schedule programmatic surveys accordingly.

Heritage Resource Site Evaluation

SFW-HERT-5: Evaluate sites that could be affected by Forest Service activities for significance and potential listing on the National Register of Historic Places.

SFW-HERT-6: Consider any site not formally evaluated as potentially eligible for listing in the National Register of Historic Places. Extend protection to those sites.

SFW-HERT-7: Protect all unevaluated, eligible, and listed sites from ground-disturbing activities. An activity proponent and the Forest archaeologist must develop protective measures. If a project will adversely affect an NRHP-eligible heritage resource and it cannot be redesigned, develop and implement a mitigation plan in consultation with the Ohio Historic Preservation Office and the Advisory Council on Historic Preservation (ACHP).

Treatment of Human Remains

SFW-HERT-8: If human remains are discovered on the Forest, ensure they remain in place until Forest Service law enforcement is notified. If remains prove to be historic or pre-historic, subsequent treatment must comply with the Native American Grave Protection and Repatriation Act (NAGPRA).

Curation

SFW-HERT-9: Curate the Forest's heritage resource collections (e.g., artifacts and archival records) according to Federal standards (36 CFR 79). All materials recovered from NFS land will remain the property of the Federal government.

Historic Structures

SFW-HERT-10: Maintain, stabilize, restore, and rehabilitate all NRHP-eligible and listed structures and properties in accordance with the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings.

SFW-HERT-11: Formally document eligible properties that cannot be maintained or stabilized using the Historic American Buildings/Historic American Engineering Record (HABS/HAER) standards to mitigate the effect of deterioration.

Interpretation of Heritage Resources

GFW-HERT-12: Interpret for the public only those heritage resources determined not at-risk of damage or vandalism, both on and off site. Where possible, include in interpretive materials information on rules, regulations, and policies relating to site protection.

GFW-HERT-13: Develop interpretive products for heritage resources in accordance with Forest-wide interpretive goals and the Underground Railroad Management and Interpretive Plan for the Forests of the Eastern Region of the U.S. Forest Service, consistent with site protection values.

Charcoal Kiln Sites

SFW-HERT-14: The remains of charcoal kilns dating to the early iron furnace period are not considered eligible for the National Register of Historic Places, per consultation with the Ohio Historic Preservation Office (OHPO). Record each kiln (e.g., UTM location, condition, and dimensions) and submit information to OHPO for assignment of a State site number. Once documented, preservation and avoidance is no longer necessary. Preserve representative undisturbed examples for public interpretation where convenient.

Inadvertent Discoveries

SFW-HERT-15: When heritage resources are discovered during project implementation, cease all activities within the vicinity until a professional archaeologist has made an on-site assessment and a final determination has been made on what type of protection or mitigation is necessary. The Ohio Historic Preservation Office will be consulted if necessary, prior to the final determination being made.

This page left blank for notes.

14 – Land Ownership

Goal 14.1 – Consolidate Ownership

Adjust land ownership within the Forest proclamation boundary to enhance public benefits and improve management effectiveness.

Objective 14.1a – Purchase, exchange, accept donations, or convey lands and mineral rights on a willing seller, willing buyer basis. Give high priority to acquisition of land that will:

- Consolidate National Forest ownership
- Provide access to NFS lands and waters
- Protect or enhance threatened and endangered species habitat, sensitive species, heritage resources, or other special areas
- Provide opportunities for the creation, expansion or management of wetlands, lakes and ponds, or for recreational facilities
- Eliminate or correct sources of water pollution
- Consolidate surface and mineral estates
- Enhance opportunities for local community development.

Objective 14.1b – Acquire rights-of-way or property to improve access to NFS land.

Objective 14.1c – Foster good neighbor relations with local communities by:

- Not acquiring land that local communities identify as having high potential for development or that is prime farmland
- Considering land exchanges that provide opportunities for development of local communities and their economies
- Facilitating special use authorizations for utilities services to local communities within and near NFS ownership
- Co-locating Forest Service and local community-service communication facilities.

Goal 14.2 – Maintain Boundary Lines

Objective 14.2a – Survey and post landlines not currently marked. Maintain lines previously marked on a 10-year cycle.

Objective 14.2b – Resolve trespass/encroachment situations.

Standards / Guidelines for Landownership

SFW-LAND-1: Ensure that land surveys conform to Federal and State legal requirements and methodology.

SFW-LAND-2: Use condemnation authority only to acquire critically needed rights-of-way, complete critical water impoundment projects, or to clear title. Use condemnation only after all other efforts have failed.

15 – Special Uses

Goal 15.1 – Special Use Authorizations

Allow special uses that enhance or maintain appropriate public access and use.

Authorize special uses that:

- Serve the public
- Promote public health and safety
- Protect the environment
- Cannot be reasonably accommodated on private land.

Goal 15.2 – Communication Sites

Allow communication sites on NFS land to provide public benefits. Design and engineer sites to minimize adverse environmental and visual impacts.

Objective 15.2a – Manage the following communication sites for administrative and cooperators' use:

- Johns Creek – Ironton Ranger District
- Shawnee Tower – Athens Ranger District.

Objective 15.1b – Permit agricultural uses, including haying, where continuing existing uses will facilitate land acquisition.

Standards / Guidelines for Special Uses

GFW-SPEC-1: Require adequate bonds or other security instruments for special use authorizations that have potential for disturbances that may require rehabilitation or when needed to ensure other performance.

GFW-SPEC-2: Do not permit roads to cross NFS land for access to private land when public road access is adequate (or can be made adequate) or where a legal right-of-way via non-NFS land is available.

GFW-SPEC-3: Require underground placement of utility distribution lines, unless the environmental impacts of buried lines exceeds those of overhead lines.

GFW-SPEC-4: Locate new utility corridors outside wetlands and riparian areas.

GFW-SPEC-5: Minimize adverse effects on wildlife from mowing/haying by not mowing during the major bird-nesting period from early spring through June.

GFW-SPEC-6: Locate roads and utilities for access to private land or to privately held mineral rights in the same corridor.

Communication Sites

SFW-SPEC-7: Design communication towers and related ridge-top developments to minimize adverse impacts to bats and migratory birds. Encourage modification of existing communication towers to minimize adverse impacts on bats and migratory birds.

16 – Range

Goal 16.1 – Range Management

Permit livestock grazing to:

- Facilitate land acquisition by permitting current use by livestock
- Contribute to wildlife habitat objectives
- Help control non-native species.

Standards/Guidelines for Range

SFW-RANGE-1: Limit grazing to existing suitable open land. Neither woodland nor brushland may be converted to rangeland.

SFW-RANGE-2: Require grazing pastures to be fenced.

GFW-RANGE-3: Grazing pastures should retain a minimum 4-inch stubble height to protect plant vigor, insure proper ground cover, and provide for wildlife forage needs.

GFW-RANGE-4: Use fencing and placement of salt to manage livestock access to lakes, ponds, rivers, streams springs, or wetlands to reduce adverse impacts to these resources. (GFW-ARR-2 will also apply.)

GFW-RANGE-5: Do not seed or plant non-native grasses to enhance forage for grazing.

GFW-RANGE-6: Forage for grazing will normally consist of native cool-season grasses. Consider planting native warm-season grasses on suitable areas to extend the grazing period and enhance wildlife habitat and visual quality.

GFW-RANGE-7: Apply lime or fertilizer primarily to enhance native grasses, establish legume or other wildlife forage or to maintain pasture. Apply lime or fertilizer according to soil test results from the specific area to be treated. Do not exceed the soil's nutrient retention capacity.

This page left blank for notes.

17 – Facilities and Transportation System

Goal 17.1 – Buildings and Structures

Provide safe, efficient facilities and related structures that meet the needs of Forest visitors.

Objective 17.1a – Conduct detailed inspections of facilities every five years, more often if needed.

Objective 17.1b – Decommission facilities that are no longer needed.

Goal 17.2 – Safety and Effectiveness of Dams

Maintain dams as safe and effective water storage facilities.

Objective 17.2a – Maintain dams to standard.

Objective 17.2b – Inspect high hazard dams annually.

Objective 17.2c – Decommissioned or appropriately dispose of dams no longer needed.

Goal 17.3 – Transportation System

In cooperation with local, State, and Federal government agencies, provide a safe, efficient transportation system for moving people, equipment, and forest products.

Objective 17.3a – Reduce sedimentation and improve passage for aquatic and semi-aquatic organisms at Forest development road stream crossings and Forest Service recreation trail stream crossings.

Objective 17.3b – Decommission temporary and system roads when they are no longer needed for administration of the Forest or its resources.

Objective 17.3c – Maintain all roads in a condition that protects the government's investment. If funds do not allow for regular preventive maintenance, close roads or restrict traffic to protect resources or investment. [1]

Objective 17.3d – Maintain at Maintenance Level 3, or higher, roads intended for passenger vehicles. [1]

Objective 17.3e – Maintain at Maintenance Level 2 roads intended for high clearance vehicles. [1]

Objective 17.3f – Maintain at Maintenance Level 1 roads that are closed to public travel. [1]

Objective 17.3g – Remove hazard trees along Forest development roads from September 15 to April 15. [1]

[1] Numbering corrected 10/16/2008 by Administrative Correction # 1

Standards / Guidelines for Facilities and Transportation System

Facilities

GFW-TRANS-1: Design and construct facilities in accordance with the Built Environment Image Guide or the current most applicable publication.

GFW-TRANS-2: When purchasing lands that contain dam structures, require an engineering evaluation to determine if the facility will be accepted as part of the land agreement. Generally, do not accept dams in administrative class A or B (as detailed in FSM 7500 section) as part of land purchases.

GFW-TRANS-3: Regularly update emergency action plans for moderate- and high-hazard dams as needed to reflect current management and condition of the structure.

Transportation System

SFW-TRANS-4: Allow motor vehicles licensed for travel on the State and Federal highways to use National Forest System roads at Maintenance Levels 2 to 5.

GFW-TRANS-5: Place load limits on roads that are susceptible to damage.

SFW-TRANS-6: All roads are closed to the public unless the Forest road atlas specifically lists them as Maintenance Level 2 to 5 (open to the public).

GFW-TRANS-7: Avoid co-locating motorized trails with Maintenance Level 2 to 5 roads.

GFW-TRANS-8: Avoid new road construction:

- Within 50 feet of OHV or pedestrian trails (except at crossings)
- Within riparian areas
- Within the filterstrips of streams and waterways, except for infrequent crossings
- On mechanically unstable soils.

GFW-TRANS-9: Require permit holders to install and maintain an appropriate physical barrier on special use roads to prevent unauthorized use. If special use roads remain in place without a barrier, the permit holder must reconstruct the road to Maintenance Level 3.

GFW-TRANS-10: New road construction should follow the design guidance provided in Appendix A of the Forest-wide Roads Analysis document.

GFW-TRANS-11: Use existing roads as an alternative to construction of new roads whenever possible.

This page left blank for notes.

18 – Public Health and Safety

Goal 18.1 – Law Enforcement

Highly trained, equipped, and visible law enforcement officers and Forest personnel contribute to safe and enjoyable experiences for visitors. Effective law enforcement protects public and employee safety, and public property.

Objective 18.1a: Prevent violations of law through:

- Education
- Information and regulatory signing
- Improved facilities
- Effective citing and prosecution of violations
- Public notice of prosecutions and penalties
- Presence of uniformed Forest Service personnel
- Working with cooperating agency law enforcement officials at times and locations of heavy public use.

Objective 18.1b: Focus law enforcement efforts on Forest priorities to reduce incidence of:

- Illegal OHV use
- Arson fires
- Trespass and timber theft
- Trash dumping.

Objective 18.1c: Establish cooperative law enforcement agreements with State and local agencies. Review and adjust cooperative law enforcement (CLE) agreements every five years. Annually review and adjust operating plans developed under these agreements.

Objective 18.1d: Report violations of laws and regulations.

Goal 18.2 – Public Health and Pollution Control

Prevent contamination of National Forest soil, water, and air resources.

Manage and mitigate known contaminated sites to protect public health and Forest resources.

Objective 18.2a: Ensure that water supplies and wastewater facilities meet relevant State and Federal laws.

Objective 18.2b: Promote public education campaign to prevent illegal dumping and debris disposal on public lands.

Standards / Guidelines for Public Health and Safety

General

SFW-SAFE-1: The Forest Service will:

- Enforce Federal laws and regulations relating to the WNF
- Cooperate with local and State law enforcement agencies in the enforcement of all State and local laws on lands within the WNF
- Aid in the enforcement of State laws concerning livestock, the prevention and extinguishing of wildland fires, and the protection of fish and wildlife; and on issues of dumping and motorized recreation as agreed to with State, County and local law enforcement agencies.
- Aid other Federal agencies in the performance of their duties as they relate to the WNF.

SFW-SAFE-2: Law enforcement will be an integral part of overall WNF management involving all Forest Service employees. It will consist of:

- Preventing, detecting, investigating, and reporting violations of laws and regulations, including those actions leading to criminal and civil proceedings
- Cooperating with and aiding other enforcement agencies in fulfilling their responsibilities
- Helping deter arson fires on both NFS and private land within the Fire Protection Boundary.

SFW-SAFE-3: Annually establish emphasis areas for law enforcement.

SFW-SAFE-4: Respond proportionately to the frequency, severity, and types of violations.

SFW-SAFE-5: Make all law enforcement contacts in a courteous and professional manner.

SFW-SAFE-6: Conduct enforcement actions in a manner that promotes better understanding of laws, regulations, and the need for compliance.

SFW-SAFE-7: Give high priority to educating Forest visitors and users of applicable laws and regulations as a means to reduce and prevent criminal violations.

SFW-SAFE-8: Use appropriate publicity to deter violations of laws and regulations.

SFW-SAFE-9: Plan, design, and engineer facilities to help prevent violations.

SFW-SAFE-10: Take action to discover and investigate violation of laws. Continue investigations until responsibility is established or until every reasonable lead has been exhausted. Bring responsible parties to account through appropriate criminal and/or civil action. Protect government interest through investigation of actual or potential claims.

SFW-SAFE-11: Cooperate with and aid local State, and Federal agencies in the fulfillment of their responsibilities. Make maximum use of cooperative law enforcement agreements (16 U.S.C. 551a).

SFW-SAFE-12: Review and adjust Cooperative Law Enforcement (CLE) agreements every five years. Annually review operating plans developed under these CLE agreements based on:

- Forest law enforcement needs
- Quality of service available
- Availability of funds.

GFW-SAFE-13: Apply recommended security measures that are cost efficient in relation to risk and value of potential loss at all facilities.

GFW-SAFE-14: Give priority to law enforcement patrols in high-use areas during peak periods.

GFW-SAFE-15: Emphasize curtailment of illegal off highway vehicle use with the help of cooperating law enforcement agencies. (36 CFR 261.13 and 36 CFR 261.56).

GFW-SAFE-16: Consistent with normally assigned duties, cooperate with and assist, as requested, the Ohio Department of Natural Resources in the enforcement of Ohio fish and game laws (36 CFR 261.8) and in the prevention of water pollution and littering on NFS lands and waters.

Hazardous Materials

SFW-SAFE-17: Post warnings of dangerous conditions and threats of immediate concern for the safety of Forest employees and the public.

SFW-SAFE-18: Issue closure orders to protect the public when clear and present dangers cannot be mitigated in a timely manner.

SFW-SAFE-19: Prohibit disposal of non-Federal wastewater on Federal lands.

GFW-SAFE-20: Store fuels and other toxicants only when they are needed for ongoing management activities. Store and transport hazardous materials only in approved containers and facilities. Properly dispose of such items when no longer needed.

This page left blank for notes.

Chapter 3

Management Area Direction

Introduction

The 2006 Forest Plan for the Wayne National Forest (WNF) uses management areas (MAs) to define where different management activities and vegetative emphases are to be applied. The WNF's 1988 Forest Plan used a similar approach. Each area of the Forest is defined by a primary emphasis or MA prescription that guides activities to take place within it. All National Forest System (NFS) land administered by the WNF are to be managed according to these prescriptions.

Each MA is identified by a name and a map abbreviation and is defined using the following elements:

- **Purpose** – A short summary of management emphasis
- **Desired Future Condition** – A description of the desired ecological, recreational, and facilities characteristics of a management area
- **Suitability** – Classification of the area's suitability to produce timber and whether surface occupancy is permitted for Federal oil and gas leases
- **Standards and Guidelines** – Management direction specific to a MA beyond that provided by Forest-wide standards and guidelines.

This chapter addresses each management area separately. If a specific resource is not addressed in an MA prescription, then Forest-wide standards and guidelines provide management direction. In addition, Federal and State laws and regulations and Forest Service directives always apply, even if they are not specifically identified in MA direction. If terms used in management area descriptions are not defined in the text, please see the Glossary for definitions.

The maps in the Map Packet display the geographical locations of the MAs. Table 3 - 1 provides a list of the management areas, the page number where they can be found, the map abbreviation, and the acreage allocated to each MA.

Table 3 - 1. Acres Allocated to Management Areas [3]

Management Area Name	Page No.	Management Area Map Abbrev.	Acres Allocated [3]
Diverse Continuous Forest	3-3	DCF	**55,267**
Diverse Continuous Forest with Off-Highway Vehicles	3-7	DCFO	**22,626**
Historic Forest	3-11	HF	**26,278**
Historic Forest with Off-Highway Vehicles	3-15	HFO	**21,274**
Forest and Shrubland Mosaic	3-19	FSM	**54,580**
Grassland-Forest Mosaic	3-23	GFM	**5,334**
Future Old Forest	3-27	FOF	**16,478**
Future Old Forest with Mineral Activity	3-31	FOFM	**10,154**
River Corridor	3-35	RC	**12,544**
Developed Recreation	3-39	DR	**4,078**
Timbre Ridge Lake	3-43	TRL	**796**
Special Areas	3-47	SA	**7,546**
Research Natural Areas	3-53	RNA	**117**
Candidate RNA	3-57	CA	**981**

[3] Acreage is National Forest System land and is current as of 2/15/2005. Land acquired after this date will be added to the Management Area designation that the newly acquired land falls within.

Diverse Continuous Forest Management Area (DCF)

Purpose

This management area emphasizes providing mature forest habitat for conservation of forest interior species.

Desired Future Condition

This management area is characterized by large blocks of mature forest containing a variety of tree species of various ages and sizes. These provide habitat for interior forest wildlife species. Shrubby or herbaceous openings are interspersed within tree stands, but these are generally found near the periphery of large forest blocks. The varied forest canopy closure results in understory and midstory vegetation that ranges from sparse to dense, providing a variety of vertical forest structure. Older trees and snags are well distributed. Ponds and wetlands add to the diversity of the management area.

The long-term desired habitat composition is:

- 1-2% - Aquatic and wetland habitat
- 2-4% - Herbaceous or herbaceous/shrub habitat
- 75-85% - All-aged, multi-layered hardwood or hardwood/pine forest
- 10-25% - Even-aged hardwood forest
    - 8% - Early Successional forest (<10 years)
    - 8% - Early forest (10-19 years)
    - 32% - Mid-successional forest (20-59 years)
    - 32% - Late-successional forest (60-99 years)
    - 20% - Older, Overmature forest (>120 years)
- 1-5% - Even-aged pine forest
    - 12% - Early successional forest (<10 years)
    - 12% - Early Forest (10-19 years)
    - 24% - Mid-successional forest (20-39 years)
    - 24% - Late-successional forest (40-59 years)
    - 28% - Older, overmature forest (>60 years)

Shade tolerant/fire intolerant species such as maple and beech are becoming more predominant in the forest understory and canopy on the more mesic sites in this management area. The effects of low-intensity ground fire are evident, generally on ridges or drier slopes, where efforts to perpetuate oak and hickory species are emphasized. A variety of uneven-aged forest conditions are maintained over time, a result of predominately uneven-aged timber harvest and occasional prescribed fire.

Dispersed, non-motorized recreation opportunities are offered in this management area. Hiking, horseback riding, and mountain bike trails may be provided. Examples of dispersed recreational activities occurring in these areas include hiking, mountain bike riding, horseback riding, hunting, fishing, viewing scenery and wildlife, and gathering forest products. Recreation facilities are designed to fit the natural appearing landscape based upon site activity, type, and capacity.

Roads on the perimeter and within this management area provide access for recreation as well as resource management. New road construction may occur within this management area if needed for resource management. Most new Forest Service road construction is for roads that are closed after the management activity is completed.

Evidence of human activities is apparent. Resource activities such as vegetative management and mineral extraction are evident. Structures, utility corridors, and timber cutting as well as mineral exploration and development are also evident. However, these structures and activities are visible mainly from on-site locations or occasionally from a distance in broken terrain.

Interaction between users is moderate. Restrictions and controls are limited to those that apply generally to public land. There is a low probability of experiencing considerable isolation from the sights and sounds of people, or closeness to nature and tranquility.

Suitability

This management area is classified as suitable for timber production.

Surface occupancy of National Forest System land is allowed for the exploration and development of Federally owned minerals.

Standards/Guidelines

Vegetation

G-DCF-VEG-1: Use uneven-aged timber management (single-tree or group selection) on approximately 75 percent of the area to achieve a variable tree canopy over contiguous blocks of forest to provide habitat for interior forest species. Where NFS ownership is small, or is interspersed by private land, maintain the largest blocks of contiguous forest that can be reasonably managed using uneven-aged techniques.

G-DCF-VEG-2: Use even-aged timber management (thinning, shelterwood, clearcut, or two-aged harvest) on approximately 25 percent of the area to perpetuate visual and vegetative diversity. Concentrate even-aged management on the periphery of the management area or on the periphery of large blocks of land targeted for uneven-aged management.

S-DCF-VEG-3: In uneven-aged management, limit individual groups harvested using group selection regeneration harvests to 0.25 to 2.0 acres in size.

G-DCF-VEG-4: Manage even-aged portions of the management area in a 120-year rotation for hardwoods and 60 years for pine. To meet wildlife, visual, or other objectives, hardwood stands may be regenerated starting at 60 years of age and pine stands at age 30.

S-DCF-VEG-5: Limit even-aged regeneration harvests to 2 to 20 acres in size.

G-DCF-VEG-6: In single-tree selection, design the harvest to retain adequate numbers of large trees for wildlife habitat.

G-DCF-VEG-7: Tree stocking of the regeneration within the group selection harvest areas should generally be kept comparable to stocking in even-aged stands.

G-DCF-VEG-8: Treatment entry cycle for areas being regenerated via single-tree or group selection is 20 to 30 years.

Wildlife

G-DCF-WLF-1: Use uneven-aged vegetation management within 100 feet of all headwater streams, unless habitat management for a Federally listed species or Regional Forester sensitive species requires a different technique.

Recreation

S-D CF-REC-1: Motorized trail use is not permitted in this management area except for administrative use.

This page left blank for notes.

Diverse Continuous Forest with Off-Highway Vehicles Management Area (DCFO)

Purpose

This management area emphasizes trails for motorized recreation and mature forest habitat for conservation of forest interior species.

Desired Future Condition

This management area is characterized by large blocks of mature forest containing a variety of tree species of various ages and sizes. These provide habitat for interior forest wildlife species. Shrubby or herbaceous openings are interspersed within tree stands, but these are generally found near the periphery of large forest blocks. The varied forest canopy closure results in understory and midstory vegetation that ranges from sparse to dense, providing a variety of vertical forest structure. Older trees and snags are well distributed. Ponds and wetlands add to the diversity of the management area.

The long-term desired habitat composition is:

- 1-2% - Aquatic and wetland habitat
- 2-4% - Herbaceous or herbaceous/shrub habitat
- 75-85% - All-aged, multi-layered hardwood or hardwood/pine forest
- 10-25% - Even-aged hardwood forest
    - 8% - Early Successional forest (<10 years)
    - 8% - Early forest (10-19 years)
    - 32% - Mid-successional forest (20-59 years)
    - 32% - Late-successional forest (60-99 years)
    - 20% - Older, Overmature forest (>120 years)
- 1-5% - Even-aged pine forest
    - 12% - Early successional forest (<10 years)
    - 12% - Early Forest (10-19 years)
    - 24% - Mid-successional forest (20-39 years)
    - 24% - Late-successional forest (40-59 years)
    - 28% - Older, overmature forest (>60 years)

Shade tolerant/fire intolerant species such as maple and beech are becoming more predominant in the forest understory and canopy on the more mesic sites in this management area. The effects of low-intensity ground fire are evident, generally on ridges or drier slopes, where efforts to perpetuate oak and hickory species are emphasized. A variety of

uneven-aged forest conditions are maintained over time using predominately uneven-aged timber harvest and occasional prescribed fire.

Motorized recreation opportunities are emphasized. Off-highway vehicle trails are developed and maintained to provide for safe trail riding. Moderate amounts of non-motorized recreation are also available. Hiking, horse, and mountain bike trails may be created to connect an existing trail system as long as these do not interfere with the OHV trails. Examples of dispersed recreational activities occurring in these areas include, hiking, mountain bike riding, hunting, and fishing; viewing scenery and wildlife, and gathering forest products.

Evidence of human activities such as vegetation management, fire scars, road use, motorized trail use, and mineral extraction is apparent. Recreation facilities are designed to fit the natural appearing landscape based on site activity, type, and capacity.

Interaction between users is moderate. The probability of experiencing considerable isolation from the sights and sounds of people or closeness to nature and tranquility is low.

Roads on the perimeter and within this management area provide access for dispersed recreational and resource management. New road construction may occur within this management area if needed for resource management. Most new Forest Service road construction is for temporary roads that will likely be closed after a management activity is completed. Roads within this area not under township, county or State jurisdiction will usually be open to the public unless they are constructed for temporary purposes.

Structures, utility corridors, timber cutting, mineral exploration, and mineral development are evident. Such structures and activities are visible mainly from on-site locations or occasionally from a distance in broken terrain.

Suitability

This management area is classified as suitable for timber production.

Surface occupancy of National Forest System land is allowed for exploration and development of Federally owned minerals.

Standards/Guidelines

Vegetation

G-DCFO-VEG-1: Use uneven-aged timber management (single-tree or group selection) on approximately 75 percent of the area to achieve a variable tree canopy over contiguous blocks of forest to provide habitat for interior forest species. Where National Forest System ownership is small or is interspersed by private land, maintain the largest blocks of

contiguous forest that can be reasonably managed using uneven-aged techniques.

G-DCFO-VEG-2: Use even-aged timber management (thinning, shelterwood, clearcut, or two-aged harvest) on approximately 25 percent of the area to perpetuate visual and vegetative diversity. Concentrate even-aged management on the periphery of the management area or on the periphery of large blocks of land targeted for uneven-aged management.

S-DCFO-VEG-3: In uneven-aged management, individual groups harvested using group-selection regeneration harvests must be between 0.25 and 2.0 acres in size.

G-DCFO-VEG-4: Manage even-aged portions of the management area on a 120-year rotation for hardwoods and 60 years for pine. To meet wildlife, visual, or other objectives, hardwood stands may be regenerated starting at 60 years of age and pine stands at age 30.

S-DCFO-VEG-5: Limit even-aged regeneration harvests to 2 to 20 acres.

G-DCFO-VEG-6: In single-tree selection, design the harvest to retain adequate numbers of large trees for wildlife habitat.

G-DCFO-VEG-7: Tree stocking of the regeneration within group-selection harvest areas generally is to be kept comparable to stocking in even-aged stands.

G-DCFO-VEG-8: Treatment entry cycle for areas being regenerated via single-tree or group selection is 20 to 30 years.

G-DCFO-VEG-9: In areas that are to be regenerated with even-aged techniques, no more than 9 percent of the hardwood stands and no more than 12 percent of the conifer stands are to be harvested in a 10-year period.

Wildlife

G-DCFO-WLF-1: Use uneven-aged vegetation management within 100 feet of all headwater streams, unless habitat management for a Federally listed species or Regional Forester sensitive species requires a different technique.

Recreation

G-D CFO-REC-1: Direction for this management area are similar to the Diverse Continuous Forest Management Area except:

- Motorized vehicle use on designated trails is emphasized.
- Construction of new motorized trails is permitted.
- Construction of new non-motorized trails will generally not occur.

Land

S-D CFO-LAND-1: Emphasize acquisition of parcels that will facilitate completion of OHV trail loops and other high priority OHV trails and trailheads.

Historic Forest Management Area (HF)

Purpose

The emphasis of this management area is the restoration and maintenance of the oak-hickory ecosystem through a combination of mostly uneven-aged timber harvest and frequent prescribed fire.

Desired Future Condition

Forest conditions have always varied over space and time, due to natural processes and changes in climate as well as natural and man-made disturbances. Forest and fire ecologists believe current conditions of the central hardwood forests lie outside their historic range of variability. The desired future condition of this management area is a mix of vegetation more nearly resembling the historic range that existed prior to 18th/19th century settlement and development. Current fuel loading/fire behavior in much of the central hardwoods is classified as Fire Regime Condition Class 2 or 3, whereas it is believed that the pre-settlement forest would have primarily been in a Fire Regime Condition Class 1.

An oak-hickory forest dominates the landscape of this management area. Oak and hickory species are typically present on ridges and drier sites, whereas coves and moist northern slopes contain a mixture of oaks together with maples, beech, and yellow poplar. Trees vary in age and size, but large, widely spaced trees dominate the landscape. The forest canopy contains small gaps because the crowns do not completely close, and single or small clumps of trees blow down, die, or are removed. Tree canopy cover averages 60-80 percent (or 20-40% open) over the management area allowing light to reach the forest floor. Away from streamside areas, moist slopes and coves, low to moderate densities of understory vegetation, give the appearance of open woodland. The forest is moved toward the historic range of variability over time using mostly uneven-aged management techniques and prescribed fire.

A variety of wildlife is present, but habitat conditions are especially favorable for species dependent on large oak and hickory trees and a near-continuous canopy. The open nature of the forest provides suitable foraging habitat for the Indiana bat, while the hard mast produced by the oak and hickories benefits many mammals and birds.

The long-term desired habitat composition is:

- 1-2% - Aquatic and wetland habitat
- 2-5% - Herbaceous or herbaceous/shrub habitat
- 90-97% - All-aged, multi-layered hardwood or hardwood/pine forest
- 0% - Even-aged hardwood forest

- 0% - Even-aged pine forest.

Moderate amounts of non-motorized recreation opportunities are provided, such as viewing wildlife and scenery, hunting, horseback riding, fishing, berry picking, trapping, hiking, and the gathering of forest products. In some areas, trails may provide access for non-motorized activities. There is low to moderate probability of experiencing isolation from the sights and sounds of people. Forest visitors experience a moderate feeling of independence, closeness to nature, and tranquility. Recreation facilities fit the natural appearing landscape and are based on site activity, type, and capacity.

Evidence of human activities such as vegetation management, fire scars, road use, and mineral extraction may be evident. Roads on the perimeter and within this management area are used for a variety of recreation activities and resource management. Roads are located to provide access to many areas of the Forest for silvicultural treatment, but most new road construction is temporary in nature.

Adaptive Management

As projects and treatments are implemented and vegetation changes across the landscape, some practices will prove to be more effective than others, depending on site characteristics and time of implementation. As these results are monitored, the types and mix of treatments will be adapted to suit the particular ecological land types.

Suitability

This management area is classified as suitable for timber production.

Surface occupancy of National Forest System land is allowed for the exploration and development of Federally owned minerals.

Standards/Guidelines

Vegetation

G-HF-VEG-1: To meet the desired condition canopy cover, thin stand overstories to a basal area of between 55 and 65 square feet.

G-HF-VEG-2: After desired general stand structure is achieved, use selection timber harvest methods as necessary to perpetuate dominance of large, widely spaced trees.

G-H F-VEG-3: As initial treatments, thin stands from below. Trees to be left after the thinning is finished should be primarily long-lived oaks. If not on the site presently, other oaks and hickories should be favored as leave-trees. On north slopes and in moist coves other hardwoods, such as yellow poplar and sugar maple, may be selected as leave trees.

G-HF-VEG-4: After the initial thinning and other silvicultural treatment, use selection timber harvest methods that will give dominance to large, widely spaced trees.

G-HF-VEG-5: Favor oak regeneration by controlling non-oak species (particularly red and sugar maple) in the understory. Control may be a combination of mechanical removal, herbicide, and/or prescribed burning, whichever is best suited to individual stand conditions.

G-H F-VEG-6: After stand conditions are established through the treatments listed above, maintain these conditions through periodic spring or fall prescribed fires (every 3-10 years) in order to:

- Control maple, poplar, and cherry reproduction
- Allow oak regeneration to develop
- Diversify the herbaceous plant community.

Use herbicides if the prescribed burns do not adequately control the maple, poplar, and cherry reproduction.

G-HF-VEG-7: When the crowns begin to close (if there are less than 15% crown openings), use timber harvest to achieve a 20-40 percent open canopy.

G-HF-VEG-8: Provide interpretation (signing, publications, tours, and news releases, etc.) of the objectives and management techniques used in this management area.

Recreation

S-HF-REC-1: Motorized trail use is not permitted in this management area except for administrative use.

This page left blank for notes.

Historic Forest with Off-Highway Vehicles Management Area (HFO)

Purpose

This management area emphasizes providing trails for motorized recreation and the restoration and maintenance of the mixed oak ecosystem through a combination of mostly uneven-aged timber harvest and frequent prescribed fire.

Desired Future Condition

Motorized recreation opportunities are emphasized. Off-highway vehicle trails are developed and maintained to provide safe trail riding. Moderate amounts of non-motorized recreation are also available. Hiking, horse, and mountain bike trails may be created to connect an existing trail system as long as they do not interfere with the OHV trails. No new non-motorized trail system would be constructed, however. Examples of dispersed recreational activities that occur in these areas include hiking, mountain bike riding, hunting, and fishing; berry picking, viewing scenery and wildlife, and the gathering of forest products.

There is low to moderate probability of experiencing isolation from the sights and sounds of people. Forest visitors will experience a moderate feeling of independence, closeness to nature, and tranquility. Recreation facilities fit the natural appearing landscape and are based on site activity, type, and capacity. Evidence of human activities such as vegetation management, fire scars, road use, motorized trail use, and mineral extraction is apparent.

Roads on the perimeter and within this management area are used to provide access for dispersed recreational activities and resource management. New road construction may occur within this management area to provide access for resource management. Most new Forest Service road construction is for temporary roads that will likely be closed after a management activity is completed. Roads within this area, which are not under township, county, or State jurisdiction will usually be open to public vehicle traffic, unless they are constructed for temporary purposes.

Forest conditions have always varied over space and time, due to natural processes and changes in climate as well as natural and man-made disturbances. Forest ecologists believe current conditions of the central hardwood forests lie outside their historic range of variability. The desired future condition of this management area is a mix of vegetation more nearly resembling the historic range that existed prior to 18th/19th century settlement and development. Current fuel loading/fire behavior in much of the central hardwoods is classified as Fire Regime Condition Class 2 or 3,

whereas it is believed that the pre-settlement forest would have primarily been in a Fire Regime Condition Class 1.

An oak-hickory forest dominates the landscape of this management area. Oak and hickory species are typically present on ridges and drier sites, whereas coves and moist northern slopes contain a mixture of oaks together with maples, beech, and yellow poplar. There is a diversity of tree ages and sizes, with large, widely spaced trees dominate the landscape. The forest canopy contains small gaps because the crowns do not completely close and single or small clumps of trees blow down, die, or are removed. Tree canopy cover averages 60-80 percent (or 20-40% open) over the management area allowing light to reach the forest floor. Away from streamside areas, moist slopes and coves, there is low to moderate densities of understory vegetation, giving the appearance of open woodland. The forest is moving toward the historic range of variability over time using mostly uneven-aged management techniques and prescribed fire.

A variety of wildlife is present, but habitat conditions especially favor species dependent on large oak and hickory trees and a near-continuous canopy. The open nature of the forest provides suitable foraging habitat for the Indiana bat, while the hard mast produced by the oaks and hickories benefits many mammals and birds.

The long-term desired habitat is:

- 1-2% - Aquatic and wetland habitat
- 2-5% - Herbaceous or herbaceous/shrub habitat
- 90-97% - All-aged, multi-layered hardwood or hardwood/pine forest
- 0% - Even-aged hardwood forest
- 0% - Even-aged pine forest.

As projects and treatments are implemented within this management area and the vegetation changes across the landscape, some practices will prove to be more effective than others, depending on the site characteristics and time of implementation. As these results are monitored, the types and mix of treatments are adapted to suit the particular ecological land types.

Suitability

This management area is classified as suitable for timber production.

Surface occupancy is allowed for the exploration and development of Federally owned minerals.

Standards/Guidelines

Vegetation

G-HFO-VEG-1: To meet the desired condition canopy cover, thin stand overstories to a basal area of between 55 and 65 square feet.

G-HFO-VEG-2: After desired general stand structure is achieved, use selection timber harvest methods as necessary to perpetuate dominance of large, widely spaced trees.

G-HFO-VEG-3: As initial treatments, thin stands from below. Trees to be left after the thinning is finished should be primarily long-lived oaks. If not on the site presently, other oaks and hickories should be favored as leave-trees. On north slopes and in moist coves other hardwoods, such as yellow poplar and sugar maple, may be selected as leave trees.

G-HFO-VEG-4: After the initial thinning and other silvicultural treatment, use selection timber harvest methods that will give dominance to large, widely spaced trees.

G-HFO-VEG-5: Favor oak regeneration by controlling non-oak species (particularly red and sugar maple) in the understory. Control may be a combination of mechanical removal, herbicide, and/or prescribed burning, whichever is best suited to individual stand conditions.

G-H FO-VEG-6: After stand conditions are established through the treatments listed above, maintain these conditions through periodic spring or fall prescribed fires (every 3-10 years) in order to:

- Control maple, poplar, and cherry reproduction
- Allow oak regeneration to develop
- Diversify the herbaceous plant community.

Use herbicides if the prescribed burns do not adequately control maple, poplar, and cherry reproduction.

G-HFO-VEG-7: When crowns begin to close (if there are less than 15% crown openings), use timber harvest to achieve a 20-40 percent open canopy.

Recreation

G-H FO-REC-1: Management area direction is similar to the Diverse Continuous Forest Management Area except:

- Motorized vehicle use on designated trails is emphasized.
- Construction of new motorized trails is permitted.
- Construction of new non-motorized trails would generally not occur.

Land

S-H FO-LAND-1: Emphasize acquisition of land that will facilitate completion of OHV trail loops and other high priority OHV trails and trailheads.

Forest and Shrubland Mosaic Management Area (FSM)

Purpose

This management area maintains a supply of early successional habitat interspersed throughout a forested landscape. Dispersed, non-motorized recreation opportunities are offered in this management area.

Desired Future Condition

Early successional habitat patches of various sizes are distributed throughout a forested landscape. The area also contains forest communities over 100 years old and permanent herbaceous forest openings. Ponds and wetlands enhance wildlife and visual diversity.

Shrub and seedling/sapling forest habitats, along with associated species, flourish and contribute to overall landscape biodiversity and conservation. As shrub and seedling/sapling forest habitats grow into stands of pole-sized trees, new shrub and seedling/sapling forest habitat are created by even-aged timber harvest.

The mix of forest communities generally consists of oak and hickory in the uplands and on drier hillsides with yellow poplar, beech, maples, oaks, hickories and other mesic species on moist slopes and in bottomlands. Native pine communities occur in portions of this area.

The long-term desired habitat composition is:

- 1-2% - Aquatic and wetland habitat
- 3-6% - Herbaceous or herbaceous/shrub habitat
- 10-25% - All-aged, multi-layered hardwood or hardwood/pine forest
- 75-85% - Even-aged hardwood forest
    - 8% - Early successional forest (<10 years)
    - 8% - Early forest (10-19 years)
    - 32% - Mid-successional forest (20-59 years)
    - 32% - Late-successional forest (60-99 years)
    - 20% - Older, overmature forest (>120 years)
- 1-10% - Even-aged pine forest
    - 12% - Early successional forest (<10 years)
    - 12% - Early Forest (10-19 years)
    - 24% - Mid-successional forest (20-39 years)
    - 24% - Late-successional forest (40-59 years)
    - 28% - Older, overmature forest (>60 years)

Prescribed fire plays a role in the maintenance of some forest communities and species, ensuring the continued presence of fire-dependent ecosystems. Forest fuel amounts do not unreasonably endanger long-term forest ecosystem health or threaten adjacent non-Federal improvements.

Roads on the perimeter and within this management area provide access for dispersed recreation and resource management activities. New road construction may occur if needed for resource management. Most new Forest Service road construction is for roads that will likely be closed after completion of a management activity.

Evidence of human activities such as vegetation management, fire scars, road use, trail use, and mineral extraction occurs in this area. Interaction between users is moderate. Restrictions and controls may be evident. There is a low probability of experiencing isolation from the sights and sounds of people, independence, and closeness to nature and tranquility.

Trails for hiking, mountain biking, and horseback riding may be provided. Hiking, mountain biking, horseback riding, hunting, fishing, viewing scenery and wildlife, and gathering forest products are examples of recreational activities which may occur in these areas. Recreational facilities fit the natural appearing landscape based on site activity, type, and capacity.

Suitability

This management area is classified as suitable for timber production.

Surface occupancy of National Forest System land is allowed for the exploration and development of Federally owned minerals.

Standards/Guidelines

Vegetation

G-FSM-VEG-1: Even-aged management (thinning, two-aged, clearcut, and shelterwood) is the predominant silvicultural system. Use uneven-aged management (group selection or single-tree selection) to meet habitat needs along riparian corridors and special visual quality objectives, such as along roads and trails.

G-FSM-VEG-2: Limit size of group selection regeneration harvests to 0.25 to 2.0 acres.

G-FSM-VEG-3: Primary rotation ages are 60 years for conifers and 120 for hardwoods. To meet wildlife, visual, or other objectives, pine stands may be regenerated at age 30 to 150 years, and hardwood stands may be regenerated at age 60 to 150 years.

G-FSM-VEG-4: The final harvest in shelterwood may be accomplished after satisfactory regeneration is established. This will usually be a minimum of 5 years after the initial harvest.

G-FSM-VEG-5: Prescriptions for stands where uneven-aged management is applied will be similar to the prescriptions applied in the Diverse Continuous Forest Management Area.

G-FSM-VEG-6: Provide interpretation (signing, publications, tours, and news coverage, etc.) of the objectives and management techniques used in this management area.

Wildlife

G-FSM-WLF-1: Temporary openings in the forest canopy, resulting from even-aged timber harvest, should vary in size from 2 to 30 acres to provide habitat for a variety of early successional species, including those that do not use smaller openings.

G-FSM-WLF- 2: Locate patches of early successional habitat in proximity to mid-successional and late-successional habitat patches.

Recreation

S-F SM-REC-1: Motorized trail use is not permitted in this management area except for administrative use.

This page left blank for notes.

Grassland and Forest Mosaic Management Area (GFM)

Purpose

This management area emphasizes habitat for grassland-dependent wildlife species on reclaimed coalmine lands. Dispersed, non-motorized recreation opportunities are offered in this management area.

Desired Future Condition

The landscape appears as a mosaic of large grassland areas edged with shrub and various-aged forest habitat. Non-native invasive species are not found in grassland habitats, and aggressive native species are controlled. Periodic application of prescribed fire retards succession to shrubs and trees, promotes growth of grasses and forbs, and a diversity of grassland habitats. Small ponds and wetlands add to habitat diversity and provide watering sources for wildlife. Small mammals, reptiles, amphibians and numerous bird species find habitat in these areas. These include Henslow's and other grassland-dependent sparrows, bobwhite quail, prairie warbler, and yellow-breasted chat.

The forested areas surrounding these grasslands are managed as a mosaic of early successional habitat patches of various sizes interspersed in the predominately forested landscape. To replace the areas growing out of this habitat condition, new early successional forest habitat is created using predominately even-age timber management. The mix of forest communities generally consists of oak and hickories in the uplands and on drier hillsides with yellow poplar, beech, maples, oaks, hickories, and other mesic species on moist slopes and in bottomlands. Native pine communities occur in small portions of this area.

The long-term habitat composition objective of the management area is:

- 0-2% - Aquatic and wetland habitat
- 30-40% - Herbaceous or herbaceous/shrub habitat
- 1-10% - All-aged, multi-layered hardwood or hardwood/pine forest
- 40-50% - Even-aged hardwood forest
    - 8% - Early successional forest (<10 years)
    - 8% - Early forest (10-19 years)
    - 32% - Mid-successional forest (20-59 years)
    - 32% - Late-successional forest (60-99 years)
    - 20% - Older, Overmature forest (>120 years)
- 1-10% Even-aged pine forest
    - 12% - Early successional forest (<10 years)
    - 12% - Early forest (10-19 years)

- 24% - Mid-successional forest (20-39 years)
- 24% - Late-successional forest (40-59 years)
- 28% - Older, overmature forest (>60 years)

Hiking, mountain biking, horseback riding, hunting, fishing, viewing scenery and wildlife, and berry picking are examples of the recreational activities that occur in these areas.

Interaction between users is low to moderate. These areas are essentially free from the evidence of restrictions and controls. There is moderate probability of experiencing considerable isolation from the sights and sounds of people, independence, closeness to nature, tranquility, and self-reliance. Human activities are evident as a result of mineral and timber extraction.

Roads on the perimeter or within this management area are used largely to facilitate resource management and provide access for recreational activities. Whenever resource conditions allow, roads are open for public use.

Suitability

This management area is classified as suitable for timber production.

Surface occupancy of National Forest System land is allowed for the exploration and development of Federally owned minerals.

Standards/Guidelines

Vegetation

G-**GFM-VEG-1:** Apply the guidelines from the Forest and Shrubland Mosaic Management Area to forested areas within this management area.

Wildlife

G-GFM-WLF-1: Maintain existing grassland patches of 5 to 250 acres or larger.

G-GFM-WLF-2: Reduce encroachment of woody vegetation in grassland habitats with prescribed fire, mowing, herbicides, or light and intermittent grazing as part of a rotational regime that maintains appropriate grassland vegetation structure. Schedule management activities only on portions of grassland habitat each year to ensure that adequate habitat is continuously available for various wildlife species dependent on different grassland conditions.

G-GFM-WLF-3: Mow grasslands only after September 1st to avoid negative impacts to spring and summer nesting birds.

G-GFM-WLF-4: Avoid discing grassland fields, unless done to convert non-native vegetation to native vegetation.

G-GFM-WLF-5: Use 3-year rotations, or longer, for prescribed fire. Use methods that produce low intensity fires.

G-GFM-WLF-6: Existing grassland habitats should not be planted with trees unless need for soil erosion control or wildlife habitat enhancement. To meet composition objectives, some lands that currently have tree stocking may be mowed, burned, or treated with chemicals to meet the objectives for grass and/or shrubs.

G-GFM-WLF-7: Promote grassland vegetation diversity by considering mixtures of grasses and legumes when converting areas from non-native to native species.

G-GFM-WLF-8: Temporary openings in the forest canopy, resulting from even-aged vegetation management treatments, should vary between 5 to 30 acres to provide habitat for a variety of early successional species, including those species that do not use smaller patches of shrub habitat.

G-GFM-WLF-9: Locate patches of early successional habitat in proximity to mid-successional and late-successional habitat patches.

G-GFM-WLF-10: Provide interpretation (signing, publications, tours, and news releases, etc.) of grassland management and mine reclamation.

Recreation

S-G FM-REC-1: Motorized trail use is not permitted in this management area except for administrative use.

This page left blank for notes.

Future Old Forest Management Area (FOF)

Purpose

This management area is characterized mostly by old forest that changes only as a result of natural disturbances and natural succession. These areas offer Forest visitors opportunities to experience solitude and closeness to nature. Such opportunities may be limited in the vicinity of private oil and gas rights until the oil and gas reservoirs are depleted.

Desired Future Condition

Extensive stands of old central hardwoods dominate the landscape. These stands contain a mix of tree sizes but are visually dominated by large, mature trees.

Numerous large, old trees, mid-size trees, and a scattering of snags and dying trees of all sizes, as well as downed, rotting trees are present throughout this management area. Woody debris from fallen trees is evident on the forest floor and in streams flowing through the area. Downed logs from trees of differing sizes are in various stages of decay. Tree stem density is generally high but variable, depending on species and location. The forest tree canopy is generally closed, but tree fall or death creates gaps that become home to dense shrub and young tree growth.

Natural processes will eventually change the forest composition of this management area. Over time, shade tolerant/fire intolerant tree species, such as maple and beech, will dominate the understory and canopy. Conversely, the amount of oaks and hickories will decline. Rare communities and associated species not dependent on disturbances will continue to exist, while disturbance dependent communities will generally decline across this management area.

Terrestrial wildlife associated with this area includes area-sensitive forest interior species such as the worm-eating warbler, Louisiana waterthrush, cerulean warbler, and wood thrush as well as species sensitive to human disturbance, such as black bear.

The long-term desired habitat composition is:

- 0-1% - Aquatic and wetland habitat
- 0-1% - Herbaceous or herbaceous/shrub habitat
- 99-100% - All-aged, multi-layered hardwood or hardwood/pine forest
- 0% - Even-aged hardwood forest
- 0% - Even-aged pine forest

Forest Service roads will be closed and decommissioned where they are no longer needed, except for access to cemeteries, private oil and gas developments, or similar specific uses. Roads necessary for access to NFS land or special use authorizations adjacent to this management area, to which reasonable access cannot otherwise be obtained, will remain. Construction of temporary roads across this management area for access to complete reclamation or needed management activities will be allowed on a case-by-case basis when other access is not feasible. Roads are designed and constructed to the minimum maintenance standard required for the activity they support. They will be closed and decommissioned when no longer needed.

Use of roads that access privately held sub-surface rights or existing Federal leases are restricted to only those users or their agents to access, develop, or maintain their property. In some portions of the area, access for hiking, horseback riding, viewing wildlife and scenery, fishing and other non-motorized forms of recreation is provided by trails.

Interaction among users is low to moderate. There is subtle evidence of other users except in the vicinity of oil and gas developments. These areas are essentially free from evidence of restrictions and controls. They offer a semi-primitive, non-motorized recreational experience. There is moderate to high probability of experiencing considerable isolation from the sights and sounds of people. Visitors can enjoy a feeling of independence, closeness to nature, tranquility, and self-reliance.

Utility corridors occur here only when locating them elsewhere would not be in the public interest. The Forest Service has no jurisdiction over mineral exploration and extraction on outstanding or reserved existing mineral rights. Roads, pipelines, and electrical lines necessary for the development of minerals on private lands or on privately held subsurface rights may occur on NFS land where such routes provide the most logical and environmentally sound access.

Suitability

This management area is classified as unsuitable for timber production.

No surface occupancy of National Forest System land is allowed for the exploration and development of Federally owned minerals, except on existing leases.

Standards/Guidelines

Vegetation

S-FOF-VEG-1: Cut trees only when necessary for public safety (e.g., trees posing hazards along roads or trails).

S-FOF-VEG-2: Collection of special forest products that require a permit is prohibited.

Wildlife

S-FOF-WLF-1: Limit wildlife, fisheries, and plant habitat management to treatments for the protection or recovery of Federally listed species, Regional Forester sensitive species, and other rare species (e.g., populations of fire dependent plant species).

Forest Health

G-F OF-FH-1: Consider prevention or control of pests, diseases, and/or non-native invasive species (NNIS) to:

- Prevent spread of NNIS already present in the area
- Eradicate non-native invasive species that are present but not yet well established (e.g., removal of ash trees to eradicate the emerald ash borer or herbicide treatment to eradicate a NNIS plant species that is not widely established within the management area)
- Prevent the spread of outbreaks onto adjacent private land.

G-FOF-FH-2: Limit treatment of non-native invasive species to the immediate area of the NNIS infestation.

Recreation

S-FOF-REC-1: Manage the area to provide semi-primitive non-motorized (SPNM) Recreation Opportunity Spectrum (ROS) experiences.

S-FOF-REC-2: Provide minimal facilities necessary to prevent site deterioration and to protect visitors' health and safety consistent with semi-primitive non-motorized recreational opportunities. Facilities for resource protection may offer user convenience such as designated camp sites, trail heads, and primitive toilets. Such facilities should be designed for a rustic appearance and be constructed from native and/or natural materials.

S-FOF-REC-3: Motorized trail construction is not permitted in this management area.

S-FOF-REC-4: OHV use is prohibited in this management area except for administrative use.

S-FOF-INTERP-1: Limit interpretive signing to trailheads.

Land Ownership

G-FOF-LAND-1: Emphasize land acquisition to consolidate surface and subsurface ownership.

Facilities and Transportation

S-FOF-TRANS-1: Limit construction of facilities to those necessary to address health and safety concerns.

G-FOF-TRANS-2: Do not construct temporary roads in this management area except for watershed restoration projects, administrative use, or for access into adjacent management areas where alternative routes are not feasible.

S-FOF-TRANS-3: Decommission unauthorized roads or system roads no longer needed for administration of National Forest system lands.

G-FOF-TRANS-4: Collector and arterial roads (Maintenance Levels 2 to 5) crossing the management area may remain open to the public, though seasonal closures may be used to protect resources.

Future Old Forest with Mineral Activity Management Area (FOFM)

Purpose

This management area is located on the Marietta Unit of the Athens Ranger District. Similar to the Future Old Forest (FOF) Management Area, a primarily custodial regime of vegetation management is planned to:

- Promote mostly old forest that changes only as a result of natural disturbance and succession
- Provide opportunities for relatively primitive recreation experiences.

Unlike the FOF Management Area, surface occupancy of Federal oil and gas leases is permitted here. Many oil and gas wells are already present within this management area, both on lands in private surface ownership and on NFS land where the subsurface minerals are privately owned (outstanding and reserved rights).

Desired Future Condition

Extensive stands of old-growth upland central hardwoods dominate the landscape. These stands contain trees of varying sizes but are visually dominated by large, mature trees. Because of the privately held mineral rights that lie beneath these areas, oil and gas wells and their associated facilities are not uncommon.

Numerous large, old trees, mid-size trees, and a scattering of snags and dying trees of all sizes, as well as downed, rotting trees are present throughout this management area. Woody debris from fallen trees is evident on the forest floor and in streams flowing through the area. Downed logs from trees of differing sizes are in various stages of decay. Tree stem density is generally high, but varied, based on specific species and location. The forest tree canopy is generally closed, but tree fall or death creates gaps that become home to dense shrub growth and young tree growth.

Natural processes will eventually result in a change of forest composition in this management area. Over time, shade tolerant tree species, such as red maple and beech, will dominate the understory and canopy. Conversely, the amount of oaks and hickories will decline. Rare communities and associated species not dependent on disturbances will continue to exist, while disturbance-dependent communities will generally decline across the area.

Terrestrial wildlife associated with this area includes area-sensitive, forest-interior species such as the worm-eating warbler, Louisiana waterthrush, cerulean warbler, and wood thrush.

The long-term desired habitat composition is:

- 0-1% - Aquatic and wetland habitat
- 0-1% - Herbaceous or herbaceous/shrub habitat
- 99-100% - All-aged, multi-layered hardwood or hardwood/pine forest
- 0% - Even-aged hardwood forest
- 0% - Even-aged pine forest

Forest Service roads are closed and decommissioned where their need is no longer demonstrated. Exceptions include access to cemeteries, oil and gas developments, or similar restrictive uses. Roads necessary for access to NFS land or special use authorizations adjacent to this management area, to which reasonable access cannot otherwise be obtained, will remain.

Construction of temporary roads across this management area for access to complete reclamation or needed management activities will be allowed on a case-by-case basis where access is not otherwise feasible. Roads accessing oil and gas well sites are present. Roads will be designed, constructed and maintained to the minimum standards required for the activity. They will be closed and decommissioned when no longer needed.

Use of roads that access privately held sub-surface rights or Federal leases are restricted only to a lessee or their agents to access, develop or maintain their property or for administrative use. On some parts of the area, access to the Forest for hiking, horseback riding, viewing wildlife and scenery, fishing, and other non-motorized forms of recreation is provided on trails. Recreation facilities are kept at a minimum but those located in this management area fit the natural appearing landscape and are based on site activity, type, and capacity.

Interaction among users is moderate. There is evidence of other users in the vicinity of oil and gas developments. Control structures such as gates are evident in the vicinity of oil and gas developments. There is a low probability of experiencing solitude.

Utility corridors occur here only when it is not in the public interest to locate them elsewhere. Mineral exploration and extraction will occur on prior existing rights. Roads, pipelines, and electrical lines necessary for the development of minerals may occur on NFS land where the route provides the most logical and environmentally sound access.

Suitability

This management area is classified as unsuitable for timber production.

Surface occupancy of National Forest System land is allowed for the exploration and development of Federally owned minerals.

Standards/Guidelines

Vegetation

S-FOFM-VEG-1: Cut trees only when necessary for public safety (e.g., trees posing hazards along roads or trails).

S-FOFM-VEG-2: Collection of special forest products that require a permit is prohibited.

Wildlife

S-FOFM-WLF-1: Limit wildlife, fisheries, and plant habitat management to treatments for the protection or recovery of Federally listed species, Regional Forester sensitive species, and other rare species (e.g., populations of fire dependent plant species).

Forest Health

G-F OFM-FH-1: Consider prevention or control of pests, diseases, and/or non-native invasive species (NNIS) to:

- Prevent spread of NNIS already present in the area.
- Eradicate non-native invasive species that are present but not yet well established (e.g., removal of ash trees to eradicate the emerald ash borer or herbicide treatment to eradicate an NNIS plant species that is not widely established within the management area)
- Prevent the spread of outbreaks onto adjacent private land.

G-FOFM-FH-2: Limit treatment of non-native invasive species to the immediate area of the NNIS infestation.

Recreation

S-FOFM-REC-1: Manage the area to provide relatively primitive recreation experiences.

S-FOFM-REC-2: Provide minimal facilities necessary to prevent site deterioration and to protect visitors' health and safety consistent with roaded natural recreational opportunities. Facilities for resource protection may offer user convenience such as designated camp sites, trail heads, and primitive toilets. Such facilities should be designed for a rustic appearance and be constructed from native and/or natural materials.

S-FOFM-REC-3: Motorized trail construction is not permitted in this management area.

S-FOFM-REC-4: OHV use is prohibited in this management area, except for administrative purposes.

G-FOFM-INTERP-5: Limit interpretive signing to trailheads.

Land Ownership

G-FOFM-LAND-1: Emphasize land acquisition to consolidate surface and subsurface ownership.

Facilities and Transportation

S-FOFM-TRANS-1: Limit construction of facilities to those necessary to address health and safety concerns.

G-FOFM-TRANS-2: Do not construct temporary roads in this management area except for watershed restoration projects, administrative use, or for access into adjacent management areas where alternative routes are not feasible.

S-FOFM-TRANS-3: Decommission unauthorized roads or system roads no longer needed for administration of National Forest system lands.

S-FOFM-TRANS-4: Collector and arterial roads (Maintenance Levels 2 to 5) crossing the management area may remain open to the public, though seasonal closures may be used to protect resources.

River Corridors Management Area (RC)

Purpose

This management area emphasizes retaining, restoring, and enhancing the inherent ecological processes and functions associated with riverine systems. Management will protect or enhance the scenic quality of these areas to provide high-quality recreation opportunities. This management area includes linear-shaped corridors along Symmes Creek, the Hocking River, the Little Muskingum River, and the Ohio River.

Desired Future Condition

National Forest System land along streams and rivers is predominantly forested; however, some floodplain wetlands or herbaceous-shrub communities may occur. Forest communities along streams and rivers are diverse and productive and generally contain multiple canopy layers with diverse habitat structure. A mixture of typical wet floodplain and mesic species dominate forested bottomlands, and typical upland and xeric species dominate the steeper slopes and ridge tops. The understory layer is highly variable. Vegetative conditions are maintained over time using both even-aged and uneven-aged techniques.

The long-term desired habitat composition is:

- 1-4% - Aquatic and wetland habitat
- 3-6% - Herbaceous or herbaceous/shrub habitat
- 75-80% - All-aged, multi-layered hardwood or hardwood/pine forest
- 12-20% - Even-aged hardwood forest
    - 8% - Early successional forest (<10 years) [1]
    - 8% - Early forest (10-19 years)
    - 32% - Mid-successional forest (20-59 years)
    - 32% - Late-successional forest (60-120 years)
    - 20% - Older, Overmature forest (>120 years)
- 1-10% - Even-aged pine forest
    - 12% - Early successional forest (<10 years)
    - 12% - Early forest (10-19 years)
    - 24% - Mid-successional forest (20-39 years)
    - 24% - Late-successional forest (40-59 years)
    - 28% - Older, overmature forest (>60 years)

The floodplains along the main streams function as storage areas for floodwaters, sources of organic matter for the streams and rivers, and habitat for riparian wildlife species. Aquatic communities are maintained or are returning to their historic compositions and distributions. Aquatic

[1] Bullet indent corrected 10/16/2008 by Administrative Correction # 1

habitat conditions contribute to the conservation of species that reside in these main stem streams and rivers.

Roads within and on the perimeter of this management area are used for a variety of recreation activities and also for commercial traffic. In some areas, boat ramps provide access for motorized and non-motorized boating. Viewing scenery and wildlife, fishing, hunting, trapping, canoeing, hiking, picnicking, and camping are key recreation activities. Trails in this management area are open only to non-motorized use.

Extensive evidence of human activities is apparent, particularly on privately owned land within this management area. On National Forest System land, most human activities are in harmony with the natural-appearing environment. Interaction between users ranges from low to high, depending on the specific area. High interaction areas are greatest near river access points and in campgrounds. Users must be able to exercise a low to moderate degree of self-reliance in an environment that offers a low to moderate degree of challenge and risk.

Forest Service recreation facilities are designed to fit the natural appearance of the landscape while providing for the specific site activity, type, and capacity. Facilities, structures, utility corridors, mineral exploration, and development are usually evident only when on site, but are fairly common.

Suitability

This management area is classified as suitable for timber production.

Surface occupancy of National Forest System land is allowed for the exploration and development of Federally owned energy minerals, but controlled surface use is applied in the riparian corridor.

Standards/Guidelines

Vegetation

S-RC-VEG-1: Apply uneven-aged management (single-tree or group selection) on at least 75 percent of the management area.

S-RC-VEG-2: Apply even-aged management (thinning, shelterwood, clearcut or two-aged harvest) on up to 25 percent of the area to provide visual and wildlife habitat diversity.

S-RC-VEG-3: Limit size of group selection regeneration harvests to 0.25 to 2.0 acres.

G-RC-VEG-4: When using single-tree selection, favor retention of larger trees and all trees larger than 30 inches diameter for wildlife habitat and visual quality values.

G-RC-VEG-5: The tree stocking level for regeneration within group-selection harvest areas will generally be comparable stocking in even-aged stands.

G-RC-VEG-6: Manage even-aged portions of the management area on a 120 year rotation for hardwoods and 60 years for pine. Hardwood stands may be regenerated starting at 60 years of age and pine stands at 30 years to meet wildlife, visual, or other objectives.

G-RC-VEG-7: Treatment entry cycle for areas to be regenerated via single-tree or group selection is 20 to 30 years.

G-RC-VEG-8: Limit the size of even-aged regeneration harvests to 2 to 10 acres. Larger openings may be made to meet wildlife habitat or visual (e.g., creation of vistas) objectives.

G-RC-VEG-9: Plan and implement vegetation management activities such as pre-commercial treatments, prescribed burning, and commercial logging so that scenery management objectives are met.

G-RC-VEG-10: Permit collection of special forest products with appropriate restrictions.

Recreation

S-RC-REC-S-1: Emphasize non-motorized recreation opportunities such as canoeing, fishing, hunting, hiking, and viewing wildlife.

G-RC-REC-2: Design new recreation sites based on an analysis of supply and demand, the capabilities of the land, and the desired Recreation Opportunity Spectrum class.

G-RC-REC-3: Supply campsite facilities to protect resources and meet public demand.

G-RC-REC-4: Campground size should not exceed the proposed area's holding capacity or negatively affects the character or water quality of the adjacent stream or river. Construct campgrounds to development levels 1 through 3. Close campsites when use is causing significant resource damage.

G-RC-REC-5: Maintain recreation sites in accordance with current mandatory critical standards for recreation sites and to a level appropriate for the desired Recreation Opportunity Spectrum (ROS) class.

S-RC-REC-6: OHV use is prohibited except for administrative purposes.

G-RC-REC-7: Locate horse trails off soils prone to rutting and erosion.

G-R C-REC-8: Limit bike trails to dual use hiking/biking trails currently within the management area.

This page left blank for notes.

Developed Recreation Management Area (DR)

Purpose

This management area emphasizes management of existing recreation facilities and the future needs of the highly developed sites that serve large numbers of people. It covers the most developed range of recreation opportunities provided on the Wayne National Forest. By offering a variety of recreation opportunities, services, and facilities in a natural setting, the WNF intends to provide visitors with quality outdoor recreation experiences.

Desired Future Condition

This management area includes both existing and potential developed recreation sites and vicinities on the Forest.

The landscape in and around these developed recreation areas varies from park-like to mature forest. Waterbodies are often associated with these areas. Vegetation is primarily hardwood forest with a wide variety of native hardwood tree and shrub species. A small amount of shrub/herbaceous openings may be provided for visual variety, play fields, and wildlife diversity. Native hardwoods are becoming more prevalent in areas of white pine plantations.

The long-term desired habitat composition is:

- 4-6% – Aquatic and wetland habitat
- 1-3% – Herbaceous or herbaceous/shrub habitat
- 91-95% – All-aged, multi-layered hardwood or hardwood/pine forest
- 0% – Even-aged hardwood forest
- 0% – Even-aged pine forest

A variety of native wildlife is present, ranging from species accustomed to campgrounds and high human use to those that inhabit mature forest habitats. Ponds and lakes in developed recreation areas generally contain game fish such as largemouth bass, bluegill, and channel catfish. A variety of wildlife and nature viewing opportunities are available within and near developed recreation sites. In cooperation with the Ohio Division of Wildlife, largemouth bass-bluegill and catfish fisheries are maintained at Lake Vesuvius and Lamping Pond.

Developed recreation areas in this MA are high-density, destination-type developments within a forested environment. They contain facilities, services, and settings designed for human activities. Universal access is available to some existing and all newly constructed facilities and structures.

Roads and trails provide access within the more developed areas. Trails lead to lakesides, riverbanks, and undeveloped areas. Roads and trails accommodate the high-density recreation use and related activities associated with the area.

Recreation facilities and structures may dominate the landscape in developed areas. Facilities include campgrounds, picnic areas, boat ramps, interpretive sites, overlooks, swimming areas, and trailheads. Facilities in some recreation areas are able to handle large numbers of people and provide desired amenities. These areas retain the sense of a natural environment and blend aesthetically with their surroundings. Recreation sites are clean, safe, and well-maintained.

Because this is an area of high public use and visibility with major public investments in facilities and structures, priority is given to acquisition of private in-holdings and subsurface mineral rights. Such acquisition consolidates NFS surface and subsurface ownership.

Within highly developed areas, human activities are quite evident, particularly in the form of roads, buildings, utilities, and signs. Interaction between users is high to very high, with a very low probability of avoiding the sights and sounds of people. These areas have some restrictions and controls, in part, because of their heavy use.

Within the more undeveloped portions of the management area, opportunities are provided for boating, fishing, hunting, and hiking, along with nature viewing and study. Human activity is evident, particularly in the form of roads, trails, and signs. Interaction between users is moderate to high. These areas have some restrictions and controls. The probability of avoiding the sights and sounds of people is a low to moderate.

Suitability

This management area is classified as unsuitable for timber production.

No surface occupancy is allowed for the exploration and development of Federally owned minerals except on existing leases.

Developed Recreation Sites

Leith Run and Capitol Christmas Tree – This area is located on the Marietta Unit of the Forest, along the Ohio River northeast of Newport, Ohio. It encompasses two existing sites that border the Ohio River, the Leith Run Campground and the Capitol Christmas Tree day-use site. This area also includes some additional NFS land adjacent to these sites that could allow for future expansion.

Lamping Homestead – This area is located on the Marietta Unit of the Forest, on State Hwy. 537 south of Graysville, Ohio. It encompasses an existing campground and picnic area, a small fishing pond, hiking trails,

and some additional NFS land adjacent to the site that could allow for expansion.

Burr Oak Cove Campground – This area is located on the Athens Unit of the Forest, on State Hwy. 13 north of Glouster, Ohio. It encompasses the Forest Service's Burr Oak Cove Campground and some adjacent NFS land that could allow for expansion.

Lake Vesuvius – This area is located on the Ironton Unit of the Forest, off State Hwy. 93 north of Ironton, Ohio. It encompasses the Lake Vesuvius campgrounds, the lake, and surrounding area, the Ironton Ranger District administrative site, the proposed Sand Hill horse camp area, and some adjacent NFS land that could allow for expansion.

Standards/Guidelines

Vegetation

S-DR-VEG-1: Apply vegetative management techniques, including removal of hazard trees, timber harvest, reforestation, and timber stand improvement, only to accomplish the management area's desired conditions and objectives for recreation, scenic values, and nature viewing.

G-DR-VEG-2: Vegetation management activities within this management area will be guided by the operation and maintenance plans developed specifically for each developed recreation site.

S-DR-VEG-3: Prohibit collection of special forest products that require a permit.

Wildlife

G-DR-WLF-1: Replenish existing underwater fish habitat structures in lakes once a decade or as natural materials decompose.

Recreation

G-DR-REC-1: Maintain recreation sites in accordance with current mandatory critical standards for developed recreation areas and to a level appropriate for the desired ROS class.

G-DR-REC-2: Operate sites at the full-service level generally from April through October. At full service, sites should be clean and sanitary, free of litter, neat in appearance, and well maintained.

G-DR-REC-3: Generally from November to April, when use is light, operate sites at the reduced-service level. At a minimum, keep vault toilets clean and sanitary. Only maintenance related to public health and safety is to be conducted during this period.

G-DR-REC-4: If public health and safety cannot be reasonably ensured, close developed sites.

G-DR-REC-5: Sites may be operated at reduced service from April through October.

S-DR-REC-6: Only watercraft powered manually or by small electric motors are permitted on the lakes and ponds in this management area.

S-DR-REC-7: Emphasize non-motorized recreation opportunities such as hiking and viewing wildlife.

S-DR-REC-8: Hunting and shooting are not permitted within the established boundaries of developed recreation sites but are permitted elsewhere within the management area.

G-DR-REC-9: Design and construct campsite facilities to meet public demand and protect resources.

G-DR-REC-10: Sign recreation areas for safety, information, interpretation, and administrative purposes.

G-DR-REC-11: Seek opportunities for concessionaire operation and maintenance of developed sites.

G-DR-REC-12: Provide areas for overnight use, day use, and group use. Make some of these sites available to the public through the national reservation system.

G-DR-REC-13: Provide areas for highly developed recreation opportunities as well as areas for dispersed recreation opportunities with lesser-developed facilities.

S-DR-REC-14: Construct trails within highly developed recreation sites to universally accessible standards.

G-DR-INTRP-15: Provide natural history and heritage interpretation, including publications, interpretive signs and interpretive programs by Forest Service employees and qualified volunteers.

Range

S-D R-RANGE-1: Prohibit livestock grazing.

Timbre Ridge Lake Management Area (TRL)

Purpose

The focus of this management area is the scenery and recreation afforded by the 100-acre Timbre Ridge Lake and the rugged, wooded hills that surround it.

Desired Future Condition

This management area is located in eastern Lawrence County on the Ironton Ranger District.

Timbre Ridge Lake provides quality fishing opportunities in a natural setting. In cooperation with the Ohio Division of Wildlife, a self-sustaining largemouth bass-bluegill fishery at Timbre Ridge Lake is maintained throughout the planning period. Channel catfish and rainbow trout fishing opportunities are provided as resources are available. Small watercraft powered manually or by electric motors may be seen on the lake.

In addition to fishing, visitors may participate in low-impact, dispersed recreational activities, such as hiking, mountain biking, backcountry camping, hunting, wildlife viewing, and picnicking.

Water quality in Timbre Ridge Lake and its feeder streams contributes to the recreational fishing experience. Water quality parameters meet or exceed State standards throughout the life of the Forest Plan.

Recreation facilities intended for use by low numbers of people are present, but do not impact the scenic value of the area. Universal access is provided to some existing and all newly constructed facilities and structures. The natural site characteristics dominate the development. Rustic facilities of informal design are available.

Interaction between users is moderate, but highest near the Timbre Ridge Lake dam. The environment offers a low to moderate degree of challenge and risk, and requires a low-to-moderate degree of self-reliance. Visitors enjoy a semi-primitive, non-motorized recreation experience.

Road access to the boat launch facility and the dam is maintained. Road access to private land in-holdings is controlled and maintained.

The landscape around the lake is mostly a closed-canopy hardwood forest, with especially colorful views in the spring and fall. Over time, the forest will change as a result of natural succession and disturbances. Vegetation will be primarily hardwood forest with a wide variety of native hardwood tree and shrub species. A small amount of shrub/herbaceous openings may provide visual variety, play fields, and wildlife diversity.

The long-term desired habitat composition is:

- 13% - Aquatic and wetland habitat
- 1-3% - Herbaceous or herbaceous/shrub habitat
- 83-86% - All-aged, multi-layered hardwood or hardwood/pine forest
- 0% - Even-aged hardwood forest
- 0% - Even-aged pine forest.

Suitability

This management area is classified as unsuitable for timber production.

No surface occupancy is allowed for the exploration and development of Federally owned minerals except on existing leases.

Standards/Guidelines

Vegetation

S-TRL-VEG-1: Apply vegetative management techniques, including removal of hazard trees, timber harvest, reforestation, and timber stand improvement, only to accomplish management area's desired conditions and objectives for recreation, scenic values, and nature viewing.

S-TRL-VEG-2: Prohibit collection of special forest products that require a permit within the developed recreational areas of this MA.

Wildlife

G-TRL-WLF-1: Replenish existing underwater fish habitat structures once a decade or as the natural materials decompose.

Recreation

S-TRL-REC-1: Only watercraft powered manually or by small electric motors are permitted on Timbre Ridge Lake.

S-TRL-REC-2: This management area is closed to horse and OHV use. **Exception:** OHV use is permitted for administrative purposes and on roads to access private property within the management area.

S-TRL-REC-3: Hunting and/or shooting is permitted within the Timbre Ridge Management Area except within developed recreation sites.

S-TRL-REC-4: Do not permit camping within 50 feet of the shoreline except where designated by the Forest Service.

G-TRL-REC-5: Emphasize non-motorized recreation opportunities such as hiking and viewing wildlife.

Range

S-TRL-RANGE-1: Prohibit livestock grazing in this management area.

Lands

G-TRL-LAND-1: Emphasize land acquisition to consolidate surface and subsurface ownership.

Facilities and Transportation

S-TRL-TRANS-1: Design and construct facilities and structures according to the Built Environment Image Guide and to blend into the natural setting of the area.

S-TRL-TRANS-2: Maintain secondary emergency access to the dam. Maintain a Maintenance Level 1 road from State Route 775, closed to public motorized use, except during emergencies.

G-TRL-TRANS-3: Temporary roads may not be constructed in this management area except for administrative use or for access into adjacent management areas where alternative routes are not feasible.

G-TRL-TRANS-4: Decommission unauthorized roads or system roads no longer needed for administration of National Forest system lands.

G-TRL-TRANS-5: Use materials native to the area to the extent practical in all construction.

This page left blank for notes.

Special Areas Management Area (SA)

Purpose

This management area emphasizes the preservation, management, and study of unique natural areas. These areas are regionally or locally significant and have been formally designated upon recommendation by a review committee and approval by the Regional Forester.

These areas meet one or more of the following criteria:

- Be representative of unique geological, ecological, cultural or other scientific values
- Be an appropriate area for scientific research
- Have potential to be a regional or national historic landmark based on natural or cultural values.

Desired Future Condition

Areas allocated to this management area are scattered throughout the Forest. Sizes vary, ranging from a few acres to several hundred acres. These areas are individually unique and generally not connected to each other. Special Area designation is based on significant cultural remains or the unique characteristics of terrain, climate, soil, water, flora, or fauna.

All activities in these areas are to be consistent with the protection or maintenance of the unique characteristics for which an area was designated (e.g., protecting and perpetuating populations of rare plants or communities).

Recreation activities are also limited to those consistent with the purpose for which an area was designated. A system of hiking trails may provide access for administrative and recreational purposes. Facilities and structures may be present if designed for compatibility with the natural surroundings, including interpretive signing. Evidence of human activities will vary but is generally controlled.

Boundaries are located where necessary to protect these significant resources.

Suitability

This management area is classified as unsuitable for timber production.

No surface occupancy is allowed for the exploration and development of Federally owned minerals except on existing leases.

The primary benefits of this management area are the potential scientific values derived from protecting these areas and from research. These areas serve as controls for management used in other locations, thus, they also provide a resource management information value. Other benefits may include hiking, hunting, and nature viewing and study.

Currently Designated Special Areas

Cambria Creek Wetland – This wetland complex, formed by beaver activity, contains numerous snags. Alder, willow, and buttonbush have become established here. The remains of the Cambria Furnace site are located in this area, giving it historical significance. (Designated 3/95)

Caulley Creek – A State-significant, mixed mesophytic community with a well-represented hickory component (5 species). The understory of sugar maple, red elm, and wild hydrangea is quite dense, and the herbaceous layer is well developed with a diverse spring flora characterized by abundant goldenseal. (Designated 3/95)

Eels Run – Contains significant populations of Synandra at the northern edge of its Appalachian range. In 1990 this species was identified as potentially threatened by the State of Ohio and considered globally rare. (Designated 1/92)

Lick Branch – Comprised of a mature hemlock-beech forest, a developing floodplain forest with a diversity of species, and an emergent marsh with arrow-head, lizard's-tail, burreed, smartweed, and hedge-hyssop. (Designated 3/95)

Little Storms Creek – Features a 3rd-order stream, floodplain forest, and associated north and south facing slopes with locally significant oak-hickory and mixed mesophytic forest communities. Small-flowered alumroot is present. (Designated 3/95)

Minnow Hollow – An area of high scenic value, especially the upper part of the hollow. It contains a State-significant mixed mesophytic forest with an abundance of beech. Wet and dry sandstone cliffs occur in the area. Several State-listed plants occur in this area. Vegetation along the stream is being modified by beavers. (Designated 3/95)

Morgan Sisters Woods – Contains the best beech-sugar maple communities found on the Ironton Ranger District. Much of the area has an open park-like understory. (Designated 3/93)

Paine Crossing – This oak-maple swamp forest and nearby buttonbush swamp occurs along an abandoned railroad bed and Monday Creek. (Designated 1/92)

Sardis Wetland – This State-significant wetland includes an old growth mixed floodplain forest, an emergent marsh, and a shrub swamp. (Designated 3/95)

Thompson Cemetery Woods – The area consists of a State-significant, complex Appalachian oak forest community. (Designated 3/95)

Waterfall Cove – A massive and complex sandstone outcrop forms a rockhouse and cliffs that contain large numbers of small-flowered alumroot. A spring-fed stream cascades over the top of the rockhouse, even in the driest of times. (Designated 3/95)

Young's Branch – A State-significant mixed mesophytic forest with spring coral-root and few-flowered tick-trefoil. Tree size, especially height, is of interest here, as is whether tuliptree dominance will remain over time. (Designated 3/95)

New Special Areas

Bluegrass Ridge – This area is significant for harboring a population of the globally rare juniper sedge. The site also contains the State-endangered bigtree plum and Virginia ground cherry. The area contains a viable population of the State-rare Cumberland sedge and the State threatened Carolina thistle.

Deadhorse Run – A forested watershed which provides opportunities to study changes that occur to terrestrial and aquatic systems as a result of active, natural erosional processes.

Dismal Creek – The scenic nature of Dismal Creek offers visitors the chance for nature viewing and photography. Hemlock regeneration can be studied here because a Hemlock looper invasion occurred about 1973-1975.

Felter Ridge – An upland forest community of Appalachian oak (chestnut oak, red oak, red maple, sourwood, blackgum) that grades to a mixed mesophytic forest community (red oak, beech, white oak, tuliptree).

Fly Gorge – This deep gorge, with 40-foot cliffs and small waterfalls, contains a State-significant mixed mesophytic forest with gradations into various other upland forest types (directly facing the Ohio River valley).

Fradd Hollow – Significant for a quality Oak Barren community (white oak-black oak) and for viable populations of the State-rare butterfly pea, tall nut-rush, and Virginia ground cherry.

Handley Branch – Significant for a quality Oak Barren community (white oak-black oak) and for having one of two Ohio populations of the State-endangered blue scorpionweed (the second population also occurs in Lawrence County). The population numbers in the thousands with several sub-populations within the area. Three other rare species include: the

endangered Sampson's snakeroot, the State-threatened balsam squaw-weed, and the potentially threatened lesser ladies' tresses.

Rockcamp Run – One of the few sites in southern Ohio with native hemlock-white pine-hardwood stands where white pine and Virginia pine occur together. It supports habitat for the globally rare rock skullcap.

Rocky Fork Gorge – A State-significant white pine-hardwood community occurs along this stream which contains a possible virgin native stand.

Witten Run – A State-significant hemlock-white pine-hardwood community is present on the western slope along Witten Run while a fairly mature, good quality oak-maple community occurs on the north facing slope.

Standards/Guidelines

Vegetation

S-SA-VEG-1: Manage vegetation only to maintain the conditions for which the area was established, except for vegetation along roads and trails. Manage vegetation along trails and roads as necessary to provide a safe environment for Forest visitors.

S-SA-VEG-2: Firewood will not be available, unless its removal is needed for habitat improvement for the species or communities for which the specific area was designated and the removal will cause no harm.

S-SA-VEG-3: Prohibit collection of special forest products that require a permit.

Wildlife

S-SA-WLF-1: Manage wildlife and fisheries consistent with the purpose for which the area was designated.

Forest Health

G-S A-FH-1: Consider prevention or control of pests, diseases, and/or non-native invasive species (NNIS) to:

- Prevent spread of NNIS already present in the area
- Eradicate non-native invasive species that are present but not yet well established (e.g., removal of ash trees to eradicate the emerald ash borer or herbicide treatment to eradicate a NNIS plant species that is not widely established within the management area)
- Prevent the spread of outbreaks onto adjacent private land.

G-SA-FH-2: Limit treatment of NNIS to the immediate area of the NNIS infestation consistent with the purpose for which the area was designated.

Recreation

S-SA-REC-1: Motorized trail construction or use is not permitted in this management area, except for administrative uses. Non-motorized recreation opportunities such as hunting, hiking, and wildlife viewing may be allowed if consistent with the purpose for which the area was designated.

G-SA-REC-2: Limit interpretation to that which does not detract from scientific and conservation values of the area.

Land Ownership

G-SA-LAND-1: National Forest System land in this management area is not eligible for exchange.

G-SA-LAND-2: Emphasize land acquisition to consolidate surface and subsurface ownership.

Special Uses

G-SA-SPEC-1: Limit special use authorizations to those required by law or regulation.

Range

G-SA-RANGE-1: Prohibit livestock grazing in this management area.

Facilities and Transportation

G-SA-TRANS-1: Do not construct facilities in this management area except to meet management area objectives (e.g., temporary research facilities).

G-SA-TRANS-2: Do not construct temporary roads in this management area except for administrative use, or for access into adjacent management areas where alternative routes are not feasible.

G-SA-TRANS-3: Decommission unauthorized roads or system roads no longer needed for administration of National Forest system lands.

G-SA-TRANS-4: Collector and arterial roads (Maintenance Levels 2 to 5) crossing the management area may remain open to the public, though seasonal closures may be used to protect resources.

This page left blank for notes.

Research Natural Areas Management Area (RNA)

Purpose

Research Natural Areas (RNAs) are nationally significant areas with unique ecosystems deemed worthy of preservation for scientific purposes. Research is conducted in these areas to better understand their natural processes.

RNA designation may come in one of two ways:

- Recommendation by a review committee and approval by the Chief of the Forest Service
- Approval of the Eastern Region Regional Forester and the Northeast Station Director for Forest Service Research.

RNAs must meet one or more of the following criteria:

- Contributes to the protection of diversity of vegetation communities and wildlife habitat
- Typifies important forest, shrubland, grassland, alpine, aquatic, and geologic types
- Represents special or unique characteristics of scientific interest and importance
- Helps legal requirements, such as providing habitat for endangered species
- Protects or maintains special aquatic, geologic or potential natural vegetation and faunal communities or protects cultural resources.

Desired Future Condition

Establishment records and RNA management plans govern individual Research Natural Areas. They describe the desired conditions and allowed activities for each RNA.

Establishment records and their associated management plans are hereby incorporated in the WNF's Forest Plan Revision.

Most of these areas are in NFS ownership, but small portions are in private ownership. The Forest Plan, establishment records, and RNA management plans apply only to NFS land and resources.

Evaluation of the unique characteristics of these areas has determined that they require protection by law or administrative order.

Suitability

Management of these areas will prohibit any activities that might harm the unique characteristics for which the areas were designated.

This management area is classified as unsuitable for timber production.

No surface occupancy is allowed for the exploration and development of Federally owned minerals except on existing leases.

Recreation activities are limited to those consistent with the purpose for which these lands were designed as a research natural area.

The primary benefits are the potential scientific values derived from protecting these areas. Other benefits may include hiking, hunting, and nature viewing and study.

Designated Research Natural Areas

Reas Run Research Natural Area was established in 1975. It is a 78-acre mature Virginia pine stand. Natural succession to climax hardwood forest is imminent and, therefore, of interest to forest researchers.

Buffalo Beats Research Natural Area was established in 1999. It consists of 19 acres with the unique feature of a one-acre relict prairie within a mixed oak forest. Significant plants found at this site include prairie species such as big bluestem, rattlesnake master, stiff goldenrod, slender blazing star, and yellow gentian.

Standards/Guidelines

Vegetation

S-RNA-VEG-1: Manage vegetation only to maintain conditions for which the area was established except for vegetation along roads and trails. Manage vegetation along trails and roads as necessary to provide a safe environment for Forest visitors.

S-RNA-VEG-2: Firewood will not be available unless its removal is needed for habitat improvement for the species or communities for which the specific area was designated and the removal will cause no harm.

S-RNA-VEG-3: Prohibit collection of special forest products that require a permit.

Wildlife

S-RNA-WLF-1: Manage wildlife and fisheries consistent with the purpose for which the area was designated.

Forest Health

G-R NA-FH-1: Consider prevention or control of pests, diseases, and/or non-native invasive species (NNIS):

- Prevent spread of NNIS already present in the area.
- Eradicate non-native invasive species that are present but not yet well established (e.g., removal of ash trees to eradicate the emerald ash borer or herbicide treatment to eradicate an NNIS plant species that is not widely established within the management area)
- Prevent the spread of outbreaks onto adjacent private land.

G-RNA-FH-2: Limit treatment of NNIS to the immediate area of the infestation consistent with the purpose for which the area was designated.

Recreation

S-RNA-REC-1: Motorized trail use is not permitted in this management area except for administrative uses. Non-motorized recreation opportunities such as hunting, hiking, and wildlife viewing may be allowed if consistent with the purpose for which the area was designated.

G-RNA-REC-2: Limit interpretation to that which does not detract from scientific and conservation values of the area.

Land Ownership

G-RNA-LAND-1: National Forest System land in this management area is not eligible for exchange.

G-RNA-LAND-2: Emphasize land acquisition to consolidate surface and subsurface ownership.

Special Uses

G-RNA-SPEC-1: Limit special use authorizations to those required by law or regulation.

Range

S-RNA-RANGE-1: Prohibit livestock grazing in this management area.

Facilities and Transportation

G-RNA-TRANS-1: Do not construct facilities in this management area except to meet management area objectives (e.g., temporary research facilities).

G-RNA-TRANS-2: Do not construct temporary roads in this management area except for administrative use, or for access into adjacent management areas where alternative routes are not feasible.

G-RNA-TRANS-3: Decommission unauthorized roads or system roads no longer needed for administration of National Forest system lands.

G-RNA-TRANS-4: Collector and arterial roads (Maintenance Levels 2 to 5) crossing the management area may remain open to the public though seasonal closures may be used to protect resources.

This page left blank for notes.

Candidate Areas Management Area (CA)

Purpose

This management area emphasizes the preservation of potentially unique natural areas. These areas possess potentially significant natural or historic characteristics.

Management is directed at protecting the potentially unique characteristics of these areas until they can be studied for designation as research natural areas or special areas.

Desired Future Condition

Each of these areas is to be analyzed and considered for designation as a research natural area or a special area or returned to some other management area.

Until such a determination is made, the potentially significant natural characteristics of these areas are to be maintained and protected.

Management activities are limited to those necessary for maintaining public health and safety or for treating non-native invasive species. These areas are valued primarily for the potential scientific benefits that may be derived from their preservation. Other benefits may include hiking, hunting, and nature viewing and study.

Suitability

This management area is classified as unsuitable for timber production.

No surface occupancy is allowed for the exploration and development of Federally owned minerals except on existing leases.

Recreation activities are limited to those consistent with the purpose for which the area was nominated as a candidate area.

Candidate research natural areas

Kaiser Hollow – Regionally significant undeveloped forest tract with mature upland forests containing small-flowered alumroot, Bicknell's panic-grass, and Ohio's largest population of Guyandotte beauty.

Standards/Guidelines

Vegetation

S-CA-VEG-1: Manage vegetation only to maintain the conditions for which the area is being considered for designation except for vegetation

along roads and trails. Manage vegetation along trails and roads as necessary to provide a safe environment for Forest visitors.

S-CA-VEG-2: Firewood will not be available unless its removal is needed for habitat improvement for the species or communities for which the specific area is being considered for designation and the removal will cause no harm.

S-CA-VEG-3: Prohibit collection of special forest products that require a permit.

Wildlife

S-CA-WLF-1: Wildlife and fisheries management must be consistent with the purpose for which the area is being considered for designation.

Forest Health

G-C A-FH-1: Consider prevention or control of pests, diseases, and/or non-native invasive species (NNIS) to:

- Prevent spread of NNIS already present in the area
- Eradicate non-native invasive species that are present but not yet well established (e.g., removal of ash trees to eradicate the emerald ash borer or herbicide treatment to eradicate an NNIS plant species that is not widely established within the management area)
- Prevent the spread of outbreaks onto adjacent private land.

G-CA-FH-1: Limit treatment of NNIS to the immediate area of the infestation consistent with the purpose for which the area is being considered for designation.

Recreation

S-CA-REC-1: Motorized trail use is not permitted in this management area except for administrative uses. Non-motorized recreation opportunities such as hunting, hiking, and wildlife viewing may be allowed if consistent with the purpose for which the area is being considered for designation.

G-CA-REC-2: Limit interpretation to that which does not detract from the scientific and conservation values of the area.

Land Ownership

G-CA-LAND-1: Acquire land to consolidate surface and subsurface ownership. National Forest System land in this management area is not eligible for exchange.

G-C A-LAND-2: Emphasize land acquisition to consolidate surface and subsurface ownership.

Special Uses

G-CA-SPEC-1: Limit special use authorizations to those required by law or regulation.

Range

S-CA-RANGE-1: Prohibit livestock grazing in this management area.

Facilities and Transportation

G-CA-TRANS-1: Do not construct facilities in this management area except to meet management area objectives (e.g., temporary research facilities).

G-CA-TRANS -2: Do not construct temporary roads in this management area except for administrative use or for access into adjacent management areas where alternative routes are not feasible.

G-CA-TRANS -3: Decommission unauthorized roads or system roads no longer needed for administration of National Forest system lands.

G-CA-TRANS -4: Collector and arterial roads (Maintenance Levels 2 to 5) crossing the management area may remain open to the public though seasonal closures may be used to protect resources.

This page left blank for notes.

Chapter 4

Monitoring and Evaluation[1]

Introduction

Monitoring and evaluation to determine how well the Forest Plan is working is required by National Forest Management Act (NFMA) regulations. Monitoring and evaluation must be designed to answer the following basic questions:

- **Did we do what we said we were going to do?** This question answers how well Forest Plan direction is being implemented. Collected information is compared to objectives, standards, guidelines, and management area direction.
- **Did it work how we said it would?** This question answers whether objectives are achieving goals and how closely standards and guidelines are being applied.
- **Is our understanding and science correct?** This question answers whether the assumptions and predicted effects used to formulate goals and objectives are valid.

The aim of monitoring is adaptive management – the ability to respond to current conditions or make appropriate changes based on new information or technology. Depending on the answers to the above questions, the Forest Plan may be amended or revised to adapt to new information or changed conditions. This chapter provides programmatic direction for monitoring and evaluating Forest Plan implementation.

Monitoring Strategy

Monitoring and evaluation are separate activities. Data and information are collected by various means. Then they are analyzed and interpreted to evaluate the success of Forest Plan implementation. To provide the public with timely, accurate information regarding this process, the Forest releases a biennial monitoring and evaluation report.

The monitoring program must be efficient, practical, and affordable, and not duplicate data collection already underway for other purposes.

[1] Replaced in full by Administrative Change #9 to be in conformance with the 2012 Planning Rule (36 CFR 219)

Monitoring tasks are scaled to the Forest Plan, the program, or the project to be monitored. Each of these entails different objectives and requirements. Monitoring is not performed on every single activity, nor does it need to meet the statistical rigor of formal research.

Budgetary constraints will affect the level of monitoring that can be done in a particular fiscal year. If budget levels limit the Forest's ability to perform all monitoring tasks, then those items specifically required by law are given the highest priority.

The components of this monitoring strategy are:

- Monitoring methods
- Monitoring questions related to implementation, attainment, and assumptions
- The biennial monitoring plan of operations
- The biennial monitoring evaluation report.

Table 4-1. Monitoring Strategy

Monitoring Methods	Monitoring Questions	Annual Monitoring Plan	Monitoring and Evaluation Report
Monitoring methods categorize how precisely and reliably monitoring items are measured.	Monitoring questions are developed by an interdisciplinary team to address Forest Plan management goals, objectives, standards, guidelines, assumptions, and science.	The annual monitoring plan of operations identifies which items will be measured and how monitoring questions are to be answered.	The monitoring and evaluation report analyzes and summarizes the monitoring results.

Monitoring Methods

Monitoring is divided into two methods, A and B, based on their relative precision and reliability.

Method A

Methods generally are well accepted for modeling or measuring the resource or condition. The cost of conducting these measurements is higher than other methods. These methods are often quantitative in nature.

Method B

Methods or measurement tools are based on a variety of techniques. Tools include project records, communications, on-site ocular estimates, or less formal measurements like pace transects, informal visitor surveys, air photo interpretation, and other similar types of assessments. Reliability, accuracy, and precision are good, but usually less than with Method A. Method B monitoring is often qualitative in nature, but can still provide valuable information on the status of resource conditions.

Monitoring Questions

A series of monitoring questions have been formulated to determine the effectiveness of Forest Plan implementation, attainment, and assumptions. These questions are displayed in Table 4-2. They address the Forest-wide goals and objectives found in Chapter 2. Monitoring methods used to gather information about each question will be identified in the biennial monitoring plan.

The purpose of monitoring questions is to determine what type of information to gather and how often to gather it in order to assess progress toward attaining goals and objectives. Some resources need to be monitored frequently to produce trend data. This gathered data may be analyzed periodically (4, 6, 8 or 10-year cycle), depending upon the time frame specified by each objective.

Monitoring Workplan of Operations

A monitoring workplan will be prepared to identify specific items for monitoring in the coming year as well as the methods to be used. The interdisciplinary team will review the monitoring items to prioritize monitoring activities and develop a monitoring workplan. The following items will be considered:

- Additional data needs identified from previous monitoring activities
- Methods and measures to provide consistent information to determine trends
- Assessment of benefits versus the cost of collecting data
- The amount of process and statistical rigor needed to obtain usable results
- The intensity, detail, and type of data needed to achieve the monitoring purpose
- The importance of the item or activity being monitored (potential for long-term or irreversible damage, local versus national risk, risk of not monitoring, etc.)
- Emerging issues and concerns that may be addressed through monitoring.

The monitoring workplan will identify and schedule various site-specific, on-the-ground monitoring activities. It should describe the purpose, methods, locations, responsible persons, and estimated costs. Each workplan must be submitted for consideration under the budget and work planning process.

The Forest Supervisor then will determine the appropriate funding for monitoring and approve implementation of the monitoring workplan.

Specific components included in the monitoring workplan of operations are:

- **Forest Plan Goa**l: As identified in Chapter 2.
- **Forest Plan Objectives**: As identified in Chapter 2.
- **Monitoring Questions:** An interdisciplinary team is to review specific monitoring questions from Table 4-2. This review ensures that the information gathered answers the questions that are essential to measuring Forest Plan accomplishment and effectiveness and is consistent with budget and work plans.
- **Monitoring Items:** A monitoring item, or data element, is a quantitative or qualitative parameter that can be measured or estimated. One or more monitoring items are associated with each monitoring question. Monitoring items provide the foundation to answer the monitoring questions.
- **Monitoring Purpose:** This component indicates the monitoring item's purpose. It notes whether it is a legal requirement and/or whether it provides information for better land management decisions.

- **Methods:** Precision and reliability as well as specific techniques are described.
- **Scale:** Describes the level of analysis with respect to land size. This measure helps clarify habitat heterogeneity and viability issues. It also describes cumulative effects of management actions.
- **Frequency of Monitoring:** Describes how often information is gathered or measured.
- **Frequency of Evaluation:** Defines how often information is analyzed and reported. Depending upon the question being answered, analysis of the information may occur at intervals greater than the frequency of monitoring.

Biennial Monitoring and Evaluation Report

Developed by the interdisciplinary team, the biennial monitoring and evaluation report summarizes the results of completed monitoring and evaluates the data. Evaluation determines whether observed changes are consistent with the Forest Plan's desired future conditions, goals, and objectives and if adjustments may be needed. The report also makes recommendations to the Forest Supervisor who will use these findings either to certify the Forest Plan as sufficient for management in the coming year or to decide that a Plan amendment is needed.

The monitoring and evaluation report may provide summaries of data collected, but it primarily displays data evaluation, conclusions, and recommendations. Comparison of subsequent monitoring and evaluation reports provides a means of tracking management effectiveness from year to year. It also shows changes that have been made or are still needed.

Key questions to be addressed in evaluations include:

- Are management direction and standards being followed?
- How well are objectives of the Plan being achieved?
- Do management prescriptions respond to issues, concerns, and opportunities?
- Are effects of Plan implementation occurring as predicted?
- Is the Forest progressing toward its long-term goals?

In summary, the biennial monitoring and evaluation report:

- Reviews the results of monitoring

- Assesses the effectiveness of management practices in achieving goals, objectives, and desired conditions (outcomes) specified in the Plan
- Compares actual outputs, services, and costs with those estimated in the Plan
- Evaluates data for indicators of trends or effects
- Identifies any need to change, amend, or revise the Plan
- Identifies research needed by the National Forest System.

Table 4 - 2. Monitoring Questions.

Goal	Objective	Monitoring Questions	Monitoring Indicators	Monitoring Frequency	Evaluation Frequency	Precision/ Reliability
2.1 – Restore water quality and soil productivity to improve health of watersheds impaired by past land use practices and mining activities. Manage activities on NFS land to maintain or enhance water quality and soil productivity.	2.1a – Restore the dimension, pattern, and profile of streams where channel and floodplain morphology has been altered.	Are altered, non-functioning channels and floodplains being improved on the Forest?	How many miles of stream have been treated to improve ecological function?	Every 4 years	Every 4 years	B
	2.1b – Enhance water quality in the Monday Creek, Sunday Creek, Symmes Creek, Raccoon Creek, and Pine Creek watersheds by reducing acid mine discharges and decreasing sediment loads.	Has water quality been enhanced in watersheds on the Forest that were impaired by past land use practices or mining activities?	What is the current geo chemistry profile of these creeks?	Every 4 years	Every 4 years	A
			What geo chemistry parameters have changed by reducing and/or treating acid mine discharges?	Every 4 years	Every 4 years	A
			How many acid mine discharges have been treated?	Biennially	Every 4 years	B
			How many subsidence features have been treated?	Biennially	Every 4 years	B
			How many miles of stream have free-flowing water where surface flow was restricted?	Every 4 years	Every 4 years	B
		Is the Forest maintaining or restoring soil productivity?	How many acres of NNIS plants that alter soil chemistry were treated?	Biennially	Every 4 years	B

Goal	Objective	Monitoring Questions	Monitoring Indicators	Monitoring Frequency	Evaluation Frequency	Precision/ Reliability
			Are management activities altering the ecological functioning of the soil by creating excessive detrimental impact?	Annually monitor, report biennially	Every 4 years	B
3.1 – Promote healthy riparian and aquatic ecosystems that sustain ecological processes and functions and a variety of plant and animal communities, including viable populations of native and desired non-native species.	3.1a – Restore wetland habitat where wetland hydrology, soils, or vegetation have been modified by past land uses.	Are wetland habitats being restored on the Forest?	How many acres of wetland habitat were restored or enhanced?	Biennially	Every 4 years	B
	3.1b – Improve habitat along streams for aquatic and riparian-dependent species.	Has habitat for aquatic or riparian dependent species improved along and within streams?	How many miles of stream were treated to improve or restore habitat for aquatic and riparian-dependent species?	Biennially	Every 4 years	B
			What physical or biotic parameters have changed at monitoring sites?	Biennially	Every 4 years	A
	3.1c – Reduce sedimentation and improve passage for aquatic and semi-aquatic organisms at Forest development roads and Forest Service recreation trail crossings.	Is sedimentation reduced and passage of aquatic species improved?	How many stream crossings were improved for aquatic organism passage and/or sedimentation?	Biennially	Every 4 years	B
			How many miles of habitat were opened up for aquatic dependent species?	Biennially	Every 4 years	B
	3.1d – Improve aquatic habitat in ponds and lakes.	Is habitat in ponds and lakes improving on NFS lands?	How many ponds or lakes were treated to improve aquatic habitat?	Biennially	Every 4 years	B

Goal	Objective	Monitoring Questions	Monitoring Indicators	Monitoring Frequency	Evaluation Frequency	Precision/ Reliability
4.1 – Promote healthy terrestrial ecosystems that sustain a variety of plant and animal communities, including viable populations of native and desired non-native species.	4.1c – Encourage the establishment of all-aged hardwood forest and hardwood-pine forest communities with structurally diverse canopy layers to maintain forest health and increase structural diversity.	Are uneven-aged hardwood and hardwood-pine forests being developed on the Forest?	How many acres of hardwood or hardwood/pine forest communities were treated to encourage the establishment of uneven-aged conditions?	Biennially	Every 4 years	B
		How are management activities providing for extensive tracts of mature interior hardwood forest composed of a well-developed understory and upper-canopy layer that includes large trees and canopy gaps?	What are the trends in cerulean warbler abundance, based on species monitoring protocols?	Monitored every 3 years; reported in the following Monitoring Report	Monitored every 3 years; reported in the following Monitoring Report	A B
	4.1d – Create early successional hardwood or hardwood-pine habitat, interspersed within mid- and late-successional forest habitat to: provide breeding habit for shrubland-dependent species and increase production of wildlife foods such as soft and hard mast and insects.	How are management activities providing for a variety of structural classes (e.g. early successional forest, mid-successional forest, and late-successional forest) intermixed and dispersed in a mosaic type condition at the small and large scale?	How many acres of early successional forest habitat were created?	Biennially	Every 4 years	B
			How are those acres distributed across the Forest Shrubland Mosaic?	Biennially	Every 4 years	B
			What are the trends in ruffed grouse abundance, based on species monitoring protocols?	Monitored every 3 years; reported in the following Monitoring Report	Monitored every 3 years; reported in the following Monitoring Report	A B
	4.1e – Regenerate existing native pine and pine-hardwood mixed communities.	Are existing native pine and pine-hardwood forests being restored on appropriate sites on the Forest?	How many acres of pine or pine-hardwood communities were treated?	Biennially	Every 4 years	B

Goal	Objective	Monitoring Questions	Monitoring Indicators	Monitoring Frequency	Evaluation Frequency	Precision/ Reliability
	4.1f – Annually, improve or maintain 5 to 10 percent of the existing grassland and grassland/shrubland habitat acreage in the Grassland Management Area.	Is 5-10 percent of the grassland or grassland/shrubland habitat in the Grassland Forest Mosaic being improved annually?	How many acres of grassland habitat were improved or maintained?	Biennially	Every 4 years	B
		How are management activities providing for extensive areas of tall, dense, grass, consisting of standing dead vegetation and well developed litter with sparse to no woody shrub vegetation?	What are the trends in Henslow's sparrow abundance, based on species monitoring protocols?	Monitored every 3 years; reported in the following Monitoring Report	Monitored every 3 years; reported in the following Monitoring Report	A B
	4.1g – Establish and maintain permanent forest openings (herbaceous vegetative cover or mix of herbaceous vegetation and shrubs) on a variety of sites, including ridge tops, mid-slope benches and valley bottoms, preferably where access by machinery is possible.	Are permanent forest openings being created and maintained on a variety of sites on the Forest?	How many acres of herbaceous or herbaceous-shrub habitat were created?	Biennially	Every 4 years	B
			How many acres of herbaceous or herbaceous-shrub habitat were maintained?	Biennially	Every 4 years	B
	4.1h – Construct waterholes and ephemeral wetlands to supplement limited water sources, enhance local biodiversity, and enhance aquatic insect production.	Are waterholes and ephemeral wetlands being constructed on the Forest to enhance local biodiversity and aquatic insect production?	How many waterholes or ephemeral wetlands were constructed?	Biennially	Every 4 years	B

Goal	Objective	Monitoring Questions	Monitoring Indicators	Monitoring Frequency	Evaluation Frequency	Precision/ Reliability
	4.1i – Install artificial nesting or roosting structures to supplement natural cavities or snags when they are short in supply or to enhance wildlife-viewing.	Are artificial nesting or roosting structures being installed when there is an opportunity to enhance wildlife-viewing on the Forest?	How many artificial nesting structures were installed?	Biennially	Every 4 years	B
5.1.1 – Retain or develop Indiana bat roosting and foraging habitat; protect all known Indiana bat hibernacula.		Is the Forest using active management to develop short-term and long-term quality Indiana bat roosting and foraging habitat?	How many acres of potentially suitable Indiana bat habitat were actively improved?	Biennially	Every 4 years	B
			Are known hazard trees removed during the appropriate time of year?	Biennially	Every 4 years	B
	5.1.1a – If additional Indiana bat hibernacula are discovered on NFS land, install bat-friendly gates to prevent unauthorized entry.	Are known hibernacula being protected from unauthorized entry?	How many bat-friendly gates were installed on known Indiana bat hibernacula?	Biennially	Every 4 years	B
5.1.3 – Cooperate in efforts to reintroduce the American burying beetle.		Have reintroductions of the American burying beetle been successful?	Have American burying beetles been found?	Annually monitor, report biennially	Every 4 years	B
5.1.4 – Actively manage known populations of running buffalo clover to maintain appropriate habitat conditions.	5.1.4b – Conduct annual monitoring of known running buffalo clover populations and adjacent areas to identify potential risks or management needs.	Were there any changes to known running buffalo clover populations and were any potential risks identified and mitigated?	What are the current RBC population numbers?	Annually monitor, report biennially	Every 4 years	B
			How many risks to the RBC populations were identified and mitigated?			

Goal	Objective	Monitoring Questions	Monitoring Indicators	Monitoring Frequency	Evaluation Frequency	Precision/ Reliability
5.2.1 – Protect bald eagle communal night roosts, daytime concentration sites, and occupied breeding territories.	5.1.2a – Conduct a minimum of three annual winter searches to locate any previously unknown communal night roosts or bald eagle concentrations.	Is bald eagle habitat being protected?	How many mid-winter bald eagle searches were conducted?	Annually monitor, report biennially	Every 4 years	B
			How many bald eagles were observed?	Annually monitor, report biennially	Every 4 years	B
			How many bald eagle nests are being monitored within the Forest Proclamation Boundary and are they active?	Annually monitor, report biennially	Every 4 years	B
6.1 – Provide forest vegetation characteristics, from understory layers to the tree canopy, that meet the habitat needs of desired native and non-native plant and animal species.	6.1a - Use all available silvicultural treatments, including pre-commercial and commercial thinning, prescribed fire, shelterwood harvests, and improvement cutting to promote the maintenance and restoration of the oak-hickory ecosystem.	Are oak-hickory forests being maintained and restored on the Forest?	How many acres are being treated with varying management actions that will likely result in the maintenance and restoration of the oak-hickory ecosystem?	Biennially	Every 4 years	B
6.2 – Reintroduce fire into fire-adapted ecosystems to conserve biodiversity and promote ecosystem structure and function closer to the historic range of variability.	6.2a – Use prescribed fire to conserve fire-adapted plant and animal biodiversity and to maintain and restore mixed oak and native pine ecosystems.	Is the Forest using prescribed fire to conserve fire-adapted plant and animal biodiversity and to maintain and restore oak and native pine ecosystems?	How many acres are being treated with prescribed fire to conserve fire-adapted plant and animal biodiversity, and to maintain and restore mixed oak and native pine?	Biennially	Every 4 years	B
	6.2b – Use prescribed fire and mechanical treatments to modify current fuel composition, and fire frequency, severity and pattern.	Is the Forest using prescribed fire and mechanical treatments to improve or maintain the fire regime condition class?	How many treated acres improved fire regime condition class?	Every 4 Years	Every 4 Years	B

Goal	Objective	Monitoring Questions	Monitoring Indicators	Monitoring Frequency	Evaluation Frequency	Precision/ Reliability
	6.2c – Use prescribed fire and mechanical treatment to maintain a current fire regime condition class that represents a historic range of variability.		Has the fire regime been maintained in the desirable condition class?	Every 4 Years	Every 4 Years	B
6.3 – Provide opportunities for the collection and use of special forest products. Manage removal of special forest products and monitor this use to sustain viable populations and future yields. Increase public awareness of special forest product harvesting impacts on populations and their ecosystems.		Is the Forest providing opportunities for the sustainable collection of Special Forest Products?	How many acres of the Forest are designated suitable for collecting Special Forest Products?	Every 4 years	Every 4 Years	B
			How many Special Forest Product permits are issued per Unit and across the Forest annually?	Biennially	Every 4 Years	B
		Are viable populations of ginseng being sustained on the Forest?	What are the population trends of ginseng at monitoring plots?	Annually monitor a portion of sites, reported biennially	Every 8 Years	A
			How many ginseng permits are issued per Unit and across the Forest annually	Biennially	Every 4 years	B

Goal	Objective	Monitoring Questions	Monitoring Indicators	Monitoring Frequency	Evaluation Frequency	Precision/ Reliability
7.1 – Limit the effects of insects and diseases on forest vegetation and wildlife to within the range of disturbances that occurred in forest ecosystems prior to the arrival of non-native insects and diseases. Manage non-native invasive species (NNIS) populations using prevention, suppression, and restoration techniques to protect and restore natural communities on the Forest.	7.1b – Cooperate with the ODNR and the State and Private Forestry Division of the Forest Service to suppress insect populations to: • Retard advance of the gypsy moth • Eradicate NNIS species that are present but not yet well established, such as the emerald ash borer. • Prevent the spread of non-native species currently lacking natural controls. • Protect populations of, or habitat for, endangered, threatened, or sensitive species. • Protect rare communities likely to be severely impacted by insect outbreak. • Prevent extensive tree mortality or defoliation in developed recreation areas and other areas where maintaining visual quality is a major objective.	Is the Forest responding appropriately to insect and disease outbreaks?	How many acres of insect and disease were treated and how did the populations respond to treatment?	Biennially	Every 6 years	B

Goal	Objective	Monitoring Questions	Monitoring Indicators	Monitoring Frequency	Evaluation Frequency	Precision/ Reliability
7.2 – Manage NNIS populations using prevention, suppression, and restoration techniques to protect and restore natural communities. Emphasize prevention of spread and early detection of and rapid response to new infestations. Improve effectiveness of NNIS prevention practices through public and inter-agency NNIS awareness and education.	7.2b – Treat and reduce populations of non-native invasive plant species with high potential for spread. Implement control treatments of infestations that threaten priority resources. Prioritize treatment areas based on risk of spread, threat to resources, likelihood of successful control/containment, and partnerships.	Is the Forest successfully responding to NNIS plant populations?	How many NNIS acres were treated and how did the NNIS populations respond to treatment?	Biennially	Every 4 years	B
8.1 – Safely implement the fire and fuels program of the Wayne National Forest. Promote State and Federal interagency cooperation in wildland fire and fuels management.	8.1c – Reduce hazardous fuels within communities at risk in cooperation with local, State, and Federal agencies.	Is the Forest reducing hazardous fuels within communities at risk?	How many acres in WUI were treated for hazardous fuels reduction?	Biennially	Biennially	B
10.1 – Provide a supply of mineral commodities for current and future generations, while protecting the long-term health and biological		Has the long-term health and biological diversity of ecosystems been protected when Federal and private minerals and energy resources are accessed?	Are site-specific mitigations providing environmentally sound exploration and development of Federal and private minerals and energy resources?	Annually monitor, report biennially	Every 4 Years	B

Goal	Objective	Monitoring Questions	Monitoring Indicators	Monitoring Frequency	Evaluation Frequency	Precision/ Reliability
diversity of ecosystems. Facilitate the orderly exploration, development, and production of mineral and energy resources on land open to these activities.	10.1b – Process plans of operation/applications for permit to drill on Federal leases in a timely manner.	Is the Forest processing plans of operations/applications for permit to drill on Federal leases in a timely manner?	How many plans of operation/applications for permit to drill on Federal leases were processed in a timely manner?	Biennially	Every 4 years	B
10.2 – While respecting privately held mineral rights, negotiate operating terms and conditions and mitigation measures to protect other Forest resources.	10.2a – Process plans of operation (and applications for major modifications) for privately owned minerals (reserved and outstanding rights) within 60 days.	Is the Forest processing plans of operation for privately owned minerals in 60 days?	How many applications were processed within 60 days?	Biennially	Every 4 years	B
	10.2b – Restore lands disturbed by minerals exploration and production when the minerals activity is completed.	Are lands disturbed by minerals exploration and production being restored when the activity is completed?	How many mineral activities were adequately restored upon completion?	Annually monitor, report biennially	Every 4 years	B
	10.2c – Plug wells when producing ceases.	Are wells being plugged when production ceases?	How many wells were plugged according to state regulations when production ceases?	Annually monitor, report biennially	Every 4 years	B
11.1 – Provide a broad range of developed and dispersed outdoor recreation opportunities and experiences within the ecosystem's acceptable limits of	11.1a – By the end of this planning period, add at least one camping facility for ATV/OHM use and one for equestrian use. This could be accomplished by the Forest Service or	Is there a broad range of quality, outdoor recreation opportunities being provided and is the Forest responsive to visitor demands/needs?	What annual visitation estimates are reported (by type of visit - day use, developed, general forest area visits)?	Monitored ever 5 years; reported out in the year following	Monitored ever 5 years; reported out in the year following	A

Goal	Objective	Monitoring Questions	Monitoring Indicators	Monitoring Frequency	Evaluation Frequency	Precision/ Reliability
change. Manage recreation facilities and opportunities to respond to public demands and promote local economic development. Emphasize recreation opportunities which can be better provided on the Forest than on private or other public land.	concessionaire on NFS land or by the private sector on adjacent private property.		Why are people visiting the Forest and what are their demographics (demographics, visit descriptions, activities)?	the NVUM report	the NVUM report	
			What level of spending is reported (spending, substitute behavior, etc.)?			
			What level of visitor satisfaction is reported?			
11.2 – Construct and maintain trails and associated facilities to provide a safe and quality experience within the capabilities of the land and appropriate to the	11.2b – By the end of this planning period, relocate/re-construct five miles of the North Country Trail where the trail is currently located on roads.		How many miles of NCT have been relocated/ reconstructed off existing roads?	Biennially	Every 4 years	B

Goal	Objective	Monitoring Questions	Monitoring Indicators	Monitoring Frequency	Evaluation Frequency	Precision/ Reliability
	11.2c – Maintain and administer the Forest's motorized trail system to provide safe/enjoyable trail riding opportunities and reduce resource impacts.		How many miles of motorized trails have been maintained to standard (annual routine and deferred maintenance)?	Biennially	Every 4 years	B
	11.2d – Where maintenance methods prove ineffective and monitoring confirms unsafe conditions or unacceptable resource damage, close and rehabilitate and/or re-locate/reconstruct sections of ATV/OHM trails.		How many miles of motorized trails have been closed and rehabilitated and/or relocated/reconstructed due to unsafe conditions or unacceptable resource damage sections from ATV/OHM use?	Biennially	Every 4 years	B

Goal	Objective	Monitoring Questions	Monitoring Indicators	Monitoring Frequency	Evaluation Frequency	Precision/ Reliability
	11.2e – Reduce and strive to eliminate illegal ATV/OHM use by: • Prohibiting cross-country travel or riding on undesignated user-created trails. • Prohibit riding on trails designated for other uses. • Riding on designated trails during closed seasons • Closing at least 20 miles illegal OHV trail within the next decade to: a) Protect federally listed species b) Protect Regional Forester's sensitive species c) Improve watershed health		Have sections of unauthorized routes on the Forest been closed and rehabilitated? What were those efforts and where did they take place?	Biennially	Every 4 years	B
	11.2f **–** Maintain the Forest's non-motorized trail system to provide safe/enjoyable trail hiking, horseback riding, and biking opportunities with minimal resource impacts.		How many miles of non-motorized trails have been maintained/reconstructed to standard?	Biennially	Every 4 years	B

Goal	Objective	Monitoring Questions	Monitoring Indicators	Monitoring Frequency	Evaluation Frequency	Precision/ Reliability
	11.2g – Construct new trails during the next 10 to 15 years within the ranges and densities shown in Table 2 - 1.		How many miles of new motorized and non-motorized trails have been constructed?	Biennially	Every 4 years	B
12.1 - Maintain or enhance the quality of scenic resources to provide desired landscape character.		Is the Forest maintaining or enhancing the quality of scenic resources?	Is the Forest being managed in accordance with the assigned SIOs and scenery guidelines found in the Forest Plan?	Annually monitor, report biennially	Every 4 years	B
13.1 – Provide current and future generations the opportunity to experience and appreciate the Forest's diversity of human history and the relationship between people and the land.	13.1c – Reduce the backlog of heritage sites that require formal evaluation for eligibility to the National Register of Historic Places.	Is the Forest reducing the backlog of heritage sites needing evaluation for National Register eligibility?	How many heritage sites have been evaluated for National Register eligibility?	Biennially	Every 4 years	B
	13.1d – Develop management plans for the long-term preservation of heritage resources that are either listed on or eligible for the National Register of Historic Places.	Is the Forest developing management plans for the long-term preservation of heritage resources that are either listed on or eligible for the National Register of Historic Places?	How many management plans have been developed for heritage sites that are either eligible for or listed on the National Register of Historic Places?	Biennially	Every 4 years	B

Goal	Objective	Monitoring Questions	Monitoring Indicators	Monitoring Frequency	Evaluation Frequency	Precision/ Reliability
14.1 – Adjust land ownership within the Forest proclamation boundary to enhance public benefits and improve management effectiveness.	14.1a – Purchase, exchange, accept donations, or convey lands and mineral rights on a willing seller, willing buyer basis. Give high priority to acquisition of land that will: • Consolidate National Forest ownership • Provide access to NFS lands and waters • Protect or enhance threatened and endangered species habitat, sensitive species, heritage resources, or other special areas • Permit development and management of wetlands, lakes and ponds, or recreational facilities • Eliminate or correct sources of water pollution • Consolidate surface and mineral estates • Enhance opportunities for community development.	Does the Forest's land-base progress toward consolidation that meets objectives by exchange, purchase or donation?	How many acres of land were acquired through exchange, purchase, or donation?	Biennially	Every 4 years	B
	14.1b – Acquire rights-of-way or property to improve access to NFS land.	Is the Forest improving access to NFS land?	How many miles of right-of-way, or parcels of land, have been acquired to facilitate access to NF tracts?	Biennially	Every 4 years	B

Goal	Objective	Monitoring Questions	Monitoring Indicators	Monitoring Frequency	Evaluation Frequency	Precision/ Reliability
14.2 – Maintain boundary lines.	14.2a – Survey and post landlines not currently marked. Maintain lines previously marked on a 10-year cycle.	Is the Forest making progress towards the eventual marking and maintaining of the entire perimeter of NFS lands against private property?	How many miles of NFS land boundary were marked to standard?	Biennially	Every 4 years	B
			How many miles of NFS boundary were maintained to standard?	Biennially	Every 4 years	B
	14.2b – Resolve trespass/encroachment situations.	Is the Forest making progress toward resolving trespasses as they occur and are discovered?	How many trespasses were resolved?	Biennially	Every 4 years	B
15.1 – Consider authorization for special uses that: • Serve the public • Promote public health and safety • Protect the environment • Cannot be reasonably accommodated on private land.		Is the Forest considering and processing reasonable requests for uses on NFS lands?	How many special use permits were requested; how many of those met the criteria, and how many were issued?	Biennially	Every 4 years	B

Goal	Objective	Monitoring Questions	Monitoring Indicators	Monitoring Frequency	Evaluation Frequency	Precision/ Reliability
16 – Permit livestock grazing to: • Facilitate land acquisition by permitting current use by livestock • Contribute to wildlife habitat objectives • Help control non-native species.		Is grazing contributing to wildlife objectives or controlling NNIS?	How many acres were grazed and contributed to wildlife habitat objectives; and how many acres were grazed to control non-native species?	Biennially	Every 4 years	B
17.1 – Provide safe, efficient facilities and related structures that meet the needs of Forest visitors.	17.1a – Conduct detailed inspections of facilities every five years, more often if needed. 17.1b – Decommission facilities that are no longer needed.	Is the Forest providing safe and efficient facilities that meet visitors' needs?	How many administrative and recreation facilities meet current safety, mission, niche and use requirements?	Monitored on a rotation, report out on those monitored biennially	Every 6 years	B
17.2 – Maintain dams as safe and effective water storage facilities.	17.2a – Maintain dams to standard. 17.2b – Inspect high hazard dams annually. 17.2c – Decommissioned or appropriately dispose of dams no longer needed.	Is the Forest maintaining safe and effective dams?	How many Forest Dams meet current applicable regulations for dam safety?	Annually monitor for high hazard, report biennially Every 2 years for other dams	Annually monitor for high hazard, report biennially Every 2 years for other dams	A

Goal	Objective	Monitoring Questions	Monitoring Indicators	Monitoring Frequency	Evaluation Frequency	Precision/ Reliability
17.3 – In cooperation with local, State, and Federal government agencies, provide a safe, efficient transportation system for moving people, equipment, and forest products.	17.3b – Decommission temporary and system roads when they are no longer needed for administration of the Forest or its resources.	Is the Forest decommissioning system roads when they are no longer needed and rehabilitating unauthorized routes?	How many miles of roads were decommissioned or rehabilitated?	When Mgmt. activities are planned that may impact a road	Every 10 years	B
	17.4c – Maintain all roads in a condition that protects the government's investment. If funds do not allow for regular preventive maintenance, close roads or restrict traffic to protect resources or investment.	Are Forest development roads maintained appropriately?	How many miles of road are maintained to the level of service required, and how often is needed maintenance performed and are the roads environmentally stable?	An average of 20% of level 3-5 roads inspected annually Visual review of 50% of Level 2 roads annually. Level 1 roads every 10 years. Report on those monitored biennially	Every 10 years	A B
	17.4d – Maintain at maintenance level 3, or higher, roads intended for passenger vehicles.					
	17.4e – Maintain at maintenance level 2 roads intended for high clearance vehicles.					
	17.4f – Maintain at Maintenance Level 1 roads that are closed to public travel.					

Goal	Objective	Monitoring Questions	Monitoring Indicators	Monitoring Frequency	Evaluation Frequency	Precision/ Reliability
Standards and Guidelines Compliance (No specific enumerated Goal)		Did any project require guideline modification or a Forest Plan amendment to modify a standard?	How many modifications were required and to which standards and/or guidelines?	Biennially	Biennially	B
Climate Change impacts on the Forest		How are spring start date and growing season length changing across southeast Ohio?	When did the growing season begin?	Biennially	Every 10 years	A B
			When did the growing season end?	Biennially	Every 10 years	A B

Index

W

Appendix A

Glossary and Acronyms

Glossary

A

accessibility - The ability of a site, facility or activity to be enjoyed by persons of varying physical and mental abilities.

adaptive management - Resource management that implies making decisions as part of an on-going process. Monitoring the results of actions will provide a flow of information that may indicate the need to change a course of action. Scientific findings and the needs of society may also indicate the need to adapt resource management to new information.

administrative use - in reference to off-highway vehicles, administrative use includes management activities conducted by the Forest Service, search and rescue missions conducted by authorized officials, and operation and maintenance of oil and gas facilities where approved by the Forest Service.

advanced regeneration - Seedlings or saplings that develop or are present in the understory, normally considered when planning regeneration treatments.

Advisory Council on Historic Preservation - A federal advisory body that advises the President and Congress on national historic preservation policies, encourages private and public interest in historic preservation, and review and comments on federal undertakings that might have an effect on properties listed on or eligible for the National Register of Historic Places.

age class - 1) A grouping of stands according to their age by an interval of years, usually 10 years. 2) A distinct aggregation of trees within a stand, originating from a single natural event or regeneration activity. (See cohort.)

all terrain vehicle (ATV) - Any motorized off-highway vehicle 50 inches or less in width, ~~can be straddled~~,[1] travels on 3 or more low-pressure tires (10 pounds per square inch (PSI) or less, or as recommended by the vehicle manufacturer.)

[1] Definition of ATV changed by Administrative Correction # 5, 10/16/08.

allowable sale quantity - The amount of timber that may be sold from the area of suitable timberland covered by the forest plan for a time period specified by the plan. The ASQ is based on a 10-year period, although it may be expressed on an "average annual ASQ" basis.

aquatic ecosystem - Refers to the interaction between the following biotic and abiotic components: the stream channel, lake and estuary beds, water, biotic community, and associated habitat features. Included are perennial, intermittent and scoured ephemeral streams and lakes with intermittently, semi-permanently and seasonally flooded channels. In the absence of flowing water, intermittent and scoured ephemeral streams may have pools, or surface water may be absent altogether.

aspect - The direction a slope faces. For example, a hillside facing east has an eastern aspect.

B

barrier - 1) Any feature or condition that restricts movement of organisms or prevents establishment of organisms that have migrated there. 2) A natural or artificial obstruction used to stop or check a fire or to provide a control line from which to work. See firebreak.

bench - Normally a long, narrow, relatively level ledge or gently inclined strip of land bounded by steep slopes above and below, and formed by differential erosion of rocks and soils that are bedrock controlled.

biological assessment (BA) - Information prepared by, or under the direction of, a federal agency to determine whether a proposed action is likely to: 1) adversely affect listed species or designated critical habitat; 2) jeopardize the continued existence of species that are proposed for listing; or 3) adversely modify proposed critical habitat.

biological diversity - The variety of life in an area, including the variety of genes, species, plant and animal communities and ecosystems, and the interaction of these elements. The term is often abbreviated to biodiversity. (See habitat diversity.)

biological opinion (BO) - A document that includes: 1) the opinion of the US Fish and Wildlife Service as to whether or not a federal action is likely to jeopardize the continued existence of listed species, or result in the destruction or adverse modification of designated critical habitat; 2) a summary of the information on which the opinion is based; and 3) a detailed discussion of the effects of the action on listed species or designated critical habitat.

board foot (BF) - A measurement term for lumber or timber. It is the amount of wood contained in an unfinished board 1 inch thick, 12 inches long, and 12 inches wide. The conversion factor used in the preparation of this document is: 6.0 board feet per cubic foot.

C

canopy - The part of any stand of trees represented by the tree crowns. It usually refers to the uppermost layer of foliage, but it can be used to describe lower layers in a multi-storied forest.

cavity - A hole in a tree, often used by wildlife species for nesting or roosting.

chemical control - The use of pesticides to control pests or undesirable species. Contrast with biological control and mechanical control.

clearcut - A regeneration method in which all or almost all of the trees are removed in one cutting.

coarse woody debris - Defined in this document as pieces of wood (branches, whole trees, root wads, etc.) that are at least 4 inches in diameter and 3 feet in length, within a stream channel. Coarse woody debris contributes to habitat complexity by forming pools, encouraging scour from stream banks, partitioning the water column and providing cover for aquatic species. Coarse woody debris serves as a refuge for fish and the hard substrates and associated invertebrate production is an important food source. Coarse woody debris also influences flow velocity, channel shape and sediment storage and routing. Also referred to as large woody debris.

collector roads - Roads that serve small land areas and are usually connected to a forest development road, a county road, or a state highway.

communications site - An area of National Forest System land designated through the land and resource management planning process. A communications site may be limited to a single communications facility, but most often encompasses more than one. Each site is identified by name, usually a local prominent landmark, such as John's Creek Communications site.

community - In ecology, the collection of species that characteristically occur together under a specified set of conditions. Often, the term is used to refer only to vegetation.

concern level - In scenery management, the measure of the degree of public importance placed on landscapes as viewed from travelways and use areas. Concern levels are ranked as 1 for high, 2 for moderate, and 3 for low. (Similar to Sensitivity Level under the Visual Management System.)

concessionaire - The permitted, private operator of a USDA Forest Service recreation facility.

conifer - A tree that produces cones, such as a pine, spruce, or fir tree. Also known as softwood.

controlled surface use stipulation - A mineral leasing stipulation that identifies standards that an operator must meet to mitigate potential adverse effects to surface resources.

coppice harvesting - A method of regenerating a stand in which all trees in the previous stand are cut and the majority of regeneration is from sprouts or root suckers.

corridor - 1) A feature of the landscape that connects similar areas. 2) A linear strip of land developed for locating transportation or utility rights-of-way within its boundaries.

Council on Environmental Quality (CEQ) - An advisory council to the President, established by the National Environmental Policy Act of 1969. The CEQ reviews federal programs for their effect on the environment, conducts environmental studies, and advises the President on environmental matters.

cover - 1) Any feature that conceals wildlife or fish. Cover may be dead or live vegetation, boulders, or undercut stream banks. Animals use cover to escape from predators, rest or feed. 2) The kind of and nature of vegetation which casts a shadow on the ground. Can describe any or all vertical layers of vegetation.

critical habitat - Areas formally designated for the survival and recovery of federally listed threatened or endangered species.

crown - The part of a tree or woody plant bearing live branches and foliage.

cultural resources - The physical remains of sites, structures, networks, or objects used by humans in the past. They can be historic, prehistoric, archaeological, or architectural in nature (see heritage resources).

cumulative effect or impact - Impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

D

desired landscape character - Appearance of the landscape to be retained or created over time, recognizing that the landscape is a dynamic and constantly changing community of plants and animals.

developed recreation (DR) - Recreation that takes place at defined areas where constructed facilities are provided for such use. Developed recreation sites include campgrounds, picnic areas, boat ramps and interpretive sites. Contrast with dispersed recreation.

dispersed recreation - Recreation that takes place in less developed settings where few, if any, constructed facilities are provided. Trail use, rock climbing, boating, hunting and fishing are examples of dispersed recreation. Contrast with developed recreation.

disturbance - A discrete event, either natural or human induced, causing change in the condition of an ecological system, community, or population structure; and changes resources, substrate availability, or the physical environment.

duff - The fermentation and humus layer of the forest floor material lying below the litter and above mineral soil; it consists of partially decomposed organic matter whose origins can still be visually determined as well as the fully decomposed humus layer. This layer does not include the freshly cast material in the litter layer. Contrast with litter.

E

ecology - 1) The interrelationships and interconnectedness of living things to one another (biotic) and to their environment (abiotic). 2) The study of these interrelationships and interconnections.

ecoregion - An area over which the climate is sufficiently uniform to permit development of similar ecosystems on sites that have similar properties. Ecoregions contain many landscapes with different spatial patterns of ecosystems.

ecosystem - An arrangement of biotic and abiotic components and the forces that move among them.

edge - The junction between two dissimilar habitat types or successional stages.

endangered species - A plant or animal species that is in danger of extinction throughout all or a significant portion of its range. Endangered species are identified by the Secretary of the Interior/Secretary of Commerce in accordance with the Endangered Species Act of 1973.

environmental analysis - 1) An analysis of actions and their predictable long and short-term environmental effects. Environmental analyses include consideration of physical, biological, social, and economic factors. 2) A general term that could refer to an environmental assessment or an environmental impact statement.

environmental impact statement (EIS) - A disclosure statement revealing the environmental impacts of a proposed action, which is required for major federal actions under Section 102(2)(C) of the National Environmental Policy Act. A draft EIS is released to the public and other agencies for review and comment. The statement provides full and fair discussion of significant environmental impacts and informs the decision maker and the public of the reasonable alternatives, which would avoid or minimize adverse impacts or enhance the quality of the human environment.

ephemeral stream - A stream that flows only in direct response to precipitation, receives no water from springs, and does not have a continuous supply from surface sources. Ephemeral streams have a functional channel with streambed and banks which are annually cleared of debris and leaf litter.

epicormic branching - A new branch arising spontaneously from a dormant bud on the stem, branch, or bole of a tree, often following exposure to increased light.

eradication - In silviculture, elimination of gypsy moth from an area infested as a result of artificial movement of gypsy moth life stages from the generally infested area.

erosion - The wearing away of the earth's surface by running water, wave action, moving ice and wind, or processes of mass wasting. Geologic erosion refers to natural erosion processes occurring over long (geologic) time spans. Accelerated erosion generically refers to erosion in excess of what is presumed or estimated to be naturally occurring levels.

European settlement - In an ecological context, the era of European settlement in the area of the Wayne National Forest is regarded as beginning around 1700 A.D. The era of pre-European settlement is generally defined as 1000 to 1700 A.D.

even-aged management - See even-aged silvicultural system.

even-aged silvicultural system - A planned sequence of treatments designed to maintain and regenerate a stand with one age class. The range of tree ages is usually less than 20 percent of the rotation; i.e. clear-cutting, seed-tree, shelterwood, and coppice methods. (Also referred to as even-aged management.)

existing landscape character - A term used in scenery management to refer to a word picture that includes cultural values, positive attributes, and sense of place. It can serve as a baseline for developing alternatives in land and resource plan revision and to develop Landscape Character Themes. (See Landscape Character Theme.)

F

feature - Topographical evidence of disturbance created by previous mining activities such as subsidence, open portals, highwalls, slumps, and seeps.

federally listed species - Refers to one or more species listed by the U. S. Fish and Wildlife Service as endangered (E), threatened (T) or proposed for federal listing as threatened or endangered (P).

filterstrips - A filterstrip is primarily a sediment and nutrient trapping tool. The width of the filterstrip necessary to protect the riparian area (including the aquatic and riparian ecosystems) and water quality will vary, depending on many factors: e. g. topography; aspect; landform; climate; soil and parent geology slope; condition of the vegetative community; aquatic community; hydrologic regime; management activity and resource objectives. Filterstrip requirements may vary from a minimum of 50 to 100 feet.

fire intolerant species - A species with morphological characteristics that give it a higher probability of being injured or killed by fire than a fire-tolerant species, which has a “relatively low” probability of being injured or killed by fire.

fire regime - Patterns of fire occurrence, size, severity and effects in a given area or ecosystem. A natural (historical) fire regime is a general classification of the role fire would play across a landscape in the absence of modern human intervention, but including the influence of aboriginal burning.

Fire Regime Condition Class (FRCC) - The ecological condition of the vegetation and fire regime of a landscape. FRCC is measured by describing the degree of departure from historical fire regimes, possibly resulting in alterations of key ecosystem components such as species composition, structural stage, stand age, canopy closure and fuel loadings. The three classes are defined as:

Condition Class 1 - Fire regimes are within a historical range, and the risk of losing key ecosystem components is low. Species composition and structure are intact and functioning.

Condition Class 2 - Fire regimes have been moderately altered from the historical range. The risk of losing key ecosystem components is moderate. Fire frequencies have departed from historical frequencies by one or more return intervals. This results in moderate changes to one or more of the following - fire size, intensity and severity, and landscape patterns. Vegetation attributes have been moderately altered from their historical range.

Condition Class 3 - Fire regimes have been significantly altered from their historical range. The risk of losing key ecosystem components is high. Fire frequencies have departed from historical frequencies by multiple return intervals. This results in dramatic changes to one or more of the following: fire size, intensity and severity, and landscape patterns. Vegetation attributes have been significantly altered from their historical range.

fire suppression - All the work of extinguishing or confining a fire beginning with its discovery and continuing until the fire is completely extinguished.

firebreak - A natural or constructed barrier used to stop or check fires that may occur, or to provide a control line from which to work. (See fireline.)

fireline - The part of the fire control line along which mineral soil has been exposed. See firebreak.

flood prone area - An area along streams which generally includes the active floodplain and the low terrace. It is delineated on-the-ground by the elevation that corresponds to twice the maximum depth of the bankfull channel as taken from the established bankfull stage.

floodplain - The lowland and relatively flat areas joining inland and coastal water including the debris cones and flood-prone areas of offshore islands and, at a minimum, that area subject to a 1 percent (100-year recurrence) or greater chance of flooding in any given year.

forest - In ecology, a mostly closed high canopy contiguous area of trees with a moderate to high basal area (60-120 or more square feet/ acre). In forestry, land at least 10 percent stocked by forest trees of any size, including land that formerly had such tree cover and that will be reforested. The minimum area for classification of forest is one acre, and at least 120 feet wide. Also referred to as forestland, forest land or forested land. When capitalized in this document, the word Forest refers to the Wayne National Forest.

forest canopy - The cover of branches and foliage formed collectively by tree crowns

forest development road (FDR) - Road under the jurisdiction of the USDA Forest Service.

forest health - 1) The perceived condition of a forest derived from concerns about such factors as its age, structure, composition, function, vigor, presence of unusual levels of insects or disease, and resilience to disturbance. Note that perception and interpretation of forest health are influenced by individual and cultural viewpoints, land management objectives, spatial and temporal scales, the relative health of the stands that comprise the forest, and the appearance of the forest at a point in time. 2) A condition where biotic and abiotic influences do not threaten resource management objectives now or in the future. Ill health is associated with declines in biological diversity, loss of primary productivity, reversal of successional patterns, widespread and severe disease, and loss of nutrient capital. A healthy forest can be envisioned as one with the capacity for renewal and resilience to a range of disturbances, while meeting the current and future needs of people.

forest land - (See forest.)

Forest Supervisor - The official responsible for administering National Forest System lands on one or more national forests. A Forest Supervisor reports to a Regional Forester.

forest type - A category of forest defined by its vegetation, particularly its dominant species, as based on a percentage cover of trees. Also referred to as forest cover type.

forestland - (See forest.)

fragmentation -The breaking up of contiguous areas into progressively smaller patches. The process of fragmentation occurs across a range of landscape patterns. At one extreme, it is represented by small disturbance patches, which disrupt the continuity of a habitat. At the other extreme, widespread habitat conversion causes isolation of the remnant original habitat into patches.

fuel loading - The amount of fuel present expressed quantitatively in terms of weight of fuel per unit area. This may be available (consumable) fuel or total fuel and is usually dry weight. Also referred to as fuel load.

fuels management - Manipulation, including combustion, or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control.

fuels - In fire management, flammable natural fuels such as leaf litter or logging slash.

fuelwood - Wood used for conversion to some form of energy, for example in homes or in cogeneration plants.

function - A the process within an ecosystem through which the elements interact, such as succession, the food chain, fire, weather, and the hydrologic cycle.

G

goal - In planning, a concise statement that describes a desired future condition to be achieved with no specific date by which it is to be attained. It is normally expressed in broad, general terms. Goal statements form the principal basis from which objectives are developed.

grazing - The consumption of standing forage by livestock or wildlife.

group selection - An uneven-aged regeneration method in which trees are removed periodically in small groups. On the Wayne National Forest, the group size is between one-quarter and two acres.

guideline - Statements describing a preferred or advisable course of action that is generally expected to be carried out. Because guidelines are discretionary, deviation from a guideline does not require an amendment to the Forest Plan, but the rationale for such deviation should be documented in the project record.

H

habitat - The physical and biological environment for a plant or animal species in which all the essentials for its development, existence, and reproduction are present.

habitat capability - The ability of a land area or plant community to support a given species of wildlife.

habitat diversity - The diversity of wildlife habitat types within a given area. See biological diversity.

heritage resources - The physical remains of sites, structures, networks, or objects used by humans in the past. They can be historic, prehistoric, archaeological, or architectural in nature. Generally a synonym of cultural resources, although heritage resources may be more broadly inclusive. (See cultural resources.)

Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) - Federal programs to document and record important architectural, engineering and industrial sites throughout the United States. A complete set of HABS/HAER documentation on a given site consists of measured drawings, large-format photographs, and a detailed written history that becomes a lasting archival record which is housed at the Library of Congress in perpetuity.

historic range of variability - The natural fluctuation of components of healthy ecosystems over time. The range of conditions and processes which are likely to have occurred prior to settlement by people of European descent.

I

integrated pest management (IPM) - The planned use of a variety of preventive, suppressive, or regulatory tactics and strategies that are ecologically and economically efficient and socially acceptable, to maintain destructive pests at tolerable levels.

Interdisciplinary Team (IDT) - A team of individuals with skills from different disciplines that focuses on the same task or project.

interior forest habitat - High canopy forest conditions suitable to meet the requirements of area-sensitive species that are adversely impacted by forest edge, including microclimate change (warmer, windier), increased predation, increased brood parasitism, and increased competition.

intermediate thinning - An intermediate treatment involving the removal of trees from a stand sometime between the establishment of the stand and the regeneration cut(s). See intermediate treatments.

intermediate treatments – An inclusive term for any treatment designed to enhance growth, quality, vigor, and composition of the stand between establishment of the stand and the regeneration cut(s). (See intermediate cutting. Types of intermediate treatments include thinning, release, and improvement cuttings.) [1]

intermittent stream - A stream that normally flows in response to a seasonally fluctuating water table in a well-defined channel (flowing 10-90 percent of an average year). The channel will exhibit signs of annual scour, sediment transport and other stream channel characteristics, absent perennial flows. Intermittent streams typically flow during times of elevated water table levels and may be dry during significant periods of the year, depending on precipitation cycles. Intermittent streams do not maintain fish populations or aquatic insects that have larvae with multi-year life cycles. Contrast with ephemeral stream and perennial stream.

[1] Definition added 10/16/2008 by Administrative Correction # 1

interpretation - The conveyance of information to the public on topics such as natural and heritage resources or general forest information through various methods to better help visitors relate to, experience, understand and enjoy the natural environment and their recreation experience.

interpretive site - A site designated primarily for providing the public interpretive materials and programs.

invasive species - A species that can move into an area and become dominant either numerically or in terms of cover, resource use, or other ecological impacts. An invasive species may be native or non-native.

issues - Topics of unresolved conflict or special concern involving management of the National Forest.

J

K

keystone species - A species whose influence on ecosystem function and diversity are disproportionate to their numerical abundance.

L

landing - A cleared area in the forest to which logs are yarded or skidded for loading onto trucks for transport.

Landscape Character Goal - In scenery management, the visual and cultural image of a geographical area. It uses base information from ecological unit descriptions supplemented with existing land use patterns or themes. It is the adopted desired future appearance of the area and represents trade-off analysis with other resources. Levels include Natural Evolving, Natural Appearing, Pastoral/Agricultural, Historic, Transitional, Suburban, and Urban.

landscape character - Particular attributes, qualities, and traits of a landscape that give it an image and make it identifiable or unique.

landscape - A large land area composed of interacting ecosystems that are repeated due to factors such as geology, soils, climate, and human influences throughout the area. Landscapes are generally of a size, shape, and pattern that are determined by interacting ecosystems.

Landscape Character Description - A combination of objective information and subjective values assigned to a landscape, which gives a visual and cultural image of a geographic area.

landtype - A unit of ecological land classification based on similar bedrock geology, soils and landform, which repeats on the landscape.

large woody debris - see coarse woody debris.

litter - The top layer of the forest floor directly above the duff layer, which includes freshly fallen or only slightly decomposed plant material, including leaves, needles, bark flakes, cone scales, fruits (including acorns and cones), dead matted grass and other vegetative parts that are little altered in structure by decomposition. Contrast with duff.

long-term sustained-yield capacity - The highest uniform wood yield from lands being managed for timber production that may be sustained under specified management intensity, consistent with multiple-use objectives.

M

management indicator species (MIS) - 1) A species whose condition can be used to assess the impacts of management actions on a particular area. 2) A species whose population changes are believed to indicate the effects of management activities, and is monitored to track population numbers and habitat conditions, as a way of monitoring biodiversity.

mature forest - Trees that have attained full development, especially height, and are in full seed production.

mature timber - Generally used in an economic sense to indicate that a forest has attained harvest age.

mechanical site preparation - The killing or retardation of competing vegetation to prepare an area for reforestation, using heavy equipment. See specific mechanical methods: chopping, disking, scarification, shearing, shredding, raking, and ripping. See site preparation, manual site preparation, chemical site preparation, and mechanical control.

mesic - Refers to moist to moderately moist soil conditions. Under mesic conditions, soil moisture is predictably adequate for plant growth during the growing season.

mesophytic - Of or adapted to a moderately moist environment.

microclimate - The climate of a small site. It may differ from the climate at large of the area due to aspect, tree cover (or the absence of tree cover), or exposure to winds. (Contrast with macroclimate.)

mineral materials - Mineral commodities having a low value per ton such as sand, gravel, stone, clay and other similar materials. Such mineral materials are saleable minerals in accordance with the Mineral materials Act of 1947.

mineral soil - Soil that consists mainly of inorganic material, such as weathered rock, rather than organic matter.

mitigation - Collective actions taken to avoid, minimize, or rectify the negative impact of a land management practice.

mixed mesophytic forest - A forest containing tree (mostly hardwood) and plant species, which normally grow in moderately moist soils, typically in coves, or in riparian areas.

monitoring and evaluation (M&E) - the periodic evaluations of forest management activities to determine how well objectives were met and how management practices should be adjusted.

mortality - 1) The death rate of a species within a given population or community. 2) In forestry, the quantity of formerly merchantable trees that have died within a specified period of time.

mosaic - In this document, areas with a variety of plant communities, generally repeating over a landscape, such as forested and non-forested areas.

N

National Historic Landmark - Cultural properties designated by the Secretary of the Interior as being nationally significant. These cultural properties may be buildings, historic districts, structures, sites and objects that possess exceptional value in commemorating or illustrating the history of the United States.

National Historic Preservation Act (NHPA) - A federal Act, passed in 1966, which established a program for the preservation of additional historic properties throughout the nation and for other purposes, including the establishment of the National Register of Historic Places, the National Historic Landmarks designation, regulation for supervision of antiquities, designation of the State Historic Preservation Offices, guidelines for federal agency responsibilities, technical advice, and the establishment of the Advisory Council on Historic Preservation.

National Register of Historic Places (NRHP) - A list of heritage resources that have local, state, or national significance maintained by the Secretary of the Interior.

native species - Any species native to a given land or water area by natural occurrence.

Natural-Appearing Landscape Character - Landscape character that has resulted from human activities, yet appear natural, such as historic conversion of native forests in to farmlands, pastures, and hedgerows that have reverted back to forests through reforestation activities or natural regeneration

National Environmental Policy Act (NEPA) process - A series of procedural steps derived from the National Environmental Policy Act of 1970. The NEPA process is intended to help public officials make decisions that are based on public input and understanding of environmental consequences, and take actions that protect, restore, and enhance the environment.

niche - As it relates to recreation marketing; the role best suited for the Forest Service in its provision of recreational facilities, activities and settings to the public it serves.

no surface occupancy (NSO) - A mineral leasing stipulation that prohibits occupancy or disturbance on all or part of the land surface to protect special values or uses.

non-native invasive species (NNIS) - An introduced species that evolved elsewhere, and that has been transported and disseminated purposefully or accidentally.

notice of intent (NOI) - A notice in the Federal Register that an environmental impact statement will be prepared.

O

objective - In planning, a concise, time-specific statement of measurable planned results that respond to pre-established goals. An objective forms the basis for further planning to define the precise steps to be taken and the resources to be used in achieving identified goals.

obliteration - In engineering, actions taken on a roadway or motorized trail over which travel has been and will continue to be denied. The entrance is obscured, and the wheel tracks or pathway is no longer continuous and suitable for travel. Maintenance needs have been eliminated, and it has been removed from the transportation or trail system inventory. Obliteration does not necessarily imply returning the road prism back to its original contours.

off-highway vehicle (OHV) - Any motorized vehicle designed for or capable of cross-country travel on or immediately over land, water, snow, ice, marsh, swampland, or other natural terrain. It includes but is not limited to four-wheel drive and other high-clearance vehicles, low-pressure-tired vehicles (ATV), motorcycles and related two-wheeled vehicles (OHM), and any other means of transportation deriving power from any source other than muscle or wind; except that such term shall exclude any registered motorboat; any military, fire, or law enforcement vehicle; any farm-type tractor and other self-propelled agricultural equipment used exclusively for agricultural purposes; any self-propelled equipment for harvesting and transporting forest products, or for earth moving or construction while being used for these purposes on the work site (and self-propelled lawnmowers, snow-blowers, garden or lawn tractors, or golf carts while being used for their designed purpose). See all-terrain vehicle.

old-growth - Old-growth encompasses the later stages of stand development that typically differ from earlier stages in a variety of characteristics which may include tree size, accumulation of large wood material, number of canopy layers, species composition, and ecosystem function. Different forest communities reach old-growth conditions at different ages, under different disturbance regimes, and via different management strategies. (Specific descriptions of old-growth on the Wayne National Forest can be found in Appendix D-Range of Natural Variability in the EIS.)

outstanding mineral rights - The rights to extract subsurface minerals that are retained by the owner of those minerals, when ownership of the surface of the land (by subsequent party) is transferred to the federal government.

overmature forest - A tree or stand that has attained full development, particularly in height, and has begun to lessen in commercial value because of declining vigor, health, or soundness.

overstory - 1) The trees in a two- or multi-layered forest stand that provides the upper crown cover. 2) A more or less continuous cover of branches and foliage formed collectively by the upper portion of the vegetation structure.

P

patch - An area of vegetation that is homogeneous in structure and composition. (See stand.)

perennial stream - Any watercourse that normally flows most of the year (greater than 90 percent of an average year) in a well-defined channel, although droughts and other precipitation patterns may influence the actual duration of flow. It contains fish or aquatic insects that have larvae with multiyear life cycles, and water-dependent vegetation is typically associated with it. (Contrast with ephemeral stream and intermittent stream.)

personal use - The use of a forest product, such as firewood, for home use as opposed to commercial use or sale.

planning area - In this document, the area of National Forest System land covered by a Forest Land and Resource Management Plan.

planning period - The 150-year time frame for which goods, services, and effects were projected in the development of the Forest Plan.

precommercial thinning - The removal from a stand of some of the trees that are too small to be sold for timber products, to promote growth of the remaining, more desirable trees. (See thinning.)

prescribed burning - The controlled application of fire to wildland fuels in either their natural or modified state, under specified environmental conditions that allows the fire to be confined to a predetermined area, and produce the fire behavior and fire characteristics required to attain planned fire treatment and resource management objectives.

prescribed fire plan - A written statement defining the objectives to be attained as well as the conditions of temperature, humidity, wind direction and speed, fuel moisture and soil moisture under which a fire will be allowed to burn. A prescription is generally expressed as acceptable ranges of the prescription elements and the limit of the geographic area to be covered.

prescribed fire - A fire ignited by management actions to meet specific objectives. More specifically, it is the controlled application of fire to wildland fuels in either their natural or modified state, under specified environmental conditions that allows the fire to be confined to a predetermined area, and produce the fire behavior and fire characteristics required to attain planned fire treatment and resource management objectives.

present net value (PNV) - The measure of the economic value of a project when costs and revenues occur in different time periods. Future revenues and costs are "discounted" to the present by an interest rate that reflects the changing value of a dollar over time. The assumption is that dollars today are more valuable than dollars in the future. PNV is used to compare project alternatives that have different cost and revenue flows. Also called present net worth; net present value.

professional archaeologist - An archaeologist who meets the Secretary of the Interior's Standards for Archaeology and Historic Preservation.

public involvement - In planning, the use of appropriate procedures to inform the public, obtain early and continuing public participation, and consider the views of interested parties in planning and decision making.

Q

q-factor - A term used in uneven-aged silviculture to describe the relative distribution of tree diameter size classes in a stand. This is expressed in terms of the "q" ratio between numbers of trees in successive 2-inch diameter classes. For example, a "q" of 1.5 means there are 1.5 times as many 10-inch trees as there are 12-inch trees, and 1.5 times as many 12-inch trees as there are 14-inch trees, etc. The lower the "q-factor", the more large trees there are in proportion to small trees.

R

range of variability - Refers to the range of sustainable conditions in a healthy ecosystem, which is determined by time, processes, species, and the land itself. For instance, ecosystems that have a 10-year fire cycle have a narrower range of variation than ecosystems with 200 to 300-year fire cycles. Also called the historic range of variability or natural range of variation.

ranger district (RD) - The administrative sub-unit of a national forest, supervised by a District Ranger who reports directly to a Forest Supervisor.

Recreation Opportunity Spectrum (ROS) - A framework for stratifying and defining classes of outdoor recreation environments or settings, activities, and experiences along an opportunity spectrum. The spectrum is defined typically by six classes of-opportunities (see below for each class description).

> **primitive** - 1) Minimum modification. 2) Area is characterized by fairly large, essentially unmodified natural environment. Interaction between users is very low and evidence of other users is minimal. The area is managed to be essentially free from evidence of human induced restrictions and controls. Motorized use in the area is not permitted

semi-primitive non-motorized - 1) Minimum modification. Motorized access not allowed. 2) Area is characterized by a predominantly natural or natural appearing environment of moderate to large size. Interaction between users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but is subtle. Motorized use is generally prohibited.

semi-primitive motorized - 1) Minimum modification. Motorized access is allowed. 2) Area characterized by a predominantly natural or

natural-appearing environment of moderate to large size, with a moderately high probability of experiencing isolation from the sights and sounds of humans, independence, closeness to nature, tranquility, and self-reliance through the application of woodsman and outdoor skills in an environment that offers challenge and risk. Motorized use is permitted.

roaded natural - 1) Moderate modification. 2) Area is characterized by a predominantly natural or natural-appearing environment of moderate size. Interaction between users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but is subtle. Motorized use is permitted, but may be restricted in some areas.

rural -1) Heavy modification. 2) Area is characterized by substantially modified natural environment. Resource modification and utilization practices are to enhance specific recreation activities and to maintain vegetative cover and soil. Sights and sounds of humans are readily evident, and the interaction between users is often moderate to high. A considerable number of facilities are designed for use by a large number of people. Facilities are often provided for special activities. Facilities for intensified motorized use and parking are available.

urban - 1) High degree of modification. 2) Area is characterized by a substantially urbanized environment, although the background may have natural-appearing elements. Renewable resource modification and utilization practices are to enhance specific recreation activities. Vegetative cover is often exotic and manicured. Sights and sounds of humans, on-site, predominate. Large numbers of users can be expected, both on-site and in nearby areas. Facilities for highly intensified motor use and parking are available with forms of mass transit often available to carry people throughout the site.

ROS is used in two different contexts – either as an inventory tool or a management objective. As an inventory tool, ROS is used to describe the existing array of recreation settings. This application describes the existing recreation opportunities or condition on the Forest and is referred to as the ROS inventory. The second way ROS is used is to describe a set of recreation management objectives or desired future recreation settings, which is referred to as ROS class objectives.

reforestation - The restocking of a harvested or poorly stocked forest by either natural or artificial means.

regeneration - 1) The renewal of a forest, including the regeneration cut(s) and subsequent reforestation. 2) A young cohort of trees generally in the seedling stage. Obsolete term: reproduction. (See advanced regeneration, artificial regeneration, and reforestation.)

regeneration method - A cutting procedure by which a new age class is created; the major methods are clearcutting, seed tree, shelterwood, and selection.

Regional Forester (RF) - The official of the USDA Forest Service responsible for administering an entire region of the Forest Service.

Regional Forester sensitive species (RFSS) - Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by (1) significant current or predicted downward trends in population numbers or density; or (2) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution. Sometimes referred to as a sensitive species.

rehabilitation - The process of repairing damage done to the ecosystem or a part of it, such that natural processes will again function in the repaired system. Contrast with restoration.

residual trees - The live trees remaining after a natural or artificial disturbance (e.g., a wind event or timber harvest).

responsible official - The USDA Forest Service employee who has been delegated the authority to carry out a specific planning action.

restoration - The process of modifying an ecosystem to achieve a desired, healthy, and functioning condition. Contrast with rehabilitation.

revegetation - The re-establishment and development of a plant cover by either natural or artificial means, such as re-seeding.

between the aquatic and terrestrial ecosystems. The riparian area is delineated by frequently or occasionally flooded soils, as defined by USDA county Soil surveys.

riparian corridor - A three-dimensional area of interaction between the aquatic and terrestrial ecosystem. The riparian corridor extends up and down streams and along shorelines, extends laterally up into the terrestrial ecosystem where the land-water interface occurs, and extends from below the water table to the canopy. It includes the riparian area and upland areas within the flood-prone, or 100 feet from the edge of the aquatic ecosystem or wetland, whichever is greater.

riparian-dependent resources - Resources that owe their existence to the riparian area.

roadless area - National Forest System lands evaluated for potential wilderness that meet one or more of the criteria in FSH 1909.12, Chapter 7.

rotation - In silviculture, the number of years required for establishment and growth of trees to a specified condition of maturity, at which point they are harvested. The term rotation applies to even-aged management and does not apply to two-age or uneven-age systems. (See cutting cycle.)

roundwood - Logs, bolts, or other round sections cut from trees for industrial manufacture or consumer use. (See sawtimber; poletimber-size.)

run-off - The portion of precipitation that flows over the land surface or in open channels.

S

sacred site - Any specific, discrete, narrowly delineated location on federal land that is identified by an Indian tribe or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion.

salvage harvest - The harvest of dead trees or trees being damaged or killed by injurious agents other than competition, to recover economic value that would otherwise be lost.

sapling - A tree, at least 1.0 inch dbh, and less than 5.0 inches dbh.

sawtimber - Trees that contain at least one 12-foot, or two 8-foot logs that can be made into lumber, that are typically at least 11 inches dbh for hardwood species, and 9 inches dbh for softwood species. Also referred to as large roundwood or saw timber.

scenery - General appearance of a place or landscape, and a natural resource of the Forests and composed of existing natural features including vegetation, water, landforms, and geology.

scenery management system (SMS) - 1) A system of inventory, analysis, and management of scenery within an ecosystem context. 2) Tool incorporated into Forest Plans to determine the relative value and importance of scenery on National Forest System lands. The process involves classifying landscapes, and setting goals and objectives for maintaining, enhancing, restoring, and monitoring scenic integrity. SMS replaced the Visual Management System (VMS) as defined in Agriculture Handbook #462.

scenery management - The art and science of arranging, planning, and designing landscape attributes relative to the appearance of places and expanses in outdoor settings.

scenic class - A group of seven classes used in forest planning to rank the relative importance or value of landscape areas with similar characteristics of scenic attractiveness and landscape visibility. A level 1 area has the highest value and Level 7 has the lowest value.

scenic integrity -The state of naturalness, or conversely, the state of disturbance created by human activities or alteration. It is a measure of the degree to which a landscape is usually perceived to be “complete”. The degrees of deviation are used to describe the existing scenic integrity, proposed scenic integrity levels, and scenic integrity objectives.

scenic integrity levels (SIL) - They are the proposed management objectives that are presented in the alternative development of the Environmental Impact Statement. Usually they are described at the management prescription level. Scenic Integrity Levels (SILs) are defined by minimal acceptable levels or performance standards in each alternative. SILs are Very High, High, Moderate, Low, and Very Low. The SILs define the degrees of acceptable deviation in form, line, color, and texture that may occur at any given time. (Full description in Agricultural Handbook 701).

scenic integrity objective (SIO) - Scenic Integrity Objectives (SIOs) guide the amount, degree, intensity, and distribution of management activities needed to achieve desired scenic conditions. They are the management objectives that are adopted through the approval of the Forest Land and Resource Management Plan. Scenic integrity levels (SILs) becomes the objectives (SIOs) when the preferred alternative is selected. (Refer to the Forest's landscape character descriptions for a definition of the valued landscape character for each Management Area.)

Very High Scenic Integrity: *Unaltered*- The valued landscape character is intact with only subtle, if any, deviations. The existing landscape character and sense of place is expressed at the highest possible level. (Equivalent to Preservation in VMS)

High Scenic Integrity: *Appears unaltered*- The valued landscape character appears intact. Deviations may be present, but are not evident because they repeat the form, line, color, texture, and pattern common to the landscape character so completely and at the appropriate scale. (Equivalent to Retention in VMS)

Moderate Scenic Integrity: *Appears slightly altered*- The valued landscape character appears slightly altered. Noticeable deviations must remain visually subordinate to the landscape being viewed. (Equivalent to Partial Retention in VMS)

Low Scenic Integrity: *Appears altered*- Deviations from the valued landscape character may begin to dominate the landscape being viewed, but they should borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes, or architectural styles that may occur elsewhere. (Equivalent to Modification in VMS)

Very Low Scenic Integrity: *Appears heavily altered***-** The valued landscape character appears heavily altered. Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect, pattern and scale of natural openings, vegetative type changes or architectural styles within or outside the landscape being viewed. However deviations should be shaped and blended with the natural terrain (landforms) so that elements such as unnatural edges, roads, landings, and structures do not dominate the composition. This is not a desirable management objective for scenery. (Equivalent to Maximum Modification in VMS)

Unacceptably Low: The valued landscape character being viewed appears extremely altered. Deviations are extremely dominant and borrow little if any form, line, color, texture, pattern or scale from the landscape character. Landscapes at this level of integrity need rehabilitation. This level should only be used to inventory existing integrity or for monitoring. It must not be used as a management objective. (Equivalent to Unacceptable Modification in VMS) (Full description available in Agricultural Handbook 701).

scenic resource - The composite of basic terrain, geological features, water features, vegetative patterns, and land-use effects that typify a land unit and influence the visual appeal the unit may have for visitors.

Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings - a series of standards developed by the Department of the Interior's National Park Service addressing the most prevalent preservation treatment today: rehabilitation. Rehabilitation is defined as the process of returning a property to a state of utility, through repair or alteration, which makes possible an efficient contemporary use while preserving those portions and features.

sediment - Material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by water, wind, ice or mass-wasting and has come to rest on the earth's surface.

seedling - A tree from the time of emergence from the seed, until it reaches sapling size (1 inch dbh). For silvicultural inventories, only established seedlings are counted. A hardwood seedling is considered established at one foot tall, and a softwood seedling at six inches tall.

seed-tree - A residual tree left after harvest as a seed source for the next cohort.

seed tree regeneration method - An even-aged regeneration method where all merchantable trees in a stand are removed in a single cut, except for a small number of widely dispersed trees retained for seed production.

seep - A wet area where a seasonal high water table intersects with the ground surface.

sensitive species – see Regional Forester's sensitive species

shelterwood - 1) An even-aged regeneration method involving the cutting of most trees, leaving those needed to produce sufficient shade to produce an new age class in a moderated microenvironment, 2) residual trees left to provide shade for a new cohort.

significant heritage resource - Any such resource that meets the criteria for listing on the National Register of Historic Places.

significant issue - In planning, an area of unresolved conflict concerning management of the National Forest.

silvicultural system - A management process whereby forests are tended, harvested, and replaced, resulting in a forest of distinctive form.

silviculture - The theory, practice, art and science of controlling the establishment, composition, growth, and quality of forest stands and trees, in order to meet management objectives.

single tree selection - An uneven-aged regeneration method in which individual trees, or small groups of trees less than one-quarter acre in size, from certain size and age classes are removed across a stand to achieve desired stand structural characteristics. Also referred to as individual tree selection.

site preparation - A reforestation activity, normally following a timber harvest, that is designed to control vegetation that could interfere with the establishment of the desired species, or designed to expose mineral soil sufficiently for the establishment of the desired species. Site preparation treatments could include mechanical, manual, chemical, prescribed fire, or a combination of such treatments.

skid road - A temporary blade-constructed pathway having a road-like function and appearance, used to drag felled trees or logs to a landing. Several skid trails normally branch off of a skid road.

skid trail - A temporary nonstructural pathway used to drag felled trees or logs to a skid road or landing, resulting in some ground disturbance. One or more skid trails normally connect to a skid road.

skidding - The movement of logs by dragging from stump to a log landing.

slash - The residue left on the ground after timber cutting or resulting from a storm, fire, or other natural event. Slash includes unused logs, uprooted stumps, broken or uprooted boles, branches, bark and other material.

slope stability - The susceptibility of a slope to erosion and landslides.

Slow-the-Spread - A strategy developed to slow the expansion of insects and/or diseases from the generally infested area.

snag - A standing dead tree or a live tree with less than 10% crown.

soil compaction - A reduction of soil volume, which results in alteration of soil chemical, physical and biological properties and qualities.

soil productivity - The potential capability of a soil to supply the physical, chemical, and biological needs of plants over the long-term, as influenced by climate, parent materials, topographic on the landscape (including aspect), and land use history.

soil survey - The systematic examination, description, classification, and mapping of soils in an area.

soil texture - The relative proportions of sand, silt and clay in a soil.

special forest products - Includes edibles (e. g. mushrooms); medicinals (e.g. ginseng and St. John's Wort); floral products (e. g. moss, grape vines and ferns); and specialty wood products (e.g. carvings and containers) removed from NFS lands for personal or commercial use.

special use authorization - A permit, term permit, temporary permit, lease, easement, or other written instrument that grants rights of privileges of occupancy and use subject to specified terms and conditions on National Forest System land.

Spectrum - A computer-modeling tool to address ecosystem management issues. It models alternative resource management scenarios applied to landscapes through time in support of strategic and tactical planning. This includes scheduling vegetation manipulation activities to achieve ecosystem management objectives; modeling resource effects and interactions within management scenarios; and exploring tradeoffs between alternative management scenarios in support of decisionmaking.

spring - A water source located where water begins to flow from the ground due to the intersection of the water table with the ground surface. Springs generally flow throughout the year.

stage construction - For analysis purposes, stage construction is used to address specific road segments of concern (i.e., stream crossings) during construction of a road project. The intent being is to require construction of a particular road segment of concern (potentially of high risk for environmental damages) as fully designed prior to proceeding further, so as to protect sensitive resources (e.g., water quality, aquatic habitats, and slope stability). This is in contrast to the more traditional definition commonly used to mean, "Construct to a lower standard initially, but returning at a later time to rise to a higher standard of construction." For example, a road would be initially constructed without gravel surfacing, with application of gravel surfacing planned for the following year.

stand - 1) In silviculture, a contiguous group of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit. 2) In ecology, a contiguous group of similar plants.

stand improvement - An intermediate treatment, not involving timber harvest, made to improve the composition, structure, condition, health, and growth of stands. Formerly known as timber stand improvement or wildlife stand improvement.

standard - Requirement found in a Forest Plan, which govern actions taken to meet objectives. Standards often preclude or impose limitations on management activities or resource uses, generally for environmental protection or public safety. Standards are mandatory, and deviation from a standard requires a Forest Plan amendment.

stocking - 1) In silviculture, an indication of growing-space occupancy of live trees relative to a pre-established standard. Common indices of stocking are based on percent occupancy, basal area, relative density, stand density index, and crown competition factor. 2) In wildlife and fisheries management, the intentional and deliberate placement of a species in a specific location.

structure - In ecology, the horizontal and vertical arrangement of ecological components. A study of an area's structure might reveal a mosaic of vegetation. In geology, one of the larger features of a rock mass, like bedding, flow banding, jointing, cleavage, and brecciation; also the sum total of such features.

succession - The natural replacement, in time, of one plant community with another. Conditions of the prior plant community (or successional stage) create conditions that are favorable for the establishment of the next stage.

suitable for timber production - Forest land where timber is produced on a scheduled basis. (See unsuitable for timber production; timberland.)

suitability - The appropriateness of the application of certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative uses foregone. A unit of land may be suitable for a variety of individual or combined management practices. For example, in this document, each prescription area has been identified as suitable or not suitable for timber production and management reflects the designation.

suppression (gypsy moth) - Reduction of gypsy moth populations in heavily infested areas.

sustainability - The ability of an ecosystem to maintain ecological processes and functions, biological diversity, and productivity over time.

sustained yield - The yield that a renewable resource can produce continuously at a given intensity of management.

T

take - An Endangered Species Act term that means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect a listed species or attempt to engage in any such conduct.

thinning - An intermediate treatment or harvest made to reduce tree density, primarily to improve growth, enhance forest health, or recover potential mortality. See non-commercial thinning, precommercial thinning.

Threatened, and endangered species (T&E) - A plant or animal species likely to become endangered throughout all or a specific portion of their range within the foreseeable future, as designated by the Secretary of the Interior or the Secretary of Commerce under the Endangered Species Act of 1973.

Threatened, endangered, and sensitive species (TES) – Combined list of threatened and endangered species and Regional Forester's sensitive species.

timber - Trees or wooded land regarded as a source of wood; a renewable natural resource.

timber harvest - The sum of activities making up a logging operation, including the felling, skidding, decking, loading, and hauling of timber products from the sale area.

timber management - A broad term that includes all of the silvicultural and technical aspects of forestry related to timber production.

timber production - The purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use. Timber production does not include the production of fuelwood. Also referred to as wood fiber production.

timber products - Logs, bolts, or other round sections available for industrial or consumer use (roundwood), or secondary products produced from roundwood, such as lumber. (See roundwood.)

timber sale - A process that is initiated by a management decision to implement a silvicultural prescription for a timber harvest. The process includes the sale area layout, designation of the timber that is to be harvested, timber appraisal, advertisement, bidding, award of sale, implementation of the timber harvest, and the closing of the sale.

timber stand improvement (TSI) - Obsolete term. (See stand improvement.)

traditional cultural property - A property that is associated with cultural practices or beliefs or a living community that (1) are rooted in that community's history, and (2) are important in maintaining the continuing cultural identity of the community.

travel route or travelway - An established road or trail designed primarily as a means of access to an area.

tree - A woody perennial plant, typically large or capable of becoming large, with a well-defined stem or stems carrying a more or less definite crown. The USDA Forest Service identifies certain species as capable of becoming trees.

U

Underground Railroad - The historic effort to assist persons held in bondage in North America to escape from slavery.

understory - The trees and other vegetation growing under a more or less continuous cover of branches and foliage known as the overstory.

undertaking - Any project, activity, or program that can result in changes in the character or use of any historic properties located in the area of potential effects (36 CFR 800.2). The project, activity, or program must be under the direct or indirect jurisdiction of a federal agency or licensed or assisted by a federal agency.

uneven-aged management - See uneven-aged silvicultural system.

uneven-aged silvicultural system - A planned sequence of treatments designed to maintain and regenerate a stand with three or more age classes- singly, in small groups, or in strips. (Also known as uneven-aged management.)

unsuitable for timber production - Forest land that is not managed for timber production. On the WNF, lands unsuitable for timber production may be further divided into two subcategories: lands where tree cutting, tree removal, or timber harvest may occur on an unscheduled basis to attain desired future conditions; or lands where timber harvest is not allowed. Determinations for suitability are based on the criteria in paragraphs (a) through (d) of 36 CFR 219.14. See suitable for timber production.

V

vegetation management - Any activity that is designed primarily to alter or modify vegetation to meet desired conditions on land or water having vegetation cover.

viability - The tendency of a species to remain at population levels sufficient to assure its continued existence on the landscape, expressed as a likelihood of achievement.

viable population - A population that has the estimated numbers and distribution of reproductive individuals to insure that its continued existence is well distributed in the planning area.

viewshed - The total visible area from a single observer's position or from multiple observer positions. Viewsheds are accumulated seen-areas a travel routes or corridors, use areas, or water bodies.

vista - A confined view, especially one seen through a long passage, as between rows of trees or down a valley. A vista often focuses upon a specific feature in the landscape. Vistas are generally created/designed by humans for the specific purpose of viewing a unique feature in the landscape

Visual Management System (VMS) - The planning and design of visual aspects of multi-use land management. This system was replaced by the Scenery Management System.

visual quality objective (VQO) - An obsolete term used in scenery management to identify a set of measurable goals for the management of forest visual resources.

W

watershed - 1) In general, the entire region drained by a waterway into a lake or reservoir. 2) More specifically, the land above a given point that contributes water to the stream flow at that point.

wetland - Area that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include, for example, swamps, marshes, bogs and similar areas.

wild and scenic river (W&SR) - A river, or river section, designated under the Wild and Scenic Rivers Act of 1964. A river can be classified under the following three categories:

> **wild river -** Free of impoundments and generally inaccessible except by trail, and within watersheds or shorelines that are essentially primitive.
>
> **scenic river -** Free of impoundments but accessible by roads, and within watersheds or shorelines that are still largely primitive and undeveloped..

recreational river – Readily accessible by roads, with some development along their shorelines and may have undergone some impoundment or diversion in the past.

wilderness - A Congressionally designated area that is essentially unaltered and undisturbed by humans. Management of this area preserves and protects its physical and biological characteristics.

wildfire - Now an obsolete term for a fire type, an unwanted wildland fire, or more specifically, a fire occurring on wildland that is not meeting management objectives and thus requires a suppression response. Wildfires can be ignited by humans or by natural events such as lightning. The term wildfire exists for use in promoting fire prevention.

wildland fire - Any non-structure fire, other than prescribed fire, that occurs in the wildland. The term encompasses fires previously identified as "wildfires," which required a suppression response, and "prescribed natural fires," which were used to meet resource objectives. Both of these terms are now considered obsolete and the appropriate response by fire personnel to "a wildland fire" cannot be discerned without additional information.

wildland/urban interface - The line, area, or zone where structures and other human development meet or intermingle with flammable natural fuels, such as leaf litter or logging slash.

wildlife habitat diversity - The number and variety of habitat types present in an area and their spatial distribution.

wildlife-associated recreation - Recreation closely associated with one or more plant or animal species. Wildlife-associated recreation is often divided into consumptive use or non-consumptive use of the resource (for example, hunting, fishing, collection of medicinal plants versus wildlife watching). See consumptive use and nonconsumptive use.

X

Xeric species – Refers to plant species adapted to very dry soil conditions. Under these conditions, soil moisture is predictably inadequate for plant growth during the growing season.

Y

Z

Acronyms

A

ABB: American Burying Beetle

ACSI: Appalachian Clean Streams Initiative

AIM: abandoned and inactive mine land inventory

APD: Application for Permit to Drill

AMS: Analysis of the management situation

AQI: Air Quality Index

ASQ: allowable sale quantity

ARPA: Archeological Resources Protection Act

ATV: All terrain vehicles

B

BA: basal area; Biological Assessment

BE: Biological Evaluation

BEA: Bureau of Economic Analysis

BEIG: Built Environment Image Guide

BF: board foot

BLM: United States Bureau of Land Management

BMP: Best Management Practices

BO: Biological Opinion

BP: before present

C

CA: candidate areas

CBM: coal bed methane

ccf: hundred cubic feet

CE: categorical exclusion

CEQ: Council on Environmental Quality

cf: cubic feet

CFR: Code of Federal Regulations

CISC: Continuous Inventory of Stand Condition

CNEPA: Comprehensive National Energy Policy Act

CSU: Controlled Surface Use

CUA: Concentrated use area

CWA: Clean Water Act

D

dbh: diameter at breast height

DCF: Diverse Continuous Forest

DCFO: Diverse Continuous Forest with Off-Highway-Vehicles

DEIS: Draft Environmental Impact Statement

DFC: desired future condition

DR: District Ranger or Developed Recreantion

E

EA: Environmental Assessment

EIS: Environmental Impact Statement

EPA: Environmental Protection Agency

ESA: Endangered Species Act

EWAP: East-wide Watershed Assessment Protocol

F

FAI: forest area of influence

FDR: Forest Development Road

FEIS: Final Environmental Impact Statement

FFIS: Foundation Financial Information System

FIA: Forest Inventory and Analysis

FLT: Forest Leadership Team

FMO: Fire Management Officer

FMP: Fire Management Plan

FMT: Forest management team

FOF: Future Old Forest

FOFM: Future Old Forest with Mineral Activity

FONSI: Finding of No Significant Impact

FRCC: Fire Regime Condition Class

FS: Forest Service

FSH: Forest Service Handbook

FSM: Forest Service Manual or Forest and Shrubland Mosaic

FSMO: Forest and Shrubland Mosaic with Off-Highway-Vehicles

G

GFM: Grassland and Forest Mosaic

GIS: Geographic Information System

H

HABS: Historic American Buildings Survey

HAER: Historic American Engineering Record

HF: Historic Forest

HFO: Historic Forest with Off-Highway-Vehicles

HUC: Hydrologic Unit Code

I

I&DC: Insect and Disease Control

ICO's: issues, concerns, and opportunities

ID: interdisciplinary

IDT: interdisciplinary team

IMPLAN: Impact Analysis for Planning

INFRA: Forest Service "Infrastructure" Application

IPM: integrated pest management

K

L

LAC: Limits of acceptable change

LBA: lease by application

LEIMARS: Law Enforcement Information and Reporting System

LEO: Law Enforcement Officer

LMP: Land Management Planning

LN: Lease Notice

LRMP: Land and Resource Management Plan

M

MA: Management Area

MAI: mean annual increment

M&E: monitoring and evaluation

MBF: thousand board feet

MCF: thousand cubic feet

MCFGPD: thousand cubic feet of gas per day

MCRP: Monday Creek Restoration Project

MIS: Management Indicator Species

MMBF: million board feet

MMCF: million cubic feet

MOU: Memorandum of Understanding

MSDS: Material Safety Data Sheets

N

NAA: Not Administratively Available

NAAQS: National Ambient Air Quality Standard

NAGPRA: Native American Grave Protection and Repatriation Act

NEPA: National Environmental Policy Act

NF: National Forest

NFC: Need for Change

NFMA: National Forest Management Act

NFS: National Forest System

NFSI: National Forest System Inventory

NFSR: National Forest System roads

NHPA: National Historic Preservation Act

NNIS: Non-native invasive species

NOI: Notice of Intent

NRHP: National Register of Historic Places

NRIS: Natural Resource Inventory System

NSO: No-Surface-Occupancy

NTFP: Non-timber forest products

NTL: Notice to Lessees

NVUM: National Visitor Use Monitoring

O

ODNR: Ohio Department of Natural Resources

OHM: off-highway motor vehicle

OHPO: Ohio Historic preservation Office

OHV: off-highway vehicle

ORV: off-road vehicle; outstandingly remarkable values

OSM: Office of Surface Mining

P

PAI: Periodic annual increment

PAO: Public Affairs Officer

PAOT: Persons-at-one-time

PIF: Partners-in-Flight

PILT: Payment in Lieu of Taxes

PIT: Passport in Time

PNF: prescribed natural fire

PNV: present net value

PSI: Pounds per square inch

Q

R

RARE II: Roadless Area Review and Evaluation

RC: River Corridors

RD: Ranger District

RF: Regional Forester

RFDS: Reasonable Foreseeable Development Scenario

RFSS: Regional Forester Sensitive Species

RNA: Research Natural Area

RO: Regional Office

ROD: Record of Decision

ROS: Recreation Opportunity Spectrum

ROW: Right-of-way

RPA: Resource Planning Act

RV: recreation vehicle

RVD: Recreation visitor day

S

SA: Special Areas

SCORP: State Comprehensive Outdoor Recreation Plan

SHPO: State Historic Preservation Offices

SIC: Standard Industrial Code

SIL: Scenic integrity levels

SIO: Scenic Integrity Objective

SMS: Scenery Management System

SMCRA: Surface Mining Control and Reclamation Act

SO: Supervisor's Office

SO_2: sulfur dioxide

SPM: Semi-primitive Motorized

SPNM: Semi-primitive Non-motorized

STARS: Sale Tracking and Reporting System

SUPO: Surface Use Plan of Operation

S & Gs: standards and guidelines

T

tcfg: trillion cubic feet of gas

TES: Threatened, Endangered, and Sensitive Species

TL: Timing Limitation Stipulation

TNC: The Nature Conservancy

TRL: Timbre Ridge Lake

TSI: timber stand improvement

U

USACE: United States Army Corp of Engineers

USDA: United States Department of Agriculture

USDI: United States Department of Interior

USFS: United States Forest Service

USGS: United States Geological Service

USFWS: United States Fish and Wildlife Service

UTM: Universal Transverse Mercator system

V

VMS: Visual Management System

VQO: visual quality objective

W

W&SR: Wild and Scenic River

WNF: Wayne National Forest

WO: Washington Office, Office of the Chief of the Forest Service in Washington, D.C.

X

Y

Z

This page left blank for notes.

Appendix B

Proposed/Probable Practices; Goods to be Produced

Introduction

This appendix presents an estimate of the goods and services to be provided by implementation of the 2006 Forest Plan. Proposed (decade 1) and probable (decade 2) management practices and other information, including land classification, are also included in this appendix.

These estimated outputs, as well as proposed and probable management practices, are based on available inventory data. Some estimates are based on computer modeling. (NOTE: The outputs and amounts listed below are estimates and are subject to annual budgets for funding the various resource programs on the Forest. Actual amounts may vary from these and will be monitored.**)**

Land Classification

Lands identified as suitable for timber production include producing timber as part of multiple use direction. These are lands that contribute to the timber sale program on a regularly scheduled basis. Table B - 1 shows how acres of these lands compare to the total acreage of NFS land administered by the Wayne National Forest.

Table B - 1. Acres of Land Suitable for Timber Management.

Classification	Acres
Total National Forest System land	238,053
Non-forest and water	8,679
Administratively withdrawn from timber production (Research Natural Areas, Special Areas and Candidate Areas)	8,644
Land not physically suited for timber production (low site index, regeneration not assured, etc.)	1,277
Inadequate inventory information (new acquisitions and incomplete inventory)	13,194
Land not appropriate for timber production due to other resource management (riparian areas, Developed Recreation, Timbre Ridge Lake, Future Old Forest, Future Old Forest with Mineral Activity, other unique areas, etc.)	44,507
Land suitable for timber management	161,752

Allowable Sale Quantity (ASQ)

The allowable sale quantity of timber (ASQ) is the maximum amount of volume that may be offered and sold during a given decade of Forest Plan implementation from land identified as suitable for timber management. The amount of timber that may be sold annually may exceed 1/10 of the ASQ as long as the decadal ASQ is not exceeded.

Table B - 2 shows the volume of timber in million board feet (MMBF) that can be harvested in each decade on a long term, sustained yield capacity. In the first decade the ASQ is 83 MMBF or 14 million cubic feet (MMCF). In the second decade the ASQ is 88 MMBF or 15 million cubic feet (MMCF).

Table B - 2. Allowable Sale Quantity, Decades 1 through 5

Decade	MMBF	MMCF
1	83	14
2	88	15
3	148	25
4	148	25
5	148	25

Estimated Average Annual Volume of Sawtimber and Pulp Produced – Decades 1 and 2

Table B - 3. Estimated Average Annual Volume of Sawtimber and Pulp, Decades 1 and 2.

	Decade 1	Decade 2
Sawtimber (average mmbf/year)	5.2	5.5
Pulp (average mmbf/year)*	3.1	3.3

* Volume is shown in mmbf for comparison purposes. 2,000 pulp cords = 1 mmbf

Estimated Management Practices for First and Second Decades

Table B - 4 lists the estimated acreage of silvicultural practices that would be used to work toward the wildlife habitat and other multiple-use desired conditions and objectives of the 2006 Forest Plan. The table displays the amount of each harvest treatment for the first and second decades of plan implementation based upon modeling. Actual treatments during plan implementation may vary from these modeled outputs. Even aged regeneration harvests set the tree stand back to age zero, meeting the 0-9 year old age class objective. As the name implies uneven-age treatments are intended to create and maintain an uneven-aged condition.

Table B - 4. Estimated Management Practices, First and Second Decade.

Estimates of Management Practices*	First Decade Acres	Second Decade Acres
Even-Aged Hardwood Regeneration Harvest	Up to 1,725	Up to 1,957
Even-Aged Pine Regeneration Harvest	Up to 200	Up to 300
Thinning	Up to 1,460	Up to 2,074
Uneven-Aged Harvest	Up to 14,556	Up to 14,780
Total harvest	Up to 17,941	Up to 19,111

* All scheduled harvest planned in management areas: DCF, DCFO, FSM, GFM, HF, or HFO

Uneven-Aged treatment acres includes Historic Forest management prescriptions.

Estimated Practices (Forest wide) – Decade 1

Table B - 5 lists other Forest management activities that are proposed to work toward the desired conditions and objectives during the first 10 years of plan implementation.

Table B - 5. Estimated Practices (Forest-wide), Decade 1.

Activity or Practice	Unit of Measure	Estimated Amount for First Decade
Control of non-native invasive species	acres	Up to 8,370[1]
Prescribed fire to encourage oak regeneration (some of these acres are double counted since they may be burned more than once in the decade)	aces	Up to 46,215
Herbicide use for oak regeneration (treatment of individual stumps of maple and beech to prevent stump sprouting.)	acres	Up to 10,994
Wildlife openings maintained (some of these acres are counted more than once since they may be maintained every other, or every third year.)	acres	Up to 6,500
Development of new wildlife openings	acres	Up to 500
Restoration & Improvement of Aquatic/Riparian Habitat – Ponds and Lakes (some of these acres are counted more than once since they may have more than one restoration treatment in the decade)	acres	Up to 150
Restoration & Improvement of Aquatic/Riparian Habitat – Streams	miles	Up to 20
Reduction of Hazardous Fuels -Prescribed Fire	acres	Up to 21,904
Reduction of Hazardous Fuels –Mechanical	acres	Up to 10,181
Wetland Restoration and Enhancement	acres	Up to 150
Treatment of Acid Mine Drainage	features	Up to 335
ORV Trails Construction (miles in addition to existing miles of ORV trail available)	miles	50 to 124
Hiking Trail Construction (miles in addition to existing miles of hiking trail available)	miles	Up to 30
Horse Trail Construction (miles in addition to existing miles of horse trail available)	miles	Up to 50
Mountain Bike Trail Construction (miles in addition to existing miles of mountain bike trail available)	miles	Up to 30
Potential NFS land affected by Private Surface Coal Mining Activities	acres	Up to 1,250
Oil and Gas well development	wells	Up to 234
Reclamation of depleted or Orphan wells	wells	Up to 128
Temporary Roads Construction	miles	Up to 50
Permanent Roads Constructed	miles	Up to 24
Permanent Road Reconstruction	miles	Up to 104
Roads Decommissioned	miles	Up to 10
Utility Corridor Development (includes larger transmission lines)	acres	Up to 500[2]

[1] Revised per Administrative Correction # 4, 10/16/08

[2] Several updates made on 7/31/2019 to utility corridor development as part of Administrative Change #10

Appendix C

Management Indicators

Management Indicator Species

National Forest Management Act regulations direct the Forest Service to select and track species that are of special interest or indicative of management trends. These are called management indicator species.

Eight bird species, in combination with three forest community types or habitats, were selected as management indicators (Table C - 1). This approach is consistent with 36 CFR 219.14(f). Emphasis was placed on selecting those management indicators that:

- Guided the development of the alternatives for the Revised Forest Plan
- Possess credible monitoring protocols
- Can be effectively and efficiently monitored.

By selecting a limited, but appropriate, set of management indicator species/habitats, resources for inventory and monitoring activity can be focused where needed.

Management indicator monitoring methods should account for situations where population trends of migratory or resident bird populations may respond not only to habitat management activities conducted on the WNF, but also to winter range conditions outside the Forest, weather or climate conditions, hunting pressure, disease, or cyclical phenomena. Because methodologies to determine population numbers and/or estimate trends vary by species, conclusions that relate management indicator species population trends to habitat conditions are also reached through a variety of methods. These include:

- Population trends can be determined through the use of 100-percent population counts or can be estimated through the use of population sampling designed to estimate actual population numbers. Although rarely used, 100-percent population counts can be feasible for some species, such as for populations in very restricted geographic areas. These are the most intensive and rigorous methods, usually reserved for some federally-listed species or some high risk globally-imperiled species selected as management indicators.

- Population trends can be estimated through the use of population indices. Indices are not estimates of actual population numbers, but are aimed at reflecting population trends or relative abundance for a species. Properly designed population indices are a well accepted method for assessing populations for many taxa. Examples could include state hunting/fishing information, track counts, and bird point counts. Population indices are commonly used in natural resource management.

- Population trends can be estimated using population occurrence data. This approach would be appropriate for a management indicator where the risk to local or broad extirpations is low to moderate (i.e., the cost of making a management decision that would adversely affect the species is low to moderate) and there is high correlation and understanding for a management indicator and its associated habitat(s) (i.e., there is a high likelihood the conclusions regarding population trends would be correct).

- When population data is not available, population trends may be inferred using species-habitat relationships information. This approach involves inferring population trends from trends in amount and condition of habitat over time, based on known relationships between species and habitat.

Site-specific monitoring or surveying of a proposed project or activity area is not required by the NFMA regulations. At the project-level, habitat analysis will be conducted to determine the effects, including cumulative effects, for each alternative on each management indicator selected for the project. The effects to management indicators for the project are put into perspective by discussing forest-wide management indicator species/habitat conditions and trends.

Table C - 1. Management indicator species for the Forest Plan and the rationale for selection.

Management Indicator	Habitat	North American Landbird Conservation Plan Ranking*	Rationale for Selection
Oak-hickory Forest	Forest stands dominated by oak and hickory species	N/A	Oak and hickory are considered keystone species in the central hardwood region. A number of species are dependent upon mast production, highly diverse herb layer, bark characteristics, and other structural characteristics of oak and hickory species.
Native Pine Forest	Forest stands dominated or partially comprised of one or more native pine species	N/A	Native pine forest was selected to supplement monitoring efforts of our management activities. Native pine occurs on only a small percentage of the WNF, but provides habitat for certain species.
Early Successional Forest	Forest stands less than 20 years of age	N/A	Approximately 35% of the terrestrial vertebrate species known to occur on the WNF use early successional forest habitat during some part of their life cycle. The herbaceous plants and shrubs provide dense cover that is necessary for predator avoidance, and they produce a variety of soft mast that is nutritionally important. This habitat component has declined significantly over time on the WNF and in the eastern U. S., and is recognized as a conservation issue in the North American Landbird Conservation Plan.
Pine Warbler	Mature pine and pine hardwood communities	Stewardship Species	The pine warbler relies upon pine habitat for breeding. Pine and mixed pine-hardwood comprises only a minor component of the WNF, yet there are some species that feed, hide or breed in these forest stands.
Pileated Woodpecker	Mature to overmature hardwood forest with snags and coarse woody debris on the forest floor	None	The pileated woodpecker is a primary cavity excavator that relies on the availability of dead and dying trees. Dead and dying trees in a forest community are important for many other species, including the Indiana bat. Many species that rely on dead and dying trees are considered cavity-dependant, and are secretive in nature and difficult to monitor. The pileated woodpecker is relatively easy to monitor because of its size, appearance, and vocalizations.
Cerulean Warbler	Mature interior hardwood forest with a heterogeneous canopy	Watch List Species	The needs of the cerulean warbler were considered in the development of the DCF, DCFO, HF, and HFO management areas. It requires large tracts of interior forest. It is a canopy nester that is generally associated with uplands and oak-hickory forest on the WNF with gaps in the canopy and taller trees exposed above the canopy.
Worm-eating Warbler	Mature interior hardwood or pine-hard-wood forest on hillsides with a dense understory and coarse woody debris on the forest floor	Watch List Species	The needs of the worm-eating warbler were considered in the development of the DCF and DCFO management areas. It requires large tracts of interior forest, is a ground nester that favors mesic areas and ravines on the WNF, but depends on disturbance to create dense understory conditions.
Louisiana Waterthrush	Mature riparian forest corridors along headwater streams; healthy aquatic habitat	Stewardship Species	Louisiana waterthrush is sensitive to declining stream quality and loss of riparian forest. It was selected as a management indicator species because taxonomic experts involved in our species viability evaluations indicated this species could reflect stream quality because it relies on aquatic invertebrates for food, and thus may also be an indicator of riparian forest condition. It is an early ground nester, often initiating nesting in March.
Ruffed Grouse	Mosaic of early-, mid-, and, late-successional forest	None	The ruffed grouse is of great interest to hunters. The needs of the ruffed grouse were considered in the development of the FSM and FSMO management areas. Many species rely on oak-hickory forest during some aspect of their life cycle, and ruffed grouse in the Appalachian states exemplify this in that its population trends may be correlated to oak mast production. It is a species that not only relies on early successional forest for brood rearing; it needs mid and late successional oak forest located near early successional forest for food and cover during part of the year.

Management Indicator	Habitat	North American Landbird Conservation Plan Ranking*	Rationale for Selection
Yellow-breasted Chat	Early successional forest habitat	None	The needs of the yellow-breasted chat were considered in the development of the FSM, FSMO, and GFM management areas. It is an area-sensitive shrub-nesting species, meaning it needs larger tracts of early successional forest habitat to reproduce. Managing for shrub nesting birds often is compatible with actions to conserve American woodcock and other game species.
Henslow's Sparrow	Extensive grasslands	Watch List Species	The needs of the Henslow's sparrow were considered in the development of the GFM Management Area. It is area-sensitive and is considered a grassland obligate species. Grassland habitat did not naturally occur within the WNF, but it occurs now as a result of past surface mining.

* Rich, T. D., C. J. Beardmore, H. Berlanga, P. J. Blancher, M. S. W. Bradstreet, G. S. Butcher, D. W. Demarest, E. H. Dunn, W. C. Hunter, E. E. Iñigo-Elias, J. A. Kennedy, A. M. Martell, A. O. Panjabi, D. N. Pashley, K. V. Rosenberg, C. M. Rustay, J. S. Wendt, and T. C. Will. 2004. Partners in Flight North American Landbird Conservation Plan. Cornell Lab of Ornithology. Ithaca, NY. 84 p.

Appendix D

Federally Listed Species/ Regional Forester Sensitive Species

Conservation Plan for Federally Listed Species

The Forest Service is committed to conserving, protecting, and maintaining habitat for Federally listed species. As a Federal agency, it has defined responsibilities in supporting recovery objectives for Federally listed species. Populations of these species will receive individualized attention. Management activities that may affect Federally listed species occur in consultation with the U.S. Fish and Wildlife Service (USFWS). If additional species that occur on the Wayne National Forest become listed, we will consult with the USFWS as appropriate (50 CFR 402.16).

A major purpose of the WNF's 2006 Forest Plan is fulfillment of the Forest's obligations under the Endangered Species Act, Section 7(a)(1), to conserve Federally listed species. Section 7(a)(1) of the Act mandates Federal agencies to take a proactive approach in the conserving of endangered species:

> "All other Federal agencies shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of this Act, by carrying out programs for the conservation of endangered species and threatened species pursuant to Section 4 of this Act."

The foundation of the Conservation Plan is the allocation of NFS lands into management areas that contain the ecological conditions needed by particular species. These management area allocations are also intended to conserve the biodiversity that will promote the recovery and maintenance of Federally listed species.

The prescriptions for the Diverse Continuous Forest and Diverse Continuous Forest with OHVs management areas call primarily for the use of uneven-aged vegetation management to create structurally diverse forest stands. The prescriptions for the Historic Forest and Historic Forest with OHVs management areas call primarily for the use of uneven-aged vegetation management combined with prescribed fire to create oak and hickory dominated forest communities with more open conditions. These

management areas were formulated, in part, to provide habitat conditions beneficial for the Indiana bat and American burying beetle.

The River Corridor and Timbre Ridge Lake management areas were developed, in part, with the bald eagle in mind and should provide long-term direct benefits to this species as it expands its range in Ohio. The purpose of the River Corridor Management Area is to retain, restore, and enhance the inherent ecological processes and functions associated with riverine systems on the Forest. The desired future condition of the Timbre Ridge Lake Management Area is excellent water quality in the 100-acre lake where a self-sustaining bass-bluegill fishery is encouraged. A landscape of wooded character surrounds the lake and provides feeding opportunities as well as suitable roosting or nesting habitat for the bald eagle.

Together, these and all other management areas provide well-distributed and diverse habitat for native and desired non-native plants and animals, including Federally listed species.

Species List

The U.S. Fish and Wildlife Service has identified ~~nine~~ eight[1] Federally listed species as occurring on or near the Wayne National Forest:

Species	Status
American burying beetle (*Nicrophorus americanus)*	Endangered
~~Bald eagle (Haliaeetus leucocephalus)~~	Delisted 8/8/07 [1]
Fanshell (*Cyprogenia stegaria)*	Endangered
Indiana bat (*Myotis sodalis)*	Endangered
Northern monkshood (*Aconitum noveboracense)*	Threatened
Pink mucket pearly mussel (*Lampsilis abrupta*	Endangered
Running buffalo clover (*Trifolium stoloniferum)*	Endangered
Small whorled pogonia (*Isotria medeoloides)*	Threatened
Virginia spiraea (*Spiraea virginiana)*	Threatened

[1] Updated on 10/16/08 by Forest Plan Administrative Correction # 3 to reflect the delisting of the Bald eagle on 8/8/2007.

Conservation Plan Relationship to Other Documents

Section 7(a)(2) of the Endangered Species Act states that Federal agencies shall consult with the USFWS.

> "Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical, unless such an agency is granted an exemption for such action by the committee pursuant to subsection (h) of this section. In fulfilling the requirements of this paragraph each agency shall use the best scientific and commercial data available."

To meet the consultation requirements under Section 7(a)(2) of the act, the Forest Service completed a Programmatic Biological Assessment for the 1988 WNF Land and Resource Management Plan in March 2001. It included a list of management activities with amounts expected to occur by September 2006. The USFWS responded with a Biological Opinion on the 1988 Forest Plan on Sept. 20, 2001.

The Biological Opinion provided non-discretionary, reasonable, and prudent measures as well as terms and conditions that would minimize the potential for incidental take of Federally listed species. It also recommended conservation measures that the WNF could implement to meet its responsibilities under Section 7(a)(1) for the Indiana bat, bald eagle and American burying beetle.

The non-discretionary, reasonable and prudent measures along with the recommended terms and conditions were incorporated into the 1988 Forest Plan (Amendment 13) as Forest-wide goals and standards, respectively. The discretionary conservation recommendations were also incorporated into the 1988 Plan (Amendment 13) as conservation recommendations. During the 2006 Forest Plan revision, these Forest-wide goals and standards, and conservation recommendations were reviewed with the USFWS, and slight modifications were made to incorporate the best available scientific information into the 2006 Forest Plan and to ensure clarity of 2006 Forest Plan direction.

Species-specific recovery plans provide additional guidance to conserve and recover each threatened or endangered species throughout its range. Each recovery plan has been developed by a team of scientists who are considered experts on the affected species. Not all recovery objectives may be applicable to the WNF since it encompasses only a portion of the range of nine endangered and threatened species.

Format of the Conservation Plan

The Conservation Plan provides managers with a concise package of information about the protection and conservation of Federally listed species that occur on or near the Wayne National Forest. Forest-wide goals, objectives, standards and guidelines directly applicable to the recovery and conservation of listed species that are found in Chapter 2 of the 2006 Forest plan are summarized in this Conservation Plan. Administrative and educational requirements carried over from the 1988 Forest Plan, as amended, have been included, as have the requirements for monitoring that were identified in the Biological Opinion for the 2006 Forest Plan. This Conservation Plan is arranged into two sections:

- Section I displays direction and guidance that is applicable to all ~~nine~~ [1] eight Federally listed species;
- Section II outlines the direction and guidance specific for the Indiana bat, ~~bald eagle~~[1], American burying beetle, and running buffalo clover. These are species that occur in the WNF, or are likely to be reintroduced to the WNF in the near future.

Implementation of the Conservation Plan

In order to be exempt from the prohibitions of Section 9 of the Endangered Species Act, the WNF must comply with all standards and guidelines and monitoring outlined in the following sections of this Conservation Plan.

Responsibilities for implementation of the Conservation Plan rest primarily with WNF personnel. Some work, however, will be done cooperatively with the USFWS, Ohio Division of Wildlife, or other conservation partners.

Conservation Accomplishments

All management accomplishments related to the conservation, protection, and recovery of Federally listed species will be disclosed in the annual WNF monitoring and evaluation report.

Conservation Direction and Guidance for all Federally Listed Species

Administrative & Technical Information

Consult with the USFWS to ensure activities planned and implemented on the WNF are in accordance with the Endangered Species Act.

To ensure that the exemption of incidental take is appropriately documented, the USFWS will implement a tiered programmatic consultation approach. As individual projects are proposed under the 2006

[1] Revised on 10/16/2008 per Administrative Correction # 3

Forest Plan, the Forest Service shall provide project-specific information to the USFWS that:

- Describes the proposed action and the specific area to be affected, including latitude and longitude coordinates for the project area
- Identifies the species that may be affected and their known proximity to the project area
- Describes the manner in which the proposed action may affect Federally listed species, and the anticipated effects
- Specifies that the anticipated effects from the proposed action are similar to those anticipated in the programmatic Biological Opinion for the 2006 Forest Plan
- A cumulative total of incidental take that has occurred to date under the Tier I Biological Opinion
- Describes any additional effects, if any, not considered in the Tier I consultation.

The USFWS will review the information for each proposed project. If it is determined that an individual project is not likely to adversely affect listed species, the USFWS will complete its documentation with a concurrence letter that refers to the Biological Opinion for the 2006 Forest Plan (the Tier I programmatic document) and specifies that the agency concurs that the project is not likely to adversely affect listed species. If it is determined that a proposed project is likely to adversely affect listed species, then the USFWS and Forest Service will engage in formal consultation for the project. Formal consultation culminates with the USFWS providing a Tier II Biological Opinion with a project-specific incidental take statement if take is reasonably certain to occur.

Reinitiation of formal consultation is required when (the amount or extent of incidental take is exceeded; (2) new information reveals effects of the 2006 Forest Plan that may affect listed species in a manner or extent not considered under the Biological Opinion; (3) the 2006 Forest Plan is modified in a manner that causes an effect to the listed species not considered in the Biological Opinion; or (4) a new species is listed or critical habitat designated that may be affected by the 2006 Forest Plan. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation. The 2006 Forest Plan can be updated as necessary to incorporate new information or results of any reinitiation of formal consultation.

Protection of Individuals

Appendix H - Oil & Gas Leasing Notification 3 - For all Federal oil and gas lease projects, the Forest Service is responsible for assuring that the area to be disturbed is examined prior to allowing any surface disturbing

activities on lands covered by this lease type. The examination is to determine effects upon any plant or animal species listed, or proposed for listing, as Federally endangered or threatened and their habitats. If the findings of this examination determine that the operation(s) may have a detrimental effect on a species covered by the Endangered Species Act, the operator's plans may be denied or restrictions added.

The Forest Service has the responsibility to conduct the required examination. In cases where the Forest Service time frames cannot meet the needs of the lessee/operator, the lessee/operator may, at his discretion and cost, conduct the examination on the lands to be disturbed. This examination must be done by or under the supervision of a qualified resource specialist approved by the Forest Service. An acceptable report must be provided to the Forest Service identifying the anticipated effects of the proposed action on Federally endangered and threatened species, or their habitats.

Inventory, Analysis and Monitoring

Coordinate and cooperate with the USFWS and experts from other agencies, universities, and organizations to conserve, protect, recover, and monitor populations and habitats of Federally listed species.

Education and Awareness

Provide training opportunities for employees on the identification, biology, and habitat requirements of Federally listed species along with monitoring techniques.

Species-specific Conservation Direction and Guidance

Indiana Bat

Additional resource management direction and guidance found in the 2006 Forest Plan and should be considered during project planning and implementation, as needed, to promote recovery of this species.

Administrative & Technical Information

Preferred Indiana bat roost trees include the following species: shagbark hickory, shellbark hickory; bitternut hickory; silver maple; green ash; white ash; eastern cottonwood; northern red oak; post oak; white oak; slippery elm; American elm; black locust; pignut hickory; red maple; sugar maple; and black oak. This list of trees is based on review of literature and data on Indiana bat roosting requirements. Other species may be added, as identified.

When identifying existing Indiana bat roosting habitat (SFW-TES-10(a)), the trees that are hollow, have major splits, or have broken tops need to have characteristics that provide maternity habitat for one or more Indiana

bats. In other words, these trees must possess crevices into the hollow area or where the split or broken top occurred for it to provide habitat for this species. Furthermore, trees with broken tops should be 6 inches dbh or greater where the broken top occurs.

Discovery of dead bats of undetermined species on the WNF should be reported immediately to the USFWS - Reynoldsburg Field Office, and the remains transported on ice to that office. The USFWS will make the final species determination of any dead or moribund bats found on the WNF. If an Indiana bat is identified, the USFWS will contact the appropriate USFWS law enforcement office.

No attempt should be made to handle any live bat, regardless of its condition. This does not apply to individuals who are permitted, as agents of the State, to conduct work on Federally listed bat species.

Report bats that appear to be sick or injured to USFWS - Reynoldsburg Field Office.

Protection of Individuals

Goal 5.1.1 – Retain or develop Indiana bat roosting and foraging habitat; protect all known Indiana bat hibernacula.

Objective 5.1.1a – If additional Indiana bat hibernacula are discovered on NFS land, install bat-friendly gates to prevent unauthorized entry.

SFW-TES-1 – Deter human access to areas surrounding known hibernacula by closing or relocating trails that lead to, or pass within easy viewing distance of hibernacula.

SFW-TES-2 – Establish a one-quarter mile buffer around all known hibernacula. Within this one-quarter mile buffer:

- Prohibit new trail and road construction
- Do not conduct prescribed burning during the fall swarming period (generally mid-August to mid-October) or during the hibernation period (September 15th through April 15th)
- Do not permit surface occupancy for exploration or development of Federally owned minerals
- Implement vegetation management only to maintain or improve Indiana bat roosting, swarming, or foraging habitat.

GFW-TES-3 – Establish a one-quarter mile buffer around all mine openings that are known Indiana bat fall swarming sites, but where actual Indiana bat hibernation has not been established. Reduce or eliminate human disturbances within the buffer. Implement vegetation

management only to maintain or improve Indiana bat roosting, swarming, or foraging habitats.

SFW-TES-4 – Develop prescribed burning plans that specify weather conditions that would prevent smoke dispersal into known hibernacula.

SFW-TES-5 – Before backfilling any mine openings, such as portal entrances or subsidence depressions with developed openings, conduct surveys for potential bat presence during the fall swarming period (generally mid-August to mid-October).

GFW-TES-6 – Conduct pre-gating and post-gating mist net surveys at mines where bat-friendly gates are installed.

SFW-TES-13 – Prohibit the cutting of standing dead trees for firewood.

SFW-MIN-10 (and Appendix H, Stipulation 10) – Within management areas where surface occupancy is generally permitted, apply the No Surface Occupancy stipulation for Federal leases where the following conditions occur:

- Areas within ¼ mile of Indiana bat hibernacula

Appendix H, Stipulation 12 (Federal oil and gas leases) – No cutting of snags (trees with less than 10% live canopy), shagbark or shellbark hickories, or trees that are hollow and/or have major splits or broken tops, except during the bat hibernation season (September 15th – April 15th). If such trees are a safety hazard, they may be cut anytime they pose an imminent threat to human safety, but if cut in the non-hibernation season, the Forest biologist must be notified in advance. This stipulation applies only to trees over six inches in diameter.

Habitat Protection & Improvement

Goal 5.1.1 – Retain or develop Indiana bat roosting and foraging habitat; protect all known Indiana bat hibernacula.

Objective 5.1.1a – If additional Indiana bat hibernacula are discovered on NFS land, install bat-friendly gates to prevent unauthorized entry.

SFW-TES-7 – When even-aged regeneration methods are used, retain forested flight corridors within and between early successional habitat patches. These flight corridors may include forested corridors along ephemeral, intermittent, and perennial streams; and where present, clumps of snags and trees of varying size classes in the early successional habitat. When present, leave larger-sized trees on the edges of early successional patches for future maternity roosts.

SFW-TES-8 – Within hardwood cutting units with uneven-aged vegetation management prescriptions, maintain an average of at least 60 percent canopy cover.

GFW-TES-9 – Retain all shagbark and shellbark hickory trees greater than or equal to 6 inches dbh, unless removal is necessary to protect human safety or to avoid adverse impacts to steep slopes, erodible soils, floodplains or wetlands (e.g., cut a hickory rather than relocating a skid trail onto a steep slope).

SFW-TES-10 – During the non-hibernation season (April 15th – September 15th), do not cut, unless they are a safety hazard:

a. Trees of any species 6 inches dbh or greater that are hollow, have major splits, or have broken tops that provide maternity habitat.

b. Snags 6 inches dbh or greater that have Indiana bat roost tree characteristics. Consider any tree with less than 10 percent live canopy to be a snag.

When removal of hazard trees is necessary in a recreation area during the non-hibernation season (e.g., developed recreation sites, access roads, trails), conduct emergence surveys at the identified hazard trees that possess the characteristics identified above, and at any hazard trees that possess large areas of loose bark providing maternity habitat.

SFW-TES-11 – Schedule any summer prescribed burning after August 15th to reduce potential effects on Indiana bat reproduction.

SFW-TES-12 – With all hardwood timber harvests, retain a minimum of 12 live trees per acre (averaged over the cutting unit) of any species that are 6 inches dbh or greater with large areas of loose bark, unless they pose a safety hazard.

In addition to these, retain live preferred roost trees, when present to provide a supply of future roost trees (i.e., large, overmature trees) as shown in the following table. Refer to the Administrative & Technical Information section above for a list of tree species preferred as roost trees by Indiana bats. Consult with the USFWS regarding exceptions that may be needed to minimize adverse effects to other resources or human health and safety.

Indiana Bat Preferred Roost Tree Size Class	Number of live trees to retain (average per acre over the cutting unit)
>20 inches (dbh)	3*
>11 in (dbh and < 20 in (dbh)	6

*If there are few or no live Indiana bat roost trees > 20 inches dbh in the stand, retain three live trees > 16 inches dbh and < 20 inches dbh per acre (averaged across the cutting unit). If there are no live trees > 16 inches dbh, retain nine additional live trees > 11 inches dbh and < 16 inches dbh per acre (averaged across the cutting unit).

SFW-TES-13 – Prohibit the cutting of standing dead trees for firewood.

GFW-TES-14 – Provide water sources that promote aquatic insect production and provide drinking sources for Indiana bats along suitable flight paths, especially in upland areas, and off/away from recreation sites, and designated trails and roads.

Appendix H, Stipulation 12 (Federal oil and gas leases) – No cutting of snags (trees with less than 10% live canopy), shagbark or shellbark hickories, or trees that are hollow and/or have major splits or broken tops, except during the bat hibernation season (September 15th – April 15th). If such trees are a safety hazard, they may be cut anytime they pose an imminent threat to human safety, but if cut in the non-hibernation season, the Forest Service biologist must be notified in advance. This stipulation applies only to trees over six inches in diameter.

Education & Awareness

Provide refresher training to employees, as needed, to ensure proper identification of Indiana bat roosting habitat. Such training should include how to recognize potentially suitable maternity roosts from other non-maternity roost trees.

Provide training to employees on the proper methods for conducting emergence surveys.

Inventory, Analysis & Monitoring

a. Emphasis will be placed on collecting information associated with Indiana bat recovery objectives. This may include, but is not limited to, monitoring population trends of known hibernacula; monitoring of microclimate conditions in known hibernacula, and assessing our understanding of Indiana bat winter and summer distributions on the WNF, including any maternity colonies.

b. Monitor and report annually and evaluate every five years the answers to the following monitoring questions, as required in Chapter 4 of the Forest Plan:

    i. How many acres of potentially suitable Indiana bat habitat were protected or improved?

    ii. How many bat-friendly gates were installed on known Indiana bat hibernacula?

c. The implementing regulations for incidental take require that Federal agencies must report the progress of the action and its impact on the species (50 CFR 402.14(i)). To meet this mandate,

the following will be monitored and reported (from the Biological Opinion):

i. As projects are proposed, the cumulative total of incidental take that has occurred to date under the Biological Opinion for the 2006 Forest Plan, in addition to project-specific information identified under Conservation Direction and Guidance for all Federally Listed Species (under the Administrative and Technical Information section), will be reported to the USFWS. Incidental take will be monitored using the number of acres/miles in the following table:

Activity	Measure
Permanent Road Construction & Reconstruction	392 acres
Temporary Road Construction	146 acres
Skid Trails and Log Landings	740 acres
Small-Scale Utility Corridor Development[1]	50 acres[1]
Fire Lines	750 miles[2]

ii. On an annual basis, the cumulative acreage of specific management activities implemented under the 2006 Forest Plan will be reported to the USFWS. The anticipated activities and acreage planned for implementation during the first decade of the 2006 Forest Plan are shown in the following table:

Activity	Acreage
Even-aged Hardwood Timber Harvest	1,725
Even-aged Pine Timber Harvest	200
Uneven-aged Timber Harvest	14,556
Thinning	1,460
Crop Tree Release	9,500[3]
Grape Vine Control	2,683
Site Prep for Native Pine	200
Reforestation (planting)	500
Prescribed Fire	
Oak Regeneration	46,215
NNIS	200
Herbaceous Habitat	1,500
Hazardous Fuels	21,904
Herbicide Application	
Oak Regeneration	10,994
NNIS	6,500[4]
Development of Permanent Forest Openings	500
Maintenance of Permanent Forest Openings and other Herbaceous Habitats (mechanical)	5,000

[1] Several updates made on 7/31/2019 with Administrative Change # 10 related to Utility Corridor Development.

[2] Updated miles of fireline 10/16/2008 with Administrative Correction # 2.

[3] Updated acres of Crop Tree Release on 12/16/09 with Administrative Correction # 6.

[4] Updated acres of NNIS to be treated in first decade on 10/16/2008 with Administrative Correction # 4

Activity	Acreage
Control of NNIS	
Mechanical	1,500[1]
Biological	170[1]
Wetland Restoration & Enhancement	150
Waterhole Construction	15
Fishing Pond/Lake Construction	15
Restoration & Improvement of Aquatic/Riparian Habitat	
Lentic (lakes and ponds)	150
Lotic (rivers and streams)	20 miles
Installation of Bat-friendly Gates	20–30 gates
OHV Trail Construction	150
Hiking Trail Construction	18
Horse Trail Construction	61
Mountain Bike Construction	36
Recreational Facility Construction (including Parking Lots)	60
Temporary Road Construction	146
Permanent Road Construction	74
Permanent Road Reconstruction	318
Road Decommissioning	29
Skid Trails and Landings (outside cutting units only)	740
Surface Coal Mining Activities	1,250
Reclamation of Depleted or Orphan Wells	70 (128 wells)
Oil and Gas Well Development (Federal Leases Only)	42 (80 wells)
Small-Scale Utility Corridor Development[2]	50
Agricultural Crop Production & Grazing	50
Treatment of Acid Mine Drainage	270
Surface Mine Reclamation	20
Closure of Open Mine Portal/Subsidence	232
Stabilization of Disturbed Areas	100
Reduction of Hazardous Fuels (mechanical)	10,181
Land Acquisition	Up to 40,000
Land Exchange	400

iii. On an annual basis, a tally of hickory trees that were removed during implementation of management activities to enable the project to proceed without causing adverse effects to other resources important to the Indiana bat (see GFW-TES-9) will be reported to the USFWS.

[1] Updated acres of NNIS to be treated in first decade on 10/16/2008 with Administrative Correction # 4

[2] Several updates made on 7/31/2019 with Administrative Change # 10 related to Utility Corridor Development

Bald Eagle

See Regional Forester's Sensitive Species, page D-18. [1]

~~Additional resource management direction and guidance found in the 2006 Forest Plan and should be considered during project planning and implementation, as needed, to promote recovery of this species.~~

~~Administrative & Technical Information~~

~~By June 1 of each year, provide an annual report to the USFWS and the Ohio Division of Wildlife, which includes the following:~~

- ~~Results of any winter searches for communal bald eagle night roosts and concentrations, including mid-winter bald eagle surveys conducted in cooperation with the USFWS and the Ohio Division of Wildlife;~~
- ~~Discovery of any bald eagle nesting territories on the WNF. If no surveys have been conducted and no territories discovered on the WNF during an annual reporting period, an annual report should be submitted with a statement to this effect;~~
- ~~Documented cases of a prescribed fire that behaved contrary to predicted movement patterns and which resulted in a confirmed adverse impact to bald eagles.~~

~~For any prescribed fire that could potentially impact bald eagles, provide the USFWS with the opportunity to review burn plans with the WNF Fire Management Officer prior to the burn plan's approval.~~

~~Protection of Individuals~~

~~**Goal 5.1.2** – Protect bald eagle communal night roosts, daytime concentration sites, and occupied breeding territories.~~

~~**SFW-TES-16** – Protect any bald eagle communal night roosts and concentrations (including nests) discovered during winter surveys or during any additional field surveys or proposed project areas, following guidelines outlined in the Northern States Bald Eagle Recovery Plan.~~

~~**SFW-TES-17** – Report discovery of bald eagle nests immediately to the USFWS and the Ohio Department of Natural Resources, Division of Wildlife.~~

~~**SFW-TES-19** – Allow no prescribed fire within one-half mile of occupied bald eagle sites. Consider all bald eagle communal night roosts, daytime concentration sites, or occupied breeding territories as occupied sites. To prevent smoke inversion from occurring at occupied bald eagle sites, and to minimize smoke drifting toward them from prescribed fires outside the~~

[1] Updated per Forest Plan Administrative Correction # 3, 10/16/08

one-half mile radius of occupied sites, require burn plans to take into account of wind direction, speed, and mixing height as well as transport winds.

Appendix H, Stipulation 12 – Protect known nests and roosts as described in the Bald Eagle Recovery Plan, or as directed by the USFWS.

Habitat Protection & Improvement

SFW-TES-18 – Protect supercanopy trees, or other identified congregation roost trees, along major river corridors and lakes in addition to following Forest-wide riparian area standards and guidelines.

Appendix H, Stipulation 12 – Protect all supercanopy trees or other identified congregation roost trees for bald eagles along major river corridors and lakes.

Education & Awareness

Provide field training for new employees so they will be able to recognize bald eagle signs at night roosts, even when eagles are absent.

Inventory, Analysis & Monitoring

Objective 5.1.2a – Conduct a minimum of three annual winter searches to locate any previously unknown communal night roosts or bald eagle concentrations.

SFW-TES-15 – Focus winter bald eagle searches in areas that eagles are known to frequent or where concentrated food sources occur near NFS land. Conduct searches during early-, mid-, and late-winter. Follow search criteria outlined in the Northern States Bald Eagle Recovery Plan.

SFW-TES-20 – If the bald eagle is found nesting on the Wayne National Forest, monitor populations according to the recovery plan. At such time as the bald eagle is de-listed, use the de-listing monitoring plan.

In addition to these Forest-wide objectives and standards, monitor and report annually and evaluate every five years the answers to the following monitoring questions, as required in Chapter 4 of the Forest Plan:

- How many winter bald eagle searches were conducted?
- How many bald eagles were observed?

American Burying Beetle

Additional resource management direction and guidance found in the 2006 Forest Plan and should be considered during project planning and implementation, as needed, to promote recovery of this species.

Protection of Individuals

Goal 5.1.3 – Cooperate in efforts to reintroduce the American burying beetle.

GFW-TES-21 – Discourage the use of bug zappers by campers in dispersed or developed recreation sites within 10 air miles of known occupied American burying beetle habitat.

GFW-TES-23 – During the American burying beetle activity period, use bait-away methods prior to and during the implementation of major earth disturbing activities that occur in known occupied American burying beetle habitat.

GFW-TES-26 – Restrict the use of insecticides within known occupied American burying beetle habitat.

Habitat Protection & Improvement

GFW-TES-22 – Limit ground compaction to the minimum area possible during major earth disturbing activities (including, but not limited to new road and trail construction, mineral resource exploration and development, or new facilities) that occur in suitable American burying beetle habitat within 10 air miles of known occupied American burying beetle habitat.

GFW-TES-24– In occupied American burying beetle habitat, design new roads with the minimum safe width necessary for planned use of the road.

GFW-TES-25 – Within 10 air miles of known occupied American burying beetle habitat, keep ground disturbance to a minimum during the reconstruction and maintenance of existing roads. Limit width of road, ditches, and surface materials to the minimum necessary for the planned use.

Inventory, Analysis & Monitoring

Cooperate in efforts to determine the extent of occupied habitat on the WNF as reintroduction efforts continue on NFS lands and non-Federal lands.

Monitor and report annually and evaluate every five years the answers to the following monitoring question, as required in Chapter 4 of the Forest Plan:

- What cooperative efforts were accomplished to achieve the reintroduction of the American burying beetle?

Running Buffalo Clover

Additional resource management direction and guidance found in the 2006 Forest Plan and should be considered during project planning and implementation, as needed, to promote recovery of this species.

Protection of Individuals

Goal 5.1.4 – Actively manage known populations of running buffalo clover to maintain appropriate habitat conditions.

SFW-TES-27 – Implement measures to protect known running buffalo clover populations during prescribed fire activities. These may include, but are not limited to wetting down the occupied area, raking off fuels from the occupied area, or constructing firelines around the occupied area.

SFW-TES-28 – Avoid mechanical construction of firelines in known occupied RBC habitat. Mechanical fireline construction adjacent to known RBC populations must maintain appropriate light conditions in known occupied habitat.

GFW-TES-29 – Restrict the application of herbicides within 25 feet of known running buffalo clover populations.

Habitat Protection & Improvement

Objective 5.1.4a – Maintain partial to filtered sunlight over and adjacent to occupied habitat.

SFW-TES-30 – Protect and maintain known RBC populations during road and trail construction, reconstruction, and maintenance by locating ground disturbance outside the occupied habitat. The appropriate light conditions must be maintained in the occupied habitat during such activities.

GFW-TES-31: Conduct surveys for running buffalo clover in suitable habitat prior to implementing ground or canopy disturbing activities.

Education & Awareness

Ensure employees are familiar with locations of known running buffalo clover populations on the WNF.

Conduct annual refresher training on running buffalo clover identification for all field-going employees.

Inventory, Analysis and Monitoring

Objective 5.1.4b – Conduct annual monitoring of known running buffalo clover populations and adjacent areas to identify potential risks or management needs.

Monitor and report annually and evaluate every five years the answers to the following monitoring question, as required in Chapter 4 of the Forest Plan:

- What running buffalo clover population and habitat monitoring efforts were accomplished?

Regional Forester Sensitive Species

Regional Forester sensitive species are plant and animal species for which population viability is recognized as a concern, as evidenced by a downward trend in population or habitat capability. Regional Forester sensitive species are so designated and considered to be at risk if:

- They are candidates for listing under the Endangered Species Act
- Have been delisted by the USFWS within the last five years
- Have The Nature Conservancy species status ranks of G1-G3, T1-T3, N1-N3
- Are considered to be at risk based upon their State status ranks (S1-S3) and their respective forest risk evaluation.

Species listed as Regional Forester sensitive species must have at least one documented occurrence within the proclamation boundary of a Region 9 National Forest.

The following management direction applies to all management activities on the Wayne National Forest, and is in addition to the Forest-wide goals, objectives, standards and guidelines identified in the Revised Forest Plan.

- Maintain a Regional Forester sensitive species list for the Wayne National Forest following direction in FSM 2670, Region 9 Supplement 2600-2001-1.
- Ensure the public has access to the most current Regional Forester sensitive species list for the WNF.
- Coordinate and cooperate with experts from other agencies, universities and organizations to conserve, protect, and monitor populations and habitats of Regional Forester sensitive species.

Bald Eagle

On August 8, 2007 the U.S. Fish and Wildlife Service, removed (delisted) the bald eagle (*Haliaeetus leucocephalus*) in the lower 48 States of the United States from the Federal List of Endangered and Threatened Wildlife due to the successful recovery of the species. The bald eagle continues to be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. These Acts require some measures to continue to prevent bald eagle "take" resulting from human activities. The bald eagle will be on the Regional Forester's Sensitive Species list for at least the next five years (FSM 2670, R9 RO Supplement 2600-2000-1). Because of this, the protections in the 2006 Forest Plan will remain, but be moved from the Threatened and Endangered Species section to the Regional Forester Sensitive Species section of the Plan.

Additional resource management direction and guidance found in the 2006 Forest Plan and should be considered during project planning and implementation, as needed, to promote recovery of this species.

Administrative & Technical Information

By June 1 of each year, provide an annual report to the USFWS and the Ohio Division of Wildlife, which includes the following:

- Results of any winter searches for communal bald eagle night roosts and concentrations, including mid-winter bald eagle surveys conducted in cooperation with the USFWS and the Ohio Division of Wildlife;
- Discovery of any bald eagle nesting territories on the WNF. If no surveys have been conducted and no territories discovered on the WNF during an annual reporting period, an annual report should be submitted with a statement to this effect;
- Documented cases of a prescribed fire that behaved contrary to predicted movement patterns and which resulted in a confirmed adverse impact to bald eagles.

For any prescribed fire that could potentially impact bald eagles, provide the USFWS with the opportunity to review burn plans with the WNF Fire Management Officer prior to the burn plan's approval.

Protection of Individuals

Goal 5.2.1 – Protect bald eagle communal night roosts, daytime concentration sites, and occupied breeding territories.

SFW-TES-38 – Protect any bald eagle communal night roosts and concentrations (including nests) discovered during winter surveys or during any additional field surveys or proposed project areas, following guidelines outlined in the Northern States Bald Eagle Recovery Plan.

Updated per Forest Plan Administrative Correction # 3, 10/16/2008

SFW-TES-39 – Report discovery of bald eagle nests immediately to the USFWS and the Ohio Department of Natural Resources, Division of Wildlife.

SFW-TES-41 – Allow no prescribed fire within one-half mile of occupied bald eagle sites. Consider all bald eagle communal night roosts, daytime concentration sites, or occupied breeding territories as occupied sites. To prevent smoke inversion from occurring at occupied bald eagle sites, and to minimize smoke drifting toward them from prescribed fires outside the one-half mile radius of occupied sites, require burn plans to take into account of wind direction, speed, and mixing height as well as transport winds.

Appendix H, Stipulation 13 – Protect known nests and roosts as described in the Bald Eagle Recovery Plan, or as directed by the USFWS.

Habitat Protection & Improvement

SFW-TES-40 – Protect supercanopy trees, or other identified congregation roost trees, along major river corridors and lakes in addition to following Forest-wide riparian area standards and guidelines.

Appendix H, Stipulation 13 – Protect all supercanopy trees or other identified congregation roost trees for bald eagles along major river corridors and lakes.

Education & Awareness

Provide field training for new employees so they will be able to recognize bald eagle signs at night roosts, even when eagles are absent.

Inventory, Analysis & Monitoring

Objective 5.2.1a – Conduct a minimum of three annual winter searches to locate any previously unknown communal night roosts or bald eagle concentrations.

SFW-TES-37 – Focus winter bald eagle searches in areas that eagles are known to frequent or where concentrated food sources occur near NFS land. Conduct searches during early-, mid-, and late-winter. Follow search criteria outlined in the Northern States Bald Eagle Recovery Plan.

SFW-TES-42 – If the bald eagle is found nesting on the Wayne National Forest, monitor populations according to the recovery plan. At such time as the bald eagle is de-listed, use the de-listing monitoring plan.

In addition to these Forest-wide objectives and standards, monitor and report annually and evaluate every five years the answers to the following monitoring questions, as required in Chapter 4 of the Forest Plan:

- How many winter bald eagle searches were conducted?
- How many bald eagles were observed?

Appendix E

Vegetation Management for Oak Ecosystem Maintenance

Introduction

This appendix briefly describes the problems of maintaining and perpetuating the mixed oaks on the landscape. It also offers possible solutions, including the most commonly prescribed techniques, and discusses the effectiveness of these treatments.

Overview

Oaks are not regenerating where they have been for many years, and other species are taking their place. Oak regeneration problems are not confined to southeast Ohio but are a concern over most of the species range in the eastern United States. Research has found that oak regeneration problems are not related to the decline of the American chestnut or to forest fragmentation (Lorimer, 1992).

Acorn Production and Predation

Because successful oak regeneration usually depends on the existence of seedlings in the understory before harvest, poor seed crops and high rates of consumption by animals can significantly limit the ability of oaks to compete with other tree species. Unfavorable weather and insect damage can also lead to poor acorn crops. Most eastern upland oak species have good seed crops at intervals of three to five years. Intervals between good seed years in white oak may be longer, but local factors occasionally can contribute to regeneration failures from this cause.

Destruction of acorns by insects, rodents, and deer are an important factor in most areas; the loss of 90 percent of an acorn crop is not unusual. In a recent Pennsylvania study, rodents removed virtually every unprotected acorn on the ground surface and 78 percent of the buried acorns. Insects destroyed 63 percent of the surface acorns protected from rodents. (Lorimer, 1992)

Deer browsing can retard oak regeneration, and the substantial growth of deer populations in many areas around the 1930s coincided with the beginning of widespread oak problems. However, the occurrence of oak regeneration failures in places where deer are not especially numerous has

led a number of researchers to see deer as more of an aggravating, rather than a primary limiting, factor. (Lorimer, 1992)

Shade Effects

The effect of a shaded forest floor resulting from closed crown canopies and dense understory vegetation is one factor that helps explain the slow growth and high mortality of understory oak seedlings. The growth strategy of oak species directs energy from photosynthesis to promote seedling root growth at the expense of shoot development. Seedlings can develop a substantial taproot, and if an adequate amount of sunlight is available, a seedling can persist for many years despite repeated shoot dieback. When an opening in the crown allows more light into the understory, seedlings with an extensive root system can grow rapidly. (Lorimer, 1992)

Shade-tolerant species such as maples often have an advantage over oaks because they can grow significantly in height despite a closed canopy (in more shade than an oak can develop). Maples can steadily increase in both size and number until a nearly continuous subcanopy or a multi-storied layer of vegetation develops. These added layers of foliage beneath a closed upper canopy intercept so much light that often less than one percent of full sunlight reaches the seedling layer. As a result, oak seedlings often die once acorn reserves are exhausted. Even among the survivors, a vigorous root system doesn't ordinarily develop. The ability to persist under dense shade appears to vary among oak species. White oak and chestnut oak, for example, are often considered to be moderately shade-tolerant. However, the shade tolerance of oaks is markedly less than for many of its mesic competitors. The average 5-year mortality rate for large, overtopped saplings in a dry-mesic stand in southern New York was 45 percent for northern red oak and 26 percent for chestnut oak, but only 11 percent for red maple. On a dry-mesic site in central Massachusetts, overtopped red oak had a 19-year mortality rate of 90 percent compared to only 16 percent for red maple (Lorimer, 1983).

On mesic sites, advanced oak reproduction that can compete does not accumulate in mature stands because of the deep shade under the closed canopy. The advanced oak reproduction cannot develop into a size that would be competitive if it were released by overstory removal. Rather, it cycles in and out of the system with new seedling establishment after good acorn crops followed by mortality. Interrupting this cycle of establishment and mortality to enhance survival and growth of advance oak reproduction requires a silvicultural treatment that alters stand structure so that more light is available to the seedlings in the understory. (Loftis, 2004)

Advanced oak regeneration in large numbers will not necessarily assure acceptable oak regeneration even if released by complete clearcutting. Even though the overstory is removed, small oak seedlings may still have

to compete with a dense understory of larger and usually more shade tolerant seedlings, saplings, and sprouts. These species usually have well-developed root systems and ample foliage which enable them to respond faster to release than small oak seedlings. If, at the time of release, the oak seedling does not have a large root system and adequate shoot height, shoot growth will be slow until the root system develops. Therefore, the mere presence of oak seedlings does not mean that oaks, if released, will become part of the future stand. On mesic sites, competition also can be expected from shade intolerant plants such as yellow-poplar and cherry.

In summary, an oak seedling can become a dominant part of the new forest type if it has developed a strong root system, and when released to adequate sunlight, it is not encumbered by an established shade-intolerant, mesic tree seedling.

The Role of Oak Stump Sprouts

Sprouts that develop from harvested trees can contribute to the stocking of the regenerated stand after harvests. Oak species vary in their capacity to sprout, but the diameter of the stump seems to be a larger factor in determining the number of sprouts that appears after a harvest. Table E - 1 shows the ability of different species to sprout at different size classes. As can be seen, white oak and black oaks are not reliable sprouters after they reach a stump diameter approaching 16 inches and larger. So, if a stand has a large number of trees greater than 16 inches at the stump for these species, the future stand will be regenerated mostly by advanced regeneration. (Sander, Johnson, Watt)

Table E - 1. Expected percentage of oak stumps that will sprout after cutting.

Diameter of Parent Tree in inches	Black Oak	Scarlet Oak	Northern Red Oak	White Oak	Chestnut Oak
2 – 5	85	100	100	80	100
6 – 11	65	85	60	50	90
12 – 16	20	50	45	15	75
17 +	5	20	30	0	50

(Sander, Johnson, Watt)

Although decay in stump sprouts has sometimes been a concern, when the sprouts originate at or below ground level, the probability of becoming infected via the parent stump is low.

Effects of Fire on Tree Growth and Regeneration

Fire has numerous functions which alleviate some of the problems outlined above. Applied at the appropriate time and place, fire can improve oak regeneration.

Fire removes excessive litter buildup from the forest floor, thereby preparing a favorable seedbed. Squirrels and bluejays prefer areas of thin

litter for acorn burial. Also, jays collect and disperse only sound nuts. This important ecological finding implies that acorns which escape predation can result in well-established first-year seedlings.

Seedlings from freshly germinated acorns cannot emerge through a heavy litter cover. Germination and first-year survival are best when acorns are buried about three centimeters deep in mineral soil. While removal of thick litter may expedite germination by encouraging squirrels and jays to cache acorns, some humus layer needs to be retained. The humus layer keeps the soil surface porous, so that uncached acorns can more easily penetrate the soil, retain moisture, and provide support for the new seedling. (Van Lear, Watt, 1992)

Fire helps to control insect predators of acorns and new seedlings. Insect pests act as primary invaders, secondary invaders, parasites, or scavengers on or in acorns. Many of these insects spend all or part of their lives on the forest floor. Infestations, which can vary from year to year and even from tree to tree in some areas, are a major contributor to the oak regeneration problem. Annually, about 50 percent of the acorn crop in Ohio is destroyed by the larvae of Curculio weevils, acorn moths, and gall wasps. However, recent studies indicate that prescribed burning may reduce populations of oak insect pests when conducted under proper conditions. A reduction in insect predation would allow more acorns to be scattered and buried by jays and squirrels. This enhances the probability of successful germination and helps subsequent seedlings become established. Burning may also reduce rodent habitat, eliminating another source of acorn predation. (Van Lear, Watt, 1992)

A regime of frequent burning over a long period creates a more open understory. In hardwood stands, long-term burning tends to eliminate small understory stems outright and gradually reduces the midstory and overstory canopies through mortality resulting from fire wounds. Increased light reaching the forest floor in these open stands will maintain the vigor of oak advanced regeneration. Frequent fires result in a slightly drier site by removing some of the fuels and small shrubs on the forest floor as well as by exposing the site to greater solar radiation through canopy reduction. (Van Lear, Watt, 1992)

The absence of fire since the early 20th century has allowed fire-intolerant species to become established and grow to sizes with bark thick enough to resist fire. At greater than five centimeters (2 inches) dbh, yellow-poplar becomes almost as fire resistant as oaks. Fire suppression over the years has allowed shrubby understory species to occupy drier sites where fire was once frequent and oak more dominant. Yellow-poplar produces an abundance of seed almost annually. Although the seed has low viability, many remain viable in the litter and duff layer for several years. Yellow-poplar seed germinate readily after some of the fuels on the ground are burned. However, in a regime of frequent fire, small yellow-poplar

seedlings are likely to be killed and the reservoir of stored seed in the duff gradually depleted. Thus, frequent fires would, to a large degree, help control this major competitor of oaks on high-quality sites. (Van Lear, Watt, 1992)

The graph in Figure E - 1 shows the percentage of mortality for hickory, oak, red maple, and yellow-poplar advanced regeneration as fire intensity increases during prescribed burns of shelterwood stands in the spring (Van Lear, David H. and Brose, Patrick H, 1998). Note that the mortality rates experienced by yellow-poplar and red maple are much higher for all intensities than for oak or hickory.

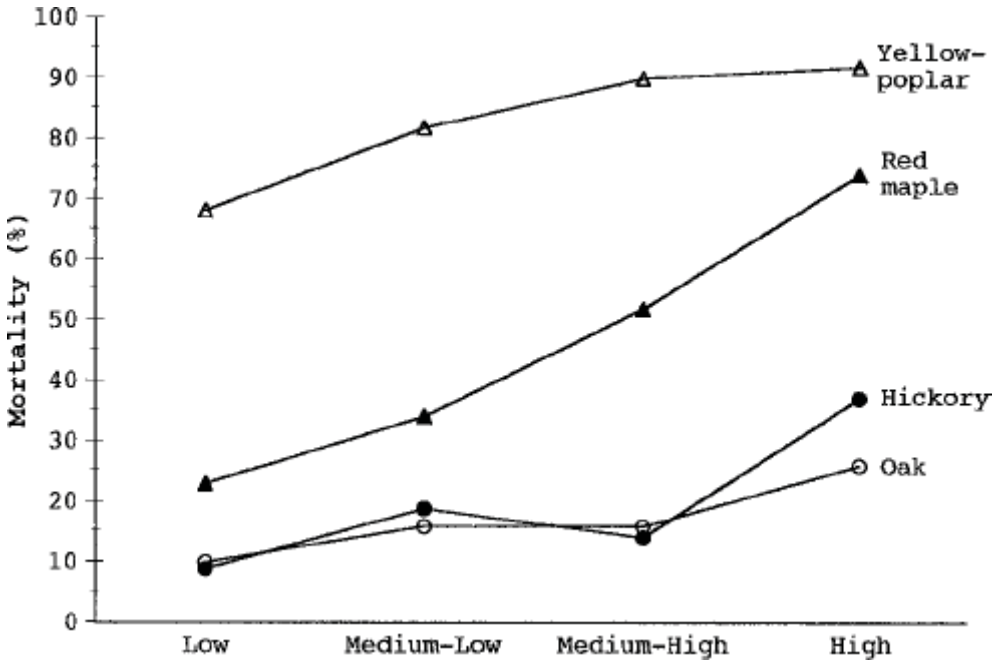


Figure E - 1. Mortality (%) of hickory, oak, red maple, and yellow-poplar as fire intensity increases during prescribed burns of shelterwood stands in the spring.

When repeated burning occurs in stands with mixed advanced regeneration, oaks have an advantage over less fire-resistant vegetation which is killed by fewer fires of lower intensity. This loss usually exceeds species gain through invasion, since the frequency of the fires is as important to reduction of fire-susceptible species as the intensity of the fire.

Thus, a regime of frequent understory burns, perhaps including both growing-season and winter burns during a period of 5 to 20 years prior to harvest, should promote a favorable root/shoot ratio during oak seedling establishment (Van Lear, Watt, 1992). This fire frequency would replicate fire-returns from the mid-1800s to 1925 that are likely an important reason why mature oaks are here now, as discussed in this document earlier. With a fire regime based on historical norms, the harvest of the overstory should

release the established seedlings from the dense shade of the overstory, and oak seedlings could then develop into a future oak stand.

The timing of the burns would depend on the observed vigor of the oak advanced regeneration and its competitors. A series of burns over an indefinite preharvest period will likely be required to favor oak regeneration. The first burn may be detrimental to oak advanced regeneration because small rootstocks may be killed. However, over the long-run, oaks will be less adversely affected than competitors and will, therefore, enjoy a competitive advantage that will enable them to favorably respond to subsequent release. (Van Lear, Watt, 1992)

Herbicides may be required to remove midstory trees that have grown too large to be killed by low-intensity fire. Herbicides provide initial selectivity of midstory stems to be eliminated prior to burning. A combination of herbicide treatment and frequent fire may be required to secure oak regeneration and allow it to maintain its vigor in mixed hardwood forests which have not been burned for decades. (Van Lear, Watt, 1992)

Forest Regeneration

Even-aged Management

Even-aged forests occur naturally after a major disturbance initiates the processes of stand regeneration. Even-aged stands generally have one age class, although two age classes can be found in some two-layered natural or managed stands. These stands generally have a well-developed canopy with a regular top at a uniform height.

Purely even-aged stands generally have a nearly bell-shaped diameter distribution. This means that most trees are in the average diameter class. However, diameter distributions should be viewed cautiously because diameter can be a poor criterion for age. The smallest trees in natural even-aged stands are generally spindly with vigor suppressed by the overstory.

Clearcutting

In a clearcut system the stand overstory is generally removed in one harvest.

If adequate numbers of advanced oak seedlings over 4½ feet tall are vigorous and have well-developed root systems, clearcutting is the most effective method to regenerate the stand to species dominated by oak and hickory. Although understory species may appear to dominate the stand

for about 10 years following clearcutting, the oaks and other overstory species begin to assert dominance, and by age 10-15 the understory species are generally in a subdominant position. (Sander, Graney, 1992)

Clearcut stands should be a minimum of two acres in size. If the existing advanced oak reproduction potential is not adequate and the stand is clearcut, the new stand will be dominated by a varying mixture of species, but oaks and hickories likely will not dominate the site. With the exception of yellow-poplar, the species that dominate the advanced reproduction will be predominant in the new stand. Yellow-poplar will also be abundant if it is present in the overstory, and some oaks will probably be present. (Sander, Graney, 1992)

If the clearcut stand is on southeast or northwest middle and upper slopes, we can expect at about age 20 to have a stand that can be molded by thinning into an essentially pure oak stand. On north and east aspects and lower slopes, the stand composition may be highly variable. Yellow-poplar will likely be abundant. Other species such as white ash, black cherry, and red and sugar maples will also be present. However, if the oak advanced regeneration is adequate, expect to have a predominantly oak stand 20 years after clearcutting. (Sander, Graney, 1992)

In practice, the Wayne National Forest will not normally prescribe true clearcuts, in which *all* merchantable trees would be cut from an area. The Wayne is likely to prescribe "clearcutting with reserves," a method in which varying numbers of reserve trees are left standing to attain goals other than regeneration. Overstory trees to be retained, called reserve trees, may be small or large trees, or combinations of small and large trees. These will be retained for future growth, certain species components, current or future den trees, future sources of snags or coarse woody debris, or some level of visual quality.

Shelterwood

In general, a shelterwood treatment is the cutting of most of the trees, but leaving those needed to produce seedlings in a moderated microclimate (The Dictionary of Forestry). In particular on the Wayne and in the central hardwoods, when the regeneration potential of the existing oak advanced reproduction is not adequate to replace the stand, the shelterwood method can be used to develop the required advanced reproduction. The minimum number of advanced reproduction is determined by inventorying the area to discover the amount and size of oak seedlings and estimating the number of stump sprouts after cutting. The procedure is outlined in the USDA General Technical Report NC-23, "A Guide for Evaluating the Adequacy of Oak Reproduction" (Sander, Johnson, Watt).

When oak advanced reproduction is small, scarce, or absent, the shelterwood regeneration method will most likely produce the best results. However, for successful seedling establishment and early seedling growth,

this method must be tailored to produce the micro-environments required by oaks. (Sander, Graney, 1992)

Without treating the micro-climate of the forest floor, such as providing more sunlight or controlling competition, oak advanced reproduction is most likely to be inadequate on the middle and lower north- and east-facing slopes. South-facing slopes and ridge tops may develop advanced oak regeneration without specific treatments because of the dry and open microclimate. (Sander, Graney, 1992)

When applying the shelterwood method to develop oak regeneration, following are some general practices that should be considered (Sander, Graney, 1992). Depending on site-specific conditions some or all of these treatments are probable:

- Control the understory by cutting or preferably killing the non-oak species that will compete with the small oaks by prescribed burning or applying herbicides.
- Reduce the overstory to 40 to 80 percent stocking. Leave the best dominant and co-dominant oaks as uniformly spaced as possible.
- If possible, apply the understory and overstory treatments before seedfall in a good seed year.
- Monitor seedling establishment and growth; make additional light cuts to keep the overstory from restricting growth.
- Apply additional understory control if the understory redevelops to a point where it restricts the oak reproduction growth. This control may be desirable 5 to 10 years after the original treatment; treatment could be prescribed burning or application of herbicides.
- When the regeneration potential of the oak reproduction is adequate to replace the stand, remove the remaining overstory sufficiently to allow the oaks to develop fully. After the shelterwood harvest and associated treatments are initiated, 10 to 20 years will likely be needed to establish enough oak seedlings and grow them to adequate sizes so that oaks would likely develop into dominant or co-dominant components of the future forest.

More than one burn may be prescribed if oak regeneration is not adequate after one burn. In many situations within the Central Hardwood Region and beyond, decades of fire exclusion have allowed oak competitors to become so firmly established that oak regeneration may not be as plentiful as desired. Oak dominance of the advanced regeneration should increase with repetitive burning. (Van Lear, D.H., 2004)

Another silvicultural treatment that has proved effective on more mesic sites is to remove mid-canopy and some lower-canopy trees and leaving a

main canopy with no large gaps, the survival and growth of small oak advanced reproduction increases. This treatment allows the population of small oak advanced reproduction to develop after a few years into a population of larger advanced reproduction, making oaks more competitive after release. Plus, this process also reduces competition from other species. Potential sprouts from mid-canopy and lower-canopy trees are treated with herbicides or prescribed fire, thereby directly reducing competition from these trees both before and after overwood removal. The reduction in competition from yellow-poplar is more subtle. First, while the residual canopy with no canopy gaps is sufficient to allow oak seedlings to develop, it is not sufficient to allow the establishment and development of yellow-poplar. Secondly, new yellow-poplar seedlings that become established after overwood removal will be in an inferior competitive position, at least on a patch-wise basis, because of the development of large advanced reproduction of oaks and other species. (Loftis, 2004)

Two-aged Management

The two-aged system regenerates a timber stand and maintains two age classes (The Dictionary of Forestry). Various other publications refer to this type of management scenario to deferment cutting, irregular shelterwood, or a shelterwood with reserves. As applied on the Wayne, harvest objectives would include the need to develop early-successional wildlife habitat, while at the same time retaining an important overstory component. The Forest would retain 15 to 20 square feet of basal area per acre of the original overstory; the selection of the "leave trees" would be based on wildlife habitat needs. For example, if the average diameter of the retained trees was 18 inches, this would be approximately 9 to 12 trees per acre. To regenerate the two-aged areas to an oak-hickory forest type, the same adequate numbers of healthy and well distributed oak seedlings must exist as was discussed for clearcut harvests prior to applying the two-aged harvest.

The Northeastern Area – State and Private Forestry reports the following observations regarding the development of two-aged stands after a regeneration cut in the central Appalachians (Perkey, Miller and Schuler, 1999).

- Leaving 12 to 15 residual overstory trees per acre and cutting all other trees 1-inch dbh and larger resulted in hardwood reproduction similar to that expected after clearcutting.
- In the Fish Trough treatment area, a sample of 10 yellow-poplar overstory crop trees was remeasured at about age 94 to determine if they were still growing well; they were. During the first 16 years of the study they grew at a rate of 2.9 inches per decade. During the last 3 years they grew at a rate of 3.2 inches per decade.

- Residual overstory trees (the older age class) were still free to grow, with an average of 20 feet of growing space between adjacent crowns; these trees were scattered over the area, not left in clumps or corridors.
- At 10 years, 70 to 85 percent of co-dominant reproduction had the potential to become timber crop trees. Three of the four treatment areas can be regarded as successfully regenerated with acceptable quality stems.
- The canopy of the younger age class was nearly closed after 10 years.
- Frequently, grapevine control work is needed in the younger age class of two-aged stands, just as it is needed in young stands regenerating after a clearcut.

Tree regeneration in the two-age harvest areas would be adequate if implemented as described. Experimental harvests on the Monongahela national Forest applied from 1979 to 1983 indicated that the reproduction that developed included a wide variety of species, similar to that observed after clearcutting. Also, the experiments found that 89 percent of the larger trees left uncut had survived, 76 to 100 percent of the survivors maintained their initial grade, and diameter growth increased for most species. (Miller, Johnson, Baumgras, 1997)

Uneven-aged Management

Uneven-aged management treatments work towards the goal of creating and maintaining an area in an uneven-aged condition. An uneven-aged stand has trees of three or more distinct age classes, either intimately mixed or in small groups (The Dictionary of Forestry). Also, uneven-aged stands have an uneven and highly broken or irregular canopy (often with many gaps). This broken canopy allows for greater light penetration and encourages deeper crowns and greater vertical structure in a stand. Most stems occur in the smallest age/size class, as regeneration quickly fills the canopy gaps. The number of small trees declines through normal species competition as age/size classes increase, to the point where the large trees are low in number and scattered (although distribution may be highly regular). In its ideal form, where diameters approximate age, distribution of diameters in uneven-aged management will approach the classic inverted-J form. Progressing through the diameter classes, the number of stems per acre drops in an inverted geometric fashion, giving a dipping curves relationship which looks like the mirror image of a "J" without the top. The graph in Figure E - 2 shows the distribution of trees in an uneven-aged condition. Note that there are a large number of very small trees and very few large trees per acre.

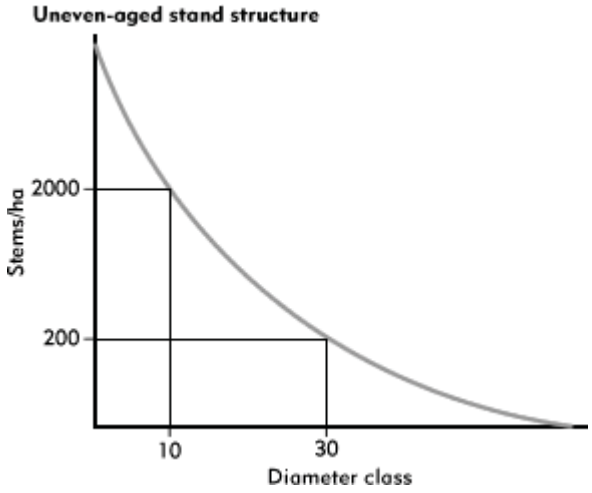
1. 

Figure E - 2. Distribution of trees in an uneven-aged condition.

In managing an uneven-aged stand of trees, the forest manager often uses a formula to mold the stand's structure according the relative numbers of trees of various sizes. This formula is often referred to as a Q-Factor. The Q-Factor describes the distribution of size classes and is expressed in terms of the ratio between numbers of trees in successive 2-inch diameter classes. For example a Q-Factor of 1.5 means that there would be 1.5 times as many 10-inch trees as there are 12-inch trees, and 1.5 times as many 12-inch trees as there are 14-inch trees. The lower the Q-factor, the more larger trees there would be in relation to small trees.

Initially, to convert an even-aged stand to an uneven-age stand, the objective is to develop new age classes, but not to immediately create a structure as pictured in Figure E - 2. Eventually, a more formalized uneven-aged regulation method can be implemented to supplement and guide the retention of given levels of stocking in the different age classes. Although a q-based (or similar) approach is essential for maintaining an uneven-aged structure after the uneven-aged structure is established, q is not applicable when initially converting even-aged stands into an uneven aged stand.

Conversion of a stand to an uneven-aged structure cannot be accomplished in the same manner as the maintenance of stand structure in an existing uneven-aged stand. Generally with the objective of changing the stand's structure to uneven-aged, the first harvest in the stand would be a reduction across the stand of one-third but no more than 60 percent stocking. Depending on the stand's age or species mix, the cutting could target different trees. Considerations would include such concerns as whether the stand has a component of short-lived trees which could not survive through the time that would be required to develop the uneven-aged structure. Therefore, the exact prescription must be tailored to each stand. (Loewenstein and Guldin 2004)

Single-tree selection system

Single-tree selection methods are most appropriate for stands in which the desired species composition is to consist primarily of such shade-tolerant species as beech and maple. Single tree selection, therefore, is generally considered inappropriate for regenerating oak forests. (Hicks, 1998)

The establishment and development of oak regeneration is not as probable or as consistent with the single-tree selection system. While harvesting single trees to achieve and maintain a specific diameter distribution does not provide the microclimate needed for oak regeneration, it does provide the conditions needed for the establishment and growth of shade-tolerant species. (Sander, Graney, 1992) Over time, single-tree selection in a mature oak stand will convert the area to predominantly shade-tolerant species such as beech and maple.

However, empirical and experimental data suggest that under certain conditions, oak stands can be managed using uneven-aged methods. (Loewenstein and Guldin, 2004) By applying oak advanced regeneration techniques, such as controlling mesic seedlings, the resulting uneven-aged stand's oak component can be increased. It is unlikely, however, that oak and hickory will be majority components of the stands in the long term. If the more shade tolerant and mesic species are controlled, the more xeric parts of the stand, such as south-facing slopes and ridgetops, may have significant oak and hickory components. Then the mesic parts of a stand, such as the lower elevations, coves and north slopes, will likely be occupied by more mesic species such as yellow-poplar, maple, and beech.

Oak seedlings have been found to show greatest response and successful establishment in the centers of forest clearings. A retardation of oak seedling growth, however, is found on the edges of openings. High levels of sun light are required for the survival and growth of advanced oak regeneration, and these light conditions cannot be achieved by the single tree selection method. (Fischer, 1979)

Group Selection Systems

The objective of group selection is creation of an uneven-aged stand by cutting and regenerating small parts or "groups" in a stand. The entire stand continues to be managed as a single unit, including both the groups that have been cut and the uncut portions in between. Individual groups are not managed as individual stands. As applied on the WNF to regenerate oak-hickory types, a group should be up to two acres in size. When the objective is to regenerate shade tolerant species, such as maple and beech, the groups should have a diameter of approximately up to the height of two mature trees (0.4 to 0.7 acres).

Group selection can be used to reproduce oaks satisfactorily, assuming (Sander, Graney, 1992):

- The oak advanced reproduction is adequate
- Culls and small trees within the groups are cut or killed, unless specifically retained for wildlife or other purposes.

The growth and development of the reproduction by group selection will resemble responses that follow clearcutting, except the influence of the surrounding stand will retard reproduction growth in a large part of the open area. (Sander, Graney, 1992)

If the oak advanced reproduction is not adequate, cutting the trees to create the opening will not result in oak reproduction. The opening will be filled by the species present in the understory and by species with seeds on the site, such as yellow-poplar. Without adequate advanced oak regeneration, the procedures for developing it, as described above for the shelterwood, could be implemented first if oak is an objective for the future stand (Sander, Graney, 1992).

Frequently, as groups are cut to create a young age-class, other parts of the stand will be thinned to enhance oak reproduction establishment and growth throughout the stand.

Oak Management in the Historic Forest Management Area

One of the main visions portrayed in the desired future condition for the Historic Forest management area is land that eventually mimics the conditions of several hundred years ago when oak dominated the landscape. Treatments likely to help achieve that condition include:

- Intensive thinning (to maintain a 50% to 60% stocking)
- Frequent prescribed burns (to control the more mesic species and promote oak regeneration)
- Herbicide treatment.

Herbicide treatment may be necessary initially, when the land is being transformed into the desired conditions, because mesic species such as maples and poplars will be too large to control with prescribed burns. Once the land has been transformed and the number of maples and poplars are minimal and their sizes small, periodic fires will likely control them.

For the first two or three decades, the stands treated in this management area will likely need to be thinned as the crowns of trees expand to a degree that do not contribute to attainment of desired conditions. After the historic forest system is in place and functioning (in 30 to 50 years), some periodic timber removal may be necessary to release seedlings to grow.

Intermediate Silvicultural Treatments

Effects Of Cleaning Treatments And Precommercial Thinning

Cleanings are release treatments performed during the sapling stage to free selected trees from competition of overtopping trees of comparable age (or woody vines and shrubs). Cleanings also favor trees needed to meet wildlife habitat or other management objectives.

It is better to wait until the stand is well into the sapling stage and has a closed canopy before making decisions regarding future crop trees. This delay will also assure that stump sprouts will not overtake desirable trees. Simply cutting most broadleaved trees and shrubs will normally stimulate sprouting, often with increased vigor. To prevent this, herbicide may be applied. (Nyland, 1996)

Benefits of release from cleaning vary with species, age, degree of suppression, and completeness of a treatment. Generally, cleaning works best in young stands while the preferred trees still have sufficient vigor to respond to release.

Timber crop tree management can provide high-quality timber products from individual trees growing at a rapid rate. The limiting factors in managing for crop trees are:

- The existing number of good-quality trees
- Increasing their growth while retaining their valuable characteristics.

Crop tree selection criteria:

- Select dominant/co-dominant trees at least 20 feet tall with large healthy crowns. On the WNF, this height would be attained when the regeneration is from 10 to 20 years old.
- Select low-origin stump sprouts with U-shaped connections. Stump sprouts that originate close to the ground are suitable crop tree candidates if they are stable and have good form.
- Select trees with no epicormic branches. For most species, dominant/co-dominant trees with large crowns and good vigor are not likely to epicormic branch to a significant degree.
- Select trees without leans or forks.

Grape Vine Control

When wild grapevines grow into tree crowns, especially in young trees, they can damage trees by breaking the tops and limbs, twisting and bending the tree boles, even uprooting trees. Wild grapevines grow best on moist soils and in full sun. Prolonged shade reduces growth and will kill the vines. Vines sprout prolifically when cut, however.

Since grapevines are intolerant of shade, the vines will generally die or not be a problem if they are cut near ground level and the crown of the surrounding stand has closed so that the ground is well shaded.

If grapevines are present in the stand before harvest, and an even-aged harvest is planned, grapevines likely will be a problem in the regenerating stand. The combination of sprouting vines and multiple seedlings after harvest, plus the increase in available sunlight, will promote grapevine growth. Grape seed remains viable for many years.

Common solutions to a grapevine problem include (Smith, H. Clay, 1984):

- After an even-aged or group selection harvest, in the first 10 years after the forest floor has become shaded, sever the grapevines at ground level; the vines will resprout, but will die because of the shaded conditions.
- At least four to five years before an even-aged or group selection harvest, sever the grape vine at ground level; the vines will resprout, but will die before the harvest.
- If a harvest is planned within four years, treat the vines with herbicide. (Note: If the area is treated before the harvest, a post-harvest treatment may be necessary, particularly on better than average sites. Herbicide may also be needed to treat seedlings that start from seed already on the forest floor. However, the growth rate of the vines from seedlings would be much less than from established roots. Their damage would be less.)

All grape vines will not be eliminated from an area. Any sensitive or rare species of grape will be retained. Grape arbors (large concentrations of vines in a small localized area) will be left untreated. The impact on wildlife habitat will be considered before any control is begun.

Commercial Thinning

As trees in a stand of timber grow, they compete with each other for nutrients, water, space, and sunlight. Each tree attempts to grow as fast and large as possible to remain competitive in the quest for food, water, and sunlight. As time passes, however, some limiting factor will prevent many trees from reaching their full potential. The species or genetic make-up of some individuals may pre-dispose them to be less effective

competitors. Trees that do not grow as fast as others become weakened rendering them even less competitive for sunlight, water, nutrients, and/or space. Because these trees are shorter than their less vigorous competitors, they cannot reach direct sunlight and have smaller live crowns. They are also more vulnerable to damage from insects and diseases and less likely to live a normal life span.

Also, even trees that have succeeded in becoming dominant or co-dominant often have different natural life spans. For example, on the WNF individual white oak trees can live to be 200 to 600 years old, whereas scarlet oak trees normally live only 100 to 150 years. These ages are for individual trees; like people, some die young while others live beyond their averages. As in the contrast between the longevity of scarlet and white oak, however, some species tend to live longer than others.

In otherwise comparable stands of trees, healthier and larger individuals will be found on sites with less tree density. Available nutrients, water, space, and sunlight are shared by fewer individuals on the less dense site.

Thinning a forest, or reducing tree density, is usually done to accomplish one or more of these objectives:

- Improve growth of the remaining trees
- Enhance the overall health of the forest's trees so they can withstand insects and diseases
- Recover potential mortality
- Favor the species of trees that will best meet the objectives of the area
- Increase light to the forest floor to encourage advanced oak reproduction.

Relative stand density is determined by using one of several stocking guides or charts developed for eastern hardwoods. The stand's relative density is then compared to management stocking levels. Acceptable growing stock (AGS) is defined as trees of acceptable species, form, and quality that could be selected as crop trees. A common method of quantifying and comparing relative stocking follows the graph in Figure E - 3 developed by Gingrich in 1967. A stocking level of 80 percent defines the upper management zone (sufficient mortality increase, growth decline, and volume present to thin). The lower management zone is 60 percent or B-level stocking (minimum residual level to thin to). Stands between 60 and 80 percent stocked usually do not need to be thinned. (Gottschalk, 1993)

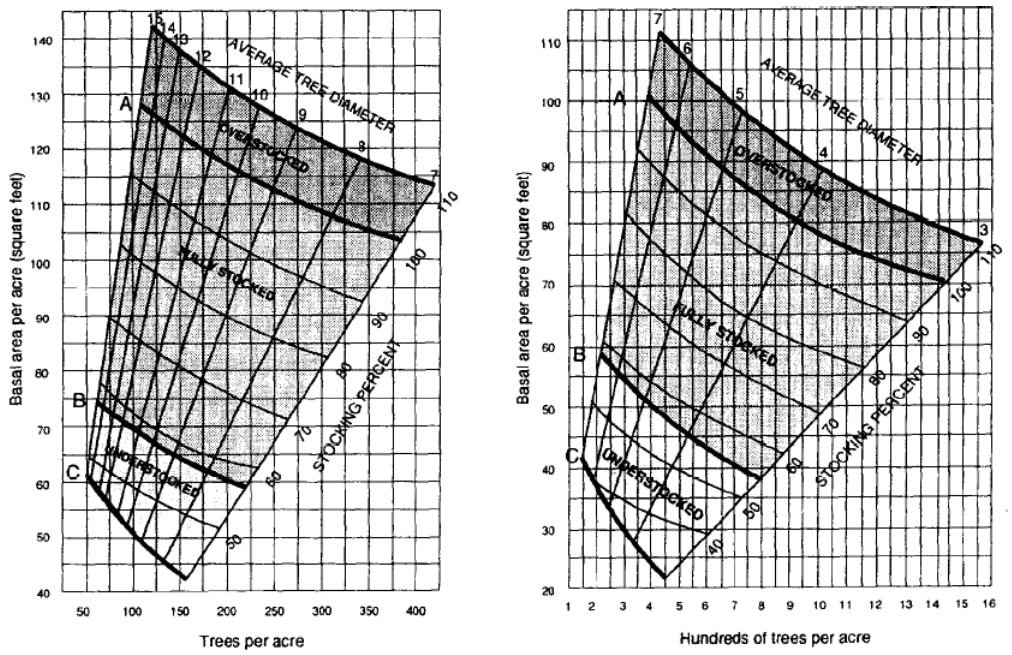


Figure E - 3. Relative stand density for upland hardwood stands, including oak.

Oak and other stands could be thinned when they have greater than B-level density of acceptable growing stock that is more than 15 years from maturity and with more than 80 percent relative density. Under normal management, they would receive a commercial thinning from below. Commercial thinning would reduce relative stand density to 60 percent, but not remove more than 35 percent in any one cut. It should remove unacceptable growing stock, harvest some of the anticipated mortality, increase the growing space for residual trees, increase in average stand diameter, and improve stand quality. (Gottschalk, 1993)

Gypsy Moth Control

As described previously, the gypsy moth (a non-native) is advancing across the northeastern United States. Infestation has reached the northeastern edge of the WNF and will likely spread across the remainder of the Forest in the next 10 to 15 years.

To preserve the health and future composition of the Forest, several treatments, such as the "Slow-the-Spread" campaign will likely be instituted by different agencies such as the USDA Forest Service and the Ohio Department of Natural Resources. In addition to these tactics, thinning the Forest before and after the gypsy moth infestations can help minimize the damage and guard against significant impacts to the oak component of the WNF. Presalvage thinning is designed to reduce damage by removing highly vulnerable (high hazard) trees before they are defoliated and die; the major objective is to reduce stand vulnerability. Secondary objectives of treatment (Gottschalk, 1993) include:

- Improved stand and tree vigor as well as crown condition
- Removal of structural features that offer refuge to gypsy moth larvae and pupae
- Promotion of gypsy moth predator and parasite habitat.

The likelihood of oak tree death after gypsy moth infestation is tied to the health and position of the tree's crown. Graphs in Figure E - 4 show rates of tree mortality based on crown health and position. As illustrated, crown in the suppressed crown position and with poor crown health conditions most often die after an infestation. (Gottschalk, 1993)

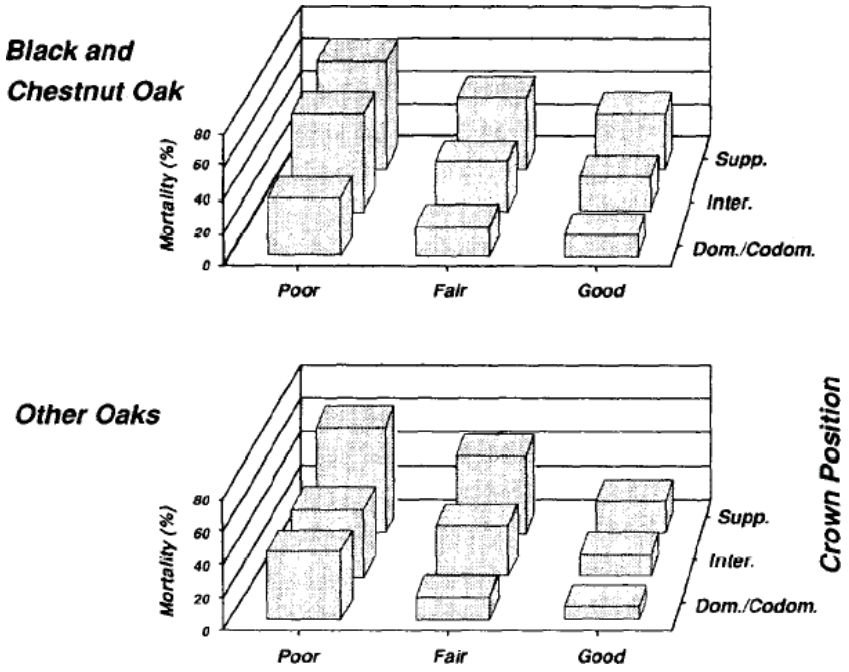


Figure E - 4. Rate of tree mortality based on crown health and position of tree crown.

To be effective, a presalvage thinning before arrival of the gypsy moth must vary slightly from the normal thinning prescription. In stands with more than 50 percent of their basal area in gypsy moth-preferred food species, as is the case for most of the WNF, normal thinning prescriptions will not reduce the preferred food species significantly enough to reduce a stand's susceptibility. Presalvage thinning focuses on reducing vulnerability.

Presalvage thinning is necessary one to three years before defoliation, because the stand will need time to recover from the stress and disturbance caused by thinning. The stress induced by thinning may temporarily expose a stand to attack by certain damaging agents. For example,

presalvage thinning may provide favorable conditions for increasing populations of shoestring root rot and twolined chestnut borer. However, these risks are gradually reduced by the increased tree growth and vigor that eventually occur. (Gottschalk, 1993)

As a supplement to normal thinning guidelines (such as removing unacceptable growing stock and targeting a specific density), priorities for marking trees to be removed are (highest to lowest):

- Oaks with poor crowns
- Non-oak species with poor crowns
- Oaks with fair crowns
- Non-oak species with fair crowns.

Figure E - 5 depicts a presalvage thinning in an older stand, showing marking priorities (-) before and result of thinning afterward (WO = white oak, RO = red oak, HI = hickory, RM = red maple).

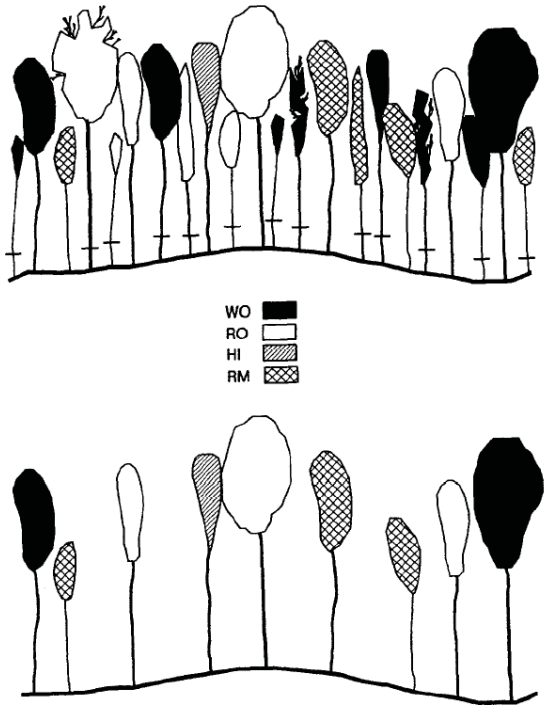


Figure E - 5. Marking priorities in a presalvage thinning of an older stand.

Sudden Oak Death (SOD)

Sudden Oak Death (SOD) is a new disease that has spread rapidly since 1995 in California. It is caused by a newly discovered pathogen (Phytophtora ramorum). The disease has been found in nursery stock in the eastern United States, so infection of natural stands is possible. Fire suppression has been effective where SOD has emerged in the west. Analysis by Moritz and Odion demonstrates a strong and consistent negative relationship between locations of confirmed SODS and areas that have been burned since 1950. The potential for fire to influence the growth of spores and mycelia of fungal pathogens through direct effects of heat and/or smoke has long been known. (Moritz and Odion, 2005)

Oak Decline

Periodic occurrences of decline and death of oaks over widespread areas have been recorded since 1900. The condition is often caused by a complex interaction of stresses and pests. Generally trees are weakened by environmental stresses such as droughts, frosts, of pests such as defoliating or sucking insects. Weakened trees are then invaded by other insects or diseases and the trees subsequently die. Healthy trees can withstand secondary pests, but in a weakened condition, they lack sufficient energy reserve to survive. Usually, the progression of decline is slow, occurring over several years. Control of oak decline is generally considered to involve keeping the trees healthy, and thus able to withstand pests and diseases. Certain causal factors such as drought and frost cannot be controlled, but management actions such as thinning can reduce competition for moisture and nutrients and thus promote a better physiological condition of the remaining trees. (Wargo, Houston, LaMadeleine, 1983)

Summary Of Effectiveness Of Management Practices

Effects of Fire on Tree Growth and Regeneration

Prescribed fire is very effective in maintaining and restoring oak in areas that have adequate light reaching the forest floor. Primarily, fire's effects enhance the development of advanced oak seedlings. Prescribed fire also controls tree species such as maple and yellow-poplar that would out-compete oak seedlings.

Herbicide Treatment of Non-oak

Controlling non-oak competitors in the understory with herbicide is very effective in maintaining and restoring oak. Some larger trees in the understory are less likely to be killed by prescribed fire. Fire treatments alone would leave them free to out-compete the oaks. Also, if successive

years of unacceptable burning weather results in a backlog of areas needing to be burned, herbicide treatment can allow mangers to "catch-up" in promoting the conditions for advanced oak regeneration.

Clearcutting and Two-aged Management (Even-aged Management)

These two even-aged management techniques for regenerating timber stands are effective in maintaining and restoring oak, provided the following conditions exist:

- An adequate amount of vigorous advanced oak regeneration exists and has large root development
- The advanced reproduction of more competitive species, such as maples and yellow-poplar, are not in large numbers

Given these conditions, a predominantly oak forest would be regenerated.

Shelterwood Cutting (Even aged Management)

A shelterwood harvest can be very effective in creating conditions in which oaks will develop in the understory so that the subsequent regeneration harvest can release the oaks to fully develop. Note that other treatments will often be necessary in conjunction with the shelterwood harvest, such as prescribed burns and/or herbicide treatments.

Single Tree Selection (Uneven aged Management)

This method of cutting is unlikely to be effective in maintaining the predominantly mixed-oak stand conditions. More shade-tolerant species are more likely to occupy the site in the future because not enough light reaches the forest floor to allow the oak seedlings to develop and compete successfully. Treatments such as prescribed burning and/or herbicide application would increase the oak component of the future stand, but the oak component would likely be well below the existing oak component.

Group Selection (Uneven aged Management)

This method of cutting would likely result in the oak component of the future stand to be greater than under single tree selection, but likely less than the component created with even-aged treatments. One reason for the less effective oak regeneration is the large amount of edge in each group. The more mesic and shade-tolerant species would have an advantage along these shaded edges, while the oaks may thrive in the centers and northern edges of each group. Eventually, the amount of oak in the entire stand will decrease so that only the dry south slopes and ridgetops would be stocked with significant numbers of oaks.

Precommercial Thinning

Precommercial thinning would allow mangers to favor oaks when releasing the stand or part of a stand. Therefore, the oaks of the future

stand would be better able to establish themselves as dominant and co-dominant trees. Also, the stand will be healthier.

Grapevine Control

Grapevine control would allow the oaks and all other species to grow without being broken or deformed by vigorous grape vines.

Commercial Thinning

Reducing the stocking through a commercial sale would have the same effect as described under precommercial thinning. A healthy tree can withstand insects and diseases and not die or become weakened and then vulnerable to other problems, such as other insects, disease, or drought. As discussed earlier, the gypsy moth will eventually affect the WNF, and oak trees are the moth's preferred host. So, the ill effects of the moth on the oak component will be less lethal if the trees already enjoy robust health.

No Treatment

If no silvicultural treatments are done, the current stands of oak and hickory will likely be replaced by species such as maple and beech. The stress induced by the overstocking will decrease the health and vigor of the forest, inviting disease and insect attacks. Very dry ridgetops and south-facing slopes will likely retain some oak trees, but without treatments, the oak-hickory forest will eventually disappear.

References

Fischer, B. C. 1979. Managing light in the selection method. In Proceedings – Regenerating Oaks in Upland Hardwood Forests, Purdue University, Feb. 22-23, 1979.

Gottschalk, K. W. 1993. Silvicultural guidelines for forest stands threatened by the gypsy moth. GTR-NE-171. Radnor, PA: USDA Forest Service, Northeastern Forest Experiment Station. p 49.

Hicks, Ray. 1998. Ecology and Management of Central Hardwood Forests. John Wiley and Sons. New York.

Lorimer, C. G. "Causes of the Oak Regeneration Problem" from Oak Regeneration: Serious Problems, Practical Recommendations Symposium Proceeding, Knoxville, Tenn., Sept. 8-10, 1992

Lorimer, C.G. 1983. Tests of age-independent competition indices for individual trees in natural hardwood stands. Forest Ecology and Management, 6: 343-360.

Loftis, D. L. Upland Oak Regeneration and Management, Gen. Tech. Rep. SRS-73. Asheville, N.C: USDA Forest Service, Southern Research Station. pp. 163-167, 2004.

Loewenstein, E. F., Guldin, J. M., 2004. Gen. Tech. Rep. SRS-73. Asheville, NC: USDA Forest Service, Southern Research Station. pp. 264-268

Miller, G. W., Johnson, J. E., and Baumgras, J. E. "Deferment Cutting in Central Appalachian Hardwoods: An Update", from the Hardwood Symposium Proceedings, May 7-10, 1997.

Nyland, R.D. 1996. Silviculture concepts and applications. McGraw Hill Companies, Inc. New York, N.Y.

Perkey, A. W.; Miller, G. W.; and Schuler, T/ M, "Regeneration Results Using Two-Aged Management", Northeastern Area State and Private Forestry.

Sander, Ivan L. and Graney, David L., Southern Forest Experiment Station, USDA Forest Service, Fayetteville, AR 72701, Regenerating Oaks in the Central States from Regeneration: Serious Problems, Practical Recommendations Symposium Proceeding, Knoxville, Tenn., Sept. 8-10, 1992

Sander, Johnson, Watt. USDA, General technical Report NC-23 "A Guide for Evaluating the Adequacy of Oak Reproduction 1976.

Van Lear, D.H. Gen. Tech. Rep. SRS-73. Asheville, NC: USDA Forest Service, Southern Research Station. pp. 65-71, 2004.

Van Lear, David II, Watt, J. M. The Role of Fire in Oak Regeneration from Oak Regeneration: Serious Problems, Practical Recommendations Symposium Proceeding, Knoxville, Tenn., Sept. 8-10, 1992.

Van Lear, David H. and Brose, Patrick H., Responses of hardwood advance regeneration to seasonal prescribed fires in oak-dominated shelterwood stands Can. J. For. Res./Rev. Can. Rech. For. 28(3): 331-339, 1998.

This page left blank for notes.

Appendix F

Soil Limitations to Vegetation Management

Introduction

The suitability and capability of the various soil mapping units on the Wayne National Forest for vegetation management, are assessed for preliminary project planning using two primary sources:

- USDA Soil Survey Manual
- The SSURGO (Soil Survey Geographic Database) database stored within the Forest's geographic information system.

These data sources were originally designed at the county level; the WNF also utilizes customized dataset based on SSURGO that allows for consistent analysis across county boundaries.

Tables within these databases contain information that aid in harvest design, regeneration, and silvicultural activities. As an example these tables may include information pertaining to limiting factors on soil types for haul roads, skid trails and log landings. The limiting factors usually pertain to soil materials and drainage characteristics and are often described as slight, moderate, or severe to provide an indication of potential issues when assessing a project. The information is not intended to provide specific design information which requires on-site investigation. However, it should provide some preliminary design information.

This page left blank for notes.

Appendix G

Stocking Levels Needed to Meet Oak-Hickory Objectives

Tracking Composition Objectives

Figure G - 1 and Table G - 1 were developed to determine whether Forest-wide and management-area composition objectives are being met. Oak-hickory composition objectives in regenerated stands will be evaluated at early ages. If overall, the Forest and management area's oak-hickory composition objectives are not being met, precommercial thinning can be considered to favor the oak-hickory regeneration. As a result, the final percentage of oak-hickory stems should be adequate to meet composition objectives. As long as the number of oak-hickory stems does not fall below the level associated with the dashed line in Figure G - 1, an oak-hickory stand type could be achieved through thinning.

Data used to develop the chart and table below were obtained from:

- Ashley, Burl, 1979. Determining adequacy of regeneration
- Proceeding from Regenerating Oaks in Upland Hardwoods, Purdue University
- Roach, Benjamin A. and Samuel F. Gingrich, 1968. Even-aged Silviculture for Upland Central Hardwoods. U.S. Department of Agriculture Handbook No. 355.
- Sander, Ivan L., Personal Communication, January 31, 1985.
- Willison, Gary L., 1981. Natural Regeneration 20 Years after Clearcutting as Affected by Site and Size of Opening in Southeastern Ohio. Masters Thesis, The Ohio State University.

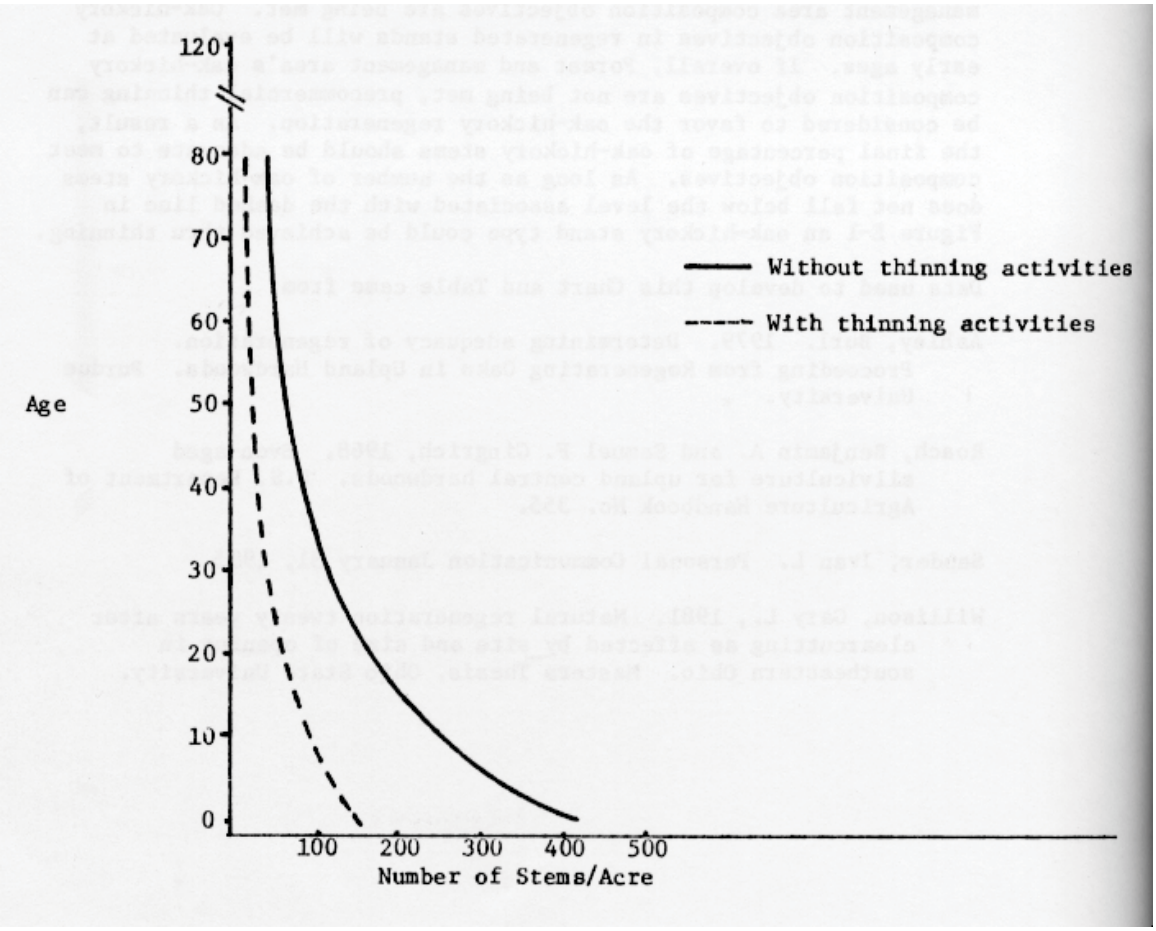


Figure G - 1. Stocking levels required to meet oak-hickory objectives.

Table G - 1. Minimum number of dominant and co-dominant oak-hickory.

	Stems Per Acre 1/	
Age	Number of Stems W/O Thinning	Number of Stems With Thinning
5	325	120
10	255	90
15	221	80
20	164	70
25	140	60
30	126	50

l/ "C" level upland central hardwoods, 5 inch dbh, 51% of total stems per acre.

Appendix H

Lease-specific Oil and Gas Notifications/Stipulations

Introduction

The following notifications and stipulations implement the standards and guidelines of the Wayne National Forest's 2006 Land and Resource Management Plan (Forest Plan). These are in addition to the standard lease terms for oil and gas leases (BLM Form 3100-11). Not all of these notifications and stipulations are applied to every lease, rather, only those that are relevant based on site conditions. These notifications and stipulations are necessary to protect specific resource values on the lease area. They may be made less restrictive or modified for site-specific situations if such change is found to be in the public interest. These notifications and stipulations may be made less restrictive or modified only after a formal analysis has been completed and specifically approved in writing by a Forest Service line officer.

Notifications

Special Notification #1

Operations under this lease will be consistent with all the standards and guidelines found in the Wayne National Forest's 2006 Land and Resource Management Plan and are hereby incorporated into this lease in its entirety. Forest Plan standards and guidelines may restrict location, timing, and methodology of oil and gas lease operations. Special surveys for protection of National Forest System land and resources will be required. A copy of the WNF's 2006 Land and Resource Management Plan is available from the following website http://www.fs.fed.us/r9/wayne/ or by writing to:

Forest Supervisor
Wayne National Forest
13700 US HWY 33
Nelsonville, OH 45764

Notification #1

Cultural Resources

The Forest Service is responsible for assuring the area to be disturbed is examined for cultural resources prior to allowing surface disturbing activities on lands covered by this lease. Important cultural resource values may be present on portions of a lease. Surface disturbing activities must avoid these areas unless the authorized officer agrees to the mitigation measures.

The lessee/operators may, at their discretion and cost, conduct the examination on the lands to be disturbed. This examination must be done by or under the supervision of a qualified resource specialist approved by the Forest Service. An acceptable report must be provided to the Forest Service identifying the anticipated effects of the proposed action on cultural resource values.

If items of substantial archaeological or paleontological values are discovered during operations, or a known deposit of such items is disturbed, the lessee (or operator) will cease work in the affected area. The lessee (or operator) will then notify the Forest Service and will not resume excavation until the Forest Supervisor gives written approval.

Notification #2

Floodplains

Any activities proposed in, or likely to affect a floodplain will be subject to:

- Analysis and identification of alternate sites
- Public notification and comment period
- Provisions of any other Federal, State or local laws and regulations as required under presidential Executive Order 11988, Protection of Floodplains.

Notification #3

Protection of Federally Listed Endangered and Threatened, and Regional Sensitive Species and Their Habitats

The Forest Service is responsible for assuring that the area to be disturbed is examined prior to allowing any surface disturbing activities on lands covered by this lease. The examination is to determine effects upon any plant or animal species listed, or proposed for listing, as Federal endangered or threatened, regional sensitive, and their habitats. If the findings of this examination determine that the operation(s) may have a detrimental effect on a species covered by the Federal Endangered Species Act, the operator's plans may be denied or restrictions added. The presence of regional sensitive species may also require some restrictions of the operation(s).

The Forest Service has the responsibility to conduct the required examination. In cases where the Forest Service time frames cannot meet the needs of the lessee/operator, the lessee/operator may, at his discretion and cost, conduct the examination on the lands to be disturbed. This examination must be done by or under the supervision of a qualified resource specialist approved by the Forest Service. An acceptable report must be provided to the Forest Service identifying the anticipated effects of the proposed action on Federal endangered or threatened species, regional sensitive species, or their habitats.

Notification #4

Compliance with Public Laws and Federal Regulations

Operators are required to comply with all public laws and Federal regulations that apply to National Forest System lands and the Wayne National Forest's 2006 Land and Resource Management Plan.

Notification #5

Steep Slopes and/or Unstable Soils

The area of this lease contains a considerable amount of land with steep slopes and/or unstable soils. Accordingly, the opportunity to locate access roads, drilling sites, pipelines, storage tanks and other improvements may be extremely limited.

Management Areas Requiring Special Stipulations

Stipulation #1

No Surface Occupancy – Future Old Forest

No surface occupancy allowed on the entire lease or on designated areas of the lease (see lease map) for the protection of the Future Old Forest resources.

On National Forest System land in Future Old Forest Management Areas, the Forest Service will issue leases for Federal oil and gas only with a No Surface Occupancy (NSO) stipulation. In the case of Federal leases issued pursuant to the Comprehensive National Energy Policy Act of 1992, the Forest Service will recommend to the Bureau of Land Management that operations be allowed to continue provided that all activities comply with Forest guidance. When the existing well (or wells) is depleted, all facilities must be removed and the site rehabilitated to Forest Service standards. No new wells will be allowed, nor will existing wells be allowed to be drilled to deeper formations. The NSO stipulation does not apply to reserved or outstanding mineral rights.

Stipulation #2

No Surface Occupancy – Research Natural Areas

No surface occupancy within designated areas of the lease (see lease map) for the protection of natural processes or research, historical, or educational values.

On National Forest System land in Research Natural Area Management Areas, the Forest Service will issue leases for Federal oil and gas only with a No Surface Occupancy (NSO) stipulation. In the case of Federal leases issued pursuant to the Comprehensive National Energy Policy Act of 1992, the Forest Service will recommend to the Bureau of Land Management that operations be allowed to continue provided that all activities comply with Forest guidance. When the existing well (or wells) is depleted, all facilities must be removed and the site rehabilitated to Forest Service standards. No new wells will be allowed, nor will existing wells be allowed to be drilled to deeper formations. The NSO stipulation does not apply to reserved or outstanding mineral rights.

Stipulation #3

No Surface Occupancy – Special Areas

No surface occupancy within designated areas of the lease (see lease map) to protect natural processes or research, historical or educational values.

On National Forest System land in Special Interest Management Areas, the Forest Service will issue Federal oil and gas leases only with a No Surface Occupancy (NSO) stipulation. In the case of Federal leases issued pursuant to the Comprehensive National Energy Policy Act of 1992, the Forest Service will recommend to Bureau of Land Management that operations be allowed to continue provided that all activities comply with Forest guidance. When the existing well (or wells) is depleted, all facilities must be removed and the site rehabilitated to Forest Service standards. No new wells will be allowed, nor will existing wells be allowed to be drilled to deeper formations. The NSO stipulation does not apply to reserved or outstanding mineral rights.

Stipulation #4

No Surface Occupancy – Candidate Areas

No surface occupancy within designated areas of the lease (see lease map) for the protection of natural processes or research, historical or educational values.

On National Forest System lands in Candidate Research Natural Management Areas, the Forest Service will only issue Federal oil and gas leases that have a No Surface Occupancy (NSO) stipulation. In the case of Federal leases issued pursuant to the Comprehensive National Energy Policy Act of 1992, the Forest Service will recommend to Bureau of Land Management that operations be allowed to continue provided that all activities comply with Forest guidance. When the existing well (or wells) is depleted, all facilities must be removed and the site rehabilitated to Forest Service standards. No new wells will be allowed, nor will existing wells be allowed to be drilled to deeper formations. The NSO stipulation does not apply to reserved or outstanding mineral rights.

Stipulation #5

No Surface Occupancy - Administrative Sites, and Developed Recreation Areas, Trails and Associated Trailheads

No surface occupancy within designated areas of the lease (see lease map) to protect special management units such as developed recreation areas, trails and associated trailheads, water supply facilities, administrative site, etc.

On National Forest System land within administrative sites, developed recreation areas, trails and associated trailheads, the Forest Service will issue leases for Federal oil and gas only with a No Surface Occupancy (NSO) stipulation. The NSO designation will include a buffer zone, which will be determined in accordance with the Implementation Guide for Scenery Management. In the case of Federal leases issued pursuant to the Comprehensive National Energy Policy Act of 1992, the Forest Service will recommend to the Bureau of Land Management that operations be allowed to continue provided that all activities comply with Forest guidance. When the existing well (or wells) is depleted, all facilities must be removed and the site rehabilitated to Forest Service standards. No new wells will be allowed, nor will existing wells be allowed to be drilled to deeper formations. The NSO stipulation does not apply to reserved or outstanding mineral rights.

Stipulation #6

No Surface Occupancy – Timbre Ridge Lake

No surface occupancy within designated areas of the lease (see lease map) for the protection of the Timbre Ridge Lake Management Area.

On National Forest System land in the Timbre Ridge Lake Management Area, the Forest Service will issue Federal oil and gas leases only with a No Surface Occupancy (NSO) stipulation. In the case of Federal leases issued pursuant to the Comprehensive National Energy Policy Act of 1992, the Forest Service will recommend to Bureau of Land Management that operations be allowed to continue provided that all activities comply with Forest guidance. When the existing well (or wells) is depleted, all facilities must be removed and the site rehabilitated to Forest Service standards. No new wells will be allowed, nor will existing wells be allowed to be drilled to deeper formations. The NSO stipulation does not apply to reserved or outstanding mineral rights.

Resources Requiring Special Stipulations

Stipulation #7

No Surface Occupancy – Cultural Resource Areas of Known Significance

No surface occupancy is allowed within archaeological or historical sites of known significance (see lease map). At the time of any new proposed lease developments, a Forest Service archeologist shall determine the need for any setbacks or restrictions for the protection of objects of historic or scientific interest.

Stipulation #8

No Surface Occupancy – Slopes in Excess of 55 Percent

No surface occupancy is allowed on slopes in excess of 55 percent (see lease map) to protect soil and water from erosion and mass failure hazards because of steep slopes.

Stipulation #9

No Surface Occupancy – Areas of Mass Soil Instability

No surface occupancy is allowed for the exploration and development of energy minerals on areas with mass soil instability, as defined by the USDA County Soil Surveys (see lease map).

Stipulation #10

No Surface Occupancy – Hibernacula

No surface occupancy within ¼ mile of all known Indiana bat hibernacula.

Stipulation #11

Controlled Surface Use – Areas of Land with a Scenic Integrity Objective of 'High' or 'Moderate'

At the time of any new proposed lease developments, the responsible line officer shall determine the need for any visual quality mitigation. Some examples of mitigation may include special design and reclamation measures, transplanting trees and shrubs, fertilization, mulching, special erosion control structures, irrigation, site recontouring to match the original land contour, low profile equipment and painting to minimize contrast. Surface occupancy may also be limited or denied in sensitive areas, such as unique geologic features and rock formations, visually prominent areas such as designated trails and developed recreation sites.

Stipulation #12

Controlled Surface Use – Known Locations of Federally Listed Species

No cutting of snags (trees with less than 10% live canopy), shagbark or shellbark hickories, or trees that are hollow and/or have major splits or broken tops, except during the bat hibernation season (September 15 to April 15). If such trees are a safety hazard, they may be cut anytime they pose an imminent threat to human safety, but if cut in the nonhibernation season the Forest Service biologist must be notified in advance. This stipulation applies only to trees over six inches in diameter.

Prior to any surface disturbing activities a Forest Service biologist will conduct an assessment for potential American burying beetle habitat and occurrence. Occupancy restrictions will be determined at the time of the evaluation.

Stipulation #13

Controlled Surface Use – Known Locations of Regional Forester Sensitive Species.

Controlled surface use may include setbacks or restrictions from portions of the lease to ensure protection of habitat for regional sensitive species. At the time of any new proposed lease developments, the responsible line officer shall determine the need for any setbacks or restrictions, or the need for timing-related stipulation in accordance with the aquatic and terrestrial wildlife and botanical resources standards and guidelines.

Protect all supercanopy trees or other identified congregation roost trees for bald eagles along major river corridors and lakes. Protect known nests and roosts as described in the Bald Eagle Recovery Plan, or as directed by the US Fish and Wildlife Service. [1]

The leaseholder and Forest Service inspector shall work together to identify locations for development and production facilities in order to protect the structural integrity of large old trees found on a portion of the tract.

Stipulation #14

Controlled Surface Use – Managed Wildlife Openings

At the time of any new proposed lease developments, the responsible line officer shall determine the extent of the surface use restrictions necessary to maintain habitat integrity for plant and animal species dependent on such habitats.

[1] Bald Eagle protection moved from Stipulation 12 to Stipulation 13 on 10/16/2008 by Administrative Correction # 3.

Stipulation #15

Controlled Surface Use – Riparian Areas

At the time of any new proposed lease developments, the responsible line officer shall determine the appropriate surface use restrictions necessary to maintain the structural and ecological integrity of riparian areas, and aquatic and riparian-dependent species viability.

Stipulation #16

Controlled Surface Use – Portions of Floodplains Outside Riparian Areas

Oil and gas activities may be allowed within that portion of a floodplain outside riparian areas. Mineral activities will be evaluated on a case-by-case basis, and appropriate mitigation measures will be applied. The leaseholder and Forest Service inspector shall work together to identify locations for roads, pipelines, well pads and production facilities.

Stipulation #17

Controlled Surface Use - Slopes Between 35 and 55 Percent

Oil and gas activities will be allowed on slopes from 35 to 55 percent on a case-by-case basis with appropriate mitigation. New road construction and maintenance shall be planned to disturb the least amount of ground. The leaseholder and Forest Service inspector shall work together to identify locations for roads, pipelines, well pads, and production facilities.

This page left blank for notes.

Appendix I

Scenery Management

Introduction

This appendix provides direction to protect and enhance the scenery resource of the Wayne National Forest. The appendix includes the following sections:

- Existing Landscape Character Description
- Landscape Character Objectives
  - Diverse Continuous Forest
  - Diverse Continuous Forest with OHVs
  - Historic Forest
  - Historic Forest with OHVs
  - Forest/Shrubland Mosaic
  - Grassland/Forest Mosaic
  - Future Old Forest
  - Future Old Forest with Minerals
  - River Corridors
  - Developed Recreation
  - Timbre Ridge Lake
  - Special Areas
  - Research Natural Areas
  - Candidate Areas
- Scenery Management Guidelines
  - General
  - Facilities
  - Permanent Openings
  - Utilities
  - Aquatic and Riparian Habitats
  - Signs
  - Roads and Trails
  - Minerals
  - Vegetation Management
  - Fuels Management
  - Recreation Areas
- Scenic Integrity Objective by Management Area
- Glossary

Existing Landscape Character Description

Setting

Southeastern Ohio is a land of visual contrasts. Areas of significant natural beauty and cultural history contrast with areas of significant environmental abuse. Abandoned mined lands, acid mine drainage seeps, roadside trash dumps, and illegal motorized vehicle use too often spoil the scenic countryside.

The Wayne National Forest lies within Ohio's oldest landscape, the unglaciated Appalachian Plateau. A network of streams and rivers winds through deep valleys surrounded by rolling, forested hills often highlighted by striking bluffs and rock shelters. Human-made lakes, remnants of past strip mining, punctuate the forested surface. Rivers and major streams wind through the Forest, often paralleled by narrow roads, eventually draining into the Ohio River.

Topography

Forested hilltops highlight the rugged, natural-appearing topography. Private farms and pastureland interlace the hilly landscape, giving a rural feel. A long series of narrow ridges and U-shaped valleys dissect the countryside. Topographic relief varies from a minimum of 500 feet to a maximum of over 1,000 feet. Slopes are typically benched or segmented by alternating sections of steep or moderate slope gradients. Local relief (the difference in elevation between the top of a ridge and the bottom of its adjacent valley) varies as little as 50 feet in some areas to as much as 500 feet in others. Slope gradients commonly range from 15 to 80 percent, but dominant slope gradients range between 25 and 55 percent.

Roads

Compared with many National Forests, the Wayne is well roaded with a transportation system maintained by local governments and the State of Ohio. Major arteries running near or through the Forest include: U.S. Highways 23, 33, 35, 50, and 52 and State Highways 7, 26, 32, and 93.

Townships and counties maintain hundreds of miles of roads within the Forest proclamation boundary. Many of the county roads are paved. In contrast, many of the township roads are single-lane, aggregate surfaced, low-standard roads.

Vegetation

Where solid blocks of National Forest System land occur, continuous, deciduous forests (primarily oak-hickory) dominate the view, especially in the Athens and Marietta Units. A large ice storm in February 2003 somewhat altered the generally closed-canopy forest aspect on the Ironton District. The storm damaged, to varying degrees, an estimated 40,000 acre swath of trees across the district (east to west). This will lead to a large influx of new vegetation in the understory in coming years.

Virtually no timber has been harvested on the WNF over the last several years due to litigation, appeals, and consultation with the U.S. Fish and Wildlife Service on appropriate conservation measures for the Indiana bat. Prior to the mid-1990s, extensive timber harvests, including clearcutting, took place on the WNF. The Forest is currently attempting to reactivate its timber sale program. The 1988 Forest Plan as amended permitted only partial harvesting methods (thinning and selection).

Minor infestations of the gypsy moth have caused some small openings in the Forest canopy. The gypsy moth infestation is expected to spread gradually over the Forest from northeast to southwest in the coming decade, and extensive, periodic defoliations and tree mortality will likely increase. Agricultural operations, timber harvesting, and residential developments on private or State-owned lands account for most large openings currently within the proclamation.

Native stands of Virginia pine and pitch pine are scattered in small stands throughout the Forest. Small planted stands of shortleaf pine and white pine also occur. These conifers add variety and interest to the scenery.

Scenery

Autumn is a beautiful time to enjoy the Wayne National Forest. With the onset of clear, sunny days and cool, crisp nights, the hardwoods begin to display a spectacular array of colors. This showy season usually peaks around the second week in October.

Cultural features such as historic barns, log structures, iron furnaces, covered bridges, and mineral developments are sprinkled across the landscape which has evolved over time.

Mineral developments, although part of the character of the area, dominate the landscape in some areas and have created unsightly mounds of coal mine wastes, spoil banks, and streams stained yellow-orange by acid runoff. Batteries of storage tanks, wells, pumps, and bright orange transmission lines give evidence of past and ongoing oil and gas development across the landscape.

National Forest System (NFS) lands, however, are moderately free of human disturbance, making current conditions visually pleasing. On about 50 percent of the Forest, management activities are little noticed or do not draw the attention of WNF visitors. The remaining 50 percent of the Forest has been modified by management activities to varying degrees. The effects of timber harvests, road and trail construction, utility lines, mineral developments, and developed recreation areas dominate the landscape.

The rugged, hilly nature of the landscape favors most recreation activities on the Forest. The WNF has become a traditional hunting area for many residents of Ohio and neighboring states. Turkey, grouse, deer, and squirrels are favorite species.

The hilly terrain and proximity to population centers also contributes to the area's popularity as a motorcycle riding area. Riders from across the country come to southeast Ohio to enjoy the area's scenic beauty. In the Ironton and Athens regions, motorcycle and OHV riding is an expanding element in a culture that values freedom of travel. This type of recreation is not as popular in the Marietta area, however.

Several population centers exist in WNF counties. In the Ironton district, a string of nine communities stretches from Portsmouth on the west to Gallipolis on the east, significantly influencing use of NFS land. In addition, many people from Ashland, Ky., Parkersburg and Huntington, W.Va., use the Forest. The Athens District contains the cities of Athens and Marietta. The nearest metropolitan city, Columbus, the capital of Ohio, lies approximately 70 miles northwest of the WNF headquarters.

Landscape Character Objectives

A landscape character objective describes the overall desired scenic character of an area. It also portrays the social and cultural landscape within each management area.

Desired Forest Landscape

The desired landscape characteristic for the Wayne National Forest is generally "natural appearing." This term denotes a landscape altered by past or present human activities that retains a natural appearance. The placement of forests, farm lands, roads, structures, etc., harmonizes with the environment.

The mostly homogenous topography of the three WNF administrative units (Athens, Marietta, and Ironton) consists of rolling, forested hills separated by ravines, coves, streams/rivers, and roads. The small to medium sized farms that dot the hilly landscape are concentrated near the fertile bottomlands.

The forest cover contains a variety of vegetation native to southeast Ohio. Soil type, landform, aspect, and slope position usually determine an area's vegetation. Oak-hickory dominates the forest cover of mid-slopes and ridgetops. Maple-beech-poplar forest generally covers the lower slopes and bottomlands. The WNF's Ecological Classification Handbook (1997) lists specific types of vegetation commonly found on each of the three administrative units.

The WNF also contains numerous indications of past mining activities. Many mining pits and catch basins have been converted to small fishing ponds. Mineral excavation areas have been rehabilitated to permanent wildlife openings or grasslands.

The Forest will continue to offer a wide variety of recreation opportunities such as hiking, horseback riding, mountain biking, OHV riding, hunting, fishing, camping, picnicking, and wildlife viewing. Cultural features such as historic barns, log structures, iron furnaces, and covered bridges will also play an important role in attracting visitors from across the country to southeast Ohio.

The Recreation Opportunity Spectrum (ROS) is also closely linked to scenery in terms of a visitor's expectation and experience. For example, a visitor looking for a primitive recreation experience will look for a natural setting with high scenic integrity (i.e., a seemingly undisturbed/unaltered landscape, rustic structures, etc.). Three ROS classes have been identified on the WNF: Semi-primitive Non-motorized, Roaded Natural, and Rural. Due to the extensive network of roads and/or motorized trails on the Forest, the majority of management areas on the WNF were assigned the ROS classification Roaded Natural. The Future Old Forest and Timbre Ridge Lake Management Areas were assigned the ROS class Semi-primitive Non-motorized, while the Develop Recreation Management Area was given the ROS class Rural. Table I - 1 provides a summary of the desired setting characteristics for the respective ROS classes.

Table I - 1: Summary of Desired Recreation Opportunity Spectrum Characteristics

ROS	Mgt. Areas	Setting	Setting Description
Semi-Primitive Non-Motorized	FOF TRL	Physical	**Theme:** Predominately natural/natural appearing; rustic improvements protect resources. **Size*:** 2,500 + acres **Infrastructure:** **Access -** Non-motorized trails are present. Closed and temporary Roads may be present but not dominant on the landscape. **Fishing sites** – Rivers, lakes and reservoirs; **Camp/Picnic sites** – Not developed, leave no trace **Sanitation** – No facilities; leave no trace **Water supply** – Undeveloped natural **Signing** – Rustic, constructed of natural materials **Interpretation** - Through self discovery, at trailheads **Water crossing** – Rustic structures or bridges made of natural materials **Vegetation:** Predominately natural, treatment areas exist to enhance forest health but are few and widely dispersed.
		Managerial	Minimum or subtle signing and regulations, some encounters with rangers. Motorized travel prohibited
		Social	High probability of solitude, closeness to nature, self-reliance high to moderate challenge and risk; some evidence of others
Roaded Natural	RC DCF DCFO FSM FOFM GFM HF HFO RNA SA CA	Physical	**Theme:** Natural Appearing with nodes and corridors of development such as campgrounds, picnic areas, and trailheads Size: **n/a** **Infrastructure**:** **Access** – Classified Road System for highway vehicle use **Fishing sites** – Rivers, lakes, reservoirs with some facilities **Camp/picnic sites** – Identified dispersed and developed sites **Sanitation** – Developed outhouses that blend with setting **Water supply** – Often developed **Signing** – Rustic with natural materials to more refined using a variety of materials such as fiberglass, metal, etc. **Interpretation** – Simple roadside signs, some interpretive displays **Water crossing** – Bridges constructed of natural materials. **Vegetation:** Changes (treatments) to the natural vegetation patterns are evident but in harmony with natural setting.
		Managerial	Opportunity to be with other users in developed sites; some obvious signs (information and regulation) and low to moderate likelihood of meeting Forest Service rangers.
		Social	Moderate evidence of human sights and sounds; moderate concentration of users at campsites; little challenge or risk.
Rural	DR	Physical	**Theme:** Altered landscapes with natural appearing backdrop. Farms and the most developed recreation sites are the major components of this ROS class. **Size: n/a** **Infrastructure:** **Access** – Travel routes highly developed, classified roads. Trails are constructed for ease of movement. Majority of routes are concrete, paved or graveled. **Camp/Picnic sites** – Developed and designed for user comfort, variety of construction materials used that blend with setting. May have hookup amenities such as hot water, electricity, and sewage disposal. **Sanitation** – Developed and designed for user comfort **Water supply** – Developed and designed for user comfort **Signing** – Natural and synthetic materials are appropriate **Interpretation** – Roadside exhibits, interpretive programs, etc; **Water crossing** – Bridges constructed of various materials, in harmony with landscape **Vegetation:** Treatments blend with landscape.

ROS	Mgt. Areas	Setting	Setting Description
		Managerial	Obvious signing (regulation and information), education and law enforcement staff available. Motorized and mechanized travel common and often separated.
		Social	High interaction among users is common. Little challenge or risk associated with being outdoors.

As in the past, natural disturbances such as ice storms, high winds, fire, insect infestation, etc., as well as resource management activities will continue to change and influence the Forest's landscape character. Consistently implementing the Forest's scenery management guidelines, however should mitigate adverse effects to scenery, thus maintaining and/or enhancing the Forest's "natural appearing" landscape.

Desired Forest Landscape by Management Area

Diverse Continuous Forest

The goal of this management area is to provide managed, mature forest habitat conditions with a continuous forest canopy. Uneven-aged management techniques, with some even-aged management, should maintain forest structure and composition. The mosaic of hardwood and conifer forest is interspersed with small water bodies and open lands. The dominant forest type is oak-hickory. All age classes of trees are found is this management area, but mature trees are prevalent. Stands of irregular size and shape blend together, interlaced by many small openings of brushy or herbaceous cover. The result is a "natural appearing" look.

Roads within and on the perimeter of this management area provide access to resource management, mineral development, and recreational activities. Some temporary roads may also be needed for resource management.

Resource management practices, such as vegetation management, are evident, but in harmony with the natural-appearing environment.

Moderate amounts of non-motorized recreation opportunities are provided. Hiking, horse, and mountain bike trails are provided. Dispersed recreational activities such as hunting, fishing, viewing scenery and wildlife, and the gathering of forest products are examples of recreation activities that may occur in these areas.

Structures and utility corridors, as well as mineral exploration and extraction, are usually evident only when viewed directly from on-site or at a distance in broken terrain.

Diverse Continuous Forest with OHVs

Same as the Diverse Continuous Forest Management Area except OHV use on designated trails is permitted.

Historic Forest

Restoring the historic oak-hickory component on the WNF, with a lower mixture of related central hardwoods and scattered pine, is the goal of this management area. This restoration will involve some timber harvest, intensive use of prescribed fire, and hand application of herbicides to achieve a balance of species. Continuous forest canopy conditions are found throughout the area.

Structures and utility corridors, as well as mineral exploration and extraction, may be observed with this management area. Roads within and on the perimeter of this management area provide access to resource management, mineral development, and recreational activities.

Moderate amounts of non-motorized recreation opportunities are provided. These include viewing scenery, hunting, fishing, trapping, and hiking. In some areas, trails may provide access for non-motorized activities, such as hiking, horseback riding, or mountain biking.

Historic Forest with OHVs

Same as the Historic Forest Management Area except OHV use is permitted on designated trails.

Forest/Shrubland Mosaic

The goal of this management area is a mosaic of early to late successional habitat conditions. Even-aged management techniques, with some minor amounts of uneven-aged management, will be used to produce desired habitat conditions. This area is a mosaic of hardwood and conifer forests marked by small water bodies and open lands. Oak-hickory is the dominant forest type.

Roads within and on the perimeter of this management area provide access for a variety of recreational activities, transport of forest products, and provide access for resource management.

Trails for hiking and horseback riding may be provided. Hunting, hiking, horseback riding, fishing, viewing scenery and wildlife, and the gathering of forest products are among the recreational activities that may occur.

Structures and utility corridors, as well as mineral exploration and development, may be evident.

Grassland and Forest Mosaic

The goal of this area is a mosaic of large grasslands (generally 30 to 250 acres or larger but includes existing grasslands greater than 5 acres) within a buffer of varying successional forest stages. Brushy forest edge and mature forestland buffer this area providing unique habitat not common on most of the WNF. Even-aged management of the forested buffer should create habitats of early, mid, and late successional forest ranging from 5 to 30 acres.

Utility corridors are permitted. Mineral activities (primarily oil and gas exploration and extraction) may occur. Roads within and on the perimeter of this management area are used largely to provide access for resource management. Roads also provide access for recreational activities such as hunting and gathering forest products.

Grasslands may be found where a natural-appearing environment exists, despite past human activities. These areas may be of sufficient size to allow for management of grassland species.

Future Old Forest

The goal of this area is to refrain from intervening in the natural succession of tree growth. Extensive stands of old central hardwoods dominate the landscape. Shade tolerant tree species, such as sugar maple and American beech, dominate these stands. Large, mature trees visually dominate stands of mixed tree sizes.

In some areas, designated trails provide the only access for hiking, viewing wildlife, fishing, and other non-motorized forms of recreation. There are few roads, and most Forest Service roads are closed to private motor vehicles.

Considerable isolation from the sights and sounds of people is highly probable in this area.

Few man-made structures and utility corridors are evident. No surface occupancy of National Forest System land is allowed for the exploration and development of Federally owned minerals, except on existing leases.

Future Old Forest with Mineral Activity

Similar to Future Old Forest except there is evidence of mineral (predominantly oil and gas surface occupancy is allowed) activity and the probability of isolation from sights and sounds of people is low in this area. Facilities, structures, utility corridors, and mineral development are present and noticeable.

River Corridors

These are major streams that run through or along the Forest. The goal is to manage this area for scenic quality, provide large-stream riparian habitat for species and communities dependant on such conditions, and improve water quality. Vegetation is characterized by a continuous tree canopy and a variety of tree sizes. Habitat management emphasizes large hardwood trees and their associated wildlife.

Extensive evidence of human activities is apparent, particularly on privately owned land within this management area. On National Forest System land, most human activities are in harmony with the natural-appearing environment. Viewing scenery, hunting, trapping, canoeing, hiking, picnicking, and camping are key recreation activities. Roads within and on the perimeter of this management provide access to recreation opportunities, forest management, and mineral activities.

Facilities, structures, and utility corridors, as well as mineral exploration and development, are usually evident only when on-site. But they are fairly common.

Developed Recreation

These areas provide opportunities for recreation along lakes and rivers for camping, swimming, picnicking, group activities, and other intensive recreation opportunities in highly developed sites. They include the Lake Vesuvius Recreation Complex, the Leith Run-Capitol Christmas Tree Complex, Burr Oak Cove Campground, and Lamping Homestead Campground.

Developed areas contain high density, self-contained, destination-type recreation developments within a forest environment. Vegetation management ensures the long-term viability, safety, and attractiveness of the area.

Highly developed recreation sites (i.e., campgrounds, day-use areas, beaches, etc.) provide intensive recreation opportunities. More undeveloped areas provide opportunities for boating, fishing, hunting and hiking.

Recreation facilities and structures may dominate the landscape in developed areas. Building materials and design, along with placement of facilities and structures, harmonize with the environment.

Roads and trails provide access within the more developed areas. Hiking trails allow access to lakesides and riverbanks. Roads and trails are designed to accommodate the high density recreation use and related activities associated with this area.

Growth of high-quality, mature hardwoods is emphasized. Vegetation management is limited to increasing visitor safety by minimizing tree hazards and to improving forest health.

Utility corridors and other special uses may be present, as long as they are compatible with the character of the area. Mineral exploration opportunities come with major restrictions. No surface occupancy is allowed for the exploration and development of Federally owned minerals except on existing leases.

Timbre Ridge Lake

The goal of this area is to:

- Protect and maintain water quality in Timbre Ridge Lake and its watershed
- Protect and maintain the semi-primitive, remote-like setting
- Promote a natural appearing landscape.
- Provide semi-developed and/or dispersed recreation opportunities uniquely tied to the lake.

Non-motorized forms of recreation will be emphasized. Developed areas contain low-density, dispersed recreation developments within a forest environment. Vegetation management will be minimal.

Roads and trails provide access within the more developed recreation areas. Hiking trails allow access to the lakeside. Roads and trails will be designed to accommodate low-density recreation use and related activities.

Recreation facilities and structures may dominate the landscape in some developed areas. Building materials and design, as well as placement of facilities and structures, harmonize with the environment. Utility corridors and other special uses may be present, as long as they are compatible with the character of the area. No surface occupancy is allowed for the exploration and development of Federally owned minerals except on existing leases.

Special Areas

These areas have been analyzed and designated as Special Areas for various reasons. Found throughout the forest, these areas may contain significant cultural remains or unique terrain, climate, soil, water, flora or fauna. Such significance is recognized by State or Federal authority and will be so designated.

These areas include a wide range of forest conditions. Vegetation will vary depending upon local characteristics. These areas are not actively managed for timber production.

A system of hiking trails may provide access for administrative purposes and recreational activities. The design and structure of any facilities will be compatible with their natural surroundings. Evidence of human activities will vary but generally will be controlled to reduce adverse effects.

The size of these areas will vary but boundaries will be located to protect only significant resource areas.

No surface occupancy is allowed for the exploration and development of Federally owned minerals except on existing leases.

Research Natural Areas

Designated as Research Natural Areas, these areas may be found anywhere on the Forest where terrain, climate, soil, water, and vegetation possess unique characteristics for scientific study. Sizes of these areas will vary, depending upon their purpose. Vegetation size and type may also vary, depending on the location selected. This area is not actively managed for timber production.

Some forms of non-motorized recreation may occur, such as hiking and viewing wildlife. Roads provide access to study areas. The design and structure of any facilities will be compatible with the natural surroundings.

No surface occupancy is allowed for the exploration and development of Federally owned minerals except on existing leases.

Candidate Areas

This management area emphasizes the preservation of potentially unique natural areas. These areas possess potentially significant natural or historic characteristics.. More analysis is needed before a decision can be made to designate, however. Management is directed at protecting these lands until the areas can be studied for designation as research natural areas, special areas, or other specific management.

Their primary benefit is the scientific value that may be derived from protected examples of unique ecosystems. Other benefits may include hiking, hunting, and nature study. No surface occupancy is allowed for the exploration or development of Federally owned minerals except on existing leases.

Scenery Management Guidelines

Guidelines for scenery management were developed for the primary purpose of restoring, maintaining, and enhancing the Forest's scenic values and to help achieve its scenic integrity objectives (SIO).

SIO by Management Areas and Scenic Classes

Table I - 2: SIO by Management Areas and Scenic Classess

Management Areas	Scenic Class				
	1	2	3	4	5
Developed Recreation	H	H	H	H	H
River Corridors	H	H	H	M	M
Timbre Ridge Lake	H	H	H	H	H
Diverse Continuous Forest	H	M	M	M	L
Diverse Continuous Forest with OHV	H	M	M	M	L
Historic Forest	H	M	M	M	L
Historic Forest with OHV	H	M	M	M	L
Forest-Shrubland Mosaic	H	M	M	M	L
Grassland-Forest Mosaic	H	H	M	M	L
Research Natural Areas	H	H	M	M	M
Special Areas	H	H	M	M	M
Candidate Areas	H	H	M	M	M
Future Old Forest	H	H	M	M	L
Future Old Forest with Mineral Activity	H	H	M	M	L

H – High Scenic Integrity Objective

M – Moderate Scenic Integrity Objective

L – Low Scenic Integrity Objective

See Forest Plan Appendix A – Glossary for definitions of Scenic Class and High, Moderate, and Low Scenic Integrity Objectives.

Table I - 3: WNF Concern Level 1 and 2 and High SIO Sites

WNF Unit	Concern Level 1 or High SIO Sites	Concern Level 2 Sites
Athens	North Country Trail/Trailheads	All OHV Trails/Trailheads
	Wildcat Hollow Hiking Trail/Trailhead	Utah Ridge Pond/Picnic Area
	Stone Church Horse Trail/Trailheads	Sand Run Picnic Area
	All trails within the Future Old Forest Management Areas	Payne Cemetery
	All Trails within the Developed Recreation Management Areas	State Routes: 13, 56, 155, 312, 328, 668, 691
	Burr Oak Cove Campground	State Route 93 (North of Shawnee and West of NCT)
	State Routes: 78, 93, 216, 278, 595, and 685	
	U.S. Highway 33	
Marietta	North Country Trail/Trailheads	State Routes: 78, 145, 255, 536, and 565
	All hiking trails/trailheads	State Route: 260 (North of St. Rt. 565)
	All horse trails/trailheads	
	All trails within the Future Old Forest Management Areas	
	Developed Recreation Management Areas	
	All developed recreation sites	
	Little Muskingum River	
	State Routes: 7, 26, and 800	
	State Route: 260 (From Ohio River to junction of St. Rt. 565)	
Ironton	Developed Recreation Management Area	Dean State Connector Horse Trail
	Timbre Ridge Lake Management Area	Symmes Creek
	All Trails within the Future Old Forest Management Areas	All horse trails east of Township Road 198
	Morgan Sisters and Symmes Creek Hiking Trails	State Routes: 93, 140, 141, 233, 373, 522, 650, 775, and 790
	State Route 522 (Between St. Rt. 93 and Darby Creek)	All OHV Trails/Trailheads
	State Route 775 (½ mile north and ½ south of main entrance to Timbre Ridge Lake)	
	FDR 605 (Timbre Ridge Lake Road)	

See Forest Plan Appendix A – Glossary for definitions of Concern Level.

Appendix J

Scientific Names

Scientific Names for Common Names Used

Common Name	Scientific Name
American basswood	*Tilia americana*
American beech	*Fagus grandifolia*
American bison	*Bison bison*
American burying beetle	*Nicrophorus americanus*
American chestnut	*Castanea dentate*
American elm	*Ulmus americana*
American ginseng	*Panax quinquefolius*
American goldfinch	*Carduelis tristis*
Amur honeysuckle	*Lonicera maackii*
Asian bittersweet	*Celastrus orbiculatus*
Asian longhorned beetle	*Anoplophora glabripennis*
Autumn olive	*Elaeagnus umbellata*
Bald eagle	*Haliaeetus leucocephalus*
Banded darter	*Etheostoma zonale*
Banded sculpin	*Cottus carolinae*
Basil bee balm	*Monarda clinopodium*
Basswood	*Tilia americana*
Bay laurel	*Umbellularia californica*
Beaver	*Castor canadensis*
Belted kingfisher	*Ceryle alcyon*
Bicknell's Panic Grass	*Panicum bicknellii*
Bigleaf maple	*Acer macrophyllum*
Bitternut hickory	*Carya cordiformis*
Black bear	*Ursus americanus*
Black cherry	*Prunus serotina*
Black oak	*Quercus velutina*
Black snakeroot	*Sanicula marilandica*
Blackberry	*Rubus spp.*
Blanchard's cricket frog	*Acris crepitans blanchardi*
Bloodroot	*Sanguinaria canadensis*
Blotchside logperch	*Percina burtoni*
Blue grosbeak	*Passerina caerulea*
Blue phlox	*Phlox divaricata*
Blue Scorpionweed	*Phacelia ranunculacea*
Blueberry	*Vaccinium spp.*
Bluegill	*Lepomis macrochirus*
Bluejay	*Cyanocitta cristata*
Blue-winged warbler	*Vermivora pinus*
Bobcat	*Lynx rufus*

Common Name	Scientific Name
Brown thrasher	*Toxostoma rufum*
Bulblet fern	*Cystopteris bulbifera*
Butterfly pea	*Clitoria mariana*
Butternut	*Juglans cinerea*
California buckeye	*Aesculus californica*
Canada cinquefoil	*Potentilla canadensis*
Canada thistle	*Cirsium arvense*
Canadian clearweed	*Pilea pumila*
Canadian wild ginger	*Asarum canadense*
Carolina thistle	*Cirsium carolinianum*
Cerulean warbler	*Dendroica cerulea*
Channel catfish	*Ictalurus punctatus*
Chestnut oak	*Quercus prinus*
Chinese privet	*Ligustrum sinense*
Chokeberry	*Phoyinia spp.*
Cinnamon vine	*Dioscorea batatas*
Clearweed	*Pilea pumila*
Common buckthorn	*Rhamnus cathartica*
Common privet	*Ligustrum vulgare*
Common reed grass	*Phragmites australis*
Common yellowthroat	*Geothlypsis trichas*
Cottonwood	*Populus deltoides*
Creamy violet	*Viola striata*
Crown-vetch	*Coronilla varia*
Dodder	*Cuscuta species*
Dwarf iris	*Iris verna*
Eastern cottonwood	*Populus deltoides*
Eastern hellbender	*Cryptobranchus alleganiensis*
Eastern hemlock	*Tsuga canadensis*
Eastern meadowlark	*Sturnella magna*
Eastern sand darter	*Etheostoma pellucidum*
Eastern towhee	*Pipilo erythrophthalmus*
Emerald ash borer	*Agrilus planipennis*
Eulalia	*Miscanthus sinensis*
Eurasian water-milfoil	*Myriophyllum spicatum*
Evening bat	*Nycticeius humeralis*
Fanshell	*Cyprogenia stegaria*
Featherbells	*Stenanthium gramineum*
Featherbells	*Stenanthium gramineum*
Field penny-cress	*Thlaspi arvense*
Field sparrow	*Spizella pusilla*
Flathead catfish	*Pylodictis olivaris*
Florist's fern	*Dryopteris spinulosa sensulato*
Flowering dogwood	*Cornus florida*
Four-toed salamander	*Hemidactylium scutatum*
Fowl mannagrass	*Glyceria striata*
Fragile fern	*Cystopteris fragilis sensu lato*
Freshwater drum	*Aplodinotus grunniens*

Common Name	Scientific Name
Garlic mustard	*Alliaria petiolata*
Garter snake	*Thamnophis sirtalis sirtalis*
Giant knotweed	*Polygonum sachalinense*
Gill-over-the-ground	*Glechoma hederacea*
Glossy buckthorn	*Rhamnus frangula*
Goldenrods	*Solidago spp*
Goldenseal	*Hydrastis canadensis*
Golden-winged warbler	*Vermivora chrysoptera*
Grasshopper sparrow	*Ammodramus savannarum*
Great blue heron	*Ardea herodias*
Green ash	*Fraxinus pennsylvanica*
Green salamander	*Aneides aeneus*
Green sunfish	*Lepomis cyanellus*
Green-faced clubtail	*Gomphus quadricolor*
Greenside darter	*Etheostoma blennioides*
Grizzled Skipper	*Pyrgus wyandot*
Ground hog	*Marmota monax*
Gypsy moth	*Lymantria dispar*
Heart-leaved groundsel	*Senecio aureus*
Henslow's sparrow	*Ammodramus henslowii*
Honewort	*Cryptotaenia canadensis*
Hooded warbler	*Wilsonia citrina*
Horned lark	*Eremophila alpestris*
Horsechestnut	*Aesculus hippocastanum*
Huckleberry	*Vaccinium ovatum*
Indian cucumber root	*Medeola virginiana*
Indian strawberry	*Duchesnea indica*
Indiana bat	*Myotis sodalist*
Indigo bunting	*Passerina cyanea*
Jack-in-the-pulpit	*Arisaema triphyllum*
Japanese barberry	*Berberis thunbergii*
Japanese honeysuckle	*Lonicera japonica*
Japanese knotweed	*Polygonum cuspidatum*
Japanese stilt-grass	*Microstegium vimineum*
Japanese wisteria	*Wisteria floribunda*
Juniper sedge	*Carex juniperorum*
Kirtland's warbler	*Dendroica kirtlandii*
Kudzu	*Pueraria lobata*
Lady fern	*Athyrium felix-femina*
Large white trillium	*Trillium grandiflorum*
Large whorled pogonia	*Isotria verticillata*
Largemouth bass	*Micropterus salmoides*
Lilliput	*Simpsonaias ambigua*
Lined sedge	*Carex striatula*
Little brown bat	*Myotis lucifugus*
Little headed nutrush	*Scleria oligantha*
Little spectaclecase	*Toxolasma parvus*
Lizard's tail	*Saururus cernuus*

Common Name	Scientific Name
Logperch	*Percina caprodes*
Louisiana waterthrush	*Seiurus motacilla*
Madrone	*Arbutus menziesii*
Manzanita	*Arctostaphylos manzanita*
Marshes St. John's wort	*Triadenum tubulosum*
Mayapple	*Podophyllum peltatum*
Mile-a-minute	*Polygonum perfoliatum*
Mink	*Mustela vison*
Morrow (Fly) honeysuckle	*Lonicera morrowi*
Mottled sculpin	*Cottus bairdi*
Mountain maple	*Acer spicatum*
Mourning dove	*Zenaida macroura*
Mud salamander	*Pseudotriton montanus*
Multiflora rose	*Rosa multiflora*
Musclewood	*Carpinus caroliniana*
Muskrat	*Ondatra zibethicus*
Narrow-leaved cattail	*Typha angustifolia*
New York fern	*Thelypteris noveboracensis*
Northern beech fern	*Thelpteris phegopteris*
Northern bobwhite	*Colinus virginianus*
Northern harrier	*Circus cyaneus*
Northern monkshood	*Aconitum noveboracense*
Northern panic grass	*Dichanthelium. boreale*
Northern red oak	*Quercus rubra*
Northern watersnake	*Natrix sipedon sipedon*
Oak fern	*Gymnocarpium dryopteris*
Ohio lamprey	*Ichthyomyzon bdellium*
Olympia marble	*Euchloe olympia*
Opossum	*Didelphis virginiana*
Ovenbird	*Seiurus aurocapilla*
Pale straw sedge	*Carex albolutescens*
Partridgeberry	*Mitchella repens*
Peregrine falcon	*Falco peregrinus*
Periwinkle or myrtle	*Vinca minor*
Persimmon	*Diospyros virginiana*
Philadelphia panic grass	*Dichanthelium bicknellii*
Pigeon grape	*Vitis cinerea*
Pignut hickory	*Carya glabra*
Pileated woodpecker	*Dryocopus pileatus*
Pine warbler	*Dendroica pinus*
Pink mucket pearly mussel	*Lampsilis abrupta (=orbiculata)*
Pinxter flower	*Rhododendron nudiflorum*
Pitch pine	*Pinus rigida*
Post oak	*Quercus stellata*
Prairie warbler	*Dendroica discolor*
Princess tree	*Paulownia tomentosa*
Purple loosestrife	*Lythrum salicaria*
Rabbit	*Sylvilagus floridanus*

Common Name	Scientific Name
Raccoon	*Procyon lotor*
Rapids clubtail	*Gomphus viridifrons*
Red elder	*Sambucus pubens*
red maple	*Acer rubrum*
Red-headed woodpecker	*Melanerpes erythrocephalus*
Reed canary grass	*Phalaris arundinacea*
River otter	*Lutra canadensis*
Roanoke darter	*Percina roanoka*
Rock skullcap	*Scutellaria saxatilis*
Round hickorynut	*Obovaria subrotunda*
Royal fern	*Osmunda regalis*
Ruby-throated hummingbird	*Archilochus colubris*
Ruffed grouse	*Bonasa umbellus*
Running buffalo clover	*Trifolium stoloniferum*
Russian olive	*Elaeagnus angustifolia*
Salamander mussel	*Villosa lienosa*
Sassafras	*Sassafras albidum*
Sauger	*Stizostedion canadense*
Savannah sparrow	*Passerculus sandwichensis*
Scarlet oak	*Quercus coccinea*
Serviceberry	*Amelanchier arborea*
Shagbark hickory	*Carya ovata*
Sharp-shinned hawk	*Accipiter striatus*
Sheepnose	*Plethobasus cyphyus*
Shellbark hickory	*Carya laciniosa*
Shingle oak	*Quercus imbricaria*
Shortleaf pine	*Pinus echinata*
Silver maple	*Acer saccharinum*
Slippery elm	*Ulmus rubra*
Small Carpgrass	*Arthraxon hispidus*
Small whorled pogonia	*Isotria medeoloides*
Smallmouth bass	*Micropterus dolomieui*
Smooth beardtongue	*Penstemon laevigatus*
Smooth brome	*Bromus inermis*
Snubnose darter	*Etheostoma simoterum*
Solomon’s seal	*Polygonatum biflorum*
Song sparrow	*Melospiza melodia*
Sour gum	*Nyssa sylvatica*
Sourwood	*Oxydendrum arboreum*
Southern arrowwood	*Viburnum dentatum*
Southern blue monkshood	*Aconitum uncinatum*
Sparse-lobed grape fern	*Botrychium biternatum*
Spotted bass	*Micropterus punctulatus*
Stonecrop	*Sedum ternatum*
Striped gentian	*Gentiana villosa*
Striped maple	*Acer pensylvanica*
Sugar maple	*Acer saccharum*
sugar maple	*A. saccharum*

Common Name	Scientific Name
Sycamore	*Plantanus occidentalis*
Tall nut rush	*Scleria triglomerata*
Tangerine darter	*Percina aurantiaca*
Tatarian honeysuckle	*Lonicera tatarica*
Timber Rattlesnake	*Crotalus horridus*
Tree of heaven	*Ailanthus altissima*
Trumpet creeper	*Campsis radicans*
Umbrella magnolia	*Magnolia tripetala*
Upright carrion flower	*Smilax ecirrata*
Virginia knotweed	*Polygonum virginianum*
Virginia pine	*Pinus virginiana*
Virginia Spiraea	*Spiraea virginiana*
Wabash river cruiser	*Macromia wabashensis*
Walleye	*Stizostedion vitreum*
Warmouth	*Lepomis gulosus*
Water milfoil	*Myriophyllum heterophyllum*
Western lake chubsucker	*Erimyzon sucetta*
White ash	*Fraxinus americana*
White clover	*Trifolium repens*
White oak	*Quercus alba*
White snakeroot	*Eupatorium rugosum*
White sweet-clover	*Melilotus alba*
White-footed mouse	*Peromyscus leucopus*
White-tailed deer	*Odocoileus virginianus*
Whorled yam	*Dioscorea quaternata*
Wild ginger	*Asarum canadensis*
Wild grape	*Vitis spp.*
Wild turkey	*Meleagris gallopavo*
Wineberry	*Rubus phoenicolasius*
Winged burning bush	*Euonymus alatus*
Wingstem	*Verbesina spp*
Wintercreeper	*Euonymus fortunei*
Witch hazel	*Hamamelis virginiana*
Wood duck	*Aix sponsa*
Wood nettle	*Laportea canadensis*
Wood thrush	*Hylocichla mustelina*
Worm-eating warbler	*Helmitheros vermivorus*
Yellow birch	*Betula alleghaniensis*
Yellow buckeye	*Aesculus octandra*
Yellow crownbeard	*Verbesina occidentalis*
Yellow gentian	*Gentiana alba*
Yellow poplar	*Liriodendron tulipifera*
Yellow sweet-clover	*Melilotus officinalis*
Yellow-breasted chat	*Icteria vireus*
Yellow-fringed Orchid	*Platanthera ciliaris*
Yellowish gentian	*Gentiana alba*
Zebra mussel	*Dreissena polymorpha*