



United States  
Department of  
Agriculture

Forest Service

Eastern  
Region



# 2006-2011 Fiscal Years Summary Monitoring and Evaluation Report



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# 2006-2011 Summary Monitoring and Evaluation Report 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

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**Responsible Official**

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

**For further information contact**

Aaron Burk, Resource Information  
Manager/Forest Planner  
Wayne National Forest  
13700 Highway 33  
Nelsonville, OH 45764-9880  
740-753-0101

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## I. 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 manages over 243,000 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 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 National Forest 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

The Summary Monitoring Evaluation Report is requirement associated with the 2006 Land and Resource Management Plan (Forest Plan), which guides 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.

## Monitoring Program

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.

## 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 an annual monitoring and evaluation report.

The monitoring program must be efficient, practical, and affordable, and not duplicate data collection already underway for other purposes. 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 NFMA are given the highest priority.

The components of this monitoring strategy are:

- Monitoring methods
- Monitoring questions related to implementation, attainment and assumptions
- The annual monitoring plan of operations
- The annual monitoring evaluation report

**Table 1.1 Monitoring Strategy**

<b>Monitoring Methods</b>	<b>Monitoring Questions</b>	<b>Annual Monitoring Plan</b>	<b>Monitoring and Evaluation Report</b>
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.

## II. Annual Monitoring and Evaluation

Developed by an interdisciplinary team, the annual 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 informs 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.

### 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 National Forest System land to maintain or enhance water quality and soil productivity.

<p><b>Objective 2.1a:</b> Restore the dimension, pattern, and profile of streams where channel and floodplain morphology has been altered.</p>	<p><b>Monitoring Work Plan Question #1:</b> How many miles of stream have been treated to restore dimension, pattern and profile?</p>
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There were zero miles of stream morphology (dimension, pattern, and profile) restored in Fiscal Year (FY) 2011. However, six subsidences were closed, approximately 300 feet of open limestone channels were constructed, three steel slag beds were constructed to treat acid mine drainage, 11 blocked drainages were opened to allow flow back on the surface and not into the underground mine complexes, 19 acres of barren soils were reclaimed with native species and shrubs, and more than ten in-stream check dams were installed to minimize sediment transport.

A contract was awarded in 2010 for the Upstream Rock Run project that was completed in the fall of 2011. This project opened 33 blocked drainages, closed 4 subsidences, and constructed a 3 acre pond that is now stocked with several local fish species. Additionally, 25 acres were reclaimed and a prairie was created with native botanical species. In addition to these activities in 2011, a five year soil and water evaluation was conducted for the purpose of looking at various projects that have been implemented on the forest and to evaluate the success and/or failure of each treatment.

Watershed restoration activities have a long-term positive effect on restoring stream morphology as subsidences are closed, blocked drainages are opened, and water flows back on the surface, re-establishing the geomorphology that once existed before disturbance occurred. Most existing streams on the Forest are currently in the process of recovery, but it may take several years before the streams stabilize and begin to meander and adjust to their appropriate depth to width ratios based on their drainage area size. In most cases where a straight line rock channel is constructed to move water off the site, the geomorphology may never return to previous

conditions where mining occurred. These channels were designed to primarily move water quickly to an existing stream and stabilize the soils to minimize and/or eliminate sediment transport. Examples of straight lined channels that may never have the natural geomorphology restored as shown in the following photos are provided for comparison with natural existing channels. Examples of natural existing channels that did not have water flowing in them for many years because the water was being captured by a subsidence, but now have flowing water are shown. The geomorphology of these channels recovers quite quickly. As can be seen in the example below at Orbiston North (before & after), meanders and point bars have formed in a short amount of time and the width depth ratios are proportional to the drainage area size for that stream. Before and after photos of Upstream Rock Run, an American Recovery and Restoration Act (ARRA) project is also included to show the reclamation of what was once some of the most disturbed lands on the forest.

### Straight Line Channels

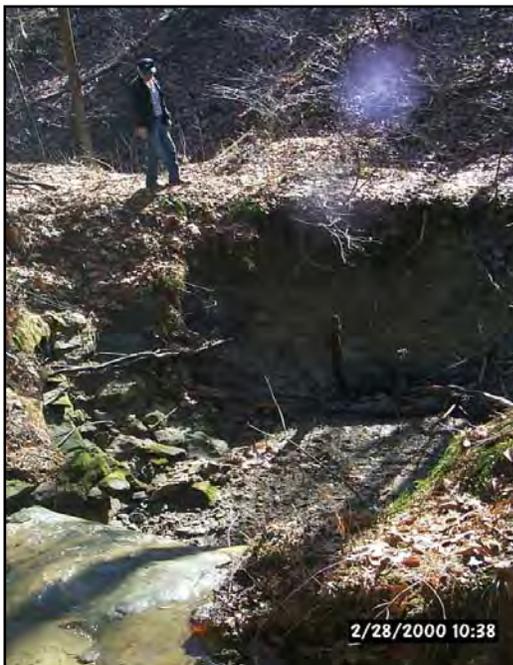


New Straitsville South Rock Lined Channel

278 Re-Route Rock Lined Channel

Before

After



Orbiston North - Subsidence Capturing Flows

Flows turned back into existing stream



**Before**  
**Upstream Rock Run Construction**



**Before**  
**Upstream Rock Run Acid Mine Drainage Seep**



**After**



**After**

<p><b>Objective 2.1b:</b> 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.</p>	<p><b>Monitoring Work Plan Question #2:</b> How many acid mine discharges have been treated?</p>
	<p><b>Monitoring Work Plan Question #3:</b> How many subsidence features have been treated?</p>
	<p><b>Monitoring Work Plan Question #4:</b> What geochemistry parameters have changed by reducing and/or treating acid mine discharges?</p>
	<p><b>Monitoring Work Plan Question #4.1:</b> How many miles of stream have free-flowing water where surface flow was restricted?</p>

Four acid mine drainage sites in the Monday Creek Watershed, and one site in the Raccoon Creek Watershed were treated by closing six subsidences, constructing approximately 300 feet of open limestone channels, construction of three steel slag beds, opening eleven blocked drainages, reclaiming 19 acres of barren soils with native species and shrubs, and installing several in-stream check dams to minimize sediment transport. To date, visual and chemical monitoring data indicates most of the systems are functioning as designed.

Implementation of restoration activities as mentioned above have resulted in approximately 4 miles of free flowing water in intermittent streams that were once blocked in the Monday Creek Watershed. Restoration efforts in the Monday Creek and Raccoon Creek watersheds have created a net decrease in acidity. Based on long-term monitoring data from partners and the Non-Point Source database at <http://www.watersheddata.com>, pH and net acidity has improved for the entire 27 mile reach of the main stem of Monday Creek. The pH in most of the main stem is 6.7 as opposed to a 3.5 pH for several decades or more based on historical mining information from Ohio Department of Natural Resources, Division of Mineral Resource Management. Additionally, conversations with local residents that have lived in the watershed their entire lives state that “they had never seen fish in the main stem of Monday Creek until now, and that the local elementary school children no longer color their streams orange in school”.

Furthermore, the 1988 Forest Plan addressed acid mine drainage as being un-restorable because the technology was not present at that time. As technology evolved, methods to treat acid mine drainage and reclaiming abandoned mine lands became management issues and were addressed in the 2006 Forest Plan.

### 2006-2011 Watershed Health Summary Report

The following information provides an overview of the work accomplished in relation to Watershed Health monitoring items since 2006.

**Table 2.1 Watershed Health Work Accomplishments**

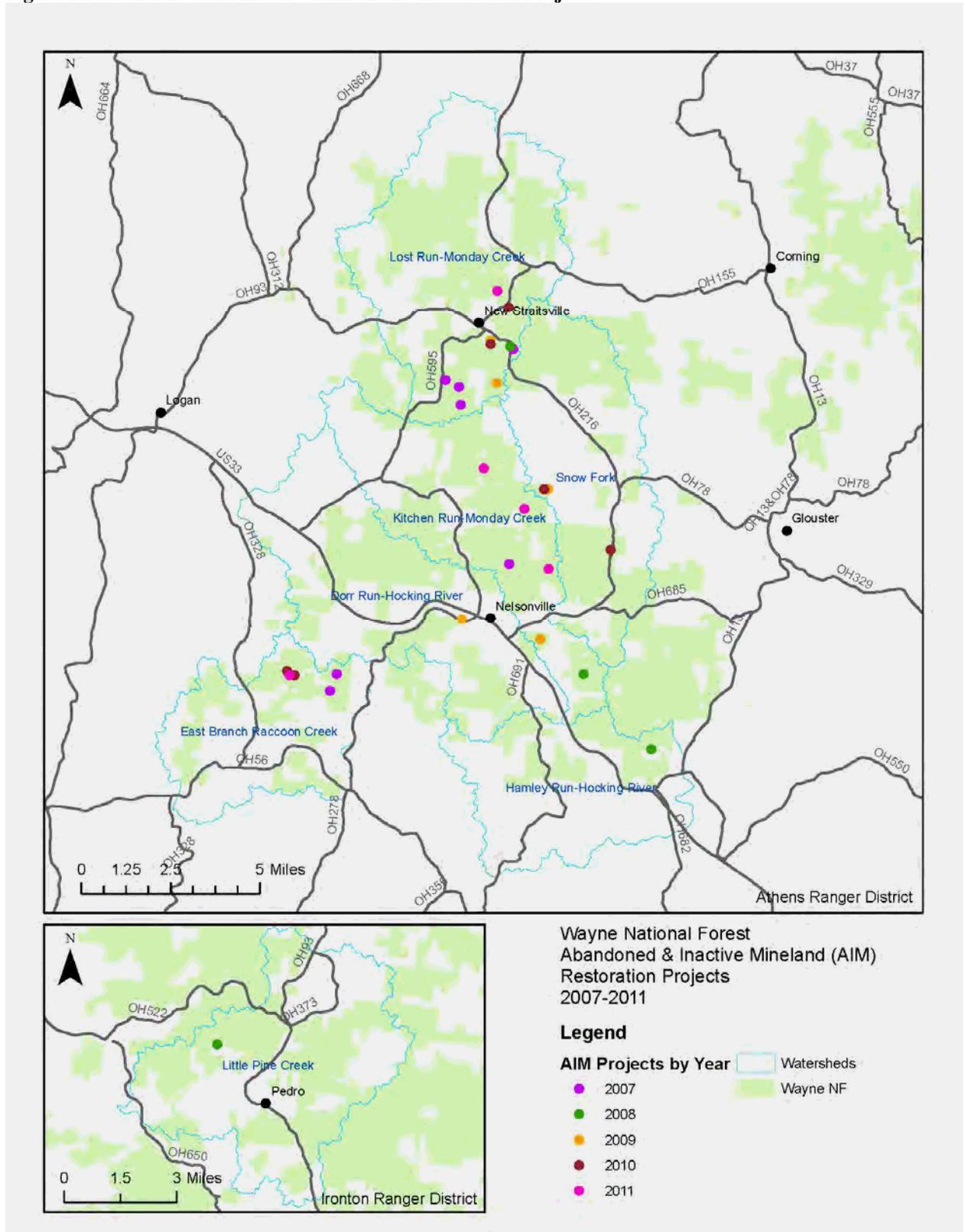
<b>Project name</b>	<b>Year constructed</b>	<b>Description of work</b>	<b>Working as designed</b>	<b>Maintenance</b>
Goose Run Portal Closures	2006	Closed 3 portals for health & safety and T&E (threatened and endangered) reasons & Installed 3 bat gates	X	
Elm Rock Portal Closures	2006	Closed with 2 Bat Gates	X	
216 Portal Closures	2007	Closed 3 subsidence & 2 portals and constructed ~ 800 feet of Open Limestone Channel (OLC)	X	
East Branch Head Cuts	2007	Stabilized headcuts in headwaters of drainage	X	X

Snake Hollow Modification	2007	Closed 3 subsidence's, installed 1 limestone leach bed, stabilized dam & constructed ~ 300 feet of OLC	X	X
Cole Dale Highwall Reclamation	2008	Reclaimed a highwall in conjunction w/a fire suppression effort on a gob pile fire	X	
Lawco Lake	2008	Constructed a 300' limestone dam and 800 feet of OLC	X	X
Valley Junk	2008	Closed 11 subsidence's, constructed 800 feet of OLC, and closed 1 portal	X	
278 Reroute	2009	Constructed 448 feet of OLC	X	
Coe Hollow	2009	Constructed 4 low head limestone dams, 3 wetland cells, 1 limestone pond, closed 2 subsidence's & 2500 feet of OLC	X	
Upstream Rock Run Coal Mine Remediation	2010	Open 33 blocked drainages, closed 4 subsidence's, constructed 3 acre pond & reclaimed 25 acres with native shrubs and trees	X	

**Definition of terms:**

- Working as designed – The work that was constructed on the site is functioning as intended.
- Maintenance – Systems at the project areas will have issues that will need to be addressed, such as flushing valves at limestone leachbeds, adding material to dosers, mowing dams, etc. For specific details please refer to the monitoring forms for that project area.

Figure 2.1 Abandoned and Inactive Mine Land Restoration Projects



**Lessons Learned From Monitoring Results:****Table 2.2 Treatment options acid mine drainage abatement.**

<b>Treatment Types</b>	<b>Advantage of various treatment options</b>	<b>Disadvantage of various treatment options</b>
Subsidence & Portal Closures	This is a permanent solution that does not require any long term operation and maintenance (O&M). Water that was once being captured is returned to the surface. In many cases there are existing channels that the flows are turned back into and positive drainage is once again restored. Additionally, millions of gallons of water that once entered the underground mine complexes now aid in the dilution of acid water in the main stems of the receiving streams.	As the pillars in the underground mine complexes continue to get older, new collapses may occur. A new collapse may occur while implementing the closure.
Open Limestone Channels (OLCs)	Open limestone channels are very efficient at getting water on the surface to a receiving stream very quickly. OLCs are also very good for stabilizing banks, thus reducing sediment transport that will create embeddedness on the stream substrate thus destroying spawning habitat for aquatic species.	Early in the restoration era, open limestone channels appeared to be the most effective method for treating acid mine drainage (raising the pH and adding alkalinity to acid waters). However, monitoring of these channels showed very little treatment was occurring because they were placed on steep slopes that did not allow for enough residence time (water in contact with the limestone). Another problem was that limestone channels placed on gentle slopes created an armoring problem by the iron precipitate covering the limestone. We also found that in many cases erodible soils in the upper reaches of the watershed fill in the void spaces of the limestone rock. This affects the overall function of the OLC.
Limestone Leach Beds (LLBs)	LLBs are very effective in producing substantial amounts of alkalinity to buffer acid waters. They are easy to construct and the footprint on the landscape is fairly small in comparison to a wetland type treatment system.	There is long-term operation and maintenance associated with LLBs. Flushing of the system is the primary function that keeps the system from plugging up.
Steel Slag Beds (SLBs)	SLBs are very effective in producing substantial amounts of alkalinity to buffer acidic waters. They are easy to construct and the footprint on the landscape is fairly small in comparison to a wetland type treatment system.	In addition to long-term O&M, SLBs needs a fresh water source very near the treatment system. In most cases this is not possible given the immense disturbance created by the previous mining activities. SLBs are also susceptible to fouling (plugging up) and there is a cost associated with replenishing the steel slag once it is used up.
Pyrolusite Systems	Pyrolusite systems are	Since pyrolusite systems are

	microbiological systems. They are very effective in treating low pH (2.2) waters. The footprint on the landscape is very small so they can be placed just about anywhere.	microbiological systems, they require injection of micro-organisms in the initial phase of construction and this is a patented process. They also require long term O&M. Acid waters with very low pHs typically have large iron concentrations. Frequent flushing of these systems is critical in being effective.
Successive Alkalinity Production Systems (SAPS)	SAPS are similar to wetland systems except they are constructed with piping and flushing mechanisms. They are very effective in treating acid waters and are more aesthetically pleasing to look at on the landscape. They are typically a series of wetland cells and no limestone rock is required. Native plants thrive at these locations and they provide open water for wildlife.	SAPS require long-term O&M. Flushing is the primary function to keep the system effective. Upfront costs are quite expensive depending on the size of the system which typically ranges from 2-5 acres in size. Given the fragmentation of the WNF, SAPS have a limited application because of the space required.
Dosers	Dosers are very proficient and effective in treating acid mine drainage. The footprint on the landscape is smaller than the pyrolusite system. Dosers are also mobile. They can be moved to different locations depending upon need.	Dosers have a very expensive upfront cost and the alkaline material needed for dosers is not cheap. They also require regular O&M and frequent break downs is not uncommon.

More detailed information related to Watershed Health on the Wayne National Forest can be found at <http://www.watersheddata.com>.

### 3 - Aquatic and Riparian Resources

#### Goal 3.1 – Sustain favorable riparian and aquatic habitat conditions

##### Stream Habitat

There are a variety of management activities that improve stream habitat, such as reforestation of streamside areas that have been farmed, restoration of wetlands, reduction of sedimentation, or improvement of road-stream crossings to ensure aquatic organism passage. The 2006 Forest Plan guides us to restore or improve 20 miles of stream during the first decade of Forest Plan implementation.

*See page # 31 for question (3.1a) #5 under the heading Wetlands, Ponds, and Waterholes*

<b>Objective 3.1b:</b> Improve habitat along streams for aquatic and riparian-dependent species.	<b>Monitoring Work Plan Question #6:</b> How many miles of stream were treated to improve or restore habitat for aquatic and riparian-dependent species?
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	<p><b>Monitoring Work Plan Question #6.1:</b> How many permanent long-term aquatic ecological unit monitoring sites were established?</p>
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The riparian areas along 0.5 mile of Little Storms Creek (Ironton Ranger District) and 0.75 mile along Eels Run (Athens Ranger District) were protected by controlling non-native invasive plant species, such as garlic mustard, Japanese knotweed, and Japanese stiltgrass. These non-natives spread into the riparian area on Forest Service lands from private lands located upstream. Non-native invasive plants crowd out native grasses, shrubs and trees in the riparian area. A healthy riparian area is essential to ensure healthy aquatic ecosystems. These efforts were accomplished through hard work by employees, volunteers and Ashland Kentucky Federal Prison Camp workers.

There were no long-term aquatic ecological monitoring sites established by the Forest Service in FY 2011. These sites have been permanently marked, so we can go back to them in the future and repeat the surveys and determine what, if any, changes have occurred to the physical or biological make-up of the streams.

### **2006-2011 Stream Habitat Summary Report**

Wayne National Forest has treated or improved 13.25 miles of stream from 2006-2011 using various methods, including:

- Abandoned Mine Land (AML) reclamation efforts, e.g., reestablishing stream channels by removing mining blockages and by closure of stream-capturing subsidences, and acid mine drainage abatement (1.5 miles in 2009);
- planting trees in riparian-area hayfields (1 mile in 2007);
- illegal dump cleanups with erosion control measures, and riparian-area non-native invasive species (NNIS) removal (4 miles in 2008, 2 miles in 2009, 3.5 in 2010, 1.25 ac in 2011); and
- non-chemical treatments, e.g., purple loosestrife beetle introductions (3-5 acres in 2008 and 2010).

These types of activities improved upstream and downstream flow conditions and stream morphology, i.e, dimension, pattern, and profile; aquatic and riparian health by reestablishing riparian buffer strips and protecting in-stream woody debris that provides and maintains habitat for Regional Forester Sensitive (RFS) species, such as the eastern hellbender, Ohio lamprey, rapids and green-faced clubtails, and various fish and mussel species; diversity of important native riparian, aquatic, and semi-aquatic plants; and aquatic habitat by stabilizing sources of erosion and sediment.

These efforts, if continued similarly over the remainder of the decade, will likely meet or exceed the 20-mile goal expressed in the 2006 Forest Plan.

A total of 25 long-term aquatic ecological monitoring sites, split between the Little Muskingum River and Symmes Creek, were established in the first half of the 2006 Forest Plan implementation. Field data was collected at each site when the point was established in either 2006 or 2007. They have not been revisited since that time. The Forest Plan specifies that

monitoring should occur every 5 years; thus, the second round of monitoring is currently due.

### **Aquatic Organism Passage**

Streams should be continuous strips of habitat for fish, crayfish, mussels, salamanders and other (semi-)aquatic animals, but that is often not the case, due to unsatisfactory road-stream crossings. Poorly installed or maintained culverts or other stream obstructions can prevent fish and other organisms from moving up or downstream, effectively partitioning the stream into segments and fragmenting aquatic wildlife populations. This can also affect sediment transport, as well as impair aquatic habitats. An Aquatic Organism Passage (AOP) culvert inventory provides information to Forest, Ohio Department of Transportation (ODOT) and county engineers to help prioritize where to do stream crossing improvement or replacement projects. The goal is to pick locations that will result in the greatest enhancement to in-stream movement for aquatic species.

<p><b>Objective 3.1c:</b> Reduce sedimentation and improve passage for aquatic and semi-aquatic organisms at Forest development roads and Forest Service recreation trail crossings.</p>	<p><b>Monitoring Work Plan Question #6.2:</b> How many crossings were improved?</p>
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The AOP culvert inventory efforts for 2011 were focused in streams on the Athens Unit of the Athens Ranger District. A total of 259 culverts and bridges were inventoried for the passability of aquatic organisms. Over 60% of these were found to be barriers to in-stream movement of aquatic and semi-aquatic species.

In 2011, 7 stream crossings are in various stages of implementation. On State Highway 26 on the Athens Ranger District, Marietta Unit, 2 structures were under construction by ODOT. Four ORV bridges were replaced on the Ironton Ranger District (3 at Hanging Rock and 1 at the Superior Trailhead).

Washington County completed design plans for the Archer's Fork culvert replacement along a perennial stream on the Marietta Unit of the Athens District. A partnership using Forest Service Highway Trust for Aquatic Passage (HTAP) funds and USFWS Partners for Fish and Wildlife funds associated with the replacement of the Archer's Fork structure were transferred to the county.

### **2006-2011 Aquatic Organism Passage Summary Report**

From 2006-2011, an aquatic organism passage (AOP) inventory was completed for all Forest designated highways, and for roads in specific 6<sup>th</sup>-level watersheds (Table 2.3).

**Table 2.3 AOP Inventory Accomplishments by Year**

<b>YEAR</b>	<b>Road-Stream Crossings</b>
2006	0
2007	Approx. 300
2008	381
2009	77

2010	Approx. 200
2011	259

The following identifies stream crossing improvements by year from the past monitoring reports. A few additions were made after consulting with the Forest Engineer to account for Off Road Vehicle (ORV) crossings which had not been discussed in previous reports. From 2006-2011, 14 road-stream crossings were improved or replaced (or under construction); funds have been transferred for the construction of another. American Recovery and Reinvestment Act (ARRA) and AOP/HTAP funding have allowed us to improve more habitat than previously expected. These activities improve and connect numerous miles of habitat, such as the Archer's Fork project, which has been estimated as 9.2 miles of improvement.

**2006:** The Forest Service and Gallia County Engineer partnered to improve one road-stream crossing on Camp Creek. A bridge was replaced with a concrete box culvert to improve aquatic organism passage.

**2007:** The Forest Service and Gallia County Engineer partnered to improve three road-stream crossings in the Symmes Creek drainage. Culverts were replaced to improve habitat and in-stream movement for the round hickorynut, lilliput, little spectaclecase, and salamander mussels, and their host fishes.

**2009:** One new ORV bridge was installed at New Straitsville (Bagley's Campground) which replaced a ford crossing.

**2010:** Three barrier structures were replaced in 2010: one structure on Paddle Creek on the Ironton Ranger District and two on the Athens Ranger District, one at Monday Creek and one on State Highway 26.

**2011:** On State Highway 26 within the Marietta unit, two structures were under construction by ODOT. Within Washington County, one structure on T-414 (Archers Fork) was designed and funds have been transferred to the county for construction in 2012. Four ORV bridges were replaced on the Ironton Ranger District (3 at Hanging Rock and 1 at the Superior Trailhead).

## 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.

Within the Forest Plan, acres of habitat created are directly related to various silvicultural harvest methods. The relationship between the Allowable Sale Quantity (ASQ) and the amount of habitat created (Forest Plan Appendix B) is displayed below. Pages B-2 and B-3 of Appendix B provides additional detail; below combines information contained within Table B-2 and Table B-4. It is important to recognize that the habitat acres within the first decade do not meet the long-term objectives (i.e., Forest Plan Chapter 3 Management Area Direction, long-term desired habitat composition); the first decade was viewed as a ramp-up stage to only achieve a portion of the habitat needs.

**Forest Plan Estimates (First Decade) Ramping Up Stage to Meet Long-Term Habitat Objectives in the Future**

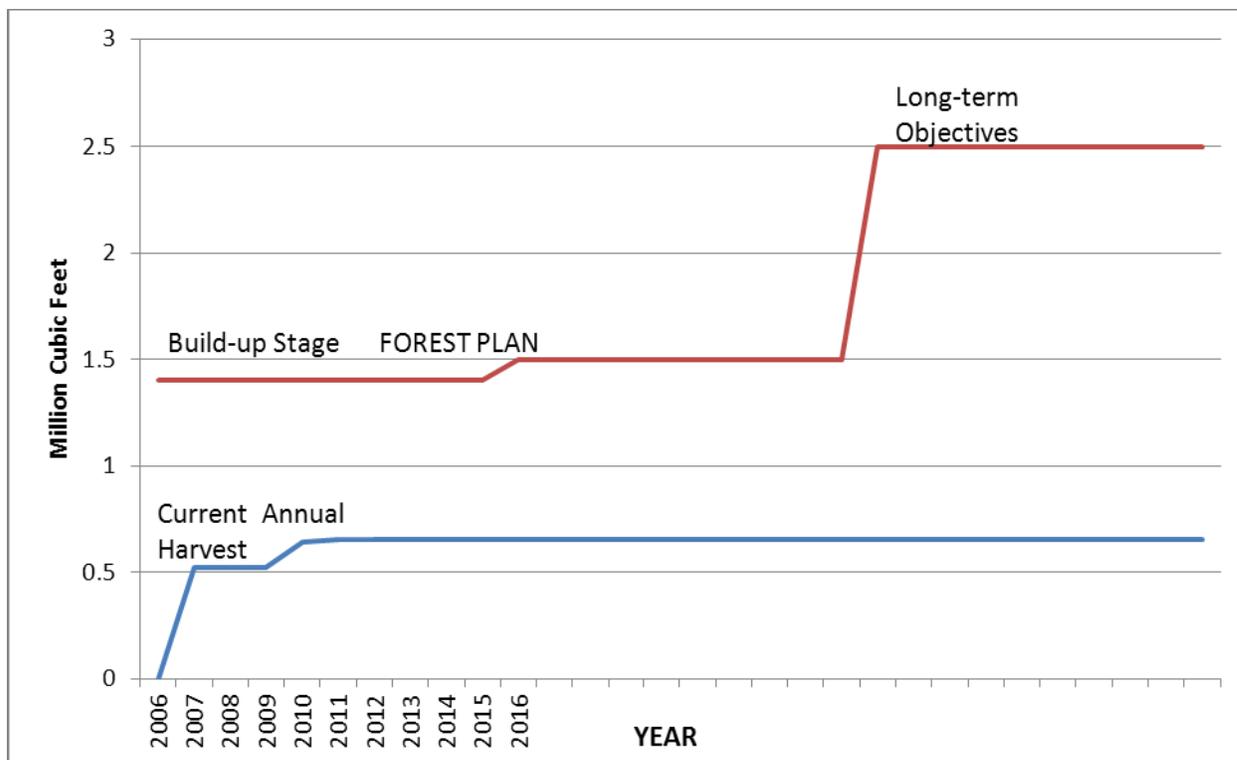
<b>ALLOWABLE SALE QUANTITY</b>	=	<b>SILVICULTURAL PRACTICES RELATED TO HABITAT CREATED *</b>
<b><i>14 Million Cubic Feet</i></b>		
1.4 million cubic feet per year		Even-aged Hardwood Regen.Harvest (Early Succession Hardwood For.): 1,725 acres Even-Aged Pine Regeneration Harvest (Early Succession Pine Forest): 200 acres Thinning (Reduce Competition): 1,460 acres Uneven-Aged Harvest (movement toward All-aged Hardwood /Pine For.): 14,556 acres

\*NOTE: These do not meet the long-term habitat objectives. Even-aged harvest would be approximately 3 times the acreage, while uneven-aged harvest would likely be a minimum of twice the acreage.

**Current Trajectory (First Decade)**

2006-2009 Annual harvest approx. 520,000 cf = Accomplishment of **Less Than Half** of the  
2010-2011 Annual harvest approx. 640,000 cf Forest Plan Habitat Objectives for the first decade

The current harvest is less than half of the ASQ; thus, our current trajectory is likely to meet less than half of our habitat objects associated with use of silvicultural systems. Considering the Pleasant Bear Project and projected habitat creation within the Buckeye project, it is likely that we will meet the early successional hardwood forest objective for the decade and the early successional pine objective but will fall short with all-aged hardwood/pine forest creation. However, meeting the objectives for the first decade for even-aged hardwood and pine corresponds to achieving only about 1/3 of the long-term objective for 0-10 year old early successional forest. Also it has to be recognized that creation of early successional habitat is concentrated within projects; thus, a project such as Pleasant Bear meets the long-term habitat objectives for early successional forest while in other areas of the forest with Forest Shrubland Mosaic (FSM), Diverse Continuous Forest (DCF), River Corridor (RC), and Grassland Forest Mosaic (GFM) Management Areas (MA's) with early successional habitat), little to no early successional habitat will be created during the first decade. Thus, while potentially meeting an objective for the first decade in one area of the Forest, it needs to be placed in context. For a species such as the ruffed grouse, we will only improve conditions by 1/3 of the long-term objective acres (0-9 year old category only) or within 1/3 of the Forest Plan area for those MAs that included creation of early successional habitat. Addressing the early successional forest habitat needs is one of the most critical for the WNF, due to the dramatic decline of early successional forest habitat species, such as the ruffed grouse.



**Figure 2.2 Relationship of the Current Harvest (trajectory) to the First Decade Objectives and the Long-Term Objectives (Reflected in MMCF annually).**

Accomplishing less than half of acres projected to be created for all-aged hardwood/pine forest for the decade has ramifications for those Management Indicator Species (MIS) associated with all-aged forest habitat: pileated woodpecker, cerulean warbler, worm-eating warbler, and the Louisiana waterthrush (See following section and Table 2.4 below; bold species are those primarily affected). Note: uneven-aged harvest may be near 1/3 of the decade projection, since projects like Pleasant Bear and Buckeye will emphasize even-aged harvest techniques within Forest Shrubland Mosaic (FSM). With approximately 5 years remaining under the Forest Plan for the first decade, efforts should be made to increase uneven-aged harvest to create all-aged forest conditions to improve habitat for these species.

Prescribed fire plays a large role in oak-hickory forest restoration. Within the Forest Plan, treatment of 46,215 acres was projected for the first decade (see Monitoring Question 6.2a). It is unclear whether these acres consisted of total affected area or re-treated acres (i.e., re-burning of same stands repeatedly to meet management objectives). From 2006-2011, 4,764 acres have been burned, including re-treated acres. This equals about 10% of planned burn acres within the decade (assuming the total included re-treatments) and has ramifications for various species of wildlife, that depend on oak forests, including MIS such as ruffed grouse, cerulean warbler, pileated woodpecker. Oak-hickory forest is important to many species for forage (acorns and nuts), foraging substrate, shelter, and other valuable characteristics. Within the remaining decade of the Forest Plan, efforts should be made to increase prescribed burning to enhance and restore oak-hickory forest.

### Management Indicator Species (MIS)

Eight bird species were selected as Management Indicator Species in the Forest Plan (Table 2-4). These species guided the development of the Forest Plan, and possess credible monitoring protocols and can be effectively and efficiently monitored (see Forest Plan, Appendix C).

<b>Management Indicator</b>	<b>Habitat</b>	<b>Mgmt Area(s) Represented<sup>1</sup></b>
Cerulean Warbler	Extensive tracts of mature interior hardwood forest with a heterogeneous canopy and diverse vertical vegetation layers; also uses early successional habitat during post-breeding period	DCF/O HF/O FOF/M (RC)
Henslow's Sparrow	Extensive grasslands consisting of tall, dense grass, a well-developed litter layer, standing dead vegetation, and sparse or no woody vegetation	GFM
Louisiana Waterthrush	Large blocks of mature forest with riparian corridors along medium to high-gradient headwater streams (mainly perennial); fallen trees with exposed root masses and riparian banks with abundant crevices for nesting; healthy aquatic habitat	DCF/O HF/O FSM GFM FOF/M RC
Pileated Woodpecker	Extensive tracts of mature to overmature forest with large-diameter snags and coarse woody debris on the forest floor; also forages in younger forest	DCF/O HF/O FOF/M RC
Pine Warbler	Mature pine and pine-hardwood forests with generally sparse understory and lack of tall deciduous midstory; generally considered area-sensitive, forest-interior species, but may use edges or small woodlots with scattered large pine.	(DCF/O) FSM GFM RC
Ruffed Grouse	Mosaic of early-, mid-, and, late-successional forest; early successional forest patches (<20 years) of at least 5-6 acres in southern Ohio for brood rearing	FSM (GFM)
Worm-eating Warbler	Mature interior hardwood or pine-hardwood forest on hillsides with high canopy cover, a dense understory, and coarse woody debris (>10" diameter) on the forest floor	DCF/O (HF/O) FOF/M RC
Yellow-breasted Chat	Early successional forest habitat with open overstory and brushy understory	FSM GFM

<sup>1</sup> Forest Plan Management Areas: Diverse Continuous Forest/ with OHVs (DCF/O); Historic Forest/ with OHVs (HF/O); Forest and Shrubland Mosaic (FSM); Grassland and Forest Mosaic (GFM); Future Old Forest/ with Mineral Activity (FOF/M); and River Corridor (RC). Parentheses indicate reduced focus for Management Indicator in that Area.

Two monitoring strategies are conducted annually to collect population trend information for these species. The Forest Service conducts a breeding bird survey in May and June where all birds observed along specific driving and hiking routes are recorded. The Ohio Division of Wildlife conducts a ruffed grouse drumming survey in April where the number of males heard drumming are recorded along specific routes. A third monitoring strategy is employed every few years to assess birds at random sampling points established for the Ironton Ranger District in 2

locations (Pine Creek project area and the FSM Management Area).

<b>Objective 4.1a:</b> Provide adequate habitat to support viable populations of management indicator species.	<b>Monitoring Work Plan Question #7:</b> Are population trends and habitat trends of management indicators consistent with Forest Plan expectations?
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**Cerulean Warbler, Henslow's Sparrow, Louisiana Waterthrush, Pileated Woodpecker, Pine Warbler, Ruffed Grouse, Worm-eating Warbler, Yellow-breasted Chat**

The annual breeding bird survey (BBS) has been conducted since 2003 on the Wayne National Forest. All birds seen and heard at 241 specific points along 23 survey routes are recorded. These routes occur in different habitat types (forest, openland, wetland, grassland). All routes are sampled twice during the period of May 20 to June 20. In 2011, a new route with 10 survey points was established across a relatively newly acquired tract (Cambria) on the Ironton ranger District. This route includes a reclaimed strip mine area that was planted in some locations in pine by previous owners and left as open grassland (with scattered pockets of trees or shrubs) in others. The new route was only sampled once in 2011 in June for a total of 492 points sampled (241 points sampled twice plus 10 sampled once).

Total observations included 5,753 individual birds, comprising 103 species during the 2011 breeding bird survey. The ten most common species recorded across the WNF were the Eastern Towhee, Red-eyed Vireo, Ovenbird, Indigo Bunting, Wood Thrush, Northern Cardinal American Crow, Acadian Flycatcher, Hooded Warbler, and Tufted Titmouse. The species that appear on the top-ten list is rather consistent, usually only varying by a species or two and by the order in which they appear year-to-year.

There are an additional 67 random bird sampling points established in FY 2009. Data was collected in 2009 and 2010. Funding was not available in FY 2011. These points require several years of data collection before any trends can be determined.

**2006-2011 MIS Summary Report**

A summary of MIS observations is provided in Table 2-5. Data are shown as the average number of individuals observed per survey. In other words, the average was calculated by taking the total number of individuals observed and dividing that by the total number of points on the survey. Each MIS is not expected to occur at each point or on each route, but displaying the survey average enables us to show that some MIS are more common than others.

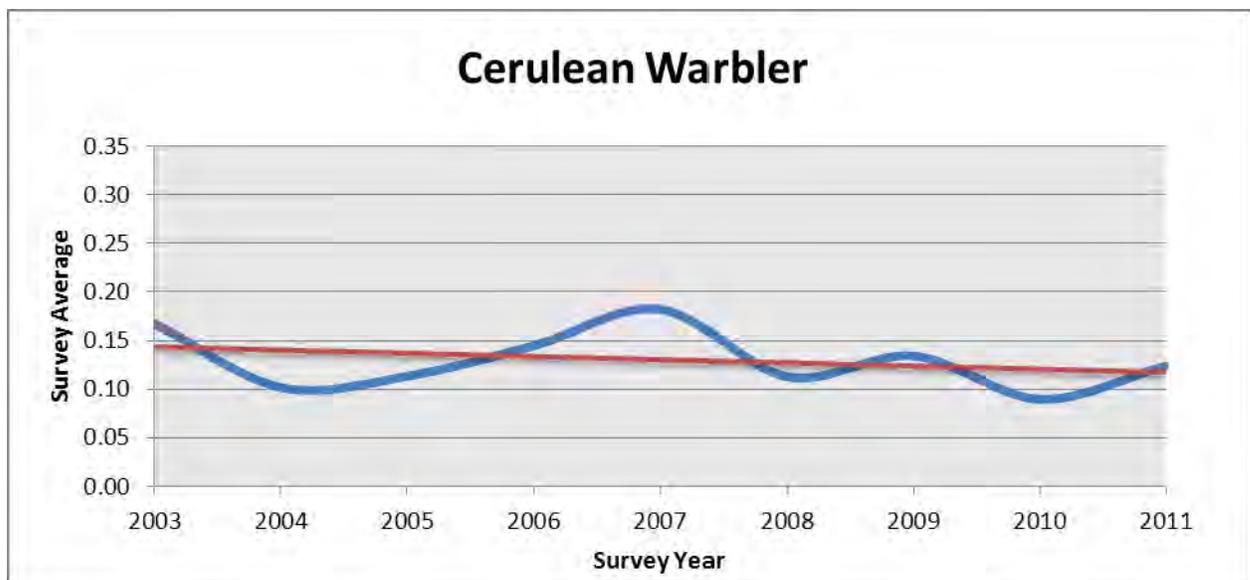
**Table 2.5 Summary of Management Indicator Species observed during the Wayne National Forest Breeding Bird Survey Routes, 2003-2011 (shown as number observed/total number of points in survey).**

MIS	2003	2004	2005	2006	2007	2008	2009	2010	2011	Mean Number Observed/Year
Cerulean Warbler	0.17	0.10	0.11	0.14	0.18	0.11	0.13	0.09	0.12	62
Henslow's Sparrow	0.04	0.02	0.02	0.07	0.04	0.03	0.01	0.04	0.05	17
Louisiana Waterthrush	0.04	0.04	0.03	0.04	0.03	0.02	0.04	0.03	0.04	16

Pileated Woodpecker	0.10	0.10	0.07	0.08	0.12	0.07	0.10	0.10	0.09	43
Pine Warbler	0.03	0.04	0.07	0.06	0.04	0.04	0.06	0.09	0.03	24
Worm-eating Warbler	0.10	0.03	0.04	0.08	0.10	0.08	0.09	0.10	0.08	38
Yellow-breasted Chat	0.12	0.29	0.11	0.19	0.21	0.21	0.21	0.24	0.19	89

### Cerulean Warbler

The North American Breeding Bird Survey (BBS) summary of population change shows that cerulean warblers have experienced a 3.0% **declining** trend survey-wide 1966-2009 (Sauer et al. 2011). In Ohio, this species has **declined** by 3.5% in the same timeframe. There is a slight downward trend across the WNF in numbers of this species detected over 9 years (using an annual survey average; Figure 2.3).

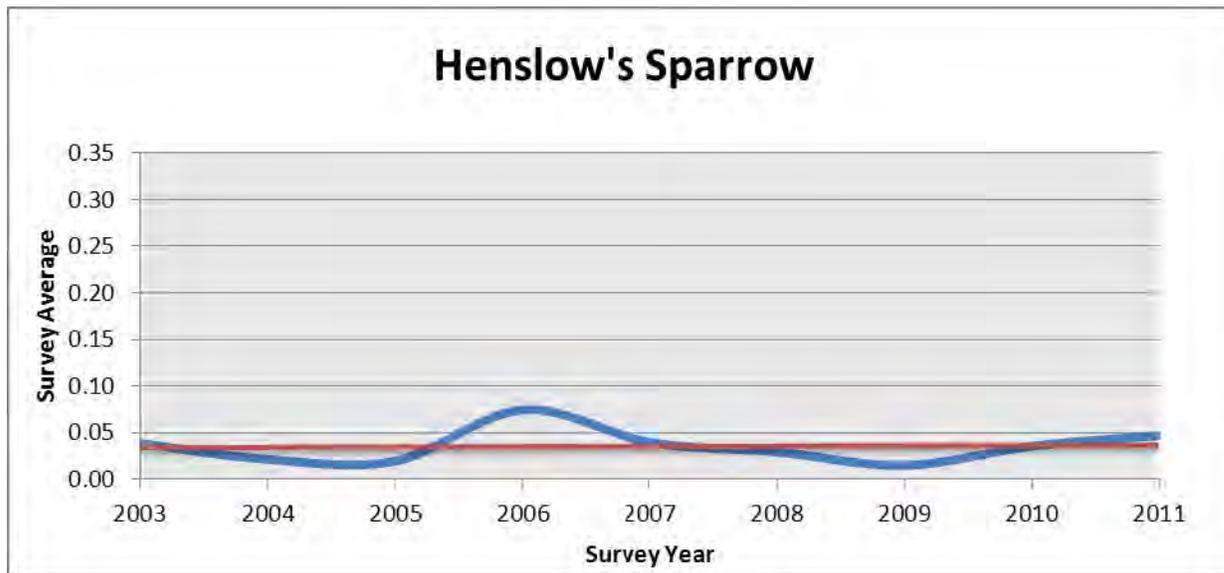


**Figure 2.3 Breeding Bird Survey trend analysis for Cerulean Warbler for 24 forest-wide WNF routes from 2003-2011.**

Habitat needs for cerulean warblers consists of extensive tracts of mature interior hardwood forest with a heterogeneous canopy and diverse vertical vegetation layers. Recent research has also shown that this species uses early successional habitat during the post-breeding period. Historic Forest management area prescriptions are geared towards habitat maintenance for this species. In the Forest Plan, cerulean warbler populations are expected to increase across the WNF, but trends for this species will mirror trends for quantity and quality of mature forest habitat as well as the availability of early successional habitat to some extent. As discussed in the previous section, accomplishing less than half of acres projected to be created for all-aged hardwood/pine forest and only 10% of projected burn acres for the decade has ramifications for cerulean warblers. With approximately 5 years remaining under the Forest Plan for the first decade, efforts should be made to increase uneven-aged harvest to create all-aged forest conditions and use of prescribed fire to improve habitat for the cerulean warbler. Creation of gaps in the canopy within even-age type stands improves cerulean warbler habitat.

### Henslow's Sparrow

The North American BBS summary of population change shows that Henslow's sparrows have experienced a 0.9% **declining** trend survey-wide 1966-2009 (Sauer et al. 2011). In Ohio, this species has **declined** by 3.7% in the same timeframe. The WNF results suggest a completely flat trend for this species detected over 9 years (using an annual survey average; Figure 2.4).



**Figure 2.4** Breeding Bird Survey trend analysis for Henslow's Sparrow for 24 forest-wide WNF routes from 2003-2011.

Habitat needs for Henslow's sparrow consists of extensive grasslands with tall, dense grass, a well-developed litter layer, standing dead vegetation, and sparse or no woody vegetation. As expected in the Forest Plan, populations of this sparrow should be stable to slightly increasing based on trends for suitable habitat. The existing acreage of open, grassy habitat needs to be maintained or improved on a rotating basis, so as not to treat all available habitat at the same time, which could negatively impact Henslow's sparrows.

A project is being developed to address the various complex issues regarding grasslands/reclaimed minelands. The grassland improvement project will likely involve enhancement of these areas to move them toward tall grass prairie/warm season grass conditions. Techniques will likely involve chemical treatment of lespedeza and fescue, burning to reduce lespedeza biomass and to maintain openings, disking to remove deep furrows, and seeding by various methods. Treatment will likely be costly per acre initially but will greatly improve habitat conditions for wildlife and improve the future maintenance of these areas as grassland habitat. Only through the combination of partnerships, stewardship, and integrated funds (e.g., WFHF funds) can the conversion and continued maintenance of reclaimed grasslands can be achieved on a long-term basis. Without maintenance, grassland habitat conditions will convert to shrub/forest conditions. The forest needs to begin to convert and maintain these areas to maintain quality habitat for the Henslow's sparrow (See Grassland section below for additional information).

### Louisiana Waterthrush

The North American BBS summary of population change shows that Louisiana waterthrush have experienced a slight 0.4% **increasing** trend survey-wide 1966-2009 (Sauer et al. 2011). In Ohio, this species has remained relatively **stable** or increased slightly (0.6%) in the same timeframe. Few Louisiana Waterthrush are detected on the WNF BBS routes, so it is difficult to make inferences about population trends with such small sample sizes. However, the WNF results suggest a completely flat trend for this species detected over 9 years (using an annual survey average; Figure 2.5).

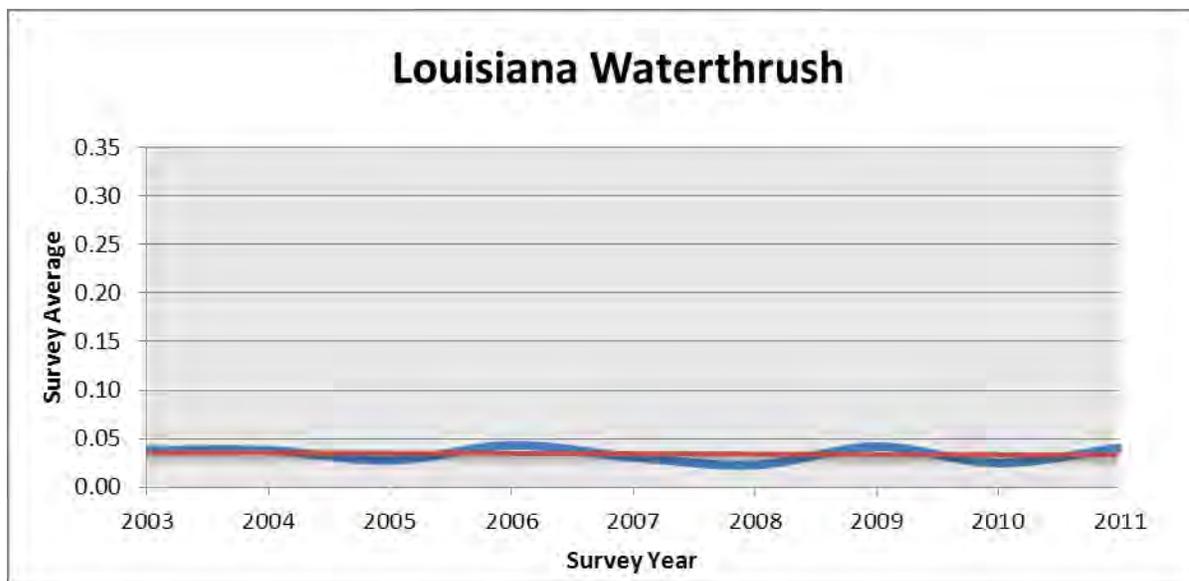
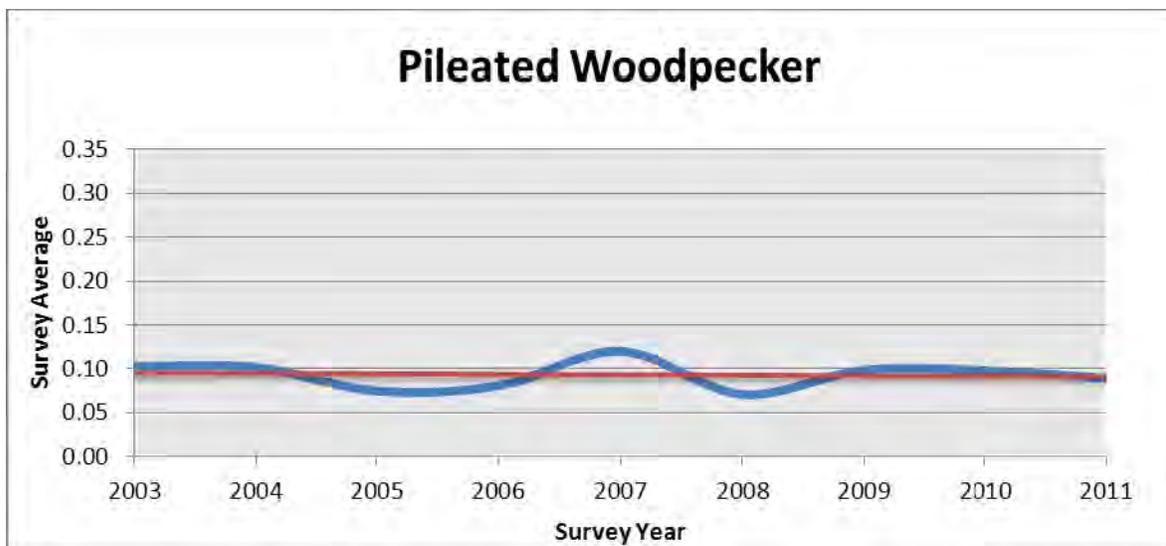


Figure 2.5 Breeding Bird Survey trend analysis for Louisiana Waterthrush for 24 forest-wide WNF routes from 2003-2011.

Habitat needs for Louisiana waterthrush consists of large blocks of mature forest with healthy aquatic habitat and riparian corridors along medium to high-gradient headwater streams (mainly perennial) with fallen trees that have exposed root masses and riparian banks with abundant crevices for nesting. In the Forest Plan, Louisiana waterthrush populations are expected to be stable to increasing as stands mature, especially within the River Corridor, Diverse Continuous Forest, and Future Old Forest management areas, and due to the inclusion of specific guidelines for riparian corridor management (e.g., filterstrip protections GFW-ARR-5).

### Pileated Woodpecker

The North American BBS summary of population change shows that pileated woodpeckers have experienced a 1.4% **increasing** trend survey-wide 1966-2009 (Sauer et al. 2011). In Ohio, this species has increased slightly (3.0%) in the same timeframe. The WNF results suggest a completely flat trend for this species detected over 9 years (using an annual survey average; Figure 2.6).



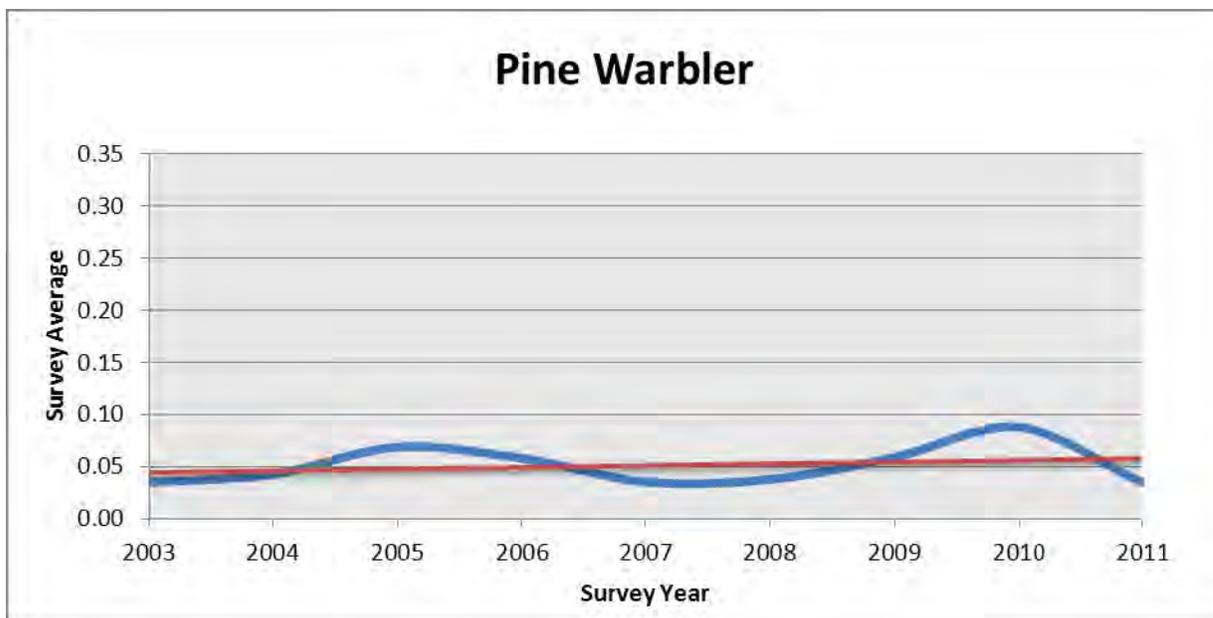
**Figure 2.6 Breeding Bird Survey trend analysis for Pileated Woodpeckers for 24 forest-wide WNF routes from 2003-2011.**

Habitat needs for pileated woodpeckers consists of extensive tracts of mature to over-mature forest with large-diameter snags and coarse woody debris on the forest floor. This species is also known to forage in younger forest stands. Historic Forest management area prescriptions are geared towards habitat maintenance for this species. In the Forest Plan, pileated woodpecker populations are expected to increase across the WNF as stands mature and standing dead trees develop (e.g., SFW-TES-12), but trends for this species will mirror trends for quantity and quality of mature forest habitat.

Oak-hickory forest is important to pileated woodpeckers for forage (mast), foraging substrate, and shelter. Since the Forest is only meeting approximately 10% of planned burn acres within the decade (assuming the total included re-treatments), efforts should be made to increase prescribed burning to enhance and restore oak-hickory forest.

### **Pine Warbler**

The North American BBS summary of population change shows that pine warblers have experienced a slight 1.5% **increasing** trend survey-wide 1966-2009 (Sauer et al. 2011). In Ohio, this species has **increased** (4.6%) in the same timeframe. WNF BBS results show an almost-imperceptible slight upward trend for this species detected over 9 years (using an annual survey average; Figure 2.7).



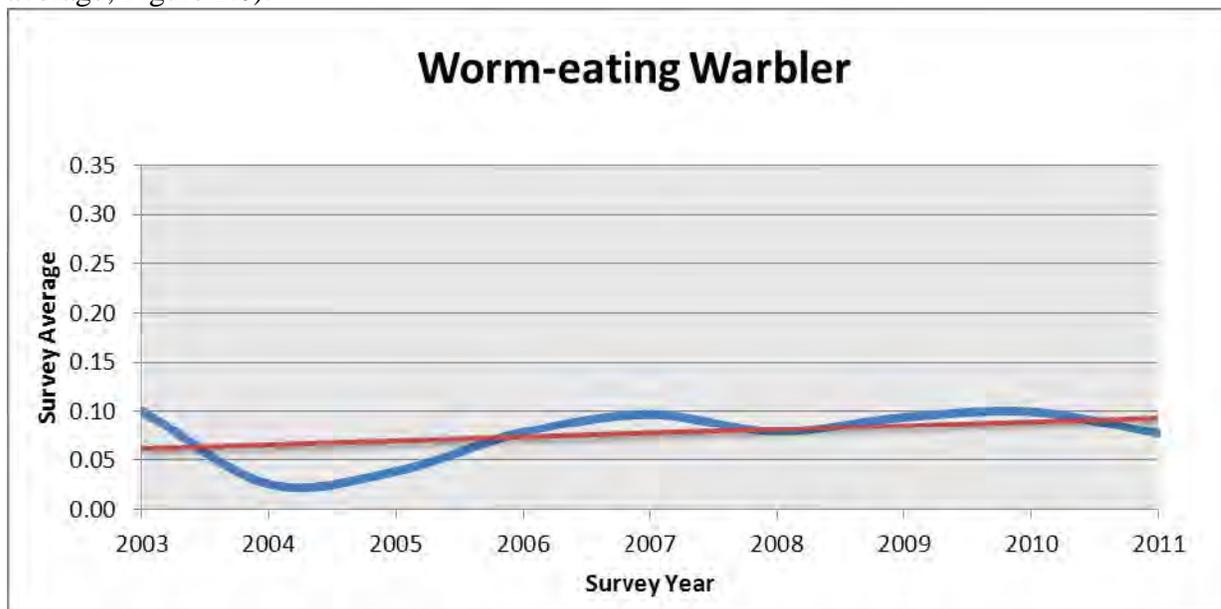
**Figure 2.7 Breeding Bird Survey trend analysis for Pine Warbler for 24 forest-wide WNF routes from 2003-2011.**

Habitat needs for pine warblers consists of mature pine and pine-hardwood forests with generally sparse understory and lack of tall deciduous midstory. This species is generally considered an area-sensitive, forest-interior species, but it may use edges or small woodlots with scattered large pine. The Forest Plan states that pine warbler population trends shall mirror pine forest trends and are expected to decline over time with the deterioration of existing pine and conversion of pine to hardwoods. However, low populations levels may be maintained, since this species will use deciduous woods with scattered mature pines and white pine plantations. Without improvements targeted specifically to regenerate pine stands, most, if not all, native pine stands will die out and be replaced by hardwoods over time, barring the occurrence of a natural event of sufficient disturbance level to open up the forest floor to full sun and remove all competing species (e.g., catastrophic wildfire). The Forest Plan's pine forest habitat objectives (200 acres) for the first decade should be met through implementation of the Pleasant Bear project and the new Buckeye project that is currently under analysis. A majority of the native pine on the forest is in the older age class and is dying and not being replaced by new pine, resulting in a conversion from pine-hardwood to hardwood forest. As this continues through time, pine warbler numbers are expected to decline and remain low as projected by the Forest Plan. Continuation of treatments (harvest and site preparation) within projects will create young pine stands, which will aid in maintaining the presence of the species within the forest in the future, though at naturally low levels. This is because, for most management areas, hardwood-pine is only 1-10% of the total acres for desired future condition.

### **Worm-eating Warbler**

The North American BBS summary of population change shows that worm-eating warblers have remained relatively **stable** or increased slightly (0.6%) survey-wide 1966-2009 (Sauer et al. 2011). In Ohio, this species has **increased** (6.0%) in the same timeframe. WNF BBS results show a slight upward trend for this species detected over 9 years (using an annual survey

average; Figure 2.8).

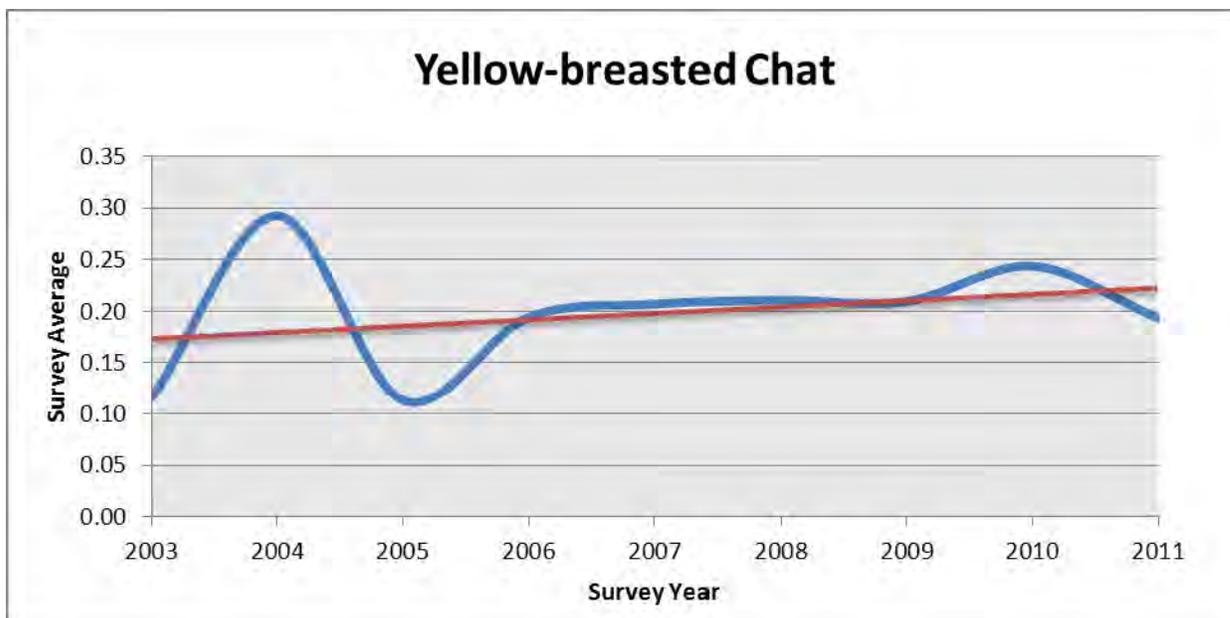


**Figure 2.8. Breeding Bird Survey trend analysis for Worm-eating Warbler for 24 forest-wide WNF routes from 2003-2011.**

Habitat needs for worm-eating warblers consists of mature interior hardwood or pine-hardwood forest on hillsides with high canopy cover, a dense understory, and coarse woody debris (>10" diameter) on the forest floor. Uneven-aged management will provide habitat (i.e., complex all-aged forest conditions) in the short term and a combination of uneven-aged and even-aged management and natural succession will provide habitat in the long term for this species. Worm-eating warbler population trends are expected to increase across the WNF, but trends for this species will mirror trends for quantity and quality of mature forest habitat. Increases could be lessened in Historic Forest areas that utilize prescriptions for frequent prescribed fire. Currently, the WNF is falling short in the creation of all-aged forest habitat described in the Forest Plan objectives for the first decade, which could negatively affect this species. Uneven-aged harvest acts as the disturbance factor to create dense understory conditions for nesting and foraging habitat for the worm-eating warbler. With approximately 5 years remaining under the Forest Plan for the first decade, efforts should be made to increase uneven-aged harvest to create all-aged forest conditions to improve habitat for the Worm-eating warbler.

### **Yellow-breasted Chat**

The North American BBS summary of population change shows that yellow-breasted chats have remained relatively **stable** (-0.3%) survey-wide 1966-2009 (Sauer et al. 2011). In Ohio, this species has **decreased** by 2.7% in the same timeframe. WNF BBS results show an upward trend for this species detected over 9 years (using an annual survey average; Figure 2.9, but numbers detected between years can vary widely. This species can be locally abundant in certain areas in certain years, due to changing habitat availability.



**Figure 2.9 Breeding Bird Survey trend analysis for Yellow-breasted Chat for 24 forest-wide WNF routes from 2003-2011.**

Habitat needs for yellow-breasted chats consists of early successional forest habitat with open overstory and dense, brushy understory in patches of sufficient size (at least 12 acres). Chats exploit and readily colonize ephemeral habitats (7-15 years old), so they require new disturbances to continually renew or create their habitat. According to the Forest Plan, yellow-breasted chat population trends will mirror that of early successional forest habitat trends. That is to say that with proposed early-successional treatments, suitable habitat available to yellow-breasted chats will increase across the WNF, and populations of this early-successional-dependent species are expected to increase with it. The Forest Plan's early-successional forest habitat objectives for the first decade should be met through implementation of the Pleasant Bear project and the new Buckeye project that is currently under analysis. Considering the Pleasant Bear project and projected habitat creation within the Buckeye project, it is likely that we will meet the early successional hardwood forest objective for the decade. However, meeting the objectives for the first decade for even-aged hardwood corresponds to achieving only about 1/3 of the long-term objective in the Forest Plan for creation of 0-10 year old early successional forest.

Yellow-breasted chat habitat includes herbaceous-shrub vegetation associated with wildlife openings. Herbaceous-shrub habitat is discussed in greater detail below (Objective 4.1g). Maintenance of openings prevents the loss of herbaceous and herbaceous-shrub habitat, which benefits yellow-breasted chats. It involves the cutting (i.e., feathering) or girdling of edge trees, which creates shrubby habitat and prevents the conversion of the opening to forest habitat. The WNF has made progress in maintaining existing herbaceous-shrub opening habitat and is expected to continue do so through partnership support. The Forest Plan also provides direction for the creation of additional new herbaceous or herbaceous-shrub habitat, but little progress has been made during this first half of the decade to towards this goal. The WNF needs to incorporate the creation of openings in vegetation management projects to address the needs of

early successional species.

**Ruffed Grouse**

The North American BBS summary of population change shows that ruffed grouse have experienced a 1.0% **decreasing** trend survey-wide 1966-2009 (Sauer et al. 2011). In Ohio, this species has **increased** by 2.6% in the same timeframe, although the range of estimates varies widely (-5.9-+11.62%). Statewide roadside drumming routes established by ODNR Division of Wildlife (DOW) show a **decreasing** trend in Ohio, especially since the mid-1980s (Figure 2.10, Mike Reynolds, DOW Grouse Biologist, pers. comm.). Declines are mainly attributed to loss of suitable habitat. A rapid increase in quality grouse habitat occurred in eastern Ohio through the early 1970s as abandoned farms reverted to brush, and grouse numbers increased significantly. However, since then, good quality grouse habitat has declined as brushland and early successional forest has grown to more mature forest.

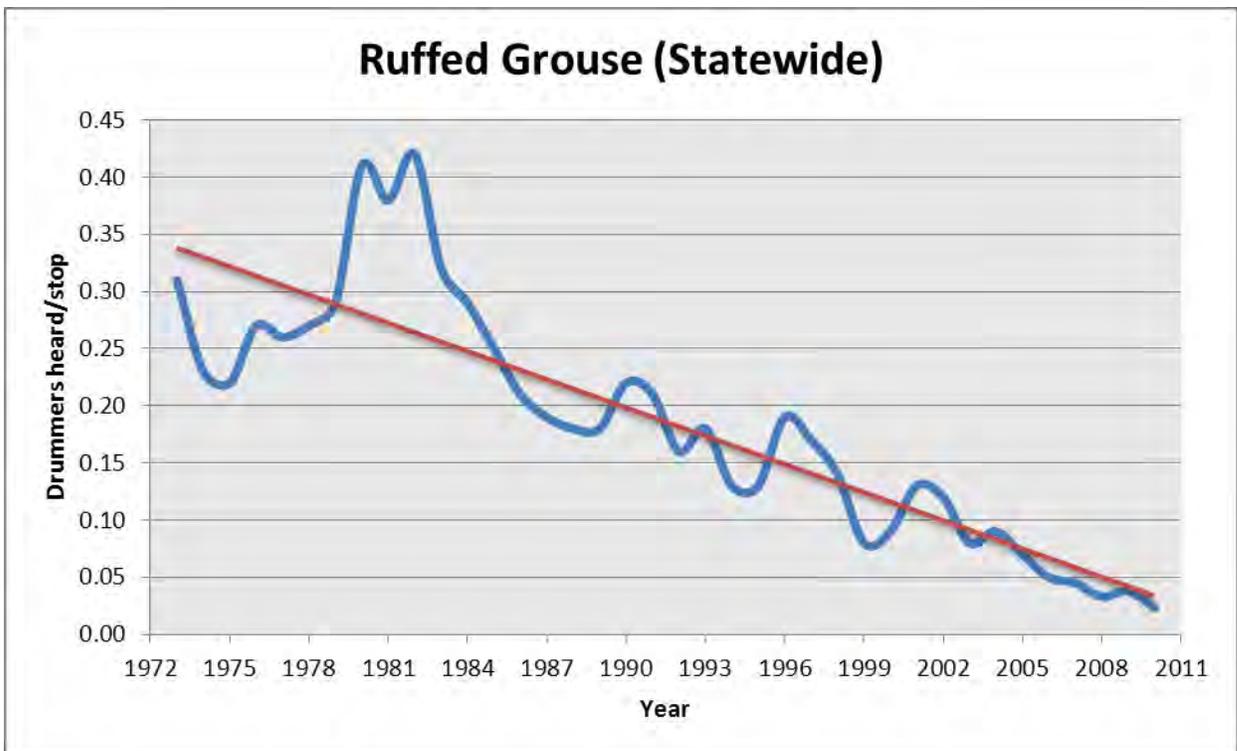
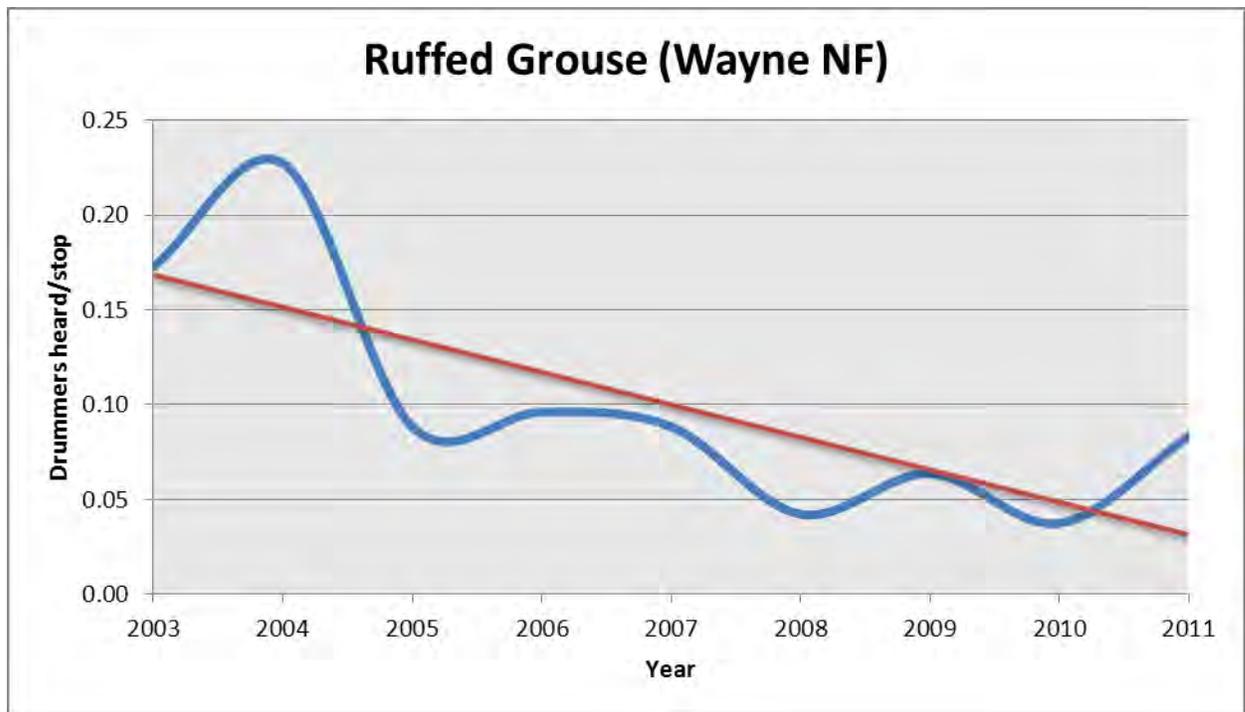


Figure 2.10 Ruffed Grouse Drumming Index trend analysis for state-wide sampling routes, 1973-2010.

Results of WNF roadside drumming routes established by DOW show a negative trend for this species detected over 9 years (2003-2011, using an annual survey average; Table 2.6 and Figure 2.10).

County	Route	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Athens Unit</b>										
Athens	Big Bailey/Utah Ridge	--	--	0.00	0.00	0.05	0.00	--	--	--
Hocking	Green/Starr Townships	0.00	0.05	0.00	0.00	0.10	0.00	--	--	--

<b>Table 2.6 Average number of drumming male ruffed grouse heard per stop on Wayne National Forest survey routes, 2003-2011 (data courtesy of Ohio Division of Wildlife). (A double-dash represents no data collection.)</b>										
County	Route	2003	2004	2005	2006	2007	2008	2009	2010	2011
Perry	Monroe Township 1	0.15	0.00	0.15	0.10	0.00	0.00	0.05	0.00	0.05
Perry	Monroe Township 2	0.00	0.00	0.00	0.00	0.00	0.15	--	--	--
<b>Ironton Unit</b>										
Lawrence	Telegraph Ridge	0.20	0.25	0.05	0.00	0.25	0.00	0.00	0.00	0.00
Lawrence	Aid Township	0.05	0.25	0.05	0.05	0.05	0.05	0.10	0.10	0.00
Lawrence	Hanging Rock	--	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scioto	Vernon Township	0.05	0.40	0.40	0.05	0.10	0.00	0.06	0.05	0.10
Gallia	Greenfield Township	0.15	0.05	0.15	0.35	0.05	0.10	0.15	0.05	0.00
Gallia	Walnut Township	0.35	0.25	0.05	0.25	0.15	0.10	--	--	--
<b>Marietta Unit</b>										
Morgan	Union Township	0.15	0.15	0.10	0.00	0.10	--	--	--	--
Monroe	Graysville	0.30	0.45	0.00	0.20	0.05	0.15	0.00	0.05	0.45
Monroe	Antioch	0.45	0.60	0.15	0.20	0.10	0.15	--	--	--
Washington	Pine Ridge	0.20	0.20	0.15	0.05	0.25	0.00	0.15	0.05	0.10



**Figure 2.11 Ruffed Grouse Drumming Index trend analysis for 14 forest-wide WNF roadside drumming routes from 2003-2011.**

Data for 2011 ruffed grouse drumming routes on WNF collected by Ohio Division of Wildlife biologists, partners, and employees indicate the abundance of drumming males took a slight increase from the previous year.

Habitat and population trends for ruffed grouse are expected to remain stable or increase slightly

during the first decade of Forest Plan implementation. It is important to recognize that populations are already extremely low (Figure 12). This trend estimate was based on the fact that 1,725 acres of early successional forest habitat could be created during this time period.

In the Central and Southern Appalachians, including southeastern Ohio, grouse are dependent on acorn production from red and white oak species (Devers et al. 2007) and the presence of a variety of forested habitats and openings to meet a range of seasonal needs, and optimally, these resources should be located in close proximity (Harper et al. 2006). Of great importance is the availability of 4 kinds of essential grouse habitat interspersed together in a home range: (1) early successional forest habitat (escape cover and food resources); (2) early to mid-aged forest habitat with coarse woody debris available (nest habitat); (3) mast-producing oak/hickory forest (foraging habitat); and (4) open, mid-age or mature forest with small canopy openings with lush herbaceous and soft-mast-producing understory (brood habitat) (Devers et al. 2007; Harper et al. 2006; Norman et al. 2004). Ideally, habitat manipulation that improves food availability and escape cover can promote population growth of ruffed grouse in the Appalachian Region (Harper et al. 2006).

According to the Forest Plan, ruffed grouse population trends will mirror that of early successional forest habitat trends. That is to say that with proposed early-successional treatments, suitable habitat available to ruffed grouse will increase across the WNF, and populations of this early-successional-dependent species are expected to increase with it. The Forest Plan's early-successional forest habitat objectives for the first decade (1,725 acres) should be met through implementation of the Pleasant Bear project and the new Buckeye project that is currently under analysis. Considering the Pleasant Bear Project and projected habitat creation within the Buckeye project, it is likely that we will meet the early successional hardwood forest objective for the decade. However, meeting the objectives for the first decade for even-aged hardwood corresponds to achieving only about 1/3 of the long-term objective for 0-10 year old early successional forest. Also it has to be recognized that creation of early successional habitat is concentrated within project areas; thus, a project such as Pleasant Bear meets the long-term habitat objectives for early successional forest while in other areas of the forest with FSM, DCF, RC, and GFM (MA's with early successional habitat), little to no early successional habitat will be created during the first decade. Thus, while potentially meeting an objective for the first decade in one area, it needs to be placed in context. For a species such as the ruffed grouse, we will only improve conditions by 1/3 of the long-term objective acres (0-9 year old category only) or within 1/3 of the Forest Plan area for those MA's which included creation of early successional habitat. Addressing the early successional forest habitat needs is one of the most critical for the WNF, due to the dramatic decline of early successional forest habitat species, such as the ruffed grouse.

Oak-hickory forest is important to ruffed grouse for forage (mast) and cover. Since the Forest is only meeting approximately 10% of planned burn acres within the decade (assuming the total included re-treatments), efforts should be made to increase prescribed burning to enhance and restore oak-hickory forest.

Devers, P.K., D.F. Stauffer, G.W. Norman, D.E. Steffen, D.M. Whitaker, J.D. Sole, T.J. Allen, S. Bittner, D. Buehler, J. Edwards, D. Figert, S.T. Friedhoff, W.M. Guiliano, C.A.

- Harper, W.K. Igo, R.L. Kirkpatrick, M. Seamster, H.A. Spiker, Jr., D. Swanson, and B. Tefft. 2007. Ruffed grouse population ecology in the Appalachian Region. Wildlife Monographs 168. 36 pp.
- Harper, C.A., B.C. Jones, D.M. Whitaker, and G.W. Norman. 2006. Managing habitats for ruffed grouse in the Central and Southern Appalachians. West Virginia University Press, Morgantown, WV. 51 pp.
- Norman, G.W., D.F. Stauffer, J. Sole, T.J. Allen, W.K. Igo, S. Bittner, J. Edwards, R.L. Kirkpatrick, W.M. Guiliano, B. Tefft, C. Harper, D. Buehler, D. Figert, M. Seamster, and D. Swanson. 2004. Ruffed grouse ecology and management in the Appalachian Region. Final project report of the Appalachian Cooperative Grouse Research Project. 61 pp.
- Sauer, J.R., J.E. Hines, J.E. Fallon, K.L. Pardieck, D.J. Ziolkowski, Jr., and W.A. Link. 2011. The North American Breeding Bird Survey, Results and Analysis 1966 – 2009 (Version 3.23.2011). USGS Patuxent Wildlife Research Center, Laurel, MD. <http://www.mbr-pwrc.usgs.gov/bbs/> Accessed: 1/24/2012 .

### Grassland Habitat

The Grassland and Forest Mosaic (GFM) management area is made up of reclaimed mine lands and forest habitat. The reclaimed areas have been planted in a grassy cover, which attracts species like the Henslow's sparrow, grasshopper sparrow, horned lark, blue grosbeak, and bobwhite quail.

The Openlands Assessment was completed in 2010. Through this assessment process, all existing openings were mapped across the forest and categorized by type. Within the GFM management area, there are 2,070 acres of openings (approximately 31% of all existing openlands on the forest), of which almost all acres are reclaimed minelands. The Forest Plan specifies that 5-10% should be improved or maintained annually, which corresponds to approximately 103-207 acres per year.

<p><b>Objective 4.1b:</b> Promote restoration and maintenance of the oak-hickory ecosystem by improving conditions for oak regeneration in the HF and HFO management areas.</p>	<p><b>Monitoring Work Plan Question #8:</b> How many acres were treated to encourage oak regeneration?</p>
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### FY11

There were 293 acres of mixed-oak stands improved through commercial thinning/selection harvest. The treatment objectives were to improve stand conditions to minimize adverse impacts from insects and disease (especially gypsy moth), and to improve conditions for developing future oak and hickory reproduction so these species will be present when the hardwood over-story is regenerated. Approximately 1,216 acres of mid-story competing species were thinned and 383 acres were treated with prescribed burns.

### 2006-2011 Oak Hickory Regeneration Summary

There were 2,171 acres of mixed-oak stands improved through commercial thinning/selection harvest. The treatment objectives were to improve stand conditions to minimize adverse impacts from insects and disease (especially gypsy moth), and to improve conditions for developing future oak and hickory reproduction so these species will be present when the hardwood over-story is regenerated.

Approximately 3,308 acres of stand improvement treatments were applied. Treatments included grape vine control, young stand weed and release, mid-story control, and non-native invasive species (NNIS) eradication.

There were 6,165 acres treated with prescribed burns.

True effectiveness monitoring has not been conducted in these treatment areas. However, informal observations do show that oak-hickory regeneration and survival is encouraged in treated stands.

### All-aged Hardwood and Pine/Hardwood Forest Habitat

The North American Landbird Conservation Plan (NALCP) highlights the fact that many declining bird species associated with mature forests require dense understory conditions. The NALCP notes that a decline in disturbance-generated mature forest structure is a key conservation issue in the Eastern Avifaunal Biome. During the first decade of Forest Plan implementation, the Wayne National Forest may treat up to 14,556 acres of hardwood and mixed hardwood forest with uneven-aged timber harvest methods to create structural diversity. It takes several entries into a stand, over many decades, to reach an all-aged condition.

<p><b>Objective 4.1c:</b> 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.</p>	<p><b>Monitoring Work Plan</b>  <b>Question #9:</b> How many acres of hardwood or hardwood/pine forest communities were treated to encourage the establishment of all-aged conditions?</p>
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### FY 11

There were 293 acres of hardwood thinning/selection harvest completed to improve structural diversity and help with the establishment of all-aged forest conditions.

### 2006-2011 Hardwood Hardwood/Pine Summary Report

There were 2,171 acres of hardwood thinning/selection harvest completed to improve structural diversity and help with the establishment of all-aged forest conditions.

### Early Successional Forest Habitat

Early successional forest is characterized by high stem densities of shrubs, seedlings and saplings. Repeated disturbances are required to maintain this habitat in the landscape. About

35% of all vertebrates native to the WNF use early successional forest habitat during their life cycle. The high density of shrubs, seedlings and saplings provide dense cover and soft mast for these species. The Forest Plan guides us to create approximately 1,725 acres of early successional forest habitat during the first decade of Forest Plan implementation.

<p><b>Objective 4.1d:</b> Create early successional hardwood or hardwood-pine habitat, interspersed within mid- and late-successional forest habitat to provide breeding habitat for shrubland-dependent species, and to increase production of wildlife foods such as soft and hard mast.</p>	<p><b>Monitoring Work Plan Question #10:</b> How many acres of early successional forest habitat were created?</p>
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### **FY11**

36 acres of Eastern white pine stands were clearcut, creating lowland early successional habitat. The objective of the treatment was to convert the non-native white pine stands to native hardwood species.

### **2006-2011 Early Successional Summary Report**

48 acres of Eastern white pine stands were clearcut, creating lowland early successional habitat. The objective of the treatment was to convert the non-native white pine stands to native hardwood species.

1,200 acres of primarily early successional acres were acquired on the Ironton ranger District through a land purchase from The Nature Conservancy in 2007.

### **Pine and Mixed Pine Forest Habitat**

Pine is a minor component of the overall forest landscape on the WNF. Native pine species include shortleaf pine, pitch pine, and Virginia pine; these species are most often found mixed with hardwoods or occur as small stands. Beginning in the 1930s, white pines were planted to stabilize eroding soils on abandoned farmlands and strip mines. While these white pine plantations occur across the Wayne, only the eastern part of the Marietta Unit is on the edge of the native range of the white pine.

The WNF estimates that 200 acres of native pine may be regenerated during the first decade of Forest Plan implementation.

<p><b>Objective 4.1e:</b> Regenerate existing native pine and pine-hardwood mixed communities.</p>	<p><b>Monitoring Work Plan Question #11:</b> How many acres of (native) pine or pine-hardwood communities were treated?</p>
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### **Both FY 11 and 2006-2011 Native Pine Summary**

No native pine or pine hardwood communities were treated.

**Objective 4.1f:** Annually, improve or maintain 5-10 percent of the existing grassland and grassland/shrub habitat acreage in the GFM management area.

**Monitoring Work Plan Question #12:** How many acres of grassland habitat were improved or maintained?

In 2011 approximately 120 acres of autumn olive and 10 acres of fescue were treated in the Peabody Area of the Athens Ranger District. On the Ironton Ranger District, field crews cut and sprayed the stumps of autumn olive in 62 acres in the Brady Run area. A total of 192 acres of grassland were improved in 2011.

### 2006-2011 Grassland Habitat Summary Report

Over the first half of the decade, most effort has been focused on treatments of autumn olive (NNIS) and prescribed burning of the Peabody/Meada Road area on the Athens Ranger District (Table 2.7). A majority of the autumn olive treatment was accomplished through American Recovery and Reinvestment Act (ARRA) funding and a partnership agreement with the Ruffed Grouse Society. Prescribed fire has been utilized as a tool to maintain habitat in the Meada Road area, but issues have developed regarding the spread of lespedeza. With the completion of the Openlands Assessment, a strategy for openlands management has been developed with three components: creation of new openlands (discussed below), maintenance of existing openings, and enhancement of grassland (reclaimed mineland). A project is being developed to address the various complex issues regarding these grasslands/reclaimed minelands. This project will likely involve enhancement of these areas to move them toward tall grass prairie/warm season grass conditions. Techniques will likely involve chemical treatment of lespedeza and fescue, burning to reduce lespedeza biomass and to maintain openings, disking to remove deep furrows, and seeding by various methods. Treatment will likely be costly per acre initially but will greatly improve habitat conditions for wildlife and improve the future maintenance of these areas as grassland habitat.

**Table 2.7 Grassland acres improved or maintained by year**

<b>YEAR</b>	<b>Autumn olive TREATMENT ACRES</b>	<b>Prescribed Fire ACRES</b>	<b>Conversion * ACRES</b>
2006	0	0	0
2007	0	188	0
2008	0	0	22
2009	400	229	0
2010	250	0	0
2011	182	0	10

\*Conversion from fescue/lespedeza to prairie conditions.

### Herbaceous-Shrub Habitat

Forest openings are periodically mowed or burned to maintain a mosaic of grasses, forbs and shrubs. These areas provide food and shelter to many animals, but some of these openings also contain rare plants or plant communities that require open conditions. Forest Plan direction is to create approximately 500 acres of herbaceous-shrub habitat during the first decade of the planning cycle. The Openlands Assessment was completed in 2010. Through this assessment

process, all existing openings were mapped across the forest and categorized by type. The four categories are early successional, reclaimed grasslands, artificial, and oak barrens. From the assessment, existing openland habitat on the forest totals approximately 6,650 acres, including grasslands (discussed above), which is approximately 31% of this total. On September 30, 2011 a decision memo was signed approving the forest-wide maintenance of 2,466 acres of existing wildlife openings through mechanical methods (addresses early successional category).

<p><b>Objective 4.1g:</b> Establish and maintain permanent forest openings on a variety of sites, including ridge tops, mid-slope benches, and valley bottoms, preferably where access by machinery is possible.</p>	<p><b>Monitoring Work Plan Question #13:</b> How many acres of herbaceous or herbaceous-shrub habitat were created?</p>
	<p><b>Monitoring Work Plan Question #14:</b> How many acres of herbaceous or herbaceous-shrub habitat were maintained?</p>

There were 388 acres of openings maintained by mechanical means to reduce woody encroachment and to retain the herbaceous-shrubby composition. This work was completed with an American Recovery and Reinvestment Act (ARRA) contract. Also in 2011, funds were obtained through the National Wild Turkey Federation (NWTf) state superfund and matching funds through the National forest foundation for maintenance activates in 2012.

Past monitoring reports have not fully captured all the maintenance activities occurring within existing openlands habitat. They account for activities within the early successional openlands category, since these are maintained by the Forest, under contract or through partnership with NWTf; however, maintenance activities in artificial openings have not been accounted for in the past. Artificial openings are those that fall under some type of permit or easement and make up approximately 1,407 acres (21%) of all openings on the forest. These openings consist of livestock allotments, hayfields, utility corridors, oil/gas wells, etc. Efforts need to occur to document the amount of maintenance occurring annually within our artificial openings.

### **2006-2011 Herbaceous-Shrub Habitat Summary**

#### *Creation of herbaceous or herbaceous-shrub habitat (permanent openings)*

From implementation of the Forest Plan in 2006 through 2011, no herbaceous or herbaceous-shrub habitat (i.e., permanent openings) have been created, although the Forest Plan direction is to create 500 acres of such habitat during the first decade. In fact, to meet the long-term habitat objectives, an estimated minimum of 1,444 acres actually needs to be created within the various management areas. (Note: this figure includes an additional 395 acres needed in the GFM management area). As identified in the Openlands Assessment, opportunities exist within specific management areas (such as FSM, GFM, and DCF) to create openings and improve wildlife habitat conditions, especially associated with the harvest and conversion of white pine plantations. During 2006-2011 time period, the Forest has not created additional herbaceous or herbaceous-shrub habitat.

#### *Maintenance of herbaceous or herbaceous-shrub habitat*

Table 2.8 displays the acres treated since 2006 within the early successional openlands category (exclusive of artificial openings). From 2006 through 2009, Ohio Department of Natural

Resources (ODNR) assisted in the maintenance of openings. A change in management emphasis by ODNR occurred, and they no longer assist with such activities on the WNF. To fill this void, ARRA funds were utilized to accomplish maintenance activities in 2011. Also in 2011, funds were obtained through the NWTF state superfund and matching funds through the National Forest Foundation for maintenance activities in 2012. The Openland assessment and subsequent decision determined the need to treat approximately 650-870 acres per year on a 3 to 4 year rotational basis (early successional category of openlands), exclusive of the maintenance needs for GFM grasslands or other grassland minelands. To accomplish this work, this program is highly dependent on partner participation, since US Forest Service NFWF budget allocations are not sufficient to support much maintenance. Funds from a stewardship contract have been used in one year to accomplish some treatment. Use of stewardship to accomplish the WNF openland habitat maintenance needs to occur. At this time partnership funds through NWTF have been secured for a portion of the maintenance activities in FY2013. As displayed (Table 2.8), a positive trend in accomplishing openland maintenance needs is occurring. Through the combination of partnerships, stewardship, and integrated funds (e.g., WFHF funds) the maintenance of both early successional and reclaimed grasslands can be achieved on a long-term basis.

**Table 2.8 Openland acres maintained by year**

YEAR	ACRES TREATED*
2006	343
2007	213
2008	187
2009	210
2010	151
2011	388

\*This value does not document acres maintained for artificial openings (see text).

### Waterholes and Wetlands

Upland wildlife species use upland waterholes and wetlands for drinking, feeding and breeding. Such areas are scattered across the Wayne National Forest. The Forest Plan guides us to restore or enhance 150 acres of wetland habitat and create 15 acres of waterhole habitat during the first decade of the planning cycle.

<b>Objective 3.1a:</b> Restore wetland habitat where wetland hydrology, soils, or vegetation have been modified by past land uses.	<b>Monitoring Work Plan Question #5:</b> How many acres of wetland habitat was restored or enhanced?
<b>Objective 3.1d:</b> Improve aquatic habitat in ponds and lakes.	<b>Monitoring Work Plan Question #6.3:</b> How many ponds or lakes were treated to improve aquatic habitat?
<b>Objective 4.1h:</b> Construct waterholes and ephemeral wetlands to supplement limited water sources, enhance local biodiversity, and enhance aquatic insect production.	<b>Monitoring Work Plan Question #15:</b> How many waterholes or ephemeral wetlands were constructed or enhanced?

Placing activities within certain categories can be subjective and up to some interpretation. For example the mowing of dikes and levees for wetlands, ponds, and lakes is a beneficial practice for ponds and wetlands. For past monitoring report these activities have been discussed but should not attributed to the total acres for Objectives 3.1a,4.1h, or 3.1d, since it is viewed that they would not truly restore or enhance wetlands or improve aquatic habitat, nor would they meet the intent of what was envisioned under the Forest Plan, though this interpretation could be argued.

Within the Forest Plan, general size ranges for waterholes are defined as 0.1-0.25 acres, while small lakes range 2-25 acres. Ponds are not defined, but it is assumed they would range 0.25-2 acres in size, for the monitoring report, beaver ponds are being categorized as wetlands.

#### **FY 11**

A total of 11.4 acres of habitat were constructed or enhanced as a part of 4 abandoned mine land projects this year. At Upstream Rock Run, locate on the Athens District a stagnant pool that was contributing to the production of AMD was removed, the valley was re-contoured to meet the watershed restoration goal of reestablishing positive surface flow, and a 3-acre lake was created to provide high-quality habitat as well as recreational opportunities for Forest visitors. In addition, several shallow depressions were created upstream to provide fishless ephemeral pools for amphibian breeding habitat. At the Lost Run Headwaters project, students from Hocking College heavy equipment classes benefitted from an opportunity to learn in a real-life situation while contributing to aquatic habitat creation. As a part of the larger project, a 1.5 acre pond was constructed to act as a feeder pond to steel slag beds that will help treat AMD and improve stream habitat downstream. Before the pond was even completely finished, frogs were chorusing at the site. A series of ponds were created at the Rock Run site to act as an AMD filtration system, and water in the last pond before it runs back into the creek should double as amphibian breeding habitat. At 2 sites in East Branch of Raccoon Creek located on the Athens District, ponds were created to act as feeders to AMD treatment systems, but with a few minor design changes, they will double as amphibian breeding habitat as well. At the East Branch-Kern Road site, we also decided to retain a beaver-created pond/wetland and shore up the dam to ensure longevity of this aquatic resource. At East Branch-Winifred, 2 sediment ponds on the edge of an old "valley fill" stripmine reclamation site were contributing to AMD production. One was eliminated but rebuilt in a better location where run-off would not contribute to AMD production, and the other was reconstructed and enlarged. State partners at the ODNR Division of Mineral Resources Management were the main proponents at the East Branch and Upstream Rock Run sites and willingly modified designs to contribute to the improvement of habitat for the benefit of wildlife.

On the Athens District at Utah Ridge pond, cattails had taken over this 1 acre pond making it nearly impossible for anglers to fish. The project was to deepen two-thirds of the pond shoreline in order to curtail cattail growth. A fishing pier was also constructed in the pond for added fishing access (Figure 2.12).



**Figure 2.12** New fishing pier installed at Utah Ridge Pond on the Athens Ranger District.

At Lake Vesuvius on the Ironton District fish habitat was improved by using bundled Christmas trees and cinderblocks, that were dumped overboard from a boat. Approximately 2 acres of lake habitat was improved through this effort.

A water control structure was placed in the Big Bailey wetland on the Athens Ranger District several years ago in response to the County Engineers fear that the wetland posed a threat to the adjacent County road. Since that time it has been a battle with beavers in keeping the structure unobstructed. The original structure was removed and a new control feature was placed and repositioned in a way to deter plugging by beaver.

### **2006-2011 Waterholes and Wetlands Summary**

#### *Restored and Enhanced Wetlands*

The following projects restored or enhanced wetland habitat: Big Bailey water control structure (8 acres); East Branch-Kern Road beaver pond dam improvement (3 acres); Snake Hollow project beaver pond dam improvement (25 acres); Whitaker Wetland tree planting, 500 saplings (25 acres); Superior Wetland levee breach repair (60 acres).

#### *Construct or Enhance Waterholes and Ephemeral Wetlands*

The following projects enhanced or constructed waterholes or ephemeral wetland habitat: Wharton Abandoned Mine Land project, 3 small waterholes (0.1 acre in total); Snake Hollow and Lost Run, 3 small waterholes and 6 simulated road ruts (0.1 acre in total); and Brush Fork pond improvement (0.1 acres).

### *Improve Lakes and Pond Habitat*

Activities such as felling of trees into a pond or lake, placement of Christmas trees (or other similar types of fish habitat enhancement), and dam repair and reconstruction, will be counted as the improvement of aquatic habitat in lakes and ponds. Activities such as mowing have been documented in past monitoring reports, but for this report, they have been excluded.

The following projects improved lake and pond habitat: 200 trees placed in Timbre Ridge Lake (5 acre); Hanging Rock shoreline tree felling in 5 ponds (1.2 acres); Timbre Ridge Lake artificial reef improvement (in 5 areas), placement of bundled Christmas trees, and Hanging Rock tree felling (1.7 acres); Timbre Ridge Lake tree felling (23 trees; 2.8 acres), Utah Ridge Pond cattail removal and dam repair (1 acre); East Branch-Winfred acid mine drainage sediment ponds (2 ponds: one relocated, one reconstructed; 3.4 acres); East Branch dam repair (0.5 acres); East Branch pond creation (3; 1.08 acres); and Lake Vesuvius Christmas tree placement (2 acres).



**Figure 2.13. Simulated road rut for bats foraging/drinking habitat and for amphibian reproductive habitat in the Snake Hollow project area.**

### *Constructed Fish Ponds/Lakes*

The following projects included construction of fishing ponds/lakes: Upstream Rock Run Lake (3 acres; Figure 2.14).

The following projects constructed ponds but the *intent was not for fishing*: Lost Run, freshwater feeder pond to steel slag beds (1.5 acres); Rock Run acid mine drainage filtration system, including 4-5 ponds (~ 2 acres) with the last pond providing fresh water (0.5 acres); and East Branch Raccoon Creek, 2 freshwater feeder ponds (3.4 acres).



**Figure 2.14** Upstream Rock Run, newly-constructed fishing lake (spring 2011), located between New Straitsville and Shawnee, Perry County, Ohio.

#### Artificial Nesting Structures

There are several cavity-dependent species that reside on the Wayne National Forest during some part of the year. Some species, like woodpeckers, excavate cavities for nesting purposes. Other species, like the prothonotary warbler or wood duck, rely on naturally occurring cavities or those that have been excavated previously. There are no quantified objectives in the Forest Plan for the number of structures to install on the WNF during this planning period. However, work often occurs with volunteer youth groups (e.g., scout groups) to install and maintain various types of wildlife boxes to increase the cavity habitat in certain areas. By doing so, kids are provided the opportunity to be outdoors and learn about wildlife resources.

**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.

**Monitoring Work Plan Question #16:** How many artificial nesting structures were installed?

In 2011, a Hocking College student constructed approximately 16 wood duck and owl boxes as part of an internship. These boxes were not installed in 2011 but are planned to be installed

along the Little Muskingum River.

### 2006-2011 Artificial Nesting Structures Summary

As specified previously, there are no quantified objectives in the Forest Plan for the number of structures to install during this planning period. The important factor is to assess where effort has occurred and where effort needs to occur to address various habitat or species needs. Biologists need to continue to assess habitat conditions and determine needs on a case-by-case basis. Table 2.9 displays the variety of structures occurring on the Forest. Efforts need to be made to continue working with various volunteers and groups to provide improved roosting and nesting opportunities across the Forest.

**Table 2.9 Nesting and roosting structures installed, constructed, and maintained on Wayne National Forest from 2006-2011.**

Bat Roosting Structures	Constructed Owl Boxes	Constructed Wood duck boxes	Constructed bluebird boxes	Maintained boxes
2 condos installed 20 rocket boxes constructed	6	6	45*	≥ 56

\*Assumes 25 boxes were constructed by scouts.

## 5 – Endangered, Threatened and Sensitive Species

### Goal 5.1 – Recover Federally Listed Threatened and Endangered species

#### Indiana Bat (Endangered)

Indiana bats were listed as a federally endangered species in 1967. This species is present on the WNF year round. Inventory and monitoring efforts have been conducted on the WNF since 1997, when Indiana bats were first documented here.

A variety of monitoring efforts for Indiana bats are undertaken annually or as needed. Certain prescriptions for Management Areas in the Forest Plan were developed, in part, to provide habitat conditions beneficial for Indiana bats, especially these areas: Diverse Continuous Forest (DCF), DCF with OHV use, Historic Forest (HF), and HF with OHV use (see Forest Plan, Appendix D). In accordance with the Conservation Plan for federally listed species (Forest Plan, Appendix D), the WNF is responsible for a number of activities to conserve and protect Indiana bats and their habitat: provide administrative, technical, and project-specific information to USFWS, conduct inventory, analysis, and monitoring in cooperation with partners, provide education and awareness training about biology and habitat requirements to key employees, require adherence to specific standards and guidelines for all projects, and as a measure of the progression of activities covered under the Forest Plan, monitor the cumulative acreage of specific management activities implemented under the Forest Plan along with Indiana bat populations and habitat use on the Forest. The following is a description of those activities.



**Indiana bat (*Myotis sodalis*) captured during a fall swarming survey at a mine opening on the WNF.**

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

<p><b>Objective 5.1.1a:</b> If additional Indiana bat hibernacula are discovered on NFS land, install bat-friendly gates to prevent unauthorized entry.</p>	<p><b>Monitoring Work Plan Question #17:</b> How many acres of potentially suitable Indiana bat habitat were protected or improved?</p>
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**2006-2011 Bat Habitat Protection or Improvement Summary**

Since 2006, a variety of timber harvest, timber stand improvement techniques, and fire have been used to improve forest composition, health, and vitality, all of which can improve Indiana bat summer roosting and foraging habitat. From 2006-2011, there were 5,527 ac of timber treatments and 4,764 ac of prescribed fire that improved Indiana bat habitat, including:

- There were 2,171 acres of thinning (primarily even-aged) treatments and single tree selection (primarily all-aged) treatments are used to reduce basal areas of respective hardwood forest blocks down to 60-70 square feet. The overall effect after one such treatment is the opening of the canopy and increased tree vigor and forest health. Designated leave trees were those that possessed currently suitable Indiana bat roosting habitat and trees that could recruit into future roost habitat. Improved stand conditions help to minimize adverse impacts from insects and disease (especially gypsy moth), and to improve conditions for developing future oak and hickory regeneration. Such treatments also created slightly more open stands that could benefit foraging bats in the short term. Also included are white pine plantation thinning that enable hardwoods to seed in and help move the stand toward a hardwood condition, which represents long-term recruitment of suitable habitat for Indiana bats.
- 48 acres of white pine plantation removal will provide suitable bottomland hardwood habitat to Indiana bats in the long term by allowing native species regeneration and/or by planting native trees, especially in riparian areas.
- There were 3,308 acres of timber stand improvement, including mid-canopy removal (or control) and crop tree release, has a primary objective to aid in oak and hickory forest restoration. Mid-canopy removal mainly involves removal of non-commercial-sized (3-8" dbh) oak competitors, such as maple to improve oak and hickory mid- and overstory growth. Crop tree release improves stands by entering 20-30 year old stands and releasing oak and hickory saplings by killing competing vegetation. These are both long-term improvements to Indiana bat habitat by providing for future preferred oak and hickory habitat.
- Prescribed burning was also a treatment to contribute to the ability to regenerate oaks and hickories. These are important habitat components to Indiana bats, due to the reduction the less fire-resistant species and preparing better seedbeds. The areas and number of acres that received treatment are as follows; (22 ac in 2006; 564 acres in Gore-Greendale on Athens Unit and Young's Branch Special Area on Ironton District in 2007; 2,554 ac in 2009; 1,541 ac in 2010; 383 ac in 2011).

Of the total prescribed burning conducted 2006-2011 on the Wayne NF that likely improves Indiana bat habitat, 3,371 ac were in Historic Forest (with and without OHV use), 853 ac were in

Diverse Continuous Forest with OHV, and 518 ac were in Young's Branch Special Area, consisting of mixed mesophytic forest. Historic Forest and Diverse Continuous Forest were the Management Areas that were developed, in part, to provide habitat conditions beneficial for Indiana bats. Acres reported previously in Wayne NF monitoring reports may be inconsistent with these reported here due to reporting errors or because they included acres for grassland burns, which are not counted towards Indiana bat habitat improvement acres.

Under Historic Forest management prescriptions, the forest is moved toward the historic range of variability over time using mostly uneven-aged management techniques and frequent prescribed fire. The burn plans for Historic Forest areas specify repeated burning over 3-5 year intervals to bring the habitat conditions more in-line with historic conditions (i.e., large, widely spaced trees, especially oak and hickory, with a sparse mid-canopy layer), which are thought to have been ideal for Indiana bat foraging and roosting habitat. Ideally, mid-canopy control treatments (timber stand improvement) are implemented first, resulting in overstory growth over a period of several years. Then forest blocks are burned at intervals, which helps knock back the understory and oak competitors and further encourages overstory growth, resulting in the desired future condition described in the Forest Plan. These steps may be completed in various orders with a similar outcome. In the Baileys (Athens District Historic Forest area), several iterations of prescribed fire have already been implemented with a dramatic change in understory composition occurring in favor of fire-adapted species (e.g., oak). In some places, where red maple was the dominant understory tree species beneath the oak canopy, oaks are now the most prevalent. However, prescribed fire, as implemented on the Wayne NF, does not affect overstory or mid-canopy tree composition. Future direction for this area will include timber stand improvement and commercial harvesting to reach the desired future condition for this management area. Pine Creek (Ironton District Historic Forest area) has used single-tree and group selection cuts in hardwood stands, as well as timber stand improvement techniques and prescribed fire, and used them in various combinations. Overall, this has resulted in increased light reaching the forest floor and the regeneration of a fire-adapted understory community, as desired. These steps across Historic Forest management across the Wayne NF provide currently suitable Indiana bat roosting and foraging habitat and ensures that they will also be available in the future.

Diverse Continuous Forest (DCF) should be characterized by mature forest containing a lot of species, habitat, and structural diversity, including shrubby or herbaceous wildlife openings on peripheries of forest blocks, varied canopy closure providing a range of mid-canopy densities, and well-distributed older trees and snags. This management area relies more on timber prescriptions (primarily uneven-aged management, such as single tree or group selection) than prescribed fire to create suitable Indiana bat habitat conditions, and fire is intended to be used occasionally, mainly to perpetuate oak and hickory species on ridges and drier slopes, on the periphery of the management area. The Gore-Greendale project area (Athens District DCF area) is the only area across the Forest thus far treated in this management area. In general, treatments in these areas will result in short-term habitat improvement for Indiana bats by opening up the mid-canopy and/or creating small forest gaps, useful for foraging and potentially finding roost trees. However, over time, the management prescriptions will result in an all-aged, multi-layered structure (i.e., cluttered) habitat that is not likely to be ideal Indiana bat habitat overall.

To put this all in perspective, on the current trajectory, the Forest is accomplishing less than half of acres projected to be created for all-aged hardwood for the decade (i.e., treatments that should primarily occur in the Historic Forest and DCF areas). This has ramifications for Indiana bats. With approximately 5 years remaining under the forest plan for the first decade, efforts should be made to increase uneven-aged harvest to create all-aged forest conditions to improve habitat for Indiana bats. From 2006-2011, only 4,764 acres have been burned, including re-treated acres. This equals only about 10% of planned burn acres within the decade (assuming the total included re-treatments) and has ramifications for various species of wildlife that depend on oak forests, including Indiana bats.

<b>Objective 5.1.1a:</b> If additional Indiana bat hibernacula are discovered on NFS land, install bat-friendly gates to prevent unauthorized entry.	<b>Monitoring Work Plan Question #18:</b> How many bat-friendly gates were installed on known Indiana bat hibernacula?
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The Forest Plan states 20-30 bat-friendly gates will be installed on open underground mine portals during the first decade of implementation. There have not been any new Indiana bat hibernacula identified; therefore no bat-friendly gates were installed on known Indiana bat hibernacula or any other mine openings in FY 2011. The only known Indiana bat hibernaculum was gated (2 side-by-side openings) in 2001. Various other non-Indiana bat mines have been closed with bat-friendly gates on both districts since 2001.

### **2006-2011 Bat-Friendly Gate Installation Summary**

Since 2006, 4 bat-friendly gates were installed on the Athens Unit of the Athens Ranger District (Elm Rock Rd, 2 at Goose Run, and Carbon Hill), mainly to address human safety concerns, while none have been installed on the Ironton Ranger District. Installation of an additional 16-26 gates within the next 5 years seems unlikely at the current rate, and is due to intentional choices. Decisions have been made to deliberately leave some mine openings in project areas ungated that have bat activity present but have a low risk of visitation/vandalism. Additionally, the emphasis of the abandoned mineland program was focused on acid mine drainage source control but is currently shifting back towards safety closures. Thus, gate installations may increase substantially in the next few years.

### **Fall Swarming Surveys/Monitoring**

Forest Service biologists conduct fall swarming surveys for pre-project monitoring of mine openings and to continue long-term monitoring of bat activity at mine openings affected by watershed restoration projects. Five mine openings on the Athens Unit were actively monitored (presence/absence surveys using ultrasonic detectors) in September 2011; 2 were pre-project monitoring and 3 were post-project evaluations. Due to White-Nose Syndrome (WNS) concerns of handling bats that may have been migrating and swarming at various mines and caves, surveys were restricted to detector and observation-only surveys this year. This level of effort is sufficient to document the degree of bat use of mine openings, but it cannot determine individual species use. Bat species documented using abandoned mine openings for fall swarming on the WNF include (in order of past prevalence) little brown bats, tri-colored bats, northern bats, Indiana bats, evening, and red bats. Weather conditions (rain and wind) throughout much of

September (fall swarming period) were problematic for bat surveys this year and limited the number that could be completed.

### 2006-2011 Indiana Bat Summer & Fall Swarming Survey Summary

Summer surveys on all units of the WNF were conducted over a period of years to document the extent of Indiana bats summer habitat use. From 1997-2003, 16 Indiana bats were recorded on or near the WNF. Since implementation of the revised Forest Plan, mist net surveys were conducted on the Ironton Ranger District in 2 summers, targeting a future project area (Pine Creek) and prime potential maternity habitat (mainly headwater streams of large lakes). No Indiana bats were documented, but 7 other species of bats were captured (northern, tri-colored, big brown, red, hoary, little brown, and silver-haired bats).

Fall swarming surveys have been conducted at abandoned coal and limestone mine openings on the Athens Unit, Athens Ranger District, and Ironton Ranger District since 1998 or before. There are few underground mine features on the Marietta Unit, Athens Ranger District, so no fall bat survey work has been done here. From 1998-2004, 5 Indiana bats were documented across the WNF. Since implementation of the revised Forest Plan, more than 120 bat-accessible underground mine openings have been evaluated for potential Indiana bat fall swarming and/or winter hibernation habitat. Many have been monitored during the fall swarming period (generally September) to evaluate the level of bat use to help determine the course of associated project work (i.e., whether they should be permanently closed, gated, or maintained open) and to evaluate effects on bat-use post-project (Table 2.10). Post-project surveys are conducted at the same sites repeatedly across years (mainly on the Athens Unit of the Athens Ranger District). Monitoring was achieved either as a presence/absence survey with ultrasonic detectors and/or observation or as a hands-on survey using a harp trap, mist net, or both.

Year	Total nights sampled	# Sites - Athens Unit	Indiana bats captured – Athens	# Sites - Ironton District	Indiana bats captured – Ironton	Notes
2006	23	6		14	2 males	3 Ironton sites surveyed 2x each
2007	13	11				2 Athens sites surveyed 2x each
2008	9	9	1 male 1 female			
2009	14	8		6		
2010	9	9	1 male			6 banded bats recaptured at same sites as previous
2011	5	5				
Total	73	48	3	20	2	

Long-term monitoring of mine openings around which watershed reclamation projects were completed generally show upward trends in bat activity during fall swarming surveys (Table 2.11). At sites where the mine opening was maintained open, such as by diverting surface water around or past the opening, the work seems to generally improve bat habitat use. Those sites that were gated (Elm Rock Road and Goose Run) had an initial drop in bat activity after gating. However, higher activity levels resumed after a couple of years, presumably as the bats became habituated to the novelty of the gates.

<b>Table 2.11 Summary of long-term fall monitoring of abandoned coal mine openings affected by watershed reclamation projects on the Athens Ranger District of the Wayne National Forest, 2000-2011.</b>											
Location	Date	Overall Bat Activity*	Survey Type (Trap, Detector, or Both)	Survey Length (hour)	Total Bats Captured	Captures per Hour	Species				
							Little Brown	Northern	Indiana	Tri-color	Evening
<b>Brush Fork Subsidence-1 (project in 2010)</b>											
	09/10/07	High	Both	4.5	71	15.8	52	5		13	1
	09/11/08	High	Both	5.5	66	12.0	32	14		19	
	09/22/09	High	Both	5	77	15.4	48	7		22	
	09/08/10	High	Both	4.75	82	17.3	47	27	1	5	2
	09/20/11	Med	Detector	4.5	-	-					
<b>Brush Fork Subsidence-2 (project in 2010)</b>											
	09/04/08	Med	Both	5	16	3.2	16	6		6	
	09/11/08	Low	Both	6	8	1.3	1	1		5	
	09/08/10	Lo-Med	Detector	3	-	-					
	9/20/11	Low	Detector	3.25	-	-					
<b>Elm Rock Rd (gated in 2006)</b>											
	09/14/00	Med	Detector	1	-						
	10/03/02	Med	Both	4	8	2.0	2	1		5	
	08/25/06	Low	Both	3.25	2	0.6	1	1			
	09/13/07	Low	Detector	4	-						
	09/05/08	Low	Detector	4.5	-						
	09/08/09	Med	Both	4.5	9	2.0	4	2		3	
	09/03/10	High	Both	5	21	4.2	11	10			
<b>Goose Run-1 (gated in 2006)</b>											
	09/18/02	Low	Detector	1.5	-						
	09/15/06	Low	Both	2.75	1	0.4	1				
	09/12/07	Med	Detector	4	-						
	09/08/08	High	Detector	4.5	-						
	09/23/09	High	Both	5.5	35	6.4	15	10		10	
	09/10/10	Med	Both	5	9	1.8	4	3		2	
<b>Monkey Hollow-21 (project in 2006; new opening discovered)</b>											
	09/11/04	Med	Both	5	9	1.8	4	2		3	
	09/13/04	Med	Both	5.25	13	2.5	2	4		7	
	10/01/04	Low	Both	5.5	2	0.4		1		1	
	09/11/06	Med	Both	3.5	15	4.3	10	2		3	
	09/07/07	Med	Both	4	15	3.8	11	4			
	09/15/08	High	Both	5	47	9.4	36	4	2	5	
	09/09/09	High	Both	5	47	9.4	27	7		13	
	09/09/10	High	Both	5	64	12.8	51	9		4	
<b>Monkey Hollow-1010C (project in 2006)</b>											
	08/29/05	High	Both	5	48	9.6	12	12		24	
	09/06/05	High	Both	5	38	7.6	13	10		15	
	08/30/06	High	Both	3.5	14	4.0	7	3		4	
	09/13/06	Low	Both	2.5	3	1.2	2	1			

09/11/07	Med	Both	3	15	5.0	8	3		4	
09/19/07	High	Both	5	23	4.6	8	3		12	
09/02/08	High	Both	5	61	12.2	7	16		37	
09/24/09	Med-Hi <sup>^</sup>	Both	2.5	16	6.4	16				
09/03/10	High	Both	5	54	10.8	17	11		26	
New Straitsville South-1035 (Project in 2010)										
09/03/08	High	Both	5	59	11.8	18	25		16	
09/07/10	Med <sup>^</sup>	Both	5	19	3.8	12	5		2	
9/14/11	Med <sup>^</sup>	Detector	3	-	-					
9/27/11	Med	Detector	5.25	-	-					
Snake Hollow-19 & 20 (project in vicinity in 2005)										
09/11/02	Low	Both	4.25	5	1.2	4	1			
09/12/02	Low	Both	4	7	1.8	4	1	1	1	
09/27/05	Low	Detector	2	-						
08/31/06	Med	Both	2.25	10	4.4	2			8	
09/04/07	Med	Both	5	18	3.6	3	5		10	
09/09/08	High	Both	5	28	5.6	16	6		6	
09/10/09	High	Both	5	26	5.2	13	7		6	
09/14/10	High	Both	5	25	5.0	17	6		2	
*Overall Bat Activity (Captures and Detector): Low = 1-10 bats; Medium = 10-25 bats; and High = 25+ bats <sup>^</sup> Rain and/or short survey length may have had a negative effect on overall bat activity recorded.										

### Hibernaculum Monitoring (Censuses)

A biennial census for Indiana bats was conducted on 10 February 2011 at an abandoned limestone mine (“Woody”) located in the Ironton Ranger District of the Wayne National Forest, Lawrence County, Ohio. Of 1,334 total bats counted, 276 were Indiana bats, 916 were little brown bats, 134 were tri-colored bats, 3 were big brown bats, 1 was a northern (-long-eared) bat, and 4 were unidentified.

Three banded bats were examined during this census. Two female Indiana bats in the Indiana Bat Room were determined to have been banded at a maternity colony in Franklin County, Ohio, one in 2009 and one in 2010. Additionally, one female little brown bat, which was banded along with 18 others in the hibernaculum in March 2010 during collection of samples for a White-nose Syndrome (WNS) study, was found in nearly the same location as last year.

This year’s total count for Indiana bats (276) is within the range of previous censuses. The largest pure Indiana bat cluster for 2011 was 163 bats (vs. 125 in 2009, 114 in 2007 and 140 in 2005). Indiana and little brown bats were clustered together in several places in the Indiana Bat Room where they are regularly found. The largest combined cluster was 112 bats (3 Indianas and 109 little browns). The next largest Indiana bat cluster had 78 Indiana bats and 10 little browns. In a few places, Indiana bats were found hanging singly. Little brown bat clusters varied from 2-68 bats, not including those mentioned previously.

Outside ambient temperature was about 34°F during the 2011 census. The surface temperature was 30°F in the Indiana Bat Room, where 63% of hibernating bats (mainly Indiana and little brown bats) were located and it is typically the coolest area in the accessible part of the mine. Studies suggest that optimal temperatures for hibernating Indiana bats are somewhere in the

range of 37-46°F (3-8°C). In 2007, when overall mine temperatures appeared to be higher than usual, 85% of bats counted were here with a surface temperature of nearly 43°F.

### **White-Nose Syndrome Monitoring**

Although regular external surveys at the mine entrance throughout the winter did not document any signs of abnormal bat behavior or other signs of WNS in the hibernaculum, closer inspection revealed the Lawrence Co. mine to be affected by WNS in 2011. During the 2011 census, bats seemed to be hibernating normally and in the usual locations, except for 2 bats that were noted behaving slightly abnormally. One bat, a little brown, had suspicious-looking lesions on the forearms, but we were unable to capture it. The other individual was an Indiana bat that was hanging oddly and looked underweight. A fungal tape lift was performed on its forearm, but the test subsequently came back negative for any fungus. No dead bats were found, and no fungus on any bats was observed. However, it was enough evidence for concern, so a second visit was made on 18 March 2011 to look for any signs of WNS. Only the entrance passages and the Indiana Bat Room were revisited and no counts were made.

Everything in the Indiana Bat Room looked normal, but on close inspection, some of the bats had stereotypical white muzzles that are associated with WNS. A fungal tape lift from the muzzle of an Indiana bat subsequently tested positive for *Geomyces destructans*, the fungus responsible for WNS. Two little brown bats with obvious fungal growth were submitted, and histopathology tested positive for WNS on one bat. We only observed 1 or 2 Indiana bats with white muzzles, but perhaps 15% of observed little brown bats in Area 3 had visible white fungus, and many were roosting in close association with Indiana bats. We did not examine the rest of the mine and do not know if or what percentage of bats in other parts of the mine were also afflicted. No bat mortality was observed. However, this represented the first confirmation of WNS in Ohio, and it is thought to be a relatively early detection of the disease at the site.

### **2006-2011 Indiana Bat Census & WNS Summary**

There is one known Indiana bat hibernaculum on the WNF in Lawrence Co. on the Ironton Ranger District, sometimes referred to as the Woody Mine. Indiana bat use was first discovered in the fall of 1998 and hibernation confirmed in 1999. It was gated with a bat-friendly design in 2001. It is recognized as a P3 hibernaculum (i.e., 50-1,000 Indiana bats). The numbers of bats present in any given year varies and depends on ambient weather and other factors. There are many mine openings (both limestone and coal) across the WNF that likely provide habitat to hibernating bats but that are not safe for people to enter and evaluate for bat use, so they may never be documented. Therefore, locations documented with substantial fall swarming activity are protected as if they may be an Indiana bat hibernaculum.

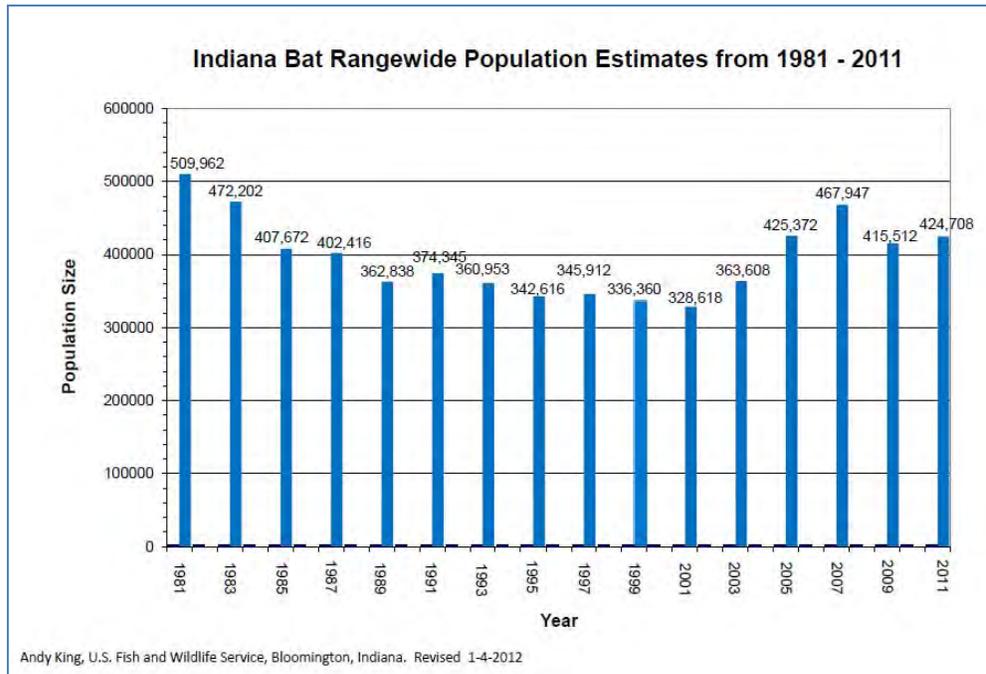
A mid-winter hibernation survey (15 Jan to 15 Feb) conducted every other year is the standard method to determine Indiana bat population estimates from across the species' range. Beginning in 2003, biennial censuses of all bat species have been conducted at the Lawrence County mine. Little brown bats have always been the most common species present with up to 1,344 individuals counted in one year and representing 53-80% of all bats (Table 2.12). Indiana bats are the second most common and represent from 13 to 37% of bats present at the site. Tri-colored bats tend to be a distant third while big brown bats and northern bats are usually only detected in small numbers (usually fewer than 10).

**Table 2.12 Biennial bat census counts and percent of each species by year for a gated abandoned limestone ("Woody") mine on Ironton Ranger District of the Wayne National Forest in Lawrence County, Ohio.**

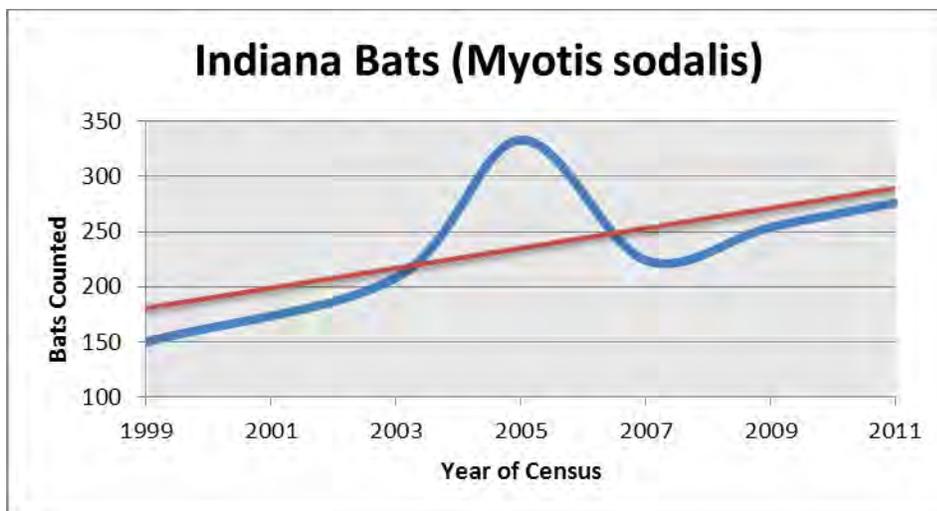
Species	2003	%	2005	%	2007	%	2009	%	2011	%
<i>Myotis lucifugus</i> Little brown	299	53.1	704	64.6	1344	79.8	593	60.4	916	68.7
<i>Myotis sodalis</i> Indiana	208	36.9	333	30.6	224	13.3	254	25.9	276	20.7
<i>Perimyotis subflavus</i> * Tri-colored	38	6.7	40	3.7	99	5.9	129	13.1	134	10.0
<i>Eptesicus fuscus</i> Big brown	5	0.9	6	0.6	6	0.4	3	0.3	3	0.2
<i>Myotis septentrionalis</i> Northern	0	0.0	3	0.3	11	0.7	2	0.2	1	0.1
Flying/Unidentified	13	2.3	3	0.3	0	0.0	0	0.0	4	0.3
<b>TOTAL BATS</b>	<b>563</b>	<b>100.0</b>	<b>1089</b>	<b>100.0</b>	<b>1684</b>	<b>100.0</b>	<b>981</b>	<b>100.0</b>	<b>1334</b>	<b>100.0</b>

\*formerly *Pipistrellus subflavus*

Indiana bat numbers were about 17% lower in 2011 than the all-time high (333) recorded in 2005 but 84% higher than the first census in 1999, which recorded 150 Indiana bats. Indiana bats were thought to be on an upward trend across the species' range (Figure 2.15) and on the WNF (Figure 2.16) before WNS was discovered. Although no mortality from WNS has been observed to-date, Indiana bats and other susceptible species are expected to decline, based on observations over the last 5 years in the northeast USA.



**Figure 2.15**  
Rangewide population estimates for Indiana bats suggested modest population recovery until the onset of White-Nose Syndrome mortality (noticeable in 2009). From the recent high in 2007 (pre-WNS mortality) to 2011, an overall decline of 9.2% was documented and at least partially attributed to WNS mortality.



**Figure 2.16 Biennial census trend analysis for Indiana bats at the Lawrence County (Woody) Mine on the Ironton Ranger District, Wayne National Forest for 1999-2011.**

Our overall efforts to monitor bats will likely need to expand beyond single-species Indiana bat monitoring in the future, due to the onset of WNS. Little brown, northern, and tri-colored bats have all been added to the Regional Forester Sensitive Species list across Region 9, due to their apparent susceptibility to WNS.

### **Hibernaculum Monitoring (Dataloggers)**

Dataloggers to monitor temperature year round were installed in the Indiana bat hibernaculum (Woody Mine) in 2004 and 2006. The purpose for such monitoring is to determine correlations between temperature and bat use of certain areas, including temperature ranges available and rates of fluctuation. Sudden changes in temperatures could also indicate alterations in the mine environment, such as a collapse that changes internal air flow patterns, which, in turn, could change where bats choose to hibernate.

Under normal circumstances we monitor 4 locations at the hibernaculum site: 1 site is outside on a tree beyond the influence of airflow from the mine opening, and 3 sites are inside the mine, including near the entrance (experiences larger temperature fluctuations), in the Indiana Bat Room, and in the main mine passage away from the influence of the entrance (Right Passage). In some years, we have experienced logger failure; thus, 2 types of loggers (Hobo and Logtag) are now used to help ensure successful data collection in each area, but total logger failure still occurs sometimes.

Biologists entered the mine in August 2011 with an Ohio mine inspector to retrieve the data collected on dataloggers throughout the past year. Unfortunately, dataloggers in 2 locations failed, so only those where we collected data this year (2 sites) are included in Table 2.13 See additional explanation about the importance of mine temperatures in the following summary.

<b>Annual</b>	<b>Right Passage</b>	<b>Outside</b>
Maximum Temperature (°F)	49.7	89.5
Minimum Temperature (°F)	34.1	6.6
Mean Temperature (°F)	44.4	54.9
<b>Mid-winter (1 Dec – 31 Mar)</b>	<b>Right Passage</b>	<b>Outside</b>
Maximum Temperature (°F)	45.4	76.6
Minimum Temperature (°F)	34.1	6.6
Mean Temperature (°F)	38.9	35.0

### 2006-2011 Hibernaculum Datalogger Summary

The temperatures inside the mine are expected to remain more stable over the year than the outside ambient temperature, due to the insulating effect of the underground environment. This is important to bats during winter to provide semi-stable cold temperatures to facilitate hibernation. Under normal circumstances, most species do not hibernate near the entrance, due to greater temperature fluctuations associated with the proximity to the outside.

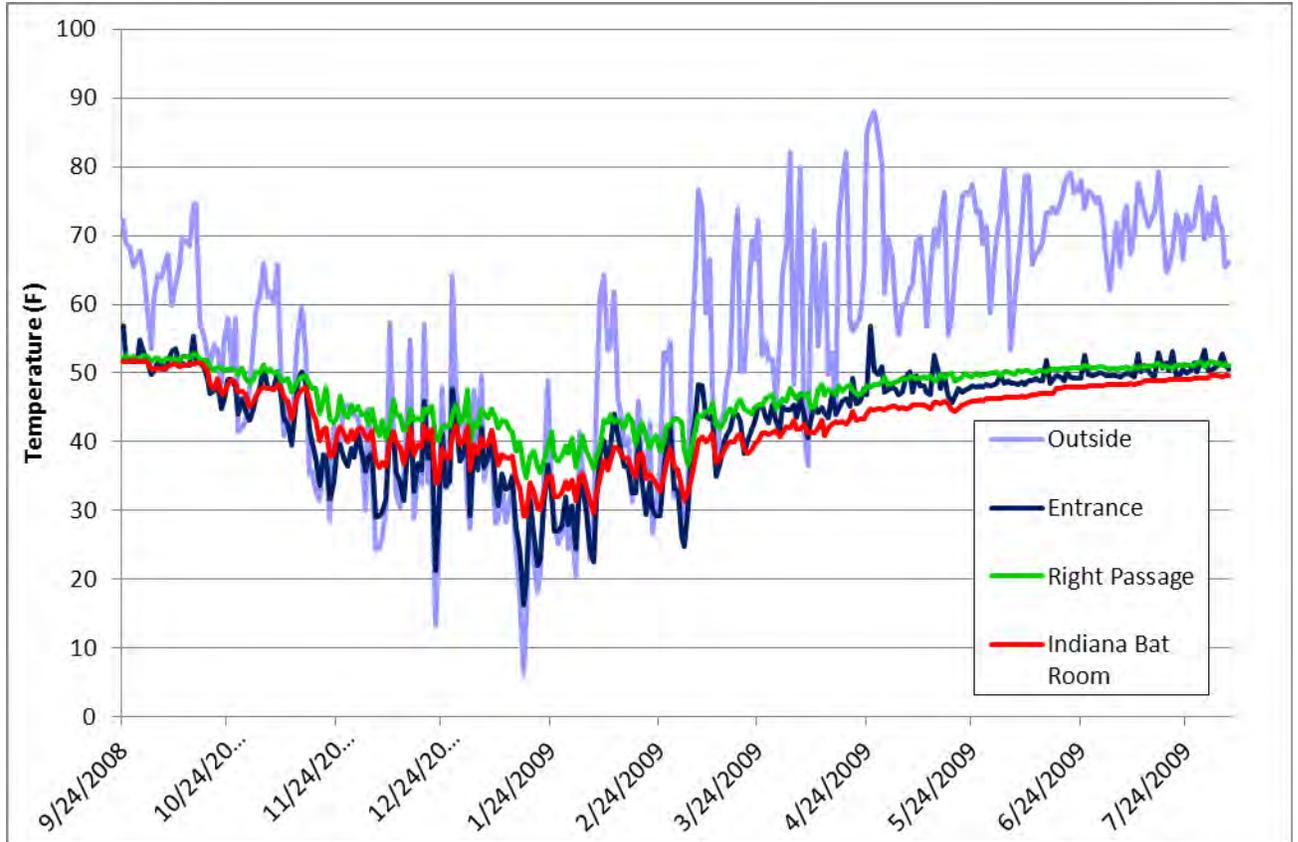
Table 2.14 shows a comparison of mean temperatures at the different monitoring locations across years. The temperatures near the Entrance of the mine are expected to fluctuate more widely compared to the Right Passage and Indiana Bat Room, due to the direct contact with the outside ambient weather conditions.

<b>Annual</b>	<b>Outside Tree</b>	<b>Entrance</b>	<b>Right Passage</b>	<b>Indiana Bat Room</b>	<b>Max T</b>	<b>Min T</b>
2005-2006	54.0	-	45.1	44.9	52.5	31.7
2006-2007	57.2	46.6	47.6	44.9	52.5	28.5
2007-2008	54.2	45.2	46.9	44.2	51.9	28.9
2008-2009	50.8	43.1	47.1	43.1	51.8	27.4
2009-2010	-	45.3	44.2	-	-	-
2010-2011	54.9	-	44.4	-	-	-
Average	54.2	45.1	45.9	44.3	52.2	29.1
<b>Winter (1 Dec – 31 Mar)</b>						
2005-2006	38.5	-	40.7	40.0	43.9	31.7
2006-2007	41.3	38.5	43.1	39.9	47.5	28.5
2007-2008	38.2	37.4	42.4	39.0	44.9	30.4
2008-2009	37.7	35.1	41.9	37.4	43.7	27.4
2009-2010	-	36.6	39.5	-	-	-
2010-2011	35.0	-	38.9	-	-	-
Average	38.1	36.9	41.1	39.1	45.0	29.5

The winter temperatures from December 1<sup>st</sup> through March 31<sup>st</sup> are most important for hibernating bats. Researchers have found that temperatures in most Indiana bat hibernacula range from about 37-43°F during these months. A comparison of temperatures for 6 years shows relatively consistent temperatures or small fluctuations between years at the specific monitoring locations within the mine. The Indiana Bat Room is where the Indiana bats are consistently found during hibernation surveys, and the averaged mean winter temperature over 4 years is

39.1°F, which is within the range used by hibernating Indiana bats elsewhere. Wayne National Forest biologists believe Indiana bats use that room, because it is consistently cooler than other parts of the mine (Figure 2.17). Stable, cool (but not freezing) temperatures are important to Indiana bats, because these conditions allow the bats to maintain normal patterns of torpor and waking to survive the winter on a limited stored fat supply. However, the temperatures do drop below freezing during the coldest part of the winter in the Indiana bat room, which may stress hibernating bats. These fluctuations may be a limiting factor and explain why only a small population of Indiana bats (200-300) uses this mine each winter. The Right Passage is an area outside of the direct influence of the entrance that tends to be warmer than the Indiana Bat Room year round. Little brown bats and tri-colored bats often hibernate there, although little browns also roost side-by-side with Indiana bats in the Indiana Bat Room. The mine is consistently moist and humid throughout the year and often has standing water in some locations during the winter. Figure 2.17 graphically depicts the temperature fluctuations at each datalogger location from summer 2008-2009 as a representation of a “normal” year. Notice how the widest temperature fluctuations are for outside, followed by the Entrance. Also, while the temperatures are consistently more stable inside the mine than out, the Indiana Bat Room is consistently cooler than the Right Passage. This fact demonstrates that different parts of the mine offer different microclimates for bats to exploit during hibernation, which gives them flexibility to find optimal conditions to suit their needs in any given year.

As a side note, a couple of physical changes have been noted inside the mine, since the first surveys were initiated. Two small roof collapses near the mine entrance have been noted. This area is the most susceptible to such collapses, due to greater exposure to freeze/thaw cycles. An additional collapse was noted recently in the rear portion of the accessible mine beyond the Right Passage. Stabilization efforts could be warranted in certain areas (especially the entrance) to ensure bat accessibility and safety in the future.



**Figure 2.17 Comparison of air temperatures recorded at noon by 4 dataloggers installed in the Lawrence County (Woody) Mine on the Ironton Ranger District, Wayne National Forest for the 2008-2009 annual recording period.**

### Acoustic Monitoring

One acoustic driving route was set up in 2009 on each unit of the WNF to inventory all bat species and their relative abundance along pre-determined transect routes during the summer maternity season. A second route was added to each unit in 2010 for a total of 6 30-mile transects forest-wide. These survey efforts are intended to establish a baseline dataset for assessment of 2 recent sources of mortality to bats: (1) White-Nose Syndrome (WNS) and (2) wind energy development. The current collection of data will be compared to data collected in the future to help determine if population declines are occurring. Since WNS arrived to the WNF in 2011, declines in susceptible bat populations are anticipated. Similarly, tree bat (primarily red, hoary, and silver-haired bats) populations are experiencing relatively intense mortality at some wind-power sites. Currently, the population size of these species and the ability of these populations to sustain an increased rate of mortality is unknown. A multi-regional effort to collect this data will help answer related questions. At this time, data is awaiting analysis by a regional team. Six routes were run a total of 35 times during the summer maternity season and the later summer/fall migration season in 2011. Hundreds of bat calls from as many as 9 species were recorded each night. Bats on the WNF include: Indiana bat, little brown bat, northern long-eared bat, tri-colored bat, big brown bat, red bat, hoary bat, silver-haired bat, and evening bat.

### **Education and Awareness Training**

Indiana bat training sessions to teach key WNF employees about Indiana bat biology and habitat requirements have been presented periodically in accordance with our Conservation Plan (Forest Plan, Appendix D). These training sessions are designed to teach field-going employees, such as fire fighters, timber markers, special use, engineering, and recreation technicians, etc., about Indiana bats, so that they can help biologists manage and conserve bats and their habitats in the course of their regular work. No training sessions were held in 2011, but a PowerPoint presentation was available to all employees for review.

Two Indiana bat training sessions were held in 2006. One session was directed at timber markers, the other was directed at employees charged with hazard tree management in our recreation sites. Both sessions included a classroom presentation about the Indiana bat – its life history and habitat requirements. A field session was included in each training session so that employees could get hands-on experience identifying trees with currently suitable roosting habitat and trees that could serve as future roost trees. In 2007, 2 training sessions were given. A session in 2008 was directed at employees who were coordinating a hazardous fuels removal contract along Forest trails. One training session was completed in 2009. A PowerPoint is also available for self-study for new employees with additional on-the-job training provided as needed by experienced personnel.

In 2008, interns for Monday Creek Restoration Project and Sunday Creek Watershed Group (both WNF partners) attended a training conducted by Forest Service Biologists to learn how to evaluate mine portals for potential bat use.

### **Hickory Tree Tally**

Shagbark and shellbark hickory trees are preferred Indiana bat roost trees and represent future roost habitat, since bats can use the flaking bark on live trees. Therefore, removal is closely monitored and only approved when necessary to protect human safety or to avoid adverse impacts to steep slopes, erodible soils, floodplains or wetlands. A total of 8 hickory trees were removed from project areas in 2011. On Athens Ranger District, 4 were removed during winter for fireline construction for the Pleasant Bear project. On Ironton Ranger District, 4 were removed during winter for construction of timber roads and a log landing associated with the Pine Creek project. Since 2006, a total of 58 hickory trees have been removed from project areas.

### **Bald Eagle (Threatened)**

Bald eagles occur in marshes, swamps and river systems throughout Ohio. Eagles have continued to recover in Ohio from a low of 4 breeding pairs in 1979. The number of breeding pairs across Ohio in 2011 was 194 across 62 counties (Figure 2.18), with 35 known new nests, and eagle production continued to be high with an estimated 254 young. Expansion of nesting pairs continues along many inland watersheds within the state. There are currently no active or inactive bald eagle nests within the Wayne National Forest, but the first known successful nest (2 eaglets) locally occurred just outside of the Athens Unit boundary in neighboring Logan in Hocking County. Wintering bald eagles are possible anywhere in the state but are most commonly observed near open water.

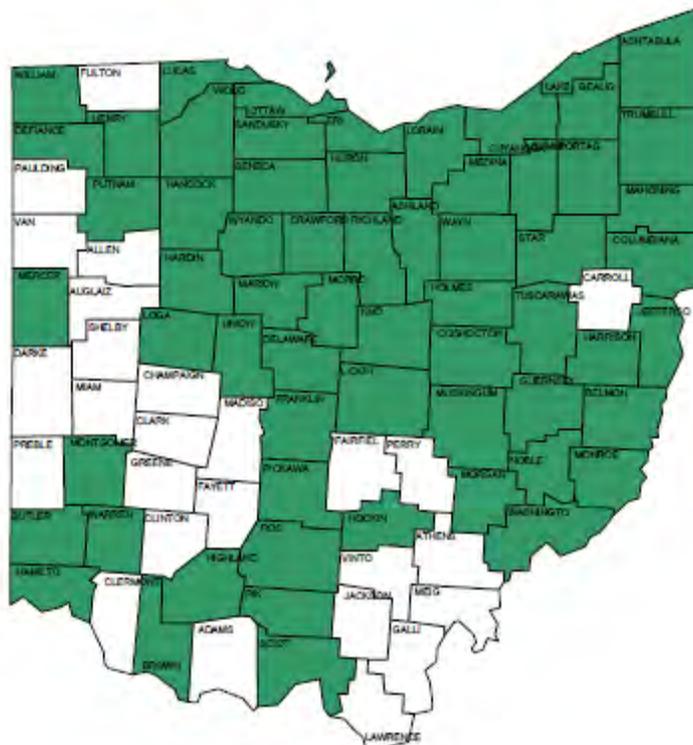


Figure 2.18 Distribution of counties with bald eagle nests in Ohio in 2011.

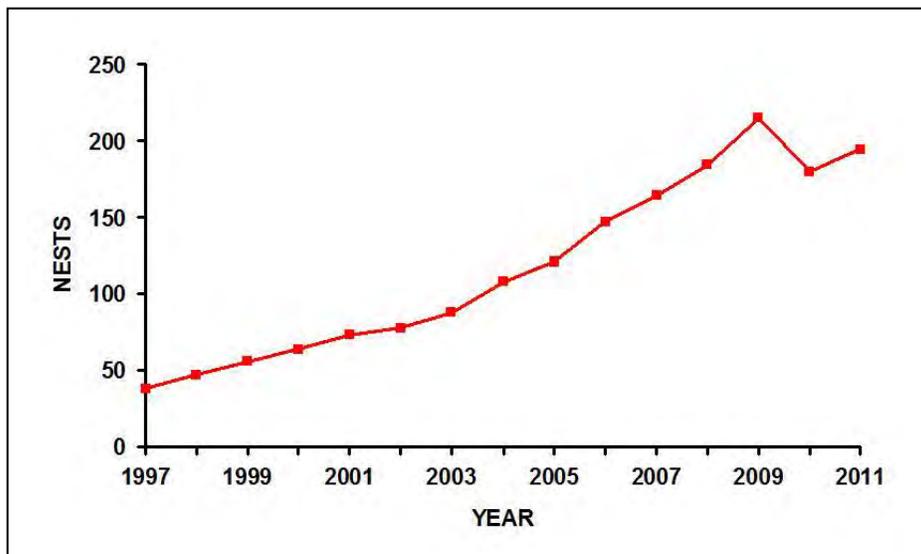
**Goal 5.1.2 - Protect bald eagle communal night roosts, daytime concentration sites, and occupied breeding territories.**

<p><b>Objective 5.2.1a:</b> Conduct a minimum of three annual winter searches to locate any previously unknown communal night roosts of bald eagle concentrations.</p>	<p><b>Monitoring Work Plan Question #19:</b> How many mid-winter bald eagle searches were conducted?</p>
	<p><b>Monitoring Work Plan Question #20:</b> How many bald eagles were observed?</p>

Wayne National Forest biologists conducted 3 bald eagle searches during the winter months at Burr Oak Reservoir (at multiple points) and one at Lake Vesuvius. No bald eagles were observed during any of the searches. Employees and members of the public, however, reported eagles in various places from 18 October through 16 March. These reports included 5 sightings of adult eagles on or near the Athens Unit of the Athens ranger District in conjunction with gravel pits along the Hocking River or at Lake Logan.

**2006-2011 Bald Eagle Summary Report**

Bald eagles were evaluated in the Forest Plan as a federally threatened species but it was delisted on 28 June 2007. At that time, it was removed from federally-listed consideration and added to the Regional Forester Sensitive Species list on the WNF. Bald eagle abundance has been on a steady increase in Ohio for many years, but no nests have been confirmed on the WNF (Figure 2.19).



**Figure 2.19 Bald eagle nest abundance state-wide in Ohio from 1997-2011.**

Since 2006, annual mid-winter surveys (generally 3 per year) on the WNF have documented both adult and juvenile bald eagles occasionally at Burr Oak Reservoir and in areas on or near the Athens Ranger District several times, usually in conjunction with gravel pits along the Hocking River or Lake Logan. They are also reported sporadically from the Marietta Unit, especially along the Ohio River. None however have been documented from the Ironton District (e.g., Lake Vesuvius, Timbre Ridge Lake, or Ohio River).

### **Goal 5.1.3 - Cooperate in efforts to reintroduce the American burying beetle.**

#### **American Burying Beetle (Endangered)**

The American Burying Beetle (ABB) was listed as a federally endangered species on July 13, 1989. The ABB was once a component of Ohio's ecosystem. Carrion-feeding beetles, such as the ABB, are an important group of scavengers that help to recycle decaying materials back into the ecosystem. No wild populations of the ABB are currently known to exist in the state. The last known capture of ABB in the wild in Ohio was in 1974 in the neighboring Hocking Hills area of southeast Ohio.

One of the goals in the Ohio Department of Natural Resources, Division of Wildlife (ODNR-DOW) ABB Conservation Plan is to establish a self-sustaining viable population of the ABB within Ohio. The WNF was identified as a potential release site for assisting the ODNR in attaining their population goals. Surveys of soil types and vegetation indicated that the WNF contained land with the right combination of conditions for a high probability of a successful reintroduction.

Thus, the WNF agreed to work cooperatively on this effort through direction in the 2006 Forest Plan by participating in a 5-year reintroduction project starting in 2008. The WNF, in conjunction with the ODNR-DOW, The Ohio State University, and the US Fish and Wildlife Service, has begun to re-introduce this endangered beetle in two locations on national forest system lands in Perry and Athens Counties, Ohio.

**Monitoring Work Plan Question #21:** What cooperative efforts were accomplished to achieve the reintroduction of the American burying beetle?

This year, 2011, was Year 4 of the 5-year project. This effort is contributing to the recovery of the species in Ohio. Due to the success of breeding individuals at rearing facilities at the St. Louis Zoo and The Wilds this year, 171 pairs of ABBs were placed at one site on the Athens Ranger District. Table 2.20 displays the number of beetle pairs introduced by year. During monitoring efforts, conducted 14 days after placement of the beetles at the site, it was estimated that a mean of 27 larvae per brood ball were produced, resulting in a new record of at least 1,822 larvae produced at the reintroduction site. This number in 2010 was 364 larvae. Due to the record number in 2011, the Cincinnati Zoo was able to collect 40 larvae from the WNF for the establishment of an ABB colony at their new rearing facility. These larvae will be the foundation of future reintroduction efforts elsewhere in Ohio.

Partners included U.S. Fish & Wildlife Service, The Ohio State University, The Wilds, St. Louis Zoo, Cincinnati Zoo, and a range of individual volunteers (Figure 2.20).

### 2006-2011 American Burying Beetle Summary

The reintroduction effort of ABBs began on the WNF in 2008 and has one more year to go in the 5-year project. Over the years, a number of beetle pairs have been reintroduced (Table 2.15).

**Table 2.15 American Burying Beetle pairs introduced on the Wayne National Forest by year**

YEAR	Pair of Beetles Introduced
2008	225
2009	448*
2010	75
2011	171
*72 of these were placed on adjacent private lands.	



**Figure 2.20** Employees and volunteers helped place male-female pairs of American burying beetles in prepared holes, in which they could lay their eggs.

Springtime monitoring by personnel from The Ohio State University, involving non-lethal pitfall trapping, is conducted in the spring prior to each new reintroduction effort to determine if ABBs have successfully overwintered. To-date such spring monitoring efforts have not been able to make this confirmation, despite the fact that post-reintroduction monitoring of brood balls has shown successful larvae production each year.

It is thought that once a population of ABB reaches a certain number in a particular geographic

region, it could possibly be down-listed from the current endangered status. Monitoring for the presence of the ABB on the WNF will continue long after reintroduction activities cease to determine the status of this beetle in southeast Ohio.

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

<p><b>Objective 5.1.4b:</b> Conduct annual monitoring of known running buffalo clover populations and adjacent areas to identify potential risks or management needs.</p>	<p><b>Monitoring Work Plan Question #22:</b> Were there any changes to known running buffalo clover populations and were any potential risks identified and mitigated?</p>
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WNF and U.S. Fish and Wildlife Service personnel monitored the running buffalo clover (RBC) population on June 17<sup>th</sup>, 2011. We counted 209 stems, 20 of which were in flower. The population of rooted crowns decreased slightly from the 2010 count. The number of flowering stems recorded also has decreased since 2010; however, sampling observations were made much later in the year as compared to previous years and may have impacted the counts.

#### Notes on items discussed in the field:

- The area is becoming a little too shady. Girdling one of the smaller, nearby trees may help improve habitat. The tree was girdled in August 2011.
- Stiltgrass treatment on the patch was conducted this summer. Half of the stiltgrass patch was hand pulled and the other half was mowed at the height of the RBC in August 2011.
- We continue to control garlic mustard and stiltgrass along illegal All-Terrain Vehicles (ATV) trails and in areas around the RBC patch.

#### 2006-2011 Running Buffalo Clover Summary

Over the past six years, the WNF and U.S. Fish and Wildlife Service personnel have monitored the running buffalo clover population (Table 2.16). The population was first discovered in 2005 along an illegal ATV trail when personnel were assessing the impacts of the Binion wildfire that had burned the area.

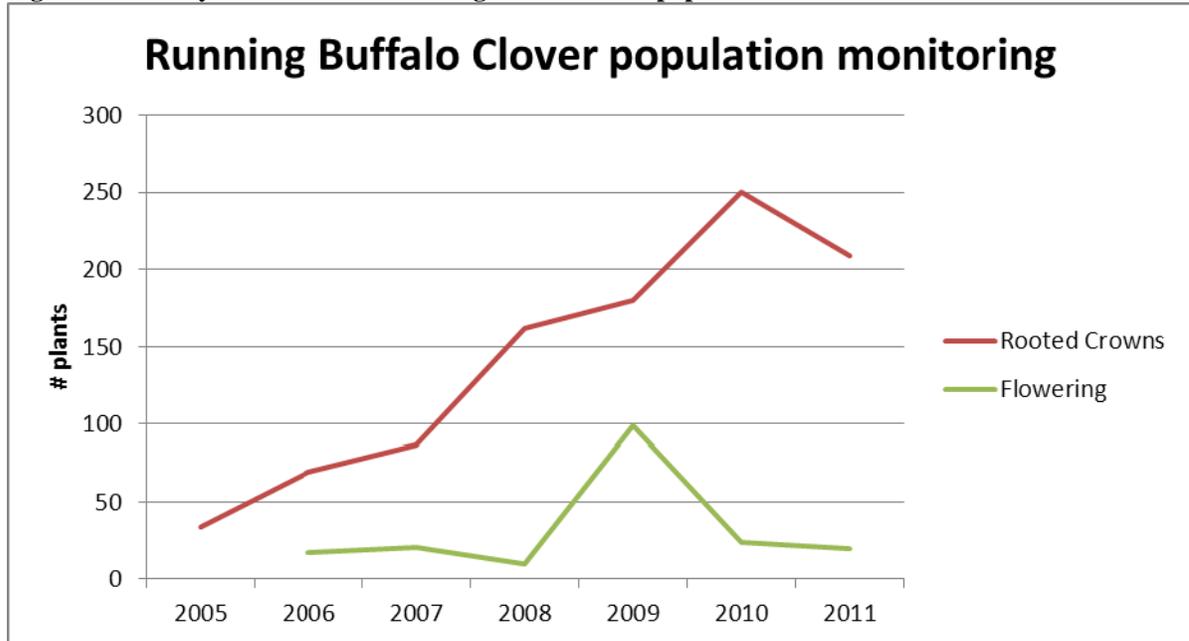
Management actions to maintain and expand the clover population have been developed with the assistance of the U.S. Fish and Wildlife Service, including:

- Mowing or hand-pulling of Asiatic stiltgrass: 2007-2011
- Surveys for additional populations of clover nearby know patch: 2007-2011
- Felling of trees across illegal ATV trail to protect population: 2007
- Clearing of think brush understory: 2008
- Planting of tree seedling to replace dying overstory trees: 2008
- Control garlic mustard, Asiatic stiltgrass and tree-of-heaven along ATV trail that leads to clover patch: 2009-2011
- Clearing of vegetation around planted seedlings: 2010
- Additional 3 walnut trees planted: 2010

- Girdling of small nearby tree that was providing too much shade: 2011

**Table 2.16 Running Buffalo Clover Monitoring Results on the WNF from 2005-2011.**

Year	2005	2006	2007	2008	2009	2010	2011
Rooted Crowns	34	69	87	162	180	250	209
Flowering	N/A	17	21	10	99	24	20
Date Monitored	N/A	5/24/2006	5/23/2007	5/15/2008	5/18/2009	5/19/2010	6/17/2011

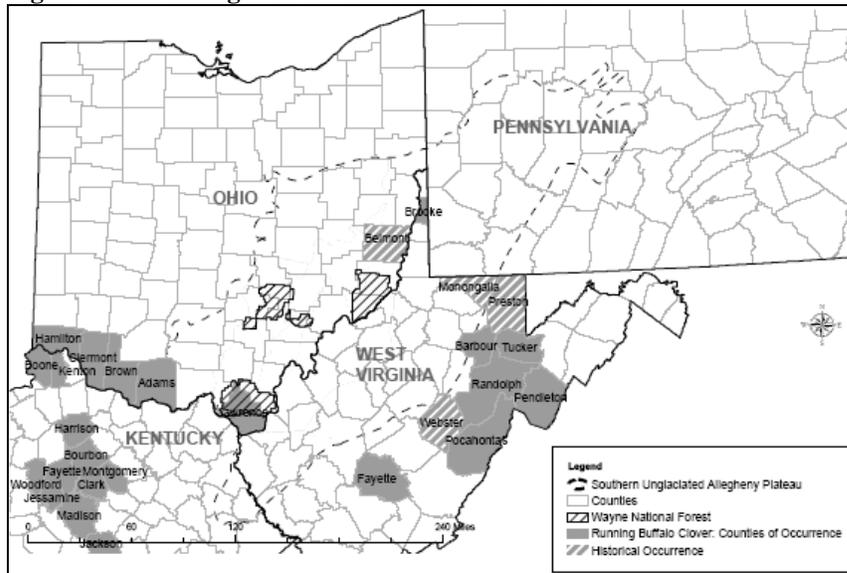
**Figure 2.21 Five-year trend of the running buffalo clover population on WNF.**

Overall, the one known population of running buffalo clover on the WNF has increased since its discovery in 2005 (Figure 2.21). The disturbance from the Binion wildfire may have provided the initial disturbance that this species requires. Careful maintenance of Asiatic stiltgrass within the clover population has decreased competition and likely helped with the clover's increase in numbers. Careful monitoring and maintenance of shade levels provided by nearby trees (removal of those overshadowing and planting of seedlings to replace dying overstory) have also probably helped the population. The spike of flowering individuals in 2009 is not explained but could be correlated to any of several environmental factors: light levels reaching the forest floor, temperature and moisture levels, disturbance activities, or perhaps a stress that the population responded to with high reproductive efforts.

The WNF plans to continue monitoring efforts with the U.S. Fish and Wildlife Service to follow this population and any new populations that may be discovered. Future efforts of management will continue to be discussed and decided upon with input from the U.S. Fish and Wildlife Service. As distribution of running buffalo clover increases in Ohio and neighboring states (see

Figures 2.21 and 2.22), it may be down-listed to threatened, and efforts for transplanting or seeding may be considered.

**Figure 2.22 Running buffalo clover distribution in 2006**



## 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.

**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.

#### Monitoring Work Plan

**Question #23:** How many acres are being treated with varying management actions that will likely result in the maintenance and restoration of the oak-hickory ecosystem?

#### FY 11

There were 293 acres of mixed-oak stands improved through commercial thinning/selection harvest. The treatment objectives were to improve stand conditions to minimize adverse impacts from insects and disease (especially gypsy moth), and to improve conditions for developing future oak and hickory reproduction so these species will be present when the hardwood overstory is regenerated. Mid-story thinning and release and weeding were accomplished on 1216 acres of competing species and 383 acres were treated with prescribed burns.

In addition, see Question # 25 concerning prescribed fire activities; fire also can maintain and restore the oak-hickory ecosystem.

### 2006-2011 Habitat Needs Summary

There were 2171 acres of mixed-oak stands improved through commercial thinning/selection harvest. The treatment objectives were to improve stand conditions to minimize adverse impacts from insects and disease (especially gypsy moth), and to improve conditions for developing future oak and hickory reproduction so these species will be present when the hardwood over-story is regenerated.

Approximately 3308 acres of stand improvement treatments were applied. Treatments included grape vine control, young stand weed and release, mid-story control, and NNIS eradication.

There were 6165 acres treated with prescribed burns.

<p><b>Objective 6.1b:</b> Use commercial timber sales and stewardship contracts to accomplish wildlife habitat objectives.</p>	<p><b>Monitoring Work Plan Question #24:</b> How many acres are being treated through commercial timber sale operations and/or stewardship contracts that will likely meet objectives of improving wildlife habitat?</p>
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### FY 11

Approximately 293 acres of forest were thinned through commercial timber sales. Included in the objectives of these sales were several short and long term effects that will benefit native wildlife, such as:

- Improve stand conditions to minimize adverse impacts from insects and disease, especially gypsy moth defoliation.
- Improve conditions for developing future oak and hickory reproduction.

### 2006-2011 Timber Sale Summary

Approximately 2,171 acres of forest were thinned through commercial timber sales. Included in the objectives of these sales were several short and long term effects that will benefit native wildlife, such as:

- Improve stand conditions to minimize adverse impacts from insects and disease, especially gypsy moth defoliation.
- Improve conditions for developing future oak and hickory reproduction.

### 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.

**Monitoring Work Plan Question #25:** How many acres are being treated with prescribed fire that will likely conserve fire-adapted plant and animal biodiversity, and to maintain and restore mixed oak and native pine?

### FY11

There were 383 acres treated by prescribed burning.

### 2006-2011 Prescribed Burning Summary

There were 6,165 acres treated by prescribed burning.

### 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.

**Monitoring Work Plan Question #26:** How many permits are issued and what are the reported harvests in each year?

In 2011: 129 firewood and 69 root permits were sold on the Forest. A breakdown of the sales per unit follows:

**Table 2.17 Forest Product Permits (2011)**

<b>WNF Office</b> (city location)	<b>Athens</b> (Nelsonville)	<b>Marietta</b> (Reno)	<b>Ironton</b> (Pedro)
<b>Firewood Permits</b>	79	26	24
<b>Root Permits</b>	18	33	18

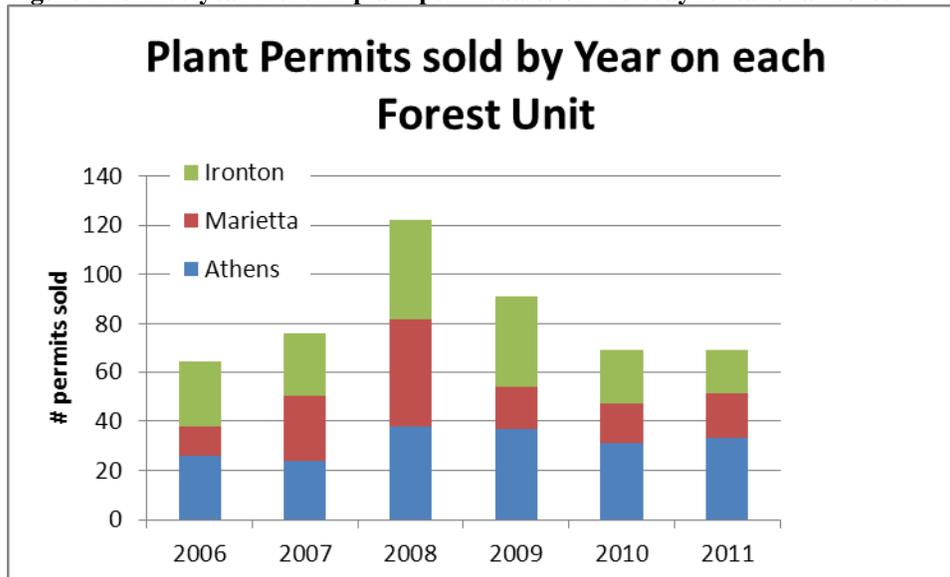
The Athens Ranger District sold permits at their two offices (Nelsonville and Reno). Ironton Ranger District sold permits at their office in Pedro. Wood and plant/root permits were \$20 per permit.

Root permits allow up to 5 wet lbs. of roots to be collected of which up to 1 lb. can be ginseng (95 plants). At total of 69 permits were sold, so maximum collection for the permits would therefore equate to a maximum of 345 wet lbs. of roots collected, of which up to 69 wet lbs. could be ginseng (approximately 6,555 ginseng plants). The amount of permits sold was the same as 2010. As of July 1st, 2012, a total of 29 permits had been returned with data on how much each permittee had collected. The total for these permits were used to estimate an average

for all permits, which provides the following average for roots harvested: 1458 ginseng roots, for an average of 50.3 ginseng roots per permittee.

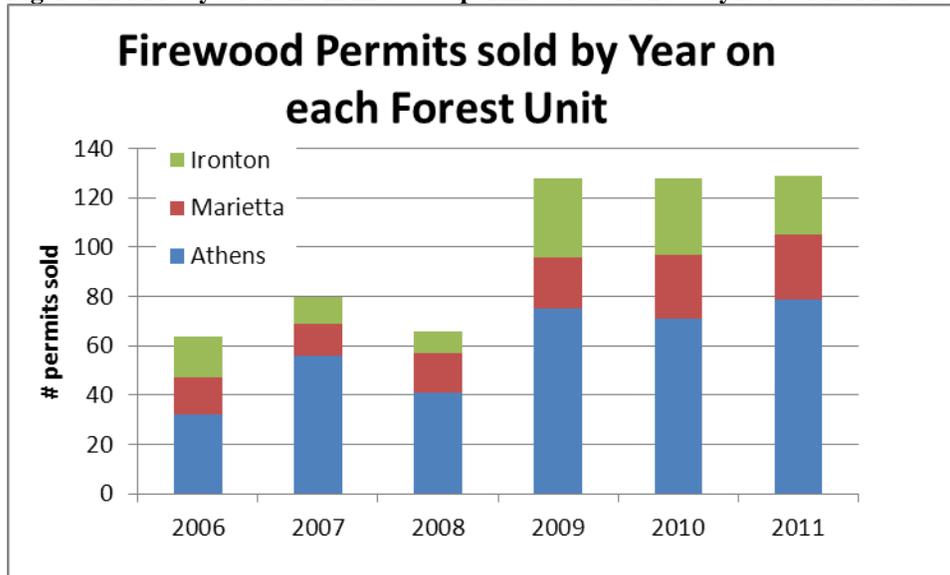
In an effort to understand the impacts of harvesting on wild ginseng, three additional permanent monitoring plots were installed in 2011. The new plots were measured when installed in the early summer and then later in the fall to capture impacts of deer browsing. Additionally, the 12 plots previously installed in 2007-2010 were re-measured in the fall. Additional plots and continued re-measurement of old plots are planned for the future to better understand how harvesting impacts ginseng sustainability on the Forest. Starting in 2010, a goldenseal count at each monitoring plot was also recorded. The Wayne National Forest is working with the Monongahela National Forest, the Eastern Regional office of the Forest Service, Ohio Department of Natural Resources and university researchers to determine how to analyze monitoring and genetic data to determine sustainability of ginseng populations that have harvest pressure. Further exploration with this joint group of cooperators will occur in 2012 to determine what additional data is needed for sustainability analyses.

**Figure 2.23 Five-year trend in plant permit sales on the Wayne National Forest**



Wood permits allow up to 2 cords of firewood to be taken. Thus the maximum amount of firewood taken off the Wayne National Forest in 2011 was 258 cords. The amount of permits sold was up by one permit from 2010. Increases in the last three years might be a result of people heating with wood to decrease electric bills during financial declines.

Figure 2.24 Five-year trend in firewood permit sales on the Wayne National Forest



## 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.

**Monitoring Work Plan Question #27:** How many acres of the Forest are inventoried for NNIS insects and diseases and when was it inventoried?

FY11

The Wayne National Forest and Ohio Department of Agriculture cooperated to monitor for the presence of the emerald ash borer (EAB) on the Wayne National Forest. Traps were deployed across the Forest and southeast Ohio in areas where EAB was not yet known to exist. The traps were installed in spring and monitored during summer and fall months. EAB has now been positively identified in three counties within the Forest proclamation boundary: Scioto, Lawrence and Perry Counties.

The Wayne National Forest and the Forest Service State and Private Forestry Forest Health Protection office in Morgantown, WV cooperated to monitor for the presence of Southern Pine Beetle (SPB). SPB traps were placed in likely pine stands on the Marietta, Athens, and Ironton units during the Spring flight season. Because of the current outbreak of SPB in New Jersey in forest conditions very similar to southeast Ohio, monitoring on the WNF was deemed appropriate. No SPB was detected this year, nor has SPB ever been detected anywhere in Ohio.

### 2006-2011 NNIS Summary Report

Beginning in 2007, the Wayne National Forest and Ohio Department of Agriculture cooperated to annually monitor for the presence of the emerald ash borer (EAB) on the Wayne National Forest. Traps were deployed across the Forest and southeast Ohio in areas where EAB was not yet known to exist. The traps were installed in spring and monitored during summer and fall months. EAB has now been positively identified in three counties within the Forest proclamation boundary: Scioto, Lawrence and Perry Counties.

As part of the Gypsy Moth Slow the Spread (STS) program, annual trap surveys have been conducted. In 2007 and 2010, outbreaks on the Ironton Ranger District were detected and treated. Treatments were aerially-applied non-lethal pheromones which disrupted the mating process.

In 2008, a hemlock wooly adelgid (HWA) survey was conducted, with no HWA detected.

An aerial survey of the entire Forest was conducted in 2010. The survey detected endemic levels of locust leaf miner, Dutch elm disease, oak decline, and other unidentified defoliation agents. Emerald Ash Borer (EAB) was also identified but not confirmed by ground sampling.

The Wayne National Forest and the Forest Service State and Private Forestry Forest Health Protection office in Morgantown, WV cooperated to monitor for the presence of Southern Pine Beetle (SPB) in 2011. SPB traps were placed in likely pine stands on the Marietta, Athens, and Ironton units during the Spring flight season. Because of the current outbreak of SPB in New Jersey in forest conditions very similar to southeast Ohio, monitoring on the WNF was deemed appropriate. No SPB was detected this year, nor has SPB ever been detected anywhere in Ohio.

**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

**Monitoring Work Plan Question #28:** How many NNIS sites were treated and how did the populations respond to treatment?

<ul style="list-style-type: none"> <li>• Prevent spread onto land or into high value areas of the Forest (e.g., rare communities, developed recreation areas)</li> <li>• Prevent the introduction and spread of Sudden Oak Death Syndrome</li> </ul>	
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**FY11**

No NNIS treatments were implemented in 2011.

**2006-2011 Gypsy Moth Treatment Summary**

Between 2006 and 2011 1,748 acres were treated for Gypsy moth in the Hanging Rock and Gallia areas of the Ironton Ranger District. The pheromone treatments effectively reduced the outbreaks enough that subsequent treatments were not required.

<p><b>Objective 7.1c</b> - Protect the Forest from wildfire by:</p> <ul style="list-style-type: none"> <li>• Treating hazardous fuels that present a high risk of wildfire.</li> <li>• Treating hazardous fuels to move the Forest closer to desired fire regime condition class and desired future condition.</li> <li>• Maintaining areas that are at the desired fire regime condition class</li> </ul>	<p><b>Monitoring Work Plan Question #29:</b> How many acres of hazardous fuels were treated?</p>
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**FY11**

There were 4,584 acres treated for fuels and 383 of those acres were treated using prescribed fire.

**2006-2011 Hazardous Fuels Summary**

There have been a total of 24,473.4 acres of hazardous fuel treated, 5,957 of those acres were accomplished using prescribed fire. All these treatments were performed to move the WNF closer the desired fire regime condition class and desired future condition.

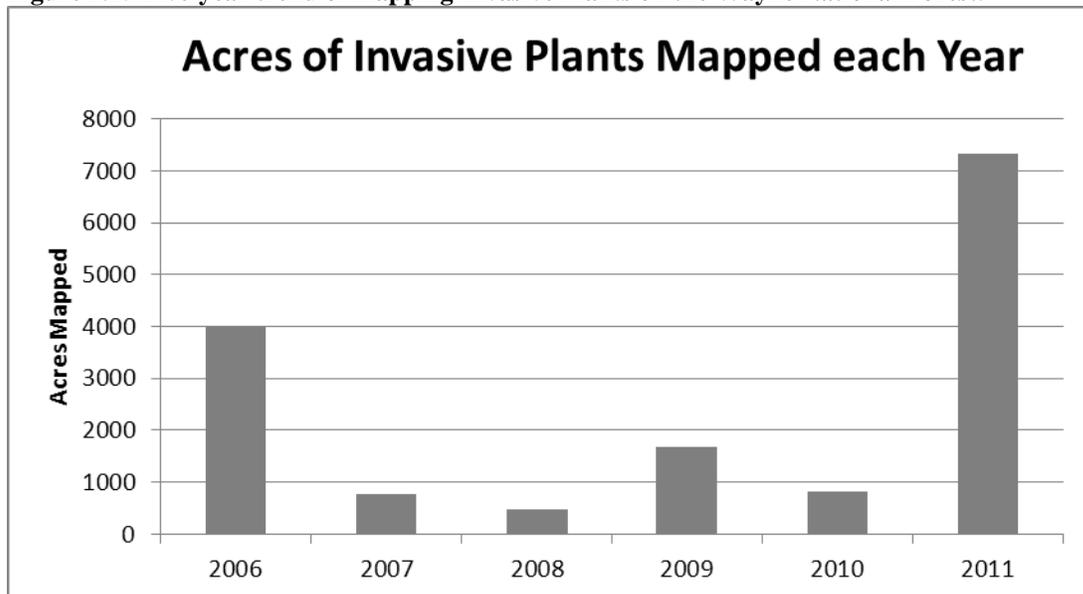
**Goal 7.2 - Control Non-Native Invasive Plants**

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

<p><b>Objective 7.2a</b> - Maintain and update an inventory of NNIS plant populations on NFS land. Include information on adjacent lands as gathered in cooperation with neighboring landowners.</p>	<p><b>Monitoring Work Plan Question #30:</b> How many acres of the Forest are inventoried for NNIS plants and when were these inventoried?</p>
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Inventories have been occurring on the Wayne National Forest since 2002. In FY 2011, 7,328 acres of invasive plants were mapped. A large number of these acres were the results of a Challenge Cost Share agreement with the Ohio Division of Forestry (ODOF) to aerially map *Ailanthus altissima*, an invasive tree. The agreement is for up to five years and involves using the Ohio Division of Wildlife helicopter along with two ODOF personnel that record pockets of reproductive female ailanthus trees as the helicopter flies over the landscape. Flights were flown during the winter, when leaves are off the trees, but seeds of ailanthus are still on the trees. Personnel document the ailanthus trees using Digital Aerial Sketch Mapping (DASM) on hand-held computers. In 2011, 8 flights surveyed 163,256 acres across portions of Washington, Noble, Monroe, Lawrence and Gallia counties. Mapping was done across all ownerships. A total of 1,376 polygons of ailanthus were mapped, which totaled to 6,461 acres infested by ailanthus. Funding from US Forest Service State and Private Forestry has been received to fund two more seasons of aerial mapping. Likewise, a \$10,000 North Central Integrated Pest Management grant ([www.ipmcenters.org](http://www.ipmcenters.org)) was received in 2011 to ground-truth some of the aerial mapping in Washington county, explore correlation of infestations with past land use (in partnership with the US Forest Service Northern Research Station), and survey for *Verticillium albo-atrum*, a fungus that could be tested as a biological control for ailanthus if found naturally occurring in Ohio.

**Figure 2.25** Five-year trend of mapping Invasive Plants on the Wayne National Forest.



Mapping of invasive species on the Wayne National Forest has varied yearly, in part dependent on availability of funds to hire seasonal employees to map invasive species and how infested survey areas are (densely infested areas vs. lightly infested areas).

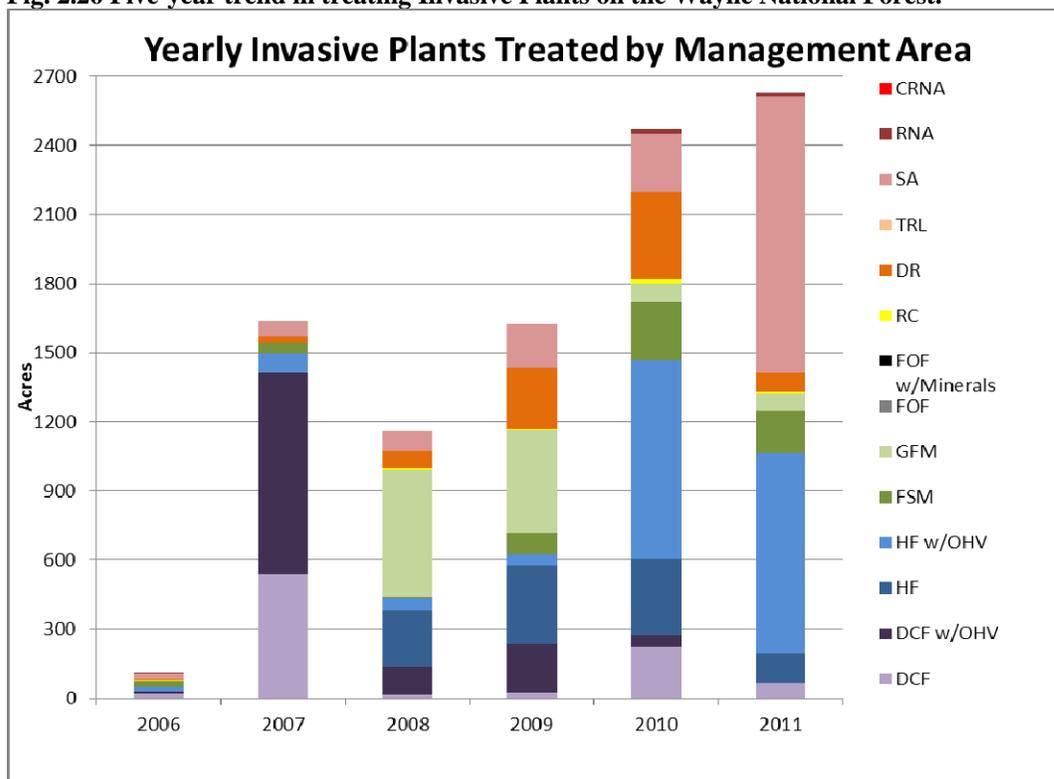
*Due to a numbering error on the 2011 monitoring work plan there is not a question #31.*

<p><b>Objective 7.2b</b> Treat and reduce populations of NNIS with high potential for spread. Implement control treatments of infestation that threaten priority resources. Prioritize treatment areas based on risk of spread, threat to resources, likelihood of successful control/containment, and partnerships.</p>	<p><b>Monitoring Work Plan Question #32:</b> How many NNIS sites were treated and how did the NNIS populations respond to treatment?</p>
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Over 30 different sites were treated manually, mechanically or chemically for invasive plants in 2011. Primary species controlled included: Japanese stiltgrass, garlic mustard, Japanese knotweed, tree-of-heaven, princess tree, autumn olive, arthraxon and kudzu. Some results of these treatments are listed below.

Garlic mustard populations decreased from previous years at Little Storms Creek Special Area (SA), Paines Crossing SA, and Wildcat Hollow SA. The decreases seen are likely the result of yearly control efforts decreasing seed banks of garlic mustard in these areas over time. Seed banks of garlic mustard are long-lived, as can be seen in these areas where control has been ongoing since as early as 1998. A Wayne National Forest garlic mustard contest has been in practice for three years, to encourage Forest Service employees to join together across resources and spend one-day a year pulling garlic mustard across the Forest. This has increased the acres of manual treatment of garlic mustard by increasing the number of personnel involved in pulling it.

Control of tree-of-heaven (*Ailanthus altissima*) was conducted across the Forest in areas where timber harvest have occurred, or are planned in the future, in hopes of removing seed sources and restricting the impacts of ailanthus on future native tree regeneration in these areas. Treatments occurred in Pleasant Bear, Pine Creek and Gore Greendale timber areas using hack 'n squirt or basal spray application methods. Herbicides used included glyphosate, triclopyr and/or imazapyr. Monitoring of sites will continue in an effort to determine which herbicides and techniques are most effective for different seasons and ecosystems.

**Fig. 2.26 Five-year trend in treating Invasive Plants on the Wayne National Forest.**

Management Areas: CRNA (Candidate RNA), RNA (Research Natural Area), SA (Special Area), TRL (Timbre Ridge Lake), DR (Developed Recreation), RC (River Corridor), FOF w/Minerals (Future Old Forest with Mineral Activity), FOF (Future Old Forest), GFM (Grassland-Forest Mosaic), FSM (Forest and Shrubland Mosaic), HF w/OHV (Historic Forest with Off-Highway Vehicles), HF (Historic Forest), DCF w/OHV (Diverse Continuous Forest with Off-Highway Vehicles), DCF (Diverse Continuous Forest)

Over the past six years, the amount of invasive plant treatments on the Wayne National Forest has seen a significant increase from less than 200 acres (2006) to over 2500 acres (2011) (Fig. 2.26). The primary driver for the increase after 2006 was the NEPA decision for the 2007 Wayne National Forest Non-Native Invasive Plant Control Project, which allowed the use of herbicides on the Forest to control invasive plants. Yearly treatments from 2007 through 2011 show an increase of the NNIS control program over time which was impacted by funding sources and integrated projects (e.g. treatment of *Ailanthus* for timber stand improvement projects). While the total numbers added from the columns appear to exceed the total acres of NNIS treatment allowed in the Forest Plan, this is because the acres in the Forest Plan only cover new treatments (re-treatments do not count toward Plan acre limits). As mentioned above, treatment in projects often require four or more years of treatment to control seed banks and re-sprouts.

Management Area acre differences occurred over the years (Fig 2.26) as the NNIS program treatment priority areas shifted. These priorities include treating in and around other resource project areas (e.g. timber sales, watershed projects) as well as in areas with rare habitat (Special Areas and Research Natural Areas). Three Management Areas have not had any NNIS treatment in them: Timbre Ridge Lake, Future Old Forest and Future Old Forest with Mineral Activity.

The reason the Future Old Forest areas have not had treatment is because there are no other resource projects occurring in the area, however, it does not mean treatment should not occur here. Current funding does not always provide enough funds to treat and re-treat all areas that are high priority areas, thus funds to map and treat invasives in lower priority treatment areas such as FOF and FOF with Mineral Activity have not been available.

### Goal 7.3 – Control Non-Native Invasive Species Aquatics

Control NNIS Aquatic populations using prevention, suppression and restoration techniques to protect and restore natural communities in National Forest 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.

**Monitoring Work Plan Question #33:** How many NNIS awareness and education events were given?

*The response below includes all NNIS (plants, insects, aquatic organisms, and disease).*

The WNF was involved in several NNIS events and workshops in 2011. On the Ironton Ranger District, the District Botanist attended two of the “Ironton in Bloom” seminar series to help answer questions about invasive plants, their impacts and control. On the Athens Ranger District two personnel were involved in a full-day “Woody Invasive Control” workshop in Albany, Ohio at Lake Snowden (21 attendees) where WNF personnel demonstrated different herbicide applicator equipment. The Forest Botanist also presented to the new Athens County Master Gardeners class (20 students) about invasive plants of southeast Ohio, and answered questions about treatment and identification. In partnership with the Ohio Division of Forestry and the US Forest Service Northern Research Station, the Forest Botanist was involved in three presentations on ailanthus, aerial mapping results and identification of *Verticillium albo-atrum*, a potential biological control of ailanthus. The presentations included one to interested WNF personnel and local partners (31 attendees), and then two additional workshops for the public in Marietta Ohio (32 attendees) where heavy infestations of ailanthus was found during aerial mapping.

The Wayne National Forest also continues to work with two local groups: Iron Furnace Cooperative Weed Management Area (IFCWMA) and the Southeast Ohio Non-Native Invasive species Interest Group, to work across boundaries to increase awareness about invasive plants and encourage treatment by other land owners. In 2011, the Wayne National Forest worked with the National Wild Turkey Federation to acquire a National Fish and Wildlife Foundation, Pulling Together Initiative grant ([www.nfwf.org](http://www.nfwf.org)) to fund a coordinator for the IFCWMA. This coordinator, Eric Boyda, has worked to continue the IFCWMA, recruit new partners and put on multiple educational programs with partners. The Ironton in Bloom was begun by the IFCWMA. The Wayne National Forest is continuing to work with Mr. Boyda to find funding sources to continue the coordinator position in 2012.



Cheryl Coon and Nick Galentin answer questions on different equipment used for controlling invasive species at a Lake Snowden workshop put on in partnership with Ohio Division of Forestry, Ohio State University Extension, Hocking College and Iron Furnace CWMA.

### 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.

**Monitoring Work Plan Question #34** How many acres of native vegetation (e.g., American Chestnut, American Elm), have become re-established?

#### FY 11

American Chestnut trees provided by United States Forest Service Northern Research Station, were planted on 3 acres in 2011. These trees included both hybrid and 100% American Chestnuts. Hybrid chestnuts are crosses of varying proportions between American and Chinese varieties. Current thought is that a 15/16 (94% American) cross will be resistant to chestnut blight. None of the trees planted were 15/16. The plantation has not been inspected for survival, so it should not be considered re-established at this time.

#### 2006-2011 Native Vegetation Summary

American Chestnut trees provided by United States Forest Service Northern Research Station and the American Chestnut Foundation were planted on 5 acres of the WNF. These trees

included both hybrid and 100% American Chestnuts. Hybrid chestnuts are crosses of varying proportions between American and Chinese varieties. Current thought is that a 15/16 (94% American) cross will be resistant to chestnut blight. None of the trees planted were 15/16. The USFS Northern Research Station is monitoring the trees planted and will release information associated with the plantings in the future.

## 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.

<p><b>Objective 8.1b</b> – Safely extinguish wildland fires using ground and/or air resources.</p>	<p><b>Monitoring Work Plan Question #35:</b> Number of wildfires suppressed with no reportable accidents/injuries or damage to private property? Number of acres of private property burned from fires with ignition on Forest Service land?</p>
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In 2011, there were 77 fires (307 acres) that were suppressed with no reportable accidents/injuries. No private property structures, improvements or infrastructure was damaged from ignitions that occurred on the Wayne National Forest. No acres of private property were burned from fires starting on Forest Service land.

### 2006-2011 Fire Management Summary

From Fiscal Year 2006 through Fiscal Year 2011, there have been 483 wildfires (2,356 acres) that were suppressed with no reportable accidents/injuries. A total of 60 acres of private property burned from ignitions that occurred on the Wayne National Forest.

<p><b>Objective 8.1c</b> – Reduce hazardous fuels within communities at risk in cooperation with local, State, and Federal agencies.</p>	<p><b>Monitoring Work Plan Question #36:</b> Number of acres in WUI treated for hazardous fuels reduction? Number of prescribed burns conducted in cooperation with local, State or other Federal agencies?</p>
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Approximately 95 % of the Wayne National Forest lands are within the Wildland Urban Interface, and hazardous fuels were reduced on a total of 383 acres through prescribed fire. Hazardous fuels treatment activities improve/alter/modify or mitigate the fuel towards a historical Fire Regime Condition Class. These activities include, but are not limited to, primary direct fuels removal through mechanical means, maintenance of wildlife openings; non-native invasive species control activity, recreational trail clearing, and oak-hickory restoration activity. Other private party activities that mitigate or reduce hazardous fuels are utility line rights-of-way maintenance.

Those acres that were mechanically treated in 2011 reducing or modifying hazardous fuels totaled 4,203.9 acres.

- 290 acres in Developed Recreation (DR) Management Area
- 435 acres in Diverse Continuous Forest (DCF) Management Area
- 194.7 acres in Diverse Continuous Forest with OHV (DCFO) Management Area
- 57 acres in Forest and Shrubland Mosaic (FSM) Management Area
- 1,122.3 acres in Special Area (SA) Management Area
- 700.8 acres in Historic Forest (HF) Management Area
- 80 acres in Grassland and Forest Mosaic (GFM) Management Area
- 1,183 acres in Historic Forest with OHV (HFO) Management Area
- 110 acres in Future Old Forest with Mineral Activity (FOFM) Management Area
- 30.7 Acres in Administrative sites

### **2006-2011 Wildland Urban Interface Summary**

Approximately 95 % of the Wayne National Forest lands are within the Wildland Urban Interface. Over the planning period hazardous fuels were reduced on a total of 5,447 acres through prescribed fire in the following management areas.

- 853 acres in Diverse Continuous Forest with OHV (DCFO) Management Area
- 518 acres in Special Area (SA) Management Area
- 3,298 acres in Historic Forest (HF) Management Area
- 418 acres in Grassland and Forest Mosaic (GFM) Management Area
- 360 acres in Historic Forest with OHV (HFO) Management Area

Hazardous fuels treatment activities improve/alter/modify or mitigate the fuel towards a historical Fire Regime Condition Class. These activities include, but are not limited to, primary direct fuels removal through mechanical means, maintenance of wildlife openings; non-native invasive species control activity, recreational trail clearing, and oak-hickory restoration activity. Other private party activities that mitigate or reduce hazardous fuels are utility line rights-of-way maintenance.

Those acres that were mechanically treated over the planning period reducing or modifying hazardous fuels totaled 18,518.9 acres.

- 2,041.7 acres in Developed Recreation (DR) Management Area
- 3,337.5 acres in Diverse Continuous Forest (DCF) Management Area
- 1,041.7 acres in Diverse Continuous Forest with OHV (DCFO) Management Area
- 3,226.4 acres in Forest and Shrubland Mosaic (FSM) Management Area
- 1,435.3 acres in Special Area (SA) Management Area
- 2,354.5 acres in Historic Forest (HF) Management Area
- 320.5 acres in Grassland and Forest Mosaic (GFM) Management Area
- 3,205.5 acres in Historic Forest with OHV (HFO) Management Area
- 523 acres in Future Old Forest with Mineral Activity (FOFM) Management Area
- 554.3 acres in River Corridor (RC) Management Area
- 8 acres in Timber Ridge Lake (TRL) Management Area

- 439.8 acres in Future Old Forest (FOF) Management Area
- 30.7 Acres in Administrative sites

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

**Monitoring Work Plan Question #37:**  
How many local volunteer fire departments were trained in wildland fire suppression?

Wayne National Forest did not provide any training to local fire departments during FY 2011.

### **2006-2011 Wildland Fire Training Summary**

In the past 5 years the Wayne National Forest provided training to the following local fire departments.

- Decatur
- Elizabeth
- Madison Jefferson
- Greenfield
- Aid
- Lawrence
- The Plains
- Coolville
- Albany
- Nelsonville
- Ward
- Starr
- Jacksonville
- Gallia

## **10 - Minerals**

### **Background**

Statutory and regulatory direction divides Federal mineral resources into three categories: locatable, leasable, and saleable. Of these three Federal categories, only leasable and saleable minerals occur on the Wayne National Forest (WNF). As of the end of FY 11, the WNF is comprised of 241,127 acres of federally owned surface (this includes acreage outside the proclamation boundary) of which about 41% (98,858 acres) are underlain by minerals fully owned by the Federal government. Reserved and/or outstanding mineral rights wholly or partially encumber the remaining 142,269 acres. Private mineral operations occur on National Forest surface lands and comprise the majority of the mineral activity on the Forest.

In FY 2011, there were no mineral material sales, no mineral material free use permits issued and no in-service use of mineral materials from the WNF for road maintenance, etc. This echoes the saleable minerals activity on the WNF for the last decade or so. No gravel pits were developed on the Forest in FY 2011.



**Typical Pump Jack-Oil and Gas Operations—Washington County, OH, WNF**

Oil and gas is the most active leasable program on the WNF. There are currently 1,299 wells on the Forest of which 42% of the active wells are on Federal minerals. The “Reasonably Foreseeable Development Scenario (RFDS) for Oil and Gas”, prepared by the Bureau of Land Management (BLM), for the 2006 WNF Forest Plan forecasted the total number of new wells likely to occur on WNF surface over a 10 year period, regardless of mineral ownership (Federal, reserved or outstanding rights), to be 234 (or about 23 per year).

There are no Federal coal leases on the Forest. Buckingham Coal Company inquired about leasing federal coal in the Morgan County area of the Forest, but has not yet been granted a coal lease to remove federally owned coal by underground mining methods. There were two (2) core drilling permits issued on the Athens Ranger District for coal exploration activities in FY 2011. Buckingham Coal Company has indicated a need for additional coal exploration permits in the Athens and Morgan County portion of the WNF and began working with the Forest in order to obtain a core drilling permit. This proposal pertains to private mineral rights under WNF and covers an extensive area. The application had not been completed prior to the end of FY11. There were 4 geophysical exploration permits issued on the Marietta Unit to explore for oil and gas potential in FY11.

During FY11 there was an increase interest in the potential for developing the Utica and Marcellus Shale plays in southeastern Ohio. The ODNR Division of Mineral Management Resources indicated an increase in applications and permits for horizontal drilling within the State. There have been no horizontal wells drilled on private minerals or federal leases on the

Forest in FY11. A Horizontal Well has been drilled in close proximity to WNF land in Monroe County. The Whitacre Well, (*Location: Monroe County, Washington Township, 4302-01 Drilling Horizontal HG Energy Whitacre Enterprises INC (39.660697 -81.200426)*) on private property, is being drilled by HG Energy of Sewickley, Pa. This well is thought to be the first of its type within close proximity to the WNF.

Though oil and gas activity has increased in other areas of Ohio and nationwide as the result of increased oil and gas prices, this increase in activity was not reflected on the Forest in FY 2011. There has been an uptick in private oil and gas leasing in the area due to speculation of the Utica and Marcellus Shale development potential in southeastern Ohio.

Numerous statutes, regulations, and Executive Orders guide Forest Service policy for the exploration and development of mineral resources on National Forest System (NFS) land, so that mineral resources can be made available while continuing to sustain the land's productivity for other uses and its capacity to support biodiversity goals. To ensure this, yearly inspections are carried out on active leases. In FY 2011, 315 inspections of mineral operations were carried out on the Forest.

### Partners – Mineral Operations

The Forest Service works with State and Federal agencies to manage private and public mineral resources underlying the Wayne National Forest. The Ohio Division of Mineral Resource Management (DMRM) provides inspection, permitting and enforcement actions in concert with the Forest Service on National Forest land regarding private minerals and federally owned mineral estates. The Eastern States Office of the BLM coordinates with the Forest Service, on WNF when federally owned minerals are leased. A BLM Petroleum Engineer position is located in the Marietta Unit Office. There are many private acquired leases on the Forest that pertain to mineral rights acquired by the Forest Service. These private acquired leases provide for the mineral operator to continue the mineral operations on Federal land, but pay a royalty interest to the United States. BLM monitors the production records to assure compliance with the mineral payments to the USA. The State and the Forest Service administer the operations similar to private mineral operations.

A one day meeting was held on June 9, 2011 and hosted by the minerals staff of the Wayne National Forest. It was attended by mineral staff from the Wayne National Forest, ODNR DMRM and the Eastern States Office of the BLM. There were 22 in attendance and one person attended via video conference. The topics pertained to oil and gas inspection and enforcement of State and Federal laws, well plugging, and recent changes in State laws that pertain to oil and gas administration. The topic for this session was Horizontal Drilling and High Volume Fracturing and BLM, ODNR and the Forest Service made presentations related specifically to this topic.

### 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.

<b>Objective 10.1a</b> – Coordinate with the Bureau of Land Management to offer leases of federally owned minerals.	<b>Monitoring Work Plan Question #38:</b> Are expressions of interest and lease offers processed in a timely manner?
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In spring of FY 2011 the Forest received Expressions of Interest (EOI) from Bureau of Land Management (BLM). The Forest submitted the completed lease package to the Regional Office for review and submission to the BLM for a December 2011 lease sale. The Forest submitted 3,302.37 acres of federally owned mineral in Perry, Athens and Gallia County, Ohio and recommended consent to lease the parcels in a December BLM Lease Auction. The EOI was processed within acceptable time frames. Note: These parcels were pulled from the lease sale prior to the auction in order to review new information related to this technology. Expressions of Interest (EOI's) for oil and gas leasing continue to come to the WNF from BLM and are processed for possible lease sales. Certain land areas will be available for leasing, however some lands will not be available due to the mineral rights are found to be outstanding in third parties once the title is validated. BLM intends to have lease sales quarterly.

### **2006-2011 Expression of Interest and Lease Summary**

As of FY11, the Wayne National Forest contained 241,127 acres. The mineral estate on the WNF is comprised of 59% private mineral rights and 41% federally owned mineral rights. There are 1,299 operating oil and gas wells on the Forest. Of the 1,299 active well, 42% are wells on Federal minerals of which 9% are Federal Leased Wells, the remaining 33% are private acquired wells where the USA owns the minerals subject to a lease and well that were present when the land was acquired. Leases that predate the 2006 Forest Plan contain stipulations that were identified in the WNF 1988 Forest Plan and Amendment 8. Mineral standards and guidelines or state laws are adhered to and enforced by Forest Service mineral staff, ODNR Division of Minerals Inspection and Enforcement and, under Federal mineral operations, BLM respective to the responsible agency. Coordination with ODNR and BLM has improved significantly since the WNF has hosted annual (2010 and 2011) meetings with these agencies. The State of Ohio passed SB 165 in 2010 that increases inspection and enforcement requirements by the ODNR Division of Minerals. A Memorandum of Understanding (MOU) exists between the Forest Service and the Bureau of Land Management that requires coordination between the agencies related to environmental management of mineral operations. The Forest has responded to several Expression of Interests (EOI's) under the 2006 Forest Plan. In 2008 an EOI for approximately 9,000 acres was received. The Forest delayed in the processing of the EOI until later 2009. The lease package was submitted to BLM containing 9,440.84 acres. These parcels were auctioned in the March 2010 lease sale. As a result of that sale, 3 Federal wells were drilled on the Marietta Unit in 2010. An EOI request was made to the Forest in 2011 and the package was processed in an acceptable time frame. In March 2011 the Forest submitted 2,774.22 acres and provided consent to lease these areas. Additional EOIs are expected to continue to be submitted to the Forest for processing. During the five year monitoring period, the annual inspection targets on the Forest have averaged 300-315 wells per year. These inspections deemed the operations to be operating to administratively acceptable standards. Coordination with ODNR and BLM was useful in the administration of the operations to assure compliance with state and federal laws and regulations.

<p><b>Objective 10.1b</b> – Process plans of operation/applications for permit to drill on Federal leases in a timely manner.</p>	<p><b>Monitoring Work Plan Question #39:</b> How many plans of operation/applications for permit to drill on Federal leases were processed in a timely manner?</p>
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One (1) Federal plan of operation/application for permit to drill (APD) was received in FY 2011 (KenOil) but was placed on hold at the request of BLM and the applicant due to lack of information provided by the applicant. The proposed federally leased well is on the Athens Ranger District in Perry County and is planned to be a vertical well to a shallow depth.

**2006-2011 Drill Permits and Surface Use Plan Operations Summary**

The Forest received 2 applications to permit to drill (APDs’) in 2008 and 3 APD’s in 2010. The Forest Service completed the reviews of the surface use plans of operations (SUPO’s) within acceptable time frames and provided a decision to proceed to BLM related to the surface occupancy.

**Goal 10.2 – Respect owners’ rights and protect surface resources**

Mineral operations occur on Wayne National Forest with respect to privately held mineral rights and administer the rights of the surface owner, the USA. The Forest Service shall negotiate operating terms and conditions and mitigation measures to protect Forest resources while meeting the requirements of domestic energy production and the mission of minerals management on NFS lands.

<p><b>Objective 10.2a</b> – Process plans of operation (and applications for major modifications) for privately owned minerals (reserved and outstanding rights) within 60 days.</p>	<p><b>Monitoring Work Plan Question #40:</b> How many applications were processed within 60 days?</p>
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There was no non-Federal applications received on the Wayne National Forest for the development of private mineral operations in FY 2011.



**Typical Tank Battery-Oil and Gas Operations-Washington County, WNF**

### **2006-2011 Applications Summary**

Since 2006 there have been a total of 9 private or reserved mineral operations processed and 3 federal mineral operations were processed on the Wayne National Forest. The private and reserved mineral operations were all processed within the 60 day processing period. The process included coordination with applicant, well site and access or infrastructure needs were reviewed by Forest Specialists in order to mitigate impacts to wildlife, botany, cultural resources or water resources. Negotiations with the mineral operator was used to alter operations plans and surface use plans in order to provide for the best management practices and mitigate potential impacts to the natural resources. Coordination with ODNR Division of Mineral Resources inspection and enforcement supports Forest Service administration of the private and reserved mineral operations.

Mineral rights held by a third party, as outstanding rights, are subject an approved plan of operation that is between the Forest Service and the mineral operator. Items required to be provided to the Forest Service include: proof of mineral ownership, a location maps showing the planned operations including access, submission of operating plan and sedimentation control plan, designation of field representative, and a state drilling permit. The processing of the private mineral operations within the 60 day period is contingent upon obtaining these items from the mineral operator in a timely manner.

Note and Comment: The 2006 Wayne National Forest Land Management Plan considered a Reasonable Foreseeable Development Scenario regarding mineral activity and operations on the Forest to be 234 oil and or gas wells operation on 300 acres of land encompassing the planned activity. This total amount was considered, after consultation and review, as acceptable. There was a rationale of management capability to administer these areas and provide for the

development of the areas site specifically with review by specialists at the time of development.

This anticipated amount is far more than has occurred under the current Forest Plan. There have been only a total of 12 wells developed representing 5% of the RFSD scenario anticipated. The Forest Plan is sufficient in its analysis of anticipated mineral activity since the actual cumulative effect of mineral activity is far less than expected to occur over the analysis period. The mineral activity has been the customary vertical wells each occupying less than 2 acres of area including access roads developed. Should new technologies be used that could increase the surface use areas of each well drilling unit, it is reasonable to consider that that remaining available of cumulative effects considered in the Forest Plan would be well within the anticipated use acreage.

<b>Objective 10.2b</b> – Restore lands disturbed by minerals exploration and production when the minerals activity is completed.	<b>Monitoring Work Plan Question #41:</b> How many mineral activities were adequately restored upon completion?
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Restoration of mineral activities as they relate to oil and gas occurs in stages. Partial restoration includes reclaiming that part of the drill pad not needed once production starts, and reclaiming 24-foot wide pre-drill access roads down to 16-foot wide post-drilling roads. Final restoration happens after a dry hole or a depleted producing well, is plugged and abandoned.

On the WNF, 7 wells were permanently restored and plugged on the Marietta Unit. One well is being planned to be plugged on the Ironton Ranger District in early FY12 (Sharon Silica Well #14).

### **2006-2011 Mineral Operations Summary**

Since 2006, 31 mineral operations were deemed no longer in a productive status and were plugged. Of the 31 wells plugged, 28 were plugged by the mineral operator and 3 were plugged under a contract with the ODNR and WNF using a Cost Share Agreement.

<b>Objective 10.2c</b> – Plug wells when production ceases.	<b>Monitoring Work Plan Question #42:</b> How many wells were plugged according to State regulations when production ceased?
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**Example of a Federal Well Plugging Operation –Began 12/08 Completed 06/09.**

A total of 7 wells were plugged in accordance with Ohio regulations in FY 2011. No abandoned wells were plugged during FY 11, however 4 wells are planned to be plugged in early FY12 as the cost share agreements were signed prior to the end of FY 11 so the projects may proceed in early 2012. These well sites are on the Ironton Ranger District, 2 in the Lake Vesuvius Recreation Area and 2 in the Hanging Rock ATV Area. These are public safety issues in high use recreation areas.

**2006-2011 Well Plugging Summary**

Since 2006, 31 mineral operations were deemed no longer in a productive status and were plugged. Of the 31 wells plugged, 28 were plugged by the mineral operator and 3 were plugged under a contract with the ODNR and Forest Service using a Cost Share Agreement. The wells were plugged to state standards and the well pads were restored to the acceptance of the WNF. The Forest wildlife biologist and botanist are consulted during well pad restoration to consider restoration alternatives with regard to seed mixture or re-vegetation in order to enhance the reclamation to achieve additional benefits. Native plant species are desired to be used in the re-vegetation of the affected areas. The WNF is aware of the introduction of non-native species (NNIS) and the management of mineral operations considers this issue in the administration of the operations and strives to mitigate the potential of NNIS introduction by requiring washing of vehicles prior to entering Forest areas and coordination with the Forest Botanist.

The WNF and ODNR enter into a Cost Share Agreement to plug 4 wells on the Ironton Ranger District and signed the agreement prior to the end of FY11. The project is expected to be completed in early 2012. The locations are in the Lake Vesuvius Recreation Area (2) and Hanging Rock Recreation Area (2). Cost Share Agreements benefit both agencies to resolve these public safety issues.



Abandoned well plugged and site restoration on the Athens Ranger District, Perry County, Ohio.

## 11 - Recreation

### 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.

<p><b>Objective 11.2b</b> – 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.</p>	<p><b>Monitoring Work Plan Question #43:</b> How many miles of NCT have been relocated/ reconstructed off existing roads?</p>
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In 2011, the Youth Conservation Corp (YCC) trail crew maintained 13.5 miles of the North Country Trail (NCT) and 6.5 miles of NCT connector trails. The River Valley Mountain Bike Association (RVMBA) contributed approximately 741.5 volunteer hours of trail maintenance on the NCT. Maintenance activities included brushing trail, replacing signs, and picking up trash along the trail. No NCT trails were relocated off roads in 2011. The WNF will continue to work with the North Country Trail Association (NCTA) Representative and local volunteers to identify re-route projects for 2012.

### 2006-2011 Miles of North Country Trail Summary

Currently, there are approximately 4 miles of NCT on Forest Service roads and 37 miles on non-Forest Service roads. Forest Plan Objective 11.2b projects that the Forest relocate/re-construct five miles of the NCT off of roads by the end of this planning period. Over the last six years (2006-2011), the WNF has not relocated any segment of the NCT off roads. Some factors that may have contributed to this include:

1. No approved plan in place that provides a strategy and guidance for getting this work accomplished.
2. Greater emphasis placed on resolving conflicts over trail use between partners (NCTA and RVMBA) than trail relocation.
3. Lack of trail funding to relocate trails.

The WNF needs to place greater priority on relocating the NCT off roads in the future if it is to meet the Forest Plan objective. This can be accomplished by having a trail relocation plan, allocating resources towards it, and working with local trails partners to implement.

<b>Objective 11.2c</b> – Maintain and administer the Forest’s trail system to provide safe/enjoyable trail riding opportunities and reduce resource impacts?	<b>Monitoring Work Plan Question #44:</b> How many miles of motorized trails have been maintained to standard (annual routine and deferred maintenance)?
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Maintaining a mile of trail to standard means meeting the following three national critical standards:

1. Effects from trail use do not conflict with environmental laws.
2. Hazards do not exist on or along the trail.
3. When signed as accessible, trails meet current agency policy and accessibility guidelines.

The Forest Plan limits motorized trail recreation to three of the following management areas: Diverse Continuous Forest w/OHV (DCFO), Forest and Shrubland Mosaic w/OHV (FSMO), and Historic Forest w/OHV (HFO). All motorized trail maintenance or reconstruction work is restricted to these Management Areas.

Motorized trails on the Forest are only open to All-Terrain Vehicles (ATVs) 50” wide or less, off-highway motorcycles, and dual-sport motorcycles.

A total of 216.2 miles of trails were maintained to standard on the Forest in FY11. Of this total, 72.8 miles were Off-Highway Vehicles (OHV) trails, which is approximately 55% miles of the total motorized trails currently on the Wayne National Forest.

Much of the “heavy maintenance” work was completed under trail contracts, while the “light maintenance” was completed with use of volunteers, YCC crew, and inmates. Maintenance work was funded with a combination of trail grants (RTP funds), appropriations (CMTL, CMLG), and user fees (FDDS).

## Athens Ranger District

In 2011, the Athens Ranger District maintained 25.74 miles (Table 1) of OHV trails to standard. The emphasis of the work was on the Inner Dorr ATV, Long Ridge, and Purdum Trail. One toilet was replaced at Scarlet Oak Trailhead (#3) and one new toilet was installed at a concentrated use area along Company Road. Six trail bridges and one low-water crossing will be constructed on the Main Corridor Trail in 2012.

The Athens District leveraged appropriated funds with trail grants, user fees, and partner/volunteer contribution to complete trail maintenance projects. Heavy trail maintenance work was generally completed by contractors, while light maintenance was completed with the help of partners and volunteers (Southeast ATV Riders).

**Table 2.18 Athens District Motorized Trail Maintenance**

Trail Name (Motorized)	Miles Maintained to Standard
Inner Dorr-Trailhead #2 Access	0.04
Inner Dorr - Central Loop Conn	0.12
Long Ridge Connector B	0.20
Long Ridge Connector A	0.36
Inner Dorr - Paramount Loop	0.71
Inner Dorr - Timber Road Trail	0.76
Long Ridge- Rocking Horse Loop	0.79
Long Ridge - Orbiston Conn.	0.90
Long Ridge - Sunday Trail	1.20
Long Ridge - Missing Crk Loop	1.32
Inner Dorr - Paramount Loop N.	1.43
Inner Dorr - Paramount Loop S.	1.51
Long Ridge - Orbiston Loop	1.57
Inner Dorr - CCC #2 Trail	1.57
Inner Dorr - Mine Shaft Trail	2.03
Inner Dorr - Deer Stand Loop	2.12
Long Ridge - Cawthorn Trail	2.18
Inner Dorr - Bowl Trail	3.18
Long Ridge	3.75
<b>Total</b>	<b>25.74</b>

(Before photo)



(After photo)



Replacing wooden trail bridge on Purdum OHV Trail with dual culverts.

### Ironton Ranger District

Approximately 59.4 miles of the Ironton Ranger District's OHV Trail system received annual routine maintenance (Table 2) in 2011.

**Table 2.19 Ironton Ranger District Motorized Trail Maintenance**

Trail Name (Motorized)	Miles Maintained
HR_Pine Cutoff ATV	0.50
HR_Hanging Rock Loop ATV	13.0
HR_Hanging Rock ATV TH Con	0.08
HR_Gas Well Connector	0.28
HR_Sawmill ATV	0.67
PC_Telegraph ATV	6.35
S_Bear Claw ATV	1.79
PC_Lyra ATV	5.0
HR_Oak Spur ATV	1.0
S_Grizzly To Trailhead ATV	1.66
S_Claw To Wolcott ATV	0.73
HR_Gas Well ATV Loop	1.80
Ir_S_Bear Top ATV	2.44
S_Superior ATV	4.60
HR_High Knob	1.0
HR_Copperhead ATV	3.0
PC_Wolcott ATV	8.0
PC_Wolcott Loop ATV	1.0
HR_Lakeview ATV	2.0
HR_Powerline ATV	4.50
<b>Total</b>	<b>59.41 miles</b>

## 2006-2011 Motorized Trails Summary Report

As shown in Table 3, the WNF maintains an average of 65% of its motorized trails each year over the last six years, which generally means that each mile of OHV trail receives some form of maintenance every two years. Some sections of trail receive maintenance every year because of the high level of use they receive or they are located on steep slopes, wet areas, etc.

This maintenance rotation meets the Forest Plan Standard SFW-REC-37 – *OHV Trails are...maintained in accordance with Forest Service standards*. Higher satisfaction level based on positive comments received from trail riders is further evidence that the motorized trails are being well maintained.

**Table 2.20 Miles of Motorized Trails Maintained to Standard (2006-2011)**

Year	Miles Maintained to Standard	% of Total
2006	75	62%
2007	81	67%
2008	120	97%
2009	74	61%
2010	66	49%
2011	72.8	54%
<b>Total</b>	<b>488.8 miles</b>	<b>390%</b>
<b>Per Year Average</b>	<b>81.47 mi./yr.</b>	<b>65%</b>

<p><b>Objective 11.2d</b> – 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/OHV trails.</p>	<p><b>Monitoring Work Plan Question #45:</b> 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 OHV use?</p>
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No sections of trail on the Athens Ranger District were closed in 2011 due to unsafe conditions or adverse impacts to natural resources.

On the Ironton Ranger District, the Hungry Hollow Horse Trail and the Vesuvius Lakeshore Hiking Trail were temporarily closed because of a landslide. They are expected to reopen in 2012.

### 2006-2011 Closures Summary

Over the past six years (2006-2011), no designated motorized trails have been closed due to unsafe conditions or unacceptable resource damage. However, most of the OHV trail system has received some reconstruction work and trail “hardening” to minimize trail rutting and soil erosion. Some of the reconstruction work involved replacing trail bridges with new bridges,

culverts, or low water crossings. Other reconstruction work involved repairing soil slips, rebuilding drainage structures, and filling in mud holes and ruts. Much of this work was completed by trail contractors and paid for by a combination of Recreational Trail Program (RTP) grants, user fees, and annual trail appropriations.

<p><b>Objective 11.2e</b> –Reduce and strive to eliminate illegal ATV/OHV use by:</p> <ul style="list-style-type: none"> <li>• Prohibiting cross-country travel or riding on undesignated user-created trails.</li> <li>• Prohibit riding on trails designated for other uses.</li> <li>• Riding on designated trails during closed seasons</li> <li>• Closing at least 20 miles of illegal OHV trail within the next decade to:             <ol style="list-style-type: none"> <li>a) Protect federally listed species</li> <li>b) Protect Regional Forester’s sensitive species</li> <li>c) Improve watershed health</li> </ol> </li> </ul>	<p><b>Monitoring Work Plan Question #46:</b> Have sections of illegal trails on the Forest been closed and rehabilitated? If so, how many miles and where?</p>
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### Athens Ranger District

The Athens District reduced trail width from 96" to 48" on 1.5 miles of Stone Church Horse Trail and blocked access to 11.15 miles of unauthorized routes on the OHV trail system.

Some of the closures and rehabilitation work occurred in an area where a trail bridge was being replaced. Riders that did not cross the stream by utilizing the bridge created unauthorized routes around the bridge as evident in the photograph to the right.



**Illegal routes circumventing bridge on Purdum OHV Trail**

The following photos display some of the unauthorized access closed on the Purdum OHV Trail.



**Blocking access to illegal routes on the Purdum Loop OHV Trail**

**2006-2011 Illegal Trails**

Over the past six years, the Forest closed off access to approximately 142 miles of illegal OHV routes, which far exceeded the Forest Plan’s objective of closing 20 miles of illegal routes by the end of this planning period.

Routes that were blocked by strategically placing large boulders, dropping or dragging large trees (greater than 12” in diameter) in place, or constructing large earth mounds (4 feet high or greater and with a 50% or greater slope) or a double mound (one right in front of another) were more effective at preventing future unauthorized riding than compared to those that were either blocked with brush, small trees, small earth mound, or by signing alone.

Many of the unauthorized routes behind these blockaded areas were not rehabilitated (graded, seeded and mulched) when closed. This may be due to lack of funding at the time of closure.

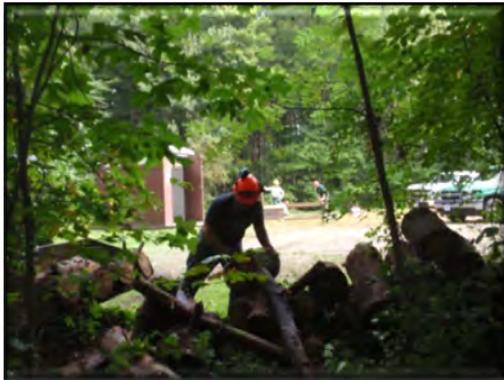
<p><b>Objective 11.2f</b> - Maintain the Forest’s non-motorized trail system to provide safe/enjoyable trail hiking, horseback riding and biking opportunities with minimal resource impacts.</p>	<p><b>Monitoring Work Plan Question #47:</b> How many miles of non-motorized trails have been maintained/reconstructed to standard?</p>
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Non-motorized trails include all hiking, biking, and horse trails. Most of these trails are multi-use (shared) trails. A total of 131.05 miles of non-motorized trails were maintained to standard in 2011. This constitutes 55% of the 239.59 total miles of non-motorized trails currently on the Forest. At this pace, the WNF should be able to maintain all of its non-motorized trails within a two-year rotation period.

**Athens Ranger District** The Athens Ranger District maintained a total of 60.5 miles of non-motorized trails in 2011. Approximately 43.4 miles of trail were maintained on the Marietta Unit by the River Valley Mountain Bike Association (RVMB) volunteers. The group cleared encroaching vegetation, replaced signs, and maintained the trail tread.

The Athens Ranger District partnered with the Washington County Ohio Horsemen's Council (OHC) to maintain 12 miles of the Kinderhook Horse Trail and Trailhead. Employees and volunteers repaired the toilet, brushed, cleared, and removed hazard trees, replaced trail signs and markers, manure bin, and hitching posts and installed a kiosk at the trailhead.

Approximately 22.5 miles of the Stone Church Horse Trail was maintained and the toilet at the Stone Church Horse Camp was repaired.



OHC Volunteers Maintaining Kinderhook Trailhead



Washington County OHC Volunteers at Kinderhook TH



Toilet Repaired at Stone Church Horse Camp

**Table 2.21 Athens Ranger District Non-Motorized Trail Maintenance**

Trail Name and Trail Type (Non-motorized)	Miles Maintained To Standard
Utah Hiking	0.25
North Country Trail - Athens	2
Wildcat Hollow Hiking Trail	3
Lamping Homestead Hiking	5
North Country Trail - Marietta	7
Stone Church Connector Horse Trail	0.85
Kinderhook Horse Trail	19.9
Stone Church Horse Trail	22.5
<b>Total</b>	<b>60.5</b>

### Ironton Ranger District

The Ironton Ranger District maintained a total of 70.5 miles of non-motorized trails in 2011. Trails and trailheads were cleaned, installed signs, maintained, and provided security patrols. Approximately 3,790 feet of horse trails were rerouted for public safety.

**Table 2.22 Ironton Ranger District Non-Motorized Trail Maintenance**

Trail Name and Trail Type (Non-motorized)	Miles Maintained To Standard
Vesuvius Rock House Hiking Trail	0.75
Vesuvius Whiskey Run Hiking Trail	1.0
Vesuvius Addis Mine Hiking Trail	1.0
Vesuvius Backpack/Hiking Trail	6.0
Vesuvius Lakeshore Hiking Trail	8.0
Morgan Sisters Hiking Trail	8.0
Hungry Hollow Horse Trail	0.50
Vesuvius Connector Horse Trail	1.0
Paddle Creek Loop Horse Trail	3.0
Dean Connector Horse Trail	5.0
Kimble Loop Horse Trail	5.3
Vesuvius Main Loop Horse Trail	31.0
<b>Total</b>	<b>70.55</b>

### 2006-2011 Non-Motorized Trails Summary Report

As displayed in Table 6, the WNF maintains an average of 51% of its non-motorized trails each year over the last six years, which generally means that each mile of trail receives some form of maintenance every two to three years. Some sections of trail may receive maintenance more often because they receive greater level of use, cause greater impacts, or are located within sensitive areas such as steep slopes, wet areas, etc. These trails receive significantly less use and therefore, are on a longer maintenance rotation than compared to motorized trails. However, they are still maintained to national standards and meet the Forest Plan Guideline GFW-REC-19 – *...maintain trails in accordance with Forest Service standards.*

**Table 2.23 Miles of Non-motorized Trails Maintained to Standard (2006-2011)**

Year	Miles Maintained to Standard	% of Total
2006	60	26%
2007	50.3	22%
2008	145.25	62%
2009	155.4	67%
2010	173.8	74%
2011	131.05	55%
<b>Total</b>	<b>715.8 miles</b>	<b>306%</b>
<b>Per Year Average</b>	<b>119.3 mi./yr.</b>	<b>51%</b>

<b>Objective 11.2g</b> – Construct new trails during the next 10-15 years within the ranges and densities shown in Table 2-5. ( <i>Forest Plan pg. 2-46</i> )	<b>Monitoring Work Plan Question #48:</b> How many miles of new motorized and non-motorized trails have been constructed?
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### Athens Ranger District

No new trails were constructed on the Athens District in 2011.

### Ironton Ranger District

Approximately 1,500 feet (.29 mile) of horse trail was constructed on the Ironton District in 2011.

### 2006-2011 New Trails Summary

Since completion of the Forest Plan in 2006, the Forest constructed a total of 14.69 new miles of trail. Of this total, the Athens District constructed 0.9 mile of hiking trails (Rutherford Trail and Monroe Outlook Trail), while the Ironton District constructed 13 miles of OHV trails (Superior Trail), 0.5 mile of hiking trail (Archery Trail), and .29 mile of horse trail (Vesuvius Main Loop).

The total miles of new trail construction is far short of the Forest Plan objective for each of the four trail categories (Table 7). At the current rate of construction, the Forest will not meet the Forest Plan objective for new trail construction.

**Table 2.24 Miles of Trails Constructed to Standard (2006-2011)**

Type of Trail	Range of New Miles Allowed in Forest Plan	New Miles Constructed		Total New Miles Constructed
		Athens District	Ironton District	
OHV	50 to 124	0	13.0	13.0
Hiking	5 to 30	0.9	0.5	1.4
Horse	5 to 50	0	0.29	0.29
Mountain Bike	15 to 30	0	0	0
<b>Total</b>	<b>N/A</b>	<b>0.9 mile</b>	<b>13.79 miles</b>	<b>14.69 miles</b>

Several challenges are contributing to this shortfall. Much of the funding for trails (appropriation, grants, and user fees) is currently invested in annual maintenance, leaving little for new trail construction. Additionally, the WNF fragmented land ownership pattern makes it difficult to construct long distance trails. Limited funding for land acquisition also presents a challenge to new trail construction.

If significant miles of new trails are expected to be constructed to meet Forest Plan objectives, then a trail construction strategy must be developed. The strategy should identify possible areas for trail expansion, sources of funding, partnerships, and a reasonable timeframe for completion. Additionally, the WNF must consider maintenance capacity when adding new trails. In other words, it is a challenge to maintain existing miles of trails to standard, much less trying to maintain new miles, under the current funding level (e.g. appropriation, user fees, and grants). Part of the trail strategy should also include a plan for trail sustainability through maintenance.

## 12 - Scenery Management

### Goal 12.1 – Maintain scenic resources

Maintain or enhance the quality of scenic resources to provide desired landscape character.

**Monitoring Work Plan Question #49:** Is the Forest being managed in accordance with the assigned Scenic Integrity Objectives (SIOs) and scenery guidelines found in the Forest Plan?

Five timber sales were monitored in 2011 for compliance of Scenery Management System (SMS) guidelines, three on the Athens Unit of the Athens Ranger District (Monday Creek Pine Sale – Unit 1; Little Monday Timber Sale – Unit 1; and Schoolhouse Timber Sale – Units 1 and 2) and two on the Ironton District (CH&D – Units 4 and 5 and Washington Timber Sale – Unit 1). Four cutting units were hardwood thinnings and three cutting units were white pine clearcuts.

#### **Little Monday Hardwood Thinning – Unit 1 (Completed July 2010)**

This 75-acre hardwood thinning is within Unit 1 of Compartment 75 on the Athens Ranger District. It is within an area assigned a “moderate” scenic integrity objective (SIO).

Upon review of the project Environmental Assessment (EA) (Gore-Greendale), it was found that an analysis of the effects on scenery resources from the proposed action and its alternatives were completed. However, not all appropriate scenery mitigation measures were included. With that said, the appropriate mitigation measures were applied and observed in the field. These measures worked relatively well to reduce the negative effects of timber harvesting activity on the scenic resources.

Though the cutting unit was adjacent to County Road 18, it was not easily noticeable to drivers because it blended well with the natural surroundings, residual trees were mature mixed upland hardwoods, well stocked and well spaced, and contained little evidence of previous logging activity. Much of the unit was on steep slopes and ridge tops. Tree stumps were approximately 1-foot high or less. Few residual slash was evident. Skid trails and landings were not easily noticeable from county road. No logging debris (flagging, trash, oil spills, etc.) was observed. The cutting unit met or even

surpassed the criteria set for a “moderate” SIO.



**Little Monday Hardwood Thinning – Unit 1 (Forest interior)  
1-year and 3 months after harvest completion (10/25/11)**

### **Monday Creek White Pine Clearcut – Unit 1 (Completed February 2011)**

This 18-acre white pine clearcut is within Unit 1 of Compartment 75 on the Athens Unit. It is within an area assigned a “moderate” SIO. The cutting unit was adjacent to and can easily be seen from County Road 18.

Upon review of the project EA (Gore-Greendale), it was found that an analysis of the effects on scenery resources from the proposed action and its alternatives were completed. However, not all appropriate scenery mitigation measures were included. The appropriate mitigation measures were applied and observed in the field. These measures worked relatively well to reduce the negative effects of timber harvesting activity on the scenic resources.

The cutting unit is located below the road in a relatively flat bottom. The clearcut appeared to be a natural opening. The opening re-vegetated very well with grasses and other vegetation. Some small hardwood trees were left to help minimize the size of the clearcut. Landings, skid trails, slash piles, and logging debris were not visibly evident. Stump heights were low (approx. 1’ high). The cutting unit appears to blend in well with the surrounding forest and landscape. It met the criteria for a “moderate” SIO.



**Monday Creek White Pine Clearcut – Unit 1  
Eight months after harvest completion (10/25/11)**

### Schoolhouse White Pine Clearcut – Units 1 and 2 (Completed August 2011)

This white pine clearcut is within Units 1 and 2 of Compartment 243 on the Athens Unit. It is within an area assigned a “high” SIO due to its proximity to State Highway 595, as well as private homes nearby. The clearcut is approximately 100 yards from Highway 595 and adjacent to several private homes.

Upon review of the project EA (Gore-Greendale), it was found that an analysis of the effects on scenery resources from the proposed action and its alternatives were completed. However, not all appropriate scenery mitigation measures were included. Some mitigation measures were applied and observed in the field. However, other mitigation measures could have been better applied, such as GFW-SM-4, 63, 75, and 77-80.

Though there is an approximately 75-foot buffer strip of mature white pines to help screen the cut area, the moderate to heavy slash piles are still in view of the adjacent homes and highway. The slash piles should have been reduced by chipping, scattering, or removal. Additionally, residual flagging (orange and pink) were noticeable along the edge of the clearcut. Some clumps of small hardwood trees were left to help minimize the size of the clearcut. Stump heights were low (approx. 1’ to 1-1/2’ high).

It is anticipated that the project area will meet its “high” SIO in 2 to 3 years once that heavy slash disintegrates and new understory vegetation covers the bare ground. This site is a good candidate for further evaluation in a year or two.



**Schoolhouse White Pine Clearcut – Unit 1  
View from edge of private property  
Two months after harvest (10/25/11)**

### Washington – Hardwood Thinning (Buckhorn)

This 133-acre hardwood thinning was completed February 2011. It is within Compartment 415 of the Ironton Ranger District. It is within an area assigned a “low” SIO. Upon review of the project EA (Buckhorn), no analysis of the effects on scenery resources from the proposed action and its alternatives were completed.

Monitoring was conducted on Unit 1 on December 8, 2011. Approximately 10 months after the harvest, the area blends well with the natural surroundings. The cutting unit is relatively unnoticed from Township Road 152. However, logging activity is more evident toward the unit’s interior. Some areas contain little or no residual slash, while other areas contain moderate to heavy slash and wind-thrown pines. The residual timber stand appears well-stocked with small to moderate sized trees. Cut stumps are low (approx. 1’ high). Some evidence of debris (flagging, unit boundary paint on trees, and trash) left from logging activity and general litter along roadside. Landing and skid road are well grassed in. Landing access is blocked by earthen berm. The units’ scenic resources will continue to improve over a period of a few years.



Washington – Hardwood Thinning (Buckhorn)  
View from edge of landing and skid trail Ten months after harvest (12/8/11)

### CH & D – Hardwood Thinning (Buckhorn)

This 106-acre hardwood thinning was completed June 2011. It is within Compartment 415 of the Ironton Ranger District. It is within an area assigned a “low” SIO. Upon review of the project EA (Buckhorn), no analysis of the effects on scenery resources from the proposed action and its alternatives were completed.

Monitoring was conducted on Units 4 and 5 on December 8, 2011. Approximately 6 months after the harvest, the area blends well with the natural surroundings. Stand appears to be well stocked, even after thinning. Except the landing, the cutting units were not easily noticeable from County Road 82. The Landing is grassing in well. No slash piles were evident from the road, but they become more noticeable as one moves toward the unit interior and along the main skid trail. There appears to be more dead and down trees in the interior as a result of logging and windthrow, especially in Unit #5. Skid trail was seeding in well. Some stumps were more than one foot high. Flagging and marking paint was also evident near landing. The units’ scenic resources will continue to improve over a period of a few years.



**CH & D Hardwood Thinning – Ironton District  
Skid Trail 6 months after harvest (12/8/11)**



**CH & D Hardwood Thinning – Ironton District  
Landing 6 months after harvest (12/8/11)**

**2006-2011 Scenery Management Summary**

No field monitoring for scenery occurred in 2006 and 2007 because no timber projects were yet implemented on the ground. However, scenery resources were analyzed and mitigation measures were prescribed in the environmental assessment (EA). Except for the Lamping Homestead and Buckhorn EA, all other EAs (since the Forest Plan was revised) analyzed the effects of management activities on scenery resources.

Seventeen timber sales were monitored over the last four years. They all met or will have met the area’s scenic integrity objective within one to two years after harvest. Many of the appropriate scenery guidelines in the Forest Plan were implemented on the ground.

All thinnings (pine and hardwood) that were monitored appeared well-stocked and blended well with the surrounding landscape, to the point that some were not noticeable from adjacent roads. Most of the clearcuts contained residual trees or clumps of trees to help lessen the contrast between the surrounding forested areas and to reduce the size of the opening. The older clearcuts are well established with grasses, shrubs, and trees and appeared as natural wildlife openings.

Aspects of logging that could be applied to help enhance visuals include, include removing boundary flagging, graying out marked/painted unit boundary trees, removing equipment damaged trees, and picking up logging debris (especially at landing areas and along roadsides). Designating firewood cut areas after harvest could also enhance visuals by minimizing the amount of slash that can be seen from adjacent roads and landings.

**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.

<p><b>Objective 13.1c</b> – Reduce the backlog of heritage sites that require formal evaluation</p>	<p><b>Monitoring Work Plan Question #50:</b> How many heritage sites have been</p>
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for eligibility to the National Register of Historic Places.	evaluated for National Register eligibility?
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No sites were evaluated for National Register eligibility in FY11.

<b>Objective 13.1d</b> – 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.	<b>Monitoring Work Plan Question #51:</b> How many management plans have been developed for heritage sites that are either eligible for or listed on the National Register of Historic Places?
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No management plans were developed for any of the priority heritage assets (PHA) on the Wayne National Forest in FY 11. However, thirteen of them were managed to standard this year. In addition, the Works Progress Administration (WPA) Stone Bridge (a PHA destroyed by flood in FY10) was formally removed from the National Register in FY11.

**2006-2011 Heritage Summary**

Of the four Heritage Objectives established in the Wayne National Forest Plan the two chosen for monitoring were those that have historically been difficult to accomplish. The intent was to identify two elements that could significantly contribute to a desired future condition for the WNF Heritage Program. Over the last six years (FY06 through FY11) the Forest has evaluated eight (8) heritage sites for National Register eligibility (Objective 13.1c; Question #50). Although this work has added 4 PHA’s to the management roster, it is not a remarkable reduction of the backlog of approximately 465 sites needing such evaluation. Similarly, no management plans have been developed for any of the now 23 PHA’s (Objective 13.1d; Question #51).

Not surprisingly, these shortfalls are the direct result of insufficient funding and resources to complete heritage tasks/goals. Like most Forests, Wayne heritage accomplishments are project-related NEPA compliance. Examination of project support activities over the last six years is impressive by comparison:

acres surveyed	2,813
sites recorded	140
interpretive projects	24
PHA’s managed to standard	average of 12/year

Heritage volunteers and partners have contributed 10,638 hours toward these accomplishments. This work does fulfill Plan Objectives 13.1a and 13.1b.

The WNF situation is typical of the struggle to balance project compliance with pure heritage activities across the Forest Service. Heritage watchdog and public monitoring of this continuing imbalance/struggle has resulted in agency formulation of a new heritage accounting standard – Program Managed to Standard (PMTS). Forest programs can no longer report project-related accomplishments each year. Yearly targets will consist of purely heritage activities scored within a point system. A program is considered managed to standard when the score is a

minimum of 46 points. Over the past two years the WNF Heritage Program has scored only half of that total.

### 2006-2011 Summary Monitoring

As for the plan monitoring objectives, the WNF Program consistently fulfills half of them (Objectives 13.1a and b) but has not shown significant movement toward the heritage objectives that remain difficult to achieve (Objectives 13.1c and d). This existing condition does not precipitate a change in these objectives, however. In general, the WNF manages to follow the intent of the Forest Plan heritage standards and goals. The areas of shortfall (e.g. goals for the desired future condition) are still attainable, especially given the implementation of the new PMTS standard that should serve to bolster these objectives.

## 14 - Land Ownership

### Goal 14.1 – Consolidate Ownership

Adjust land ownership within the WNF proclamation boundary to enhance public benefits and improve management effectiveness. The FY 2011 size of the WNF is 241,127 acres.



*Mill Creek Falls-Dye Tract Land Purchas –Marietta Unit*

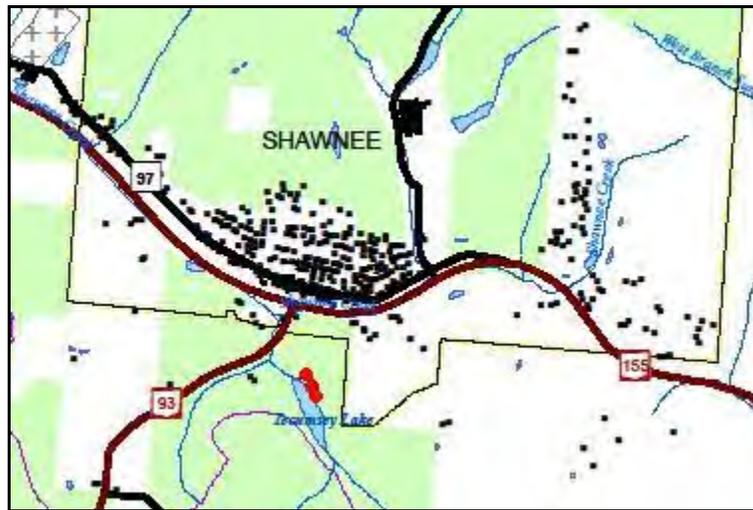
### Land Adjustment and Special Uses

In FY 2011, the Forest received and spent Land and Water Conservation Funds (L&WCF) Critical In-holding Funds and other Administrative Funds (Land Adjustment to acquire 11.19 acres of land. Three purchases occurred on the WNF on the Athens Ranger District. Two cases were optioned on the Marietta Unit, but did not close prior to the end of FY11. These cases will close in early FY 12.

The Special Uses program occurs on all three units of the Forest. Where applicable, Cost Recovery is applied regarding the customer service directives.

<p><b>Objective 14.1a</b> – Purchase, exchange, accept donations or convey lands and minerals rights on a willing seller, willing buyer basis.</p>	<p><b>Monitoring Work Plan Question #52:</b> Does the Forest’s land base progress toward consolidation that meets objectives by exchange, purchase or donation?</p>
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The WNF land base is progressing toward improved consolidation by land purchase and exchange. In 2011 the WNF acquired 11.19 acres that improved consolidation. These acquisitions meet the objectives of land purchases, exchanges or donations. All three parcels were true inholding completely surrounded by NFS lands. Of the 11.19 acres acquired, the tracts were in Management Areas as follows: 8 acres in Future Old Forest (FOF), 2 acres in Diverse Continuous Forest with OHV (DCFO), and 1.19 acres in Forest Shrub land Mosaic (FSM).. One land exchange was initiated on the Ironton Ranger District, the Sean Doyle Exchange at Timber Ridge Lake, but has not had a Feasibility Analysis Review completed prior to the end of FY11. The Huntington Bank Tract on the Athens Ranger District is a land donation received in FY11. Due to a very complex land survey, it had not been completed by the end of FY 11 and will be completed in early FY 12.



Athens Ranger District-Critical Inholding parcel acquired near Shawnee, OH

### 2006-2011 Land Consolidation

As of the end of FY11 the WNF was 241,127 acres in size. There are 104,305 acres on the Ironton District, 72,176 acres on the Athens District and 64,646 acres on the Marietta Unit. The Forest is within a Proclamation Boundary that contains approximately 833,990 acres of gross area whereas about 29% of this area is WNF. The WNF increased in size by 4,310.37 acres since 2006. The WNF spent \$3,598,086 of Land Water Conservation Funds (LWCF) to acquire these lands. The tracts being acquired are leading to a more consolidated land base and reducing WNF boundary lines and fragmentation. Inholdings, lands surrounded by WNF, comprised eight cases/tracts acquired during this period. The WNF partnered with land trusts and nationally recognized groups such as The Nature Conservancy (TNC), The Trust for Public Land (TPL) and locally, Forest Conservancy Limited. The WNF acquired the Cambria Tract on the Ironton District that significantly consolidated the northern portion of the District. This was a 4,116 acre very contiguous property near Blackford, Ohio. The Nature Conservancy acquired the property in 2005 and conveyed it to the WNF in a phased acquisition from 2006 to 2008. The Cambria Tract acquisition joined several miles of the Proclamation Boundary and multiple parcels of existing NFS lands. This was an excellent example of an acquisition that progressed toward consolidation that meets the objectives of the Forest Plan. There were two land exchanges completed during the period, both on the Marietta Unit. The Jackson Township exchange

allowed the Township to gain use of an area they had under permit for years and expand a cemetery in exchange for lands deemed acceptable to improve consolidation of the WNF. The Washington County Sisk Act Exchange allowed the WNF to sell a 2 acre parcel to the County that they had under Special Use permit for many years so they could improve the property with a new building. The funds obtained from the sale of the land were used to acquire other property on the WNF. The use of the Sisk Act is limited by the terms of the Act. There were no donations processed on the WNF during the period.

<b>Objective 14.1b</b> –Acquire rights of ways or property to improve access to NFS land.	<b>Monitoring Work Plan Question #53:</b> How many miles of right-of-way, or parcels of land have been acquired to facilitate access to NF tracts?
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The WNF acquired three parcels of property that improved access to existing WNF lands in FY11. Three (3) temporary rights of ways were acquired for administrative use. These are three year term licenses to access public land on the Athens Unit of the Athens Ranger District.

#### **2006-2011 Acquired Right-of-Way Summary**

The properties acquired from 2006 to 2011 all joined existing NFS land and provided or improved access. The inholding properties improved the ownership pattern by reducing the need to avoid private land within the WNF property. There were no permanent easements acquired for access during the period. There were 13 Temporary Licenses or Permits acquired during the period. These are typically 3 year term permits acquired for the temporary access across private lands for timber, watershed or recreation related projects. The land owners agree to the use of an existing roadway and the WNF Service is responsible for the maintenance and restoration of the roadway. Once the use is no longer needed within the agreed to period, the road is restored. Landowners in this area typically do not desire to convey a permanent road easement that encumbers their property.

<b>Objective 14.1c</b> – Foster good neighbor relations with local communities.	<b>Monitoring Work Plan Question #54:</b> How many Special Use permits were authorized and re-authorized to allow local community developments on NFS lands?
	<b>Monitoring Work Plan Question #55:</b> How many acres of prime farmland or acres of land with high potential for community development have been purchased?

The WNF issued 28 special use permits in FY 2011. These permits contribute to community development since private individuals or companies hold permits to occupy public land or provide access to private property. The community benefits by the use of public lands for occupancy since alternatives are not available on private land. The WNF issued numerous

temporary Recreation Event Permits in FY 2011, which are accountable by the Recreation Staff.

The WNF did not acquire property that contained prime farmland or land with high potential for community development in FY 2011.

### **Partners – Land Adjustment- Acquisitions and Exchanges**

The Wayne National Forest works with local Land Trusts and the Ohio offices of national conservation groups such as the Nature Conservancy (TNC) and the Trust for Public Land (TPL) to acquire land for the United States. TNC assisted in the purchase of more than 4,000 acres on the Ironton Ranger District from 2006 to 2008. The acquisition of the Cambria Tract was a significant and successful purchase that consolidated public ownership and now provides habitat for many wildlife species and the protection of historic sites such as the Pioneer Iron Furnace. In 2011, the local land trust, Forest Conservancy Limited (FCL), of New Plymouth, Ohio assisted in the acquisition of two parcels of land.

### **2006-2011 Special Use Authorization and Re-authorization Summary Report**

Due to the ownership pattern on the WNF there are many private properties intermingled within the WNF. This fragmented ownership creates a need for public uses to sometimes be authorized on WNF land. Utilities such as water, electric, telephone or gas transmission lines and road uses are common uses on the WNF. Other permits such as cultivation for hay may serve a dual role to achieve some shared management of the NFS property while the permit holder gains also gains some benefit. In 2006 the Forest Service implemented the Cost Recovery Program related to Special Use Permit authorizations. Under this program the applicant for a special use permit may be required to pay for the processing the application before the permit is issued. There is a customer service requirement response to this program in that the permits, if approved, must be processed within 60 days or within 30days the applicant shall be notified as to when they may expect the permit to be issued. The implementation of this program may have created a decline in the number of permits being issued. There were 113 Special Use Permits issued on the Forest during the period.

The WNF did not acquire any prime farm land during the period. The WNF did not acquire any property that was deemed to have a high potential for community development. There was some discussion during the acquisition of the Cambria Tract on the Ironton Ranger District by the Lawrence County Chamber of Commerce as to the potential for private uses of this large block of property. The Chamber was provided factual information regarding the property and did not object to the acquisition further.

## Goal 14.2 Maintain Boundary Lines



Forest Surveyor with his Total Station Surveying Equipment

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

**Monitoring Work Plan Question #56:** Is the Forest making progress towards the eventual marking and maintaining of the entire perimeter of NFS lands against private property?

The WNF completed 15 miles of boundary maintenance. The WNF continues to make progress in marking National Forest property boundaries. High visibility and recognition of boundary marking along public road frontage is making public land more available to the public.



Entering National Forest Land-2 Red Blazes



Private use encroachment onto WNF lands-Note trailer extends over property line where orange Carsonite post is located. Resolved by Survey.

<p><b>Objective 14.2b</b> – Survey and post landlines not currently marked. Maintain lines previously marked on a 10-year cycle.</p>	<p><b>Monitoring Work Plan Question #57:</b> Is the Forest making progress towards resolving trespasses as they occur and are discovered?</p>
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The WNF resolved 4 trespasses discovered in FY 2011. The WNF continues to investigate and resolve trespass and encroachments on the Forest as they are discovered. If a trespass or encroachment is discovered, the Lands Staff will provide coordination with the Line Officer to adhere to Forest Service Manual and Handbook directions.

The WNF entered into a Stewardship Contract involving the 33 By-pass and Hocking College in Athens. The contribution of 5 miles of boundary maintenance was performed by Hocking College students in coordination with the Forest Surveyor completed in FY 11.

Contracting for boundary maintenance and cadastral survey contracting achieved successful results on the Marietta Unit, Athens Ranger District and the Ironton Ranger District. Four survey contracts were awarded in FY11, one at Athens and three at Ironton.

### **2006-2011 Survey Summary**

During the period the WNF has resolved numerous encroachments and trespass as they are discovered or ones that have been identified. Examples of trespass and encroachment are private uses extending onto NFS lands such as a timber harvest, a yard, shed, fence, or other structures. Mobile homes, garages, and dwellings are found to be on WNF Service lands. As these trespasses or encroachments are discovered and investigation is done to determine what is involved. The WNF is making progress on resolving trespass and encroachment by surveying more boundaries and providing information to neighbors of the need to obtain boundary information from the WNF in order to avoid trespass. Law Enforcement and legal counsel from the Office of General Counsel (OGC) is used as part of the resolution process. Title Claim Reports are developed and submitted seeking guidance or legal opinions as necessary to resolve trespass and encroachment.

## **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

**Monitoring Work Plan Question #58:** Is the Forest considering and processing reasonable requests for special use authorizations on NFS lands?

**Helca Water Co. installation of buried water line along public road-during project**



**Hecla Water Co. buried water line under permit and current condition-after**

The WNF considers all special use requests. If the request meets the standards set forth in the directives of the Forest Service and the agency and are deemed an acceptable use, the application is processed per the customer service standards. A permit is issued for special use authorizations on NFS lands once all aspects of the process are complete and processing and land use fees are collected. The WNF processed and issued 28 permits in FY 2011. The WNF inspected 115 permits and found them to be to standard. The WNF continues to implement the Cost Recovery Program for Special Uses.

**2006-2011 Special Uses Summary**

The WNF considers special use requests and if deemed an acceptable use, processes the application and issues a permit for special use authorizations on NFS lands. If the use could be done on private land or off National Forest land, it may not be authorized. The Cost Recovery Program is applicable in most cases and appears to have caused a decline in the number of permits being issued. Fees collected from Special Use permits contribute to the payments made to the counties in the form of payment in lieu of taxes (PILT).

## 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

**Monitoring Work Plan Question #59:** How many parcels of land were acquired in the current year that were being grazed by livestock within approximately one year prior to acquisition by the Forest Service? If there are any parcels, how many? And are they still being grazing, or being offered for grazing?

No parcels of land acquired in FY2011 are under a grazing permit.

**Monitoring Work Plan Question #60:** How many acres were grazed and contributed to wildlife habitat objectives; and how many acres were grazed to control non-native species?

There were 120 acres permitted for grazing, all on the Marietta Unit. None of these acres contributed to wildlife habitat objectives or were grazed for non-native invasive species control. The WNF Service mowed 50 acres of the grazing pastures to knock back multiflora rose, an invasive plant that cattle do not consume.

#### 2006-2011 Range Summary

No parcels of land acquired in since 2006 are under a grazing permit. From 2006-2009, 140 acres were permitted for grazing. Of these, 0 acres were grazed for wildlife habitat objectives and 30 acres (in the FSM Management Area) were grazed for NNIS control. During 2010, none were grazed for NNIS control, rather 50 acres were mowed to remove multiflora rose, an invasive plant that cattle do not consume. In 2011, 20 acres of grazing were dropped from a permit on the Ironton Ranger District, leaving only 120 acres under permit for grazing, all on the Marietta Unit of the Athens Ranger District. The WNF Service again mowed 50 acres of the grazing pastures to knock back multiflora rose.

## 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.

<b>Objective 17.1a</b> – Conduct detailed inspections of facilities every five years	<b>Monitoring Work Plan Question #61:</b> How many administrative and recreation
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more often if needed.	facilities meet current safety, mission, niche, and use requirements?
<b>Objective 17.1b</b> – Decommission facilities that are no longer needed.	

Normal updates and repairs consistent with standard procedures were undertaken at our offices consistent with normal operations.

In FY 2011, 3 facilities were inspected for general maintenance needs under condition surveys, far less than the 20% that was expected. Normal maintenance as needed was completed when problems were noted by staff or the public at all facilities. Condition surveys will be conducted and in 2012 to make up for the short fall in 2009, 2010 and 2011. In 2011, the WNF was busy with construction projects and administration of ARRA projects. Condition surveys were considered a lower priority. All area lighting at Supervisor’s Office facility was replaced by LED lights reducing electric usage in that area by 90%.

### 2006-2011 Building and Structures Summary

The total number of inspections for the planning period is 61. This is far below the expected amount of inspecting 20% of facilities each year. This is due in part to WNF staff working on ARRA projects since FY 2009.

### Goal 17.2 – Safety and Effectiveness of Dams

Maintain dams as safe and effective water storage facilities.

<b>Objective 17.2a</b> – Maintain dams to standard.	<b>Monitoring Work Plan Question #62:</b> How many Forest dams meet current State and Federal regulations with respect to storage capacity, storm routing, spillway capacity, and general dam safety?
<b>Objective 17.2b</b> – Inspect high hazard dams annually.	
<b>Objective 17.2b</b> – Decommission or appropriately dispose of dams no longer needed.	

In FY 2011, heavy maintenance and repairs were completed under contract for three dams on the Forest – Timbre Ridge, Brady Dam #2 and Brady Dam #3. Brady Dam #2, was permanently breached and converted to a wetland to prevent future maintenance needs. It has served its intended design need as a settling pond for upstream mining activities. The sites above the dam are well vegetated and sediment is no longer an issue.

The Forest currently has two dams classified by the Ohio Department of Natural Resource, Division of Surface Water, Dam Safety Office as high hazard dams. They are Vesuvius and Timbre Ridge dams located on the Ironton Ranger District. Both were inspected in 2011 by both the Forest engineering staff and the Regional Dams Engineer. One deficiency noted at Timbre Ridge dam in previous inspections, inoperable stem on the emergency dam drain valve,

this deficiency was repaired under contract. The repair was completed in 2011; funds were utilized from the ARRA program. During repairs it was found that the concrete inlet structure was heavily damaged by what we believe was sulfate attack on the concrete. Minor earth work was completed in the emergency spill way and the debris guard on the principle overflow structure was replaced to enhance safety. The face of the dam was also cleared of large woody vegetation and maintained to standard.

Currently there is no secondary all-weather route to Timbre Ridge for emergency equipment and repair in the case of partial dam failure as noted in the FY 2010 and previous monitoring reports. Funds were requested under the ARRA program for the construction of this road in 2009, no funds were received. The Forest will continue to request funds to correct the situation.

Two dams on the Athens District, (Utah Ridge and Lamping) were inspected and needed repair for partially inoperable outflow devices. Both dams received inspections and the engineering staff completed design packages and a stewardship sale was sold to complete the needed work. Only the temporary breaching of Utah pond was completed at the end of FY 2010. It is expected that the work at Lamping Homestead will be completed in 2012.

At Utah Pond, the dam was drained to allow the soil to dewater and a new contract was awarded in 2011 that will replace the flow structure. Once that is complete the dam can be refilled.

Smith Hollow dam on the Ironton District was planned for ARRA funding, but funding was not received. There is a damaged control structure that is not considered likely to cause unrecoverable environmental damage, is also unlikely to be a safety concern to public in the event of a breach. If funding is available, the repairs will be planned and executed at that time.

**Table 2.25 Dam Inspections**

Dams	2011 Inspections	
	Number Receiving Inspections by District	Noted Deficiencies
Athens District – 7	2	2
Ironton District – 10	2	2

### **2006-2011 Dam Inspection Summary**

There has been a total of 34 dam inspections in the planning period, and total of 10 deficiencies noted.

### 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.

<p><b>Objective 17.3a</b> – Reduce sedimentation and improve passage for aquatic and semi-aquatic organisms at Forest development road and forest service recreation trail crossings.</p>	<p><b>Monitoring Work Plan Question #63:</b> How many stream crossing were inventoried and/or corrected for sedimentation production?</p>
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In FY 2011, road-stream crossings were inventoried within several watersheds on the Ironton & Athens Ranger Districts. Those noted as possible impediments to aquatic organism passage were identified and a record made of their location as well as a picture and measurements taken to help future monitoring and prioritization of replacements. Data is stored in a Geographic Information System (GIS) database at this office. The information will be used to request funding for aquatic passage replacement according to the degree of impedance and the quality of the fishery the culvert serves. No crossings under Forest jurisdiction were noted as likely to cause excessive sediment. All identified as likely to impede aquatic passage will be monitored in the future to determine if they need repair/replacement, or are producing undue stream sediment load.

ARRA funds were received by the Forest and two structures were replaced in 2011. A third structure under Washington County jurisdiction was funded for environmental review and the design on Archers Fork was completed in 2011. Archers Fork is a tributary to the Little Muskingum River, the Forest's highest priority watershed and one of the most bio-diverse watersheds in the eastern US. The Forest continues to work with Ohio Department of Transportation (ODOT), County Engineers and some Township governments to improve the entire road/stream crossing system under public domain.

**Table 2.26 Road-Stream crossings inventoried for probable sediment production and aquatic passage**

	<b>Sedimentation Production</b>	<b>Aquatic Passage</b>
Athens District -	No structures under Forest Jurisdiction were found to be significant sediment producers in 2011. Several structures under State or Local Government jurisdiction were noted as potential sediment sources and will be monitored in subsequent years.	0
Ironton District –	no issues of concern noted	70+ (estimated)

Four new ORV bridges were constructed on trails in the Ironton District. These new bridges will improve aquatic life by reduction in sediment loads and improve the safety of trail users. An example below for before and after project implementation.



**Proposed ORV bridge location (center) with current low-water crossing visible to the right at Hanging Rock Site 2.**



**Completed ORV bridge at Hanging Rock Site 2.**

**2006-2011 Inventory Summary**

A total of 470 road stream crossing have been inventoried in the planning period with no reports of sedimentation.

<p><b>Objective 17.3b</b> – Decommission temporary and system roads when they are no longer needed for administration of the Forest or its resources.</p>	<p><b>Monitoring Work Plan Question #64:</b> How many miles of roads were evaluated to determine maintenance, storage or decommission needs?</p>
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In FY 2011 numerous system roads were monitored by Forest personnel as they traveled the road system working on other ongoing management activities.

**2006-2011 Road Decommission Summary**

There were 111.53 miles reported as evaluated to determine maintenance, storage or decommission needs from 2006-2008. Since that time monitoring has not been reported in miles and is performed as part of ongoing management activities as roads are traveled by Forest staff.

<p><b>Objective 17.4c</b> – 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.</p> <p><b>Objective 17.4d</b> – Maintain at maintenance level 3, or higher, roads intended for passenger vehicles.</p> <p><b>Objective 17.4e</b> – Maintain at maintenance level 2 roads intended for high clearance vehicles.</p> <p><b>Objective 17.4f</b> – Maintain at Maintenance Level 1 roads that are closed to public travel.</p>	<p><b>Monitoring Work Plan Question #65:</b> 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?</p>
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The table below represents the roads by objective maintenance level. It also depicts the number of miles that meet the objective maintenance level. If a road was not evaluated it cannot be assumed to meet or not meet objective maintenance level. Due to this data gap, and estimate of total roads not meeting objective maintenance level cannot be determined at this time. The values are based on professional judgment of the Forest Engineer.

**Table 2.27 Road Maintenance**

	<b>Total System Miles at Operational Maintenance Level (End of FY)</b>	<b>Roads Receiving Maintenance *** Approx. (Miles)</b>	<b>Estimated Roads meeting Objective Maintenance Level (Miles)</b>
Maintenance Level 1 and 2	299	36.5	110**
Maintenance Level 3	27	21.7	15**
Maintenance Level 4	9.9	8.2	6**
Maintenance Level 5	14.7	9.7	8**
<b>Total Miles</b>	<b>350.6</b>	<b>76.1</b>	<b>139</b>
<b>% Estimate of Road segments at Objective ML</b>			<b>39.7%**</b>

\*\*\* Estimated from data review and personal observation of engineering staff.

\*\* Professional estimate as the Forest does not currently perform calculation or inventory to ascertain if a road segment quantifiably meets Objective Maintenance Level.

The WNF Infrastructure (INFRA) data base for roads needs a major clean-up. A first-cut study of the roads in INFRA indicates 3000 – 5000 pieces of missing or incorrect/erroneous data.

Monitoring of environmental stability was performed on those roads where staff made site visits and problems were noted. Work was scheduled on these roads as funding allows by the district engineering technicians.

Use of closed roads by the public with motorized vehicles continues to damage the road system beyond what funding allows for annual repair. Currently the open roads that receive the most use are receiving the majority of the funding available. System roads that are no longer needed for long term administrative use or pose a hazard to the public/environment will be evaluated for removal on a case-by-case basis as problems are discovered.

Maintenance is performed in most cases once a year or less on level 3 and 4 and 5 roads as funds allow, and as needed as problems are found or after assessment on level 1 and 2 roads.

Design and construction specification documents were completed for the following projects in 2011:

- (1) CR29 (FH2) Bridge replacement on the Ironton District.
- (2) Three (3) landslide repairs on FH1955 & 1957 on the Ironton District.

Two major landslides occurred on FH-132. Emergency Relief for Federally Owned Roads (ERFO) officials visited the site and approved the use of ERFO funding for the repairs. Funding should be received on the WNF in FY2012 with planning, design and construction in FY2012. See examples below of project in process.



Figure 2.27 Lake Vesuvius Road Slip #2 before repair.



Figure 2.28 Lake Vesuvius Road Slip #2 during repairs: installation of heli screws and softwall (25% completed).

### 2006-2011 Maintenance Summary

The WNF has performed 355 miles of road maintenance in the planning period.

<p><b>Objective 17.4g</b> – Remove hazard trees along Forest development roads from Sept. 15 through April 15.</p>	<p><b>Monitoring Work Plan Question #66:</b> Are known hazard trees removed during the appropriate time of year?</p>
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In FY 2011, no (0) hazard trees with Indiana bat roost tree characteristics were removed during the period from April 15<sup>th</sup> to September 15<sup>th</sup> of 2011. All hazard trees were removed before

April 15<sup>th</sup> or after September 15<sup>th</sup> by Forest Service personnel or contractors along Forest roads.

### 2006-2011 Hazardous Tree Summary

No Hazard trees have been removed with Indiana bat roost tree characteristics were removed during the period from April 15<sup>th</sup> to September 15<sup>th</sup> during the planning period.

## 18 - Public Health and Safety

### Goal 18.1 – Law Enforcement

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

<p><b>Objective 18.1a</b> - Prevent violations of law through:</p> <ul style="list-style-type: none"> <li>• Education</li> <li>• Information and regulatory signing</li> <li>• Improved facilities</li> <li>• Effective citing and prosecution of violations</li> <li>• Public notice of prosecutions and penalties</li> <li>• Presence of uniformed Forest Service personnel</li> <li>• Working with cooperating agency law enforcement officials at times and locations of heavy public use.</li> </ul>	<p><b>Monitoring Work Plan Question #67:</b> How many prevention activities were performed?</p>
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Hundreds of routine daily prevention activities were performed in FY 2011 including: ATV patrols on designated and illegal trails, boat patrols, hunting, fishing, recreation areas, camping areas, horse and hiking trail patrols.

### 2006-2011 Prevention Activity Summary

The activities above are indicative of the types of patrols prevention activities that are regularly performed by law enforcement at the Forest.

<p><b>Objective 18.1b</b> - Focus law enforcement efforts on Forest priorities to reduce incidence of:</p> <ul style="list-style-type: none"> <li>• Illegal OHV use</li> <li>• Arson Fires</li> <li>• Trespass and timber theft</li> <li>• Trash dumping</li> </ul>	<p><b>Monitoring Work Plan Question #68:</b> How many incidences of illegal OHV use, arson fires, trespass and timber theft, and trash dumping were reported?</p>
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### FY 2011

Incidences by category are as follows: OHV 200, Fire 15, Timber 20, Sanitation (Trash Dumping) 100.

### 2006-2011 Illegal OHV Summary

Incidences by category are as follows: OHV 1,414, Fire 189, Timber 133, Sanitation (Trash Dumping) 891.

<p><b>Objective 18.1c</b> – 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.</p>	<p><b>Monitoring Work Plan Question #69:</b> How many agencies does the Forest have agreements with?</p>
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Wayne National Forest has Cooperative Law Enforcement Agreements (CLE's) with six counties: Athens, Gallia, Hocking, Lawrence, Monroe and Scioto.

### 2006-2011 Agreements Summary

The Forest has had as high as 7 CLE's in the past including Perry County which last had an agreement in 2008.

<p><b>Objective 18.1d</b> – Report violations of laws and regulations.</p>	<p><b>Monitoring Work Plan Question #70:</b> How many violations were reported?</p>
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There were 936 violations in FY 2011.

- Warnings: 274
- Incidents: 388
- Violation Notices: 274

### 2006-2011 Violations Summary

There have been a total of 5,115 violations reported in the planning period.

## 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.

<p><b>Objective 18.2a</b> – Ensure that water supplies and wastewater facilities meet relevant state and federal laws.</p>	<p><b>Monitoring Work Plan Question #71:</b> Were the appropriate water quality tests performed?</p>
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### Drinking Water

In FY 2011, the WNF operated three collateral transient water systems at four campground areas, Vesuvius Recreation Area (two campgrounds and several day use areas), Leith Run and Burr Oak Campground. These are collateral systems that are served by public water suppliers. Our system is distribution only, no treatment or mass storage takes place at our facilities.

Testing on contaminants such as coliform bacteria and total chlorine residual is maintained by each District. The Ironton Ranger District has forwarded documentation in the past to the Forest Supervisor's office; the Athens Ranger District has not forwarded this data. The previous Assistant District Ranger for recreation in Athens had made agreements with the public water providers (Burr Oak Regional Water District and Newport Water District) to sample our recreation sites. Their sampling plan reportedly samples water at each of the campgrounds supplied by the respective water districts. These samples are open records to the public and cover sampling on our distribution system. There will be follow up with the Athens District in 2011 as to the sample regime and data storage and collection, because the Assistant Ranger District Ranger that set up the sampling is no longer on staff.

Leith Run campground waterline replacement was completed in FY 2011. The waterlines installed in 1992 have been problematic and caused significant disruptions in service for the public when lines break or leak during the busy summer camping season. This caused a concern for public safety as contaminants could enter the system at the break site and contaminate the lines.

### Permitting

The Forest no longer has any National Pollutant Discharge Elimination Systems (NPDES) permits, however a historic permit for the Ironton District Rangers District office continues to receive violation notices from OEPA for testing that was not performed and/or not reported to OEPA. Twice during the year the WNF contacted both OEPA's district office in Logan and state office in Columbus to verify the permit was closed and we were not violating its terms. Contacts included once by e-mail and one time by mail to verify the notices are erroneous. A file of correspondence with EPA is kept by the Forest Engineer. The WNF was assured that the permit will eventually be removed from the automated violation mailing system that reports failure to provide test results. Our Forest engineer was told that it is closed and to disregard any future notices. The closure will eventually be recognized by their automated system, and sometimes it takes several years to complete the process internally at OEPA.

The official letter signed by the Forest Supervisor in 2008 was resent to both offices at OEPA in

2009. We will continue to respond to notices of non-compliance periodically until they are discontinued.

Continued monitoring of the effluent disposal mound at the Nelsonville office is scheduled for 2012. Some initial information from 2010 monitoring indicates the mound may be nearing the end of its life cycle. No sign of effluent leaving the mound on the surface or short-circuiting is visible to date. It seems that the pressure required to pump to the mound is increasing as a compression joint on the mound side of the pumps is periodically being forced off the discharge pipe. No effluent has been released and there is little danger of any future release. In 2012, a review of the mound will take place to determine the cause and remedy the issue.

The beach house wastewater treatment in the Ironton District has experienced some alarm problems in FY 2011 indicating operational problems in the drip irrigation system.

Seepage in the sides of the leach field mound system at the Oak Hill campground is occurring at various locations along the mound.

### **2006-2011 Summary**

All water supplies have been appropriately tested during the planning period.

### **Standards and Guidelines Compliance**

Did any project require guideline modification or a Forest Plan amendment to modify a standard?
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No standards or guidelines in the 2006 Forest Plan were modified from 2006-2011 fiscal year.

## Climate Change

The Wayne National Forest has developed a strategy and five-year action plan for implementing the Forest Service's National Climate Change Scorecard. Our strategy uses the scorecard as a framework to organize relevant parts of our program of work and to link our Forest Management Plan to appropriate national frameworks. For example, this approach would allow us to be especially responsive in the area of broad scale assessments, which are an expected part of our forest monitoring program under the pending national planning rule, and to do so in an especially efficient way.

The strategy is simple. The basic idea is to begin work where we already have traction and then build capacity where and how it makes sense as we learn more about the newly emerging National Planning Rule and Climate Change Framework. Specifically, the proposed strategy is built upon three principles:

1. Smart to Start: Select initial scorecard elements that build on existing efforts and focus on those priorities.
2. Smart to Grow: Be responsive in the near-term by working toward initial priorities while at the same time growing capacity to adopt a more robust framework at the eco-regional scale (Central Appalachia).
3. Smart to Change: When appropriate, validate or adjust elements and actions to recalibrate the WNF scorecard response with the finalized Forest Planning Rule and revised Climate Change Scorecard Guidance

As detailed in the document, we expect the proposed strategy to provide substantive operational benefits to the WNF. Among those benefits are the following:

- 1) More coherent and consistent NEPA planning for landscape-scale vegetation projects,
- 2) A more informed and engaged workforce that understands sustainability as being about reducing operational costs, reducing overhead, and making more dollars directly available for projects,
- 3) Increased capacity and resources to implement the 2006 Forest Plan and annual work plans,
- 4) Relevant, meaningful connection between the Climate Change Scorecard and the inventory, monitoring, and assessment elements of the 2006 Forest Plan,
- 5) Built-In responsiveness and alignment with national efforts including: Invasive Species Strategy, 2011 Planning Rule, Watershed Condition Framework, Priority Watersheds and Jobs Stabilization Initiative, Collaborative Forest Landscape Restoration Program

The USDA Forest Service is working to improve the vitality of our forests and grasslands by restoring functions and processes that characterize healthy, resilient ecosystems. Those functions and processes are challenged by climate change, as well as by other drivers. The core of the Forest Service response to climate change centers on adaptation and mitigation. Adaptation is understood as actions that reduce the vulnerability of species and ecosystems to the

effects of a changing climate; mitigation is understood as activities that directly reduce or offset the greenhouse gas emissions that lead to climate change. To address these challenges, the Forest Service has designed *A Roadmap for Responding to Climate Change* to chart a course to the future based on local needs. The Forest Service will use a scorecard to track progress along that roadmap.

The Forest Service is also working to establish a new Forest Service Planning Rule to replace the 1982 Planning Rule. Agency Planning Rules direct the revision and amendment of Land Management Plans for all National Forests. The scorecard and the pending Planning Rule align in several major areas:

- 1) Identification of broad-scale contributions to the broader landscape, including contributions to restoring or maintaining healthy ecosystem functions,
- 2) Identification of broad-scale contributions to social, environmental, and economic sustainability,
- 3) Emphasis upon integrated resource restoration,
- 4) Reliance upon an integrated approach to inventory, monitoring, and assessment

One of the greater challenges to restoring or maintaining functions and processes of healthy ecosystems is the challenge of responding to climate change at an ecoregional scale. The Eastern Regional Office and the Northern Research Station are working together to provide science support to the Forests and Grasslands. This partnership has produced a pilot Climate Change Response Framework. It was developed and tested on the Chequamegon-Nicolet NF and then expanded to include Forests in Michigan and Minnesota for the Northwoods ecoregion. A similar framework is now being adapted and built for the Central Hardwoods Region (Missouri, Illinois, and Indiana). A similar framework has been proposed for Central Appalachia. The WNF strategy is to work on strengthening key partnerships and to be positioned to recalibrate and adapt it.

### **Policy Context: National Climate Change Performance Scorecard**

With the National Forest Management Act (NFMA; 16 USC 1600), Congress defines the job of land management by the US Forest Service. Specifically, Congress gives the Forest Service statutory authority, under the Department of Agriculture, that includes "... a responsibility and an opportunity to be a leader in assuring that the Nation maintains a natural resource conservation posture that will meet the requirements of our people in perpetuity" (16 USC 1600).

Today, addressing climate change is part of the Forest Service's job because it is no longer possible to conserve the nation's renewable resources without addressing climate change. Congress has been quite specific in its expectations on this. For example, NFMA requires that the Forest Service prepare and update a Renewable Resource Assessment every ten years. That assessment is important because of what Congress sees as "...the vital importance of America's renewable resources of the forest, range, and other associated lands to the Nation's social and economic well-being, and of the necessity for a long term perspective in planning and undertaking related to national renewable resource programs administered by the Forest Service..." (16 USC 1601(a)).

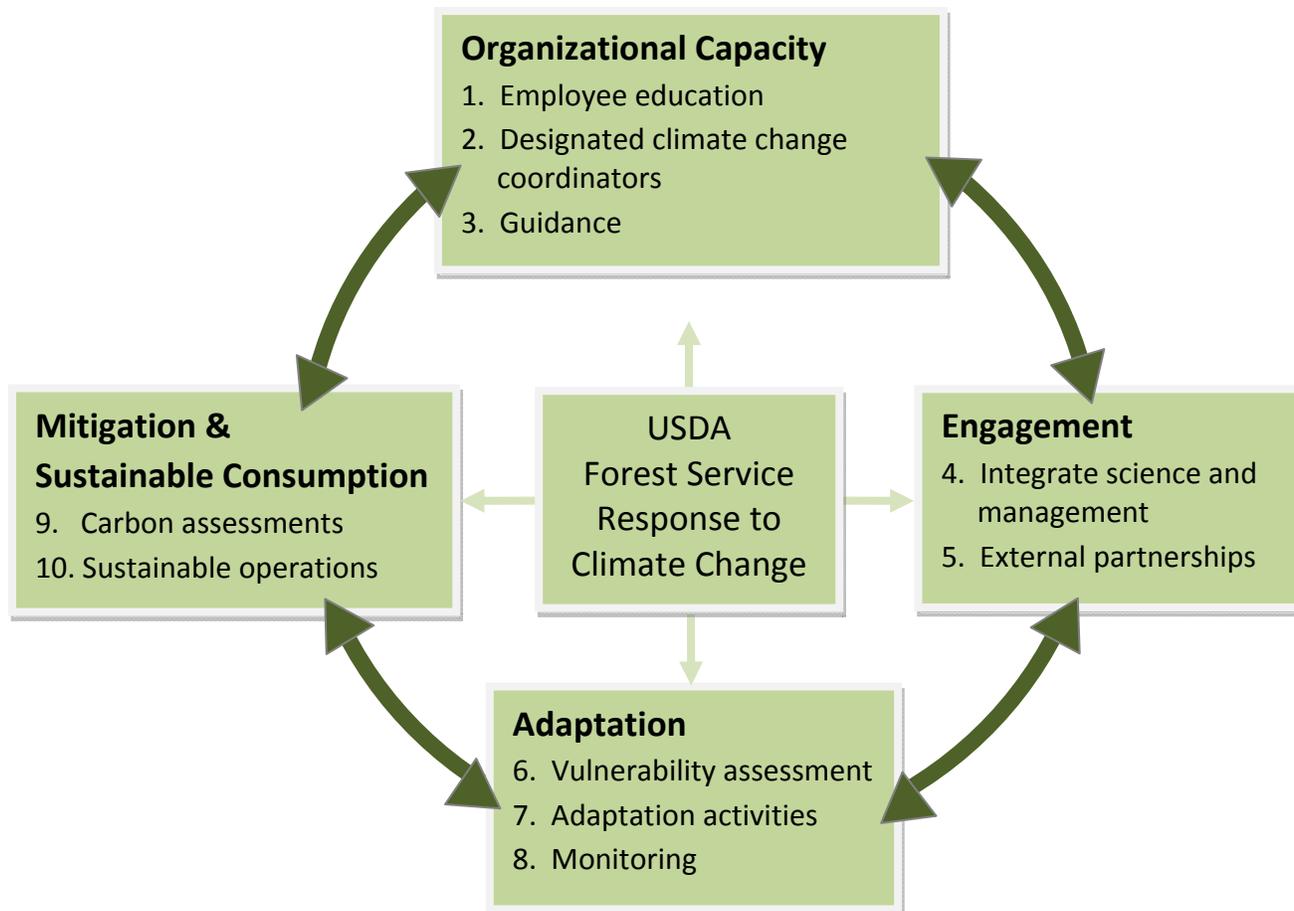
To reflect the vital importance of conserving America's renewable resources, the Renewable Resource Assessment must include seven topics, including two addressing climate change:

.... (5) An analysis of the potential effects of global climate change on the condition of renewable resources on the forests and rangelands of the United States; and

(6) An analysis of the rural and urban forestry opportunities to mitigate the buildup of atmospheric carbon dioxide and reduce the risk of global climate change...

To ensure that resource management plans of the National Forest System are responsive to climate change, a climate change scorecard has been established. The Scorecard was developed in consultation with the National Leadership Council as a response to both the USDA Strategic Plan 2010-15 and Executive Order 13514. USDA set a departmental goal to “Ensure our national forests and private working lands are conserved, restored, and made more resilient to climate change, while enhancing our water resources.” As a measure of this goal, each National Forest and Grassland needs to provide evidence to support a yes answer for at least seven Scorecard questions, with at least one yes in each dimension, by 2015. EO 13514 – Federal Leadership in Environmental, Energy, and Economic Performance – directs each agency to not only develop a sustainability strategy and reduce greenhouse gas emissions but to develop policies and practices to support the Federal Adaptation Strategy. The Scorecard will simplify accomplishment reporting for both of these initiatives. The Scorecard is not just about NFS but is supported by other Deputy Areas. For example, Business Operations has led discussions regarding sustainable operations and greenhouse gas reductions. Research & Development will deliver much of the science and has been instrumental in working with NFS staff in developing the guidance by providing background material and recommendations.

The Forest Service’s Climate Change Scorecard is a set of ten yes-or-no questions in four Dimensions—organizational capacity, engagement, adaptation and mitigation—and will be completed annually by all National Forests and Grasslands in the years 2011-2015. At least seven of the questions, with at least one in each Dimension, must be answered yes to achieve compliance. The goal is 100% compliance for all Units by 2015. The Scorecard is a way for the Forest Service to improve its organizational capacity and readiness to respond to climate change. Results will be used to measure Agency progress and to assess strengths and identify areas for greater investment. The Climate Change Advisor’s Office will use information from Units and Regions to refine guidance and Scorecard expectations, coordinate national efforts to support areas of need, and communicate our Agency’s progress and successes with the Administration, Congress, the media and key stakeholders.

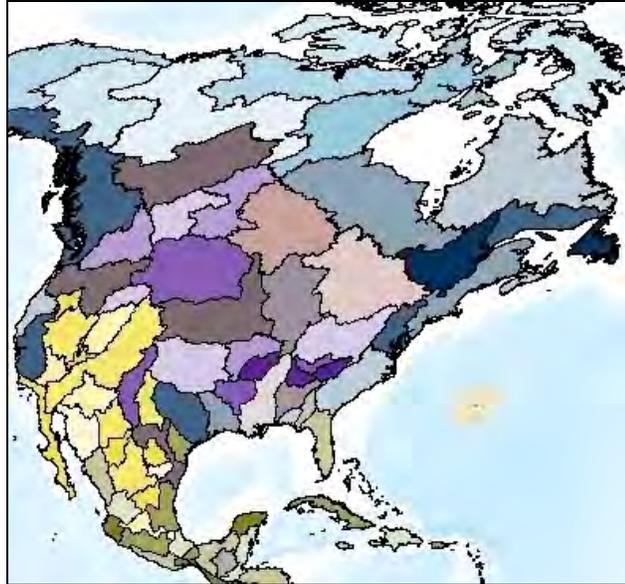


### **Ecological Context: Southern Unglaciaded Allegheny Plateau**

The Wayne National Forest is located in southeast or Appalachia Ohio, part of the Southern Unglaciaded Allegheny Plateau (see map on cover, Province 221 Section E). Forest systems on the Wayne are part of the Appalachian mixed mesophytic forests, representing the oldest and most biologically diverse forest systems in North America (Ricketts et al., 1999). These forests include 80 tree species, including the most primitive forms of flowering plants, the tulip poplar and magnolias. The mixed mesophytic forest encompasses the Allegheny and Cumberland mountains and reaches into nine states including Ohio. WNF is also located in the heart of the Teays-Old Ohio Freshwater Ecoregion, which holds globally significant diversity for both fish and mussels (Abell et al., 2008 or [www.feow.org](http://www.feow.org)). The Little Muskingum River on the Marietta Unit and Symmes and Pine Creeks on the Ironton Unit contain high quality and representative examples of aquatic systems in this ecoregion.

Ohio's rebounding forests and watersheds are currently at a crossroads. The dominant oak systems are no longer flourishing and are gradually being replaced by more mesic, shade-tolerant and fire-intolerant tree species such as sugar maple and tulip poplar. Watersheds like Sunday and Monday Creek no longer support diverse aquatic life or provide safe drinking water. Climate change impacts in Ohio can be seen by earlier springs, more extreme weather events

such as heavy/flashy rainstorms and droughtier summers coupled with exacerbating issues of air pollution such as acid deposition and “ground-level” ozone. Early springs can affect the timing of plant and animal life cycle events. Global warming coupled with stressors like pollution can weaken trees by physical damage to leaf surfaces and interrupted metabolisms, early senescence, decreased reproductive success and frost hardiness and changes in nutrient availability and retention. Forest health is being impacted by non-native invasive plant and insect species as well as air pollution compounded by the impacts of climate change. Historical fire regimes have been suppressed and fire response changed by altered vegetation structure and composition.



**Freshwater Ecoregions [www.feow.org](http://www.feow.org)**

 Teays-Old Ohio Freshwater Ecoregion

# WNF Scorecard Phases:

Smart to  
Start  
2011-15

Smart to  
Grow  
2013-15

Smart to  
Change  
2014-15

The Forest Service Climate Change Performance Scorecard, 2010 (version 1.2) To be completed annually by each National Forest or Grassland (Unit).		
Scorecard Element		Yes/No
<b>Organizational Capacity – engage employees through training and integrate climate change into program of work</b>		
1. Employee Education	Are all employees provided with training on climate change causes, impacts, role of forests and grasslands, and possible responses? Are employees made aware of the potential contribution of their own work to climate change response?	Underway
2. Designated Climate Change Coordinators	Is at least one employee assigned to coordinate and be a resource for climate change questions and issues? Is this employee provided with the institutional support to make his/her assignment successful?	Yes
3. Guidance, Training, Plans of Work	Has Unit leadership developed guidance for progressively integrating climate change activities into Unit-level operations?	Yes
<b>Engagement– develop partnerships and transfer knowledge</b>		
4. Integrate Science and Management	Does the Unit actively participate with the science community to improve its ability to respond to climate change?	
5. External Partnerships	Does the Unit have strategic alliances in place to respond to climate change?	
<b>Adaptation – assess impacts of climate change and manage change</b>		
6. Vulnerability Assessment	Has information relevant to management actions at the Unit level been developed and synthesized to assess the vulnerability of key resources to the impacts of climate change and the interaction with other stressors and human communities?	Central Appalachia Proposal
7. Adaptation Activities	Is an adaptation strategy in place that helps incorporate the vulnerability of resources and places into priority setting and management actions?	
8. Monitoring	Is monitoring being conducted to track changes in conditions of species, watershed condition, forest and grassland health, and other measures, and the effectiveness of adaptation activities?	
<b>Mitigation and Sustainable Consumption – assess carbon stocks and reduce our Agency footprint</b>		
9. Carbon Assessment	Has information relevant to the Unit level been developed and synthesized to assess carbon stocks and the influence of land management activities and disturbances on potential changes in carbon stocks?	
10. Sustainable Operations	Is progress being made toward achieving sustainable operations targets to reduce energy, emissions, water, and other environmental footprints?	

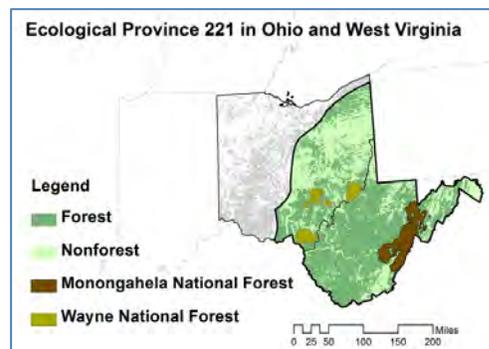
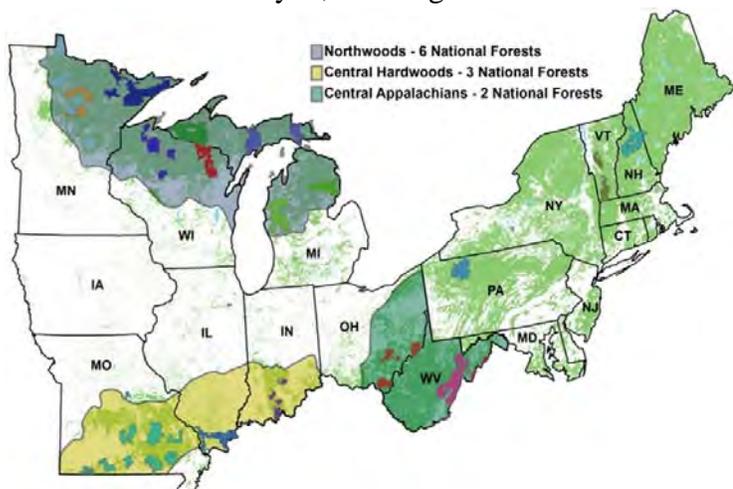


# Central Appalachians Climate Change Response Framework

– December 2011 –

Land managers face the immense challenge of integrating the inherent uncertainties of a changing climate into decisions that span multiple spatial and temporal scales. The Climate Change Response Framework process is designed to deliver credible and relevant information to land managers, as well as a process to apply that information at multiple scales. In the broadest sense, it is applied conceptually throughout the region. This general process is then adapted to individual ecoregions, forests, and finally to the project level. This process is flexible enough to be adapted to a wide variety of ownership types, so it allows for a coordinated “all lands” response to climate change. **Three ecoregional Climate Change Response Framework projects encompass 133 million acres in eight states, including 11 National Forests.**

- **Northwoods:** Ecological Province 212 in WI, MN, and MI. Launched 2009 in WI, expanded to MI and MN in 2011. National Forests: Chippewa, Superior, Chequamegon-Nicolet, Ottawa, Hiawatha, and Huron-Manistee.
- **Central Hardwoods:** Ecological Province 222 in IL, IN and MO. Launched spring 2011. National Forests: Mark Twain, Shawnee, and Hoosier.
- **Central Appalachians:** Ecological Province 221 in OH and WV. Launched fall 2011. National Forests: Wayne, Monongahela.



The Central Appalachians Climate Change Response Framework (CCRF) is a collaborative effort among scientists, managers, and landowners to incorporate climate change considerations into forest management throughout Appalachian Ohio and West Virginia. The Central Appalachians CCRF expands an original project initiated in 2009 in northern Wisconsin to provide a model for landscape management and climate change response. A team

of federal and state land management agencies, private forest owners, conservation organizations, and others initiated this project in 2011 to accomplish three objectives:

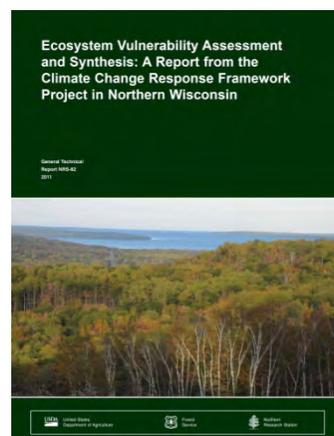
- 1) Provide a forum for people working across the Central Appalachians to effectively and efficiently share experiences and lessons learned.
- 2) Develop new user-friendly tools to help public and private land managers factor climate change considerations into decision making.
- 3) Support efforts by public land managers, private landowners, and others to implement adaptive responses to climate change impacts in the Central Appalachians.

## Framework Components

The Climate Change Response Framework is an integrated set of tools, partnerships, and actions to support “**climate smart**” conservation and management. These four main components inform and build upon each other:

### Vulnerability Assessment

Vulnerability assessments collect information about projected changes in climate and impacts on forest ecosystems in order to provide critical information to determine what species, ecosystems, or other features are most vulnerable to the effects of climate change. The [Ecosystem Vulnerability Assessment and Synthesis](#) for northern Wisconsin has recently been published as a General Technical Report and is an example of such an assessment. The vulnerability assessment being developed for the Central Appalachians will feature forest simulation modeling (Frank Thompson-NRS), modeling for suitable habitat of tree species (Louis Iverson-NRS), and downscaled 2011 climate projections (Katherine Hayhoe-Texas Tech). Other pertinent information and assessments will also be incorporated.



### Partnerships

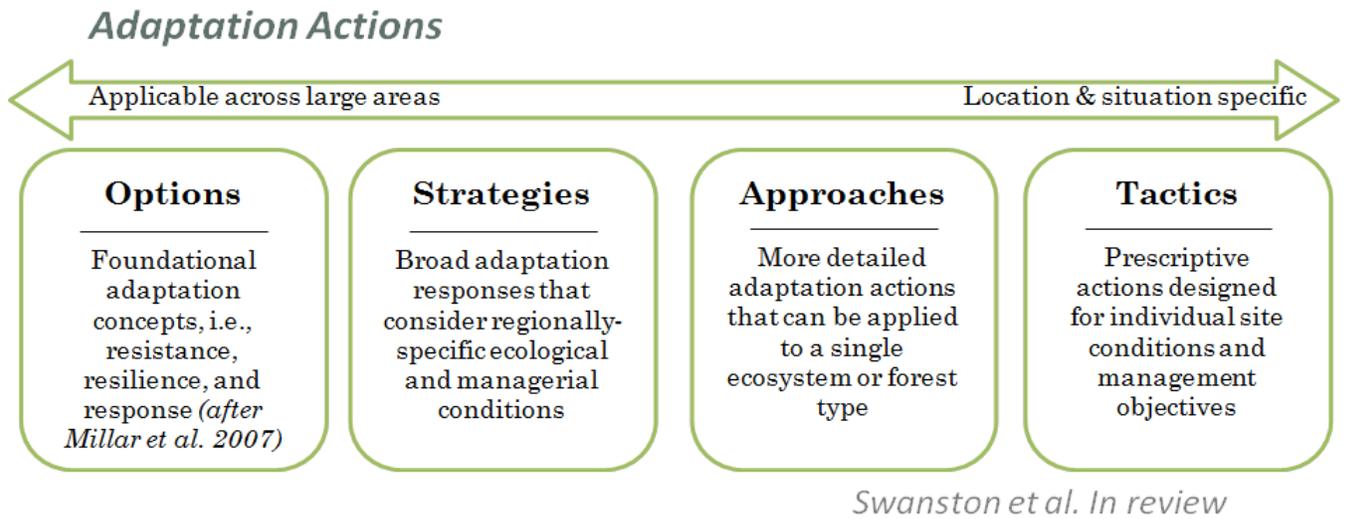
Climate change is inherently a cross-boundary issue because all places will be affected in some way. Partnership efforts engage a variety of land managers, scientists, and others who will continue to enrich the skills, creativity, lands, resources, and perspectives available to the project. A Science Roundtable will also include academics, conservationists, agency scientists, land managers, and other groups. These groups provide input on the vulnerability assessment and adaptation tools, and also help identify opportunities for

climate change adaptation pilot projects.

### Forest Adaptation Resources

The document [Forest Adaptation Resources](#) (FAR) incorporates findings from the assessments and provides a variety of tools and resources to inform management in the context of climate change. It includes a “menu” of strategies and approaches to better adapt ecosystems to changing climate. The FAR also contains a workbook process for managers to consider management objectives, ecosystem vulnerabilities, and approaches for adaptation in order to identify management actions to adapt forests to climate change. The FAR will be expanded upon by local expertise to

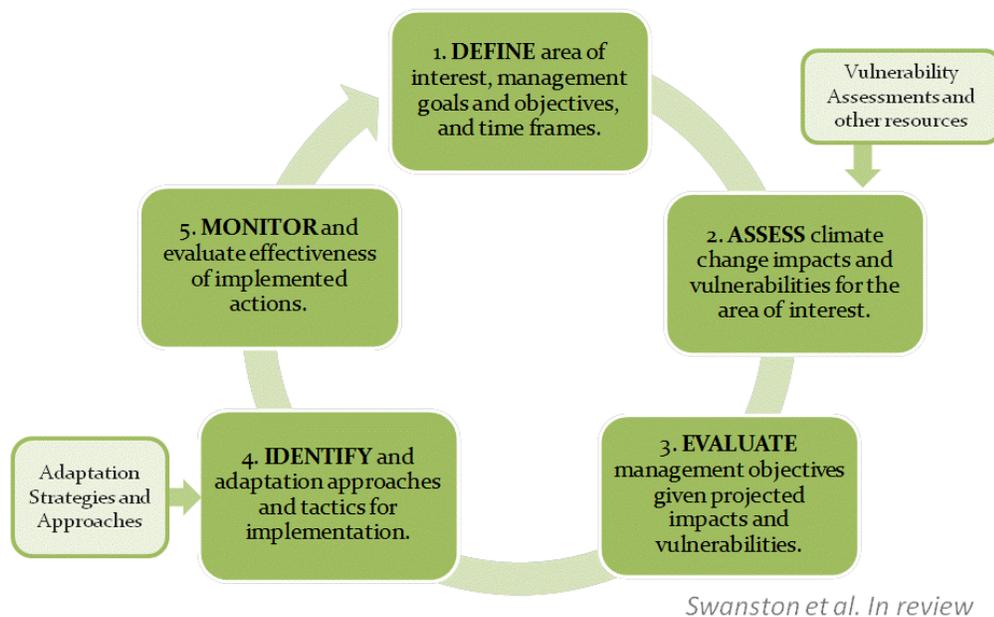
incorporate forest types and ecosystems in the Central Appalachians.



**Demonstration Projects**

A collaborative approach to sustainable forest management is required to effectively respond to current management challenges, including climate change, invasive species, and landscape fragmentation. Demonstrations will use the *Forest Adaptation Resources* to help land managers integrate climate considerations into their planning and activities. Dialogue among land owners, land managers, and others will enhance shared learning across ownerships and encourage coordination of management activities.

**A process for incorporating adaptation actions**



## How does it work?

The Framework uses a six-step process that is adaptive and incorporates opportunities for new information, ideas, and lessons learned during the process to be incorporated into the elements and activities. The process is flexible, and can be adjusted to accommodate different spatial scales and planning processes.

### **Step 1: Identify location, ecosystems and time frame**

The first step is defining the scope of the project, including the geographic scale and extent of the analysis area, the ecosystems of interest, and relevant timelines for evaluating available information.

### **Step 2: Establish partnerships**

Communication and coordination with partners increases the ability of everyone involved to respond to climate change by increasing the amount and accessibility of information and ideas.

### **Step 3: Assess ecosystem vulnerabilities and mitigation potential**

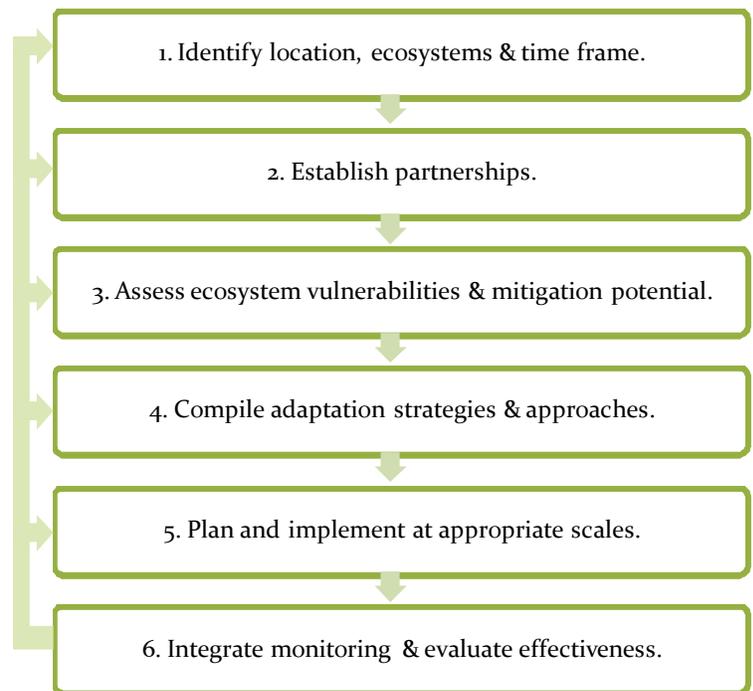
Collecting information about projected changes in climate and impacts on ecosystems provides critical information to determine what species, ecosystems, or other features are most vulnerable to the effects of climate change.

### **Step 4: Compile adaptation strategies and approaches**

Most of the available information on adapting forests to climate change is very broad and not directly applicable at scales most relevant to land managers. Refining adaptation strategies in the specific context of the analysis area and its ecosystems will help identify an array of strategies that are most relevant for local land managers. This comprehensive array of strategies and approaches serves as a “menu” from which managers can select actions based on their management needs for a particular situation.

### **Step 5: Plan and implement at appropriate scales**

After considering management goals and local vulnerabilities, and then choosing adaptation strategies and approaches, land owners and managers can devise adaptation tactics that are best suited to their needs and constraints. Implementation of adaptation tactics will vary widely across ownerships and through time, just as there is currently a wide variety of tactics applied in forest management.



**Step 6: Integrate monitoring and evaluate effectiveness**

Monitoring is a critical step to evaluate whether management actions are effective in responding to climate change and reducing the vulnerability of ecosystems to changes that are occurring. Results from monitoring can be integrated throughout this framework to refine individual steps.

**Central Appalachians CCRF Contacts:** Patricia Butler, Coordinator, [prbutler@mtu.edu](mailto:prbutler@mtu.edu), (906) 482-6303 ext. 12 Chris Swanston, Project Lead, [cswanston@fs.fed.us](mailto:cswanston@fs.fed.us), (906) 482-6303 ext. 20

For more information, please visit us online: <http://www.nrs.fs.fed.us/niacs/climate/>

### III. Acknowledgment of Contributors

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Jarel Bartig	Forest Ecologist
Steve Blatt	Forest Biologist
Kristofer Butcher	Program Assistant, South Central Zone, Law Enforcement & Investigations
Cheryl Coon	Forest Botanist
Ann Cramer	Forest Archeologist
Richard Jones	Lands, Minerals and Special Uses Program Manger
Chris Wilson	Forest Engineer
Jonathan Olsen	Forest Fire Management Officer
Katrina Schultes	Wildlife Biologist
Pamela Stachler	Forest Hydrologist, Watershed Program Manager
Chad Wilberger	Recreation Program Manager