USDA Forest Service
U.S. DEPARTMENT OF AGRICULTURE

Fiscal Years 2018 thru 2019 Monitoring and Evaluation Report

Forest Service | Eastern Region | Wayne National Forest | December 2021

2018-2019 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

Wayne National Forest

Nelsonville, Ohio

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Responsible Official: Carrie Gilbert
Forest Supervisor
Wayne National Forest
13700 Highway 33
Nelsonville, OH 45764-9880
740-753-0101

For further information contact: Will Dienst
Natural Resources Staff Officer
Wayne National Forest
13700 Highway 33
Nelsonville, OH 45764-9880
740-753-0101

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Introduction

Location and History

The Wayne National Forest (WNF) is located across 12 counties of southeast Ohio and is the state's only national forest. The Wayne's proclamation boundary encompasses approximately 855,000 acres, of which approximately 244,000 acres are National Forest System lands. The Wayne is organized into two ranger districts, the Athens Ranger District and the Ironton Ranger District. The Athens Ranger District has two management units, the Athens Unit and the Marietta Unit.

The Wayne is located in the hills of southeast Ohio, a portion of the State that remained unglaciated during the last Ice Age, and today lies 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 part of eastern Kentucky. While southeast Ohio is the least densely populated part of the state, it lies within one of the most densely populated regions of the United States. An estimated 12.6 million people live within 100 miles of the Wayne National Forest.

The WNF is situated in the core of the Appalachian foothills, 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. However, a number of American Indian cultures inhabited this area for at least 13,000 years prior to the arrival of Euro-American immigrant settlers in the 18th and 19th centuries. Ongoing research shows that American Indian settlements predating contact with Euro-American explorers and settlers were widespread and numerous in the region, even if most of their sites are no longer obvious.

Figure 1 – Location of the Wayne National Forest in southeast Ohio.

Although many people today view the Wayne as the remnant of a "forest primeval," 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 European immigrants arrived were cut for timber and firewood, high-graded and grazed, and tilled to make way for farms and settlements. Even more invasive was the mining for iron ore, limestone, coal, and clay, which scarred hillsides and polluted many streams. As factories closed and farms failed in the 1930s, the Forest Service began to acquire and reforest those lands. Much of that land has since been reclaimed, resettled, and restocked, although traces of its exploitative past are easy to find.

Purpose of the Forest Plan

The Monitoring Evaluation Report is an annual 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 a period of 10 to 15 years. The Forest Plan 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 WNF releases monitoring and evaluation reports.

The monitoring program must be efficient, practical, 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. 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 monitoring plan of operations
- The monitoring evaluation report

Monitoring Strategy

Table 1 - The Wayne National Forest's monitoring strategy.

Monitoring Methods	Monitoring Questions	Monitoring Plan	Monitoring and Evaluation Report
Monitoring methods categorize how precisely and reliably monitoring items are measured.	Monitoring questions are developed by an interdisciplinary team to address Forest Plan management goals, objectives, standards, guidelines, assumptions, and science.	The monitoring plan of operations identifies which items will be measured and how monitoring questions are to be answered.	The monitoring and evaluation report analyzes and summarizes the monitoring results.

Monitoring and Evaluation

Developed by an interdisciplinary team, the Monitoring and Evaluation Report summarizes the results of 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 change to the Plan is needed. Monitoring efforts are compiled and reported out using the federal fiscal year (FY); the time period from October 1 to September 30. This Report covers FY 2018 through 2019.

Watershed Health

Goal 2.1 – Water Quality and Soil Productivity

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

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

Monitoring Plan Indicator 1: How many miles of stream have been treated to improve ecological function.

In partnership with the Ohio Department of Natural Resources – Division of Mineral Resources Management, the Shannon Evans project reconstructed 455 feet, or 0.08 mile (0.1 mile rounded up) of stream channels as treatment for five subsidence holes acting as stream captures.

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

- **Monitoring Plan Indicator 2: What is the current geo chemistry profile of these creeks?**

Monday Creek Watershed: In 2017-2018, 27.5 of the 33 (83%) miles monitored met the target pH of 6.5. For comparison, 11 of 34 (32%) miles had pH values of 6.5 or above at baseline sampling in 2001.

Sunday Creek Watershed: In 2017-2018, 42.8 of the 43 (99%) miles monitored met the target pH of 6.5. For comparison, 27 of 36 (75%) miles had pH values of 6.5 or above at baseline sampling in 2001.

Raccoon Creek Watershed: In 2017-2018, 110 of 116 (95%) miles monitored met the target pH of 6.5. For comparison, 61 of 100 (61%) miles had pH values of 6.5 or above at baseline sampling in 2001.

Pine Creek Watershed: Unknown.

Symmes Creek Watershed: Based on the 2016 report by the Ohio EPA, the mainstem of Symmes Creek meets most of the water quality criteria for its designation of warmwater habitat and exceptional warmwater habitat (Ohio EPA 2016). Dissolved oxygen is the only water quality parameter that often was below the minimum water quality standard throughout the summer, however, it does not seem to impact the biological community. There are tributaries or reaches of tributaries that have water quality standard exceedances in heavy metals loading, and in very few cases, pH values, ammonia contamination, and temperature pollution, but the predominant water quality parameter failing to meet water quality standards still occur as low dissolved oxygen.

- **Monitoring Plan Indicator 3: What geo chemistry parameters have changed by reducing and/or treating acid mine discharges?**

Monday Creek Watershed: Total acid load reduction increased from 3,035 lbs/day in 2014 to 4,006 lbs/day in 2017-2018. Total metal load reduction also improved from 260 lbs/day in 2014 to 393 lbs/day in 2017-2018.

Sunday Creek Watershed: Total acid load reduction decreased from 352 lbs/day in 2014 to 22 lbs/day in 2016. Total metal load reduction also decreased from 110 lbs/day in 2014 to 31 lbs/day in 2016.

Raccoon Creek Watershed: Total acid load reduction decreased from 5,018 lbs/day in 2014 to 2,645 lbs/day in 2017-2018. Total metal load reduction also decreased from 915 lbs/day in 2014 to 573 lbs/day in 2017-2018.

Pine Creek Watershed: Unknown.

Symmes Creek Watershed: Unknown.

The variations in the geo chemical parameters, acid, and metal loadings for the past several years are due to a combination of the fine-tuning of existing investments, environmental dynamics such as weather, and the addressing of newly-discovered subsidence holes, stream captures, and other acid mine drainage and abandoned mineland issues that do not require long-term operation and maintenance.

- **Monitoring Plan Indicator 4: How many acid mine discharges have been treated?**

No new acid mine discharges were treated in this reporting period, but several existing treatment systems were maintained.

- **Monitoring Plan Indicator 5: How many subsidence features have been treated?**

Within the Monday Creek Watershed, a vertical shaft was capped near SR-685 in 2018. Outside of the areas identified in Objective 2.1b, several stream captures and vertical shafts were also treated, including the Shannon Evans project mentioned above.

- **Monitoring Plan Indicator 6: How many miles of stream have free-flowing water where surface flow was restricted?**

No new projects were conducted within the Monday Creek, Sunday Creek, Symmes Creek, Raccoon Creek, or Pine Creek watersheds to restore free-flowing water where surface flow was restricted in this reporting period. However, outside of these areas, the Shannon Evans project restored approximately 0.1 miles of free-flowing water, as mentioned above.

- **Monitoring Plan Indicator 7: How many acres of NNIS plants that alter soil chemistry were treated?**

All non-native invasive plants treated on the Wayne National Forest have the potential to alter soil chemistry by changing nutrient cycling. In Fiscal Year 2018, 945.6 acres were treated, and in Fiscal Year 2019, 798.3 acres of non-native invasive species treatments were completed on the Wayne National Forest. Treatment acres are the footprint acres on the ground and may have received several types of treatments in the same area.

- **Monitoring Plan Indicator 8: Are management activities altering the ecological functioning of the soil by creating excessive detrimental impact?**

Beginning in the last reporting period, the Wayne National Forest continued to conduct pre-implementation Forest Soil Disturbance Monitoring Protocol in areas proposed for management activities to establish a baseline of the soil conditions. They will serve as a reference for comparison once proposed treatments are implemented to gauge the resulting levels of disturbance. There is currently insufficient post-implementation data to accurately answer this question. However, research and literature reviews suggest current Best Management Practices (BMPs), which the Wayne National Forest implements in our projects, are effective at minimizing detrimental impacts.

Aquatic and Riparian Resources

Goal 3.1 – Healthy Riparian and Aquatic Ecosystems

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

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

- **Monitoring Plan Indicator 9: How many acres of wetland habitat were restored or enhanced?**

Non-native invasive species were treated in 2018 on the 34-acre Big Bailey Wetland. Wetland enhancement work on the Wayne continues to be steadily conducted due largely to the active NNIS program.

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

species

- **Monitoring Plan Indicator 10: How many miles of stream were treated to improve or restore habitat for aquatic and riparian-dependent species?**

No streams were treated to improve or restore habitat for aquatic and riparian dependent species in this reporting period.

- **Monitoring Plan Indicator 11: What physical or biotic parameters have changed at monitoring sites?**

While habitat for aquatic or riparian dependent species have not been improved or restored, ongoing adjustments and fine-tuning of existing investments at critical times and locations, have led to water quality improvements such that a previously extirpated fish species, Stonecat Madtom (*Noturus flavus*) was found in Monday Creek.

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

- **Monitoring Plan Indicator 12: How many stream crossings were improved for aquatic organism passage and/or sedimentation?**

No stream crossings were improved for aquatic organism passage and/or sedimentation in this reporting period.

- **Monitoring Plan Indicator 13: How many miles of habitat were opened up for aquatic-dependent species?**

As no improvements were made to stream crossings, no new stream miles were opened up for aquatic dependent species.

Stream restoration work slowed during FY 2018 and 2019, but the Forest's active NNIS program continues to contribute to stream improvements through NNIS treatments in riparian areas. Many more stream miles could still be restored and improved, however, to promote healthy riparian and aquatic ecosystems that sustain ecological processes and functions per Forest Plan Goal 3.1. Existing partnerships are being leveraged to assist with and plan for future projects.

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

- **Monitoring Plan Indicator 14: How many ponds or lakes were treated to improve aquatic habitat?**

No ponds or lakes were treated to improve aquatic habitat in this reporting period. However, the partnership with Rural Action is being leveraged to assist and plan for future projects in this program area.

Wildlife and Plants

Goal 4.1 – Promote Healthy Terrestrial Ecosystems

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

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

- **Monitoring Plan Indicator 15: How many acres of hardwood or hardwood/pine forest communities were treated to encourage the establishment of uneven-aged conditions?**

Approximately 207 acres were treated through timber harvest activities to encourage all-aged conditions. All 207 acres were located within the Pine Creek Historic Forest project area on the Ironton Ranger District.

- **Monitoring Plan Indicator 16: What are the trends in cerulean warbler abundance, based on species monitoring protocols?**

The Breeding Bird Survey took place annually from 2003 to 2013 on the WNF and every third year since 2013, with FY 2019 being the latest survey. All birds seen and heard at 242 points along 25 routes (mainly along roads and trails) are recorded. These routes are in a variety of habitats: interior forest, open forest, open land (i.e., herbaceous and shrubby vegetation), wetland, and grassland. They are sampled twice from May 20 to June 20. These data are used to develop trend graphs for cerulean warbler and Henslow's sparrow.

The trend in cerulean warbler abundance (provided as a survey average) for the WNF is slightly downward (See Figure 2). Trends are expected to mirror those for quantity and quality of breeding habitat, which is described as mature interior hardwood forest habitat composed of a well-developed understory and upper-canopy layer that includes large trees and canopy gaps, as well as, to some extent, the availability of early successional forest habitat that is used during the post-breeding phase. Thus far, the Wayne National Forest has not reached the full potential intended in the Forest Plan to create and maintain suitable habitat for this species (through timber harvest - graph above, prescribed fire, and other methods). Thus, conditions have not changed much across the Forest, and the cerulean warbler trend observed here is similar to what is expected, given the relatively low levels of related management activities. Steeper declines have been documented elsewhere in the state and across this species' range, as reported by the Second Atlas of Breeding Birds in Ohio and the North American Breeding Bird Survey.

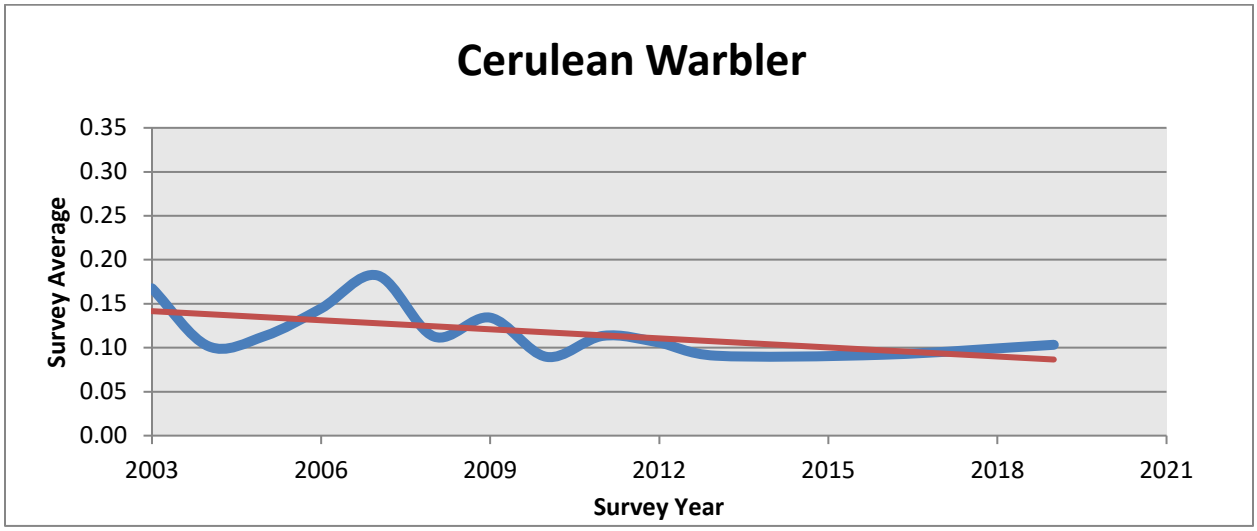

Figure 2 - Cerulean warbler survey average trend on established breeding bird monitoring routes in the Wayne National Forest

Objective 4.1d – 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 and insects.

- **Monitoring Plan Indicator 17: How many acres of early successional forest habitat were created?**

Zero acres of early successional forest habitat were created on the WNF in FY 2018 through FY 2019.

- **Monitoring Plan Indicator 18: How are those acres distributed across the Forest Shrubland Mosaic?**

From 2006 to 2019 approximately 184 acres of early successional habitat were created through timber harvest. Of those 51 acres were created within the Forest Shrubland Mosaic Management Area on the Marietta unit. The remaining 133 acres are located within other management areas and not within the Forest Shrubland Mosaic. None of the 184 acres of early successional habitat creation happened during this monitoring period.

- **Monitoring Plan Indicator 19: What are the trends in ruffed grouse abundance, based on species monitoring protocols?**

Ruffed Grouse Drumming Surveys

Data collected through 2019 along ruffed grouse transects, where observers listen for drumming males, indicate abundance has decreased from the previous year and all previous years. Thirteen Ohio routes are located in or near the WNF. Data have been collected as far back as 1961 for 3

routes, since 1971 for 1 route, since 1985 for 2 routes, and since the early 2000s for the other 7 routes. Ruffed grouse have experienced precipitous declines across Ohio and the WNF over the last 50 years.

Population trends in the WNF (graph below) for ruffed grouse are expected to mirror trends for quantity and quality of the diverse forest habitat conditions that meet the needs of all life stages, especially during the breeding period when early successional forest is key. A comparison of forested stand data between 2006 and 2018 indicates young forests less than 20 years of age have declined on the WNF by 93%. Not surprisingly, the Grouse trend observed in the WNF is on a steep decline. Also of note, state biologists report that while the declining grouse numbers in Ohio are primarily attributed to the loss or lack of young forest habitat, there is also a growing concern about mortality associated with West Nile virus. Thus, state wildlife agencies advocate for larger, more resilient grouse populations that are associated with abundance of quality young forest habitat, because these populations should be more resilient to stressors like West Nile virus and able to recover from annual losses, compared to those in marginal, isolated habitats.

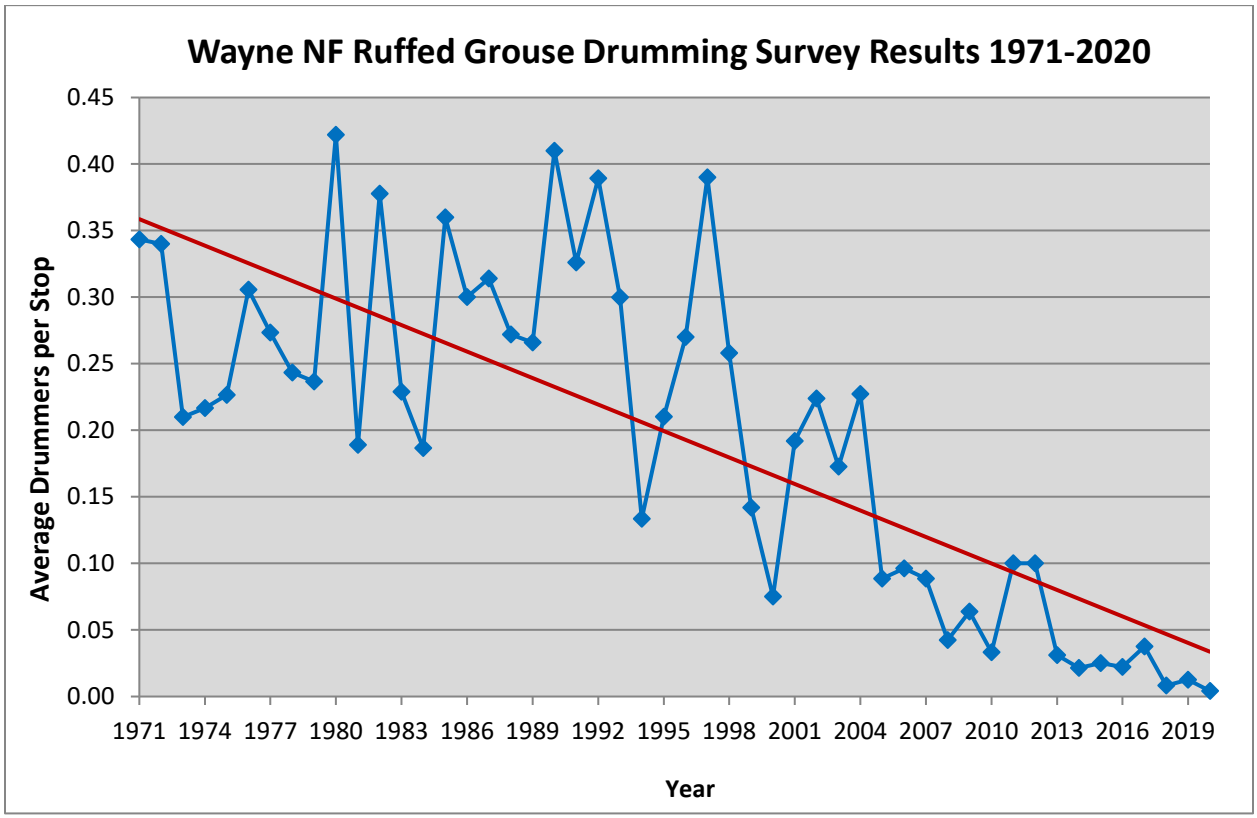

Figure 3 - Trend showing declining average drummers per stop for the past 50 years along established Ruffed grouse drumming survey transects in and around the Wayne National Forest.

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

- **Monitoring Plan Indicator 20: How many acres of pine or pine-hardwood communities were treated?**

5 acres have been harvested with the intent to restore native pine, and all of these acres were treated during FY 2018-19. The native pine group selection units occur within the Spur A timber sale, located on the Ironton Ranger District. These openings were planted to shortleaf pine seedlings in the spring of 2021.

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

- **Monitoring Plan Indicator 21: How many acres of grassland habitat were improved or maintained?**

The Grassland and Forest Mosaic management areas are made up of reclaimed surface mine lands and adjacent forest habitat. The reclaimed grasslands are in various stages of succession across the Athens and Ironton Units. The larger reclaimed areas that were planted in a grassy cover attract species like the Henslow's sparrow, grasshopper sparrow, blue grosbeak, and bobwhite quail, many of which are grassland-obligate species, requiring varying levels and sizes of grassy or shrubby habitats.

In FY 2018, 201 acres of reclaimed grassland habitat (8% of the forest-wide total of 2,489 acres) were improved in the Peabody and Meada Road areas of the Athens Unit. Autumn olive was cut and the stumps were treated with herbicide to reduce woody encroachment. No grassland treatments were accomplished in 2019. The current annual treatment average is 220 acres, which is approximately 9% of our total grassland area. However, given the rate at which non-native woody encroachment is occurring, more treatments are likely needed to keep up.

- **Monitoring Plan Indicator 22: What are the trends in Henslow's sparrow abundance, based on species monitoring protocols?**

Henslow's sparrows require extensive areas of tall, dense, grass, consisting of standing dead vegetation and well-developed litter with sparse to no woody shrub vegetation; thus, they are a good indicator of quality open grassland habitat that also benefits other species. Henslow's Sparrows are on an overall downward trend in the Wayne (Figures 4 and 5). They are present on the Peabody and Meada tracts and have benefitted from some woody NNIS treatments over time that reduce encroachment and maintain grassland conditions, which may account for the most recent more positive survey result. However, there is still a downward trend on that route, showing a continued need for habitat improvement. The Brady Run grasslands have not been treated or managed within the last decade and are experiencing substantial woody encroachment from non-native shrubs and native trees. As a direct result, no Henslow's sparrows have been detected there since 2007. Unauthorized motorized traffic across both grassland complexes can also have a negative impact on all nesting birds and their habitats.

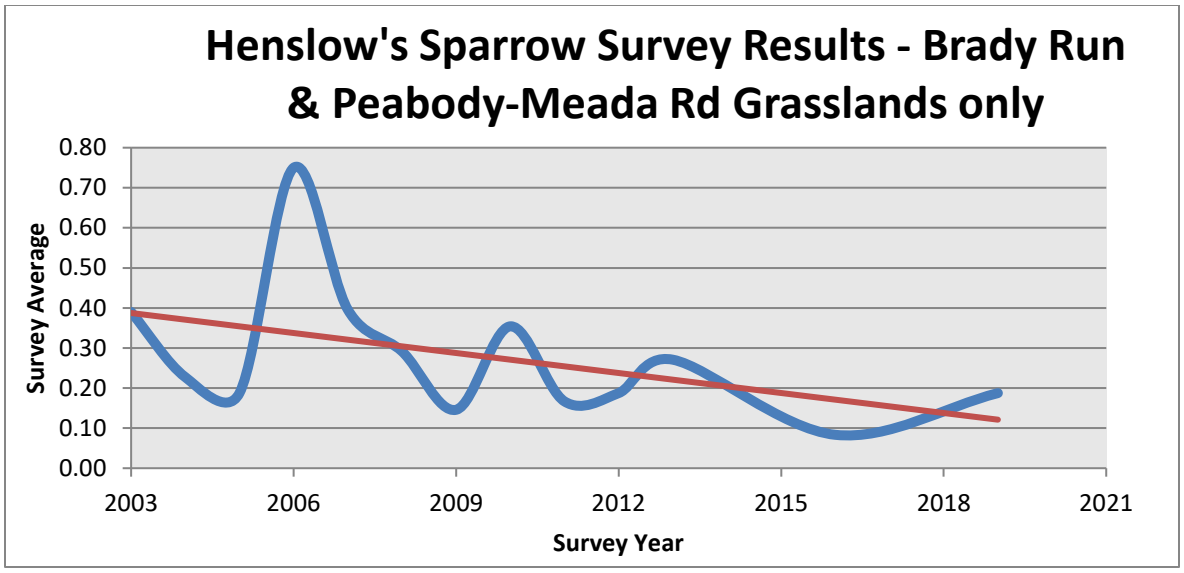

Figure 4 - Henslow's sparrow survey average trend on established breeding bird monitoring routes in the Wayne National Forest (Brady Run and Peabody-Meada Road grasslands).

Henslow's sparrow survey averages have fluctuated over the nine years that the Cambria Tract route has been surveyed with the overall trend being slightly downward. They benefitted from some woody NNIS treatments and small-area conversions to warm season grasses several years ago, but there are also other habitat conditions on parts of the grassland that may not represent ideal nesting conditions (e.g., ground furrowing in preparation for pine planting that was not completed, resulting in water-filled ditches across much of the grassy areas).

A concerted effort in grassland habitat management to reverse negative species trends will be needed. Efforts to provide Henslow's sparrows with suitable habitat will also inevitably benefit many other grassland-nesting species.

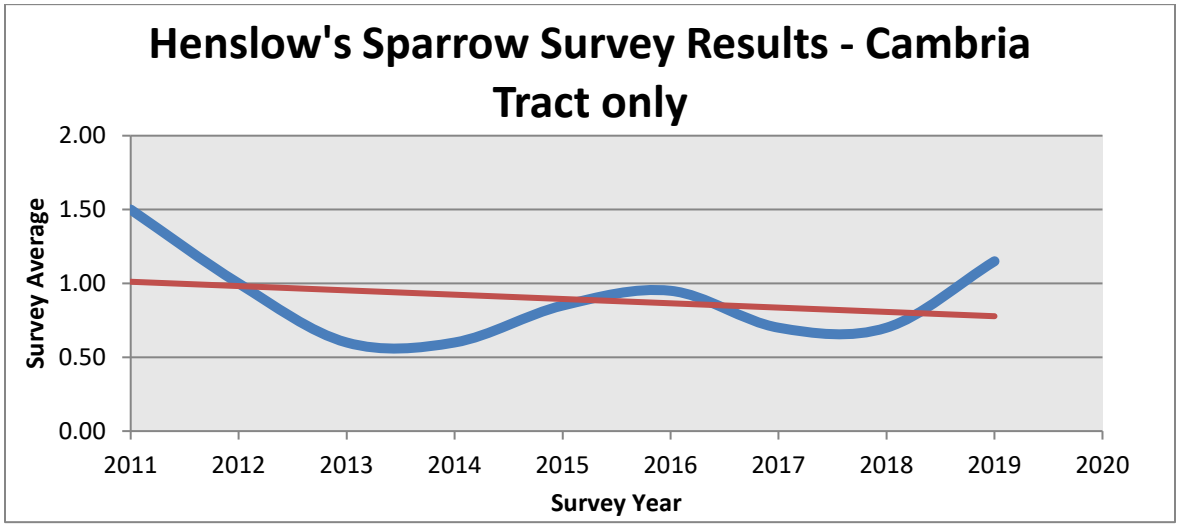

Figure 5 - Henslow's sparrow survey average trend on established monitoring route (Cambria Tract).

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

- **Monitoring Plan Indicator 23: How many acres of herbaceous or herbaceous-shrub habitat were created?**

- **Monitoring Plan Indicator 24: How many acres of herbaceous or herbaceous-shrub habitat were maintained?**

No new permanent openings were created in FY2018 or 2019; however, approximately 105 acres were maintained by mechanical means across a variety of sites in the Marietta and Ironton units in 2018. No maintenance occurred in 2019.

Maintenance of herbaceous or herbaceous-shrub habitat in the form of permanent forest openings has been occurring across the Wayne for a number of years. This activity benefits a variety of generalist and shrub-specialist wildlife species by providing soft-mast-rich foods and an abundance of insects, flowering plants for pollinators, brushy cover, and forest gaps in a heavily forested landscape. Given that these habitats are short-lived and quickly grow back to forest without a disturbance regime (natural, mechanical, or fire), benefits are short-lived without continued maintenance.

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

- **Monitoring Plan Indicator 25: How many waterholes or ephemeral wetlands were constructed?**

No waterholes or ephemeral wetlands were constructed in this reporting period. The Forest has been focused on other priorities over the last few years, but if given the right opportunities while implementing these other priorities, waterholes or ephemeral wetlands could be created or enhanced. No such opportunity presented itself within this reporting period.

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 Plan Indicator 26: How many artificial nesting structures were installed?**

No artificial wildlife structures were installed in FY2018 or 2019. Structures are typically installed on an as-needed basis, when funding is available, or when volunteer hours are donated, such as by a scout. Various types of boxes and structures have been installed, especially in locations where natural cavities are in short supply, such as in wetlands for mallards, wood ducks, and prothonotary warblers and in reclaimed grasslands for eastern bluebirds and tree swallows. Bat houses have been popular additions to recreation areas to help relocate bats out of buildings or to provide educational interpretation. Other installations over the years have

included large bat condominiums, boxes for southern flying squirrels and eastern screech owls, and one purple martin house.

Endangered, Threatened, and Sensitive Species

Goal 5.1 – Recover Federally Listed Threatened and Endangered species

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

- **Monitoring Plan Indicator 27: How many acres of potentially suitable habitat were actively improved?**

In 2018-2019, a total of 9,682 acres of potentially suitable Indiana bat habitat were improved through various techniques, including, but not limited to: timber harvests, timber stand improvement activities, prescribed fire, and non-native invasive species treatments. Some benefits to bats are short-lived, while other may take a while to develop but will have lasting positive ecosystem effects and benefits for bat habitat into the future. Cumulatively, this represents improvements on approximately 27,500 acres of the Wayne since 2006.

Ideal Indiana bat roosting and foraging habitat in southeast Ohio is typically considered to be mature hardwood (or hardwood-pine) forest with large, widely spaced trees, especially oak-dominated forest, with relatively high average canopy cover but with intermittent gaps, a sparse mid-canopy layer, and a presence of snags with suitable bat-roosting characteristics. Forested riparian corridors may be especially important as foraging and travel habitat. Due to the short-lived suitability of snags as roosting habitat, management should provide both currently suitable habitat, as well as lay the foundations for future suitable habitat on the timescale of forests, which can be hundreds of years. The bats may use many forest types and conditions, and habitat is not considered a limiting factor in the Wayne. Forest management activities are implemented annually that contribute to the development of desirable conditions or to the natural range of variation, forest health, and ecosystem resilience and all contribute to short- or long-term improvements to Indiana bat roosting and foraging habitat, as described below.

2018-2019 Summary of activities to enhance Indiana bat habitat
Commercial harvest (single tree selection) treatments were conducted on 207 acres of the Pine Creek project on the Ironton District to promote a multi-aged forest with diverse vertical vegetative structure. Many of the harvest treatments create canopy gaps and may provide sunlight to residual snags, which can improve foraging and roosting habitat, respectively.

Timber stand improvement (TSI) activities that are designed to provide or improve conditions that perpetuate oak-dominated forest over time were conducted on 1,214 acres in 2018-2019. In the long term, TSI contributes to the availability of future quality habitat on the landscape for Indiana bats. In the short term, TSI can improve roosting and foraging habitat by reducing uncharacteristically closed and dense vegetative structure (“clutter”) and establishing conditions closer to the natural range of variation that Indiana bats seem to prefer. Various activities qualify as TSI, including, but not limited to, crop tree release, midstory control and post-harvest site preparation.

A total of 4,003 acres of prescribed fire treatments were conducted on the Wayne in 2018-2019. Low-intensity prescribed fire is designed to improve conditions supporting oak-dominated forest habitat, which ensures long-term Indiana bat habitat suitability. Short-term habitat improvements may result from reduced under- and midstory clutter in foraging habitat or creation of small canopy gaps through occasional tree death, which can improve both roosting and foraging habitat.

Non-native invasive woody shrub and tree treatments were conducted on 1,910 acres across the Wayne. The treatments include both short- and long-term benefits by improving native substrates for insect prey production, improving current and future health and vigor of stands, plus promoting native tree recruitment as future Indiana bat roosting and foraging habitat.

Finally, invasive pest control treatments for *Lymantria dispar* populations were conducted on 2,348 acres of the Athens Unit. These treatments will benefit Indiana bats through the long-term maintenance of oak-dominated forests across the landscape.

- **Monitoring Plan Indicator 28: Are known hazard trees removed during the appropriate time of year?**

We routinely plan removal of known hazard trees (e.g., at recreation sites and along firelines) during the bat hibernation season to avoid adverse effects to roosting bats. Unanticipated removals occur at other times of the year on a case-by-case basis with wildlife biologist input and appropriate mitigation measures.

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

- **Monitoring Plan Indicator 29: How many bat-friendly gates were installed on known Indiana bat hibernacula?**

There have not been any new Indiana bat hibernacula identified; therefore, no bat-friendly gates were installed on known Indiana bat hibernacula. However, a total of 6 mines with the potential for Indiana bat use have been closed with bat-friendly gates since 2006.

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

- **Monitoring Plan Indicator 30: Have American burying beetles been found?**

The American Burying Beetle (ABB) was listed as a federally endangered species on July 13, 1989. The WNF began a cooperative 5-year reintroduction project starting in 2008 with ODNR Division of Wildlife, The Ohio State University, and the US Fish and Wildlife Service. Breeding beetle pairs from Arkansas stock were reintroduced in two locations on NFS lands in Perry and Athens Counties, Ohio from 2008 to 2012. The WNF has been monitoring for presence of the ABB since the last reintroductions.

During the 2019 survey period (surveys were not conducted in 2018) efforts focused in an area of planned timber sales and buckets were also placed in the Wildcat Hollow area near previous reintroduction efforts.

A total of seventeen trap nights were conducted during the 2019 monitoring effort. Three species of *Nicrophorus* were captured: *orbicollis*, *tomentosus* and *pustulatus*. No ABBs (*Nicrophorus americanus*) were caught during this effort.

The 2019 season did bring good news for two other areas in Ohio where new, potentially hardier breeding stock from Nebraska were reintroduced. Both areas documented overwintering success by finding adult beetles during spring monitoring efforts for the very first time.

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

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

- **Monitoring Plan Indicator 31: What are the current RBC population numbers?**

Running buffalo clover populations and population trends are impacted primarily by plant succession, and natural or human-caused disturbance. Populations are monitored annually for the total number of plants and by the number of flowering stems in the population. Both known populations on the Wayne National Forest also receive annual habitat maintenance and non-native invasive plant species control to prevent over-shading and population decline from non-native competition.

There are two running buffalo clover populations on the Wayne National Forest. The Ironton District population was discovered in 2005. Annual monitoring began in 2006 and has continued to the present. A second population was found on the Athens District in 2012. The Athens District population has been monitored from 2013-present. As a result, the years analyzed in population trend charts are different for the two populations.

Population counts for 2018 and 2019 were mixed for Wayne National Forest running buffalo clover populations. The Athens Ranger District population saw a decline from 576 plants in 2018 to a total of 356 plants in 2019. In addition, the Athens population saw a decline from 48 flowering stems to just 25 flowering stems in 2019. It should be noted that the Athens population received moderate to intense disturbance from a natural flood event that deposited silt over a significant portion of the population in early 2019. While running buffalo clover is disturbance-adapted, intense disturbance events can cause populations to decrease.

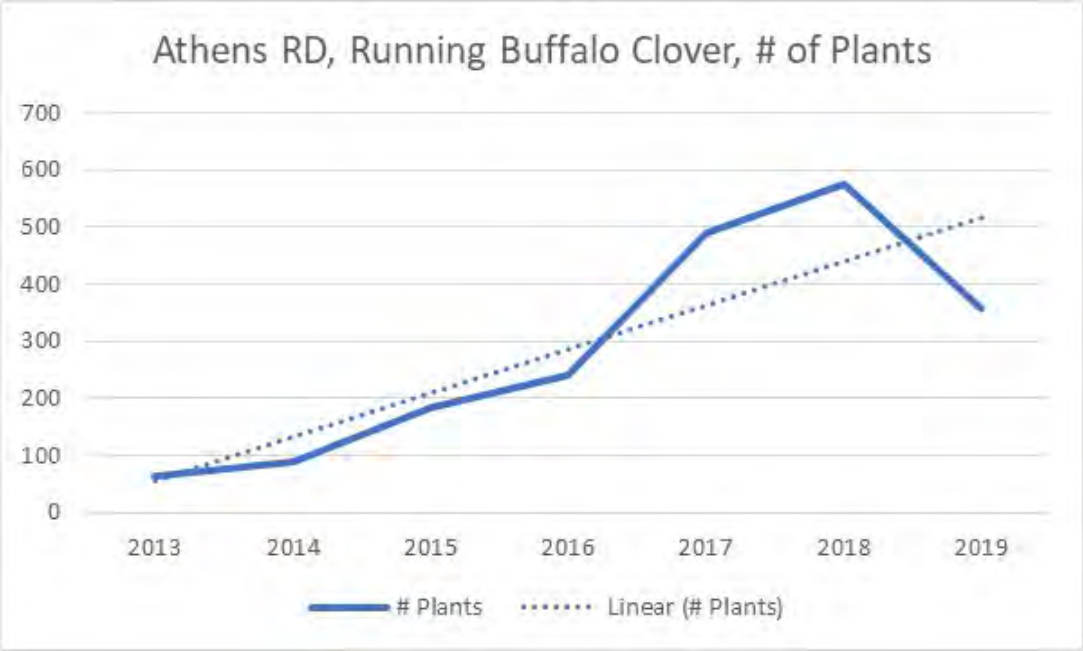

Figure 6 - Running Buffalo Clover, Number of Plants, Athens RD, 2013-2019

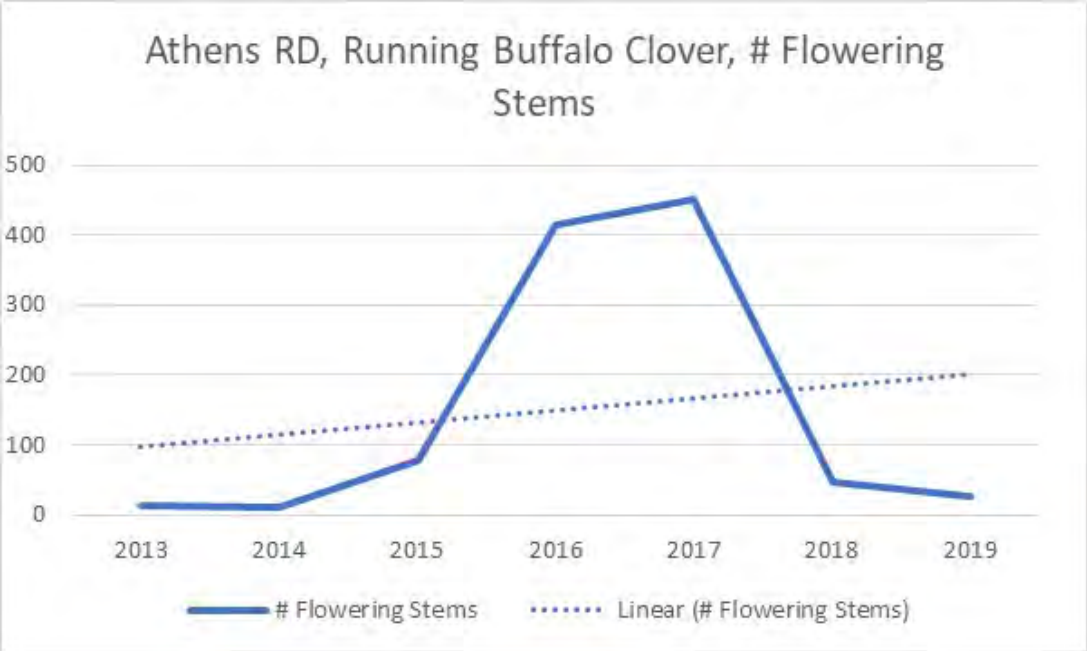

Figure 7 - Running Buffalo Clover, Number of Flowering Stems, Athens RD, 2013-2019

The Ironton Ranger District population saw steady, modest increases in 2018 and 2019. The number of plants increased from 45 in 2018 to 110 in 2019. The number of flowering stems held steady at 57 in both 2018 and 2019. The Ironton population has benefitted from more regular canopy and understory maintenance in recent years.

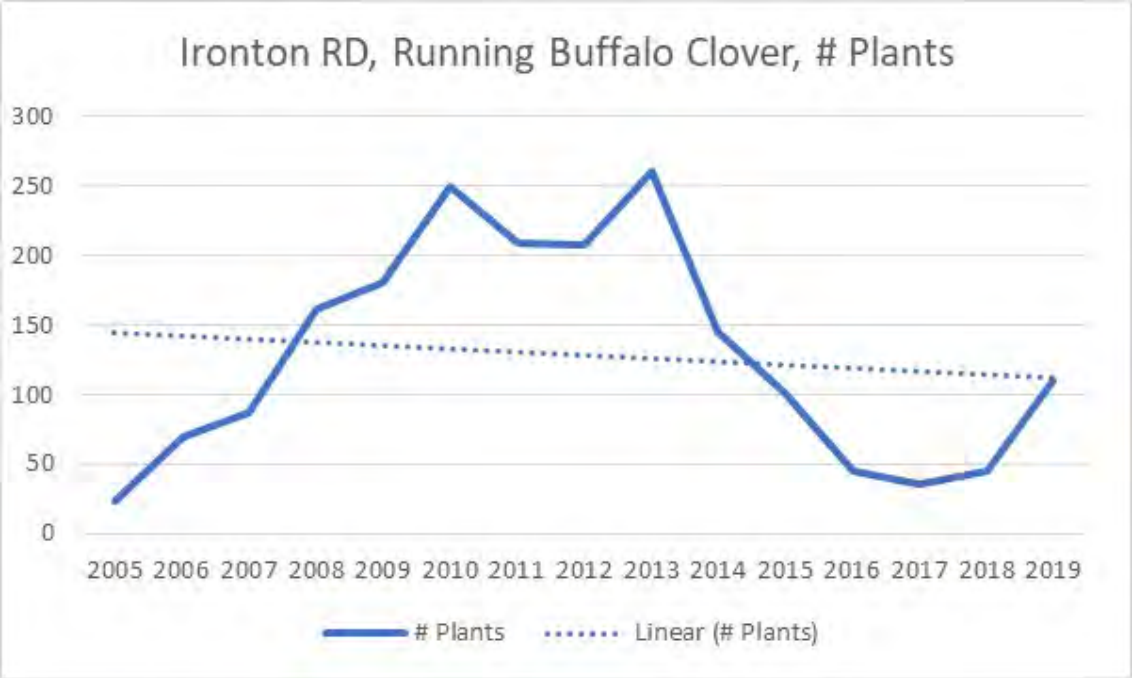

Figure 8 - Running Buffalo Clover, Number of Plants, Ironton RD, 2005-2019

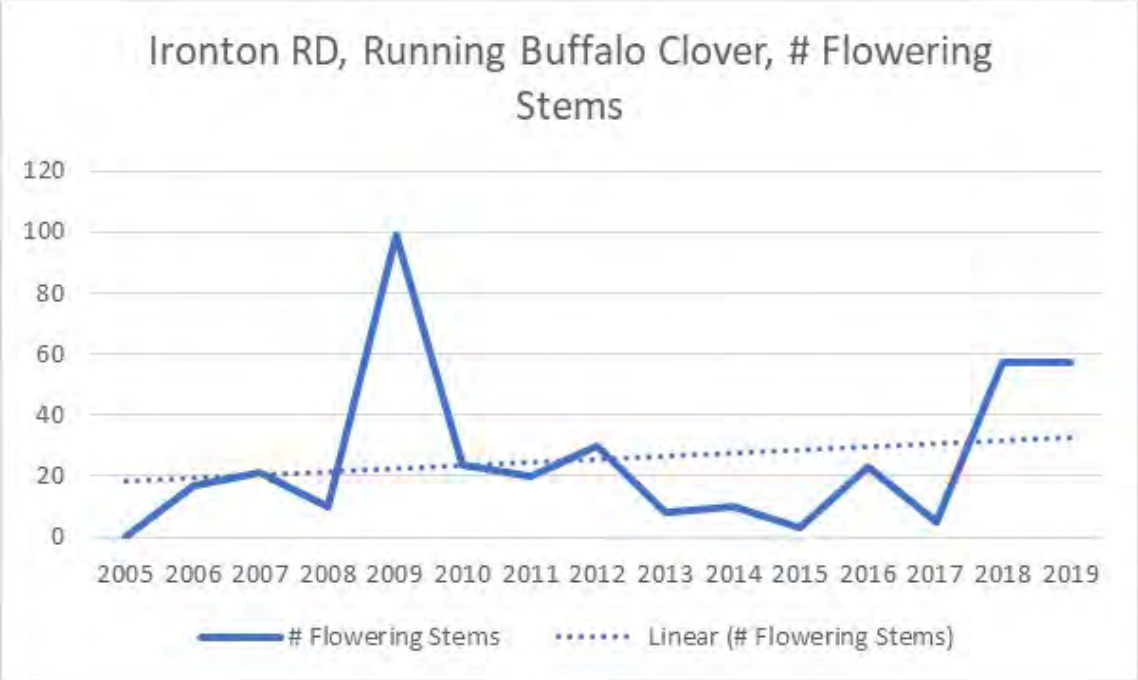

Figure 9 - Running Buffalo Clover, Number of Flowering Stems, Ironton RD, 2005-2019

- **Monitoring Plan Indicator 32: How many risks to the RBC populations were identified and mitigated?**

Risks to both populations have not changed in recent years. Primary threats are shading from forest succession, competition from NNIS plants (Primarily *Microstegium vimineum*), and excessive disturbance from Off-Road Vehicle (ORV) traffic and flooding. Annual habitat

maintenance and NNIS control have continued to maintain suitable light levels and limit interspecific competition from NNIS plants. Other anthropogenic risks such as illegal ORV traffic are harder to mitigate, but have been mostly successful with strategic placement of woody debris. Natural disturbance from flooding cannot be mitigated.

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

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

- **Monitoring Plan Indicator 33: How many mid-winter bald eagle searches were conducted?**
- **Monitoring Plan Indicator 34: How many bald eagles were observed?**
- **Monitoring Plan Indicator 35: How many bald eagle nests are being monitored within the Forest Proclamation Boundary, and are they active?**

Eleven comprehensive searches were conducted at Burr Oak Reservoir on the Athens Unit during this two-year timeframe from December thru mid-April for winter eagle occurrences. Nest monitoring extended thru May if young were detected. Sixteen eagle sightings were made at Burr Oak Reservoir over various areas of the lake.

Nest monitoring was conducted at one nest at Burr Oak Reservoir, located within the Proclamation Boundary of the Forest. Unfortunately, the previously documented nest on the Marietta Unit, in the Newport area along the Ohio River, blew down and the eagles did not re-build.

Table 2 - Results of 2018 Nest Monitoring at Burr Oak Reservoir

Date	Observation
March 2	Adult on nest
March 30	Adult feeding 1 young; possibly second in nest, due to observed adult behavior, but not seen
May 5	Two adults at nest; confirmed 1 young, possibly 2nd in nest but not seen

Table 3 - Results of 2019 Nest Monitoring at Burr Oak Reservoir

Date	Observation
March 15	One adult on nest
April 8	Two adults sitting in nest, 1 eaglet seen in nest
April 22	Two adults flying around area of nest; no nestlings seen

A few observations of bald eagles, from private citizens and the District biologist, were reported

from Lake Vesuvius on the Ironton District during the 2018-19 season. No nests have been located.

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, prescribed fire, shelterwood harvests, and improvement cutting to promote the maintenance and restoration of the oak-hickory ecosystem.

- **Monitoring Plan Indicator 36: How many acres are being treated with varying management actions that will likely result in the maintenance and restoration of the oak-hickory ecosystem?**

For this two-year reporting period, approximately 8,601 acres were treated with varying management actions that will likely result in the maintenance and restoration of the oak-hickory ecosystem across all management areas.

A variety of treatments were used to encourage oak regeneration, including timber harvests, timber stand improvement treatments (manual or herbicide control of competing species and prescribed fire), and NNIS treatments. Many of them should occur together or in a specific order to maximize the potential for successful oak regeneration.

Hardwood timber harvests were completed on 207 acres within the Spur A timber sale located on the Ironton Ranger district. Harvests there used a combination of single tree and group selection timber harvests to implement the Historic Forest Management Area prescription designed to resemble the large tree, widely spaced forest conditions prior to European settlement.

Manual Low Shade Removal, also referred to as Midstory Control, treatments were conducted on 833 acres by removing shade tolerant saplings and pole sized trees to promote oak-hickory regeneration. Treatment areas overlap within prescribed burn units in the Pine Creek Historic Forest project area, as well as the Handley Branch and Bluegrass Ridge Special Areas.

Crop Tree Release treatments were completed to promote oak in young stands on 361 acres of the Ironton Ranger District. These non-harvest treatments encourage oak regeneration by removing or girdling undesirable trees competing with desired young trees of a variety of species, principally oaks and hickories. These units were treated in partnership with the National Wild Turkey Federation.

During 2018-19, prescribed burns were completed on approximately 4,003 acres of NFS lands across all three units of the Wayne NF. Treatments on the Athens unit included the Gore-Greendale and Long Ridge SE project areas and the Pleasant Bear project area on the Marietta unit. Prescribed burns on the Ironton Ranger District occurred within the Bluegrass Ridge and Handley Branch Special Areas, Lake Vesuvius, and the Pine Creek project areas. Low intensity

fire further reduces competing vegetation and leaf litter for oak regeneration establishment and maintenance.

NNIS treatments, typically in the form of woody tree and shrub treatments, were completed on the WNF in a variety of areas covering approximately 829 acres.

Lastly, 2,348 acres of *Lymantria dispar* control treatments were conducted across several locations on the Athens unit. These treatments maintain oak dominated forests by targeted treatments preventing population growth from this invasive pest. *Lymantria dispar* are well known to cause widespread mortality to oak and other tree species within these important ecosystems. For purposes of this tracking, only mating disruption acres are counted to avoid duplicating acres of overlapping treatments within some years. See Goal 7.1 for additional details.

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 Plan Indicator 37: How many acres are being treated with prescribed fire to conserve fire-adapted plant and animal biodiversity, and to maintain and restore mixed oak and native pine?**

The Wayne National Forest implements prescribed burning to reintroduce fire into fire-adapted ecosystems, promoting conditions closer to historic fire regimes as defined in the Forest Terrestrial Ecosystems Assessment Supplemental Report (USDA FS 2020). Between 2018 and 2019, the Forest prescribed burned 4,023 acres. Twenty of those acres occurred on private lands under participating agreements.

Table 4 - Prescribed Burn Unit Acres by year

Year	Unit Name	Acres
2018	Dart A, B, C	145
2018	Bolivian Run A	117
2018	Upper Bailey B	269
2018	Handley Branch Units 1 and 2	231
2018	Lake Vesuvius Units 5-8, 12, and 13	297
2018	Pine Creek Units J and K	505
2019	Gore Greendale Unit C	311
2019	Yellow Fringed Orchid	20

Year	Unit Name	Acres
2019	Upper Bailey A	415
2019	Buffalo Beats	17
2019	Bluegrass Units 1-6	1,264
2019	Lake Vesuvius Units 1-4 and 9-11	432
Total Acres Prescribed Burned	All Burn Units	4,023

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

- **Monitoring Plan Indicator 38: How many treated acres improved fire regime condition class?**

The Fire Regime Condition Class (FRCC) is an interagency tool used to determine the degree of ecological departure from reference conditions, vegetation, fuels, and disturbance regimes. Fire regime groups, or the estimated frequency and severity of fire occurrence on the landscape, directly affect an area's vegetation composition and structure. When compared to current conditions, FRCC and fire regime groups indicate that most of the Forest is classified as a FRCC 2 or 3, indicating a moderate to high departure from reference conditions. From 2018-2019, the Wayne National Forest reintroduced fire on the landscape by prescribed burning approximately 4,023 acres to improve FRCC.

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

- **Monitoring Plan Indicator 39: Has the fire regime been maintained in the desirable condition class?**

As discussed in monitoring plan indicator 38, the Wayne National Forest is predominantly classified as having a moderate to high departure from reference conditions. Since 2006, the forest has made a focused effort to improve FRCC within oak dominated stands. From 2018 - 2019, the forest prescribed burned a total of 4,023 acres to improve the FRCC. Between 2006 and 2019, the forest implemented 22,477 acres of prescribed burning in combination with 100,153 acres of various treatments to improve or maintain FRCC across the landscape.

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 Plan Indicator 40: How many acres of the Forest are designated suitable for collecting Special Forest Products?**

There has been no change in the number of acres designated suitable for collecting special forest products. Suitability for collection of Special Forest Products is designated by the Forest Plan and is dependent on management area. Collection of Special Forest Products that require a permit is prohibited in Future Old Forest, Future Old Forest with Mineral Activity, Developed Recreation, Special Areas, Research Natural Areas, and parts of Timbre Ridge Lake management areas. This leaves about 190,000 acres of the Forest that is suitable for collecting Special Forest Products.

- **Monitoring Plan Indicator 41: How many Special Forest Product permits are issued per Unit and across the Forest annually?**

In 2016 the Wayne National Forest began selling separate ginseng and medicinal root permits to forest permittees. Thus, a standalone ginseng permit was created, while remaining medicinal root species, including goldenseal, bloodroot, black cohosh, blue cohosh, and white snakeroot, remained on a separate medicinal root permit.

The Wayne National Forest saw relatively steady sales of ginseng and medicinal root permits in 2018 and 2019. Overall, 81 ginseng permits were sold in 2018, and 91 were sold in 2019. 2018 permits included 44 sold in Athens, 19 in Marietta, and 18 in Ironton. 2019 saw Athens increase to 67 permits, while Marietta (16) and Ironton (8) both saw decreases in permit sales.

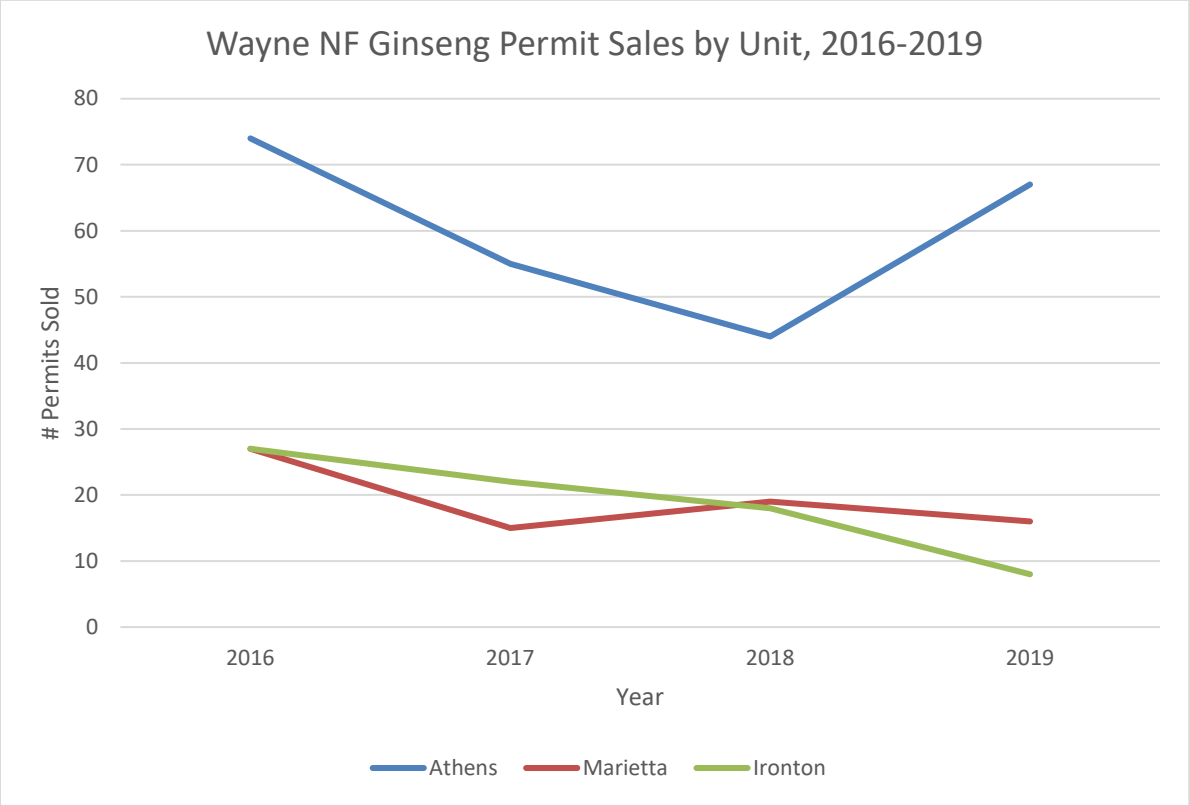

Figure 10 - Wayne National Forest Ginseng Permit Sales 2016-2019

Medicinal root permit totals were roughly similar in 2018 (39 permits) and 2019 (44 permits). The Athens District sold 18 root permits in 2018, while the Ironton District sold 21. In 2019

Athens District permit sales increased to 23, while Ironton permits remained steady at 21.

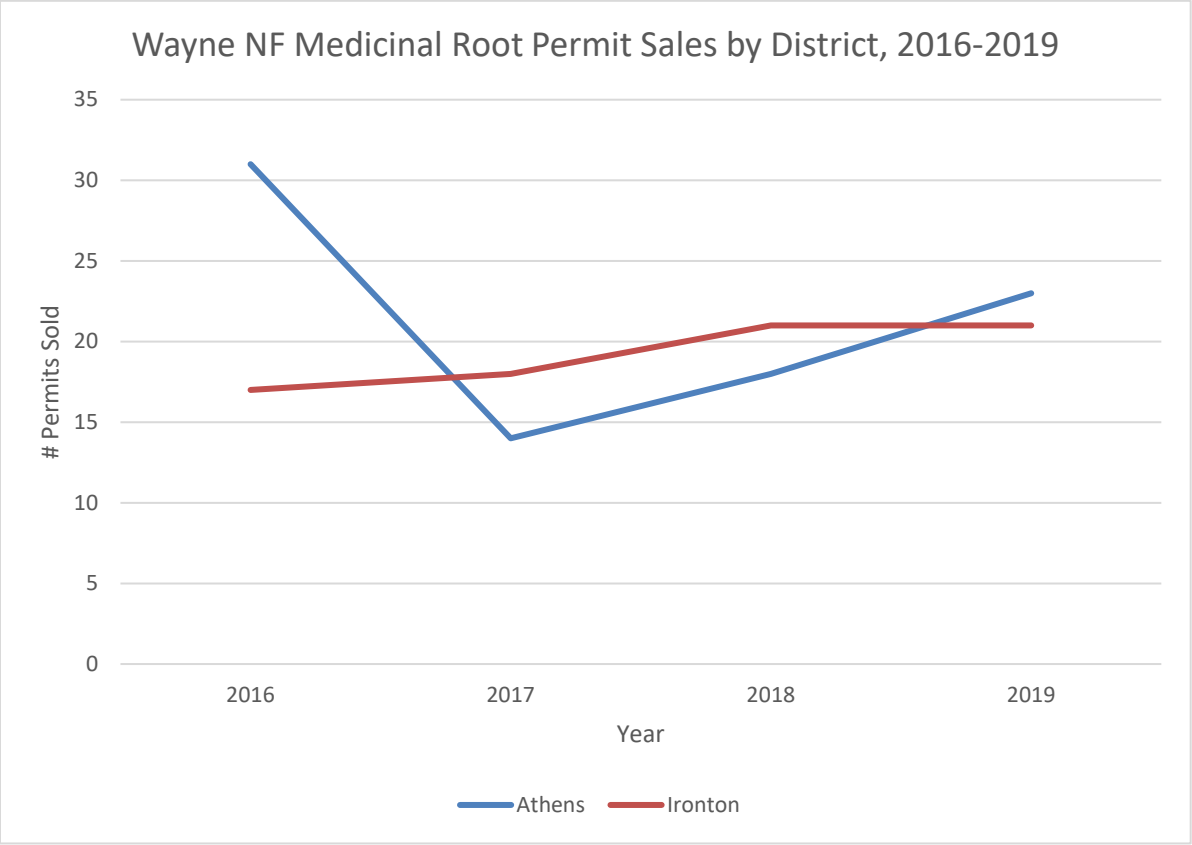

Figure 11 - Wayne National Forest Medicinal Root Permit Sales 2016-2019

- **Monitoring Plan Indicator 42: What are the population trends of ginseng monitoring plots?**

A selection of Wayne National Forest American ginseng (*Panax quinquefolius* L.) populations are monitored twice per year. The early population counts generally occur mid to late June, and the late count occurs mid to late August. The number of populations monitored have varied over the years (Table 5), and ginseng populations have demonstrated vacillating numbers since monitoring began. In the first year, the early monitoring period reported an average 15.6 plants per populations, and by 2019, the average was 18.4 plants. The intrinsic rate of increase for the early population counts has been calculated as 0.02, suggesting a very slow increase over time. Examinations of the populations during the late count, which immediately precede the legal collection time beginning September 1st, reported an average of 15.2 individuals per population in 2007 and 12.8 individuals by 2019. The intrinsic rate of increase for the late population counts has been calculated as -0.02, suggesting a very slow decrease over time. However, data statistics for the sampling period demonstrate very high variability that is likely due to low samples sizes, inconsistent sample sizes year-over-year, and naturally wide ranges of population sizes across the landscape to name a few. As such, population trends cannot be accurately discerned at this time.

Table 5 - Number of populations monitored per year per census on Wayne National Forest, 2001-2019

Monitoring Year	Early Census	Late Census
2007	5	5
2008	10	10
2009	11	11
2010	10	9
2011	0	13
2012	14	14
2014	13	14
2016	14	14
2017	14	14
2018	16	16
2019	15	15

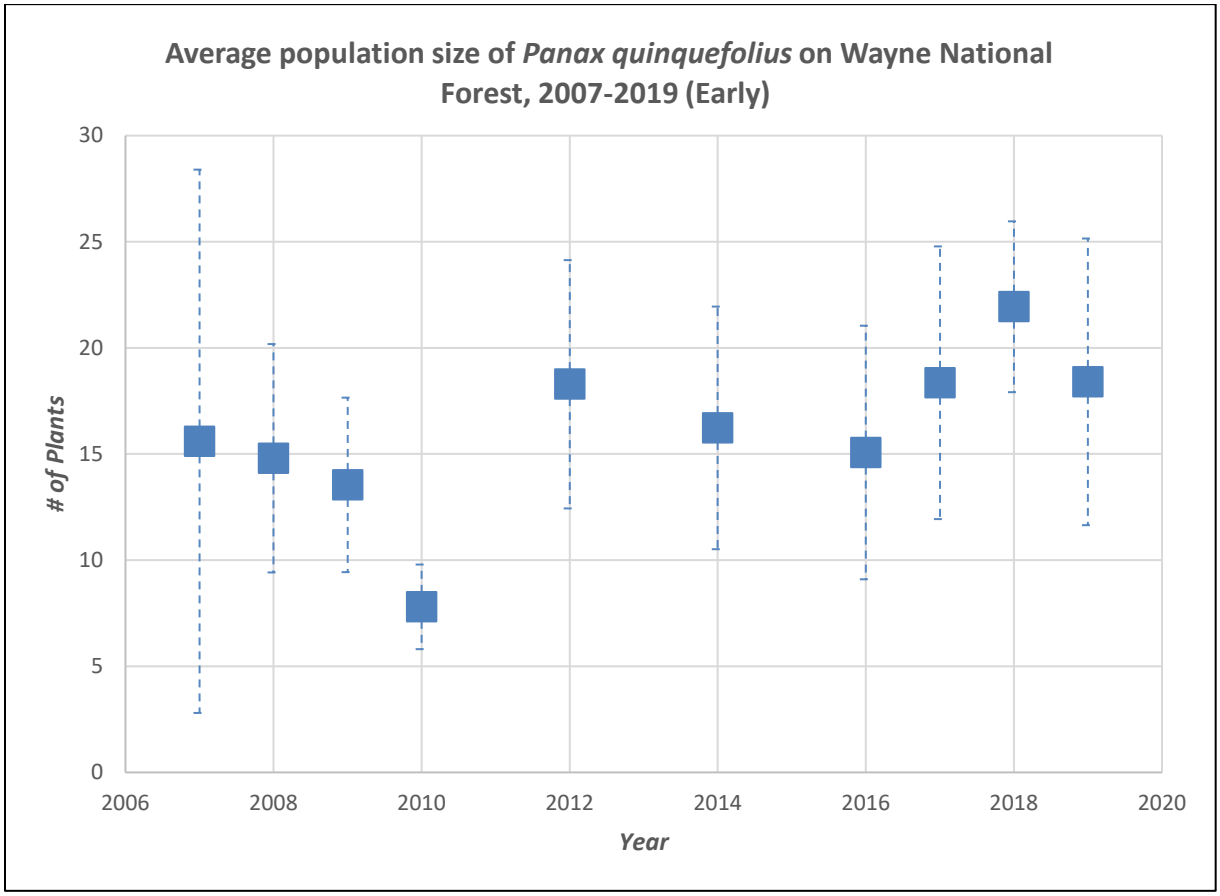

Figure 12 - Average population size of American ginseng during early annual surveys, 2007-2019. Error bars represent 95% CI of the mean.

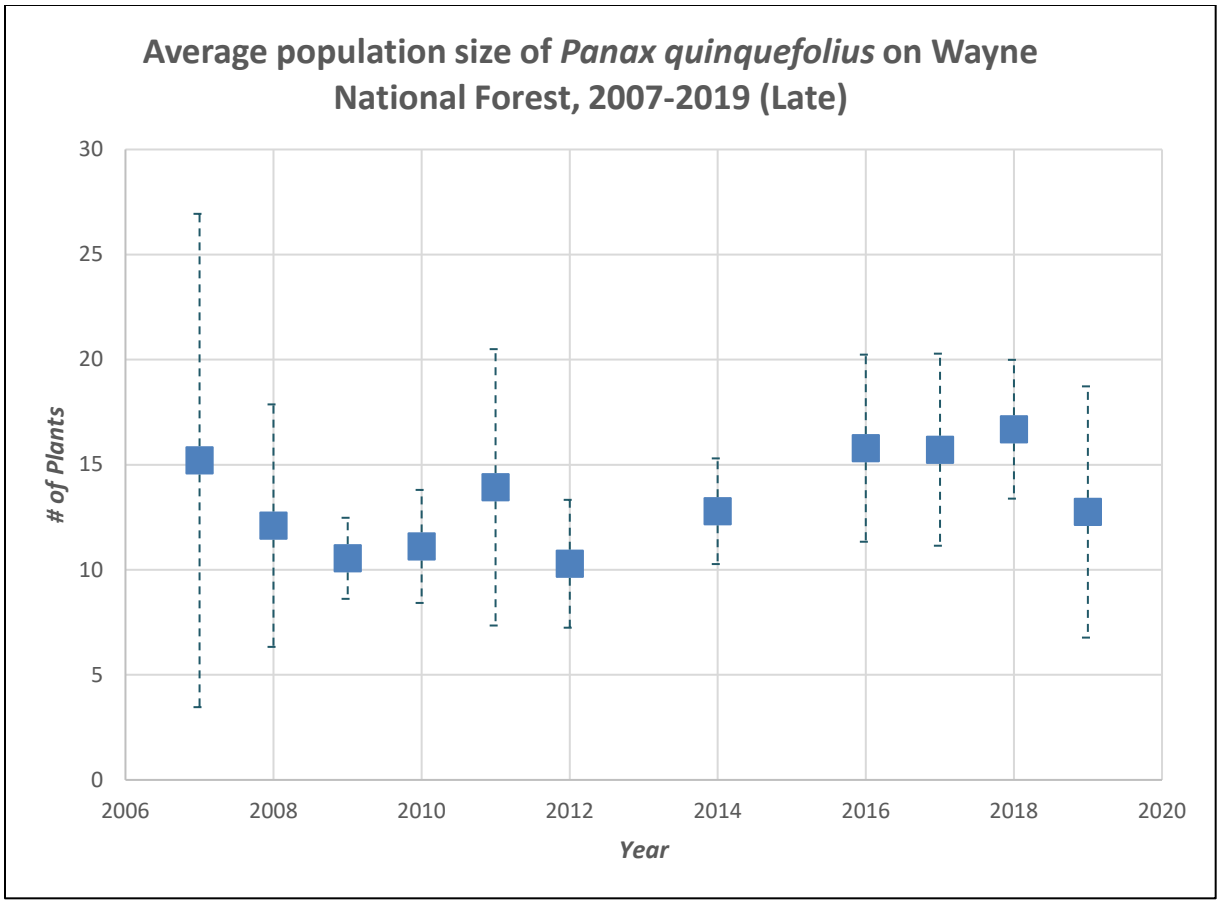

Figure 13 - Average population size of American ginseng during late annual surveys, 2007-2019. Error bars represent 95% CI of the mean.

Only 3 or 4-prong individuals can be collected on the Wayne National Forest with a valid ginseng permit after the 1st of September. The number of 3-prong individuals for monitored populations were averaged and compared by year for both the early and late monitoring effort. 4-prong individuals were not included in past monitoring report calculations, although counting 3 and 4-prong individuals would inform the number of total harvestable individuals within and among populations. For consistency, only 3-prong individuals are included.

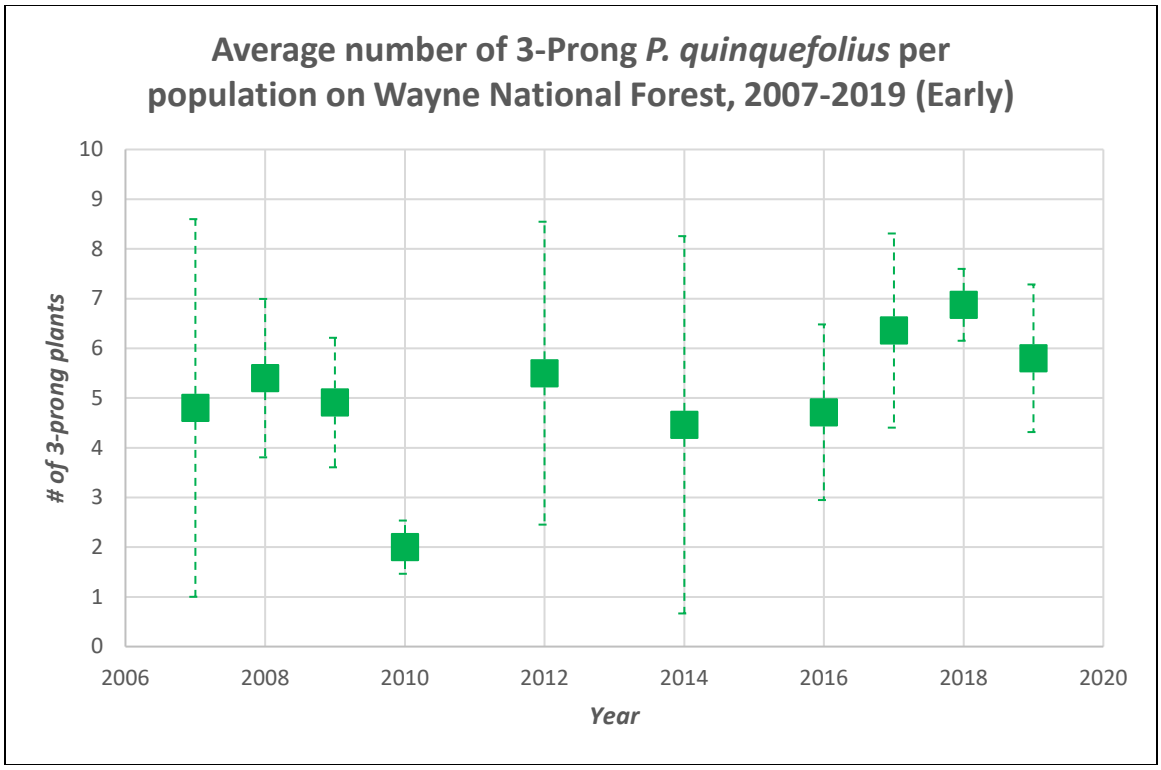

Figure 14 - The average number of 3-prong American ginseng per populations during early annual surveys, 2007-2019. Error bars represent 95% CI of the mean.

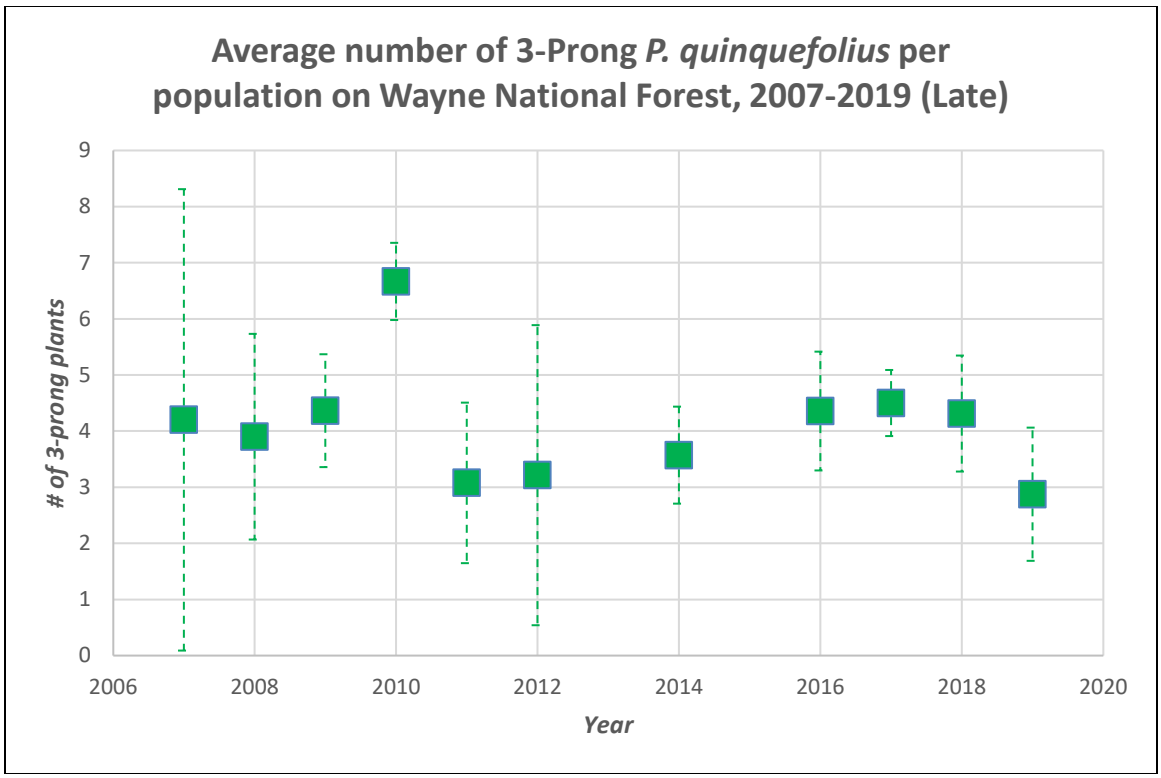

Figure 15 - The average number of 3-prong American ginseng per populations during late annual surveys, 2007-2019. Error bars represent 95% CI of the mean.

Again, data statistics for both the early and late monitoring period presented a high amount of variability making any trend analysis inappropriate at this time. However, the data statistics suggested enough stability to evaluate the percent of 3-prong individuals per population. Calculations for the early monitoring period show that 3-pronged plants encompassed 31.5% +/- 2.5% (95%CI) of the population, and the late monitoring period show that 3-pronged plants encompassed 31.6% +/- 7.2% (95% CI).

In 2019, 6 of the 16 populations monitored had zero legally harvestable individuals during the late monitoring period. The number of 3-prong individuals during the late monitoring period will always be less than or equal to the number of 3-prong individuals during the early monitoring period primarily due to browsing.

Reproductively active individuals were identified as having a flower bud or flower present during the early monitoring period and as having fruit present on the plant during the late monitoring period. The average number of reproductively active individuals per year and for both monitoring periods were calculated. Again, data statistics for the early and late monitoring period indicated a high amount of variability making trend analysis inappropriate at this time. However, data statistics suggested enough stability to evaluate the percentage of reproductively active individuals per population. Reproductively active individuals encompassed 33.8% +/- 7.8% (95% CI) of the early populations and 24.9% +/- 4.5% (95% CI) of the late populations.

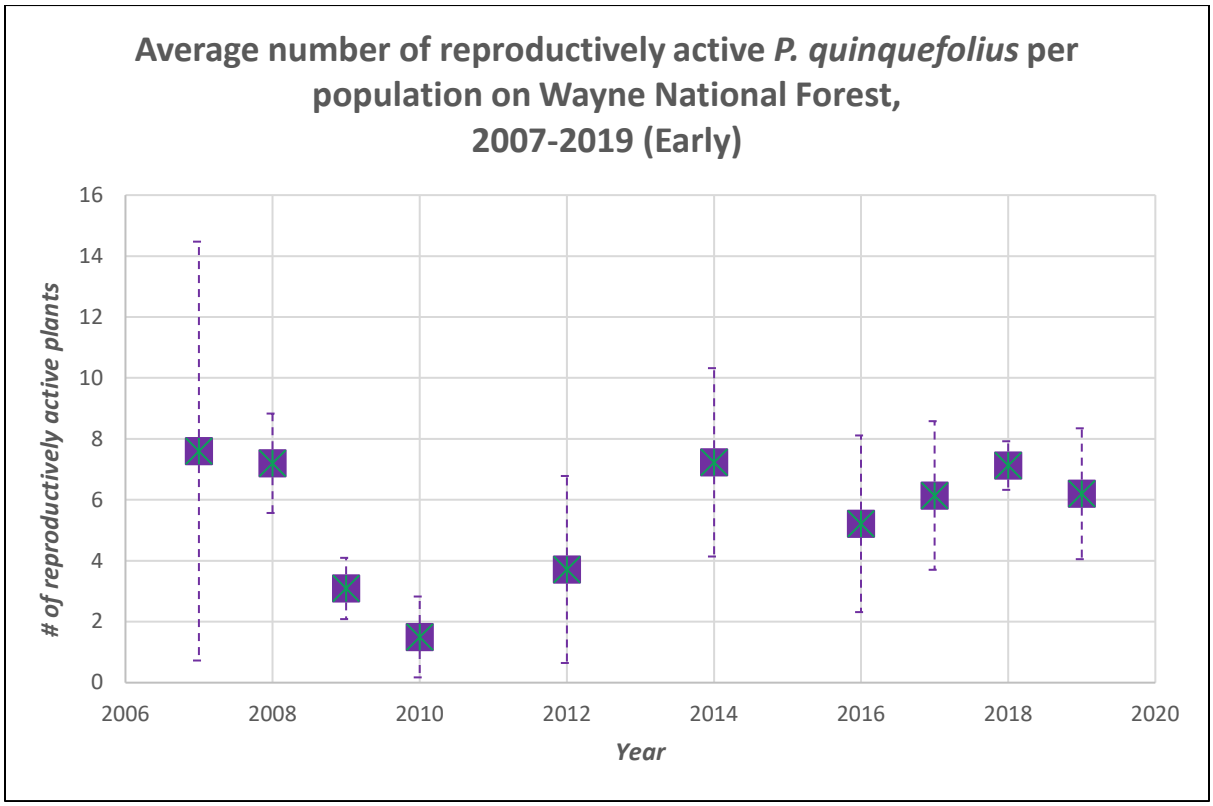

Figure 16 - The average number of reproductively active American ginseng per populations during early annual surveys, 2007-2019. Error bars represent 95% CI of the mean.

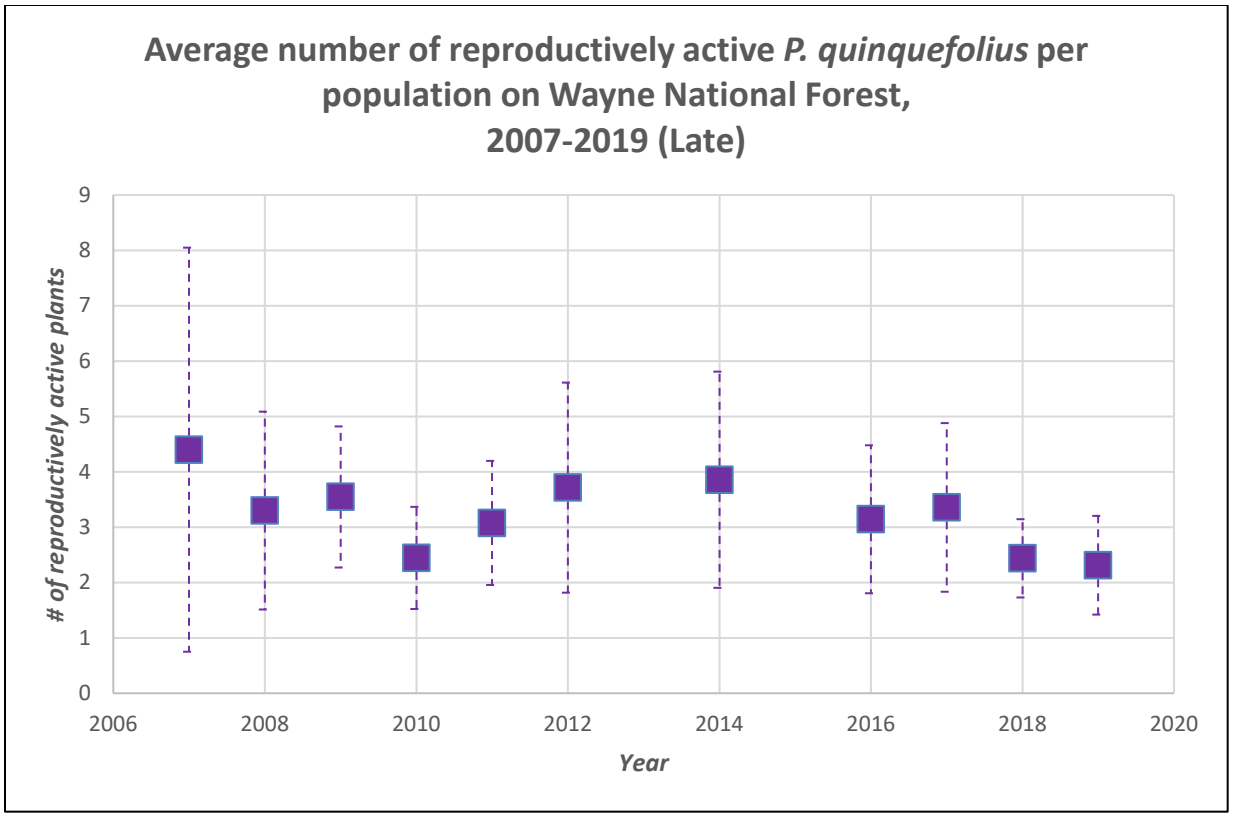

Figure 17 - The average number of reproductively active American ginseng per populations during late annual surveys, 2007-2019. Error bars represent 95% CI of the mean.

- **Monitoring Plan Indicator 43: How many ginseng permits are issued per Unit and across the Forest annually?**

See response to Monitoring Indicator 41.

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 WNF.

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 *Lymantria dispar*; 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 Plan Indicator 44: How many acres of insect and disease were treated and how did the populations respond to treatment?**

Insect and disease treatments in FY18-19 were all directed at control of the *Lymantria dispar*. Three different treatments can be used separately or in combination against *Lymantria dispar* – Gypchek, Btk, and mating disruption pheromone.

Btk is a naturally-occurring bacterium that is manufactured for aerial treatment of *Lymantria dispar* caterpillars. It is somewhat species-specific in that moth and butterfly caterpillars that are present and feeding during or within 7-14 days following the treatment may be killed by the bacterium. Species like swallowtails are not present as caterpillars at the time of the application and typically monarchs are not either.

Gypchek is made from a naturally occurring virus that is propagated in live *Lymantria dispar* caterpillars. The caterpillars are then ground up and aerially applied to spread the virus over the treatment area. The virus is specific to only *Lymantria dispar*; therefore, there are no impacts to other species from this treatment. Unfortunately, Gypchek is no longer being produced due to the extensive costs associated with its development, so its use is targeted to areas that have known populations of rare, threatened, or endangered moths or butterflies that would be susceptible to Btk.

Mating disruption pheromone is a synthetic formulation of the pheromone naturally produced by the female *Lymantria dispar*. It targets *Lymantria dispar* at the adult, moth life stage and, therefore, does not immediately prevent defoliation. In low-level populations of *Lymantria dispar*, the males find the females by following the pheromone scent emitted by the female. In the mating disruption treatment, the area is saturated with female *Lymantria dispar* pheromone so that the males cannot find the females. The result is that reproduction is eliminated or drastically reduced. This will reduce caterpillar numbers in subsequent years. At higher *Lymantria dispar* densities, mating disruption pheromone becomes less effective because male moths can find females visually, without the aid of a pheromone.

As part of the nation-wide "Slow the Spread Program," the Ohio Department of Agriculture aerially sprayed portions of National Forest System lands on the Athens Unit of the Wayne National Forest (WNF) in 2018 and 2019. Treatments are indicated in Table 6.

Table 6 - Wayne National Forest Athens RD *Lymantria dispar* Treatments

Year	**Mating disruption only (acres)**	**Gypchek followed by mating disruption (acres)**
2018	2,031	39
2019	317	0

The area of treatment was identified from monitoring efforts conducted by the ODA in the summer of the year prior to treatment. Areas of lower *Lymantria dispar* populations are identified for mating disruption treatment, with the Gypchek designated for areas with higher

populations.

The purpose of this project was to reduce the impacts of *Lymantria dispar* locally by eliminating caterpillars in areas of higher densities and/or disrupting mating of adult moths, thereby drastically reducing future numbers of the pest. On a large-scale front, the purpose of the project, as part of the Slow the Spread Program, was to slow the advance of *Lymantria dispar* by treating populations on the leading edge of the species known range.

Monitoring of treatment effectiveness

Ohio, which is along the leading edge, extensively traps for *Lymantria dispar* to monitor the spread and population levels. Approximately 12,000 traps are set each year in the state.

Trap catch numbers above a certain threshold trigger more intensive trapping the following year to more finely identify the infestation location and extent. In the third year, treatments are conducted to control the population. Monitoring occurs the year following treatment, with follow-up treatments proposed to control isolated spots as needed.

Wet springs are attributed to helping with the development of higher levels of entomophaga maimaiga fungus, a non-native and introduced fungus which acts as a biological control for the *Lymantria dispar* larvae. Purposeful treatments outlined above in combination with the entomophaga maimaiga fungus are truly a success story for helping to control this non-native invasive threatening the forests of Ohio.

Since the Slow the Spread Program has become operational in Ohio in 2000, the leading edge has been pushed back 54 miles (averaged across the state).

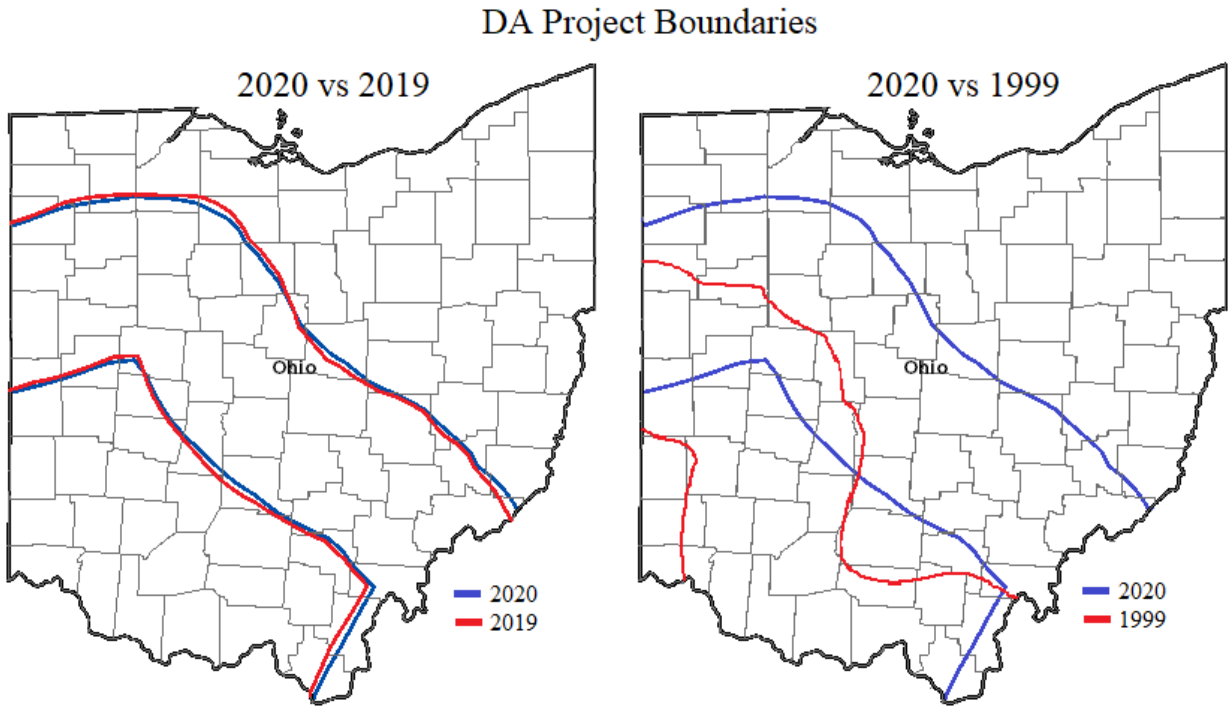

Figure 18 - *Lymantria dispar* project boundaries

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 and early detection of and rapid response to new infestations. Improve effectiveness of NNIS prevention practices through public and inter-agency NNIS awareness and education.

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

- **Monitoring Plan Indicator 45: How many NNIS acres were treated and how did the NNIS populations respond to treatment?**

The Wayne National Forest has steadily increased NNIS treatments across the forest in recent years. 2018 saw approximately 3,227 acres treated across the forest for a variety of woody invasive trees and shrubs. In 2019 the Wayne National Forest led Region 9 with over 6,516 acres of NNIS treatment. The Wayne has focused on larger treatment blocks around planned timber harvest and prescribed fire sites in recent years, along with focused efforts within Research Natural Areas and Special Areas. Treatment of these units and the adjacent forest allows the Wayne to better combat invasion to disturbance sites and subsequent degradation, while also protecting higher quality plant communities from invasive species competition. In turn, local forest resilience increases.

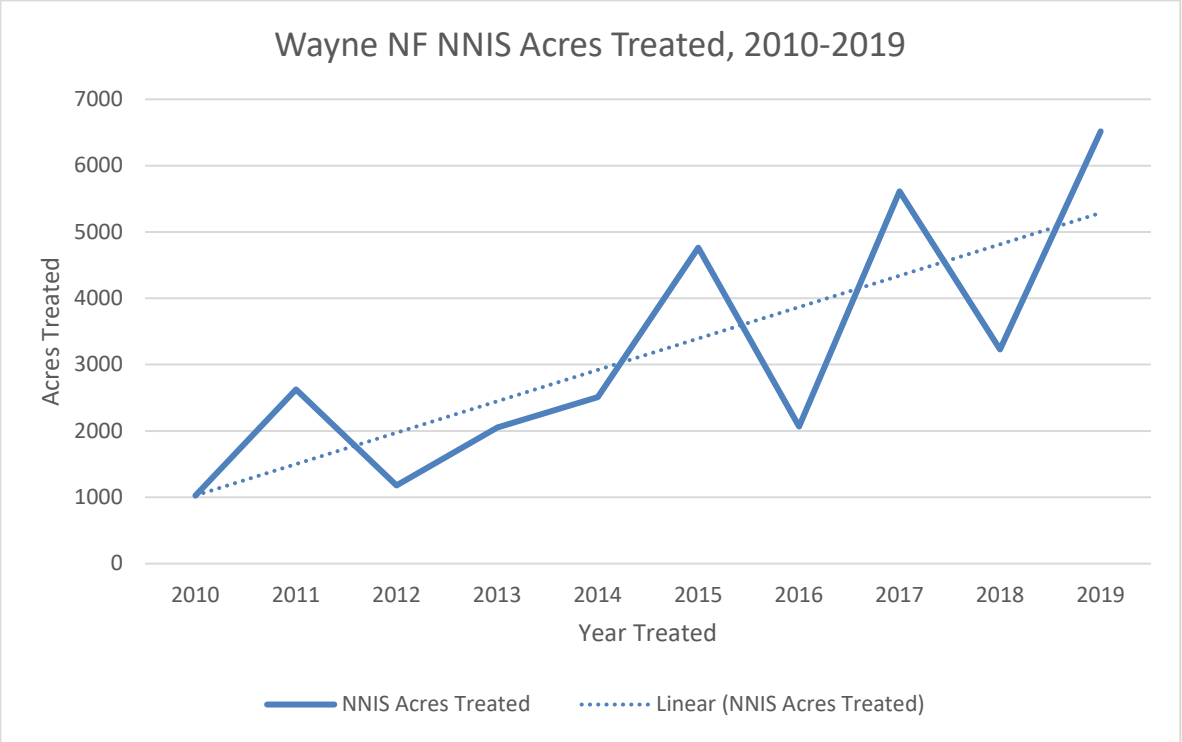

Figure 19 - Wayne National Forest Non-Native Invasive Species, Acres Treated 2010-2019

Fire Management

Goal 8.1 Integrated Fire Prevention

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

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

- **Monitoring Plan Indicator 46: How many acres in WUI were treated for hazardous fuels reduction?**

In fiscal years 2018-19, the Wayne National Forest applied prescribed fire on 4,023 acres within the Wildland Urban Interface (WUI). From 2006-2019, the Forest prescribed burned approximately 22,914 acres within the WUI.

Minerals

Goal 10.1 – Provide mineral commodities

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

- **Monitoring Plan Indicator 47: Are site-specific mitigations providing environmentally sound exploration and development of Federal and private minerals and energy resources?**

Yes, the Forest Service works with State and Federal Agencies and the mineral owners to ensure compliance with plans of operations to mitigate resource impacts.

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

- **Monitoring Plan Indicator 48: How many plans of operation/applications for permit to drill on Federal leases were processed in a timely manner?**

Federal mineral Surface Use Plans of Operation (SUPO) or Application for Permit to Drill (APD) were tracked starting in 2011. In 2018-2019, staff availability allowed for 12 such requests to be processed.

Figure 20 - Federal Mineral Lease Permits Processed, 2006-2019

Goal 10.2 – Respect owners' rights and protect surface resources

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

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

- **Monitoring Plan Indicator 49: How many applications were processed within 60 days?**

One application was processed in fiscal years 2018-19.

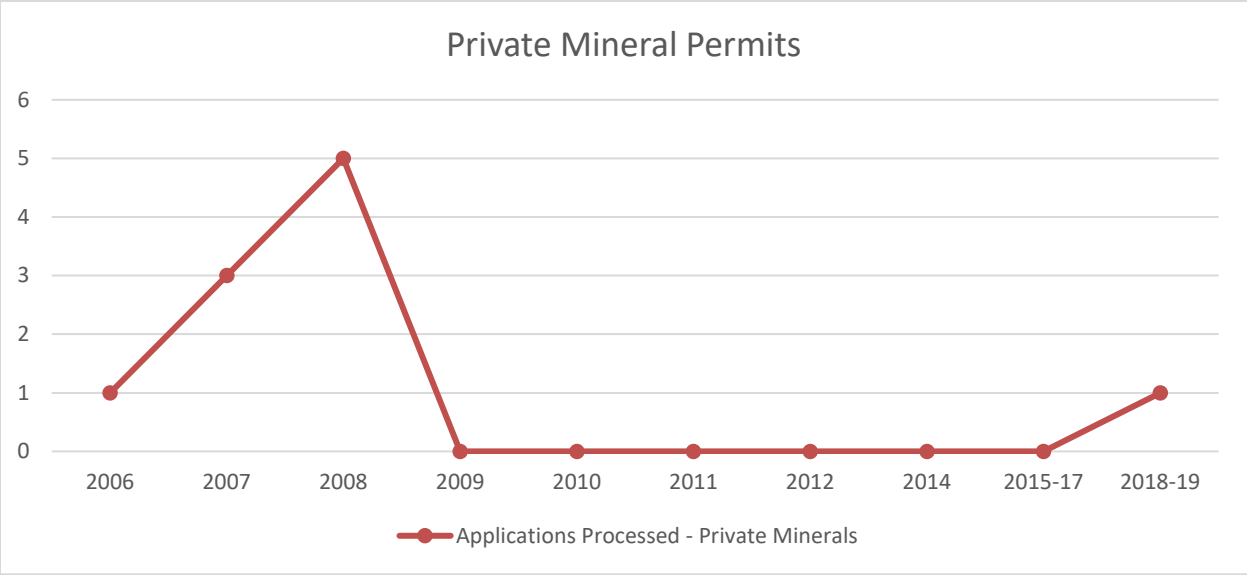

Figure 21 - Private Mineral Permit Applications Processed, 2006-2019

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

- **Monitoring Plan Indicator 50: How many mineral activities were adequately restored upon completion?**

In fiscal years 2018-19, 5 mineral activities were adequately restored upon completion.

Objective 10.2c – Plug wells when producing ceases.

- **Monitoring Plan Indicator 51: How many wells were plugged according to state regulations when production ceases?**

In fiscal years 2018-19, 5 wells were plugged according to state regulations.

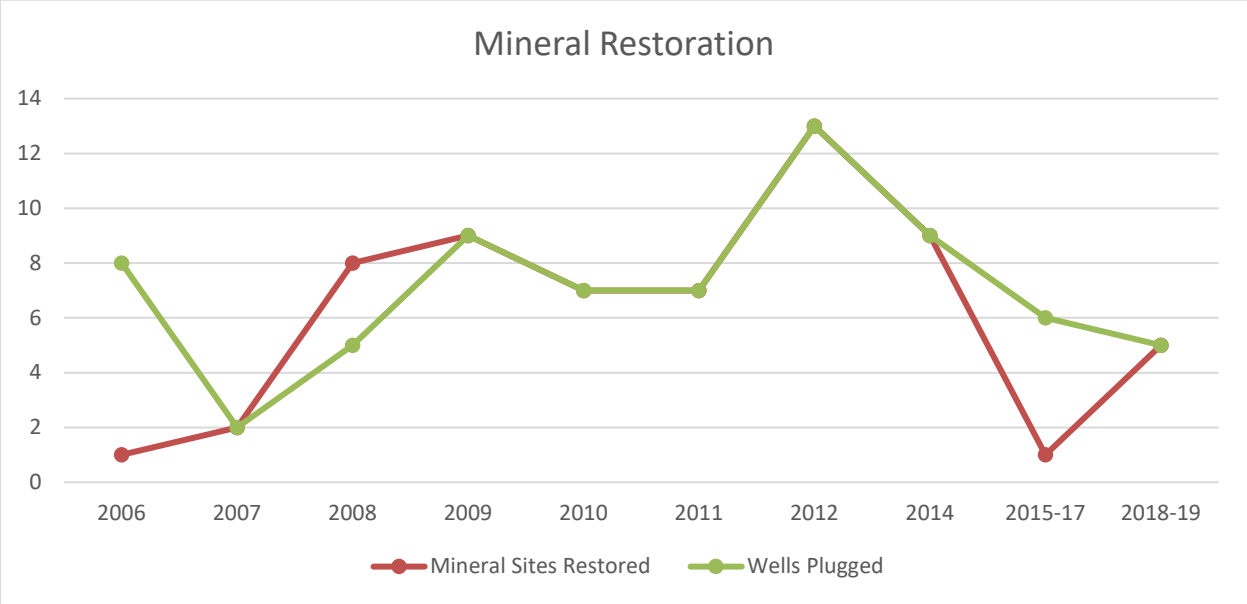

Figure 22 - Mineral Sites Restored and Wells Plugged, 2006-2019

Funding and assistance from the State greatly influences the ability of the Forest to meet these goals. The annual trend displayed reflects this cooperative approach.

Recreation

Goal 11.1 – Provide a Broad Range of Recreation Opportunities

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

Objective 11.1a – By the end of this planning period, add at least one camping

facility for ATV/OHM use and one for equestrian use. This could be accomplished by the Forest Service or concessionaire on NFS land or by the private sector on adjacent private property.

Since 2004, the Wayne National Forest conducted four rounds of the National Visitor Use Monitoring (NVUM) surveys. Responses to the Forest Plan monitoring questions were from results of the 2019 NVUM surveys.

- **Monitoring Plan Indicator 52: What annual visitation estimates are reported (by type of visit – day use, developed, general forest area visits)?**

In 2019, the Forest received about 205,000 site visits and 159,000 National Forest visits. Table 7 displays the number of visits by recreation site types (i.e., Day Use Developed Sites, Overnight Use Developed Sites, and the General Forest Area). Day Use Developed Sites are picnic sites, boat launches, and swim areas. Overnight Use Developed Site include campgrounds and cabins, and the General Forest Area supports outdoor recreation activities such as hunting, fishing, and nature viewing.

Results from the 2019 NVUM survey indicate the Forest experienced a drop in the number of national forest visits and the number of recreation site visits. This decrease may be attributed to a number of factors, including but not limited to changes in the NVUM design criteria and data collection methods, downturn in the economy, shift in forest policy for trail use, shift in OHV use, increasing recreation and trail fees, delayed openings, or temporary closures of recreation sites and trails due to floods, slips, and waterline breaks, and other contributing factors.

Table 7 – 2019 Site Visitation Estimates by Site Types

Survey Year	Developed Day Use	Developed Overnight Use	General Forest Area	Special Events	Total
2019	64,000	33,000	108,000	1,000	206,000

NVUM data also indicate that developed overnight use had the highest length of visitor stay with 35.7 hours/visit compared to use in the general forest area (4.2 hours/visit) and use at the developed day use areas (2.7 hours/visit).

- **Monitoring Plan Indicator 53: Why are people visiting the Forest and what are their demographics (demographics, visit descriptions, activities)?**

Visitor Demographics

Gender

NVUM results from 2019 indicate an average of 71.2% of Forest visitors were males and 28.8% were females. The percent of males visiting the Forest has traditionally been about 3.5 times higher than females visiting the forest; however, there has been a noted increase in visitation to

the forest by females.

Race/Ethnicity

In the 2019 NVUM survey, 99.5% of visitors identified themselves as white. Visitation rates were lower among other racial and ethnic groups. See Table 8.

Table 8 - Percent of National Forest Visits by Race/Ethnicity

Survey Year	White	Hispanic/Latino	Native American	African American	Asian	Pacific Islander
2019	99.5	2.8	2.1	0	0.2	0.1

NOTE: Respondents could choose more than one racial group, so the total may be more than 100%. Race and Ethnicity were asked as two separate questions. Non-respondents to race/ethnicity questions were excluded from analysis.

Age

In 2019, NVUM data indicates that the Forest had a large and relatively even distribution of visitors based on age. The under 16 age class had the highest average percentage of visits (21.8%), followed by 40 to 49 (15.4%), 60 to 69 (13.9%), 30 to 39 (12.9%) and 50 to 59 (11.4%). See Table 9

Table 9 - Percent of National Forest Visits by Age

Survey Year	Under 16	16 - 19	20 - 29	30 - 39	40 - 49	50 - 59	60 - 69	70 +
2019	21.8%	7.0%	11.0%	12.9%	15.4%	11.4%	13.9%	6.6%

Distance Traveled

Results from NVUM reports for 2019 indicate almost three-quarters of visitors live within 50 miles of the Forest. More than half of visitors live within 25 miles of the Forest. See Table 10.

Table 10 - Percent of National Forest Visits by Distance Traveled

Survey Year	0-25 Miles	26-50 Miles	51-75 Miles	76-100 Miles	101-200 Miles	201-500 Miles	Over 500 Miles
2019	54.6%	17.6%	4.1%	4.7%	13.5%	3.5%	2.1%

Visitor Participation

In the 2019 round of NVUM, eight outdoor recreation activities received the highest percentage of visitor participation (Table 11) with relaxing as the highest participated activity and motorized trail activity/OHV use the highest participated main activity. Non-motorized water activities, gathering forest products, driving for pleasure, horseback riding, and bicycling were among the other top participated activities occurring on forest and many more occurring at smaller percentages.

Table 11 - Percent of Top Visitor Participating Activities (2019)

Activity	Percent Participating	Percent as Main Activity
Relaxing	35.7%	1.1%
Hiking/Walking	32.9%	17.3%
Motorized Trail activity/OHV Use	29.7%	20.9%
Viewing Natural Features	23.7%	7.5%
Primitive/Developed Camping	22.4%	11.2%
Fishing	20.8%	17.9%
Wildlife Viewing	16.8%	0.3%
Picnicking	16.0%	2.7%

- **Monitoring Plan Indicator 54: What level of spending is reported (spending, substitute behavior, etc.)?**

Visitors' Annual Household Income
2019 NVUM data indicate around 45% of visitors have a household income of less than $50,000 per year, while 11% of households make $25,000 or less. About 24% of visitors come from households making over $100,000 annually. See Table 12.

Table 12 - Percent of National Forest Visits by Annual Household Income

Survey Year	Under $25,000	$25,000 – $49,999	$50,000 – $74,999	$75,000 – $99,999	$100,000 – $149,999	$150,000 and Over
2019	11%	34%	20%	12%	14%	10%

Per Party Trip Spending
NVUM data indicate a visiting party to the Wayne National Forest in 2019 spends an average of $197.00 per trip. This includes spending both on and off the national forest.

- **Monitoring Plan Indicator 55: What level of visitor satisfaction is reported?**

Recreation visitors were asked to provide an overall satisfaction rating of their visit to the Wayne National Forest. Visitor satisfaction information was collected at Day Use Developed sites, Overnight Developed Sites and General Forest areas. Overall, visitors were generally satisfied with the condition of facilities, access, safety, and services across all sites. A few items that visitors would like the Forest to concentrate on improving include employee helpfulness, restroom cleanliness, availability of recreation information, signage adequacy, interpretive display, and value for fee paid.

Approximately 14 different elements, such as restroom cleanliness, parking availability, signage,

feeling of safety, etc. were considered. These elements were organized into four main categories: 1) Developed Facilities - includes restroom cleanliness and facility condition; 2) Access - includes parking availability, parking lot condition, road condition and trail condition; 3) Services - includes availability of information, signage, employee helpfulness; and 4) Perception of Safety.

The following is a summary of the visitor satisfaction results for each type of recreation site.

Developed Recreation Sites

For developed recreation sites in 2019, which includes overnight sites and day-use sites, the overall visitor satisfaction is 89.1% with visitor perception of safety receiving the highest rating at 96.6%. The national satisfaction target is 85%. See Table 13.

Table 13 - Visitor Satisfaction Percentages for Developed Recreation Sites

Survey Year	Developed Facilities	Access	Services	Safety	NVUM Year Average
2019	82.3%	92.9%	84.7%	96.6%	**89.1%**

General Forest Areas

For general forest areas in 2019 overall visitor satisfaction drops below the national satisfaction target of 85% at 73.9% with visitor perception of safety receiving the highest rating at 87.8%. The 2019 NVUM report indicated that 8 of 14 satisfaction measures listed for the general forest areas received a "Keep up the good work" rating. Restroom cleanliness, recreation information availability, and signage adequacy received a "Concentrate here" rating, while employee helpfulness, availability of recreation information, and value for fee paid did not receive a rating since there was insufficient data.

Table 14 - Visitor Satisfaction Percentages for General Forest Areas

Survey Year	Developed Facilities	Access	Services	Safety	NVUM Year Average
2019	65.8%	77.8%	64.1%	87.8%	**73.9%**

Goal 11.2 – Provide Safe, Quality Trails

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

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

- **Monitoring Plan Indicator 56: How many miles of NCT have been relocated/reconstructed off existing roads?**

With help from the Buckeye Trail Association, the Forest relocated approximately 2.5 miles of

the North Country Trail (NCT) off roads. The work began in 2018 and was completed in 2019. The relocation section began at the Old Stone Church Trailhead, moved south, and ended at the Howdyshell Road (T-241).

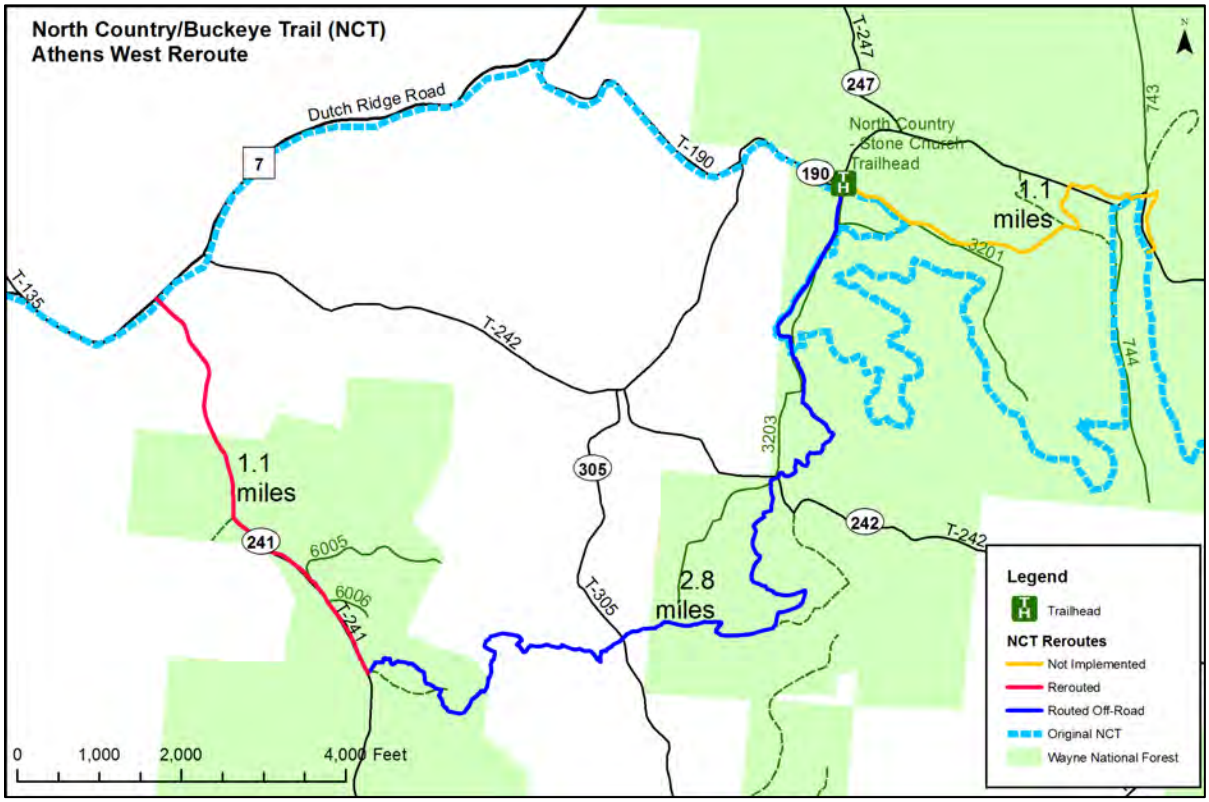

Figure 23 - NCT miles located off roads (2018/2019)

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

- **Monitoring Plan Indicator 57: How many miles of motorized trails have been maintained to standard (annual routine and deferred maintenance)?**

A trail is considered "Maintained" if the following three national critical standards are met:

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 two management areas: Diverse Continuous Forest w/OHV (DCFO) and Historic Forest w/OHV (HFO). All motorized trail maintenance or reconstruction work is restricted to these Management Areas.

National trail performance measure definitions include the following:

- **Miles Maintained** – the miles of national forest system trails (NFST) on which at least

one maintenance task is performed to standard during the fiscal year. This measure includes annual maintenance and deferred maintenance (repair, replace, and decommission).

- **Miles Meeting Standard** – the total NFST miles that meet Trail National Quality Standards consistent with the maintenance cycle identified for the trail. Trail-specific maintenance cycles are identified on Trail Management Objectives.
- **Miles Improved** – the miles of NFST improved or constructed to standard. This measure includes trail alteration, expansion, or new construction.

Approximately 373 miles of national forest system trails were "maintained" on the Forest in FY18 and 368 miles in FY19. Typically, partners and volunteers maintained the majority of the horse, hiking, and biking trails, followed by labor from force account. Generally, contractors are not utilized to maintain hiking trails. Conversely, Force account and contractors are primarily used to maintain OHV trails, with minimal partner and volunteer assistance.

Athens Ranger District

Over the last two years, the Athens District maintained 165 miles of OHV trails (81 miles in 2018 and 84 miles in 2019). Most of the maintenance work was completed using trail force account followed by contractors, though some partner/volunteer assistance was received. Appropriated funds were leveraged with trail grants, user fees and volunteer/partner contribution to complete trail maintenance projects. Heavy trail maintenance work was generally completed by contractors and force account, while light maintenance was completed by force account with the help of partners and volunteers. Table 15 lists the miles and source that completed trail maintenance on the Athens District's motorized trails from 2018 through 2019.

Table 15 - Athens District - Motorized Trail Maintenance

Accomplished By	Miles Maintained 2018	Miles Maintained 2019	2-Year Total
Force Account	81.38	68.50	149.88
Contract	0	12.82	12.82
Partner/Volunteer	0	2.5	2.5
Total Miles	81.38	83.82	165.20

Figure 24 - Section of Dorr Run Loop Trail *before* maintenance

Figure 25 - Section of Dorr Run Loop Trail *after* maintenance

Figure 26 - Dorr Run Trail *before* heavy tread maintenance

Figure 27 - Dorr Run Trail *after* heavy tread maintenance

Ironton Ranger District

Over the last two years, the Ironton District maintained 122 miles of OHV trails (59 miles in 2018 and 63 miles in 2019). Much of the maintenance work was completed using force account,

followed by trail contractors, then volunteers. Appropriated funds were leveraged with trail grants, user fees, and partner/volunteer contribution to complete trail maintenance projects. Heavy trail maintenance work was generally completed by contractors or force account, while light maintenance was completed by force account with the help of partners and volunteers. Table 16 lists the miles and source that completed trail maintenance on the Ironton District's motorized trails from 2018 through 2019.

Table 16 - Ironton Ranger District Motorized Trail Maintenance

Accomplished By	**Miles Maintained 2018**	**Miles Maintained 2019**	**2-Year Total**
Force Account	59.43	16.71	76.14
Contract	0	42.84	42.84
Partner/Volunteer	0	3.0	3.0
Total Miles	59.43	62.55	121.98

Figure 28 - Trail tread repair and culvert replacement on Hanging Rock OHV Trail

Figure 29 - Trail tread repair and culvert replacement on Hanging Rock OHV Trail

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

- **Monitoring Plan Indicator 58: 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?**

No motorized trails on the Forest were closed, rehabilitated, relocated, or reconstructed due to unsafe conditions or unacceptable resource damage in 2018 and 2019.

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

- Prohibiting cross-country travel or riding on undesignated user-created trails
- Prohibit riding on trails designated for other uses
- Riding on designated trails during closed seasons
- Closing at least 20 miles of illegal OHV trail within the next decade to:
    - Protect federally listed species
    - Protect Regional Forester's sensitive species
    - Improve watershed health

- **Monitoring Plan Indicator 59: Have sections of unauthorized routes on the Forest**

been closed and rehabilitated? What were those efforts and where did they take place?

Outside of Recreation Trail Program (RTP) grants, no federal appropriation funds were available for unauthorized route closures in 2018 and 2019. Contractors maintaining designated trails utilizing RTP grant funds closed access points to any unauthorized routes identified along the trail. The total number of access points that were closed is unknown.

Figure 30 - Unauthorized access from Paramount Loop Trail

Figure 31 - Unauthorized access from Paramount Loop Trail blocked

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

- **Monitoring Plan Indicator 60: How many miles of non-motorized trails have been maintained/reconstructed to standard?**

Non-motorized trails include all hiking, biking, and horse trails. Most of these trails are multi-use (shared) trails. Forest-wide, a total 225 miles of non-motorized trails were maintained in 2018 and 228 miles in 2019.

Athens Ranger District
The Athens Ranger District maintained 301 miles of non-motorized trails in 2018 through 2019. Appropriated funds were leveraged with trail grants, user fees, and partner/volunteer contribution to complete trail maintenance projects. A majority of trails were maintained by partners/ volunteers (211 miles), followed by force account (90 miles). No trail miles were maintained by contractors. Table 17 displays the miles of non-motorized trails maintained by each work group on the Athens District between 2018 and 2019.

Table 17 - Athens Ranger District, Non-Motorized Trail Maintenance, 2018-2019

Accomplished By	Miles Maintained 2018	Miles Maintained 2019	2-Year Total
Force Account	36.86	53.27	90.13
Contract	0	0	0
Partner/Volunteer	111.92	99.09	211.01
Total Miles	148.78	152.36	301.14

Ironton Ranger District
The Ironton Ranger District maintained 152 miles of non-motorized trails in 2018 through 2019. Appropriated funds were leveraged with trail grants, user fees, and partner/volunteer contribution to complete trail maintenance projects. Over the two-year period, 92 miles of non-motorized trails were maintained by partners/volunteers and 59 miles by force account. Less than a mile of non-motorized trails was maintained by contractors. Table 18 displays the miles of non-motorized trails maintained by each work group on the Ironton District between 2018 and 2019.

Table 18 - Ironton Ranger District, Non-Motorized Trail Maintenance, 2018-2019

Accomplished By	Miles Maintained 2018	Miles Maintained 2019	2-Year Total
Force Account	29.33	29.51	58.84
Contract	0	0.75	0.75
Partner/Volunteer	46.43	45.54	91.97
Total Miles	75.76	75.8	151.56

Objective 11.2g – Construct new trails during the next 10-15 years within the ranges and densities shown in Table 2-5. (Forest Plan pg. 2-46)

- **Monitoring Plan Indicator 61: How many miles of new motorized and non-motorized trails have been constructed?**

No new trails were constructed in 2018 and 2019.

Scenery Management

Goal 12.1 – Maintain scenic resources

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

- **Monitoring Plan Indicator 62: Is the Forest being managed in accordance with the assigned Scenic Integrity Objectives (SIOs) and scenery guidelines found in the Forest Plan?**

Two timber sales were monitored in 2019 for compliance with Scenery Management System guidelines. Beech Grove II Timber Sale on the Athens Unit and Spur A Timber Sale on the Ironton District. Both timber sales were monitored in December 2019/January 2020. Photos were taken to serve as a visual reference.

Due to the nature of the white pine forest type (e.g., prone to wind throw) that is predominant in the treatment areas, the Forest decided to depart from following Forest scenery guidelines.

- **GFW-SM-86:** In lands with a low scenic integrity objective, human alterations and management activities dominate the original scenic attributes of the natural or natural appearing landscape character. They borrow from naturally established design attributes – form, line color, and texture.
- **GFW-SM-91:** Minimize the number of log landings visible from a travelway.

Scenery Monitoring Observations

Beech Grove II White Pine Clearcut – Units 1 and 2

Unit 1 (Compartment 31/Stand 1 and Compartment 32/Stand 35) is an 11.49-acre clearcut on the Athens Unit. Harvesting was completed in October 2019 and monitoring was conducted in December 2019. It is within an area assigned a "Low" scenic integrity objective (SIO). The unit was divided in half by Township Road 281. The clearcut was completed in December 2019. A few dead snags and live trees were left for wildlife. No slash piles were observed. Slash was scattered and kept low throughout the unit. The skid road near the landing was well seeded and mulched – grass seeds were germinating. Tree stumps were cut low (1'-2' tall). Residual trees were not damaged from logging operation. No rutting or erosion was observed. The haul road was well-graveled, and no logging debris or oil spills were present. Figures 32-35 below are photographs of Beech Grove II, Unit 1.

Figure 32 - Beech Grove II white pine clearcut, Unit 1. Photo taken 11/20/19.

Figure 33 - Beech Grove II white pine clearcut, Unit 1. Photo taken 11/20/19.

Figure 34 - Beech Grove II white pine clearcut, Unit 1. Photo taken 11/20/19.

Figure 35 - Beech Grove II white pine clearcut, Unit 1. Photo taken 11/20/19.

Unit 2 (Compartment 31/Stand 42 and Compartment 32/Stand 13) is an 18.85-acre clearcut on the Athens Unit. Harvesting was ongoing in Compartment 31/Stand 42 and almost completed at time of monitoring (December 2019). It is within an area assigned a “Low” to “Moderate” scenic integrity objectives (SIO). The unit was divided in half by Township Road 281 and approximately 500 feet southeast of Unit 1. A few dead snags and live trees were left for wildlife. Characteristics of Cutting Unit 2 were similar to Unit 1, but the landing had not yet been seeded and mulched.

Both cutting units met all but one scenery guidelines. Guideline GFW-SM-88 would likely be met within one to two growing seasons after project completion. The following photos show the cutting unit at time of harvest completion (December 2019).

Figure 36 - Beech Grove II white pine clearcut, Unit 2. Photo taken 11/20/19.

Figure 37 - Beech Grove II white pine clearcut, Unit 2. Photo taken 11/20/19.

Figure 38 - Beech Grove II white pine clearcut, Unit 2. Photo taken 11/20/19.

Figure 39 - Beech Grove II white pine clearcut, Unit 2. Photo taken 11/20/19.

Spur A Timber Sale Single-tree and Group Selection Cuts – Units 1, 2, 5, and 6
All units were irregular in shapes and sizes, and some contained buffer strips of trees along riparian areas to help minimize the size of the "seen" areas along adjacent roads.

Unit 1 (Compartment 438/Stand 24) is a 35-acre single-tree and group selection harvest on the Ironton District. Harvesting was completed in April 2019 and monitoring was conducted in January 2020. It is within an area assigned a "Moderate" scenic integrity objective. The unit is

situated along Forest Road 132-A. Grass is spotty with the landing and along the main skid road through the cutting unit. A few dead snags and live trees were left for wildlife. No slash piles were observed. Slash was scattered and kept low throughout the unit. Tree stumps were cut low (1’ tall). Residual trees were not damaged from logging operation. No rutting or erosion was observed. The haul road was well-graveled, and no logging debris or oil spills were present.

The cutting unit blends well with the natural surrounding and would likely meet its “moderate” SIO within one to two growing seasons. The following photos show the cutting unit in January 2020.

Figure 40 – Spur A single tree and group selection cuts, Unit 1. Photo taken 1/15/20.

Figure 41 - Spur A single tree and group selection cuts, Unit 1. Photo taken 1/15/20.

Figure 42 - Spur A single tree and group selection cuts, Unit 1. Photo taken 1/15/20.

Figure 43 - Spur A single tree and group selection cuts, Unit 1. Photo taken 1/15/20.

Unit 2

This 62-acre hardwood thinning (single-tree selection) is within in Compartment 438, Stands 15, 43, and 44. Harvesting was completed in June 2019 and monitoring was conducted in January 2020. It is within an area assigned a “Moderate” scenic integrity objective. The cutting unit was adjacent to and can be partially seen from Forest Road 132A-1. The landing next to the road is partially vegetated with grass. Skid roads throughout the cutting unit are relatively bare of grass. A few dead snags and live trees were left for wildlife. No slash piles were observed. Slash was

scattered and kept low (2’ to 3’ high) throughout the unit. Tree stumps were cut low (1’ tall). Residual trees were not damaged from logging operation. No rutting or erosion was observed. No logging debris or oil spills were present. The unit matched the natural surroundings and would meet its “moderate” SIO within a year or two. The following photos show the cutting unit in January 2020.

Figure 44 - Spur A single tree and group selection cuts, Unit 2. Photo taken 1/15/20.

Figure 45 - Spur A single tree and group selection cuts, Unit 2. Photo taken 1/15/20.

Figure 46 - Spur A single tree and group selection cuts, Unit 1. Photo taken 1/15/20.

Figure 47 - Spur A single tree and group selection cuts, Unit 1. Photo taken 1/15/20.

Unit 5 (Compartment 422/Stands 6, 15) is an 18-acre single-tree and group selection harvest on the Ironton District. Harvesting was completed in February 2019 and monitoring was conducted in January 2020. It is within an area assigned a “Moderate” scenic integrity objective (SIO). The unit is situated along Forest Road 132 and an OHV trail traverses through the unit. The trail is partially graveled with a few potholes along the trail. The unit’s skid trails and landing are well grassed in. However, the access road leading to the unit’s entrance has some minor rutting and

there was a small illegally dumped trash pile near the unit's entrance. Trash has been removed from this spot multiple times over the last several years. A few dead snags and live trees were left for wildlife. No slash piles were observed. Slash was scattered and kept low throughout the unit. Tree stumps were cut low (1' tall). Residual trees were not damaged from the logging operation.

The cutting unit blends well with the natural surrounding and is expected to meet its SIO within one growing season. The following photos show the cutting unit in January 2020.

Figure 48 - Spur A single tree and group selection cuts, Unit 5. Photo taken 1/15/20.

Figure 49 - Spur A single tree and group selection cuts, Unit 5. Photo taken 1/15/20.

Figure 50 - Spur A single tree and group selection cuts, Unit 5. Photo taken 1/15/20.

Figure 51 - Spur A single tree and group selection cuts, Unit 5. Photo taken 1/15/20.

Unit 6 (Compartment 422/Stand 15) is a 10-acre single-tree and group selection harvest on the Ironton District. Harvesting was completed in January 2019 and monitoring was conducted in January 2020. It is within an area assigned a “Moderate” scenic integrity objective (SIO). The unit is situated along Forest Road 132. A few dead snags and live trees were left for wildlife. No slash piles were observed. Slash was scattered and kept low (2’ to 3’ high) throughout the unit. Tree stumps were cut low (1’ tall). Residual trees were not damaged from the logging operation.

No rutting or erosion was observed. No logging debris or oil spills were present. The unit matched the natural surroundings and would meet its “moderate” SIO within a year or two. The following photos show the cutting unit in January 2020.

Figure 52 - Spur A single tree and group selection cuts, Unit 6. Photo taken 1/15/20.

Figure 53 - Spur A single tree and group selection cuts, Unit 6. Photo taken 1/15/20.

Figure 54 - Spur A single tree and group selection cuts, Unit 6. Photo taken 1/15/20.

Figure 55 - Spur A single tree and group selection cuts, Unit 6. Photo taken 1/15/20.

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.

Heritage sites on the Wayne National Forest that have been reported are managed in both Heritage and GIS databases. The monitoring of sites is typically completed in advance of

projects to set up protective buffers, evaluate impacts or opportunistically when in the field for unrelated projects. As time permits site visits occur to complete determinations of eligibility for the National Register of Historic Places or for research purposes. For most sites there is no mandatory timeframe that a condition assessment must be completed. Sites that are eligible for or listed on the National Register get distinctly separate treatment and are visited to have their condition assessed on at minimum a five-year basis. The Wayne National Forest has 18 Priority Heritage Assets.

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

- **Monitoring Plan Indicator 63: How many heritage sites have been evaluated for National Register eligibility?**

Overall, 78% of the total known sites on the Wayne National Forest have been evaluated for their significance and eligibility for the National Register (Table 19). About 1% were found to meet the criteria to be eligible and only 2 sites are listed on the National Register of Historic Places. The vast majority of sites that have been evaluated are not eligible. However, 573 sites or 21.8% still require determinations of eligibility (DOE). Typically, DOEs are completed when sites are discovered and evaluated as part of a project. In some situations, more information or research is required to make a determination of eligibility.

Table 19 - List of heritage sites with National Register of Historic Places designations

	Listed on NRHP	Eligible Sites	Not Eligible	Needs DOE	Total
Number of Known Sites	2	18	2,036	573	2,629
Percent of Known Sites	0.1%	0.7%	77.4%	21.8%	100%

In these cases, the DOE is listed as unevaluated. Work on the backlog of DOEs is typically not necessary until the site is threatened by a project. However, it is still good practice, and our goal is to evaluate all the sites on the forest. To this end, all the new sites discovered since 2018 have been evaluated for the NRHP and received concurrence from the Ohio Historic Preservation Office (OHPO). At least three new sites discovered from Section 110 surveys were also evaluated and determined ineligible. As of 2021 the Wayne heritage program has added staff which will allow us to increase our progress on reducing the DOE backlog.

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

- **Monitoring Plan Indicator 64: How many management plans have been developed for heritage sites that are either eligible for or listed on the National Register of**

Historic Places?

The Wayne Heritage program has one management plan for the heritage sites that are listed as eligible for the NRHP. This management plan includes all Priority Heritage Assets (PHA) on the Wayne. Note: Some sites could be listed as eligible for the NRHP, but not listed as a PHA.

Priority Heritage Assets
Cultural resources are historic, prehistoric, archaeological, or architectural sites, structures, places or objects and traditional cultural properties. They are considered heritage assets. Priority Heritage Assets (PHA's) are those heritage assets of distinct public value that are or should be actively maintained. The designation of some heritage assets as "priority" was introduced to reduce the deferred maintenance backlog. Condition assessments at PHAs are required every five years to be considered managed to standard. Priority Heritage Assets meet one or more of the following criteria:

The significance and management priority of the property is recognized through an official designation such as listing on the National Register of Historic Places or on a State register.

The significance and management priority of the property is recognized through prior investment in preservation, interpretation, and use.

The significance and management priority of the property is recognized in an agency-approved management plan.

The property exhibits critical deferred maintenance needs and those needs have been documented. Critical deferred maintenance is defined as a potential health or safety risk or imminent threat of loss of significant resource values. To date the following sites are listed as PHAs:

Cambria Iron Furnace, Canaday Property, Center Furnace/Superior, Edington Property, Gilbert Antill Property, Martin Quarry and Workshop, Morrison Property, Payne Cemetery, Robert Lindamood Property, Shawnee Lookout Tower, Taber Well, Vesuvius Dam, Vesuvius Furnace Latrine, Vesuvius Garage, Vesuvius Iron Furnace, Vesuvius Museum, Vesuvius Recreation Office, Vesuvius Warehouse, Walter Ring House.

Land Ownership

Adjust land ownership within the Forest proclamation boundary to enhance public benefits and improve management effectiveness. The current size of the WNF is 244,243 acres of which 107,093 acres are on the Ironton District, 72,483 acres are on the Athens Unit and 64,667 acres are on the Marietta Unit. This is 29% of the land area within the Proclamation Boundary. The county with the highest acreage of NFS land is Lawrence County with 75,331 acres or 26 % of the county land area.

Goal 14.1 – Consolidate Ownership

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

Objective 14.1a – Purchase, exchange, accept donations or convey lands and minerals rights on a willing seller, willing buyer basis.

Give high priority to acquisition of land that will:

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

- **Monitoring Plan Indicator 65: How many acres of land were acquired through exchange, purchase, or donation?**

Acquisition of land is dependent on unsolicited willing sellers or donators. Such opportunities to acquire land have reduced over the past few years or the number of offers has been smaller acreage being offered for acquisition. Additionally, federal funds made available at regional and national levels to purchase lands has been limited.

In 2018-2019, a total of 21.5 acres were acquired through donation, purchase, and exchange.

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

- **Monitoring Plan Indicator 66: How many miles of right-of-way, or parcels of land have been acquired to facilitate access to NF tracts?**

No miles or parcels of ROW were acquired during FY 2018-19.

The WNF continues to seek opportunities for consolidated ownership when such actions are beneficial for land management.

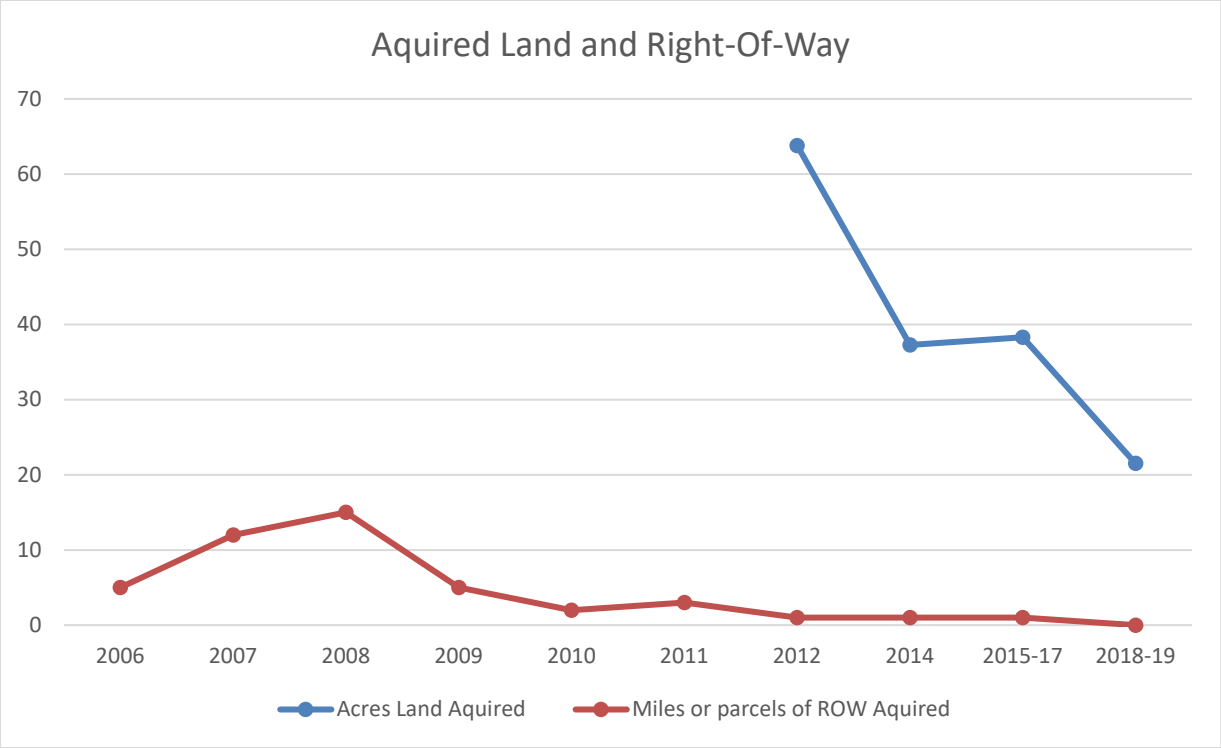

Figure 56 - Acquired acres of land and miles of Right-of-way. 2006-2019.

Goal 14.2 – Maintain Boundary Lines

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

- **Monitoring Plan Indicator 67: How many miles of NFS land boundary were marked to standard?**

- **Monitoring Plan Indicator 68: How many miles of NFS boundary were maintained to standard?**

Twenty-eight miles of boundary were marked or maintained during this monitoring period. The WNF continues to make progress in marking NFS property boundaries on a 10-year cycle. High visibility and recognition of boundary marking along public road frontage is making public land more available to the public.

Objective 14.2b – Resolve trespass/encroachment situations.

- **Monitoring Plan Indicator 69: How many trespasses were resolved?**

One trespass was resolved during this monitoring period. We continue to investigate and resolve trespasses and encroachments on the WNF as they are discovered. When a trespass or encroachment is discovered, the Lands Staff coordinates with the District Ranger, the Regional Office, and Office of General Counsel to resolve the issue.

Special Uses

Goal 15.1 – Special Use Authorizations

Consider authorization for special uses that:

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

- **Monitoring Plan Indicator 70: How many special use permits were requested; how many of those met the criteria, and how many were issued?**

Since 2006, there has been a steady number of 17 to 26 throughout the years of issued authorizations. This number includes new proposals processed to issuance, reissued of continued uses, and transferred improvements to a new holder. This number reflects only unsolicited proposals from the public to use NFS lands.

During the 2018-2019 period, there were 38 requested proposals of new and reissued authorizations accepted. There were 16 new or reissued authorizations during this same time period. Of these, eight were reissued to the previous Holder, while another eight were new uses upon the land. There were seven applications that were submitted and then withdrawn by either the applicant or Forest. A total of 69 permits were closed by reissuance, denied reissuance, not desired by Holder, or activity completed.

Table 20 - Permits Requested and Issued FY 2018-2019

Type of Action	Number
Requested proposals accepted	38
Reissued authorizations from terminated authorizations	8
Issued new authorizations	8
Withdrawn by applicant	7
Denied by authorized officer	0
Closed	69

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 Plan Indicator 71: How many acres were grazed and contributed to wildlife habitat objectives; and how many acres were grazed to control non-native species?**

There were 114 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.

Facilities and Transportation System

Goal 17.1 Buildings and Structures

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

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

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

- **Monitoring Plan Indicator 72: How many administrative and recreation facilities meet current safety, mission, niche, and use requirements?**

In fiscal year 2018, 99% of Forest facilities were inspected. All facilities meet current safety, mission, niche, and use requirements.

Goal 17.2 – Safety and Effectiveness of Dams

Maintain dams as safe and effective water storage facilities.

Objective 17.2a – Maintain dams to standard.
Objective 17.2b – Inspect high hazard dams annually.
Objective 17.2c – Decommission or appropriately dispose of dams no longer needed.

- **Monitoring Plan Indicator 73: How many Forest dams meet current applicable regulations for dam safety?**

The WNF has 14 dams; 9 Low hazard, 2 significant hazard and 3 High hazard. Of all 14 dams there are 1 High hazard and 1 significant hazard dams that are operating with limitations. The other 12 dams are fully operational.

Two of our high hazard dams were evaluated by the ODNR Division of Surface Water, Dam Safety Office during this monitoring period. Sand Run and Lamping now have completed assessments with recommendations for repairs/maintenance for both dams. Funding to implement repairs from those assessments are in the request queue for funding. Our third high hazard dam was previously evaluated, and maintenance has been planned and repairs partially implemented for Vesuvius Dam.

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 previous monitoring reports. Funds were requested under the ARRA program for the construction of this road in 2009, no funds were received. The WNF put out a contract for survey and design of improvements for the Timbre Ridge dam in 2019. Funding sources are being requested for improvements.

Goal 17.3 – Transportation System

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

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

- **Monitoring Plan Indicator 74: How many miles of roads were decommissioned or rehabilitated?**

No roads were decommissioned or rehabilitated during FY 2018-2019.

Objective 17.3c – Maintain all roads in a condition that protects the government's investment. If funds do not allow for regular preventive maintenance, close roads or restrict traffic to protect resources or investment.
Objective 17.3d – Maintain at maintenance level 3, or higher, roads intended for passenger vehicles.
Objective 17.3e – Maintain at maintenance level 2 roads intended for high clearance vehicles.
Objective 17.3f – Maintain at maintenance level 1 roads that are closed to public travel.

- **Monitoring Plan Indicator 75: 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?**

Maintenance is an ongoing issue due to funding sources. With the re-establishment of a Timber program, the WNF is building a maintenance fund for recurring road maintenance.

All system roads were evaluated in 2017 by engineering staff. Of the 386 miles of system road, 365 miles or 95% are operated at or above their objective. The remaining 11 miles or 2.8% are being operated below their objective.

All maintenance level 3-5 system roads had condition surveys completed in 2019. Maintenance

level 1 and 2 roads were evaluated for habitat management use only and are otherwise kept closed to vehicle traffic. Illegal use of closed roads is an ongoing issue and causes a deterioration to the low-level roads. 27.9 miles of Level 3-5 roads received Maintenance in 2019 through an IDIQ Road Maintenance Contract. This contract is due to be re-advertised in 2021.

The WNF will continue to assess all system roads on a cycle to better address maintenance issues.

Standard and Guideline Compliance

- **Monitoring Plan Indicator 76: How many modifications were required and to which standards and/or guidelines?**

The Kehota Vegetation Management Project was signed during the first quarter of Fiscal Year 2018 and included departure from ten guidelines. These were explained throughout the project analysis, with the reasoning for why the project would not follow each guideline given in the Appendix A to the environmental assessment.

Following is the list of guidelines:

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

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

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

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

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

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

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

GFW-SM-70: Retain groups of trees or large single trees within cutting unit boundaries. Retain

trees in accordance with the management area's desired future condition.

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

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

Climate Change Impacts

- **Monitoring Plan Indicator 77: When did the growing season begin?**
- **Monitoring Plan Indicator 78: When did the growing season end?**

Table 21 - 2006-2019 average growing season dates for the Wayne National Forest. Hard frost is defined as temperatures below 28˚ F.

Weather Station	Average Date of Last Hard Frost (growing starts)	Average Date of First Hard Frost (growing ends)	Average number of growing season days
Portsmouth	**March-21**	**November-21**	**226**
Huntington	**March-21**	**November-21**	**222**
New Lexington	**April-21**	**October-21**	**197**
Parkersburg	**March-21**	**November-21**	**231**
Marietta	**April-21**	**November-21**	**221**

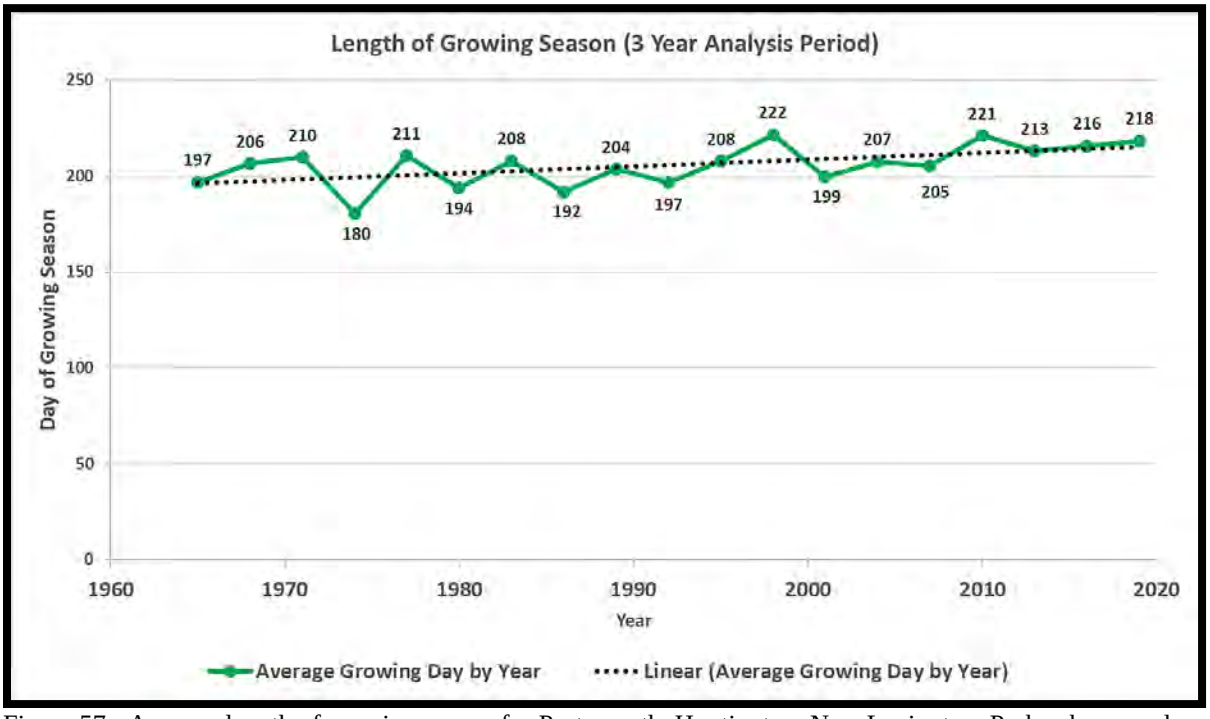

Figure 57 - Average length of growing season for Portsmouth, Huntington, New Lexington, Parkersburg, and

Marietta weather stations.

When viewed in the long-term, the growing season length in Southeast Ohio has exhibited a trend towards longer growing seasons. This trend is consistent with observations and projections for the Central Appalachian region under a changing climate (Butler et al. 2015).

References

Butler, Patricia R. et al. 2015. Central Appalachians forest ecosystem vulnerability assessment and synthesis: a report from the Central Appalachians Climate Change Response Framework project. Gen. Tech. Rep. NRS-146. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 310 p.

Ohio Environmental Protection Agency (Ohio EPA). 2016. Ohio 2016 Integrated Water Quality Monitoring and Assessment Report. Columbus (OH): Ohio Environmental Protection Agency, Division of Surface Water. Available at http://wwwapp.epa.state.oh.us/dsw/2016IR.pdf.

U.S.D.A. Forest Service (USDA FS). 2020. Terrestrial Ecosystems Assessment Supplemental Report: Wayne National Forest. On file with Wayne National Forest, 13700 US Hwy 33, Nelsonville, OH 45764. Available at https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd766398.pdf.

Acknowledgment of Contributors

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The following staff directly contributed the various components of this report:

Andy Tremayne	*Archaeology/Heritage Resources*
Todd Hess	*Lands, Minerals and Special Uses*
Chad Meenach	*Engineering*
Lisa Kluesner	*Ecology*
Trey Scott	*Botany*
Autumn Coffey	*Botany*
Katrina Schultes	*Wildlife*
Lynda Andrews	*Wildlife*
Dan Anerino	*Fire*
Chad Wilberger	*Recreation*
Chad Fitton	*Silviculture*
Rachel Reed	*Environmental Coordinator*
Dan Giannamore	*NEPA Planner*
Ben Poling	*NEPA Planner*