
**Management Plan
for
Glen Helen**



Photo: Lauren Paige

Prepared by

Glen Helen Ecology Institute

405 Corry St.
Yellow Springs, OH 45387
July 8, 2015

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I. Plan Summary

This document describes planned strategies and procedures to manage and protect the 973-acre Glen Helen nature preserve.

The specific goals of the management plan are:

- To preserve and improve aquatic habitat in and around the Little Miami River, Yellow Springs Creek, and Birch Creek.
- To preserve and improve the quality of native hardwood forests and herbaceous understories
- To preserve and improve habitat for diverse bird and wildlife populations, including rare, threatened, and endangered species
- Protection of cultural/historical remnants including Grinnell Mill and Orator's Mound, both National Register sites, and the ruins of the Bell Works on the Little Miami River.
- To preserve, improve, and extend the natural conservation values in an historic nature preserve for the enjoyment and education of citizens of the area and students from around the world.
- To foster environmental learning programs, lessons, classes, and events within dedicated facilities and along the trails in Glen Helen.

II. Description of the protected resources

A: Geology:

The property is the location of numerous geologic features, including Pompey's Pillar, Ohio's best-known natural rock stack. Also within Glen Helen is the Yellow Spring, a naturally iron-rich water source from which the nearby community draws its name. Flowing year-round at sixty gallons per minute, the spring is Greene County's largest. The Covenant area also features the Cascades of Birch Creek, and numerous rock shelters of Silurian dolomite found along the gorges formed by the Birch and Yellow Springs Creeks.

B: Ecology:

In an area of high quality soils and concomitant high percentages of cultivated land, it is highly unusual to find 973 contiguous acres that have had over 80 years of stewardship as a natural area. While virtually no "old growth" woods remain in southwest Ohio, the stands of White and Chinquapin Oak rival the best found anywhere in the state. The longstanding history of the Property as a resort kept sawyers, farmers, and shepherds at bay in many of the steep and riparian areas of the preserve, and allowed the survival of numerous trees more than 200 years old.

C: Biology:

Glen Helen benefits from decades of documentation on their biological inventory. Two books have been dedicated to documentation of the diverse plant life found in the area: The Vascular Flora of Glen Helen, Clifton Gorge, and John Bryan State Park, by Sture F. Anliot, Ohio

Biological Survey, Biological Notes Number 5, 1973; and The Vegetation Types of Glen Helen, by Beth Krisko, Miami University, 2002.

Anliot's work remains an important source for many plant scholars in the area. Krisko's more recent work documents the tree communities in the neighboring Glen Helen. While invasive species impinge on the borders of the property, the riparian areas remain unusually diverse.

More than 340 species of wildflowers are found in the area. Field naturalist Daniel Pearson documented several rare species on the riverbank at the Property. These include:

Squirrel Corn (*Dicentra canadensis*)
Harbinger of Spring (*Erigenia bulbosa*)
Gray's Sedge (*Carex grayi*)
Button Bush (*Cephalanthus occidentalis*)
Cardinal Flower (*Lobelia cardinalis*)
White Turtlehead (*Chelone glabra*)
Cardinal Flower (*Cephalanthus occidentalis*)
Mist Flower (*Conoclinium coelestinum*)
Scarlet Toothcup (*Ammannia coccinea*)
Conobea (*Leucospora multifida*)
False Pimpernel (*Lindernia dubia*)
Marsh Purslane (*Ludwigia palustris*)

137 species of birds have been documented in the area since 2006, including cerulean warbler, an of-concern species. Breeding birds present around the Little Miami include Louisiana waterthrush, Yellow-throated warbler, Acadian flycatcher, Summer tanager, and Red-shouldered hawk.

Both macroinvertebrate and fish community indices are classified as "Exceptional" (OEPA, 2000) on the property. According to ODNR, More than 87 species of fish and 36 species of mussels (including five state endangered species) reside within the river valley.

D: Rare and endangered species:

The Property provides habitat for rare and endangered animal species, as documented in the Ohio Heritage Inventory. Greg Schneider, program administrator of the Ohio Natural Heritage Program, identifies three of these species:

Tongue-tied Minnow (*Exoglossum laurae*)
Wavy-rayed Lampmussel (*Lampsilis fasciola*)
Creek Heelsplitter (*Lasmigona compressa*)

E: Invasive plants:

Glen Helen Ecology Institute land stewards have been aggressively removing invasive species since 2000. Because of the ongoing management against invasive species and the lack of

timbering, invasive species have not been able to establish a strong foothold in the most sensitive areas of the Glen. However, the property has several areas of vulnerability. Areas that were formerly quarried, tilled, grazed, or logged are particularly susceptible to invasion by invasive shrubs like honeysuckle, which has become ubiquitous in Southwestern Ohio. Also, the proximity to the town of Yellow Springs has resulted in a profusion of landscaping plants in Glen Helen, particularly those with bird-borne fruit like oriental bittersweet, burning bush, and wintercreeper. Furthermore, since the property is centered around waterways, its narrow width increases the ability of invasive species to penetrate into the preserve from the bordering lands.

Invasive species that impact the property include:

- Amur honeysuckle (*Lonicera maackii*)
- Autumn olive (*Elaeagnus umbellata*)
- Burning bush (*Euonymus alatus*)
- Callery pear (*Pyrus calleryana*)
- Canada thistle (*Cirsium arvense*)
- Common privet (*Ligustrum vulgare*)
- English ivy (*Hedera helix*)
- Garlic mustard (*Alliaria petiolata*)
- Japanese barberry (*Berberis thunbergii*)
- Japanese honeysuckle (*Lonicera japonica*)
- Japanese knotweed (*Fallopia japonica*)
- Japanese stiltgrass (*Microstegium vimineum*)
- Lesser celandine (*Ranunculus ficaria*)
- Multiflora rose (*Rosa multiflora*)
- Norway maple (*Acer platanoides*)
- Oriental bittersweet (*Celastrus orbiculatus*)
- Periwinkle (*Vinca minor*)
- Poison hemlock (*Conium maculatum*)
- Reed canary grass (*Phalaris arundinacea*)
- Tree of Heaven (*Ailanthus altissima*)
- Wintercreeper (*Euonymus fortunei*)

Invasive species that impact multiple acres of the property include:

- Amur honeysuckle: *Lonicera maackii*
- Wintercreeper: *Euonymus fortunei*
- Oriental bittersweet: *Celastrus orbiculatus*
- Garlic mustard: *Alliaria petiolata*
- Common privet: *Ligustrum vulgare*
- Multiflora rose: *Rosa multiflora*

From previous work in invasive plant removal, the Glen Helen Ecology Institute has gained experience in providing ecological stewardship education for its volunteers. Thus, individuals who assist with the effort to remove honeysuckle and other invasives from the Property will have the opportunity to learn about invasive plant identification, ecology, and safe removal.

III. Cultural history

The cultural significance of the Little Miami and environs has special resonance for area residents, who are reminded of the great locally reared Shawnee chief, Tecumseh. Schools, roads, and organizations are named after the chief whose valiant effort to unite Indian tribes nearly changed the shape of American settlement. Deeper in history, this area was home to the Hopewell and Adena people. Along the river are earthworks built during that era, including the “Bell Works,” located in Glen Helen, and featured in Squier and Davis’ landmark 1848 publication, “Ancient Monuments of the Mississippi Valley,” the first publication of the Smithsonian Institution.

In the early 1800s, the area around the Village of Yellow Springs was developed as a resort. This early development kept sawyers, farmers, and shepherds at bay, and allowed the survival of numerous trees more than 200 years old, along with an intact understory of native wildflowers and shrubs.

There were once numerous mills along the river, including several upstream in what is now Clifton Gorge State Nature Preserve. Of the two that remain, one, Grinnell Mill, is located within Glen Helen. It has been recently restored as a museum to the 19th Century industrial development of the region. In 1982, Grinnell Mill earned a spot on the National Register of Historic Places.

IV. Management protocol

A: Invasive plants:

In accordance with the Woodland Stewardship Management Plan developed by the ODNR Division of Forestry, invasive species removal is a core aim of the project. Land stewards have been aggressively removing invasive species since 2000. Their goals are to prevent new infestations of invasive species, and to substantially remove woody invasive species from the priority areas of Glen Helen within two years of the easement closing.

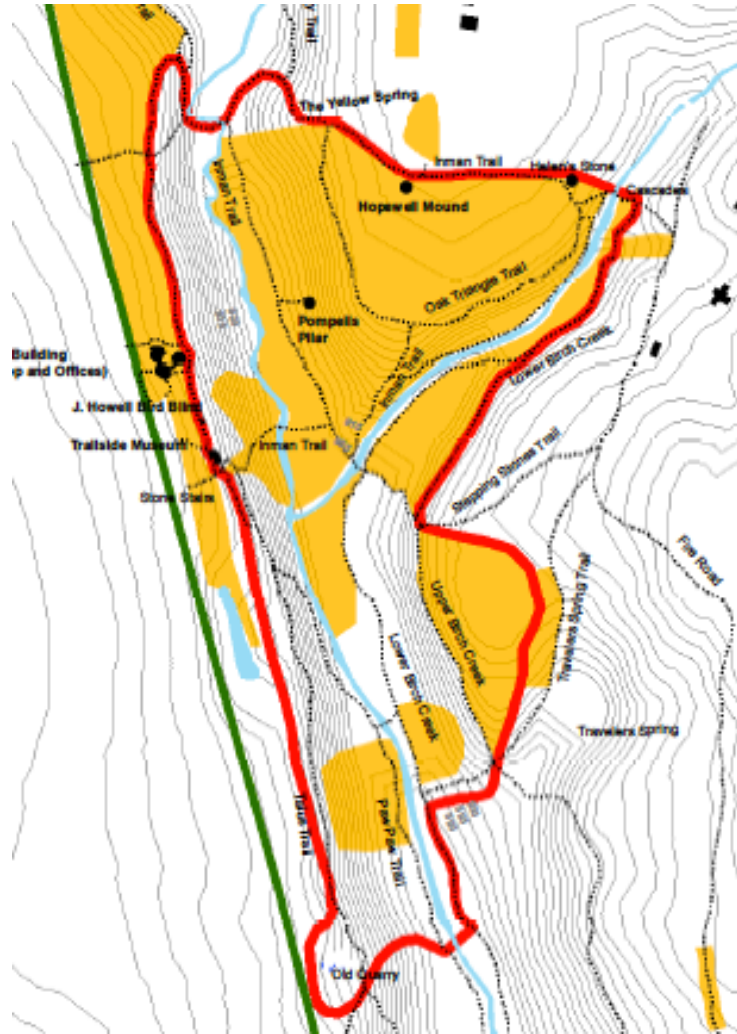
The Ecology Institute Land management staff has completed a systematic review of Glen Helen, and determined the priority areas for invasive species removal. Areas of highest priority have minimal soil compaction and an existing and diverse herbaceous understory. Secondary priority areas are those with less diverse herbaceous understory, but high potential for biodiversity because of their existing woody plant diversity, soil health, or proximity to springs or streams.

Eight such areas were identified within the preserve, as described and pictured below. The highest priority areas are outlined in red. The secondary priority areas are outlined in orange. As invasive species removal has moved forward in these areas, progress has been noted through orange shading. Cumulatively, these priority areas contain 76 acres that remain significantly impacted by invasive plants.

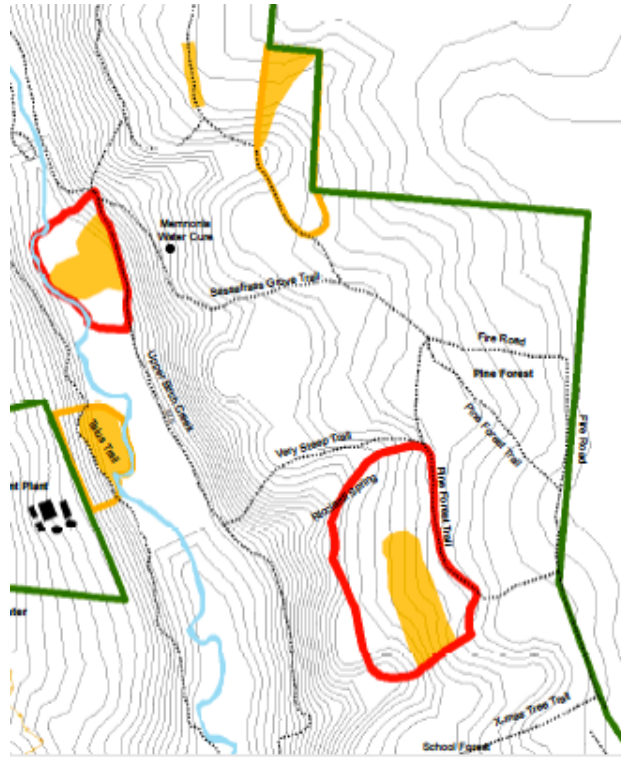
1. National Natural Landmark area.

A 96-acre area in the north section of Glen Helen was never substantially logged, grazed, or

farmed, and includes Birch Creek and the Yellow Springs Creek near their point of confluence. Much of this area designated as a National Natural Landmark by the U.S. Department of Interior in 1965. The herbaceous understory is substantial, particularly in the Birch Creek valley. Cliffs and rock faces complicate the challenge of ecological restoration in this area. Shown in red outline below:



There are four areas in the north-central section of Glen Helen, described from the top of the image below in clockwise manner.



2. White oak regeneration area.

Along the eastern perimeter of the property is an area atypical from most other places in Glen Helen in that it contains white oak trees that are younger than 200 years old. While the area has fairly low diversity in its herbaceous understory, the health of its canopy community suggests that it has high ecological potential. Shown in orange at the top of the image above.

3. Red oak forest.

In the 1920s, several CCC-era restoration works projects were carried out in what is now Glen Helen. This includes a well-known plantation of white pine and Norway spruce. South of the spruce/pine area, the works crew planted a grove of red oak and tulip poplar. These have since grown to maturity, and are now naturally reseeding the area. The red oak forest zone also contains one of the largest springs in Glen Helen. Shown in red at the bottom of the image above.

4. Warm water outflow.

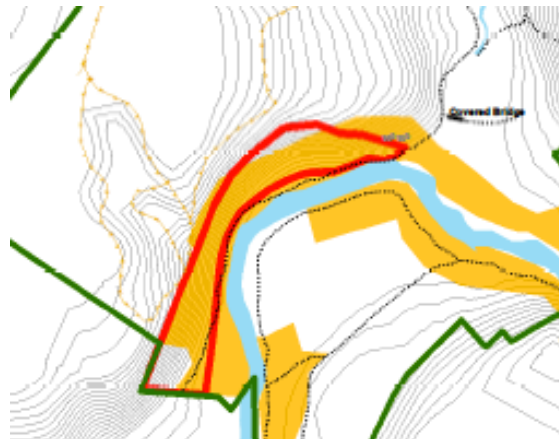
The municipal wastewater treatment plant for the Village of Yellow Springs is found on the western edge of Glen Helen. Effluent from the plant enters the Glen on its way to the Yellow Springs Creek. The floodplain adjacent to this effluent stream contains a significant grove of Twinleaf, Sessile trillium, and other native herbaceous plants. Shown in orange on the left side of the image above.

5. Walnut floodplain.

South of the National Natural Landmark area on the Yellow Springs Creek, there is evidence of past logging, farming, or grazing. Significant widening of the Yellow Springs Creek floodplain begins in this area, which contains mature Paw paw groves, 25' Spicebush, and the largest open-grown Black walnut on the property. Shown in red on the left side of the image above.

6. Oxbow slope

This slope, within the riparian zone of the Little Miami River, was largely cleared of invasive species during 2012. A small part of this area still has substantial stands of invasive species. Shown in red below.



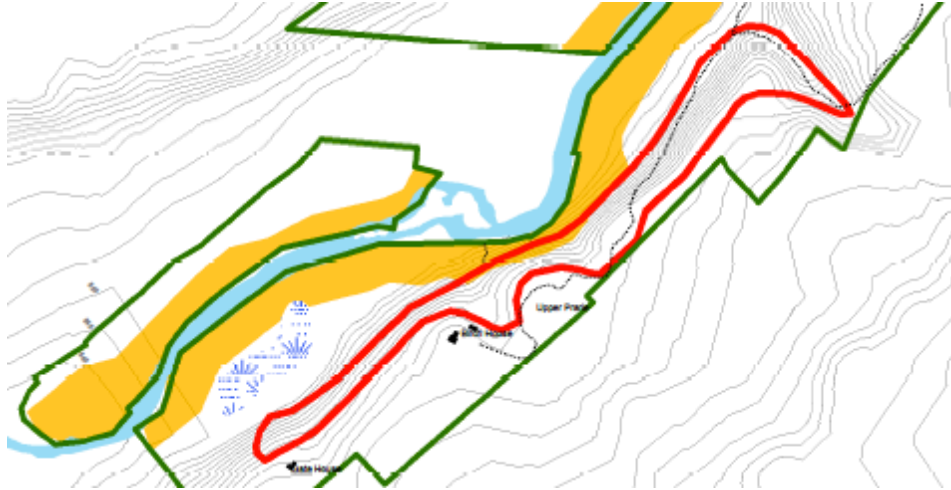
7. Upland oak forest

This area includes a grove of white oak trees that are at least 350 years old. While it has limited diversity in term of its herbaceous understory, it is deemed to be of high ecological potential. Shown in orange below.



8. Slope wetlands.

Near the southern border of Glen Helen, the riparian slope of the Little Miami River contains a number of springs, creating a mature wet woods which is desirable habitat for species of concern in Ohio, including the cerulean warbler. Significant slope complicates the work of invasive species removal in this area. Shown in red below.



Invasive species are removed through the best practice technique that affords minimum soil disturbance or collateral damage. Direct application of herbicides is expressly preferred over foliar sprays.

Cutting and treating work most efficiently with a 3-4 person team. One who operates a chain saw, one who sprays stumps, and one to two who move debris and lop small branches. Dragging and chipping are well-suited for volunteers. Depending on the slope, water, and density of the stand, the cutting and treating crew can process a heavily impacted area at 12-14 crew hours/acre. A supervised volunteer crew of seven can drag and chip to clear an acre in 4 hours.

The specific technique depends on the species involved, the extent of the infestation, and the feasibility of successful eradication and restoration. Current strategies for target species include the following:

Invasive species	How removed
Amur honeysuckle (<i>Lonicera maackii</i>)	Timing: Optimal timing is early spring before herbaceous leaf out, or fall above 40 degrees F Methods: Cut & treat stumps 1” from ground Herbicide: Using 20 % Aquaneat brand of glyphosate mixed with 2 oz. Pentrabark surfactant with 1 oz. red dye in a 2.5 gallon jug. Addl Info: Species we focus most attention on for eradication due to high infestation levels throughout the Glen, 170 acres have been cleared as of Fall 2014.
Autumn olive (<i>Elaeagnus umbellata</i>)	Timing: Summer-late fall Methods: Cut & treat stumps 1” from ground Herbicide: 20 % Aquaneat mix Addl Info: Mainly occurs in abandoned pastures and borrow pits.
Burning bush	Timing: Summer-late fall

<i>(Euonymus alatus)</i>	Methods: Cut & treat stumps 1” from ground Herbicide: AGS152 Addl Info: Sprouter. We eradicate 60-80 per year on slopes in the Glen.
Callery pear (<i>Pyrus calleryana</i>)	Timing: Removed whenever identified Methods: Cut & treat stumps 1” from ground Herbicide: AGS152 Addl Info: Sprouter. Found infrequently up to 8” diameter.
Canada thistle (<i>Cirsium arvense</i>)	Timing: June 1 and June 29 each year Methods: Mow at 8” high Herbicide: None used Addl Info: Mostly found in Homestead lowlands and Grinnell Prairie.
Common privet (<i>Ligustrum vulgare</i>)	Timing: Summer-late fall Methods: Cut & treat stumps 1” from ground Herbicide: 20% Aquaneat mix Addl Info: Prefers moist or wet environments, associated with honeysuckle.
English ivy (<i>Hedera helix</i>)	Timing: Late fall, herbaceous dormant, 50 degrees and sunny optimal Methods: Foliar spray Herbicide: 3% Aquaneat with 2 oz. Pentrabark Addl Info: Occurs mostly adjacent Corry Street.
Garlic mustard (<i>Alliaria petiolata</i>)	Timing: Critical, when the seedpods over the flowers are formed but not yet viable Methods: Seedheads scythed twice, once at the head and once at the base of the plant. This renders the plant incapable of producing a new seedhead Herbicide: None used Addl Info: This approach can be very precise in sensitive areas if scythe user is skilled. We have scythed up to 30 acres in a spring.
Japanese barberry (<i>Berberis thunbergii</i>)	Timing: Spring-late fall Methods: Cut & treat stumps 1” from ground Herbicide: 20 % Aquaneat mix Addl Info: Infrequent clusters found in the Glen but at times found in large patches.
Japanese honeysuckle (<i>Lonicera japonica</i>)	Timing: Late fall, herbaceous dormant, 50 degrees and sunny optimal Methods: Foliar spray Herbicide: 3% Aquaneat with 2 oz. Pentrabark Addl Info: Difficult to kill without killing interwoven vegetation.
Japanese knotweed	Timing: Fall

<i>(Fallopia japonica)</i>	<p>Methods: Cut with machete or scythe, basal bark stumps and fill some of the bamboo-like pockets at 15”</p> <p>Herbicide: AGS152</p> <p>Addl Info: Very difficult to kill, it has huge rhizomes and can spread vegetatively in water.</p>
Japanese stiltgrass <i>(Microstegium vimineum)</i>	<p>Timing: Late summer</p> <p>Methods: Foliar spray</p> <p>Herbicide: 3% Aquaneat</p> <p>Addl Info: New invader.</p>
Lesser celandine <i>(Ranunculus ficaria)</i>	<p>Timing: Early spring, preferably before flowering, or through April</p> <p>Methods: Foliar spray</p> <p>Herbicide: 3% Imazapyr solution or 3% Aquaneat solution</p> <p>Addl Info: Fastest growing herbaceous plant in North America.</p>
Multiflora rose (<i>Rosa multiflora</i>)	<p>Timing: Summer-late fall</p> <p>Methods: Cut & treat stumps 1” from ground</p> <p>Herbicide: 20 % Aquaneat mix, though it seems that the AGS152 may be more successful</p> <p>Addl Info: Multiflora rose blight has arrived in the South Glen, we expect it to spread.</p>
Norway maple (<i>Acer platanoides</i>)	<p>Timing: Removed whenever identified, it is easiest to identify in fall when the leaves are mixed yellow and green</p> <p>Methods: Cut stumps 1” from ground</p> <p>Herbicide: None used</p> <p>Addl Info: Has spread from town and Birch Manor extensively throughout the Glen.</p>
Oriental bittersweet <i>(Celastrus orbiculatus)</i>	<p>Timing: Summer-winter</p> <p>Methods: Young sprouts are pulled and the roots are severed from the plant, larger vines are cut at 5’ off the ground for visibility and major stumps are then cut and treated. A combination of basal bark and stump treatment is used on the horizontal vines that root consecutively. It is a sprouter.</p> <p>Herbicide: AGS152</p> <p>Addl Info: We have had success treating them in winter, even in deep snow.</p>
Periwinkle (<i>Vinca minor</i>)	<p>Timing: Late fall, herbaceous dormant, 50 degrees and sunny optimal</p> <p>Methods: Foliar spray</p> <p>Herbicide: 3% Aquaneat with 2 oz. Pentrabark</p> <p>Addl Info: Easily killed with the right conditions.</p>
Poison hemlock <i>(Conium maculatum)</i>	<p>Timing: After blooming, before seeds are fully mature, in June</p> <p>Methods: Brush scythed at the base</p> <p>Herbicide: None used</p> <p>Addl Info: Strenuous and scratchy work.</p>

Reed canary grass (<i>Phalaris arundinacea</i>)	Timing: Late summer Methods: Mowing early in the season at 8", foliar spray in the fall Herbicide: 3% Aquaneat Addl Info: Difficult to kill, spreading rapidly in river corridors.
Tree of Heaven (<i>Ailanthus altissima</i>)	Timing: Late August-early October Methods: Foliar spray for small sprouts, cut & treat sprouts from pencil size through 1.5" diameter, basal bark spray 18" from ground mature trees from 2"-30" Herbicide: Using AGS152, a custom blend of 17% Garlon4, 2% Stalker in oil base with blue dye. Addl Info: Most units in the Glen are small sprouts, larger units have been basal barked and have since died.
Wintercreeper (<i>Euonymus fortunei</i>)	Timing: Late fall, herbaceous dormant, 50 degrees and sunny optimal Methods: Using gas-powered string trimmer, take off most of the foliage leaving bare tendrils, immediately foliar spray Herbicide: 3% Aquaneat with 2 oz. Pentrabark Addl Info: Difficult to kill, labor intensive. Waxy-leaved evergreen, groundcover vine has infested the village and the Glen.
Wintercreeper fruiting bodies	Timing: Spring-fall Methods: Remove 6" section of vine from the tree trunk. Stump treat the lower portion of vine Herbicide: AGS152 Addl Info: 2,000 units have been cut & treated on the Grinnell slope.

B: Trails:

The Glen Helen trail system spreads throughout the preserve, providing approximately twenty miles of footpaths. Visitor foot traffic through the preserve is encouraged on the trails able to withstand heavier use, including the Inman Trail and the Fire Road.

Trails are maintained in rustic condition, with no asphalt paving material applied. Locally sourced or onsite materials are used for trail maintenance purposes whenever possible. In areas of potential erosion, trails may be stabilized with locally sourced crushed limestone or river gravel. Water bars may be used to further correct or prevent erosion on sloped trails. New water bars are preferentially composed of locally-sourced, naturally rot resistant wood such as Eastern red cedar. On steep trails, rough-hewn, preferably repurposed locally sourced limestone may be formed into steps, and stabilized with an underlayment of gravel and mortar.

In areas of frequent high water, trails may be elevated through use of boardwalks or stepping stones to prevent erosion and protect water quality. Arsenic-based pressure treated lumber will not be used in trail maintenance. In all cases, trail maintenance will comply with the

conservation principals expressed in the conservation easement document.

Bridges are maintained and rebuilt as needed to protect the conservation values expressed in the conservation easement.

Trails obstructed by fallen trees will be promptly reopened to prevent visitors from inadvertently creating new trails. To keep visitors on trails and preserve the conservation values articulated in the conservation easement, railings may be installed along the trail, especially along steep slopes. Railings will be composed of locally sourced, rot resistant wood, including Eastern red cedar, Osage orange, and Black locust. Trail clearings will take into account the aesthetic component, to maintain the feeling of a landscape governed by natural principles.

The Glen Helen Land Manager will walk the trails regularly, to ensure that there are no new obstructions. New trails can form quickly if visitors step outside of the existing trail system. In the event that the Land Manager observes, or is informed of a new trail being formed, the trail is promptly closed through the application of locally sourced thorny brush, typically Osage orange or Honey locust.

The Ecology Institute conducted major trail restoration along the Inman Trail in 2011-12. The Institute intends to restore the Castle Rock Trail between Corry St. and the Yellow Springs Grotto in 2015-16. Both of these projects were facilitated with funding from the Recreation Trails Program of the Ohio Department of Natural Resources. The Institute hopes to be able to secure funding for restoration of additional trails on a timeline of every 3-4 years.

Any re-routing of trails within the Environmental Covenant Area will proceed only after approval from the Ohio EPA. No such rerouting is planned at present.

C: Ecological restoration:

Glen Helen staff and volunteers will employ reasonable, diligent, and good faith efforts to manage the property according to the best practices for natural areas restoration and management, as those practices are articulated by professional associations of conservation professionals, including the Association of Nature Center Administrators, the Natural Areas Association, the Society for Ecological Restoration, and the National Park Service. Management regimes of local/state organizations including the Marianist Environmental Education Center, State Nature Preserve system, and ARC of Appalachia preserve will also be considered.

Land managers have a stated preference to allow native species to expand their range and abundance on their own timetable.

Where it appears that native plants are unlikely to recolonize an area without assistance, restoration plantings will be considered. Likely areas for this work include sites where trails have been closed, serious infestations of invasive species have been removed, meadows are being allowed to revert to forest, or prairie is being cultivated.

Plantings, when done, will utilize species native to the Little Miami River watershed. Preferentially, plants will be local phenotypes, with the highest preference placed on seed stock sourced within Glen Helen.

Trees and shrubs of interest include:

- Bur oak (*Quercus macrocarpa*)
- Shagbark hickory (*Carya ovata*)
- Black haw (*Viburnum prunifolium*)
- Ninebark (*Physocarpus opulifolius*)
- Shadbush Serviceberry (*Amelanchier laevis*)
- Spicebush (*Lindera benzoin*)
- Pawpaw (*Asimina triloba*)
- Red osier dogwood (*Cornus sericea*)
- Silky dogwood (*Cornus amomum*)
- Eastern wahoo (*Euonymus atropurpureus*)
- Bladdernut (*Staphylea trifolia*)

D: Wildlife management:

Recreational hunting, trapping, or fishing on the Property is not consistent with the habitat preservation objectives of the Glen Helen Ecology Institute, and will not be permitted.

Hunting and trapping will be considered solely as a wildlife management tool, respecting local ordinances, and in consultation with property neighbors. Any hunting or trapping permitted would be done in accordance with the best practices outlined by the Association of Fish and Wildlife Agencies.

E: Ecological buffer:

Antioch College, along with the state of Ohio, the Boy Scouts, Girl Scouts, 4H, and the Nature Conservancy, developed the concept of the “Country Commons” in 1963. The Country Commons was a plan to protect a broad triangle of land spanning from Yellow Springs to the town of Clifton and the northern reaches of Xenia Township. This triangle was bordered by State Route 343 on the north, Clifton Rd. on the east, and Corry St. and the Little Miami bike path on the west. The concept was that the parcels within this triangle would be protected from development by reciprocal easements between neighbors. Although the easement agreements that were generated through the Country Commons process are no longer considered to be as robust as a modern conservation easement held by a qualified land trust, the concept of establishing broader ecological protections across a patchwork of public and private lands remains prescient.

Greene County has seen more commercial development in the past 20 years than most of the greater Dayton region, and has seen population growth, due to ongoing net migration out of Dayton. As documented in the appraisal process, the proximity to Yellow Springs creates a premium for scenic, wooded properties as home sites. In October 2013, an 11-acre lot on

Grinnell Rd. sold to a private individual with plans to tear down the existing house and to redevelop the site with a \$2 million home. As Beavercreek and Cedarville continue to grow rapidly, this land within the Country Commons triangle is being threatened by development from all sides.

In the spirit of the Country Commons, the Glen Helen Association has made it a strategic priority to work with neighboring landowners toward the protection of their properties, either through outright purchase, or through supporting the Tecumseh Land Trust in their work to place conservation easements on undeveloped parcels within the Country Commons area.

In 2015, the Glen Helen Association finalized the purchase of Camp Greene, a 30-acre parcel along the Little Miami River, which had been previously owned and operated by the Girl Scouts of Western Ohio.

F: Easement monitoring:

Tecumseh Land Preservation Association (doing business as Tecumseh Land Trust) will hold a conservation easement on the Property, and perform and document a full annual assessment of compliance with the easement on the Property, and be available to confer with Glen Helen Ecology Institute on an ongoing basis. The Tecumseh Land Trust adheres to the Standards and Practices of the Land Trust Alliance in its monitoring practices and seeks regular in-person contact with the owners in order to pre-empt inadvertent easement violations. Tecumseh Land Trust's monitoring policies and documentation were recently evaluated as a part of a rigorous review for accreditation. As a result, the Tecumseh Land Trust became the first land trust in Ohio to achieve accreditation in Ohio.

G. Easement areas:

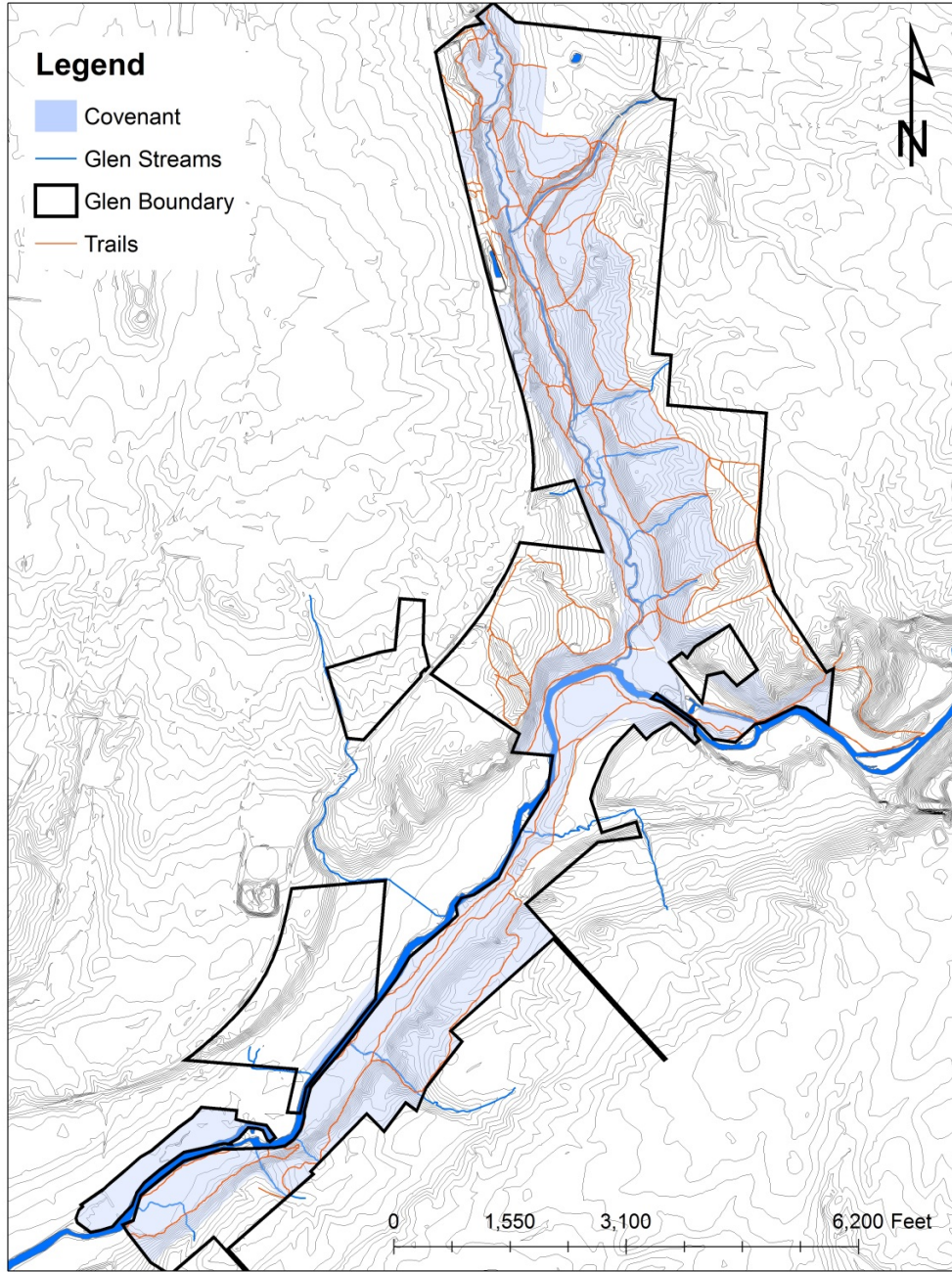
1. Environmental Covenant Area

The Ohio Environmental Protection Agency's Water Resource Restoration and Sponsorship Program (WRRSP) is a competitively scored program designed to protect and restore high quality water resources. Funding from this program was secured by Tecumseh Land Trust in 2009 to protect the Little Miami River, the Yellow Springs Creek, Birch Creek, and the cliffs and hillsides that drain into these waterways.

Matching funds were sought and secured from the Upper River Fund of The Dayton Foundation. This fund was created to preserve the Upper Little Miami River and the land that could be seen from the river.

The funding available from WRRSP and the Upper River Fund was not quite equal to the appraised easement value of the 563 acres comprising the Covenant area. Hence, the Trust for Public Lands sought and received additional funds from the Clean Ohio Conservation Fund to fully fund the easement purchase on the Covenant area.

Environmental Covenant Area



Tecumseh Land Trust
P.O. Box 417
Yellow Springs, Ohio

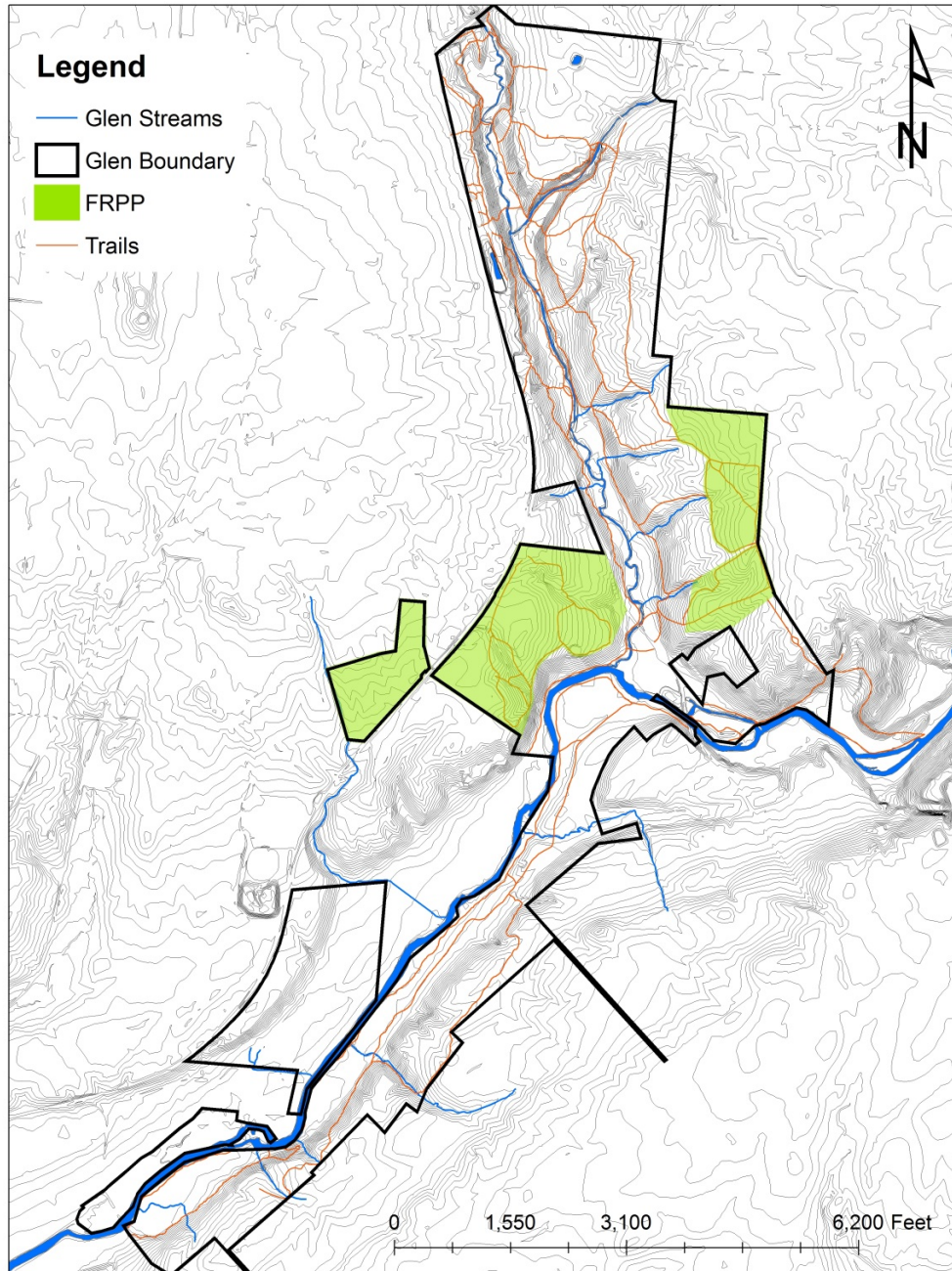
2. The Farm and Ranchland Protection Area

The traditional uses of the two Riding Centre areas, the Vernet Preserve, the School Forest, and the Pine Forest areas fit well within the Farm and Ranchland Protection Program (FRPP) of the United States Natural Resource Conservation Services. The program is designed to permanently protect prime soils for a large variety of agriculture and conservation purposes. FRPP required local matching funds for easement purchase of these 153.6 acres.

Local matching funds for the purchase of the easement on this area came from the Village of Yellow Springs and the Glen Helen Association. The Village targeted funds for protection of the Country Common and Jacoby Greenbelt around the Village in the early 1970s, and has maintained some level of funding for this purpose since.

The Natural Resource Conservation Service stands ready as a resource for management of this area. The District Conservationist for the area prepared a Conservation Plan with recommendation for management of the area, and can update that plan over time at the request of the landowner. Federal Conservation funds are available periodically to assist with improved conservation practices on the area.

Farm and Ranchland Protection Program Area

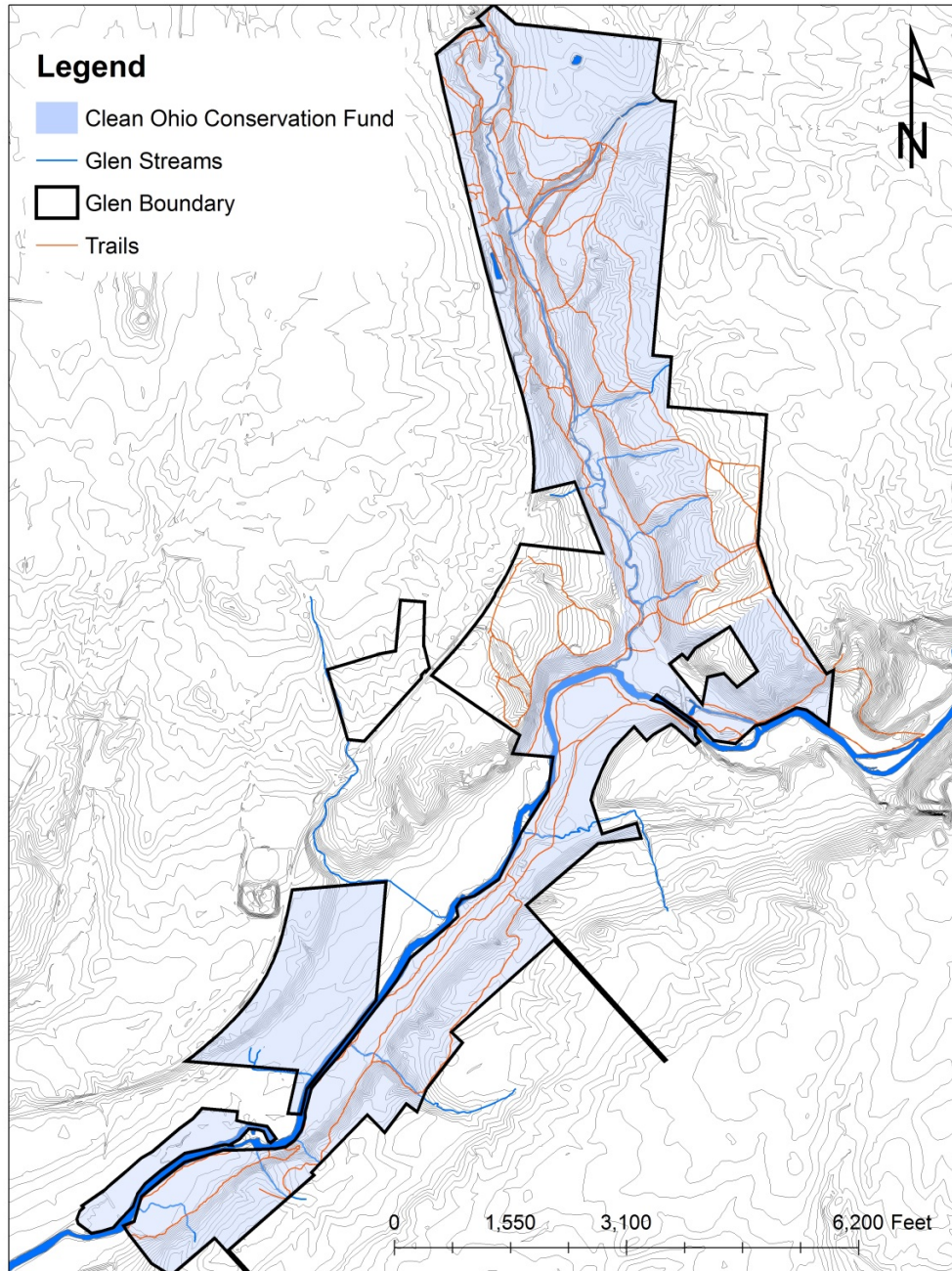


Tecumseh Land Trust
P.O. Box 417
Yellow Springs, Ohio

3. Clean Ohio Conservation Fund Final Easement Area

Most of the building envelopes for educational and maintenance structures in Glen Helen are in the final easement area, comprising some 257 acres, plus the adjacent 563-acre Covenant area. This, plus the 153.6-acre Farm and Ranchland Protection Area form the entirety of the Antioch College lands comprising Glen Helen.

Clean Ohio Conservation Fund Final Easement Area



Tecumseh Land Trust
P.O. Box 417
Yellow Springs, Ohio

H. Monitoring zones:

1. Management and Monitoring Zone 1: Confluence of Creeks

The Confluence of Creeks monitoring zone extends from the north edge of the Glen nearly to the Pine Forest and includes the visitor's complex, the oak triangle, the bulk of the National Natural Landmark area, and glacial valleys that make the confluence of Birch and Yellow Springs Creeks. This area has landmark preserved trees from the 1880s and white oaks that are over 350 years old.

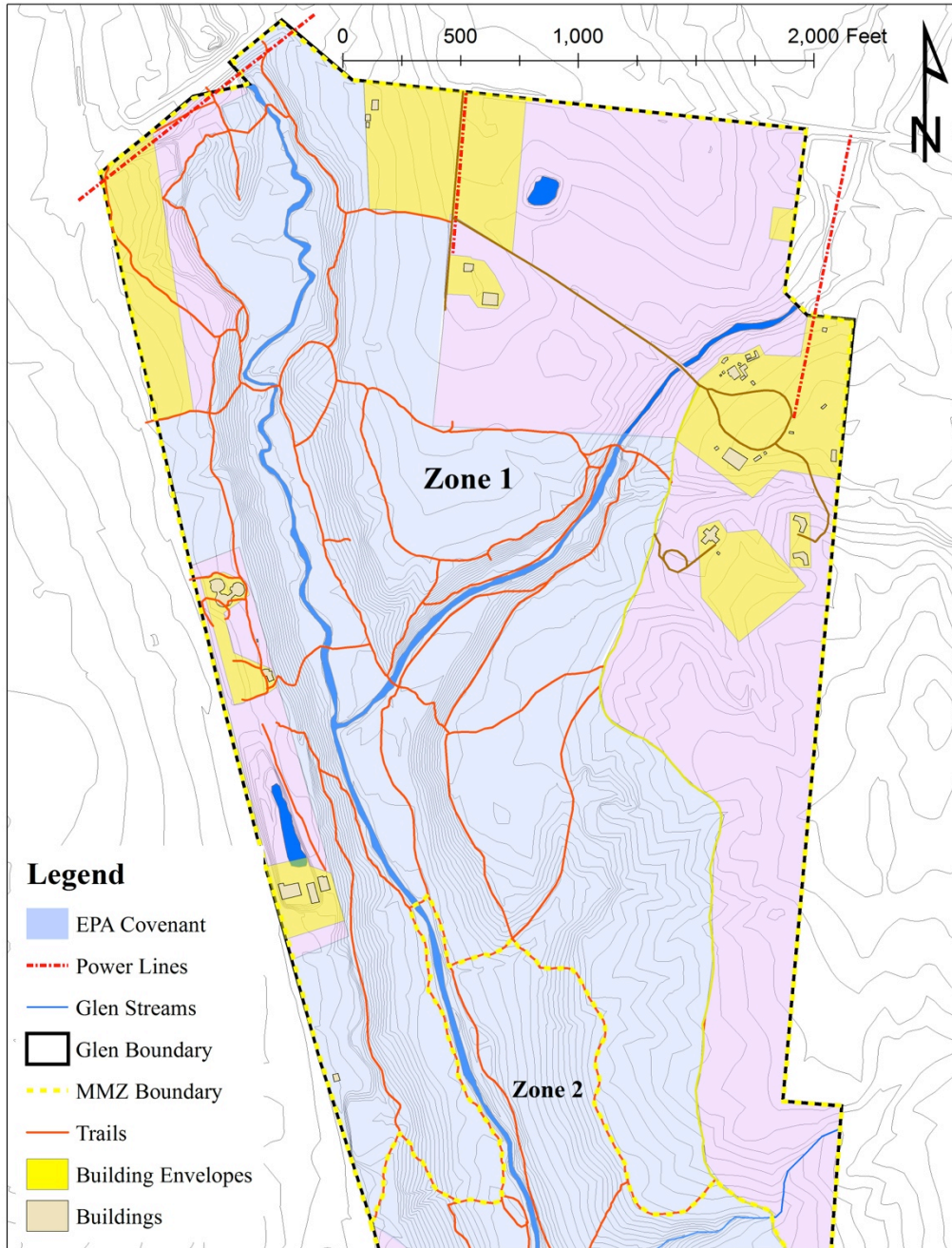
Zone 1 has the highest public use pressure on it due to the popularity of the Yellow Spring and the Cascades, as well as the ease of access due to the parking lot at the Visitors Center and Trailside Museum.

Specific management issues and plans include:

- i. **Bird Blind:** The current bird blind between the Vernet Ecological Center and Trailside Museum is recognized to be in a problematic location. It is located close to sensitive habitat, and near to the Yellow Springs Creek gorge. Further, there is scant habitat to be seen through its windows, so a visit to the blind is rarely productive. The Ecology Institute plans to dismantle the blind in 2015-16, and to restore the habitat where it was located. The blind was named in honor of Jim Howell, a celebrated professor of ornithology at Antioch College. The naming plaque will be transferred to the bird blind at the Outdoor Education Center complex.
- ii. **Castle Rock Trail:** Glen Helen staff are, as of 2015, planning to restore the Castle Rock Trail between Corry Street and the Yellow Springs grotto. The restoration will include closure of a steep trail that goes straight down the gorge, stonework where the trail crosses a seep, and construction of a bridge and boardwalk across the existing dam. Debris from the old and destroyed bridges will be removed.
- iii. **Outdoor Education Center comprehensive campaign:** As of 2015, the Glen Helen Association is in the early phases of planning for capital improvements to the facilities of the Outdoor Education Center. Specific changes that will affect the building footprints include plans to remove the "Fox Den" building, expand or relocate the lodge building, and construct a new dormitory for students.
- iv. **SR 343 parking:** There is a current parking area straight back from the State Route 343 entrance. This lot provides quick and relatively level access to the Cascades and Yellow Spring. However, it is also prone to vandalism because of its relatively isolated location, and inappropriately located in terms of its proximity to the ecologically sensitive areas of the preserve. The Ecology Institute has reserved a building envelope at the SR 343 entrance, to serve as an alternate parking area for the Yellow Spring. If developed, this parking area may also have the capacity to serve visitors to the Outdoor Education Center.
- v. **Neff Lake Trail:** After the Castle Rock Trail project is completed, the restoration of the trail around the former Neff Lake will be the top priority project for Recreation Trails Program funding.

- vi. Reserved visitor's center: An area along the northwest edge of this zone is reserved as a location of a possible new and relocated visitor's center. There are no plans at present to develop this concept.
- vii. Unauthorized uses: Zone 1, being the closest to downtown Yellow Springs, is the area most impacted by visitors who disregard the rules of the preserve. Specific challenges include vandalism, such as breaking or carving into trees, litter, breaking glass, spray paint, off-trail behavior, swimming or wading in the streams, walking dogs off leash, and after-hours visitation. The Ecology Institute counters these challenges to the best of its ability by working with Antioch College security and the Village of Yellow Springs police force. The Institute also employs a ranger who will shift from 12 hrs/week to full time, starting in mid-2015.

Management Monitoring Zone1: Confluence of Creeks



Tecumseh Land Trust
P.O. Box 417
Yellow Springs, Ohio

2. Management and Monitoring Zone 2: Yellow Springs Creek Valley and Uplands:

The Yellow Springs Creek Valley and Uplands monitoring zone extends from the Grinnell Road to the Pine Forest, and includes a stretch of Yellow Springs Creek along Grinnell Road with a prime black walnut floodplain, the Talus Slope Trail and the Upper Birch Creek Trail entering the School Forest Area. It includes the triangle of land bordered by Corry St, Grinnell Rd, and Hyde Rd.

There are four entrances to the Glen in this zone: a spur of the Talus Trail accessed off Grinnell Rd. near its intersection with Corry St, two trails that run alongside the Yellow Springs Creek, accessed where the Creek meets Grinnell Rd, and the School Forest entrance, accessed on Bryan Park Rd near the border with the state park.

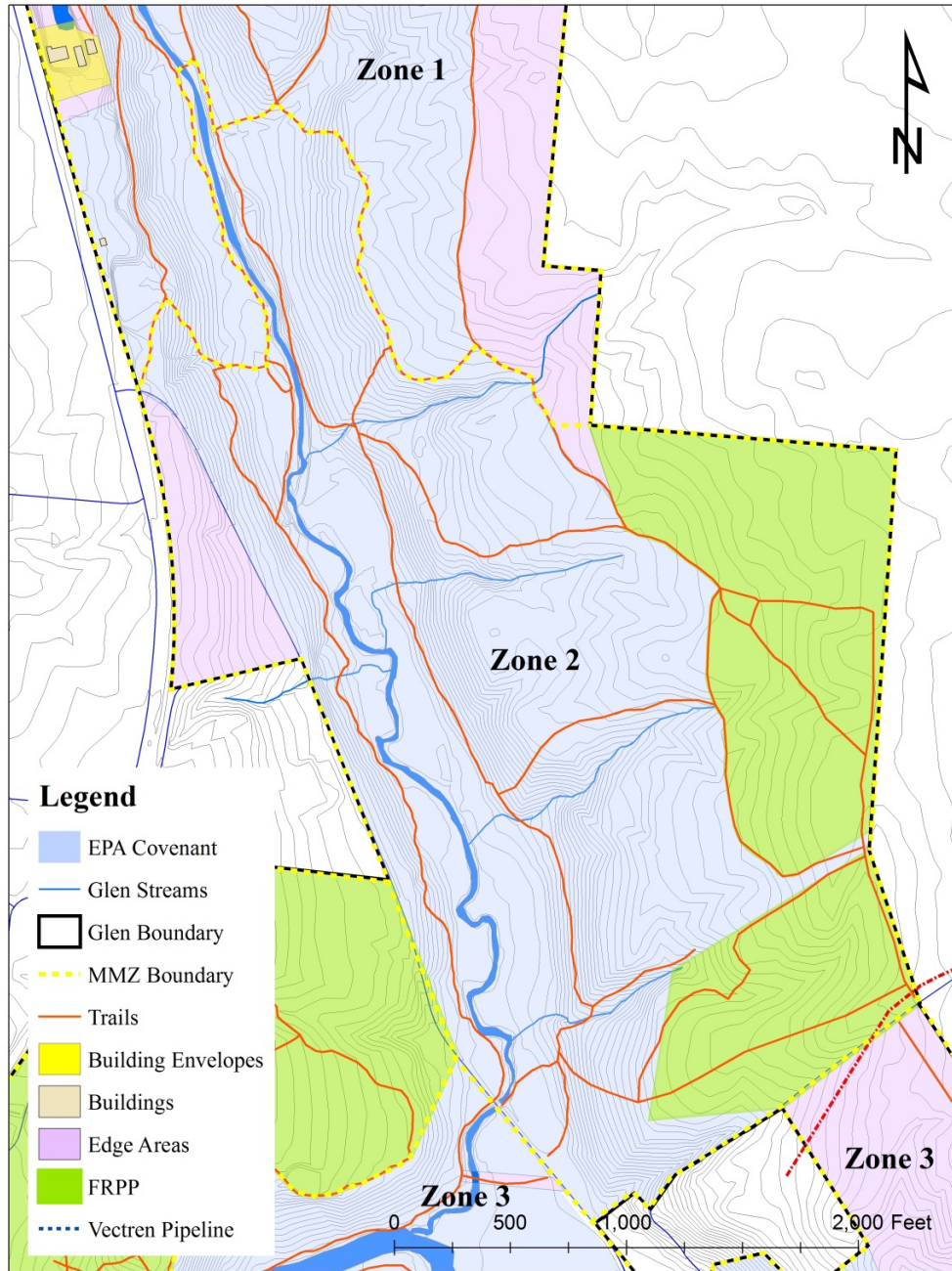
The Grinnell Road Triangle is very seldom used by the public as it has no trails. The 19-acre School Forest area is used by the Yellow Springs High School, School Forest Program to cultivate cut-your-own Christmas trees and holds an annual festival. It is the oldest educational forest program in the state of Ohio. Outflow from the adjacent Village wastewater treatment plant enters this zone and contributes to the Yellow Springs Creek, this confluence is in the EPA covenant and is considered an area of high ecological importance. A notable tributary enters from the Alexander property as it drains agricultural land. This tributary may change as management practices change higher up in the watershed. The “Conway Colony” of freed slaves lived in this area in the 1860s and subsequent decades. Little trace of their homesteads remain.

The area includes several restoration reforestation projects undertaken in the 1920s-30s, including a plantation of white pine, Norway spruce, and Austrian pine, known popularly as the pine forest. The pines, which do not grow natively in this area, are steadily dying out. Nearby are plantings of red oak and tulip poplar.

Specific management issues and plans include:

- i. Pine Forest restoration: Although there are no specific plans to do so, the concept of reestablishing a pine forest is under consideration, in partnership with the Yellow Springs School Forest program.

Management and Monitoring Zone 2: Yellow Springs Creek Valley and Uplands



Tecumseh Land Trust
P.O. Box 417
Yellow Springs, Ohio

3. Management and Monitoring Zone 3: Little Miami River Oxbow Slope:

The Little Miami River Oxbow Slope monitoring zone extends from the entrances off Grinnell Road on the north and south sides of the Little Miami River (one near the covered bridge and the other just south of the Grinnell Road bridge) to the Vectren clearcut. Grinnell Rd. bisects this zone. Monitoring Zone 3 includes the Chinquapin Oak slope behind the Whitmore inholding and building envelopes that include the Grinnell Mill and the Mill Run Cabin. The Horace Mann and Erastus Birch Monuments are located in Zone 3, as is the covered bridge over the Yellow Springs Creek. This monitoring zone also includes the confluence of the Little Miami River and the Yellow Springs Creek, the former barn site which is surrounded by old agricultural fields that are returning to wooded areas, a large portion of river frontage including the Little Miami River Oxbow. Other areas of high importance are bottomland along the Little Miami River below the Chinquapin Oak slope.

There are four entrances to the Glen from this area. A parking area between the Yellow Springs Creek and the Little Miami River provides access to the covered bridge. A small parking area southeast of the Little Miami River bridge provides access to the South Glen. A parking area at Grinnell Mill provides access to the Little Miami River trail, along the Grinnell Mill millrace. A gate at the Horace Mann monument provides access to the monument grounds and the Chinquapin slope. This area also is easily accessible from John Bryan State Park.

This zone includes one of two culverts in the Glen (the other in Zone 2) with the culvert in this zone being a good navigational landmark and allows passage over a main tributary that originates in private land along Clifton Road.

Zone 3 has a private land inholding in the zone's northern portion. The noted encumbrances are power lines that are maintained going into the private land inholding, and powering the Grinnell Mill and Mill Run Cabin. Additional encumbrances include a buried waterline extending to the neighboring private land as well as above ground power lines to power the well pumps.

Zone 3 does not have the public pressure that Zone 1 has but is surrounded by private land along its southeast and southwestern borders. The Little Miami River bounds southwestern border and has private land beyond that that includes a horse farm and the Vale community. Grinnell Mill is operated as an overnight bed and breakfast, with oversight by Miami Township. The septic needs of the Mill are served by a leach field. The Mill Run Cabin is leased to Glen Helen employees.

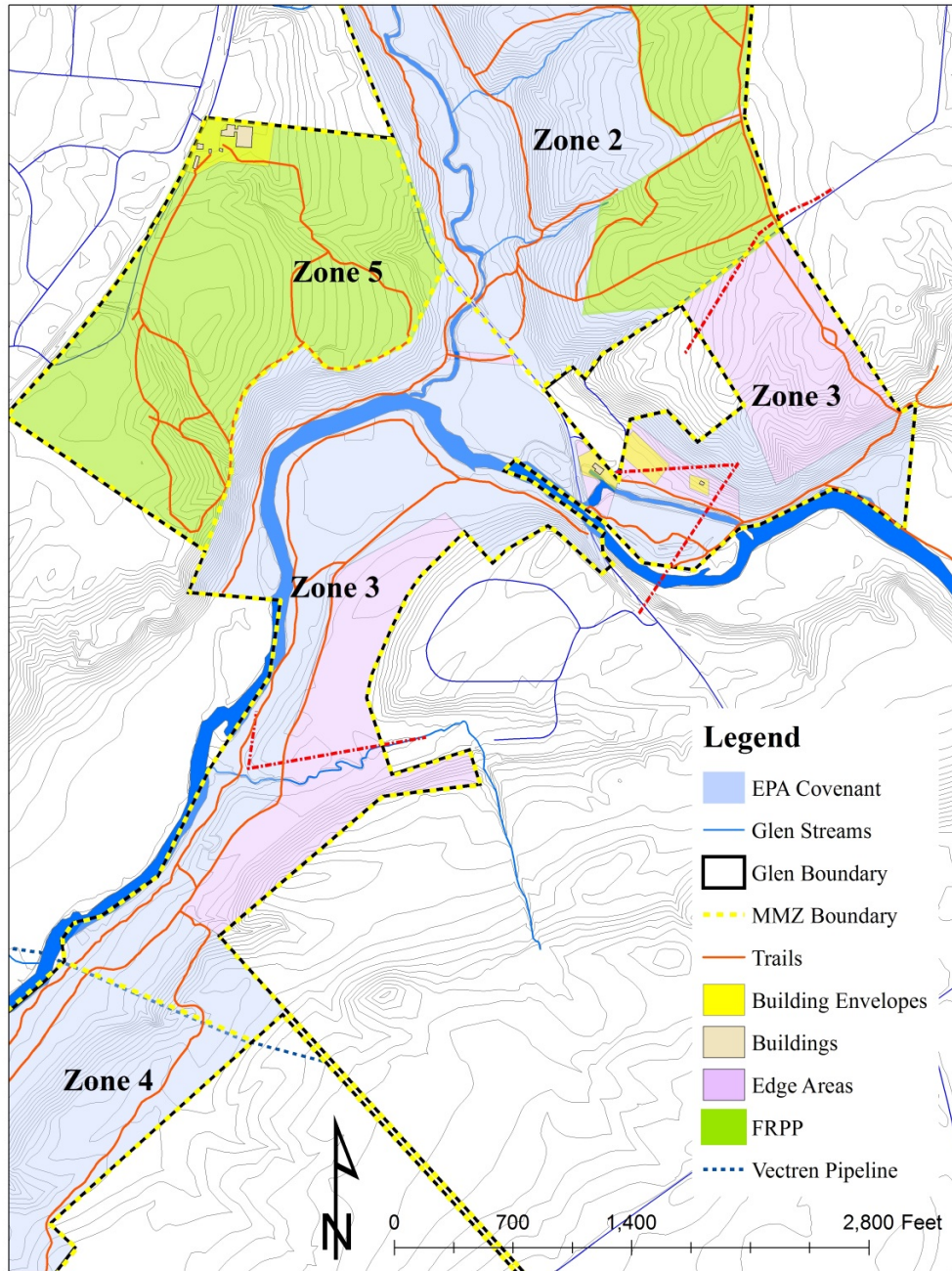
Specific management issues and plans include:

- i. Mill Run Cabin: The structure is a simple log cabin with rudimentary weatherization. It does not meet building codes, and has little insulation. Current as of 2015, the cabin provides residence for the director of the Raptor Center. Once the current Raptor Center director moves, the cabin may be demolished, relocated, or turned back into a seasonal residence, rather than a year-round home.
- ii. Horace Mann monument: The statue of Horace Mann is one of two casts made from the original mold. It stands atop a large stone edifice, which is showing significant decay.

The Ecology Institute plans surface restoration of the edifice in 2015. Long-term plans call for restoring the statue and/or relocating the monument to the Antioch campus.

- iii. Grinnell Mill: The mill was substantially renovated in 2005-07, and since then has served as a bed and breakfast and museum to milling. The building itself is owned by Miami Township, and the parcel beneath the building is leased to the township. Ecology Institute staff are exploring a simpler management regime for the building.

Management and Monitoring Zone 3: Little Miami River Oxbow Slope



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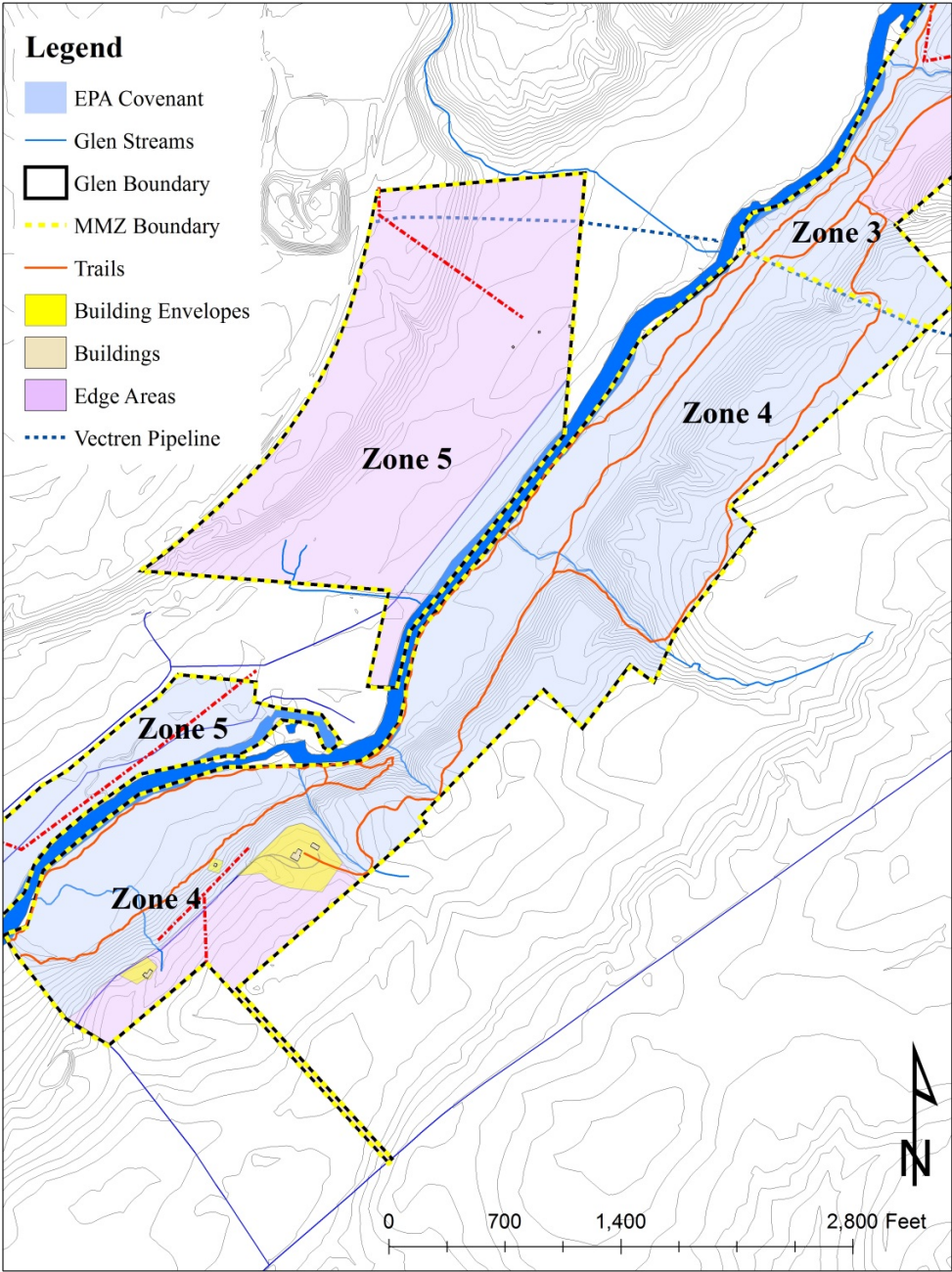
4. Management and Monitoring Zone 4: Little Miami River Delta Flood Plain:
The Little Miami River Delta Flood Plain monitoring zone extends south from the Vectren clearcut down to Jacoby Road past Birch Manor and the Gatehouse. This monitoring Zone includes the Little Miami River floodplains as well as upland areas with quality slopes and woodland seeps in between. The zone has old woods including Chinquapin oaks below the Birch Manor. The entire monitoring zone is south of the Little Miami River. South of the Vectren clearcut, the only encumbrances are power lines entering the property to power the four buildings.

The public pressure on this zone is low due to lack of public access. The two public access points are the river trail, via the Greene County Jacoby Road Canoe Launch, and the eastern perimeter trail, accessed via Birch Manor. One tributary of note enters the Glen from another protected property (Spracklen-Anderson) and is the first and largest as you head south from the clearcut. Potential pressures for violations are from the adjacent private lands that border the entire zone to the south. These neighbors are agricultural in land use and drain their farms directly into the zone. Birch Manor is used as a program space.

Specific management issues and plans include:

- i. Wetlands Trail: The current trail system as mapped differs from what one finds in the field in this area. This is particularly the case with regard to the mapped loop trail around the South Glen wetlands. Staff will be determining whether to remove this trail or to restore it.

Management and Monitoring Zone 4: Little Miami River Delta Flood Plain



Tecumseh Land Trust
 P.O. Box 417
 Yellow Springs, Ohio

5. Management and Monitoring Zone 5: Homestead and Riding Centre Areas

The Homestead and Riding Centre Areas monitoring zone includes four distinct areas, all north/west of The Little Miami River. Beginning in the south the zone includes; the area that is along the river extending north from just south of the 68 side of Jacoby Road, The Homestead, The Riding Centre, and the McCally Area. The area furthest south is low river floodplain with mixed hardwoods, which includes an access and power line easement that supplies the houses to the north. This area of the Glen extends away from the river only 250 feet, with its widest point being approximately 500 feet.

The Homestead area to the north includes similar river bottomland as well as steep slopes with seeps and an open flatland. Notable features in this area include the breach that removed an embankment that created an open ditch to drain historic agricultural land. Two acres of this area now a wetland with a more natural stream pattern. This water does drain to the south where it meets a drainage ditch that goes directly to the Little Miami River. The Village of Yellow Springs has an access easement, allowing them to send water from the Village well field to the river. The Homestead is also adjacent to a creek on its north side that starts in the Village of Yellow Springs and also runs along the west side of the McCally Area. This creek is a main tributary that enters the Little Miami from Yellow Springs. The Homestead area also includes the 3 well pump houses for Morris Bean Co. which has a water, power line, and access lease thorough the area. The Vectren clearcut also extends through this area. This area includes the remnants of the “Bell Works,” a Hopewell-era circular earthwork, and a garden maintained by the residents of the Vale community. The Little Miami Scenic Bike Trail runs along the western edge of the property. Effluent from the Morris Bean retention pond enters the Glen along this western edge.

The Riding Centre Area is located along Corry St and Hyde Road with the Little Miami Scenic Bike Trail bounding its western side. The Riding Centre Area includes all the buildings (5 total) in the Riding Centre Building Envelope as well as fencing associated with the equine programs. One notable fence is a temporary fence that fences out horses from entering a creek that bisects the area and starts off property. Included in this area are also pasture land used for grazing of horses.

The fourth area called the McCally Barn Area also includes pasture land as well as open area used for horse grazing and riding. The area also is adjacent to the creek mentioned above that runs along the Homestead Area.

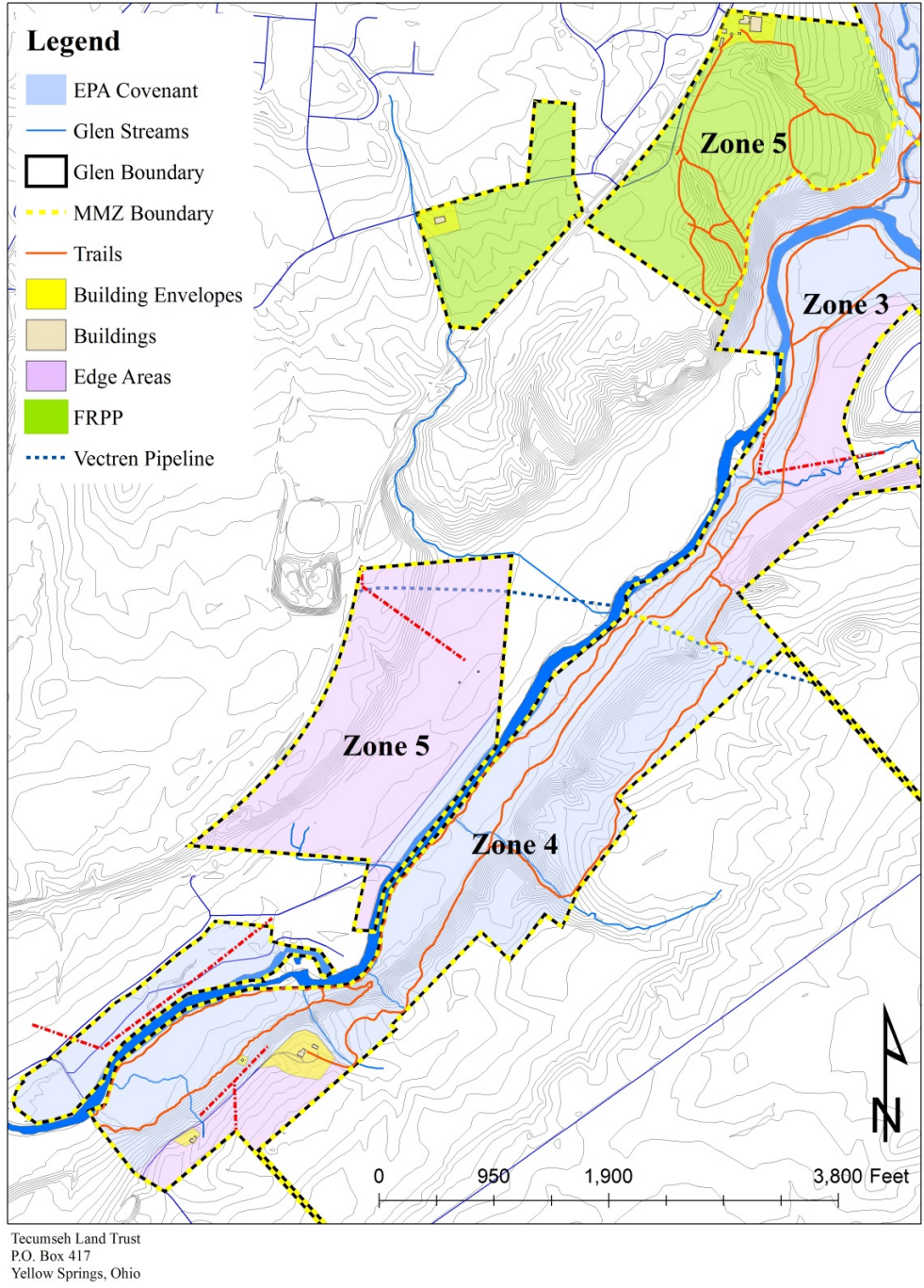
The Homestead area is one of the most isolated areas of the Glen as there is no vehicular access, the only access is through the south and the village well field, or the west side via the Little Miami Scenic Bike Trail.

Specific management issues and plans include:

- i. Jacoby Road inholding: This neighboring property is a priority for acquisition and conservation.

- ii. Morris Bean wells: The aluminum foundry on the western border of the Glen draws its water from wells located in the preserve. For this purpose, they maintain vehicular access to the well buildings from Jacoby Rd, along with water and electric lines which come from the plant. Ecology Institute staff hope to actively find a way to minimize the impact of this lease on the preserve.
- iii. Riding Centre: The area leased by the Riding Centre Association has a current conservation management plan set forth by Soil and Water Conservation Service, which includes manure disposal practices, trail maintenance, and keeping horses out of active streams. See Appendix A.
- iv. Vale garden: The Vale, an intentional community owned by the Arthur Morgan Institute for Community Solutions, has a garden area within the homestead. The Executive Director of Community Solutions has been notified that the garden, and its location within Glen Helen, is not in compliance with our conservation easement and our stewardship plan for the property. Ecology Institute staff plan to reach an agreement with Community Solutions to relocate the garden out of the Glen over time.
- v. Village well field: The well field was sited at its current location in 1961, on lands that were formerly part of Glen Helen. In the event that the Village moves its well field, or determines to source its water from another location, the well field parcel would be in position to revert to Glen Helen.
- vi. Village well field utility access: Just inside the western edge of the Homestead area, the Village of Yellow Springs has a utility easement providing for water and electric lines between the well field and the Village. The easement allows the Village to maintain a 60ft right-of-way through the Glen. However, it also requires that the Village make a good faith effort to reroute the water and electric lines outside the preserve, should either line need to be replaced.

Management and Monitoring Zone 5: Homestead and Riding Centre Areas



V. Public use

A: Research:

Glen Helen is made available for scientific research to students and faculty of area educational institutions. Researchers who desire to conduct scientific fieldwork are required to submit an application for a research permit. This application would be considered by Glen Helen staff before a permit is granted. Researchers must be able to document several criteria before their application can be approved. These include:

- a. If project objectives require that research operate off trails, researcher must be able to justify that need, and to have a plan for minimizing new trail formation, erosion, and soil compaction.
- b. Research should not involve take of locally or nationally rare, threatened, or endangered species.
- c. If take is required for the project, researcher must show that they possess all necessary permits, and that collection can be done without adversely impacting the ecology of the preserve.
- d. No introduction of species
- e. Researcher must make all data gathered available to the Glen Helen Ecology Institute.

B: Glen Helen programming

Glen Helen is the site of the Glen Helen Outdoor Education Center, the oldest residential environmental learning center in the Midwest. In operation since 1956, the center has provided environmental education programming to over 140,000 children over its history. Up to 3000 children are in residence at the center over the course of each year. They use the trail system on a daily basis for their lessons.

Public programming is run out of the Glen Helen visitor's complex on Corry St. More than 200 public hikes, lectures, and other programs are scheduled each year. Many use the trail system of the preserve to teach visitors about botany, ornithology, geology, etc.

C: Collaborative use with other entities:

Glen Helen has several longstanding arrangements with outside organizations for use of sections of the preserve. As these leases and agreements come up for renewal, updates to ensure that they are in line with current management of Glen Helen and the conservation easements will be made.

1. Yellow Springs Schools: The Yellow Springs High School utilizes 18 acres of Glen Helen for its School Forest program. High School students plant Christmas trees, and make them available for harvest on a rotation of approximately seven years. Over time, the Ecology Institute hopes to work with the high school to shift the program toward focusing more on native plants, and to also work with the high school students in support of Glen Helen land stewardship goals.
2. Miami Township: The township owns the Grinnell Mill, leases the parcel on which the mill sits, and has a separate agreement with Glen Helen for a leach field. The mill serves

as a bed and breakfast and museum to milling. Ecology Institute staff are exploring a simpler management regime for the building.

3. Riding Centre Association: The Riding Centre Association leases approximately 100 acres of the Glen for the operation of the Riding Centre, which features horse boarding, lessons, classes, camps, and therapeutic riding. An updated lease with the RCA is in draft form, and allows for greater management oversight by the Ecology Institute staff, including the capacity to determine trail closures in inclement weather, and direct management oversight of the wooded parts of the leased area.

D: Public access:

The trails of Glen Helen are open to the public daily during daylight hours. Ecology Institute staff reserves the right to temporarily restrict access for purposes of public safety or inclement conditions. Public access to the Property is through the following entrance points (clockwise from the northwest corner)

1. 1075 State Route 343. Several locations are accessed by this entrance, all of which provide limited access. The Yellow Springs parking lot is closed to visitors, with no plans to reopen. Occasionally, this lot is used as a staging area for land stewardship work. It holds approximately 10 cars. The Farmhouse provides parking for naturalist staff of the Outdoor Education Center. No public parking is available. The Raptor Center lot provides space for 4 cars visiting the raptor facility. Hikers are requested not to park here. The Outdoor Education Center provides parking for approximately 30 cars, but restricts this area to users of the facility.
2. John Bryan State Park. Hikers who travel downstream along the Little Miami River in John Bryan State Park will find a sign at the boundary with Glen Helen. The trail along the Little Miami continues through Glen Helen to Grinnell Mill.
3. School Forest. Located on the north side of Bryan Park Rd, south of the state park, this gated entrance provides access to the School Forest area, the fire road that runs along the eastern border of the preserve, and the Pine Forest.
4. Horace Mann Meadow. Located on the opposite side of Bryan Park Rd. from the School Forest entrance, this gated access point can provide parking for more than 50 cars on an as needed basis. Generally, the gate is kept closed, and access is for foot traffic only. Trails from this location access Grinnell Mill and the John Bryan State Park trail system.
5. Grinnell Mill. Located on Bryan Park Rd, and just to the left of the mill structure, this access point provides parking for approximately four vehicles. The trailhead provides access to the Grinnell Mill millrace and trails along the Little Miami River to John Bryan State Park.
6. Little Miami River bridge. Located on the south side of Grinnell Rd, just east of the Little Miami River, this access point provides parking for approximately three vehicles. The trailhead provides access to the trails of the south Glen, including routes to Birch Manor and Jacoby Rd.
7. Grinnell Rd. Prairie. Located on the south side of Grinnell Rd, this access point provides parking for approximately five vehicles. The trailhead provides access to the prairie, the covered bridge, and the trail system within the area leased by the Riding Centre Association.

8. Yellow Springs Creek east trail. From the north side of Grinnell Rd, this footpath goes up the east side of the Yellow Springs Creek, eventually connecting with the lower Birch Creek Trail.
9. Yellow Springs Creek west trail. From the north side of Grinnell Rd, this footpath goes up the west side of the Yellow Springs Creek, eventually connecting with the Talus Trail.
10. Birch Manor. The access drive is currently the only paved road within Glen Helen. At the clearing by the manor house is parking for 40-50 cars. Trail access to the South Glen prairie and trails heading north to Grinnell Rd.
11. Little Miami River boat launch. The boat launch provides a parking area just outside the Glen boundary. Visitors have ready pedestrian access to the South Glen wetlands and the Birch Manor access drive.
12. Grinnell Rd at Corry St. Pedestrian-only access to the south side of the Talus Trail.
13. Glen Helen Visitor's Complex. The main entrance to Glen Helen, located at 405 Corry St. Parking is available for approximately 40 vehicles. Access the Talus Trail, Inman Trail, and Rim Trail.
14. Castle Rock Trailhead. Located at the intersection of Corry St. and Glen St, the trailhead provides the most direct public access point to Yellow Springs Creek dam, grotto of the Yellow Spring, and the Yellow Spring itself. ODNR funding through the Recreation Trails Program was granted in 2014 to provide for the restoration of the Castle Rock Trail, including a new bridge and walkway across the existing dam.
15. Village lift station. Located at US Rt. 68, this pedestrian-only trailhead provides access to the loop trail around the former Neff park pond.

VI. Management structure:

A: Owner:

Glen Helen is owned by Antioch College Corporation. The property was donated to Antioch College in 1929 by Hugh Taylor Birch, who sought to establish a living memorial to his daughter Helen Birch Bartlett.

B: Manager:

In its capacity as an operating program of Antioch College, the Glen Helen Ecology Institute provides day-to-day management of the preserve.

The Ecology Institute has a staff of 26, including educators, administrators, plus those with responsibilities in restoration and land management. The Ecology Institute and its predecessor organization have been managing the preserve since 1929. Collectively, the Ecology Institute staff has over 75 years experience in Glen Helen. Principal qualification of its key staff include:

Nick Boutis, Executive Director, Glen Helen Ecology Institute: Boutis received his B.A. in Biology from Oberlin College, and his M.G.A from the University of Maryland in Non-Profit Management. He received his naturalist training from the Glen Helen Outdoor Educator Center in 1990. Prior experiences in environmental and conservation education include work at Old

Woman Creek State Nature Preserve in Huron, Ohio, and the National Audubon Society. On a volunteer basis, Boutis also serves as Executive Director of the Glen Helen Association.

George Bieri, Land Manager: Bieri has served as Land Manager since 2001, and has coordinated Glen Helen invasive species removal efforts throughout that time period. George has 55 years of practical experience in Glen Helen. He is an experienced woodworker who brings a craftsman's eye for detail to his land stewardship work. His twenty years experience as an easement monitor for the Tecumseh Land Trust, a land trust with over 20,000 acres under conservation easement, has given him a clear understanding of the landscape of Greene and Clark Counties.

Shahkar Strolger: Property Manager: Strolger is responsible for supervising maintenance and upkeep in all educational buildings in Glen Helen nature preserve. He has over 10 years experience in facility management.

Susan Smith, Ranger: Smith has served as the Glen Helen Ranger since 2011. She has peace officer training, and prior work experience as an officer on the Yellow Springs, Ohio police department.

C: Friends organization:

The Glen Helen Association has functioned as a “friends” organization to Glen Helen since 1960. Originally formed to defend the nature preserve against a planned highway bypass and a sewer line re-routing, the Association has, for over 50 years, served as the volunteers, advocates, and donors that allow the conservation and education work of the Glen Helen Ecology Institute to proceed.

The Association will provide volunteer labor in support of the management objectives detailed in the plan, and provide funding for the capital improvements detailed herein.

D: Easement monitor:

The Tecumseh Land Preservation Association holds the easements on Glen Helen, and provides ongoing monitoring and enforcement.

The land trust works with the Ecology Institute staff to prepare thorough documentation, with photographs and maps, of the current state of the preserve. Annual monitoring reports will document the current status of conservation values relative to this baseline. Each report will be presented to the Ecology Institute to inform implementation of this management plan for the following year.

Appendix A

NRCS Conservation Plan



XENIA SERVICE CENTER
 1363 BURNETTE DRIVE
 XENIA, OH 45385-5681
 9373724478 ext. 3

DISTRICT CONSERVATIONIST

Conservation Plan

ANTIOCH COLLEGE CORPORATION
 1 MORGAN PL
 YELLOW SPRINGS, OH 45387

Brush Management (314)

Woodland quality and wildlife habitat can be improved through Brush Management. Woody invasive species control includes removing non-merchantable and undesirable trees and shrubs. Medium infestation will be determined by service forester based on difficulty of controlling species, stem densities or other factors. Medium woody invasive species control may be accomplished in one year or may take multiple years of treatment depending on the site, Medium woody invasive infestation is defined as less than 10%-39% of area is infected. As time and financial resources allow, control woody and herbacious invasive species per recommendations from a certified woodland manager or the ODNR Service Forester.

Tract	Field	Planned Amount	Month	Year	Applied Amount	Date
12968	10	45.7 ac	6	2014		
12968	12	3.4 ac	6	2014		
12968	14	17.8 ac	6	2014		
12968	15	34.8 ac	6	2014		
	Total:	101.7 ac				

Diversion (362)

Construct a channel across the slope with an embankment on the lower side to prevent runoff water from causing gully erosion in the gravel-protected lot. NRCS can provide an engineering design for the proposed structure.

Tract	Field	Planned Amount	Month	Year	Applied Amount	Date
12968	10HQ	150 ft	8	2013		
	Total:	150 ft				

Fence (382)

A temporary fence as shown on the plan map will be constructed and maintained according to NRCS Standards and Specifications. The purpose of the fence is to exclude the horses from the intermittent stream as needed. The fence will be moveable so that the area can be maintained more easily.

Tract	Field	Planned Amount	Month	Year	Applied Amount	Date
12968	10HQ	600 ft	8	2013		
	Total:	600 ft				

Forage Harvest Management (511)

Take hay from this field on a schedule that protects plant vigor provides the highest quality forage as possible. Continue to monitor nutrient levels by soil testing at least every 5 years. If raw sawdust is applied with the horse manure, consider adding some nitrogen after manure application, or add nitrogen to the manure and sawdust as it is collected from the stalls.

Tract	Field	Planned Amount	Month	Year	Applied Amount	Date
12968	5	6 ac	5	2013	6 ac	7/26/2013
	Total:	6 ac			6 ac	

Forest Stand Improvement (666)

With guidance from a professional forester or botanist, remove and control bush honeysuckle, tree of heaven, grapevine and other target invasive species as identified. Progress as time, funding and labor permit.

Tract	Field	Planned Amount	Month	Year	Applied Amount	Date
12968	10	45.7 ac	6	2014		
	Total:	45.7 ac				

Heavy Use Area Protection (561)

Nearly all areas around the buildings are protected by gravel heavy use pads that were installed by the Riding Centre personnel over past years. As pads become weak they are replaced with another surface layer. Consider rebuilding heavy use areas when needed using NRCS design and specification, as the pads will likely have a longer live span and cost less in the long term.

Tract	Field	Planned Amount	Month	Year	Applied Amount	Date
12968	10HQ	0.5 ac	5	2013		
	Total:	0.5 ac				

Prescribed Grazing (528)

Grazing will be managed according to a schedule that meets the needs of the soil, water, air, plant and animal resources and the objectives of the resource manager. A "Prescribed Grazing and Maintenance Plan" will be provided to you that outlines the grazing and rest periods for your specific operation. Low prescribed grazing is defined as more than 7 day grazing period and meets prescribed grazing standard.

Horses are grazed on these four fields during the daylight hours through the growing season. Fields 7, 9 and 16 are grazed lightly during winter months. The current management system results in a vigorous stand of grass during the spring, summer and fall months. Use caution when allowing horses to graze and exercise during periods of wet soil conditions and dormant grasses.

Tract	Field	Planned Amount	Month	Year	Applied Amount	Date
12968	3	19.8 ac	10	2012	19.8 ac	7/26/2013
12968	7	12.2 ac	10	2012	12.2 ac	7/26/2013
12968	9	8.7 ac	10	2012	8.7 ac	7/26/2013
12968	16	4.6 ac	10	2012	4.6 ac	7/26/2013
	Total:	45.3 ac			45.3 ac	

Tree/Shrub Establishment (612)

These fields, known as the School Forest, are managed by local college students at the direction of Antioch College and the Glen Helen Association. Tree planting, thinning, weed control and other silviculture activities are among the activities involved.

Tract	Field	Planned Amount	Month	Year	Applied Amount	Date
12968	12	3.4 ac	8	2013		
12968	14	7.5 ac	8	2013		
	Total:	10.9 ac				

Early Successional Habitat Development/Management (647)

Manage the Vernet prairie restoration to promote native grass and forb establishment. Control woody species and noxious weeds. Mow and disk every 3 years to prevent the grass from becoming too thick.

Tract	Field	Planned Amount	Month	Year	Applied Amount	Date
12968	17	5.1 ac	8	2015		
	Total:	5.1 ac				

Upland Wildlife Habitat Management (645)

The wooded areas of the Riding Centre property are part of the large contiguous wooded areas of Glen Helen and John Bryan State Park. In the current condition the woodland provides food and cover for a variety of upland wildlife species. Like most other adjacent areas, woody invasives such as bush honeysuckle and tree of heaven, along with many other species, have degraded the quality of the stand. Continue to plan for control of target species as labor and funding

Tract	Field	Planned Amount	Month	Year	Applied Amount	Date
12968	10	45.7 ac	8	2013	45.7 ac	7/26/2013
12968	17	5.1 ac	8	2015		
	Total:	50.8 ac			45.7 ac	

Waste Utilization (633)

Horse manure that is deposited in the stalls is collected daily and transported to offsite facilities that compost it for local yard and garden application. Manure is also collected from the heavy use areas around the buildings on a daily basis and transported in the same manner. Field 5, managed as hayland, receives periodic applications of manure per soil test results. With this management system, a temporary manure storage facility is not needed.

Tract	Field	Planned Amount	Month	Year	Applied Amount	Date
12968	10HQ	0.5 ac	10	2012	0.5	7/26/2013
	Total:	0.5 ac				

CERTIFICATION OF PARTICIPANTS

ANTIOCH COLLEGE CORP DATE

CERTIFICATION OF:

CERTIFIED CONSERVATION PLANNER

Nathan Weber 3/9/15
DATE

CONSERVATION DISTRICT

GREENE SOIL & WATER CONSE DATE

PUBLIC BURDEN STATEMENT

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collections is 0578-0013. The time required to complete this information collection is estimated to average 45/0.75 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection information.

PRIVACY ACT

The above statements are made in accordance with the Privacy Act of 1974 (5 U.S.C 522a). Furnishing this information is voluntary; however failure to furnish correct, complete information will result in the withholding or withdrawal of such technical or financial assistance. The information may be furnished to other USDA agencies, the Internal Revenue Service, the Department of Justice, or other state or federal law enforcement agencies, or in response to orders of a court, magistrate, or administrative tribunal.

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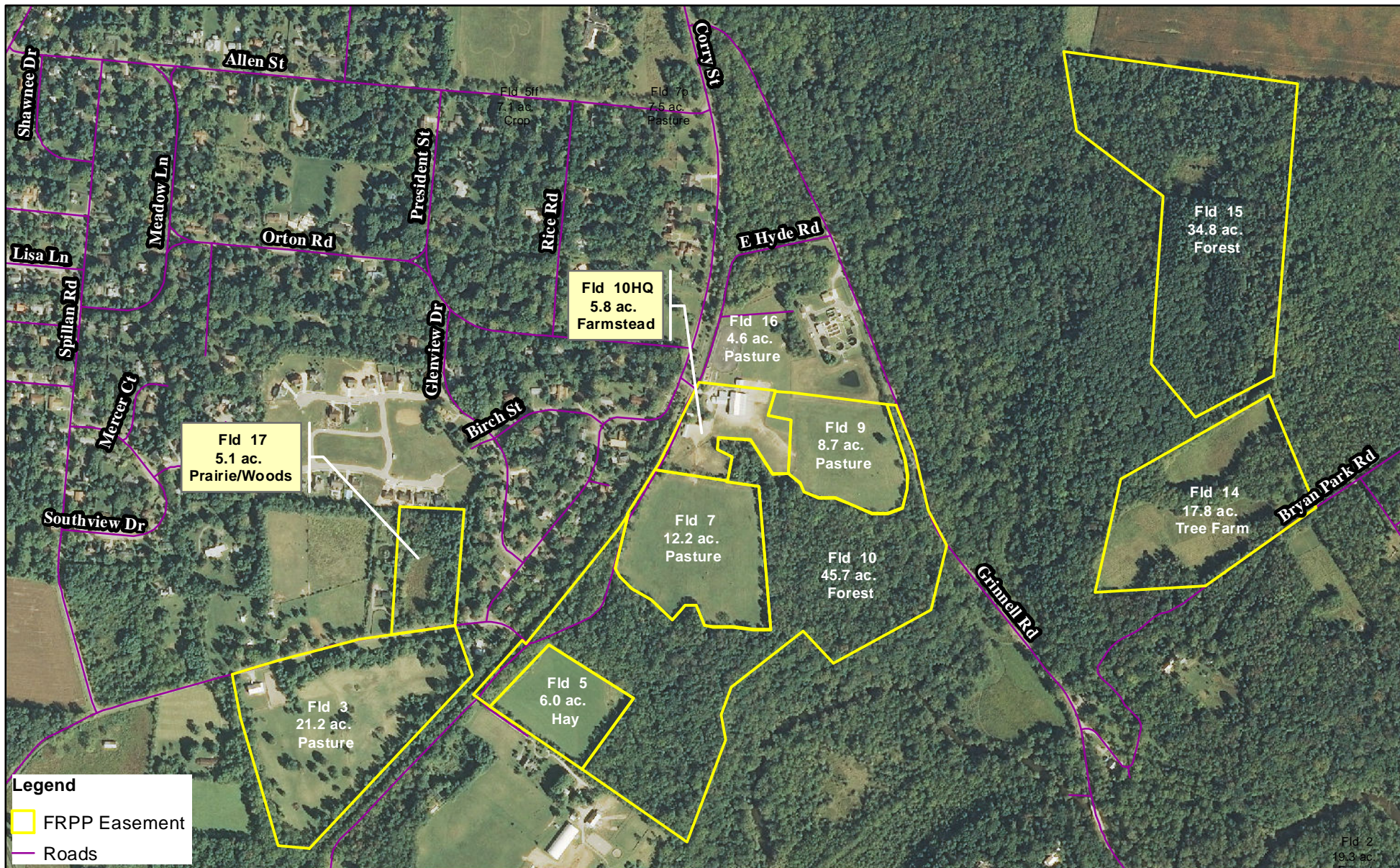
Conservation Plan Map

Date: 2/12/2015

Customer(s): GLEN HELEN ECOLOGY INSTITUTE
District: GREENE SOIL & WATER CONSERVATION DISTRICT

Field Office: XENIA SERVICE CENTER
Agency: USDA-NRCS
Assisted By: NATHAN WEBER

Legal Description: Tract 12968



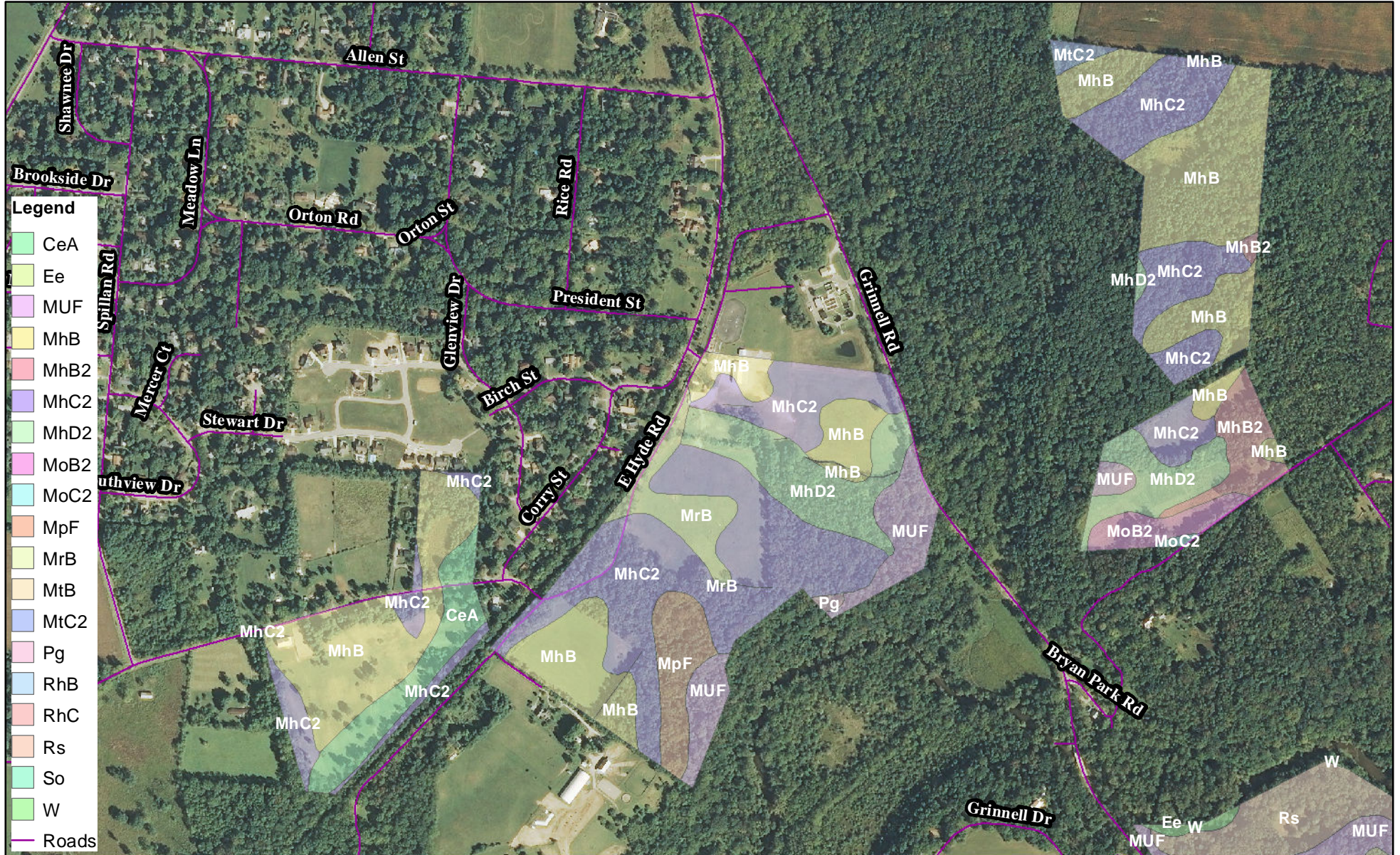
Soils Map

Date: 2/12/2015

Customer(s): GLEN HELEN ECOLOGY INSTITUTE
 District: GREENE SOIL & WATER CONSERVATION DISTRICT

Field Office: XENIA SERVICE CENTER
 Agency: USDA-NRCS
 Assisted By: NATHAN WEBER

Legal Description: Tract 12968



- Legend**
- CeA
 - Ee
 - MUF
 - MhB
 - MhB2
 - MhC2
 - MhD2
 - MoB2
 - MoC2
 - MpF
 - MrB
 - MtB
 - MtC2
 - Pg
 - RhB
 - RhC
 - Rs
 - So
 - W
 - Roads



Appendix B

ODNR Division of Forestry Plan

Woodland Stewardship Management Plan



Owner's Information:

Owner: Antioch College Corporation

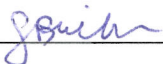
Signed: _____

Date: _____

Case Number: 29-334

Preparer's Information:

Prepared by: Casey Burdick

Signature: 

Casey Burdick

Date: 2/18/2015

Ohio Division of Forestry

777 Columbus Ave. Suite 5-A

Lebanon, OH 45036

This plan is valid for the period beginning 2/18/2015 and ending 2/18/2025.

Plan Status: Revised

Woodland Stewardship Management Plan

Owner Antioch College Corporation
Address 1 Morgan Place
Yellow Springs, OH 45387
Phone _____ Case Number 29-334
Cell _____ Email Address _____
County Greene Township/Village/City: Miami
Parcel(s): F16-1-13-12, F16-1-14-15, F16-1-10-26, F16-1-10-27
Location: Property is located along the eastern edge of Yellow Springs, this plan covers a section of woods surrounding the horse stable are on E. Hyde Road, the Christmas tree planting area and old plantation on Bryan Park Road.
Woodland Stewardship Acreage: 75.1 Non-woodland Stewardship Acreage*: _____
Total Property Acres 153.6 * Non-woodland acres for which stewardship recommendations are made.

This plan was written to qualify the landowner's woodland for the programs checked below:

- Ohio Forest Tax Law American Tree Farm Program
 Environmental Quality Incentives Program (EQIP) Farm Protection Program (FRPP)

Property coordinates (report in WGS 84, decimal degrees.)

Longitude: -83.8857 Latitude: 39.8006

Landowner Objectives

1. Maintain and improve the health and productivity of this woodland.
2. Enhance and maintain the aesthetic, wildlife, and recreational value of the property for the future.
3. Select and manage tree species best suited to the soil and site's capability.
4. Leave this woodland in a better condition than received for future generations.
- 5.

General Woodland Description

The land known as the Glen Helen Nature Preserve covers 1000 acres on the eastern edge of Yellow Springs. Five sections of this property for a total of 153.6 acres have been set aside for the FRPP conservation easement program with the Tecumseh Land Trust. Three of the Five sections contain woodlands. The first section is partially horse pasture and woodland leading down to Little Miami River. The second section is managed by the local school district for growing Christmas Trees. The third section is an old conservation plantation planting form the 1920's.

MAP

Case Number: 29-334

Landowner's Name: Antioch College- Glen Helen

County: Greene

Township: Miami



Legend

Property Lines



Total (Wooded)

Stand 1- 73.55 acres (36.75 acres)

Stand 2- 17.86 acres (5.56 acres)

Stand 3- 33.73 acres (32.88 acres)

Map Not to Scale

Property boundaries are roughly drawn

Woodland Stand Description and Management Recommendations

Stand # 1 (Riding Center) - 36.75 acres

Dominant Species: Ash, Osage Orange, Red Cedar, Shingle Oak, Red Oak, White Oak, Hickory, Maple

Forest Type or Dominant Vegetation: Northern Hardwoods

Stand Diameter or Size Class: All size classes

Stocking Level: Fully stocked **and/or Basal Area :** (ft²/acre)

Stand History: Other

Topography: Rolling

Invasive plants or insects impacting this stand: Emerald Ash Borer, bush honeysuckle, autumn olive

Present conditions or resource concerns to consider: Ash trees dying back

Past management activities completed in this stand: Work has begun to control the invasive plants, a trail system has been established for horse riding or hiking, and the horses have been fenced out of the woods.

<i>Management Recommendations:</i>
Continue to control the invasive plants
Monitor and remove hazard trees in high use areas
Maintain trail system

Is a timber harvest recommended? No

Comments: Work should be done to control invasive plants. Bush honeysuckle and autumn olive can be cut and the stump treated with herbicide or treated by a foliar spray (in late fall). Enclosed you will find a factsheet from Ohio State Extension describing the latest concentrations of herbicide recommended.

Hazard trees are trees that have a potential target if it falls. The areas most important to monitor these trees are in parking areas, around buildings, outdoor educational areas, high use trails, and roadways. Dead or obviously damaged trees should be removed from these areas. If assistance is needed to determine the health or integrity of a tree, a professional forester or arborist should be contacted.

Stand # 2 (School Forest) - 5.56 acres

Dominant Species: White Pine, Scotch Pine, surrounded by Sugar Maple, Ash

Forest Type or Dominant Vegetation: As Listed in Dominant Species

Stand Diameter or Size Class: Seedling/Sapling

Stocking Level: Under stocked **and/or Basal Area :** (ft²/acre)

Stand History: Other Since the 1940's this area was established as an outdoor education forest (currently the oldest in Ohio). Now the local high school students plant, shear, and sell the trees on a 7 year rotation.

Topography: Gently sloping

Invasive plants or insects impacting this stand: bush honeysuckle and autumn olive can be found in the surrounding wooded areas

Present conditions for you to consider:

<i>Management Recommendations:</i>
Control invasive plants
Maintain trail

Is a timber harvest recommended? No

Comments: Work should be done to maintain control invasive plants before they become established. Bush honeysuckle and autumn olive can be cut and the stump treated with herbicide or treated by a foliar spray (in late fall).

Stand # 3 (Pine Forest) - 32.88 acres

Dominant Species: White Pine, Norway Spruce, Red Oak, Yellow-Poplar, Black Locust, Black Walnut

Forest Type or Dominant Vegetation: As Listed in Dominant Species

Stand Diameter or Size Class: Small/Medium sawtimber

Stocking Level: Fully stocked **and/or Basal Area :** (ft²/acre)

Stand History: Other This area was planted through a local conservation group in the 1920's

Topography: Rolling

Invasive plants or insects impacting this stand: bush honeysuckle, autumn olive

Present conditions or resource concerns to consider:

Past management activities completed in this stand:

<i>Management Recommendations:</i>
Control invasive plants
Maintain trails

Is a timber harvest recommended? No

Comments: Work should be done to control invasive plants before they become established. Bush honeysuckle and grapevines can be cut and the stump treated with herbicide or treated by a foliar spray (in late fall).

Management Activity Schedule

Year(s) Suggested	Mgmt. Unit	Required Task?	Acres	Recommendations
2015-2020	1	<input type="checkbox"/>	10	Control invasive plants
2015-2020	All	<input type="checkbox"/>		Mitigate harzard trees in high use areas
2015-2020	2&3	<input type="checkbox"/>		Control invasive plants before they become established in active areas and plantation plantings
2020-2025	1	<input type="checkbox"/>	10	Control invasive plants
2015-2025	All	<input type="checkbox"/>		Maintain trail system
		<input type="checkbox"/>		
		<input type="checkbox"/>		
		<input type="checkbox"/>		
		<input type="checkbox"/>		
2025	Whole Property	<input type="checkbox"/>	Next Site Visit – Woodland reviews are recommended at least once every five years, and plan updates once every ten years, based upon the date of the last woodland evaluation conducted by your forester	

Before entering a timber sale agreement, or conducting other forestry work that is not listed in your activity schedule, contact your forester first to ensure compliance with your approved woodland stewardship management plan

Woodland Resource Descriptions

General Soils Information – a general description of the soil type(s) and the general productive capacity of the soil:

- **Soil Type(s):** Miamian silt and clay loam
- **Soil Drainage Class:** Well drained
- **Site Class: (using Woodland Productivity):** Good

- **General Description of Main Soils:** The Miamian series consists of very deep, well drained soils that are moderately deep to dense till.

Timber Information - a general description of the timber characteristics of quality and potential:

Timber production is practical and possible for this property. The woodlands are stocked with a variety of marketable timber species that can produce valuable wood products now and into the future. Timber stand improvement (TSI) management practices such as grapevine control, cull tree & undesirable hardwood species control, and crop tree release will certainly enhance the quality and value of your timber resources over time, and are important tasks to implement in order to maximize the timber potential in your woodland.

Wildlife – a general description of the wildlife habitat quality and potential:

Your forestland provides valuable habitat for wildlife, including mammals, birds, and amphibians. Many of the tree species are used by this wildlife for food, cover and nesting sites. Some of the more valuable wildlife food trees species include oaks, beech, cherry, dogwood and hickory. Many other tree species are critically important to certain species of wildlife. Grapevines also are an important food and cover for birds.

Cover, food and water are all necessary to attract wildlife. Different species use different cover types, and maintaining a diversity of cover is key to attracting a wide variety of wildlife. A mixture of sapling areas, pole areas and sawtimber areas will help meet the need for habitat diversity. Small openings in the forest and/or open areas along woodland roads help provide areas for birds and their young to come and catch insects. Openings can also be seeded to grass and clover mixes to provide an additional variety of food.

Please note all habitats don't necessarily have to be present on your property...your neighbor's land may offer a habitat type different than what is available at your forest. You can extend habitat benefits using complimentary cover types beyond your boundaries...the wildlife don't mind.

Water - a general description of the water resources on the property:

Soil and water conservation practices can be applied to this property. Perennial streams should always be buffered with trees. Livestock should be kept out of streams. Water control structures should be used in areas where access trails and roadways are present.

The water and soil resources on your property should be protected and enhanced. Using the information in this plan and information available through your local Soil and Water

Conservation District you can implement sound soil and water conservation practices on your property.

Best Management Practices – maintaining the integrity and productivity of woodland sites:

Basic protection measures used to guard your forest soils against problems related to soil/site limitations and equipment usage - rutting, excessive disturbance and compaction, erosion, and sedimentation - are commonly referred to as Best Management Practices (BMP'S). One very easy BMP landowners may use is simply to limit heavy equipment access to dry weather periods.

Hilly to steeply sloped terrain is more subject to site disturbance and subsequent soil erosion and sedimentation. Forest management often may still be accomplished on these steep areas with the use of BMP's. Even when the forest terrain is nearly level to gently rolling, and where slope does not present a hindrance to access for management activities, it is important to keep the trails up away from the small drainages where possible. This helps protect water quality by providing a buffer strip of undisturbed soil and leaf litter where any sediment can be trapped before reaching the drainage, if some should get washed off the path.

During timber harvest activities, follow the Best Management Practices outlined in the Ohio State University Bulletin #916 – BMPs for Erosion Control for Logging Practices in Ohio. This booklet is available online at www.ohiodnr.gov/forestry/ or at your local Division of Forestry office.

Practically speaking, the use of BMP's to prevent soil loss is a sound agricultural practice that helps maintain site & timber productivity. Also, implementing BMP's helps you comply with Ohio's Agricultural Pollution Abatement Law (HB 88) standards for Silvicultural Operations.

Forest Health – a general description of the health of the woodland:

No problematic insect pests or diseases were noted during the woodland review. This woodland shows good overall health and vigor. Control of grapevines on selected crop trees will guard those crop trees from the damage risks posed by this woody native vine. However, native grapevines are part of the forest ecosystem; keeping selected vines may be considered a part of maintaining overall forest health.

Oak species are preferred food sources for the Gypsy moth. The good news is that after the initial wave of Gypsy moths showed up in Ohio, a fungus showed up that keeps these critters in pretty good check. The fungus is named *Entomophaga mimaiga*... "Em" for short. Still, it's a good idea to keep tabs on any oaks present in the forest to see if any egg masses start to show up in July-August - identified as a characteristic tan fuzzy oval mass that looks like Velcro. If you see egg masses, and can count more than 50 during a five minute walk around the oaks, then your trees are at risk of being partially or completely defoliated if the Spring is very dry and therefore not conducive to development of the Em fungus for natural control. There are options for control of Gypsy moth using aerial application of pesticides to the tree leaves, so that larvae ingesting such pesticides then die. One such pesticide is actually a "biocide" - the bacteria *Bacillus thuringiensis* (Bt).

Another woodland pest of great concern is the emerald ash borer (EAB), an invasive insect from Asia that only attacks ash trees. The larvae eat the living tissue of ash trees just underneath the

bark. With a large enough infestation, this process essentially chokes off the flow of water and nutrients within the tree which leads to the tree's mortality. This insect can spread naturally from tree to tree, as well as artificially through the movement of ash material such as firewood.

You can reduce the risk of losses by gradually reducing the ash component of your woodlot. When doing a forest thinning or a crop tree release, if you have a choice between an ash and another desirable species, you may choose to cut the ash and let the other species grow. By gradually doing this ash reduction throughout your woods, you can avoid any serious impact on your woods if the emerald ash borer does eventually get there

The best thing you can do now is to stay informed. The following websites should be checked periodically for the most up to date information on the emerald ash borer:

<http://www.agri.ohio.gov/eab>

<http://www.emeraldashborer.info/>

<http://ashalert.osu.edu/>

<http://www.ohiodnr.com/forestry/health/eab.htm>

Wetlands – a general description of any wetland resources and/or vernal pools:

Wetlands are extremely important for water quality, and they provide unique habitats for fish and wildlife. These are an important forest resource component for overall health of the forest system. Ephemeral or seasonal wetlands – also called vernal pools - are typically small in size, and tucked within the forest cover. Vernal pools periodically dry up and do not contain fish. This drying may occur annually or just during drought years. However, these ephemeral pools provide unique habitat for amphibians like salamanders and frogs, as well as many other species of wildlife. Many landowners find that wetlands improve the aesthetics and overall enjoyment value to their land. It is very important to protect permanent and ephemeral wetland areas for the health of the forest and the environment.

Threatened & Endangered Species – considerations for threatened and endangered species, including the direct relationship with biological diversity:

No specific threatened or endangered species were noted within your forestland, but I did not conduct a complete biological survey. Some threatened or endangered species found in Ohio include the Timber rattlesnake, the Northern Harrier, the Indiana bat, and the American Burying Beetle. Habitat requirements for threatened and endangered species may or may not be found on this forestland; such species have certain habitat requirements. Specific information on threatened or endangered species may be obtained by contacting the Ohio Department of Natural Resources Division of Wildlife directly to access the "Ohio Biodiversity Database":

ODNR - Division of Wildlife
2045 Morse Road, Bldg. G-3,
Columbus, OH 43229-6693
Phone: (614) 265-6452

Archeological/Historical Resources – a general consideration and description of such resources:

Historical and cultural resources are nonrenewable and can never be replaced once destroyed. These resources provide us a unique glimpse into the past and a look at the people and how they cared for the land. Good stewardship involves recognizing these resources and protecting them. These resources should be conserved whenever possible when they are present on the property.

Recreation – current and potential recreational activities at property:

Each forest has a unique history and character...and this continues to build under your stewardship. This forest could be used for hunting, picnicing, or wildlife watching. Many landowners find enjoyment in doing improvement work in their woods. Others find pleasure in watching the birds. Some folks gain gourmet foods from the woods, gathering fruits, nuts, or wild mushrooms. Flowering trees like dogwood, redbud and serviceberry, whenever present, add to the beauty of the forest. Maintaining some trails will improve access and your opportunities for use of the area. A walk in the forest provides a time of learning but also a time to relax. The woodlands can be a quiet place of solitude after a busy day at work, or anytime for that matter.

Aesthetics – current or future aesthetic considerations for the woodland:

Forest aesthetics is often associated with older, more mature forests. However, it also has been said that beauty is in the eye of the beholder. Many folks enjoy mature forests with big trees...yet other folks find beauty in a young forest vibrant with the songs of early successional forest songbirds, or where they can take their favorite bird dog for an autumn hunt for ruffed grouse. Forest stewardship management addresses these and other various aesthetic tastes, and may weigh in visual goals of the neighbors. When you are weighing aesthetic goals, consider as a "group" 1) visual aesthetics, 2) the aesthetics of a dynamic functioning forest ecosystem, and 3) the particular wildlife species you hope to encourage at your property.

Other Resources – a general description of any other notable woodland resources:

Associated forest resources vary somewhat from forest to forest, but typically include a variety of herbaceous plants present within the woodlands or old fields within a property. Spring, summer, and fall wild flowers provide non-timber benefits to anyone who takes the time to enjoy the blossoms. Along with the flowers, there is a vast array of insect life – pleasant and sometimes unpleasant – that is essential to good ecosystem function. Native and non-native honey bees and butterflies are examples of beneficial insects. Medicinal shrubs and herbs and maple syrup are more examples of other beneficial forest resources.

Fire – identify hazards, fire breaks, safety zones, note dead trees from insects or disease, etc.:

Properties and homes in Ohio are not immune to the risks of fire and fire-related damage. Spring and fall are Ohio's main "fire seasons". A step one may take to protect one's forest is to have a system of paths that may double as fire breaks. For the home site, maintain good access for fire vehicles, create a defensible space around your home and outbuildings by removing flammable materials such brush, leaves, sticks, and twigs; remove these from roofs and gutters too. Landscape around buildings with less flammable plants and materials, avoid evergreens by or

near the home, keep an outdoor water source, and avoid outdoor burning. For more information on outdoor fire safety and fire safety around your home, Firewise brochures are available from the Ohio Division of Forestry (toll-free 877-247-8733). You may also contact your local fire department with questions about Firewise and home safety regarding wildfire.

Ohio Fire Laws: ORC 1503.18 regarding kindled fires prohibits outdoor open burning statewide in unincorporated areas during the months of March, April, May, October, and November between the hours of 6:00 am and 6:00 pm. ORC 1503.18 is administered by the Ohio Division of Forestry; call toll-free 877-247-8733 with questions. OAC 3745.19 regarding outdoor burning is administered by the Ohio Environmental Protection Agency (EPA); EPA notification is required for many types of open burns in Ohio. Call 614-644-2270 with questions, or visit www.epa.ohio.gov/dapc/general/openburning.aspx.

Carbon Cycle – Healthy, sustainably managed forests can help to reduce atmospheric carbon:

When you as a forest landowner choose to maintain your forest land rather than convert it a non-forest use, you are making a significant contribution to the carbon cycle equation; healthy forests generally take in (sequester) more carbon than they release. Forest landowners that hold an interest or focus upon the carbon cycle have opportunities to enhance carbon sequestration on the property by conducting various silvicultural practices that enhance the forest's ability to capture and hold carbon, and by re-establishing woodlands on non-forested land.

Efforts to reduce carbon dioxide emissions have resulted in carbon now being a priced environmental commodity in the global marketplace. Active forest managers may find opportunities for carbon trading under participation in “ecosystem services” markets. For further information about carbon sequestration and voluntary carbon markets, plus other potential forest ecosystem services, visit the US Forest Service web site at <http://www.fs.fed.us/ecosystems-services/>.

Forestry Terms – Forestry terminology for landowners, professional foresters, and others:

Consistent forestry terminology is essential to anyone interested and involved in the science, management, and conservation of forests. The Society of American Foresters (SAF) offers a great resource for such forestry terminology: “The Dictionary of Forestry”. This dictionary is an excellent tool available for anyone to learn more about the language used in forestry. The dictionary provides precision, clarity, and consistency in communication of forestry terms. You may access “The Dictionary of Forestry” for free at SAF at www.dictionaryofforestry.org. If internet access is not available, one may purchase a printed version from SAF (toll free 866-897-8760).