



Strode's Barn

Natural Area Stewardship Report

East Bradford Township, Chester County, PA

November 2016



Natural Lands Trust

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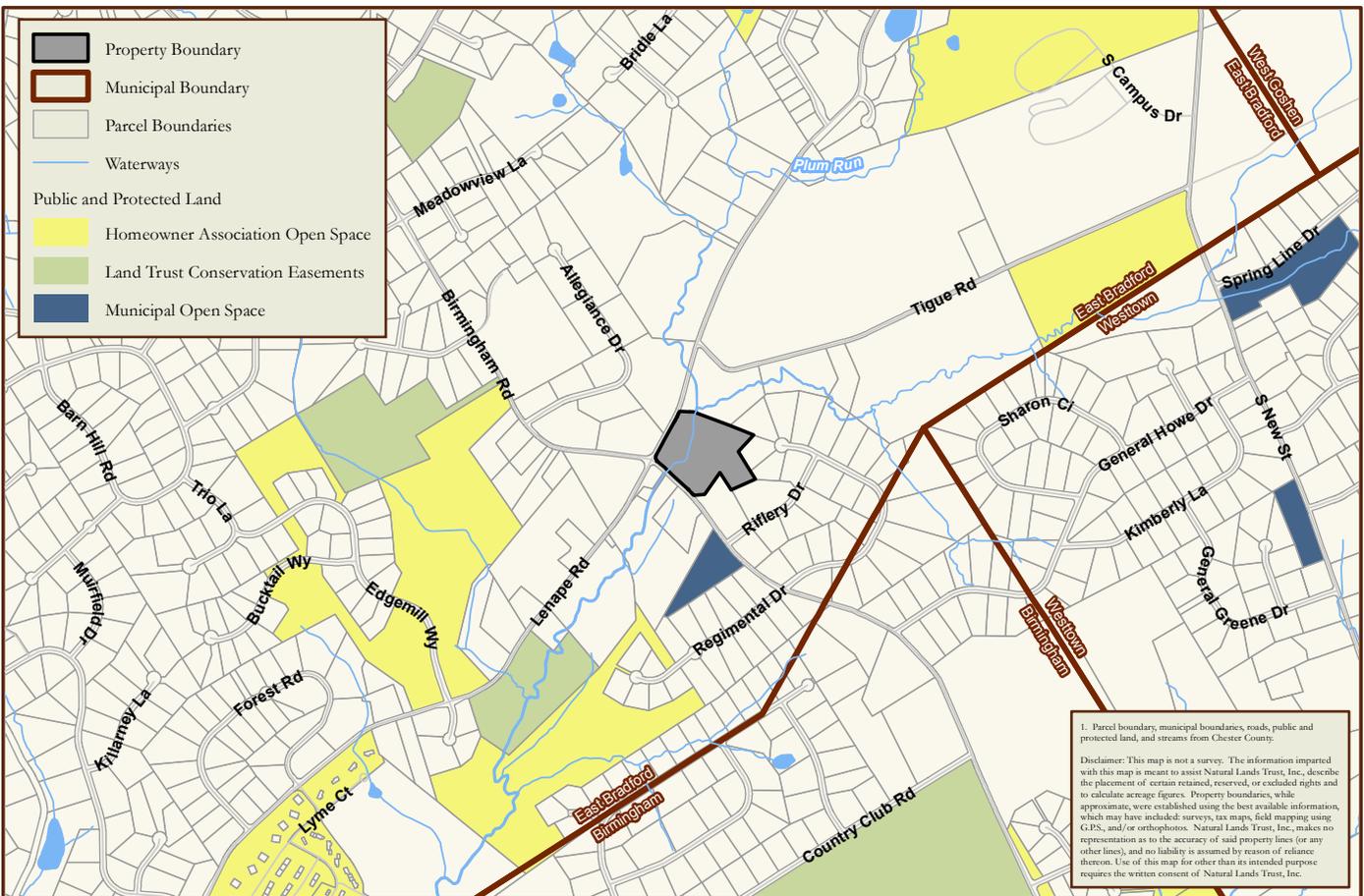
Natural Lands Trust

Hildacy Farm Preserve
1031 Palmers Mill Road
Media, PA 19063
610-353-5587
natlands.org

November 2016

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1. Parcel boundary, municipal boundaries, roads, public and protected land, and streams from Chester County.
 Disclaimer: This map is not a survey. The information imparted with this map is meant to assist Natural Lands Trust, Inc. describe the placement of certain retained, reserved, or excluded rights and to calculate acreage figures. Property boundaries, while approximate, were established using the best available information, which may have included: surveys, tax maps, field mapping using GPS, and/or orthophotos. Natural Lands Trust, Inc. makes no representation as to the accuracy of said property lines (or any other lines), and no liability is assumed by reason of reliance thereon. Use of this map for other than its intended purpose requires the written consent of Natural Lands Trust, Inc.


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Public and Protected Land
STRODE'S BARN PROPERTY
 Tax ID: 51-7-137.2 (+/- 6.9 acres)
 East Bradford, Chester County, PA

N

 0 500 1,000 Feet
 Compiled By: KEB 06/06/16

INTRODUCTION

GENERAL PROPERTY DESCRIPTION

The 6.9-acre Strode's Barn Property (Property) is located in East Bradford Township, Chester County at the intersection of Lenape Road and Birmingham Road. The Property was acquired by the Township in 2012 to protect the historic barn on the Property as well as the surrounding natural resources. The Property is adjacent to Strode's Mill, another historic site. Historically, the Property was used for agriculture and was largely open fields through 1971, as evidenced by historical aerial photography (see *Historical Aerial Photography maps, 1937 and 1971*).

Natural Lands Trust staff, accompanied by Mandie Cantlin, Assistant Township Manager, and Tenley Adams, Property and Recreation Assistant,

conducted a field inspection of the Property on June 22, 2016. The Property's natural resources were assessed and documented in field notes and photographs.

HISTORIC SIGNIFICANCE

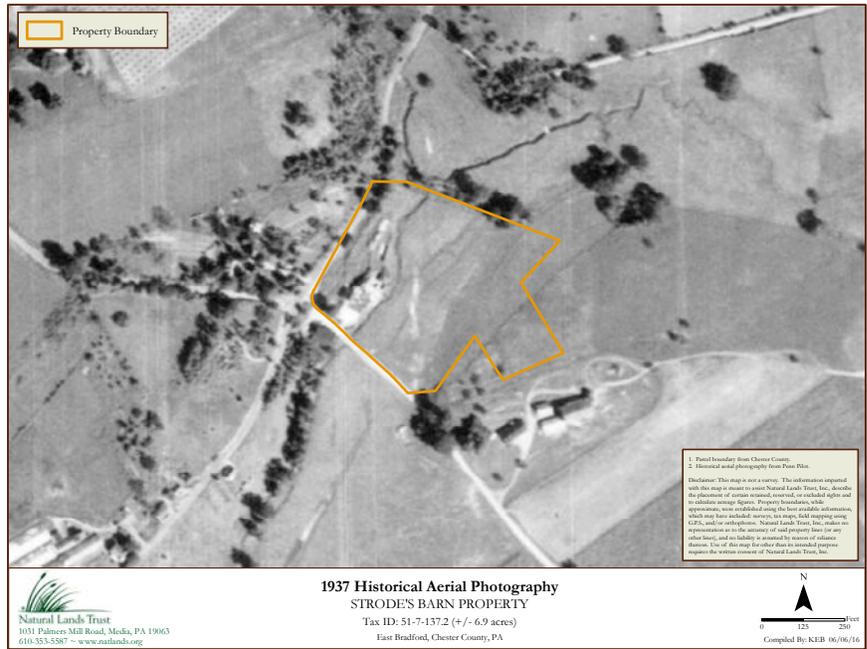
The Property was purchased by the Strode family in the mid 18th century and used as a farm and creamery. The Property is significant due to its proximity to the Battle of the Brandywine, which took place during the Revolutionary War. Prior to the battle, British Troops marched past the Strode Property along Birmingham Road and stopped in the area before continuing to the battle. The Barn, built in

the early 18th century, represents another important chapter in the Property's history. In the mid-19th century, the Strode family began to produce pork and scrapple. The business was a staple of the community into the mid-20th century. The Friends of Strode's Barn and The Strode's Barn Study Committee are assessing the current state and potential future use of the Barn to ensure its continued existence as a key piece of the Township's history.

Protection of the open space around the Barn preserves the connection between open space and the history of the structure and Property. The



Colonial landscape was typically composed of farms with large open spaces, hedgerows, and minimal development. The landscape influenced the path of armies and tactical strategy during the Revolution as troops had to navigate hills and streams to gain the best possible advantage¹. The agricultural history of the area is also reflected in the landscape, again through the presence of open fields and hedgerows. Protecting the landscape and managing the natural resources will preserve a key part of the area's history.



Strode's Barn



¹ Chester County Planning Commission and John Milner Associates, Inc. *The British Left Hook-Preparing for Battle: Scanneltown & Strodes Mill Strategic Landscapes Plan, A Specific Plan for the Brandwine Battlefield Preservation Plan*. December 2015.

SITE ANALYSIS

NATURAL FEATURES

Topography

The elevation of the Property ranges from approximately 208 to 260 feet above mean sea level (see *Natural Features* map). The highest elevation is found along the eastern border. The lowest elevation is found within the stream valley along Plum Run. The Property generally slopes from both the east and west toward Plum Run in the center of the Property. Steep slopes (15–25% and greater than 25%) are found along Plum Run and on the sides of the eastern and western hills.

Water Resources

The Strode's Barn Property is located within the Upper Brandywine watershed. Approximately 545 feet of Plum Run crosses the Property, flowing from north to south. Plum Run is a tributary to the Brandywine Creek, which flows into the Christina River, a tributary of the Delaware River. Hydric soils and a 100-year floodplain accompany the stream and cover the entire valley within the Property. Accounts from neighbors during the public meetings indicate that the Property floods one to three times annually.

Plant Resources

Four vegetation communities are found within the Property (see *Vegetation* map). The remainder of the area is comprised of the barn site and a pump station and lawn. Communities are described below with invasive species highlighted in **bold** type.

Mixed Hardwood Woodland

The eastern third of the Property is a 2.7-acre Mixed Hardwood Woodland. This area is heavily dominated by invasive vines and shrubs.

The canopy is composed of box-elder (*Acer negundo*), sycamore (*Platanus occidentalis*), black walnut (*Juglans nigra*), black locust (*Robinia pseudoacacia*), black cherry (*Prunus serotina*), Eastern white pine (*Pinus strobus*), and **princess-tree** (*Palownia tomentosa*). The understory includes **tree-of-heaven** (*Ailanthus altissima*). The shrub and vine layer includes brambles (*Rubus* spp.), **multiflora rose** (*Rosa multiflora*), **porcelain-berry** (*Ampelopsis brevipedunculata*), Japanese honeysuckle (*Lonicera japonica*), amur honeysuckle (*Lonicera maackii*), **mile-a-minute** (*Persicaria perfoliata*), **oriental bittersweet** (*Celastrus orbiculatus*), and **wineberry** (*Rubus phoenicolasius*). The herbaceous layer is comprised of common milkweed (*Asclepias syriaca*), fleabane (*Erigeron* sp.), goldenrods (*Solidago* spp.), dogbane (*Apocynum androsaemifolium*), stinging nettles (*Urtica dioica*), pokeweed (*Phytolacca americana*), **Japanese stiltgrass** (*Microstegium vimineum*), **Canada thistle** (*Cirsium arvense*), **poison-hemlock** (*Conium maculatum*), **reed canary-grass** (*Phalaris arundinacea*), **crown-vetch** (*Coronilla varia*), and **garlic-mustard** (*Alliaria petiolata*).

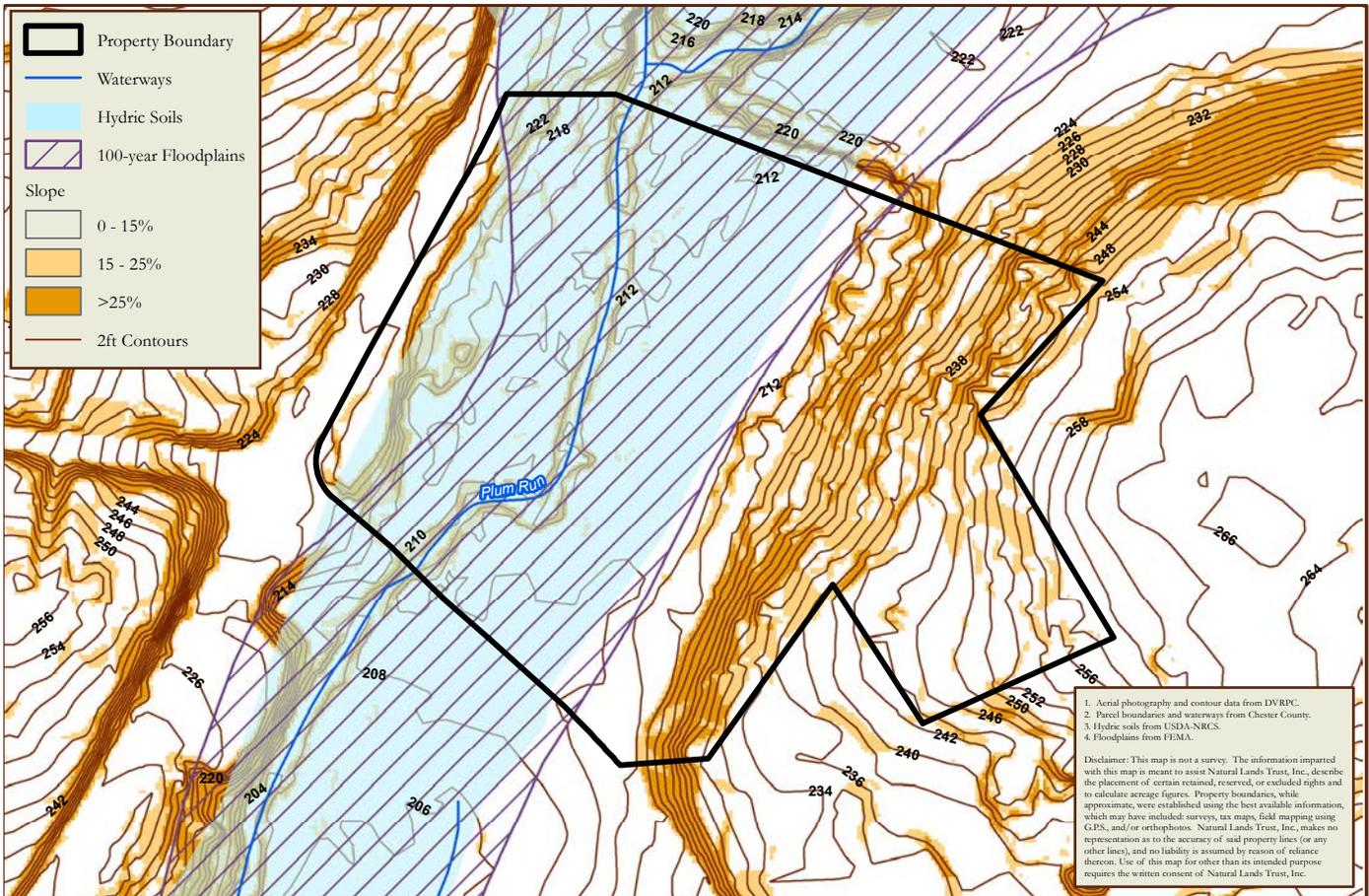
Sycamore Floodplain Forest

The western forest is a Sycamore Floodplain Forest covering 2.1 acres. The canopy is dominated by sycamore. Other canopy species include box-elder and willow (*Salix* sp.). The understory contains

black cherry. The shrub and vine layer is mainly comprised of invasive species. Species present include wild cucumber (*Echinocystis lobata*), tearthumb (*Persicaria sagittata*), multiflora rose, wineberry, mile-a-minute, and porcelain-berry. Plants present in the herbaceous layer include common milkweed, stinging nettle, mullein (*Verbascum thapsus*), jewelweed (*Impatiens* sp.), horsetail (*Equisetum* sp.), reed canary-grass, Canada thistle, poison-hemlock, crown-vetch, Japanese stiltgrass, and garlic-mustard.



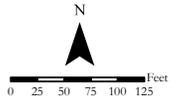
Sycamore Floodplain Forest





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Natural Features
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0 25 50 75 100 125 Feet
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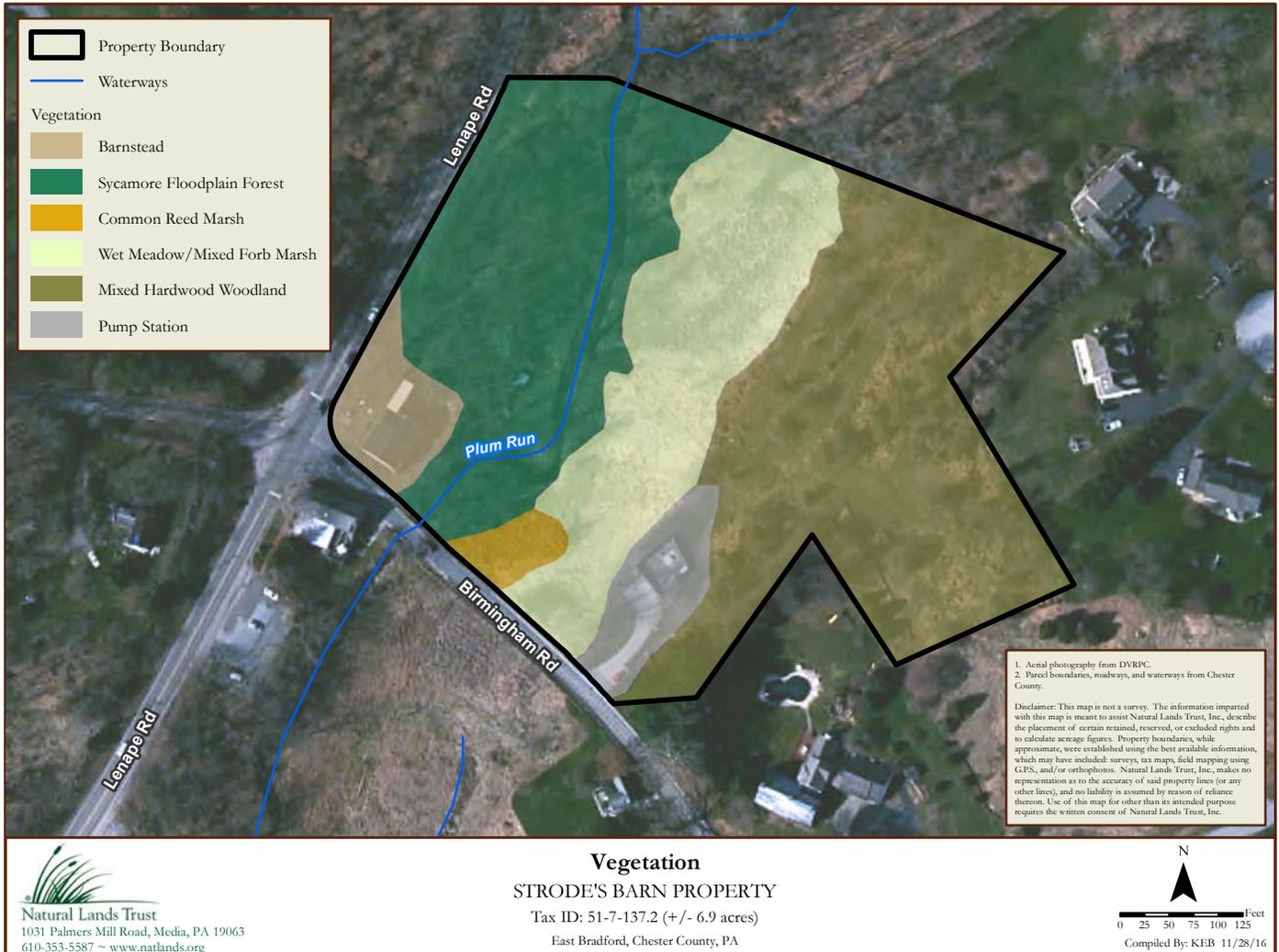


Wet Meadow / Mixed Forb Marsh

The center of the Property is a 1.5-acre Wet Meadow/Mixed Forb Marsh.

Reed canary-grass dominates the Wet Meadow areas. The Mixed Forb Marsh areas are dominated by forbs (non-grass flowering plants). These include common cat-tail (*Typha latifolia*), jewelweed, rushes (*Juncus* spp.), sedges (*Carex* spp.), tearthumb, duck-potato (*Sagittaria latifolia*), sensitive fern (*Onoclea sensibilis*), skunk-cabbage (*Symplocarpus foetidus*), and **common reed** (*Phragmites australis*).

Wet Meadow / Mixed Forb Marsh



Common Reed Marsh

A 0.13-acre marsh containing a **common reed** monoculture is located at the southern boundary of the Property.

CURRENT USE

The majority of the Property is currently unused. The Barn was abandoned approximately 30 years ago and has been deteriorating since then. A pump station located along the southern boundary is used by the Township. A sewer line right-of-way (ROW) crosses the eastern part of the Property from north to south.



Common Reed Marsh

STEWARDSHIP ISSUES, OPPORTUNITIES, AND RECOMMENDATIONS

The following stewardship issues and opportunities were observed during a visit to the Property on June 22, 2016. They are described in the context of two overall stewardship goals for the Property's natural areas:

1. to protect and enhance plant communities that support resident and migratory wildlife; and
2. to provide a safe and enjoyable environment for passive recreation and historical interpretation.

Each stewardship issue and opportunity is followed by general recommendations to address the issue or fulfill the opportunity. The *Stewardship Issues and Opportunities* map shows the vegetation communities and recommended trail layout and amenities.

STEWARDSHIP GOALS AND STRATEGIES

Invasive Plants

Invasive plants are a common problem when stewarding natural lands. They pose a significant threat to natural environments as they out-compete native vegetation and can drastically reduce species diversity, leading to degraded wildlife habitat. Invasive plants edge out native species through a multitude of factors including early reproductive maturity, quick seed germination, long distance seed dispersal, and vegetative and sexual reproduction. They have the ability to adapt to varied habitats, have few predators, accumulate biomass quickly, and may also alter soil chemistry. Invasive plants tend to proliferate in disturbed areas faster than native

species. They are not readily used as a food source by native animals, including deer. This can lead to overgrazing of native species, allowing invasive plants to further colonize the area.

The Strode's Barn Property has invasive plants throughout all vegetation communities. The Common Reed Marsh is the most heavily invaded area, as it is made up entirely of an invasive species—**common reed**. The Mixed Hardwood Woodland has the next highest density of invasive species, with **poison-hemlock** and the multitude of vines being of greatest concern. **Poison-hemlock** is highly toxic to people and animals and spreads rapidly. As such, it is the top priority for removal throughout the Property. Aggressive vines can smother seedlings and can increase a tree's vulnerability to blow-down by increasing the weight on the tree as well as increasing surface area, which can accumulate snow and ice, and act as a sail in high wind. The Sycamore Floodplain Forest has moderate levels of invasive species. Again, **poison-hemlock** and aggressive vines are of high concern. The Mixed Forb Marsh has the fewest invasive species present.

Recommendations

As invasive plants can decrease the dominance and diversity of native plants, as well as negatively impact wildlife habitat, we recommend the following strategies to control invasive species at the Strode's Barn Property. In general, it is best to address invasive plant control with a *top-down* (starting in the canopy and working down through understory, shrub, and groundcover layers), *least-first strategy* (starting in the least impacted areas). Exceptions to this include highly toxic and/or rapidly spreading invasive plants

such as **poison-hemlock**, which has both qualities, and should be the top priority for control. Highly visible areas can be prioritized as they can increase community support for stewardship, such as around the Barn or near the road.

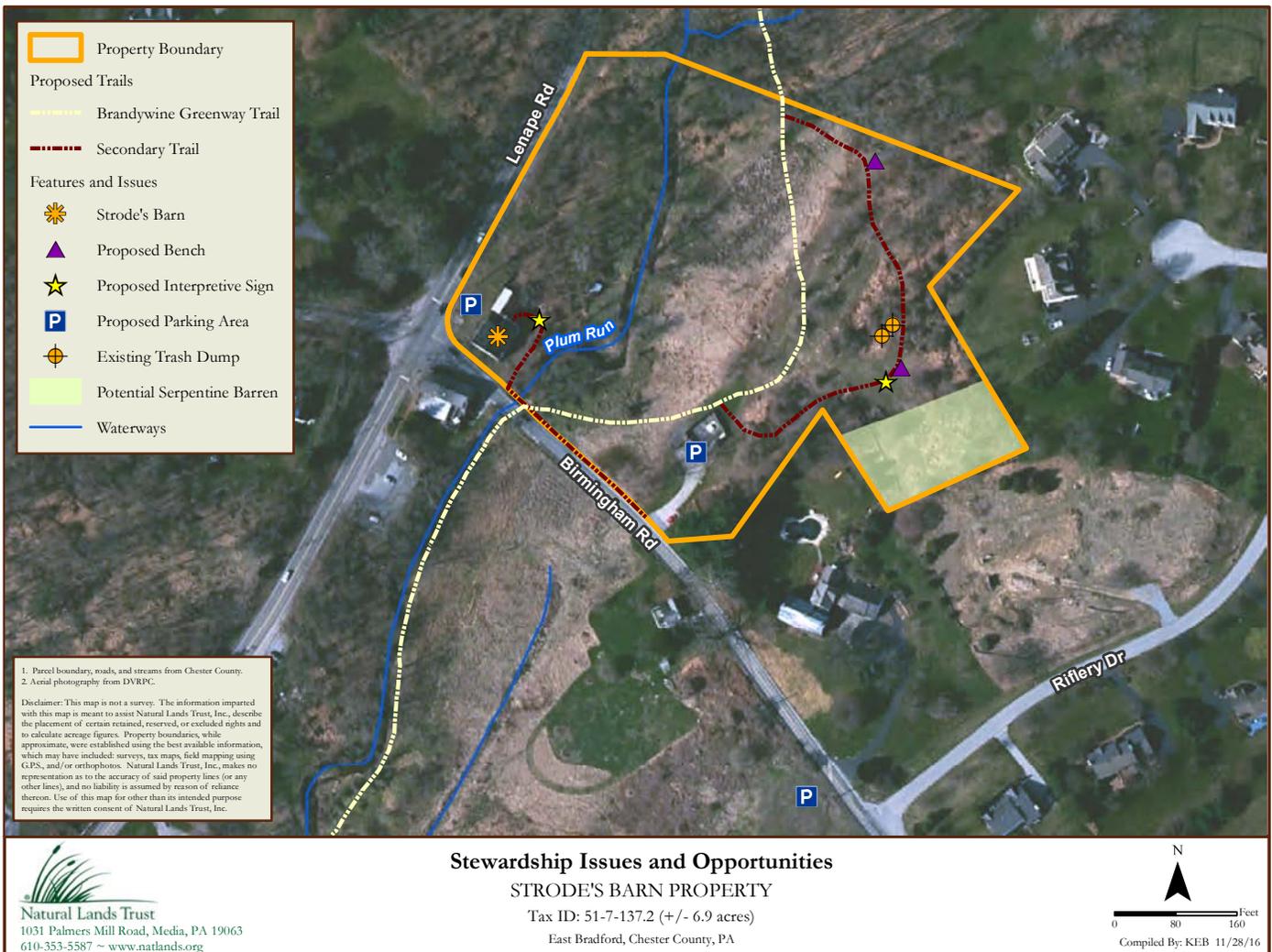
In addition to managing invasive plants already present, it is important to monitor for colonization by new invasive species. It is easier to control and eliminate a species if it is found early, when the population is small and requires far fewer resources to manage.

After removing invasive plants, install native species to restore habitat, deter recolonization by invasive plants, and control soil erosion on steep hillsides. The "Native Plant Materials" section of Natural Lands Trust's *Land for Life: A Handbook on*

Caring for Natural Lands (2014) also provides a list of native species that are appropriate for the natural areas.

In order to successfully revegetate an area with native species, deer populations will have to be kept to a sustainable level. New plantings should be monitored for deer browsing. If needed, protect newly planted trees from deer browsing using tree shelters for plants less than 6 feet in height. For trees over 6 feet in height, tree wraps limit damage from buck rubbing. Newly planted shrubs should be protected with wire fencing. For information on deer management, see "Forest Sustainability" section below.

The following invasive species management recommendations for the Strode's Barn Property are listed in general order of priority. The "Invasive





Poison Hemlock and
Canada Thistle



Porcelain-berry

Vegetation Management” section of Natural Lands Trust’s *Land for Life: A Handbook on Caring for Natural Lands* (2014) also provides guidelines for monitoring and controlling invasive plants typical of the southeastern Pennsylvania landscape.

Any volunteer or contractor involved with invasive plant control should be able to distinguish native species from invasive species (e.g., native poison-ivy from non-native **oriental bittersweet**). In areas near water resources on the Property (the stream, marshes, hydric soils, floodplain), only herbicides approved for aquatic use (e.g., Rodeo) should be applied.

Where trade names are used, no endorsement is implied; Natural Lands Trust and the authors of this document are not liable for problems associated with the use of herbicides described therein.

- Monitor the Property for new colonies or invasive species and address new populations before they mature.
- Control **poison-hemlock** as the top priority throughout the entire Property. **Poison-hemlock** can be hand pulled using rubber gloves for small infestations. Larger populations should be treated with a glyphosate application (using wetland approved herbicides where needed) in the early spring prior to flowering.
- Control invasive plants in the least degraded vegetation communities first, i.e., (1) Mixed Forb Marsh, (2) Sycamore Floodplain Forest, (3) Mixed Hardwood Woodland, (4) Common Reed Marsh. *Vine removal and control within the Mixed Hardwood Woodlands, particularly along Birmingham Road could be prioritized as a highly visible, community building project.*
- Control invasive plants using a top-down approach, i.e., (1) vines and canopy trees, (2) understory trees, (3) shrubs, (4) herbaceous layer.
- In the meadow openings within the Mixed Hardwood Woodland, which are composed almost entirely of invasive plants, a forestry mower or goats can be used to clear vegetation.
- **Japanese honeysuckle**, **porcelain-berry**, and **oriental bittersweet** vines should be cut at ground level and at least 5 feet above the ground. Stumps can be treated with a wetland approved herbicide such as Rodeo from fall to mid-winter. Cutting vines is an appropriate project for volunteers.
- **Tree-of-heaven** should be treated with a triclopyr basal bark application during the fall. After the tree has died it can be removed by cutting if it poses a hazard. Cutting before the tree is dead will result in extensive root sprouting. The recent discovery of a native pathogen of **tree-of-heaven** (a verticillium wilt) holds promise to address this species without herbicides. If available, bringing infected wood from another site will speed up the spread of this pathogen.
- **Princess-tree** can be treated with a basal bark application of triclopyr.
- **Mile-a-minute** weed can be controlled by repeated mowing or herbicide application. Smaller infestations may be hand pulled. Hand pulling **mile-a-minute** (while wearing gloves) is an appropriate project for volunteers.
- **Wineberry** and **shrub honeysuckle** should be cut and then treated with an herbicide. Stumps can be treated with triclopyr or sprouted foliage can be treated with glyphosate.
- **Multiflora rose** can be managed by allowing the rose rosette disease to reduce populations.
- Hand pull **garlic-mustard** in early spring when the plants have flowered. Plants should be bagged and removed from the site to prevent spreading more seed. In heavily invaded areas the basil rosette can be sprayed with glyphosate, which would be followed by hand pulling of any remaining plants approximately two weeks later. Hand pulling **garlic-mustard** is an appropriate volunteer project.
- **Reed canary-grass** may be controlled by cover and mulch, or wetland approved herbicides. Hand pulling or edging out by shading or fast

growing plants may be effective for newer populations. Prescribed grazing may also be effective.

- **Japanese stiltgrass** should be mowed or hand pulled in late summer or can be treated with glyphosate.
- For small colonies, **Canada thistle** can be controlled by hand pulling, being sure to include the taproot, or cutting during the early spring. For larger colonies, Crossbow can be used with moderate results. Hand pulling **Canada thistle** is an appropriate volunteer project (volunteers should wear gloves).
- **Crownvetch** can be controlled by treating with herbicide once in mid-summer and once in the fall.
- **Common-reed** can be controlled by applying a wetland approved herbicide such as Rodeo either directly to the stalks or by first cutting the stalks and then applying a drip application of herbicide inside the cut.
- Plant native species once invasive plants are removed to restore habitat, as well as prevent soil erosion and recolonization by invasive species; protect plantings with tree shelters or fencing. Monitor for deer browsing.



Plum Run

Water Resources

Plum Run is an important natural resource both within the Property and throughout the surrounding area. The 2008 *Restoration Plan for Plum Run Watershed*, created as part of the Red Streams Blue Program by the Brandywine Red Clay Alliance, outlines restoration efforts throughout the watershed. The *Restoration Plan* gives recommendations for issues directly upstream and downstream of the Property, but does not indicate any issues on the Property. The general recommendations from the *Restoration Plan* include improving the riparian buffer.

Riparian buffers are vegetated areas along waterways that protect water quality and quantity. By having an established root system and providing vegetative cover, riparian buffers can lower water temperature, promote infiltration and groundwater recharge, mitigate flooding, filter nutrients, and provide food and habitat for aquatic organisms. A riparian buffer will be of increasing importance as the effects of climate change are felt. Climate change is predicted to increase temperatures and change current precipitation patterns, with higher overall rainfall and more intense events, but with rainfall concentrated in the spring and fall and potential drought conditions over the summer. A riparian buffer could help mitigate these impacts on water

quality and flow by maintaining lower water temperatures (through stream shading) and by increasing infiltration into groundwater reserves that slowly feed waterways throughout the year.

In order for riparian buffers to adequately perform these functions, the U.S. Forest Service recommends at minimum a 95-foot buffer, broken into three different sections. Following their recommendations, the 15 feet closest to the stream is undisturbed forest; this will shade the stream to maintain cool water temperatures and provide detritus.

The next 60 feet is managed forest to promote nutrient filtration and prevent excess sediment from reaching the stream. Trees and shrubs in this zone are periodically pruned to promote rapid growth, which results in increased intake of nutrients that would otherwise enter the waterway. The last 20 feet is grasses or a grass and shrub mix to reduce water runoff. Stream bars and conservation swales can help increase stormwater infiltration further.

Recommendations

The Mixed Forb Marsh provides an effective buffer. The adjacent forest and woodland provide some additional buffering as well. There is an area between the Mixed Forb Marsh and Sycamore Mixed Hardwood Woodland which is a non-marsh area with no trees. Enhancing the riparian buffer by removing invasive plants and adding trees and shrubs in this open area would help protect and improve water quality.

- Protect the existing riparian buffer by controlling invasive plants (see “Invasive Plants” section above) and managing deer populations (see “Deer Management” below).
- Plant trees and shrubs in the gap between the Mixed Forb Marsh and Mixed Hardwood Woodlands.

Deer browsing



Forest Sustainability

A healthy, sustainable forest has well established canopy, understory, shrub and vine, and herbaceous layers. Within each layer a diverse range of plants provide important ecological functions, such as water filtration and habitat for wildlife. A forest with high biological and structural diversity can more easily recover from short- and long-term disturbance events, such as droughts or strong storm events that cause blow-down. New plantings in structural gaps or where there is low diversity can improve forest sustainability, but should only be done after invasive plants in the area are controlled.

Deer overabundance is a common problem in the region which can affect forest health negatively. Deer consume seeds and browse on seedlings, shrubs, and herbaceous plants. A high deer population can decimate structural layers and prevent regeneration. Because they prefer native plants over invasive species, deer can increase the dominance of invasive plants. As the structural and biological diversity is compromised, other wildlife, especially songbirds, is affected by habitat loss. Overabundant deer populations can have direct effects on people as well, as they cause vehicular accidents and are a critical link in the life cycle of the tick that spreads Lyme disease.

Recommendations

In order to determine if the deer population is too high, the Property should be monitored for signs of browsing and lack of regeneration of native plants. If deer populations are unsustainable, a deer management program should be considered. The recommended deer density to perpetuate a healthy native forest with a diversity of native shrubs and wildflowers is 10 deer per forested square mile (one deer per 64 acres). As the Property is only 6.9 acres, only a portion of which is forested, it cannot sustainably support any deer population. Due to the close proximity of residential houses, a public deer management program is not recommended. Instead, a

cull can be implemented—ideally in coordination with adjoining landowners—to reduce the deer population. The cull may have to be repeated over multiple years to reach a sustainable level. As any deer management program will take time to implement and achieve results, new plantings should be protected with tree shelters or fencing (see “Invasive Plants” section above for more information).

- Plant a diverse range of native species in areas where invasive plants have been removed or regeneration of native plants is low. Protect plantings with tree shelters or fencing.
- Monitor the Property for signs of deer browsing. If high levels of browsing are noted, contact the USDA about a deer cull using professional sharpshooters.

Serpentine Barrens

The eastern and western hills are underlain by serpentine geology. This geology can support the unique and globally rare serpentine barrens vegetation community. The soil which sustains this community is very shallow, low in nutrients, and high in metals (magnesium, chromium), producing harsh conditions that prohibit many plants from colonizing. Of the few species that can tolerate the harsh conditions, many are species of concern. Fires and grazing often helped maintain these communities as barrens by preventing soil accumulation and invasion by successional species².

Recommendations

Restoration of serpentine plant communities should only be considered if: 1) there is historical proof that they once existed on this site; and 2) serpentine bedrock is within six inches of ground level. A historic occurrence of serpentine communities would ensure that the seed bank would include serpentine adapted species. To create a serpentine barren from a currently vegetated area, the topsoil needs to be scraped off down to mineral soil and the existing

vegetation needs to be removed. The area could then be vegetated with serpentine barren species from the seed bank, augmented by plantings. Maintenance of this area would require more resources as management would be needed to prevent the encroachment of the surrounding woodlands. The potential area for a serpentine barren at the Strode’s Barn Property only includes the top of the eastern hill. The western hill should not be considered for conversion as it includes the Barn and provides an even smaller area within which to work.

Wildlife Enhancement

Wildlife habitat can be enhanced by leaving dead wood and brush piles within the forest and woodland as they can serve as dens for wildlife and reintroduce nutrients into the soil. Dead standing trees (snags) should also be left if they are located in areas that are not heavily used by the public. Snags benefit wildlife by providing cavities and loose bark for nesting and shelter, perching sites, and decaying wood for insects that provide food for birds such as woodpeckers and nuthatches. Visitors should also be reminded to keep their dogs on leashes through educational signage. This will help prevent wildlife from being disturbed by off-leash dogs, particularly during breeding season.

Recommendations

- Provide educational signage for visitors related to the effects of leaving their dogs off-leash—including disturbance of wildlife and other visitors.
- Leave brush piles, dead wood, and snags where they are not hazardous to visitors.

Hazards and Unwarranted Use

There is a potential for hazard trees (trees that due to structural defects could fall in part or whole on a “target” such as a road, residence, or person) along roadways, trails and other locations where the public might pause for any extended time—such as a sign, bench, or the Barn area. As the landowner, East

² Zimmerman, E., T. Davis, G. Podniesinski, M. Furedi, J. McPherson, S. Seymour, B. Eichelberger, N. Dewar, J. Wagner, and J. Fike (editors). 2012. *Terrestrial and Palustrine Plant Communities of Pennsylvania, 2nd Edition*. Pennsylvania Natural Heritage Program, Pennsylvania Department of Conservation and Natural Resources, Harrisburg, Pennsylvania.

Bradford Township is responsible for preventing trees and branches from falling into the adjacent right-of-way on the bordering roads through the monitoring and removal of hazard trees. The Property abuts Lenape and Birmingham Roads along two sides and will have at least one trail through the woodlands; these areas should be monitored regularly. The forest around the Barn should also be monitored, as this area will be a gathering point for the public. Vines growing on the trees in these areas create a greater risk as they can both kill trees and increase their susceptibility to wind due to increased weight.

Unwarranted use is another concern for the Property given the large extent of road frontage. Although only a small amount of trash was noted during the site visit, it is best to address this issue as soon as possible to deter further occurrences.

Recommendations

- Monitor potential hazard tree areas—public roads, trails, the Barn, benches, and interpretive signs—by foot once each year and following severe storms. Address potential hazard trees (prune or remove) as needed. Ideally, a certified arborist should be hired to complete this task and address any identified hazards through pruning or removal. See the “Hazard Tree Monitoring Program” section of the Natural Lands Trust’s *Land for Life: A Handbook on Caring for Natural Lands* (2014) for information about procedures for hazard tree monitoring.
- Remove vines from trees near roads, trails, or public gathering areas (see “Invasive Plants” section above).
- Monitor and remove scattered trash regularly.

Boundary Encroachment

Proper maintenance of property boundaries is an important stewardship priority on open space parcels. Undeveloped properties are often subject to unwarranted and frequently unintentional use by neighbors due to poorly marked boundaries. These

activities may include dumping of yard waste or placements of sheds, fences and other structures on the Township property. The Township has already posted boundary signs on the Property boundary to address the potential for unwarranted use.

Recommendations

- Maintain boundary postings to assist in preventing encroachment issues and to inform passing motorists about the location of the public open space.

PASSIVE RECREATION AND HISTORIC INTERPRETATION

The Strode’s Barn Property is an important site for passive recreation due to its rich history and future inclusion in the Brandywine Greenway.

The Brandywine Greenway Trail is planned to cross Plum Run above the Strode’s Barn Property and traverse the Property from north to south along the sewer right-of-way (see *Stewardship Issues and Opportunities* map). Specifications for the Trail should follow the plan designed by the Brandywine Greenway. Secondary trails can be added to connect to points of interest on the Property—one climbing the eastern hill to a scenic overlook and one from the Trail to the Barn. If the Birmingham Road bridge is rebuilt with a pedestrian walkway, the second trail can run along the road and connect to the Barn. Because the Brandywine Greenway Trail will be crossing Birmingham Road, traffic calming measures should be implemented along Birmingham Road.

The Property is included in the County’s plans for the Brandywine Battlefield area as a potential interpretive site with a visitor center³. If the Barn does become a visitor center, it will offer a greater opportunity to show visitors how the landscape and the history of the site influenced each other. Interpretive signage along the trails can connect visitors to the landscape and history of the area. In the overlook area, an interpretive sign that describes how the landscape has changed from a farm field to its current state and how it was used at

³ Chester County Planning Commission and John Milner Associates, Inc. *Brandywine Battlefield Preservation Plan: Revolution in the Peaceful Valley*. December 2013.

different points in time can help visitors understand the evolution of the Property. Alternatively, the sign could focus on how the landscape would have looked at a specific point in time, such as during the Revolutionary War. A second interpretive sign on the trail leading to the Barn can describe the history of the structure. Other opportunities for interpretive signs include:

- How the landscape influenced troop movement
- The importance of streams and fords during the Battle of the Brandywine and the condition of streams then and now
- How the British used the area as a resting point before battle

The Township should consider installing a property entrance sign along Birmingham Road near the trail entrance. The entrance area could also include a kiosk with trail map and a dog station. Beautification plantings such as flowering trees and shrubs could be installed in this area. In addition, benches would be appropriate at the scenic overlook and along the Brandywine Greenway Trail as desired.

Opportunities for parking on the Property are very limited due to wetlands, hydric soils, and poor access options. Installation of a small parking lot between the Barn and Lenape Road can be considered if regrading between the road and Barn occurs during Barn demolition. Another option would be to expand the paved area around the pump station. This would only be feasible if the area is redesigned to either move the pumps or submerge them. A grass parking area, used only during events, may be a viable option, as it would not have a significant impact on the natural resources. Other areas along Birmingham Road should be explored for possible parking locations, including the municipal parcel southeast of the Property (dependent upon any restrictions) since it is close to the Property and the planned path of the

Pump station and potential events parking area



Brandywine Greenway Trail. If this option is chosen, traffic calming measures will be needed to allow for safe access to the Trail. Alternatively, an events only parking area can be designated in the mown area around the pump station. Which option the Township chooses may depend on the type and level of use the Barn receives; higher visitation levels may necessitate a paved parking lot off site.

Recommendations

- Install the Brandywine Greenway Trail as determined by the Brandywine Greenway Plan
- Create secondary trails that connect to the Barn and an overlook area
- Install interpretive signage to connect the history of the area to the landscape
- Install a property entrance sign with a kiosk and dog station
- Install benches

VOLUNTEERS

Volunteers can be a great asset when managing conserved lands as many stewardship tasks are well suited to them. These can include cutting and pulling invasive plants as well as providing routine trail

maintenance. One of the most important roles for volunteers is to be eyes and ears on the Property. By having an active volunteer presence, unwarranted uses can be more quickly identified and addressed.

Outreach to community members, especially neighbors, should be conducted to generate a stewardship volunteer base. Conservation oriented groups such as school clubs, hiking groups, and birding groups could be contacted for organized volunteer days. Environmentally themed holidays, such as Earth Day and Arbor Day, are great times to recruit volunteers for one day projects.

Natural Lands Trust has developed methods to involve trained and invested volunteers. Similar volunteer opportunities can be implemented at the Property for engaging the community. Effective methods of engaging volunteers include:

Volunteer Groups

Volunteer groups can engage a range of audiences, such as work groups, sports teams, school classes, and civic organizations, in a day of service. Designed to both educate and engage volunteers, group service days are an opportunity for all ages to take an active role in caring for the Property through tasks such as invasive plant control and tree planting. Service groups should be considered an important part of volunteer programming.

Friends of Strode's Barn Stewardship Corps

A dedicated volunteer group could benefit the Property by providing regular care and maintenance under the direction of the Township. Additionally, a Friends group could monitor the Property for inappropriate uses, trail issues, or trash problems and report any concerns to the Township.

Natural Lands Trust's Force of Nature Volunteer Training Program

The Friends group could benefit from training similar to Natural Lands Trust's Force of Nature volunteer program. NLT's Force of Nature volunteers have participated in an in-depth training program, preparing them to assist with stewardship and visitor outreach as either a Trail Ambassador or Team Leader. Trail Ambassadors walk the trails, greeting visitors and helping with property care. Team Leaders lead volunteer groups or help with ongoing volunteer projects in our offices and on our preserves.

Recommendations

- Establish a Friends of Strode's Barn Stewardship Corps. Train volunteers in common stewardship practices
- Host events and group work days for community members and groups

FUTURE ACQUISITIONS

To improve the environmental and recreational benefits of the Property, emphasis should be placed on expanding connections to other land held as conservation areas. Connecting preserved lands can increase habitat area and preserve the historic and cultural landscape. In this case, the Brandywine Greenway Trail would benefit from protection of connecting lands to create a scenic corridor for the trail. The Property is in close proximity to other preserved land including homeowner association open space, municipal open space, and conservation easements. Undeveloped land that is either adjacent to the Strode's Barn Property or can provide a connection to other preserved lands should be priority preservation targets.

PUBLIC PARTICIPATION

Public meetings were held at the East Bradford Township building to connect with and gather input from community members. The first public meeting was held June 15, 2016 and the second meeting was held July 7, 2016. Background information about the Property, including current resources and past uses and issues, was presented to community members. Feedback about desired uses was then solicited from the audience. Community members were also encouraged to submit input after the meeting. In general, discussion focused on the history of the Property, parking, stream restoration, invasive plants, and the Brandywine Greenway Trail.

STEWARDSHIP PRIORITIES AND IMPLEMENTATION SCHEDULE

PRIORITY ¹	STEWARDSHIP RECOMMENDATIONS	SEASON	WHO COULD IMPLEMENT? ²
FIRST YEAR			
Invasive Plants			
1	Control poison-hemlock	Spring	Township Staff or Contractor
1	Monitor the Property for new colonies of invasive species	Anytime	Township Staff
1	Control invasive plants in the least degraded vegetation communities first: (1) Mixed Forb Marsh, (2) Sycamore Floodplain Forest, (3) Mixed Hardwood Woodland, (4) Common Reed Marsh)	Spring - Based upon the vegetation communities habitat value priority ranking, begin focused invasive removal using techniques described below.	Township Staff
1	Control oriental bittersweet , porcelain-berry , and Japanese honeysuckle ; prioritize highly visible areas for volunteer projects	Anytime - cut vines at ground level and at 5 feet above the ground; Fall - cut and herbicide stumps	Township Staff or Volunteers
2	In heavily invaded forest canopy gaps, use Fecon mower or goats to remove invasive species	Anytime	Township Staff or Contractor
2	Control mile-a-minute	Spring - pull with gloves; Summer and Fall - mow repeatedly or herbicide	Township Staff or Volunteers
2	Control shrub honeysuckle and wineberry	Fall - cut to stump and herbicide	Township Staff
2	Control garlic-mustard	Early Spring and summer - pull, bag, and remove from site or treat with glyphosate using wick application	Township Staff or Volunteers

¹ 1 = high priority; 2 = mid-priority; 3 = low priority

² Must have PA Pesticide Applicator Certification to apply herbicides on public property

PRIORITY ¹	STEWARDSHIP RECOMMENDATIONS	SEASON	WHO COULD IMPLEMENT? ²
Invasive Plants, <i>continued</i>			
2	Control Japanese stiltgrass	Late summer - mow or hand pull	Township Staff or Contractor
2	Control reed canary-grass	Fall	Township Staff or Contractor
2	Control Canada thistle	Spring - hand pull, cut, or apply spot herbicide	Township Staff or Volunteers
3	Control crown-vetch	Mid-Summer and Fall - herbicide	Township Staff
2	Revegetate after invasive removal	Spring or Fall	Township Staff or Volunteers
N/A	Multiflora rose	Can be managed by allowing the rose rosette disease to naturally reduce the population	N/A
Deer Management			
1	Monitor plantings for deer over-browsing; if indicative of unsustainable population levels, consider implementing a cull	Year-round	Township Staff
Wildlife Enhancement			
2	Leave dead wood and snags for wildlife habitat	Anytime - in areas not accessed by visitors	Township Staff or Volunteers
2	Leave brush piles for wildlife	Anytime - in areas not accessed by visitors	Township Staff or Volunteers
Hazards and Debris			
1	Monitor for hazard trees	Annually and after severe storms	Township Staff
1	Remove scattered trash	Year-round	Township Staff or Volunteers
2	Monitor for new signs of trash	Year-round	Township Staff or Volunteers
Boundary Encroachment and Illegal Use			
1	Add property boundary signs where lacking	Anytime	Township Staff
1	Monitor for signs of encroachment	Annually	Township Staff

PRIORITY ¹	STEWARDSHIP RECOMMENDATIONS	SEASON	WHO COULD IMPLEMENT? ²
Volunteers			
2	Host events and group work days for community members and groups	Anytime	Township Staff

SECOND YEAR

Invasive Plants

1	Control poison-hemlock	Spring	Township Staff or Contractor
1	Monitor the Property for new colonies of invasive species	Anytime	Township Staff
1	Control invasive plants in the least degraded vegetation communities first: (1) Mixed Forb Marsh, (2) Sycamore Floodplain Forest, (3) Mixed Hardwood Woodland, (4) Common Reed Marsh)	Spring - Based upon the vegetation communities habitat value priority ranking, begin focused invasive removal using techniques described below.	Township Staff
1	Control oriental bittersweet, porcelain-berry, and Japanese honeysuckle	Anytime - cut vines at ground level and at 5 feet above the ground; Fall - cut and herbicide stumps	Township Staff or Volunteers
2	In heavily invaded forest canopy gaps, use Fecon mower or goats to remove invasive species	Anytime	Township Staff or Contractor
2	Control tree-of-heaven	Fall - basal bark application	Township Staff
2	Control Princess-tree	Fall - basal bark application	Township Staff
2	Control mile-a-minute	Spring - pull with gloves; Summer and Fall - mow repeatedly or herbicide	Township Staff or Volunteers
2	Control shrub honeysuckle and wineberry	Fall - cut to stump and herbicide	Township Staff
2	Control garlic-mustard	Early Spring and summer - pull, bag, and remove from site or treat with glyphosate using wick application	Township Staff or Volunteers
2	Control Japanese stiltgrass	Late summer - mow or hand pull	Township Staff or Contractor
2	Control reed canary-grass	Fall	Township Staff or Contractor

PRIORITY ¹	STEWARDSHIP RECOMMENDATIONS	SEASON	WHO COULD IMPLEMENT? ²
Invasive Plants, <i>continued</i>			
2	Control Canada thistle	Spring - hand pull, cut, or apply spot herbicide	Township Staff or Volunteers
3	Control crown-vetch	Mid-Summer and Fall - herbicide	Township Staff
3	Control common-reed	Fall - herbicide	Township Staff or Contractor
2	Revegetate after invasive removal	Spring or Fall	Township Staff or Volunteers
N/A	Multiflora rose	Can be managed by allowing the rose rosette disease to naturally reduce the population	N/A
Forest Communities			
2	Plant trees and shrubs in areas of low regeneration; protect with tree tubes	Spring or Fall	Township Staff or Volunteers
Deer Management			
1	Monitor plantings for deer over-browsing; if indicative of unsustainable population levels, consider implementing a cull	Year-round	Township Staff
Wildlife Enhancement			
2	Leave dead wood and snags for wildlife habitat	Anytime - in areas not accessed by visitors	Township Staff or Volunteers
2	Leave brush piles for wildlife	Anytime - in areas not accessed by visitors	Township Staff or Volunteers
3	Install educational signage about effects of dogs off-leash on wildlife	Anytime	Township Staff
Passive Recreation			
2	Install the Brandywine Greenway Trail	Anytime	Township Staff or Volunteers
3	Install secondary trails	Anytime	Township Staff or Volunteers
Hazards and Debris			
1	Monitor for hazard trees	Annually and after severe storms	Township Staff
2	Monitor for new signs of trash	Year-round	Township Staff or Volunteers

PRIORITY ¹	STEWARDSHIP RECOMMENDATIONS	SEASON	WHO COULD IMPLEMENT? ²
Boundary Encroachment and Illegal Use			
1	Monitor for signs of encroachment	Annually	Township Staff
Volunteers			
2	Host events and group work days for community members and groups	Anytime	Township Staff

THIRD YEAR			
Invasive Plants			
1	Control poison-hemlock	Spring	Township Staff or Contractor
1	Monitor the Property for new colonies of invasive species	Anytime	Township Staff
1	Control invasive plants in the least degraded vegetation communities first: (1) Mixed Forb Marsh, (2) Sycamore Floodplain Forest, (3) Mixed Hardwood Woodland, (4) Common Reed Marsh)	Spring - Based upon the vegetation communities habitat value priority ranking, begin focused invasive removal using techniques described below.	Township Staff
1	Control oriental bittersweet, porcelain-berry, and Japanese honeysuckle	Anytime - cut vines at ground level and at 5 feet above the ground; Fall - cut and herbicide stumps	Township Staff or Volunteers
2	Control tree-of-heaven	Fall - basal bark application	Township Staff
2	Control Princess-tree	Fall - basal bark application	Township Staff
2	Control mile-a-minute	Spring - pull with gloves; Summer and Fall - mow repeatedly or herbicide	Township Staff or Volunteers
2	Control shrub honeysuckle and wineberry	Fall - cut to stump and herbicide	Township Staff
2	Control garlic-mustard	Early Spring and summer - pull, bag, and remove from site or treat with glyphosate using wick application	Township Staff or Volunteers
2	Control Japanese stiltgrass	Late summer- mow or hand pull	Township Staff or Contractor

PRIORITY ¹	STEWARDSHIP RECOMMENDATIONS	SEASON	WHO COULD IMPLEMENT? ²
Invasive Plants, <i>continued</i>			
2	Control reed canary-grass	Fall	Township Staff or Contractor
2	Control Canada thistle	Spring - hand pull, cut, or apply spot herbicide	Township Staff or Volunteers
3	Control crown-vetch	Mid-Summer and Fall - herbicide	Township Staff
3	Control common-reed	Fall - herbicide	Township Staff or Contractor
2	Revegetate after invasive removal	Spring or Fall	Township Staff or Volunteers
N/A	Multiflora rose	Allow the rose rosette disease to naturally reduce the population	N/A
Riparian Buffer			
2	Plant trees and shrubs in gap between the Mixed Forb Marsh and Mixed Hardwood Woodlands	Spring or Fall	Township Staff or Volunteers
Forest Communities			
2	Plant trees and shrubs in areas of low regeneration; protect with tree tubes	Spring or Fall	Township Staff or Volunteers
Deer Management			
1	Monitor plantings for deer over-browsing; if indicative of unsustainable population levels, consider implementing a cull	Year-round	Township Staff
Serpentine Barren			
3	Consider converting eastern hill; if desired begin conversion process	Anytime	Township Staff
Wildlife Enhancement			
2	Leave dead wood and snags for wildlife habitat	Anytime - in areas not accessed by visitors	Township Staff or Volunteers
2	Leave brush piles for wildlife	Anytime - in areas not accessed by visitors	Township Staff or Volunteers

PRIORITY ¹	STEWARDSHIP RECOMMENDATIONS	SEASON	WHO COULD IMPLEMENT? ²
Passive Recreation			
1	Maintain trails	Year-round	Township Staff or Volunteers
2	Install property entrance sign with kiosk and dog station	Anytime	Township Staff
3	Install interpretive signage	Anytime	Township Staff
Hazards and Debris			
1	Monitor for hazard trees	Annually and after severe storms	Township Staff
2	Monitor for new signs of dumping	Year-round	Township Staff or Volunteers
Boundary Encroachment and Illegal Use			
1	Monitor for signs of encroachment	Annually	Township Staff
Volunteers			
2	Host events and group work days for community members and groups	Anytime	Township Staff
3	Establish a Friends of Strode's Barn Volunteer Corps	Anytime	Township Staff
ON-GOING			
Invasive Plants			
1	Control poison-hemlock	Spring	Township Staff or Contractor
1	Monitor the Property for new colonies or invasive species	Anytime	Township Staff
1	Control invasive plants in the least degraded vegetation communities first: (1) Mixed Forb Marsh, (2) Sycamore Floodplain Forest, (3) Mixed Hardwood Woodland, (4) Common Reed Marsh)	Spring - Based upon the vegetation communities habitat value priority ranking, begin focused invasive removal using techniques described below.	Township Staff

PRIORITY ¹	STEWARDSHIP RECOMMENDATIONS	SEASON	WHO COULD IMPLEMENT? ²
Invasive Plants, <i>continued</i>			
1	Control oriental bittersweet, porcelain-berry, and Japanese honeysuckle	Anytime - cut vines at ground level and at 5 feet above the ground; Fall - cut and herbicide stumps	Township Staff or Volunteers
2	Control tree-of-heaven	Fall - basal bark application	Township Staff
2	Control Princess-tree	Fall - basal bark application	Township Staff
2	Control mile-a-minute	Spring - pull with gloves; Summer and Fall - mow repeatedly or herbicide	Township Staff or Volunteers
2	Control shrub honeysuckle and wineberry	Fall - cut to stump and herbicide	Township Staff
2	Control garlic-mustard	Early Spring and summer - pull, bag, and remove from site or treat with glyphosate using wick application	Township Staff or Volunteers
2	Control Japanese stiltgrass	Late summer - mow or hand pull	Township Staff or Contractor
2	Control reed canary-grass	Fall	Township Staff or Contractor
2	Control Canada thistle	Spring - hand pull, cut, or apply spot herbicide	Township Staff or Volunteers
3	Control crown-vetch	Mid-Summer and Fall - herbicide	Township Staff
3	Control common-reed	Fall - herbicide	Township Staff or Contractor
2	Revegetate after invasive removal	Spring or Fall	Township Staff or Volunteers
N/A	Multiflora rose	Can be managed by allowing the rose rosette disease to naturally reduce the population	N/A
Riparian Buffer			
2	Plant trees and shrubs in gap between the Mixed Forb Marsh and Mixed Hardwood Woodlands	Spring or Fall	Township Staff or Volunteers

PRIORITY ¹	STEWARDSHIP RECOMMENDATIONS	SEASON	WHO COULD IMPLEMENT? ²
Forest Communities			
2	Plant trees and shrubs in areas of low regeneration; protect with tree tubes	Spring or Fall	Township Staff or Volunteers
Serpentine Barren			
3	Consider converting eastern hill; if desired begin conversion process	Anytime	Township Staff
Deer Management			
1	Monitor plantings for deer over-browsing; if indicative of unsustainable population levels, consider implementing a cull	Year-round	Township Staff
Wildlife Enhancement			
2	Leave dead wood and snags for wildlife habitat	Anytime - in areas not accessed by visitors	Township Staff or Volunteers
2	Leave brush piles for wildlife	Anytime - in areas not accessed by visitors	Township Staff or Volunteers
Passive Recreation			
1	Maintain trails	Year-round	Township Staff or Volunteers
Hazards and Debris			
1	Monitor for hazard trees	Annually and after severe storms	Township Staff
2	Monitor for new signs of dumping	Year-round	Township Staff or Volunteers
Boundary Encroachment and Illegal Use			
1	Monitor for signs of encroachment	Annually	Township Staff
Volunteers			
2	Host event and group work days for community members and groups	Anytime	Township Staff
3	Establish a Friends of Strode's Barn Volunteer Corps	Anytime	Township Staff

APPENDIX

Invasive Plants in Pennsylvania

Poison Hemlock

Conium maculatum



Pedro Tenorio-Lezama
www.forestryimages.org

Background:

In the 1800s, poison hemlock was brought to the United States from Europe as an ornamental. In ancient times, it was probably used to poison Socrates, a famous Greek philosopher.

Range:

Poison hemlock is native to Europe, western Asia and North Africa. It is now widespread throughout much of North America. It has also been introduced to other continents, such as South America and Australia.

Description:

Poison hemlock is a biennial herb with hollow, purple-spotted stems that can reach eight feet in height. Its finely dissected leaves emit a foul, parsnip-like odor when crushed. Plants begin as a rosette of leaves and flower in the second year of growth. The small, white flowers are borne in umbrella-shaped clusters.



Eric Coombs, Oregon Dept. of Ag.
www.forestryimages.org

Habitat:

This plant commonly occurs in dense stands along roadsides, field margins, irrigation ditches and waste areas. It also invades native plant communities in riparian woodlands, open floodplains and along stream banks.

Biology and Spread:

A single poison hemlock plant can produce over 30,000 seeds. These seeds can adhere to farm machinery, vehicles, fur and clothing, as well as be carried by water, and to a limited extent, wind. Poison hemlock is capable of rapid establishment, particularly in disturbed sites.

Ecological Threat:

Poison hemlock can be a tenacious weed, particularly in moist sites. As a pioneer species, it quickly colonizes disturbed sites, displacing natives. All parts of the plant, especially the seeds, are extremely poisonous to humans and livestock.



John D. Byrd, Mississippi State U.
www.forestryimages.org

How to Control this Species:

Physical

Hand-pulling works best for wet soils with small infestations. Because poison hemlock is not a perennial, removal of the entire root system is not necessary.

Mowing or cutting the plant close to the ground just before flowering is often effective, but may require retreatment if new growth is produced at the base.

Poison hemlock remains toxic for several years after being pulled. Ensure that the material is kept out of reach of children and wildlife.

Look-A-Likes:

Poison hemlock is sometimes confused with the invasive giant hogweed (*Heracleum mantegazzianum*) and our native water hemlock (*Cicuta maculata*). Deaths have occurred from mistaking the roots for wild carrots.



Steve Dewey, Utah State University
www.forestryimages.org

Chemical

The application of herbicides, such as glyphosate and 2,4-D can effectively control large infestations.

Complete eradication may be difficult if a viable seedbank is present.



Barry Rice, sarracenia.com
www.forestryimages.org



Pedro Tenorio-Lezama
www.forestryimages.org

References:

Center for Invasive Species and Ecosystem Health:

<http://www.invasive.org/browse/subinfo.cfm?sub=4365#maps>

USDA Forest Service: <http://www.invasive.org/weedcd/pdfs/wow/poison-hemlock.pdf>

For More Information:

DCNR Invasive Species Site: <http://www.dcnr.state.pa.us/conservationscience/invasivespecies/index.htm>

DCNR Invasive Exotic Plant Tutorial for Natural Lands Managers:
http://www.dcnr.state.pa.us/forestry/invasivetutorial/poison_hemlock.htm



Natural Lands Trust

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