



Applebrook and East Goshen Township Parks

Natural Areas Stewardship Report

MARCH 2010

Location: East Goshen Township,
Chester County

Size: ~100 acres (Applebrook Park)
~55 acres (East Goshen Township Park)

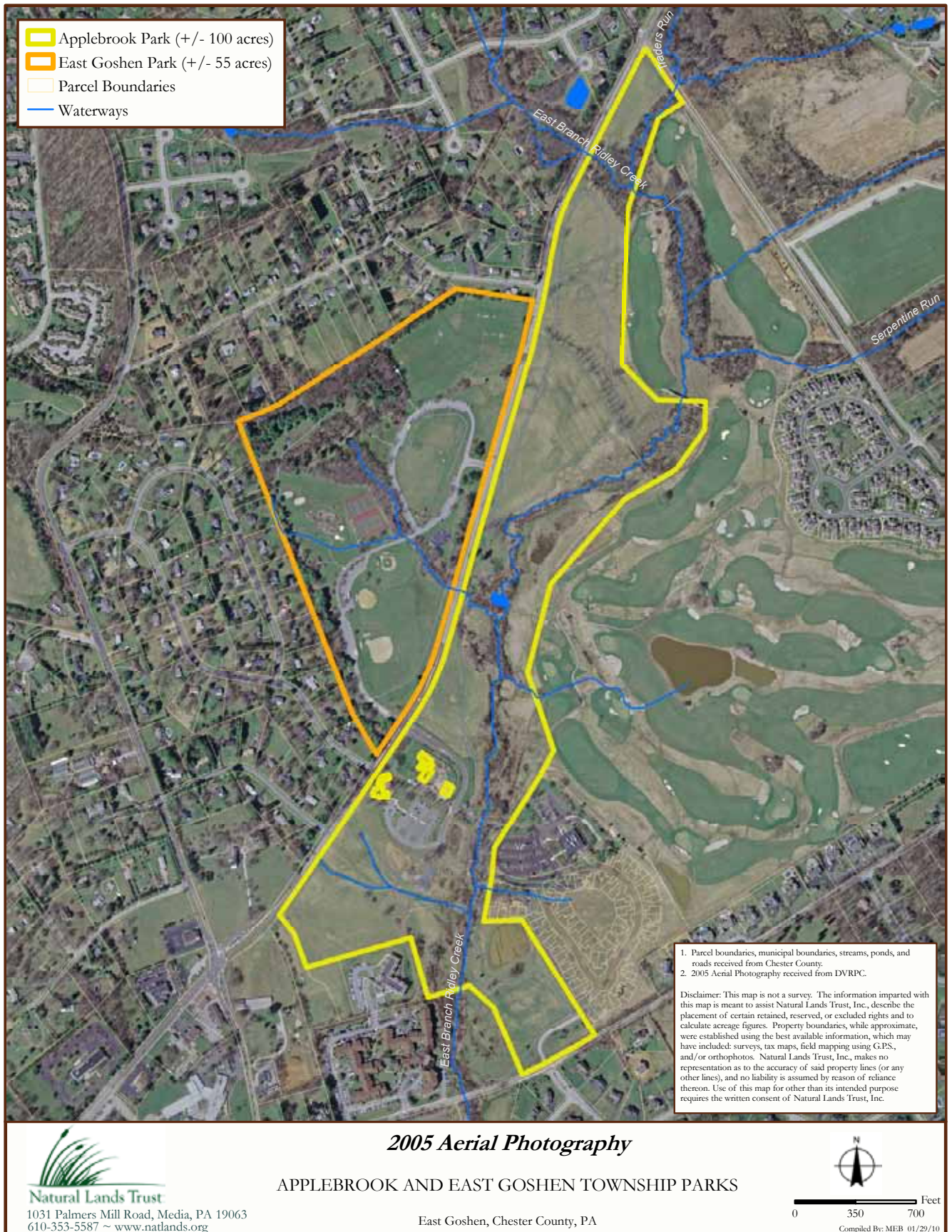
General Description of Natural Areas

Applebrook and East Goshen Township Parks are located in West Chester (East Goshen Township, Chester County) along Paoli Pike, northeast of its intersection with Route 352 (see **2005 Aerial Photography** with property boundaries, *page 2*). David Steckel and Andrea Stevens of Natural Lands Trust conducted a field inspection of Applebrook Park and the forested areas of East Goshen Township Park on December 10, 2009 and were accompanied by Rick Smith (Township Manager), Thom Clapper (Member, Board of Supervisors), Mark Miller (Director of Public Works), Bryan DelMonte (Vice Chair, Conservancy Board), Frank Vattilano (Director of Parks and Recreation), and Bob Huebner (Member, Parks and Recreation Board). Photographs of the natural features on the two sites were taken at this time.



FrogWatch habitat in Applebrook Park (see *Plant Resources*)

Applebrook Park provides open space for passive recreational uses and East Goshen Township Park offers active recreational opportunities for residents of the township. The parks are located within a suburban landscape of residential and commercial uses. A paved walking trail extends across much of the length of Applebrook Park and along the East Branch Ridley Creek that flows from north to south



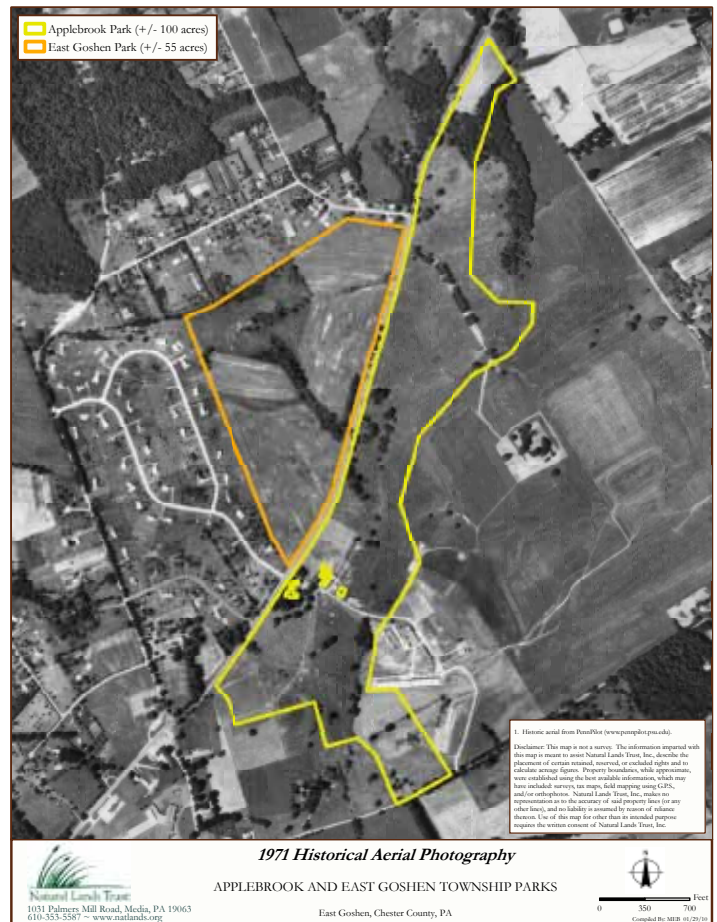
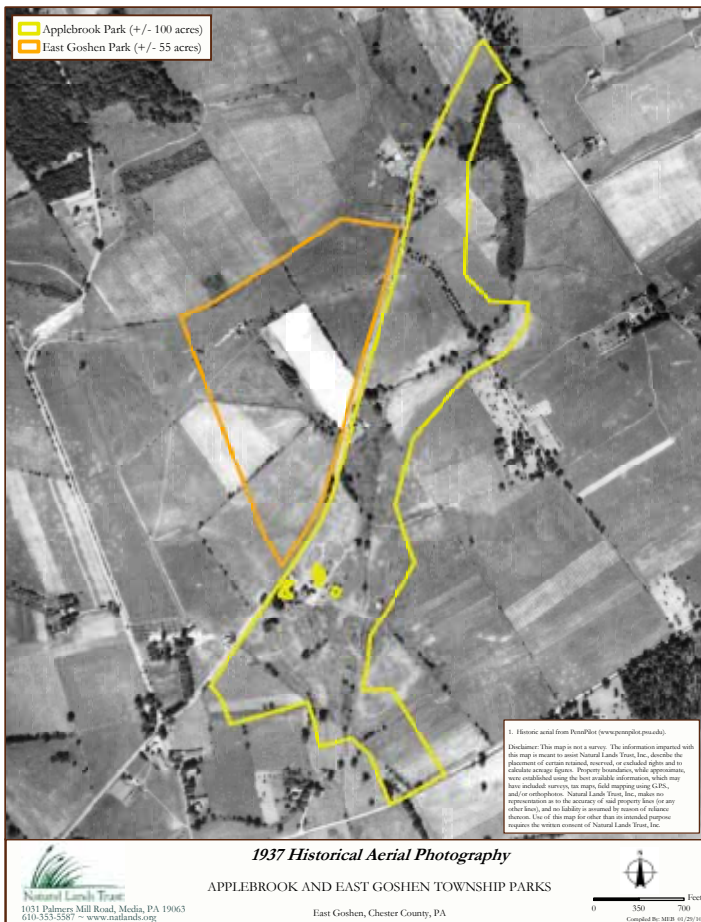
through the property. Facilities in the East Goshen Township Park include playing fields, volleyball courts, tennis courts, basketball courts, a fitness trail, child activity area, and putting green. Paved walking trails provide access for the public to these facilities and through the natural areas in the park. The riparian corridor in Applebrook Park and the forested area in the northwestern corner of East Goshen Township Park are the focus areas of this Natural Areas Stewardship Report.

Historical aerial photography indicates almost exclusively agricultural use of the area in 1937 with residential development appearing to the west by 1971 (see **1937** and **1971 Historical Aerial Photography**). From the mid 1940's until the 1960's, prize cattle were raised on the farm which is now Applebrook Park.

Plant Resources

The general plant communities in Applebrook and East Goshen Township Parks are described below. Non-native invasive species are noted in **bold**.

The natural plant communities of Applebrook Park are associated with the riparian corridor of the East Branch Ridley Creek. Much of the remainder of the park is maintained as mowed lawn and landscaped areas. A **mixed hardwood floodplain forest** occurs along the creek in the middle and southern areas of the park. American sycamore (*Platanus occidentalis*), silver maple (*Acer saccharinum*), black walnut (*Juglans nigra*), and black cherry (*Prunus serotina*) are the canopy trees within this floodplain area, with occasional **European alder** (*Alnus glutinosa*) and willow (*Salix*





Mixed hardwood floodplain forest along the East Branch Ridley Creek



Red maple palustrine forest near northern boundary of Applebrook Park

sp.) in the understory. Dominant shrubs and vines include **multiflora rose** (*Rosa multiflora*), **shrub honeysuckle** (*Lonicera* sp.), blackberry (*Rubus* sp.), grape (*Vitis* sp.), and **oriental bittersweet** (*Celastrus orbiculatus*). Other species that occur less frequently along this corridor include white ash (*Fraxinus americana*) and silky dogwood (*Cornus amomum*). The groundcover was sparse at the time of our dormant season visit, most notably including goldenrods (*Solidago* spp.) and invasions of **mile-a-minute** (*Persicaria perfoliata*) and **teasel** (*Dipsacus* sp.) along forest edges.

Near the northern boundary of Applebrook Park, where the creek flows from west to east, a **red maple palustrine forest** occurs with dominant canopy species including red maple (*Acer rubrum*) and red ash (*Fraxinus pennsylvanica*), with occasional red

oak (*Quercus rubra*) along the forest edge. Skunk-cabbage (*Symplocarpus foetidus*) was the dominant herbaceous species noted along the forest floor in this community.

Cat-tail marshes occur occasionally on the outer edge of the floodplain forest along the creek. These communities are dominated by cat-tail (*Typha* sp.), sedges, with less frequent sensitive fern (*Onoclea sensibilis*), iris (*Iris* sp.), blue vervain (*Verbena hastata*), and red ash seedlings. **Common reed** (*Phragmites australis*) and cat-tail occur along the edges of a detention basin near the park's southern extent. Vegetation typical of **wet meadows** such as rushes (*Juncus* spp.), reed canary-grass (*Phalaris arundinacea*), and cat-tail occurs near the branching headwater tributary to the Ridley Creek near the southern boundary of the park. A large area of cat-tail marsh



Cat-tail marsh along East Branch Ridley Creek



Narrow wet meadow along headwater creek



White pine plantation invaded by red maple and pin oak in East Goshen Township Park



Degraded serpentine barrens in East Goshen Township Park

and wet meadow has been designated as a FrogWatch habitat in Applebrook Park where the calls of frogs and toads are monitored by citizen scientists and data are entered into an online database.

The forested areas in the East Goshen Township Park include a **white pine plantation** that has become invaded by red maple and pin oak (*Quercus palustris*). Shrubs and vines in this forest include American holly (*Ilex opaca*), black-haw (*Viburnum prunifolium*), **privet** (*Ligustrum* sp.), **shrub honeysuckle**, winterberry (*Ilex verticillata*), **Japanese honeysuckle** (*Lonicera japonica*) and poison ivy (*Toxicodendron radicans*). Sensitive fern and **Japanese stiltgrass** (*Microstegium vimineum*) grow along edge areas. A **red maple palustrine forest** occurs north and northeast of the tennis courts in East Goshen Township Park. Interspersed within this forest is an

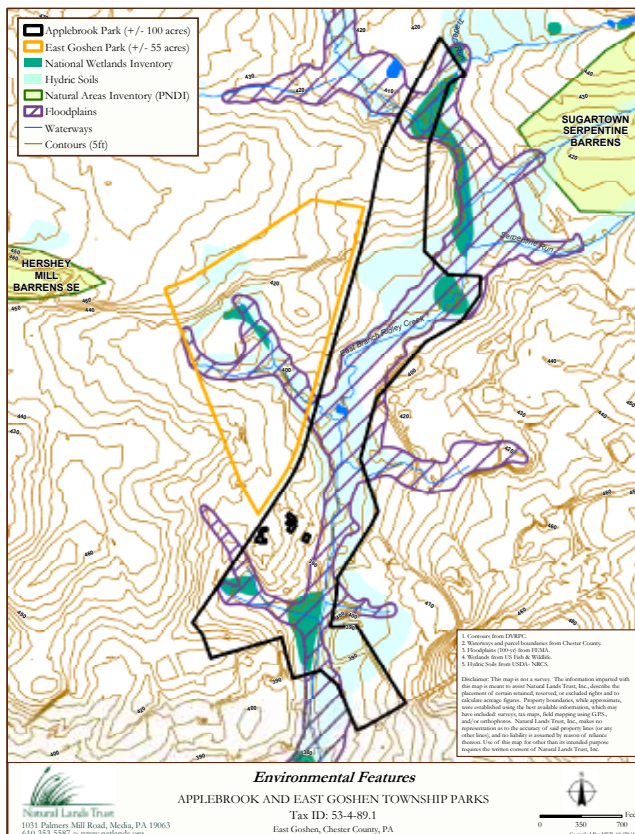
upland component of hickories (*Carya* spp.), red oak, and black gum (*Nyssa sylvatica*).

A swath of degraded **serpentine barrens** stretches across the eastern half of East Goshen Township Park and includes two areas of exposed serpentine bedrock – one along Paoli Pike that features an old quarry and a second in the middle section of the park. These barrens are underlain by the same bedrock formation that supports the nearby Sugartown and Hershey Mill Barrens. Serpentine barrens are rare communities characterized by soil nutrient deficiencies and high metal concentrations. Only a select group of plant species (several of which are rare, including the globally-rare fameflower) are able to survive in these unusual conditions. The fragments of serpentine barrens in East Goshen Township Park have become degraded because

accumulations of organic matter are buffering the toxic effects of the bedrock, allowing more common species to invade the barrens. Current woody invaders include red maple, white pine (*Pinus strobus*), black walnut, staghorn sumac (*Rhus typhina*), Eastern red-cedar (*Juniperus virginiana*), greenbrier (*Smilax* sp.), wineberry (*Rubus phoenicolasius*), Japanese honeysuckle, and multiflora rose.

Water Resources

Applebrook and East Goshen Township Parks fall within the Upper Ridley Creek subbasin of the Ridley Creek Watershed. The East Branch Ridley Creek flows from north to south through Applebrook Park. First order tributaries of this creek bisect East Goshen Township Park and the southern portion of Applebrook Park (see **Environmental Features map**). Creeks in this part of the Ridley Creek Watershed are designated by the Pennsylvania Department of Environmental Protection as high quality trout stocking fisheries.



Spring in Applebrook Park

Current Use and Stewardship

Applebrook Park was set aside as open space with easily accessible trails to encourage passive recreational use by the residents of the township. Current stewardship priorities for the site include protecting and enhancing the natural habitats along the riparian corridor and continuing to provide a destination for passive recreational uses. East Goshen Township Park provides facilities for active recreational uses (playing fields, tennis and basketball courts, children's playing areas, and a fitness circuit area). A stewardship priority for this park includes enhancing the forest areas near the northwestern corner of the property. The township should also consider the feasibility of restoring the serpentine barrens.

Stewardship Issues, Opportunities and Recommendations

The following stewardship issues and opportunities were observed during our site visit to Applebrook and East Goshen Township Parks on December 10, 2009. They are described in the context of two overall stewardship goals for the natural areas:

1. To maintain a safe and enjoyable environment for passive (Applebrook Park) and active (East Goshen Township Park) recreation; and
2. To protect and enhance native plant communities to support resident and migratory wildlife.

We have provided a summary of issues and opportunities for stewardship in the parks that are followed by recommendations to address the issue or fulfill the opportunity.

Invasive Plants

A ubiquitous problem encountered in the stewardship of natural lands in southeastern Pennsylvania – and increasingly recognized as a threat worldwide – is the presence of invasive plant species. An invasive species is one that rapidly spreads and outcompetes multiple native species, chiefly because of the absence of predators, pathogens, and herbivores that keep it in check in its native range. Most invasive plants are particularly well adapted to colonize disturbed areas. In southeastern Pennsylvania, disturbance from human activities, particularly sprawl, coupled with the rich horticultural history of the southeastern counties, has afforded numerous invasive species the opportunity to become well established throughout the region. Even though the occasional immigration of new species into plant communities is a normal process, the current high rate of introduction – fueled by the planting of exotic (non-native) species for horticulture, wildlife management, and erosion control – is threatening the integrity of native plant communities and lowering native biodiversity. Not only do invasive plants alter the makeup of the plant communities on a site, but they also may affect soil chemistry and hydrology and are usually less beneficial to wildlife than the native plants they replace, contributing further to the loss of biodiversity.

The narrow riparian corridor in Applebrook Park is heavily impacted by invasive plants because of the high availability of light. Vines (native grape, **Japanese honeysuckle**, **oriental bittersweet**) are commonly seen climbing into canopy and understory trees bordering the East Branch Ridley Creek. Aggressive vines can greatly raise a tree's vulnerability to blowdown through the increased weight (that elevates the tree's center of gravity) and by the vast increase in surface area (that acts to collect wind, ice, and snow). Vines can also smother tree seedlings and prevent them from reaching the canopy to replace trees felled by old age, windthrow, or pathogens. Heavy invasions of **multiflora rose** are

also impacting most of the riparian corridor in this park and compromising wildlife habitat values.

RECOMMENDATIONS

Since the diversity of native species in a system is not only vital to providing suitable habitat for resident and migratory wildlife, but also contributes to an enjoyable visitor experience for community residents, we suggest the following measures to control invasive plant species on the 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). The "Invasive Vegetation Management" section of the Natural Lands Trust *Stewardship Handbook for Natural Lands in Southeastern Pennsylvania* (2008) provides guidelines for monitoring and controlling invasive plants typical of the southeastern Pennsylvania landscape. The following invasive control recommendations for Applebrook Park, a higher priority for invasive species management than East Goshen Township Park, are presented in general order of priority:

- 1) Cut vines climbing into canopy trees. **Oriental bittersweet** vines should be cut and the stumps treated with a systemic herbicide (e.g., glyphosate), if possible. Because grape vines are beneficial for native wildlife, only cut these vines when they are compromising the structural integrity of native trees. Cut stumps of grape vines can be left to resprout. Care should be taken not to cut poison ivy vines unless they are close enough to paths to warrant removal to limit public exposure. Poison ivy is a native species that benefits wildlife and it rarely becomes large enough to impact canopy trees.
- 2) Control **Japanese honeysuckle** in the forest using a foliar treatment of glyphosate herbicide. This is particularly effective on warm days in the late fall and winter months when the leaves of this species remain green and nearby native (non-target) species are dormant and will not be affected by the treatment.



Vines in canopy tree along the East Branch Ridley Creek

- 3) Improve the integrity of the riparian forest buffer by controlling the invasive trees (**European alder**) and shrubs (**multiflora rose** and **shrub honeysuckle**) along the creek. The shrub species can be cut to the stump and a glyphosate herbicide approved for aquatic use (e.g., Rodeo) can be applied to the cut stump. Alternatively, after cutting, these shrubs can be left to resprout and the young foliage treated with a glyphosate herbicide. **European alder** can be controlled with a foliar spray of glyphosate (e.g., Accord) at $\frac{3}{4}$ –1¼% or with a basal bark treatment of 20–25% triclopyr solution mixed with basal oil. If a brush mower is used to cut invasive shrubs, care should be taken to avoid disturbance of nearby native species such as silky dogwood.



Thicket of multiflora rose covered with Japanese honeysuckle along East Branch Ridley Creek

- 4) In gaps where invasive trees and shrubs have been removed, replant with native species to improve wildlife habitat value and protect exposed slopes from erosion. Red maple, American sycamore, blackgum, silky dogwood, shrub willow, and buttonbush would be appropriate native trees and shrubs for replanting. Additional suggestions for native plantings are included in the “Native Plant Materials” section of the Natural Lands Trust *Stewardship Handbook for Natural Lands in Southeastern Pennsylvania* (2008).
- 5) Remove any small “islands” of invasive trees and shrubs in lawn areas on the property that provide seed sources for nearby natural areas.
- 6) Control **garlic mustard** in the groundcover of the forests by pulling, bagging, and removing plants from the site before seed set in the spring. This is a good spring activity for volunteers of all ages and should be started as soon as possible to prevent further spread.

Any individual using herbicides to control invasive plants on property used by the public should be certified as a Commercial or Public Pesticide Applicator by the Commonwealth of Pennsylvania (see <http://www.pested.psu.edu/applicators>). Contractors and volunteers involved with invasive plant management should be able to distinguish native species from invasive species. Only herbicides approved for aquatic use should be used near streams and in wetland areas.

Water Quality

Riparian forests provide many benefits to streams and wetland systems including:

1. Buffering adjoining land uses that may generate run-off and cause erosion;
2. Anchoring streamside soils and absorbing nutrients that contribute to water quality degradation;
3. Shading surface waters and providing habitat for a greater diversity of native aquatic species; and
4. Depositing twigs and limbs that offer structures and shelters for a variety of fishes and aquatic organisms.

Impacts to the riparian forests in Applebrook Park should be carefully managed to enhance the wetland system and to realize the many wildlife benefits and ecosystem services these forests provide.

RECOMMENDATIONS

- Consider increasing the width of the riparian forest natural habitat in Applebrook Park to enhance the benefits of a vegetated buffer. Using species

that already exist at the site are most suitable for planting as a riparian buffer. Silver maple, red maple, American sycamore, and blackgum are recommended tree species; silky dogwood and winterberry are preferred shrubs. Native trees and shrubs that would be appropriate in upland and edge areas of the buffer and would also provide aesthetic appeal for park visitors include redbud, shadbush, and flowering dogwood. Another option is to convert part of the buffer to a native meadow either through planting of meadow species (native grasses and wildflowers) or by limiting mowing along the vegetated buffer to once or twice each year. Recommendations for native plant species suitable for a riparian buffer are included in the “Native Plant Materials” section of the *Natural Lands Trust Stewardship Handbook for Natural Lands in Southeastern Pennsylvania* (2008). Planted trees should be one- to two-inch caliper in size to ensure high survival rates. Protect newly planted trees from deer browse using tree shelters for plants less than 6 feet in height. For trees over 6 feet in height, tree wraps will protect trees from buck rubbing.



Island of invasive shrubs and vines

Native Habitat Restoration

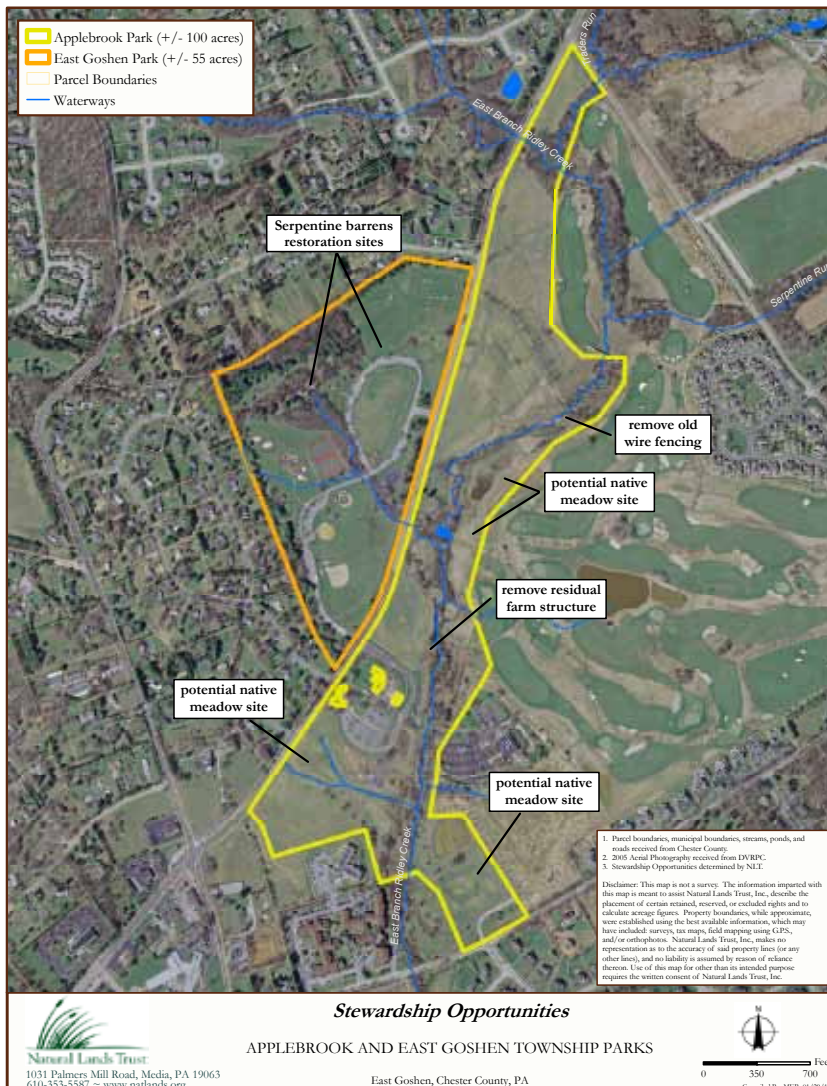
Applebrook Park contains extensive open areas that are currently managed as lawn. An alternative cover for areas that are not utilized by the public is native meadow. Native meadows are characterized by a diverse structure and composition of short and tall grasses and native wildflowers that provide feeding and nesting habitat for declining grassland birds (e.g., Eastern Meadowlark, Bobolink) and small mammals, as well as nectar sources for numerous butterflies and other insects. Native meadow species are naturally adapted to the soils and climate of our region and can, if necessary, survive on very little rain (and no irrigation). Once established, native meadows usually require just one mowing each year to limit

encroachment by trees and shrubs. Occasional spot herbicide treatments are also necessary to manage invasive species.

The degraded serpentine barrens in the northern part of East Goshen Township Park (see **Stewardship Opportunities map**) also offer a native habitat restoration opportunity that could provide both ecological and educational benefits.

RECOMMENDATIONS

- Consider limiting mowing in the wet lawn areas in Applebrook Park (e.g., the southernmost extension of the park and the area between the two branches of a headwater creek, shown on the **Stewardship Opportunities map**) to once each year, preferably in late winter. Reducing the mowing frequency will not only favor native meadow species and prevent soil disturbance during the warmer wet seasons, but will also offer more visual diversity and interest for park visitors. Other areas of the park that are not used by the public could also be enhanced as native meadows. For example, a once-yearly mowing regime (late winter when the ground is frozen) could be initiated in the wet meadow on the east side of the East Branch Ridley Creek near the middle of Applebrook Park (see **Stewardship Opportunities map**).
- There are several options for restoring the temporary materials storage area in Applebrook Park once it is no longer needed. The township could consider creating a public use hub in this area where a kiosk, benches, and picnic tables could be installed. A kiosk could display a trail map, photos of wildlife that may be seen during particular seasons, and announcements of upcoming volunteer events. In areas not used as a public use hub, a native meadow habitat and/or native plant demonstration gardens could be established. The most effective approach to establishing a native meadow is to eliminate existing vegetation using herbicides and replanting with native meadow species. Meadows can then be seeded with desirable species using a no-till drill. A no-till drill is equipped to plant the fluffy warm-season grass seeds that are difficult to sow using conventional methods. A no-till drill also limits





Wet lawn area near southern boundary of Applebrook Park provides an opportunity for conversion to a native meadow

Potential site for native meadow installation between two branches of a headwater creek in the southern part of Applebrook Park



Temporary storage area for trail materials that could be converted to a public use hub surrounded by a native meadow and/or native plant demonstration gardens.



**Old quarry within degraded serpentine barrens
(East Goshen Township Park)**

soil disturbance and the establishment of invasive plant species.

- Consider developing a restoration plan for the serpentine barrens in East Goshen Township Park. Although these barrens are currently degraded with no rare species present, it is likely that seeds of rare plants still exist within the mineral soil. Potential restoration activities include removal of existing vegetation and organic soil through scraping and prescribed fire to expose the serpentine bedrock. A restoration plan will determine the extent of potential serpentine communities and a prescription of restoration activities.

Wildlife Enhancement

Additional opportunities for enhancing the wildlife habitat in Applebrook Park are listed below.

RECOMMENDATIONS

- Consider installing Bluebird nesting boxes on the edge of the lawn areas in Applebrook Park. See attached Natural Lands Trust publication Bluebird Nesting Boxes for tips about placement and maintenance of these structures.
- Consider installing nesting boxes for Wood Duck in more isolated areas of the riparian corridor

in Applebrook Park. See attached articles on this subject – “Building and Placing Nesting Structures” and “Breaking Out of the Box”.

Hazards

Short segments of the paved trails in Applebrook and East Goshen Township Parks are bordered by trees. Some of these trees could decline over the years from construction impacts. There are also trees on township property near Paoli Pike and the access road to the parking area and adjacent development. The township is responsible for the monitoring and removal of hazard trees (trees that due to structural defects could fall in part or whole on a “target” such as a road, residence, or person). If not already in place, the township should initiate an annual monitoring program for trees along the roads and trails (particularly in areas – benches, interpretive signs – where people congregate or stop for extended periods) to identify potential hazard situations. See the “Hazard Tree Monitoring Program” section in the Natural Lands Trust *Stewardship Handbook for Natural Lands in Southeastern Pennsylvania* (2008) for information about procedures for monitoring hazard trees.

Residual structures from past activities can also be hazards for humans (particularly free-roaming children) and wildlife and are unsightly.



Hazard trees next to bridge



Old wire fencing on the east side of the creek



Residual farm structure

RECOMMENDATIONS

- Monitor high use areas for hazard trees by foot once each year and following severe storms. This is particularly important along paved walking trails and near bridges where the roots of nearby trees can be impacted, compromising tree health. Ideally, a certified arborist should complete this task and address any identified hazards through pruning or removal. Alternatively, the township could have a member of the public works staff trained to identify and safely address hazard trees. Contact Natural Lands Trust for a list of training options in the region.
- Remove old wire fencing in the marsh on the east side of the creek in Applebrook Park (see **Stewardship Opportunities map**, page 11).
- Remove residual farm structure in the southern portion of Applebrook Park on the west side of the creek (see **Stewardship Opportunities map**, page 11).

Environmental Education

The riparian corridor and associated wetland habitats and the forest fragments in Applebrook and East Goshen Township Parks provide a diversity of natural communities that are readily accessible. The stewardship of these communities offers many opportunities to connect residents of the township

with their natural surroundings and provide meaningful environmental education experiences. The following suggestions could enhance these educational opportunities in the parks.

RECOMMENDATIONS

- Invite residents to participate in natural areas restoration projects including removing invasive plants or replanting the riparian corridor. Schedule “workdays” on earth-friendly holidays such as Earth Day or Arbor Day. Encourage local boy scout troops to implement stewardship projects such as building and installing bluebird boxes, removing invasive plants (cutting vines with pruners or handsaws and pulling **garlic mustard**) and planting native species.
- Label healthy examples of native trees along trails with scientific and common names.
- Consider installing deer exclosures in the forested areas of East Goshen Township Park to demonstrate the effects of overabundant deer.
- Encourage local schools and environmental groups to use the parks for nature walks and exploration.



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