

2014 Highlights

Urban Forestry and Ecosystem Management (UFEM) Division

Citizen Scientists

UFEM developed classes to train citizen scientists in connection with the Forest Management projects. 30 people from the Cobbs Creek watershed (and others) attended a 6-week class called “A Short Course on Land Management,” which included a number of field trips to the Haddington project site. This was followed in the fall by a 4-week course on “Experimental Design.” These citizens will assist PPR in monitoring the changes over time in the project areas.

Urban Forest Working Group

In order to develop new approaches to ecosystem restoration, UFEM formed an Urban Forest Working Group made up of technicians, land managers, regulators and academics. The group met 4 times during the year, including one design charrette with the members of the Citizen Science classes.

Restoration Projects

In January and February 2014, UFEM staff conducted field work on three sites, each 23-25 acres in size. The sites were selected based on several factors, with the goal of conducting large-scale forest restoration projects. A brief description each site follows:

- Haddington Woods in Cobbs Creek Park: The majority of the forest is badly degraded, with a canopy that has been overwhelmed by vines, and an understory devoid of tree seedlings and overrun with non-native shrubs
- Wigard Woods in Wissahickon Valley: The 7-acre forest core is badly degraded, with a canopy that has been overwhelmed by vines, and an understory largely devoid of native tree seedlings and dominated by non-native shrubs. The forest surrounding this core forest has a relatively healthy tree canopy, but native seedlings, saplings and shrubs are sparse due to ongoing browsing by deer.
- Three Springs Hollow in Pennypack Park: The canopy is characterized by a mature stand of native hardwood trees, some with diameters exceeding 3 feet and more than 100 feet in height. Although this stand is impressive, there are almost no tree seedlings or saplings and very few shrubs besides spice bush, due to excessive deer browse over many years.

The field work focused on delineating and flagging project boundaries, characterizing the stands, identifying and marking beneficial trees and shrubs to be retained within degraded portions of the stands, and geographic data collection. After the initial field work, maps were developed, along with plans and specifications for work to be done at each site. More than 100 soil samples were collected throughout the sites to compare soil existing conditions with future conditions, following restoration.

The following work is to be completed: 1) remove the overwhelming invasive species (two sites); 2) erect deer fencing to eliminate browse damage; 3) replant to re-establish healthy forest stands; and 4) conduct experiments on restoration techniques and plant species.



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UFEM produced bid documents for the first two tasks mentioned above (invasive removal and deer fence installation) for the three sites, and a contract was awarded for the work. The selected contractor, Bustleton Services, began clearing invasive vegetation at the Haddington Woods site in December. Clearing work will be completed in February 2015 and deer fence will be installed later in the year. Planting will begin in fall 2015 under a different contract. Experimentation will be done on the sites for multiple years.

Benefits of the projects will include:

- Elimination of deer browsing and rubbing damage, allowing for natural forest regeneration throughout the fenced areas
- Restoration of forests by replacing invasive non-native plants with native species, resulting in increased plant and wildlife diversity
- Improved aesthetics and safety
- Opportunities for citizens and local scientists to participate in a major forest restoration project.

The projects were identified as potential demonstration projects in the Parkland Forest Management Framework, released in April 2013. Butch Blazer, Deputy Under Secretary for Natural Resources and Environment at the US Forest Service, paid a visit to the Haddington Woods site in July as part of a local urban forest conference.

Soil Sampling

In conjunction with the three projects described above, Urban Forestry and Ecosystem Management staff spent several days in October systematically collecting soil samples at the three sites. The 103 collected samples were shipped to Penn State University's Agricultural Analytical Services Laboratory for analyses of multiple parameters. The results of these analyses provide a baseline for site soil conditions and will help staff understand the role of various soil parameters in vegetation responses on each site.

Three Springs Hollow Trail

In preparation for the Three Springs Hollow project (described above), a pre-existing trail network was mapped. The network was comprised of unsanctioned trails that would conflict with the deer fence installation and forest restoration work that was to occur on the site. Though the trails were unsanctioned, the decision to eliminate them raised opposition from the local mountain bike community. The UFEM Division began a dialogue with the Pennypack Park Trail Advocates (PPTA), a group representing the mountain bikers. Over a few months' period, a compromise was worked out between the two parties: PPTA agreed to forego use of the old trail network (desirable for mountain biking); UFEM offered to facilitate construction of a new trail around the perimeter of the deer fence, primarily geared to mountain bikers.

Soon after the agreement was reached, PPR contacted the Fairmount Park Conservancy to see if the Conservancy would "fast-track" the construction of a new trail. The Conservancy responded, hiring Terra Firma Trails, a trail expert, to design and construct a new perimeter trail. UFEM staff and PPTA worked out a mutually-acceptable layout with Terra Firma. Terra Firma owner Steve Thomas built the new mile-long loop trail in December 2014. UFEM staff constructed a bridge where the new trail needed to cross over a small stream. The new trail was a large step in developing a working relationship with Pennypack mountain bikers, who were generally distrustful of PPR in the past.



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Hazard Tree Removal

Urban Forestry and Ecosystem Management initiated a hazard and ash tree removal contract within our parks during fall 2014. The work has been subcontracted to Independence Constructors Corp., who have already removed 220 + large, dangerous trees that are lurking in our parks. Both hazard trees and ash trees of other species have been removed. These trees were selected by PPR arborists Mike Helsen, Dan Dolan and Rich Sunday as some of their least favorite standing threats. They have been removed due to their deteriorated condition along with their proximity to a target (trails, parking areas, play equipment, structures, etc.). It is nearly impossible to predict what a tree will do; however, it is certain that all trees will eventually succumb to gravity, and that this will occur sooner rather than later for those identified by our experienced arborists. The ash trees are being removed in an effort to prepare for the arrival of the emerald ash borer (EAB), which will kill all ash trees in our parks within the next 10 years. Dead and dying ash trees will rapidly become standing threats to park users. It is worth noting that it is much safer for arborists, and less costly to remove a living ash tree rather than a dead tree. The implementation of this contract will support PPR's ongoing initiatives to keep the parks safe. This contract is anticipated to be completed as of February 15, 2015.



A 30" diameter tulip poplar that was badly rotted and hanging over the trail along the Wissahickon

An innovative management tool was developed by PPR Geospatial Analyst Nora Dougherty specifically as a pilot for this tree removal project. All hazard tree data was loaded into an Arc GIS application on Apple iPads. The hazard tree removal contract required Independence to obtain appropriate hardware and utilize this application. This innovation greatly facilitated the project, enabling Independence to readily locate the contracted hazard trees scattered throughout our parks, and for PPR to easily monitor the contract progress. This pilot program was a huge success and will enable PPR to streamline and simplify future similar contracts.

EAB Update

Philadelphia Parks and Recreation (PPR) prepared an Emerald Ash Borer Management Plan for the City of Philadelphia (EAB Management Plan), dated February 2012, which is available on the PPR Website. This management plan was developed in anticipation of the arrival of the emerald ash borer (EAB), an insect pest that is expected to kill all ash (*Fraxinus* spp.) trees in the City of



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Philadelphia. The City of Philadelphia has been acknowledged by state agencies as one of very few municipalities that have begun preparation for the arrival of this insect.

In accordance with the EAB Management Plan, an inventory was conducted by trained interns during summer 2013. This effort provided data on over 7,700 trees throughout the City parks system, including a recommendation for tree removal or treatment. Trees were recommended for removal if they were unhealthy or included a structural defect; whereas trees were recommended for treatment if their canopy was judged to be in good health, and they were also structurally sound. Treatment is performed by injecting an insecticide (Emamectin benzoate) directly into the tree base.

The EAB has been found nearby in Bucks and Montgomery Counties, about 20 miles from Center City, and 10 to 15 miles from the northern city limits. It has also been found about 12 miles east of downtown, in Burlington County, NJ. It is very likely that it will arrive in the greater Philadelphia area by summer of 2015.

In anticipation of this imminent threat, PPR UFEM staff recently reviewed and refined the inventory of trees recommended for treatment, with over 1,000 ash trees now being identified to be saved. In order to perform the treatment of these 1000+ trees, PPR intends to hire four summer 2015 interns who will be trained on proper techniques and will be expected to become certified public pesticide applicators. This training and certification will not only begin the process of protecting an important natural resource, but should also provide these interns with an excellent opportunity for future employment in the private sector.

In addition to preparing for the arrival of the EAB, PPR staff have arranged for staff seminars and provided presentations on our management planning at both West Chester University and to the City Office of Emergency Management.



A magnificent, 55" diameter ash tree, located near the Chamounix Mansion, that will be treated by interns this summer

Site Maintenance RFP

Over the years, PPR staff has conducted natural lands restoration projects on about 400 sites totaling roughly 600 acres. The demands of ongoing maintenance of these sites have exceeded the capacity



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of the two staff members who focus on field work. In 2014, the UFEM Division developed a Request for Proposals (RFP) for a contractor to conduct maintenance of as many of these sites as possible. Much of the work will involve removing vines and other invasive vegetation and selectively herbiciding invasive exotics. The goal is to keep these forest and meadow sites moving in the trajectory of native-dominated ecosystems, which provide the most benefits for local and migratory wildlife. After proposals are received, a contractor will be selected, and work is expected to start in July 2015.

Greenland Nursery

Greenland Nursery, PPR's native plant nursery has been steadily improving over the years. In 2014, Greenland's manager and others collected seed from a wide variety of native plant species from multiple natural areas in the Philadelphia region. Since the seed is from naturally-occurring native vegetation, plants grown from it are expected to have good level of fitness to local conditions. Thus, the plants are valuable in restoration projects in park forests. Greenland's manager processed collected seed from many species and began growing them in late 2014.

In fall 2014, a new water service and high efficiency drip irrigation system for in-ground container plants was installed at the nursery. This system greatly enhances the efficiency and capacity of the nursery operation.

Finally, in 2014, UFEM staff designed and constructed a rain garden next to the new pole barn. The rain garden captures and stores stormwater from throughout the nursery site, helping the water infiltrate into the ground and providing habitat for amphibians and other animals. The completed rain garden was planted with native plants that were propagated at the nursery.

Plant Discovery in Houston Meadow

Houston Meadow is the site of a large scale restoration project done in 2009-2012. The project was aimed at enhancing habitat for 24+ species of migratory birds, some of them with very specific habitat requirements. The meadows hold a number of plant species that are uncommon in Philadelphia (including two state-listed species), so the site has attracted outings from local botanists. In July 2014, a member of the Philadelphia Botanic Club leading a tour made a surprising discovery – a population of white-bracted eupatorium (*Eupatorium album*). Before it was discovered on some other sites within the last five years, this species was thought to be extirpated from Pennsylvania. Before then, the last documented occurrence of the species in the state was 1964. The finding was a reminder that urban parks of Philadelphia still hold a few surprises!

Horticulture Center Forest Garden

The forest garden installation was completed in 2014 with the planting of edible berries and herbs during the spring and fall. These plantings, along with the fruit trees, provide a public example of permaculture gardening. The garden, which was planted with the Philadelphia Orchard Project and the Penn State Master Gardeners, will begin to bear fruit in 2015.



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