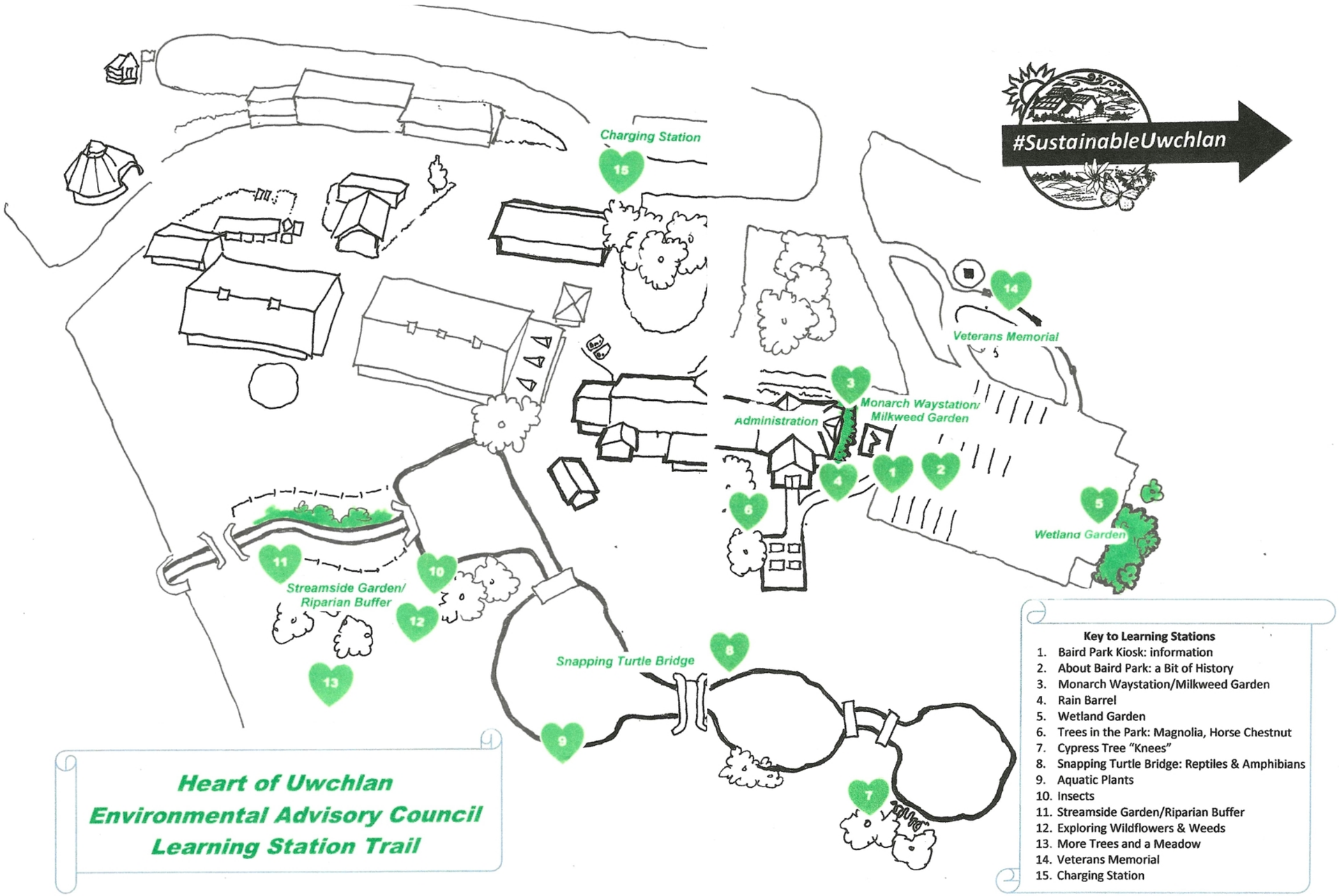
HANDBOOK:
HEART OF

LEARNING STATIONS
UWCHLAN PROJECT

LEARNING TRAIL MAP



Contents

LEARNING STATION 1: Info kiosk, Nature Learning Trail, & Heart of Uwchlan project

An information Kiosk is located outside the Meeting Room end of the Township Building. This is the starting place for the map of the **Heart of Uwchlan Nature Learning Trail.**

THE NATURE LEARNING TRAIL

The **Nature Learning Trail** is part of the **Heart of Uwchlan Project**, designed to provide information about the natural environment of Baird Park.

The Learning Trail features marked Stations at key points of interest to direct you and your family on your visit. The purpose is education, especially suited to children, about the plants, animals, and ecology of the park, to stimulate interest in, and understanding of, nature.

At each marked Station, you'll find a QR code for you to access information about that location. Use your device to scan the QR Code to learn about the plants, animals, and ecology of each location.

A **Learning Trail Backpack** is available for your family to use during your visit. It contains some simple exploration tools and nature guides. Request one at the Administration office.

A **Learning Trail Handbook**, containing information for all Stations, is available on the Uwchlan Township website. A copy is also located in the Administration Lobby.

We hope you enjoy your visit.

Feedback and suggestions can be sent to eac@uwchlan.com

HEART OF UWCHLAN PROJECT

The Heart of Uwchlan project was started by the Uwchlan Township Environmental Advisory Council (EAC) in 2020.

The goals of the Project are to:

- Introduce native plants and enhance the biodiversity of Baird Park
- Support #SustainableUwchlan goals and EAC initiatives
- Provide education for the public of sustainable gardening practices through examples.

It includes three gardens in Baird Park: the Monarch Waystation Milkweed Garden by the Meeting Room, the Wetland Garden at the far end of the Parking Lot, and a Riparian Buffer Streamside Garden around and below the ponds and stream. In October 2023, over 100 native trees and shrubs were added to extend the Riparian Buffer.

Thank you to volunteers who have helped to plant and maintain these gardens.

If you're interested in joining our volunteers, contact us at eac@uwchlan.com

LEARNING STATION 2: History of Baird Park

There is interesting history behind the Township Building and Baird Park. The property goes back

to 1735, when Hugh Pugh purchased this property from the heirs of William Penn. The oldest section of the building was built soon after. Rudolph Haines purchased the property in 1761. Hobart Baird acquired the building in 1924. In the 1940's, Baird and his workers put in the multi-level ponds, which are fed by springs on the property. He added 20th century additions and renovations to the mansion. He also planted several specimen trees, giving it its park-like setting. Uwchlan Township acquired the property in 1975 and named it Baird Park in honor of Hobart Baird and his wife Ruth Cypress.

When the Township acquired the building, arrangements were made for Mr. and Mrs. George Jones, caretaker and cook for the Bairds, to live in the addition as long as they desired. A two-story addition was built in 1988 for residence; it also expanded the meeting facilities of the Township on the flagstone patio. The Township outgrew these facilities and, in 2006, the New Meeting Room was added on the site of the Baird's kitchen. First floor renovations in 2007 revealed and resulted in reproduction of the original beehive bake oven from 1735 in the now named Pugh Room.

Other features of historic interest include the following:

The **SPRINGHOUSE**: built between 1735 and 1748, its lower level was used to cool milk or for short-term food storage in crocks or pails.

The **BARN & GARAGE**: The stone barn, with its unusual two stone sections, was built in the late 1790's. It is a typical Chester County side bank barn. It was renovated to provide storage for vehicles and a shop area. The large building across the driveway was built in 1988 and houses the Police and Township Roads & Maintenace department. It was renovated in 2002; a new building behind the barn was constructed for the Parks Department. The 20' x 20' frame garage is said to have been built on the site of a corn crib.

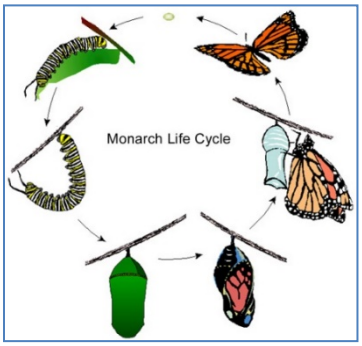
The Uwchlan Township Historical Commission, housed in the John Cadwalader House on Village Avenue, maintains documentation of the Township's history, and provides tours of the Cadwalader House on the first Sunday of the month.

LEARNING STATION 3: Monarch Waystation

The Monarch Waystation Garden, next to the Township meeting room, has been planted with plants that support pollinators in general and monarch butterflies in particular. These include several kinds of milkweed plants, to provide food for monarch caterpillars, but also other native plants that will provide nectar for pollinators, migrating monarchs and host plants for eggs laid by other butterflies.

A Butterfly Garden Plant List and other handouts on the Uwchlan Township website provide a list of valuable native plants and directions on how to sow seed and raise milkweed plants.

WHY PLANT MILKWEEDS?



Milkweeds are the host plants that feed the caterpillars of the monarch butterflies. They **only** eat milkweeds. Although the adult butterflies will take nectar from many blooming plants, the **caterpillars** of most butterflies and moths have evolved to eat only one or two particular plants. For example, the tiger swallowtail caterpillars only eat dill, fennel, or parsley. If we want these butterflies in our garden, we need to plant the plants the caterpillars will eat.

Milkweed seeds, like the seeds of many native wildflowers, need **"stratification," or exposure to cold for a period of time, in order to germinate.** There are several ways to stratify the seeds; one common one is to hold them in your refrigerator for a couple of months. But the method using plastic jugs as "mini greenhouses" is easier and very successful.

WHY DO WE WANT BUTTERFLIES IN OUR GARDEN?

Because they are **beautiful**, but also because they, like the many native bees, **pollinate** the flowers we grow – and thus enable production of the fruits and vegetables we harvest. And it takes many **caterpillars to feed the birds**. Chickadee parents need to find 350 to 570 caterpillars every day, depending on the number of chicks for a total of 6,000 to 9,000 caterpillars to bring a clutch of chickadees to maturity.

WHAT MILKWEED IS PLANTED IN OUR GARDEN?

Common Milkweed *(Asclepias syriaca)*

Blooms June-August – Likes Dry Soil, Sun

A native perennial. The monarch butterfly deposits its eggs on the milkweed, the caterpillars feed on the leaves. Plants grow to 2-4 feet high; long, oblong leaves grow to about eight inches long. The stems and leaves bleed a milky sap when cut. Fragrant clusters of pink-purple flowers, seed pods two to four inches long split when ripe to cast many fine seeds to the wind.

Swamp Milkweed *(Asclepias incarnata)*

Blooms June-July, Likes Sun, Damp Location

Another Monarch host plant. Leaves are narrow, tapering. Pink flowers. Narrow pods. Good in wet pollinator gardens, rain gardens, pond edges, and monarch habitat plantings. Bright pink flowers. Can get tall (3-4').

Butterfly Weed *(Asclepias tuberosa)*

Blooms June-August, Sun, Dry Location

Produces flat clusters of bright orange blossoms all summer long. Nectar- and pollen-rich flowers attract hummingbirds and hordes of butterflies, bees and other beneficial insects throughout the blooming season. Food plant for monarch caterpillars. It is about one to two feet tall. The seed pods turn brown over time and add winter interest to the garden.

NOT TO BE CONFUSED with Butterfly Bush (*Buddleia davidii*), a fast-growing, deciduous non-native shrub that blooms from summer to autumn. While Butterfly Bush attracts butterflies, its pollen is inferior and the birds carry seeds, making it invasive.

REFERENCES

Books of Interest

- **Bringing Nature Home**, by Douglas W. Tallamy (Timber Press, 2015),
- **Nature's Best Hope – A New Approach to Conservation That Starts in Your Yard**, by Douglas W. Tallamy (Timber Press, 2019),
- **Attracting Native Pollinators**, a Xerces Society Guide (Storey Publishing)
- **Butterfly Gardening with Native Plants**, by Christopher Kline (Skyhorse Publishing, 2015),
- **Attracting Birds, Butterflies, and other Backyard Wildlife (Expanded Second Edition 2019),** National Wildlife Federation, David Jizejewski
- **10 Steps to Gardening With Nature,** Carole Ann Rollins and Elaine Ingham

Organizations and Websites

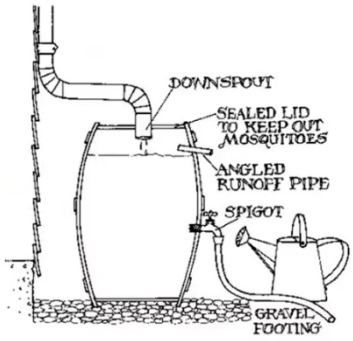
- **Audubon Society -** Native Plants Database: search for native plants by your zip code
- **Penn State Extension -**. Planting for Pollinators handout lists native perennials for sun, shade, etc.; Certify your pollinator-friendly garden with the Penn State Master Gardeners. Why Pollinators Matter and How to Create a Pollinator Certified Garden (psu.edu) or contact your local Penn State Extension office.
- **National Wildlife Federation**
- **Saveourmonarchs.org**
- www.MonarchWatch.org

LEARNINGS

- What plants attract butterflies and other pollinators, especially monarch butterflies
- Why native plants are important for our gardens
- Understand ways to support pollinators and ecological biodiversity

LEARNING STATION 4: Rain Barrel

A Rain Barrel is one of several measures a homeowner can take to manage stormwater runoff and allow the water to infiltrate into the ground rather than flooding. A Rain Barrel captures rainwater from a roof and stores it for later use, such as watering plants or gardens. Thus, it conserves water and reduces impact of stormwater runoff.



A Rain Barrel has a hole at the top to allow it to be connected for flow from a downspout. It has a sealed lid with a screen to prevent mosquitoes and a spigot at or near the bottom to allow you to drain and use the water. It has an overflow outlet that diverts excess water so it doesn't overflow.

stormwater runoff include:

- Downspouts that divert water away from the home;
- A rain garden that uses drainage and water-tolerant plants to capture and slow the infiltration of the water through the soil;
- Riparian buffers that put trees and plants at stream banks to prevent erosion;
- Pervious rather than impervious pavings that allow water to infiltrate.

ABOUT STORMWATER RUNOFF PROBLEMS

In the natural environment, most precipitation is absorbed by trees and plants or permeates into the ground, which results in stable stream flows and good water quality. Things are different in the built environment. Rain that falls on a roof, driveway, patio or lawn runs off the surface more rapidly, picking up pollutants as it goes. This stormwater runoff flows into streams or storm drains that discharge into waterways like creeks and rivers.

Poorly managed stormwater runoff can cause a host of problems. These include:

- **Flooding**
- **Pollution**. Stormwater running over roofs, driveways, roads and lawns will pick up pollutants such as oil, fertilizers, pesticides, dirt/sediment, trash, and animal waste, and carry them into local streams, polluting our waters.
- **Stream Bank Erosion**. Eroding banks can eat away at streamside property, damage natural habitat for fish and other aquatic life, and cause sediment pollution in streams.
- **Threats to Human Health**. Stormwater runoff can carry many toxic pollutants, contaminate drinking water supplies, hampering recreational opportunities, and threatening fish and other aquatic life.

HOMEOWNER'S GUIDE TO STORMWATER

Penn State University offers the Homeowner's Guide Stormwater, How to Develop and Implement a Stormwater Management Plan for Your Property.

LEARNING STATION 5: Wetland Garden

The Wetland Garden, established in 2021, is proof of "right plant in the right place." This area was too wet to be mowed so instead, we planted native plants that flourish in wet areas to help the area naturally regenerate.

Plants include ... eed, swamp goldenrod and phlox, obedience plant, native iris, river ... asters, and sunflowers. In addition, naturally occurring plants like ... me up on their own. A grove of wet tolerant trees serves as the start ... ver birches, a swamp oak, and buttonbush.

... rovide blooms throughout the spring, summer, and autumn seasons ... ve bees and butterflies, to visit for nectar and pollen. Bluebirds and ... in the birdhouse and other birds, including goldfinches, forage the ...

The Wetland Garden provides an example for property owners of Uwchlan Township, to see how they might usefully plant native plants to manage a very wet area.

LEARNING STATION 6: Trees in the park

There are several things to see about trees in Baird Park.

- **Historic Trees: the Magnolia**
- **Native Trees and Riparian Buffer**
- **Horse Chestnut Tree: Identifying Trees and Understanding Flowers**

HISTORIC TREE: MAGNOLIA

The large Magnolia trees are some of the historic trees in Baird Park, planted in the 1940's by Hobart Baird and his workers, when they put in the multi-level ponds and established the park. Other specimen trees planted then include the Horse Chestnut and numerous Cedars, some of which have developed the "Cedar Knees" described in another **LEARNING STATION 7**.

Magnolia is an ancient genus dating from 95 million years ago. The Southern Magnolia (Magnolia grandiflora) in the park have large fragrant bowl-shaped or star-shaped flowers in shades of white or pink that often appear before the leaves, in Spring. Cone-like fruits are often produced in Autumn.

NATIVE TREES AND THE RIPARIAN BUFFER

In October 2023, Environmental Advisory Council, Heart of Uwchlan, Township staff, and community volunteers planted more than 100 trees and shrubs, 60 tree seedlings and 100 seedlings of native grasses in Baird Park. This project was made possible by the TreeVitalize Watersheds Grant Program, managed by the Pennsylvania Horticultural Society, with funding from the Pennsylvania Department of Environmental Protection's Growing Greener program, PECO and Aqua PA. It was also supported by the Keystone Plant 10 million trees program.

A **stream buffer** of native trees was installed along the unnamed tributary to Valley Creek in the park. This tributary is impaired for aquatic life caused by siltation and flow from urban runoff/storm sewers. Buffers were also planted along the park's three ponds and associated waterway for a total length of 400 feet. To protect from deer, seedlings and single stem trees were encased in tree tubes, while the larger multi-stem species were placed in enclosures created along the creek to establish no mow zones.

In addition to the buffers, a 6000 square foot **lawn area which slopes towards the creek was planted with native canopy and understory trees.**

Creekside buffer plantings	**Tree plantings**
• Silky Dogwood • Buttonbush • River Birch • White Fringe tree • Sweetbay Magnolia • Willow Oaks.	• Willow Oak • Red Bud • Black Gum • Flowering Dogwood • Serviceberry • American Plum

Overall, these plantings account for 0.28 acres of lawn being converted at the park! They will provide shade, prevent erosion, create habitat for wildlife, and filter run off.

A handout providing information about these native trees and shrubs is available on the Uwchlan Township website.

HORSE CHESTNUT: IDENTIFYING TREES

The **Horse Chestnut tree** (*Aesculus hippocastanum)* near the Picnic Tables is one of the original trees planted in the grounds of the historic farmhouse that has become the Uwchlan Township campus. It is not native to the U.S., and is widely cultivated in streets and parks throughout the temperate world.

It is a good example to learn about tree terminology and characteristics by which to identify them.

It is a large **deciduous** tree, growing to about 128 ft tall with a domed crown of stout branches; on old trees the outer branches are often pendulous with curled-up tips. The leaves are **opposite and palmately compound**, **with 5–7 leaflets**; each leaflet is 5–12 inches long, making the whole leaf up to 24 inches across, with a 3–8 inch **petiole**.

The **leaf scars** left on twigs after the leaves have fallen have a distinctive horseshoe shape, complete with seven "nails". The flowers are usually white with a yellow to pink blotch at the base of the petals; they are produced in spring in erect **panicles** 4–12 inches tall with about 20–50 flowers on each panicle. Usually only 1–5 fruits develop on each panicle; the shell is a green, spiky capsule containing one (rarely two or three) nut-like seeds called **conkers** or horse-chestnuts. Each conker is ¾–1 ½ inches in diameter, glossy nut-brown with a whitish scar at the base.

The seeds, especially those that are young and fresh, are slightly poisonous. Although not dangerous to touch, they cause sickness when eaten; consumed by horses, they can cause tremors and lack of coordination.

The tree is only distantly related to the **American chestnut tree** (*Castanea dentata*) that was once considered one of the most important forest trees throughout its range and was considered the finest chestnut tree in the world. **However, the American species was devastated by chestnut blight**, a fungal disease that came from introduced chestnut trees from East Asia. It is estimated that between 3 and 4 billion American chestnut trees were destroyed in the first half of the 20th century by blight after its initial discovery in 1904. Efforts are under way to find and breed blight-resistant versions.

LEARNINGS

Tree identification terminology

- **Deciduous** – the tree drops its leaves in the fall, rather than **evergreen** or retaining leaves or needles through the winter.
- **Opposite** – the leaves are arranged in pairs on the branch, opposite each other, rather than **alternate**, or one then another down the branch.
- **Palmate compound** leaf – a leaf that is composed of several leaflets and the leaflets are arranged like a hand, from a single center point, rather than **pinnate** or along a stem.
- **Simple** leaf – not lobed or pinnate
- **Entire margins –** smooth not notched edges of the leaf
- **Petiole –** the "stem" that connects the tree to the branch.
- **Leaf scar –** the scar left on the branch when the tree drops its leaves in the fall
- **Panicle -** a loose branching cluster of flowers
- **Tepal -** one of the outer parts of a flower. The term is used when these parts cannot easily be classified as either sepals or petals. This may be because the parts of the perianth are undifferentiated (i.e. of very similar appearance), as in *Magnolia*.
- **Carpel -** A carpel is the female reproductive part of the flower, interpreted as modified leaves that bear structures called ovules, inside which the egg cells ultimately form and composed of ovary, style and stigma.

Imported vs native trees

Despite similar names, the Horse Chestnut and the American Chestnut are not closely related. This is an example of when using scientific names is often important.

Impact of Invasive Diseases

The native American Chestnut was a major tree in America, economically important and key in our landscapes until the blight killed them early in this century.

REFERENCE

Trees of Pennsylvania Field Guide by Stan Tekiela

LEARNING STATION 7: Cypress Tree 'Knees"

The Bald Cypress trees (*Taxodium distichum*) are among the other large trees planted in the original Baird Park. Cypresses are like other conifer trees in that they have **needles** rather than leaves. Cypresses, like many other conifers, produce **cones**. It's called "bald" cypress since it is a **deciduous conifer**, losing its needles in fall and growing new ones in the spring. A long-lived tree, some are more than 1,000 years old and are among the oldest living things in North America.

Perhaps the most distinctive feature of the bald cypress is the presence of "knees." **Cypress knees are cone-shaped structures that grow vertically from the roots of the tree where the roots are at the soil/sediment surface.** The most likely function of the kn stability in the swamp substrate and give the tree roots access to air where the ground is saturated with moisture.

LEARNINGS

Tree identification terminology

- **Conifers –** trees with needles, most often that remain on branches year-round, and that have seeds in cones. Includes pines and spruces. Bald Cypress and Tamarack are the only ones that are deciduous, shedding needles in autumn.
- **Needles –** to distinguish among conifers, check the number of needles that arise from one point. They may be **single** (cypress, spruce, Eastern hemlock, balsam fir), **clustered** needles 2 per cluster (some pines), clustered needles 3 per cluster (pitch pine), or 5 needles per cluster (Eastern white pine). Other conifers have scaled needles (Eastern white-cedar).
- **Cones –** cones are the reproductive structures in c conifers also produce **male** and **female cones**, son not, depending on the species. The cone is not the multiple seeds that are released when the cone has
- **Cypress Knees –** structures produced at their root wetness.

REFERENCE

Trees of Pennsylvania Field Guide by Stan Tekiela

LEARNING STATION 8: SNAPPING TURTLE BRIDGE – Reptiles & Amphibians

REPTILES

Snapping Turtle *(Chelydra serpentine)*

The snapping turtles in the ponds here are examples of reptiles found in our area. Snapping turtles are not dangerous and won't attack humans unless they are provoked. However, their long necks and powerful jaws make them unsafe to handle. **You should not enter the ponds or try to catch any turtles you see.**

About Reptiles

Reptiles are animals in the class Reptilia, including turtles, alligators and crocodiles, snakes, and lizards. Usually four-legged, except for snakes and a few lizards, each foot has three to five clawed toes. Their skin usually has horny scales, sometimes bony plates. Most lay eggs, though some snakes are live-bearing. **Their extinct relatives include the dinosaurs.** The study of these traditional reptile orders, historically combined with that of modern amphibians, is called **herpetology**.

Common Reptiles in Our Area

Pennsylvania is home to a diverse population of amphibians and reptiles. Follow the links on the **Pennsylvania Fish and Boat Commission (PFBC)** website at https://www.fishandboat.com/Conservation/Reptiles-Amphibians/Pages/default.aspx to find out more about them.

There are **no poisonous snakes** in the Uwchlan Township Heart of Uwchlan area. Snakes are a beneficial and interesting part of the natural biodiversity of our area, despite the tendency for most people to be fearful of them. They are generally harmless, mostly avoid humans, and **should not be harmed.**

Common Box Turtle

Eastern Garter Snake

AMPHIBIANS

Frogs

In the spring you may see tadpoles and adult frogs in the ponds here in the Heart of Uwchlan. Frogs and toads are **amphibians**. Most spend at least part of their lives in water or in moist surroundings. The group also includes salamanders and their kin.

Frogs and toads lay jelly-covered eggs in clumps or strings in quiet water. These eggs hatch into tadpoles, which breathe through gills. They develop legs, losing their tail, and become air-breathing adults. The adults return to water to mate and lay eggs. In the winter they hibernate underground or in the mud on pond bottoms.

The frogs in the ponds here are usually bullfrogs or green frogs.

Pennsylvania's 16 frog and toad species range in size from the tiny **spring peeper**, which just over 1 inch, to the **bullfrog**, which tops out at 8 inches long, and the small **gray tree frog** (*Hyla versicolor*), which spends much of its time in trees hunting for insects and invertebrates.

Toads

In Pennsylvania, there are three kinds of toads; the Eastern American toad, Fowler's toad, and the Eastern spadefoot toad. Toads have dry, warty skin. **They will not give you warts if you touch them!** However, poison in the large neck glands is used for defense against predators; it may irritate your skin. Like most amphibians, the American toad returns to water to mate and lay eggs each spring.

Toads eat many kinds of insects, slugs, worms, and other small invertebrates. Because **they eat many common insect pests**, they are a friendly sight to gardeners and farmers throughout the late spring, summer, and early fall.

Salamanders

Pennsylvania has **22 species of salamanders**, representing five families and 11 genera. Salamanders are secretive and nocturnal. All need moisture to survive. Their skin is smooth and must remain moist. Even the so-called terrestrial species can live only in areas that are moist or damp.

Salamanders can sometimes be found under logs in moist woods, especially in the spring. They often migrate nocturnally to vernal (temporary) pools to mate and lay eggs. Populations of salamander species, like many amphibians, are decreasing due to habitat loss, possibly pesticides, climate change, and other factors.

More About Common Amphibians in Our Area

Pennsylvania is home to a diverse population of amphibians and reptiles. Learn more about them on the **Pennsylvania Fish and Boat Commission (PFBC)** website at https://www.fishandboat.com/Conservation/Reptiles-Amphibians/Pages/default.aspx.

Decline in frog species

Several frog and other amphibian species native to Pennsylvania appear to have declined significantly in recent years. **Pesticides, herbicides, and habitat loss and degradation** singly and in combination threaten our populations of frogs and toads. It is essential that we find and address the causes of the decline to ensure their survival.

LEARNINGS

- Observe our reptiles and amphibians with care and admiration. Do not handle them or harm them. Snakes will not harm you!
- Learn about the kinds of reptiles that you may find in our general area, their life cycle, typical habitat, and role in the biological web.
- Don't be afraid of toads. **They will not give you warts** if you touch them, although they can irritate the mouths of small animals that grab them. If you pick one up, though, handle it gently.
- Toads are beneficial. Although they may look ugly and have had a "bad rap," toads are one of the most beneficial critters hopping around our area.
- Learn about the kinds of amphibians that you may find in our general area, their life cycle, typical habitat, and role in the biological web. Also found in our area are **green frogs, leopard frogs, pickerel frogs, chorus frogs, and wood frogs.**
- **Salamanders** are also amphibians found in our area.

LEARNING STATION 9: Aquatic Plants

Several aquatic plants grow in the ponds at Uwchlan.

BROADLEAF ARROWHEAD *(Sagittaria latifolia)*

This plant is found in shallow wetlands and is sometimes known as duck-potato, Indian potato, or wapato. This plant produces edible tubers that were extensively used by the indigenous peoples of the Americas. Although this plant occurs naturally in many areas, it is also a sought-after aquatic plant that is cultivated by those who have ponds or waterways on their property.

YELLOW POND-LILY OR SPATTERDOCK *(Nuphar advena)*

Spatterdock is a large plant whose leaves are often floating, however submersed and immersed leaves are common. Spatterdock commonly occurs in ponds, lakes and sluggish streams and blooms from spring to summer.

Spatterdock can be a valuable plant for fish and wildlife habitat providing food, shelter, and a place of breeding for many. Leaves provide shade, shelter, and cover from predators for many invertebrates that fish use for food. Seeds are eaten by waterfowl and other birds. Many invertebrates spend their entire life cycle on spatterdock with varying effects on the plant. Humans have put spatterdock to many uses.

Historical cultures have cooked the rhizome or dried and ground it into flour for baking. It has also used medically as a poultice. Leaves and roots contain tannin that was used for dying and tanning. More recently this decorative plant is used in aquariums and water gardens. Problems with spatterdock arise due to its growth potential which enables it to reach very large populations in shallow water bodies possibly displacing or eliminating other plant species.

COMMON CATTAIL *(typha latifolia)*

d many species are also cultivated ornamentally as pond plants Native Americans used many parts of cattails. The long flat *a latifolia*) are used especially for making mats and chair seats. and are considered one of the highest aquatic plants in starch

They provide important wildlife habitat, shelter for birds, food ects they eat. Cattails help protect the banks of a pond from organisms that help break down organic materials. Cattails are d shoreline protectors. Their extensive root systems prevent water.

Often found in similar conditions as cattails is the non-native ***Phragmites australis***, often called **common reed**. It is one of several invasive emergent aquatic plants (emergent plants are those that grow and stand upright in shallow water). It builds dense populations that crowd out native species and congest ponds.

INVASIVE AQUATIC PLANTS

Although spatterdock is not considered invasive, its extensive rhizome system allows it to grow and reproduce rapidly if not managed. Like it, other invasive aquatic plants can cause problems. Rapid growth of invasives like Phragmites can occur in shallow water bodies when there is an excess of nutrients allowing the plants to completely cover the surface in just a few years and control becomes necessary. Dense growth of invasive aquatic plants in shallow water areas can interfere with boating and other forms of recreation; it can cause light reduction and oxygen depletion that can kill fish or other plants.

RED-WINGED BLACKBIRD

One of the species you will often find making a home in cattails is the red-winged blackbird. Glossy-black males have scarlet-and-yellow shoulder patches they can puff up or hide depending on how confident they feel. Females are a subdued, streaky brown, almost like a large, dark sparrow. Their early and tumbling song are happy indications of the return of spring. Listen for the male's *conk-la-lee!* song.

ALGAE AND WATER QUALITY

The ponds at Uwchlan Township Baird Park do sometimes experience accumulations of algae, as similar ponds do in the township and surrounding area.

Planktonic algae growing in the ponds have value for the ecosystem, as **a key component at the base of the food web,** supporting beneficial insects and fish.

Moderate blooms of most plankton algae are generally beneficial and not a concern for the pond ecosystem, but large blooms can sometimes kill fish later in the summer as the algae decompose and remove oxygen from the water. Of greater concern are blooms that are dominated by blue-green algae (technically cyanobacteria), which often cause odors, unsightly surface scums, and rarely, harmful toxins.

The primary cause of excess algal growth is runoff of excessive nutrients into the water. For this reason, it is important to limit applying fertilizers near ponds or where runoff may take the substances into the pond. Reductions can be achieved by:

- planting low-maintenance lawns
- applying less fertilizer near waterways
- using phosphorous-free fertilizer
- maintaining vegetated riparian buffers to absorb nutrients
- increasing bank stability to reduce soil erosion
- and maintaining proper aeration and good water flow.

For more details on plankton algae including their causes, benefits, problems and control, go to the Penn State Extension website.

LEARNINGS

- Understand the ecology of ponds, the plants that grow in them, including algae, and their place within the food web.
- Understand that some aquatic plants are invasive and distinguish them from beneficial plants.
- Understand the causes of excessive growth ("blooms") of aquatic plants, the impact on water purity, and how to prevent excessive growth through sound lawn, garden, farming, and other practices. Specifically understand the impact of fertilizers as well as pesticides applied in the suburban setting near ponds.
- Know that permits are required when applying herbicides to a pond.

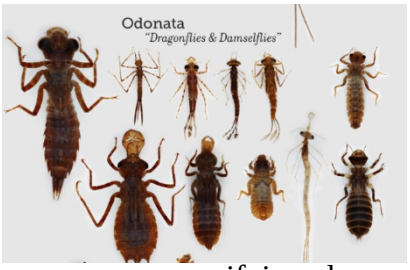
LEARNING STATION 10: Insects

The insect life in Baird Park is varied and interesting. The previous learning stations have focused greatly on the bees and butterflies which the Pollinator Gardens were planted to attract. The information noted several important facts:

- We require beneficial insects for many reasons: to pollinate the plants that produce much of our food; to feed the birds and other wildlife that are important components of a well-functioning ecosystem; to provide beauty.
- Many of these bees and butterflies require specific native plants as food sources for their caterpillars and other immature stages, for their pollen and nectar, because they co-evolved with these plants over millennia. So, we need to incorporate those native plants in our gardens. Non-native plants will not sustain them.

DRAGONFLIES AND DAMSELFLIES

Throughout the summer you will find other delightful insects, especially around the ponds in Baird Park. Of note are the **dragonflies** hovering over the pond and the plants next to them. They typically land with their four veined wings flat. Note also the **damselflies**. They often have dark blue or black wings and land with wings folded up behind their bodies. As they fly, these feed on mosquitoes and flies and other flying insects, so they serve an important role in pest insect control. They aren't harmful to us humans, despite their name.



Dragonflies and damselflies are found near the ponds in part because many of them have immature stages which thrive in the water of the ponds. The immature forms live underwater and are called nymphs. The nymphs metamorphosize (change) into adults.

The immature forms of these insects are among the aquatic **macroinvertebrates**, called so because they are invertebrates (animals without a backbone) that you can see without using a microscope or magnifying glass.

MACROINVERTEBRATES AND WATER QUALITY

Aquatic macroinvertebrates are important indicators of stream quality because they are affected by the physical, chemical, and biological conditions of the stream. They can't escape pollution and so their presence (or lack) show the effects of short- and long term pollution events. Surveying a stream or pond for its macroinvertebrates is one very important measure of the purity of the water.

LEARNING STATION 11: Streamside Garden & Riparian Buffer

STREAMSIDE GARDEN

A Streamside Garden was established in 2020 as part of the Heart of Uwchlan Project to enhance biodiversity in Baird Park. It contains native plants and shrubs specifically as part of the Riparian Buffer along this small stream. These perennial native plants have been planned to provide bloom through the summer and fall to support pollinating butterflies, bees, and other beneficial insects as well as birds. They were selected to tolerate the wet area next to the stream and survive the occasional flooding that occurs during the heaviest rainstorms.

The native plants include chokeberry, Joe-Pye Weed, asters, several kinds of milkweeds, goldenrod, alder, and other native plants that will thrive in your garden where it is damp.

A detailed list of suggested plants is available from Uwchlan Township website's EAC page

RIPARIAN BUFFER

In 2023 major additions were made to the Streamside Garden (see LEARNING STATION TREES IN THE PARK). Among the over 100 trees planted, many were native trees and shrubs of species specifically suited to the wet area. They were planted along the stream and into the adjacent field. A containment fence was installed to protect the area from deer.

Creekside buffer plantings included Silky Dogwood, Buttonbush, River Birch, White Fringe tree, Sweetbay Magnolia, and Willow Oaks.

The Streamside Garden and Stream Buffer have a different look than the area has had in the past. The grass is being allowed to grow naturally rather than being mowed or weed-whacked right to the edge. This reduces erosion of the banks so they can better manage stormwater runoff.

The plants filter runoff water and reduce sediment and pollutants like excess fertilizers and pesticides from being carried downstream.

The Riparian Buffer plantings of native trees and shrubs along streams and wetlands will restore the streamside area to more natural conditions:

- Increase infiltration and groundwater recharge
- Improve water quality
- Control erosion and sedimentation
- Provide wildlife habitat

Riparian buffers are essential to feed, shelter, and provide travel paths to more than 95 percent of our wildlife, including birds, reptiles, amphibians, mammals, and beneficial insects such as pollinators.

This Riparian Buffer demonstrates the concept for homeowners who may have small streams on their properties. And it helps the health of this stream, which has a tendence to accumulate algae from the ponds above, because of excess nutrients in the water from fertilization.

LEARNINGS

- Understand the value of a natural environment around ponds and streams for stormwater management, water clarity, biodiversity
- Understand a Riparian Buffer and its benefits
- Appreciate a “less formal” appearance that fosters a naturally functioning environment for plants and wildlife
- Know specific plants for damp areas, stream and pond sides
- Understand specific practices that are within the capability of the typical homeowner to apply in their own property with appropriate effort and cost

REFERENCES

Penn State University offers the *Homeowner’s Guide Stormwater, How to Develop and Implement a Stormwater Management Plan for Your Property.*

LEARNING STATION 12: Exploring Wildflowers & Weeds

There are many opportunities along the Heart of Uwchlan Learning
the park to observe and learn about wildflowers. The species you'll
there will be flowers and seeds as well as leaves to help you identif

Try using an **app** like **iNaturalist or Seek** to identify the plants
Wildflower Guide. Several good ones include:

- *Newcomb's Wildflower Guide*
- *National Wildlife Federation Field Guide to Wildflowers of*
- *Peterson Field Guides Wildflowers of Northeastern/North C*

Distinguishing characteristics are usually flower color, leaf shap
shape. The picture is Blue Vervain in our streamside garden, a
"*Verbena hastata* is a flowering plant in the vervain family, Verbenaceae. It is an herb with opposite, simple leaves which have double-serrate margins, borne on stiffly erect, branching square stems. The purple flowers appear in summer. This is a common plant that occurs across North America."

EXAMPLE OF A WEED: THE LOWLY PLANTAIN *(Plantago major)*

A lot of plants we may overlook as weeds, but they have interesting history. Consider, for example, the lowly **Plantain, *Plantago major***. It grows all over North America and around the world. It is commonly found in yards and gardens where pesticides aren't used. It is not native to the United States. In fact, native people called this plant "white man's footstep," as it followed the path of the white settlers, growing along wagon roads and railroads. The Latin name of the common plantain also echoes this, *Plantago major*, Plantago referring to the sole of the foot.

According to many books on healing plants, it is considered a medicinal plant. It helps stop bleeding, supports tissue regeneration, and is naturally antiseptic. Chewed or crushed leaves can be applied directly to the skin. It can also be infused, essentially into a strong tea or a tincture. Plantain is edible. According to herbalists, it's a good source of bioavailable zinc, calcium, and beta-carotene. The plant can be eaten raw or cooked and used dried or fresh.

CAUTION: Do not eat any plant or fungus (i.e., mushroom) without completely identifying it and verifying it is edible.

NATIVES, NON-NATIVES, AND INVASIVES

There is sometimes disagreement about these terms. However, it is understood that **native species are plants and animals that normally live and thrive within a particular ecosystem.** They have evolved within the habitat over many millennia, and in some cases have **co-evolved** with other native species. For example, the larvae of many butterflies and moths can only eat a particular native species of plant; the monarch caterpillar has evolved to tolerate the toxic substances in the milky sap the milkweed plant has evolved to deter predators. Some of our most important native bees are also species-centric, i.e., will seek pollen only from a particular species. Hence native plants have great importance in our ecosystems.

Introduced species are those that have been brought into an ecosystem from another location, by human accident or deliberate intervention. Sometimes these are called **alien** or **non-native** species. Many of the customary plants used to landscape our homes fall into this category. Generally, they do not integrate with the ecosystem; they do not support beneficial insects or add to the food web.

Invasive species are those that are non-native to an area and tend to spread to a degree that causes harm to the environment, local species, or human interests. Without their customary predators or restraints, invasives tend to crowd the habitat and exclude natives. Examples include the Dutch elm disease, the garlic mustard plant, or the spotted lantern fly.

Integrated Pest Management (IPM)

Invasive plants are often a major problem for homeowners as well as caretakers of parks such as Baird Park. Identification and removal of invasives can require a lot of time and energy. In many cases manual removal is the best solution for homeowners without large problems. In some cases, manual removal may prove difficult; major mowing and other equipment may be needed. Some cases may require use of chemicals. However, chemical treatment of invasives should be carried out with caution, to avoid harming beneficial species.

Integrated Pest Management (IPM) is a science-based decision-making process that combines tools and strategies to identify and manage pests. IPM is "a sustainable approach to managing pests by **combining biological, cultural, physical, and chemical tools in a way that minimizes economic, health, and environmental risks.**" Federal agencies are required by law to use IPM in their pest management activities and to promote IPM in their regulations, procurement, and other activities.

IPM provides economic, health, and environmental benefits. IPM practitioners use knowledge of pest and host biology in combination with biological and environmental monitoring to respond to pest problems with management tactics designed to prevent unacceptable levels of pest damage; minimize the risk to people, property, infrastructure, natural resources, and the environment; and reduce the evolution of pest resistance to pesticides and other pest management practices.

The Pennsylvania Department of Agriculture provides direction on IPM.

Considerations for Homeowners

Homeowners looking to remove invasive plants from their properties should consider the principles of IPM. Where manual removal is impractical, chemical means should be performed with care and preferably by individuals licensed to administer the chemicals.

The Pennsylvania DCNR maintains Invasive Plant Fact Sheets

- Trees
- Shrubs
- Vines
- Grasses
- Herbs
- Aquatic Plants

https://www.dcnr.pa.gov/Conservation/WildPlants/InvasivePlants/InvasivePlantFactSheets/Pages/default.aspx

LEARNINGS

- How to use iNaturalist, Seek, and Wildflower Guides to identify common plants, including “weeds”
- Understand the value of native plants, be able to identify invasives and understand their potential for harm
- Discuss ways to remove and/or replace invasive plants safely and with the least harm to the environment

LEARNING STATION 13: More Trees & Meadow

As with **LEARNING STATION 8: TREES IN THE PARK** and **LEARNING STATION 12: EXPLORING WILDFLOWERS AND WEEDS**, this learning station allows the opportunity to use apps like **iNaturalist** and **Seek,** or other field guides, to learn how to identify trees and shrubs. Following are some useful field guides:

- *Peterson Field Guides: Eastern Trees*, by George A. Petrides/Janet Wehr
- *Trees of Pennsylvania: Field Guide*, by Stan Tekiela
- *Common Trees of Pennsylvania*, by the Department of Conservation and Natural Resources Bureau of Forestry (www.dcnr.state.pa.us/forestry)
- *A Color Guide to Familiar Trees: Leaves, Bark and Fruit*

TREE PLANTING PROJECT

As noted in the chapters for these other learning stations, an initiative to plant native trees in Baird Park was led by the Uwchlan Township EAC and Heart of Uwchlan project members in October 2023. Community volunteers supported the planting of 100 containerized trees and shrubs, 60 tree seedlings and 100 seedlings of native grasses.

A **stream buffer** of native trees was installed along the unnamed tributary to Valley Creek in the park. Buffers were also planted along the park's three ponds and associated waterway for a total length of 400 feet. In addition, a 6000 square foot **lawn area which slopes towards the creek was planted with native canopy and understory trees.**

The trees included Silky Dogwood, Buttonbush, River Birch, White Fringe tree, Sweetbay Magnolia, Willow Oaks, Red Bud, Black Gum, Flowering Dogwood, Serviceberry, and American Plum.

A handout providing information about these native trees and shrubs is available on the Uwchlan Township website at: https://www.uwchlan.com/DocumentCenter/View/1526/Native-Trees-Information-PDF.

DEER PROTECTION AND DEER RESISTANT/TOLERANT PLANTS

Why are white-tailed deer such a problem? They are among the most influential species impacting our forests and gardens. At the beginning of the founding of Penn's Woods, the early days of the colonial settlement of the Commonwealth of Pennsylvania, there was a balance between deer and their predators. Since that time, that balance was lost, and by 2001 there were 1.5 million deer, or 30 deer per square mile and continues to increase. As a result, deer browse and deer antler rub cause destruction of desired plants in our gardens and parks; their browsing of tree seedlings prevents wooded areas from growing new trees. Their impact on ecological health is severe.

Deer Fence, Tree Tubes

To protect from deer, seedlings and single stem trees planted in Baird Park were encased in tree tubes, while the larger multi-stem species were placed in enclosures created along the creek and along the ponds. Various kinds of fencing and tree tube protection is available commercially and as part of grants for tree planting projects.

Deer-Tolerant Plants

It is probably better to consider plants tolerant rather than resistant to deer; they will under some circumstances eat almost anything. However, plants with certain characteristics are less pallatable to the deer.

REFERENCES

- *50 Beautiful Deer Resistant Plants*, by Ruth Rogers Clausen
- *Deer Resistant Native Plants for the Northeast*, by Ruth Rogers Clausen and Gregory D. Tepper
- *DCNR PA Deer Resistant/Tolerant Plants of Southeastern PA*
- *Garden for Wildlife:* https://gardenforwildlife.com/blogs/learning-center/deer-resistant-native-plants-a-guide-to-keeping-your-garden-safe-and-beautiful

LEARNINGS

- Identifying mature trees and shrubs using iNaturalist and Tree Guides
- Observe protection and maintenance of newly planted trees
- Discuss tree planting project requirements, i.e., assessing the site environment, determining what is suitable plantings, knowing how to plant and properly maintain trees in a home property (i.e., avoid “mulch volcanos” around tree trunks)

LEARNING STATION 14: Veterans Memorial

The Uwchlan Township Board of Supervisors announced the addition to Baird Park and the township campus, the Veterans Memorial, in 2017. Formal dedication of the memorial took place in the spring of 2017.

The Veterans Memorial is a stop on the Uwchlan Trail system. This location, alongside the Uwchlan Trail, was used by Washington's troops after the Battle of the Clouds. This memorial is intended to be a place of remembrance, reflection, and celebration of all veterans. This effort was championed by a group of Uwchlan Township veterans who volunteered their time and talents to create this memorial for all veterans and their families.

Veterans can be recognized, remembered, and celebrated by purchasing a paver engraved with their name, branch of service, rank, dates, etc. Each engraved paver of remembrance will cost $50 with a portion of the cost set aside for maintenance of the memorial.

The umbrella shape of the lighted stone wall with its five pillars seeks to embrace the field of pavers showcasing the names of veterans. The five stone pillars are each adorned with a bronze medallion representing a branch of the US Armed Forces. At night, both the US and POW flags, as well as the memorial, are lit.

A statue of the Revolutionary War Minute Man soldier was added.

Patriotic celebrations are scheduled throughout the year.

LEARNING STATION 15: Charging Station

Uwchlan Township has installed a Single Charging Station with dual charging ports. Both ports are 40amp double pole breakers. Charging time per car is approximately 45 minutes for a full charge. The fee is .07 cents per KW.

The Charging station is available 24 hours, seven days a week.

This project was funded in part by the PA DEP Driving PA Forward Level 2 E.V. Charging Station Rebate, which secured the Township $10,000 via a rebate program, and through a $500.00 rebate from PECO.

This system officially went online July of 2019.

READY FOR 100 RENEWABLE ENERGY

Uwchlan Township's Resolution no. 2019-04 was resolved and enacted on February 11, 2019, supporting a 100% renewable energy future by 2050. The resolution can be found on the Uwchlan Township website at https://uwchlan.com/DocumentCenter/View/388/2019-04_Ready-for-100?bidId=