



Horn Farm
*Center for
Agricultural Education*

Land Use Management Plan

**HORN FARM CENTER FOR AGRICULTURAL EDUCATION
PROPERTY**

The following information was collected for the Land Use Management Plan on parcels located in Hellam Township, York County, Pennsylvania known as the Horn Farm Center.

Compiled from data collected January 2, 2016 through December 13, 2016.

Adopted by the Board of Directors on December 14, 2016.

By: 
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Executive Director

Land Use Management Plan

A Comprehensive Site Analysis and Inventory

Committee members: Alyson Earl, Jon Darby, Mike Flinchbaugh, Gary Jones, and Kim Hogeman

Goals of the committee:

To conduct a comprehensive inventory and gain additional knowledge about the property as it currently operates while identifying obstacles and opportunities for land use. This will allow the HFC to allocate resources appropriately while determining multiple uses for the available land.

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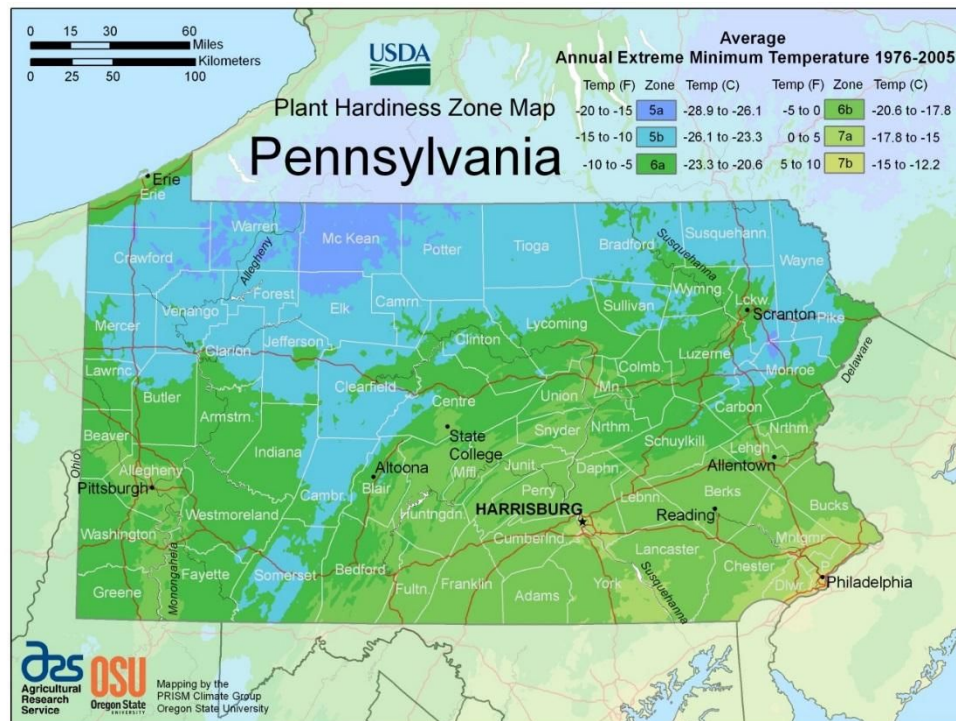
1. York County Comprehensive Plan
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The Horn Farm Center for Agricultural Education used a scale of permanence when compiling the data for this plan. This scale organizes factors by what is more permanent in the landscape and helps us in deciding how to make the least amount of change for the greatest effect.

Scale of Permanence:

1. Climate

- a. The 2012 USDA Plant Hardiness Zone Map is the standard by which gardeners and growers can determine which plants are most likely to thrive at a location. The map is based on the average annual minimum winter temperature during a 30 year period, divided into 10-degree F zones. According to the USDA Plant Hardiness Zone map for 2012, the Horn Farm falls into zones 6b and 7a. The hardiness zones are measured by the annual extreme minimum temperatures which would equal -5 degrees to 5 degrees Fahrenheit.



Although this edition of the USDA PHZM is drawn in the most detailed scale to date, there might still be microclimates that are too small to show up on the map. Microclimates, which are fine-scale climate variations, can be small heat islands—such as those caused by blacktop and concrete—or cool spots caused by small hills and valleys.

b. Predicted future climate change status

United States Geological Service (USGS): National Climate Change for York County

	1950-2005	2050-2074	Change
Annual Mean Max Temperature	62.8 F	69.4 F	6.7 F
Annual Mean Min Temperature	42.4 F	49.1 F	6.7 F
Annual Mean Precipitation	11.0 in/day (x100)	12.2 in/day (x100)	1.2 in/day (x100)
Annual Mean Snow	0.5 in	.01 in	-0.4 in

c. Annual precipitation

According to the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information, the closest geographic areas that are monitored at a sub-county level are York Haven (17370) and Brogue (17309).

2014	Highest Temp	Lowest Temp	Total Precipitation	Total Snow/Sleet
York Haven	---	---	41.46"	47.0"
Brogue	93	3	42.59"	50.8"

Seasonal distribution

Average precipitation in York County for 2015 in inches

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
3.4	2.7	3.6	3.5	4.25	4.2	3.7	3.3	4.09	3.1	3.4	3.2

d. Degree days

Average High Temperature for York County in 2015

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
39	43	53	65	75	83	87	85	78	67	54	43

Average Low Temperature for York County in 2015

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
21	23	31	39	49	58	63	61	54	42	34	26

Data recorded for the complete calendar year for 2015 at the KTHV airport.

	Maximum	Average	Minimum
Heating Degree Days	59	15	0
Cooling Degree Days	16	2	0
Growing Degree Days	30	9	0

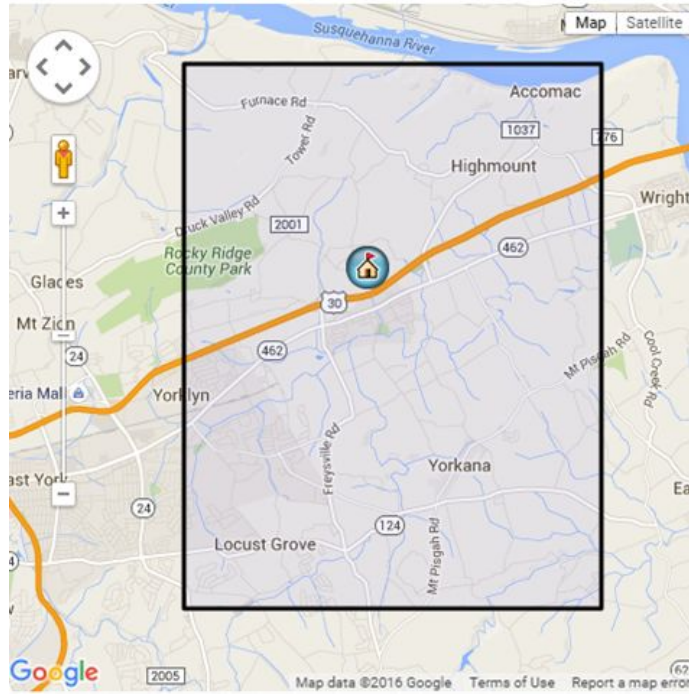
- e. Average frost free days:
 - i. average last frost date: May 1 through 10
 - ii. average first frost date: October 21 through 31

- f. Chilling hours:

Some bulbs and flowers have chilling requirements to bloom, and some seeds have chilling requirements to sprout. The number of chilling hours can be calculated by adding the total amount of time in winter (November 30 through February 28/29) spent between 32 and 45 degrees Fahrenheit and subtracting one unit for every hour over 60 degrees. The average number of chilling hours for York County is 1400 hours (University of Maryland data).

- g. Extreme weather potential (drought, flood, hurricane, tornado, fire)

According to the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information, the following data contains the recorded number of lightning strikes in 2015 in a small square area surrounding 4945 Horn Road, York, PA 17406, within Hellam Township.



Recorded Lightning Strikes					
Feb 15, 2015	4	Apr 30, 2014	4	Apr 19, 2013	1
Mar 26, 2015	15	May 22, 2014	16	May 10, 2013	1
Apr 30, 2015	15	May 25, 2014	3	May 11, 2013	1
May 6, 2015	4	May 27, 2014	1	May 15, 2013	2
May 16, 2015	210	Jun 4, 2014	4	Jun 13, 2013	18
May 18, 2015	10	Jun 11, 2014	2	Jun 18, 2013	36
May 27, 2015	13	Jun 13, 2014	2	Jun 26, 2013	1
May 31, 2015	3	Jun 19, 2014	2	Jul 1, 2013	4
Jun 1, 2015	130	Jun 26, 2014	10	Jul 7, 2013	2
Jun 8, 2015	42	Jul 3, 2014	4	Jul 18, 2013	1
Jun 9, 2015	1	Jul 8, 2014	1	Jul 20, 2013	3
Jun 19, 2015	2	Jul 14, 2014	1	Jul 23, 2013	27
Jun 21, 2015	16	Jul 23, 2014	616	Aug 8, 2013	1
Jun 23, 2015	215	Jul 27, 2014	620	Aug 13, 2013	5
Jul 1, 2015	16	Jul 28, 2014	165	Aug 28, 2013	4
Jul 8, 2015	4	Aug 21, 2014	1	Sep 1, 2013	1
Jul 9, 2015	164	Aug 28, 2014	2	Sep 11, 2013	8
Jul 15, 2015	9	Sep 2, 2014	18	Sep 12, 2013	31
Jul 19, 2015	1	Sep 5, 2014	346		
Jul 27, 2015	115	Sep 6, 2014	10		
Jul 30, 2015	36	Oct 16, 2014	7		
Aug 4, 2015	118				

Aug 11, 2015	45				
Aug 20, 2015	32				
Aug 24, 2015	418				
Sep 4, 2015	5				
Sep 12, 2015	11				
Sep 30, 2015	2				
Oct 9, 2015	23				
Oct 29, 2015	5				

The following data set include NEXRAD Level III storm structure products: recorded number of hail signatures, for a three-year period, in a small square area surrounding 4945 Horn Road, York, PA 17406, within Hellam Township.

Hail Signatures					
Apr 30, 2015	4	May 1, 2014	8	Apr 19, 2013	1
May 6, 2015	1	May 22, 2014	1 2	May 8, 2013	1
May 16, 2015	14	May 25, 2014	1	May 15, 2013	3
Jun 1, 2015	13	Jun 13, 2014	3	Jun 2, 2013	1
Jun 8, 2015	2	Jun 19, 2014	3	Jul 23, 2013	3
Jun 21, 2015	2	Jun 26, 2014	2	Aug 1, 2013	6
Jun 23, 2015	9	Jul 2, 2014	4	Aug 13, 2013	3
Jul 1, 2015	4	Jul 12, 2014	4	Sep 1, 2013	1 9
Jul 9, 2015	12	Jul 27, 2014	2 1	Sep 11, 2013	2
Jul 15, 2015	10	Jul 28, 2014	1 1	Sep 12, 2013	1 3
Jul 19, 2015	1	Aug 3, 2014	2	Oct 10, 2013	2
Jul 27, 2015	23	Aug 28, 2014	4		

Aug 4, 2015	23	Sep 5, 2014	4 2		
Aug 11, 2015	6	Sep 6, 2014	3		
Aug 20, 2015	4	Oct 16, 2014	4		
Aug 24, 2015	15				
Oct 9, 2015	5				

NEXRAD is a network of 160 high-resolution Doppler weather radars operated by the NOAA National Weather Service (NWS), the Federal Aviation Administration (FAA), and the U.S. Air Force (USAF). Doppler radars detect atmospheric precipitation and winds, which allow scientists to track and anticipate weather events, such as rain, ice pellets, snow, hail, and tornadoes, as well as some non-weather objects like birds and insects.

The Level III data consists of reduced resolution, low-bandwidth, base products as well as many derived, post-processed products. Level III products are recorded at most U.S. sites, though non-US sites do not have Level III products. There are over 40 Level III products available from the NCDC. General products for Level III include the base and composite reflectivity, storm relative velocity, vertical integrated liquid, echo tops and VAD wind profile. Precipitation products for Level III include estimated ground accumulated rainfall amounts for one and three hour periods, storm totals, and digital arrays. Estimates are based on reflectivity to rainfall rate (Z-R) relationships. Overlay products for Level III are alphanumeric data that give detailed information on certain parameters for an identified storm cell. These include storm structure, hail index, mesocyclone identification, tornadic vortex signature, and storm tracking information.

During the three-year period, 2013 – 2015, there were no recorded data sets for either mesocyclone signatures or tornado signatures.

2. Landform

a. Topographic position

The York County Integrated Water Resource Plan states; the Kreutz-Muddy Creeks Watershed is characterized by broad, rounded to flat-topped hills and shallow valleys. The highest elevations are located in the Hellam Hills area (1,060 feet) and the lowest point in the Watershed is located in Peach Bottom Township. Steep slopes of 16-25% are predominant along the streams that traverse the area as well as in the Hellam Hills. Slopes greater than 25% are particularly evident along Muddy Creek and the

Susquehanna River. The portion of the Watershed that lies in the Hanover-York Valley has the highest concentration of nearly level to gently rolling land with slopes of less than eight percent (8%).

b. Geology and Physiography

About 80% of the Kreutz-Muddy Creeks Watershed is underlain by rocks that were deposited the Lower Paleozoic Era. This is part of the Piedmont Upland section of the Piedmont physiographic province. A portion of Lower Windsor Township extending into East Prospect Borough and a portion of Wrightsville Borough extending southwestward into Springettsbury Township is located in the Piedmont Lowland Section of the Piedmont Province.

The Lowland Section is characterized by slopes that are nearly level to gently rolling. The general drainage pattern in the Piedmont Province is dendritic. Most of the Watershed is part of the Piedmont and Blue Ridge Aquifer, which contains enough permeability to store and transmit usable amounts of water. This Aquifer is composed of very small fractures, thus its yields are relatively low (2-25 gallons/minute). The limestone areas of Hallam and Wrightsville Boroughs and Hellam and Springettsbury Townships are in the Piedmont Carbonate Rock Aquifer. Yields are variable, up to several thousand gallons per minute.

3. Water

The York County Integrated Water Resource Plan states; the Kreutz-Muddy Creeks Watershed is located in the southeastern portion of York County and extends from the New Freedom/Shrewsbury area northeast to the Wrightsville area and east to the Susquehanna River. The total area of this watershed is approximately 192,000 acres or 300 square miles.

The watershed consists of the Townships of Hellam, Windsor, Lower Windsor, Chanceford, Lower Chanceford, Peach Bottom, Fawn, East Hopewell, Hopewell, Shrewsbury, Springettsbury, and North Hopewell and the Boroughs of Wrightsville, Hallam, Yorkana, East Prospect, Windsor, Red Lion, Winterstown, Felton, Cross Roads, Stewartstown, Fawn Grove, Delta, Shrewsbury, and New Freedom. Some municipalities are located entirely in the Watershed, while others are only partially within it.

- a. Existing sources of supply: location, quantity, quality, dependability, sustainability, network layout and features
- i. Wells: Two working wells exist on the property. There is a well on the west side of the summer kitchen which serves the farmhouse and summer kitchen. A second well at the northwest corner of the pole barn feeds the wash station. All water from the wells pass through UV light systems. They are located in the

summer kitchen, in the farmhouse basement and in the southwest corner of the pole barn.

- ii. Springs: Several springs are present on the Horn Farm. The spring at the northern edge of the field above the farmhouse was an early and abundant source of water for the Horn farmhouse and barn, and was piped down through the field. A concrete spring box encloses the springs. Two water holding cisterns and the water line from the spring to the Community Gardens was installed in 2008 or 2009.
 - iii. Pond: The pond, with a capacity of 70,000 gallons, was constructed in 2012 to provide water for the Incubator Farm. The pond is fed by a water line from a spring north of the farmhouse and by rainwater runoff from the pole barn and corn barn.
 - iv. Irrigation system for the Incubator Farm: As originally constructed, a pump and an expansion tank in the two cisterns next to the pond moved water to four access connections along an irrigation line running north and parallel to the barns. In 2016, repairs were made to address water leaking into the cistern containing the pressure tank. A shut off valve was installed in the cistern containing the pump. A water line connecting the pump cistern to the second greenhouse was added. In September 2016, the pump failed, and a portable gasoline-powered pump is being used as a temporary means of moving water. A full assessment of the irrigation system will be completed in 2017.
- b. Potential pollution sources:
- i. All of Hellam Township drains into the Susquehanna River, the majority through a small third-order stream, Kreutz Creek. The majority of the Kreutz Creek watershed is contained within Hellam Township. A portion of the Codorus Creek drainage is also located in the Township, in its northwestern sector. The stream valleys of these creeks and their tributaries create a distinct topography, and this interconnected system of water resources has great importance as the source of the Township's groundwater and water supply, as well as creating wetlands, vernal pools and other habitat for water-related plants and animals.
 - ii. Neighboring parcels: drift from herbicides applied to Route 30 shoulder vegetation; exhaust particulates from motor vehicle traffic along Route 30; water runoff from Horn Road; organically managed plots on the farm are subject to contamination from chemicals applied to fields currently in non-organic production.
- c. Flooding, ponding and puddling areas: Horn Road between the farm house and greenhouse, community gardens access points from Horn Road, stream crossing near Tracey School Road.
- d. Location of all on-site and nearby off-site culverts, wells, water lines, septic systems, old wells: the farmhouse is connected to a septic tank to the south side which can be

accessed through the concrete cistern. Per municipal regulation, it must be pumped and inspected every four years. A non-working well is located at the southeastern corner of the greenhouse. Culverts carry water under Horn Road at the stream in the hedgerow east of the community gardens and the stream near the intersection with Tracey School Road. A drainage ditch between Route 30 and the Horn Farm boundary (marked by a wire fence) conveys water runoff from Route 30, Horn Road, as well as pond overflow.

- e. erosion: existing and potential--sides of Horn Road from the top of the hill north of the barns continuing past the farmhouse to the curve in the road; from the stream in hedgerow H5 eastward through the incubator farm field, on the west side of hedgerow H2 in the field north of hedgerow H3; from the steepest section in field 1A into woodland W1, from the springbox area through field 3F to Horn Road; from field 4B into woodland W4 and into field 4E and from there into the stream in hedgerow H4 at several locations leading to an accumulation of sediment in most of the 250 feet of stream north of Horn Road; in fields 8A and 8B along the stream that dissects those fields.

4. Access/Circulation - See maps.

5. Vegetation and Wildlife

Tree canopy is intermittent--about 30%. Densest coverage is due to vining plants massing at the canopy layer rather than leaves from mature trees. Many dead trees both standing and fallen and in various states of decay. W2 and H1, W4 and H4 have intermittent streams that are gully-like, channelized, eroded, and sediment-bearing. A tributary of Kreutz Creek runs along W6 branches--one branch through the Stonehaven property owned by Eileen Campbell while the other branch crosses under Tracey School Road to run along the edge of W7.

Perimeter of hedgerows and woodlands are thick with vining species making access difficult from June through November. Animal and hunter trails provide easiest access.

Evidence some woodland was formerly pasture--barbed wire and fence posts in woodlands W1 and W2. At least two dumps exist on the property: one in W4, the other in what appears to be a former ore pit along Horn Road in W1.

Where down slope woodland edges abut fields in no-till, monocrop rotation, there is evidence of surface water flow and erosion toward the woodland parcel. Access limited due to dense vining plants.

Tree species:

Acer rubrum - Red Maple
Ailanthus altissima - Tree-of-heaven
Asimina triloba - Pawpaw (along the edges of W8)
Castanea dentata - American Chestnut
Catalpa speciosa
Ilex aquafolium - American Holly
Juglans nigra - Black Walnut
Liriodendron tulipifera - Tulip Poplar
Morus alba - White Mulberry
Morus rubra - Mulberry (w/black sap disease common)
Pinus strobus - White Pine
Plantanus occidentalis - Sycamore
Prunus spp. - Cherry
Quercus alba - White Oak
Quercus rubra - Red Oak
Rhus typhina - Staghorn Sumac
Robinia pseudoacacia - Black Locust
Sassafras albidum - seedlings to mature forms
Celtis occidentalis - Hackberry

Edges of wooded areas and understory are dense with plants that thrive in disturbed environments such as:

Celastrus orbiculatus - Oriental Bittersweet
Ligustrum vulgare - Wild Privet
Lonicera japonica - Japanese Honeysuckle
Parthenocissus quinquefolia - Virginia Creeper
Polygonum perfoliatum - Mile-a-minute
Rosa multiflora - Multiflora rose
Rubus phoenicolasius - Wine berries
Rubus spp. - brambles: raspberries, blackberries
Smilax rotundifolia - Roundleaf greenbriar
Toxicodendron radicans - Poison Ivy
Vitis spp. - Wild Grape

Mammals:

Deer, white tail
Turkey
Red fox

Gray fox
Ground hog
Eastern Coyote

Birds:

Crow
Scarlet Tanager
Blue jay
Cardinal
Mourning Dove
American Robin
Red Tailed Hawk
Shin Hawk
Cooper's Hawk
Barred Owl
American Kestrel
Black Vulture
Turkey Vulture

Reptiles/Amphibians:

Eastern garter
Black Rat Snake
Frogs!

5. Buildings and Infrastructure

Farm House: The Farmhouse dates to at least the 1860s; it was built by Samuel Ruby, who farmed the property for many years. Various tenant farmers later occupied the farmhouse when David Horn owned the farm. The Horn Farm was donated to York County by the Horn family in 1981. It is now used for events, classes, workshops, and offices for Horn Farm Center staff.

Well and Root Cellar: The Well was conveniently located near the farmhouse and summer kitchen to provide water for drinking, cooking, washing clothes and other things. Root Cellars were very important to the farm family. They kept food cool and at a steady humidity in the summer and prevented stored vegetables and fruits from freezing in the winter months.

Green House: The greenhouse was constructed in 2013 and provides the opportunity for our Incubator Farmers to start plants for their farms and for sale to the public. It is

ventilated, and when needed, the heated interior allows for extension of the growing season, so that certain plants such as salad greens can be available to market after the growing season is ended.

Summer Kitchen: Historically, a farm family used the Summer Kitchen for preparing and processing of foods, both for meals in the hot months and for storage of fruits and vegetables for the winter months. The most important part of the summer kitchen was the fireplace and bake oven. The upstairs provided extra bedroom space for family and hired farmhands.

In 2014, construction began to renovate the summer kitchen while still keeping a measure of the historical integrity to the space. This will enable the kitchen to be certified as a commercial kitchen by the Pennsylvania Department of Agriculture which can then be used to produce value-added products.

Squirrel Tail Oven: This typical Pennsylvania German type of oven was located outside the fireplace on the exterior wall and featured a flue that started at the back and rose over the top of the oven, mimicking the tail of a squirrel curled over the squirrel's back, hence the name 'squirrel tail' oven. Many delicious baked goods have been produced in our Squirrel Tail Oven by our talented volunteers, and it has become an integral part of Horn Farm Center activities.

J. Crist Memorial Pole Barn: The Pole Barn was built in 2010 with funds donated by the Dale and Evamae Crist family in honor of their son, Jeffrey Crist. The barn provides storage area for farm equipment, tools and supplies for the incubator farmers, as well as a cooler and other storage space for farm produce. Rainwater collected from the barn roof is piped to the pond for use in incubator farm irrigation.

Corn Barn: Historically, corn barns were used for storing corn, usually intended for feed, flour, or meal. The corn was kept in cribs along either side of the building. The Corn Barn building is oriented so that the doors take advantage of the wind and form a tunnel which draws air through the building, which aids in the drying process. The large path in the center allowed the tractor and wagon to drive directly into the barn and unload.

Lookout Platform: From the Lookout Platform (built as an Eagle Scout Service Project by Ben Dannels of Boy Scout Troop 49 in Hellam) you can view 120 acres of the Horn Farm farmed by the Flinchbaugh family, who lease the land from the Horn Farm Center to grow corn, soybeans and wheat for wholesale markets. They manage storm water using swales and contour farming. Their farming methods include no till farming, and crop rotations.

Corn Barn Foundation: Near the intersection of Horn and Accomac Roads the foundation of a former corn barn constructed in the 1930s remains after the wood was removed in the fall of 2016.

For specific locations of utilities, electrical lines, water pipes -- See Horn Farm Campus Map detail

8. Zones of Use

a. Incubator Farming

The Incubator Farm Project is designed to ‘grow new farmers’ by offering beginning farmers up to prime farmland at a reasonable rent for 3 to 5 years and providing necessary infrastructure (water, barn storage, farm equipment, cooler), marketing resources, business planning assistance, and technical training. All things that would typically be cost-prohibitive during the first few years of farming while providing a safe environment allows farmers to flourish while designing, building, and running a small business.

The Incubator Farm Program has been identified by the Board of Directors as a priority focus area in the most recent strategic Plan.

b. Internship Program

This is a part-time, hands-on training program for people with 0 to 2 years of farm experience. The program provides foundational knowledge and practical skills for those interested in small-scale, intensive, organic vegetable and permaculture-based production methods. This program will be valuable and suitable for anyone interested in exploring a future in small-scale vegetable production as well as anyone interested in learning growing skills for the purpose of homesteading, gardening, and feeding themselves and their community.

Through instruction, hands-on practice and networking, the farmer training program is designed to help you take real progress towards understanding how soil, plants, climate, and people interact to create sustainable farms with environmental, economic, and social well-being as their core values. This foundational knowledge offers a solid understanding on which you can build as you take the next steps to becoming part of the vibrant organic farm community.

c. Incubator Beekeeping

Participants work under the supervision of our beekeeper, Mark Gingrich of Gingrich Apiaries. Through the course of the two year program, the Incubator Beekeeper will work side by side with Mark and other incubator beekeepers to learn all aspects of keeping bees. At the end of year one, the participant will have the option of receiving a

bee colony to be moved to his/her home property. During the second year, the Incubator Beekeeper will continue to learn the beekeeping process as well as assist with mentoring the following year's incoming incubator beekeeper(s).

There are four new incubators for 2016, two returning from last year, as well as a returning incubator beekeeper who has also volunteered to help with the program for her third year. For 2016 the program will have a total of eight people involved. Each year the program has doubled in size. We decided to expand 2016 to four incubators and received eight qualified applications.

One mouthful in three of the foods we eat directly or indirectly depends on pollination by honey bees. Everyone that grows plants at the Horn Farm Center benefits in some way. Numerous studies show that the addition of bees at a time when plants are flowering significantly increases both the yield and quality of crops. Crops such as beans, tomatoes, onions and carrots, not to mention the hundreds of other vegetables, oilseeds and fruits depend upon bees for pollination.

d. Community Gardens

Growing your own food comes with a multitude of benefits – including being able to personally ensure food safety and security, saving money, the health benefits of eating the freshest food possible, the satisfaction and enjoyment of raising your own food from seed to harvest, and fostering a connection with the natural world.

The popular Community Garden program at the Horn Farm Center for Agricultural Education offers dirt lovers and aspiring farmers the opportunity to grow fresh, chemical-free food on prime farmland in the company of other enthusiastic and dedicated gardeners. Garden plots are open from mid-April until the end of October.

The Community Garden plots are rented to gardeners looking for good land on which to grow vegetables and flowers in small quantities for use at home or to share with others. The Community Gardens project began in 2009 and has grown to its current size of 102 plots, each 20 ft. x 20 ft. Plots are available for both seasonal gardeners and year-round gardeners. All of the plots are required to follow the organic and sustainable methods supported by the HFC.

The Community Garden program plans to expand into more educational programming moving forward. Programming can include, but is not limited to: cooking with fresh produce, food preservation, protecting plants from harmful pests, etc.

e. Large-scale farming

The Flinchbaugh's currently farm 89 acres of the Horn Farm land. This comprises all of the tillable land north and east of Horn Road excluding the community gardens, the two fields located between Horn Road and Rt. 30, the northern most field on the west side of Horn Road and the western-most field on the farm above the diversion. This field is located next to the York Water Company pump house. All products produced on these lands are sold to mills and farms in Lancaster and Chester counties.

Farming Methods:

The Flinchbaugh's grow corn, soybeans and wheat. The typical rotation is one or two years of corn followed by one year of soybeans. In the fall, immediately following soybean harvest wheat is planted. The next summer, immediately after the wheat is harvested and the straw baled, soybeans are planted. This double crop of soybeans is harvested in the fall and the rotation starts over the next spring. At the request of the Center, they plan in 2016 to transition fields 3E, 3F, and 2A (7A?) into organic hay production.

The Flinchbaugh's have an up-to-date conservation plan on all of the land they farm. This plan takes into account the numerous grassed diversions and waterways on the farm that function to help prevent erosion on the property. These diversions and waterways along with several grass field roads are mowed by the Flinchbaugh's two to three times per year to prevent weeds from becoming established. The Flinchbaugh's practice no-till methods for all of their grain crops. All land that the Flinchbaugh's currently farm at the Horn Farm has been continuously no-tilled for 12 years. The Flinchbaugh's currently plant cover crops on many other properties that they farm. Historically they have not often planted cover crops on the Horn Farm due to the later harvest dates of the cash crops on the farm. Their goal is to continue to explore and implement methods that allows them to establish cover crops on more of the land they farm, including the Horn Farm.

Poultry manure is utilized on the farm to reduce the need for purchased fertilizers. Much of this manure comes from animals that receive feed from mills where the grains grown on the farm are sold to. This helps with the recycling of the nutrients used to grow the crops. All manure is applied in accordance with the Flinchbaugh's' manure management plan. All fertilizer, be it manure or commercial fertilizer is applied using GPS technology which helps to eliminate overlaps or skips in application and ensures the correct amount of fertilizer is applied, no more or less. The need for fertilizer is determined through soil sampling which is done every two years, yield monitoring as well as tissue testing.

An Integrated Pest Management (IPM) system is used for monitoring and controlling weeds and pests. Fields are scouted frequently throughout the growing season. This in conjunction with the use of models for several diseases is used to determine if or when certain weeds or pests need to be controlled.

Field Overview:

- Field 1A - 11.5 acres: Northern most field on farm. On average, the poorest soils on the farm. This field has many sections of steep shallow soils that dry out quickly in the summer. The southern 30-60 ft of this field where it runs along the woods has greatly reduced yields due to shading. This field has above average deer damage for the farm.
- Field 2A - 4 acres: The northern most field on the west side of Horn Rd. Average soils. This field has a large area along Horn Road that stays wet for long periods of time in the spring. Planting in this field must wait until the wet spot dries up. In wet springs, the wet spot does not dry up and it must be left fallow.
- Field 3A - 9.5 acres: Located to the east of 2A across Horn Rd. Variable soils. The western edge along Horn Rd. has a large wet spot similar to the one across the road in 2A. It must be managed the same way. The western 2/3rds of the southern edge also takes longer to dry out in the spring although not the extent of the western spot. However this spot also dictates that the field must wait to be planted until soils dry or you will be replanting. At the eastern side, the field gets very steep with very shallow soils that dry out very quickly in the heat of summer. This area of the field contains the overall poorest spot of soil on the farm. This small spot (approximately .25 acres), will only produce a crop on the very best years, maybe 1 in 10. In years with heavy deer pressure this field can have deer damage along the diversion.
- Field 3D - 6.5 acres: Located south of the diversion from 3A. Average soils. A few spots in the southern half of the field have shallower soils. A small section near the eastern end is often too wet to plant due to water seeping up from a broken tile line. The southern 30 feet along the trees has very low yields due to shading. Heavy deer damage is normal in the southeastern corner and in years with high deer pressure damage can be seen along the diversion.
- Field 3F - 2.5 acres: Located north of the diversion near the house. Good soils. A 100 ft. strip on the southern edge often stays wet in the spring. Planting must be delayed until soils dry out.
- Field 3E - 8.5 acres: Located next to the house and community gardens. Good soils. This field contains some of the best soils on the farm. There is a wet area in the northeast section of the field. Shading and wildlife damage can limit yield along the stream on the eastern edge.

- Field 4A - 6 acres: Located east of 3A and north of the diversion. Average soils. A 100 ft. strip along the southern edge stays wet in the spring. Planting must wait until this area dries out. Deer damage is common where the field borders the diversion.
- Field 4B - 23 acres: Located south of 4A, east of the central woods and north of 4E. Variable soils, good to poor, but on average good. The southern extension of this field is steep but has good soils. The eastern extension has very stony, shallow and poor soils. The central portion has good soils and the northern portion average. The trees that border this field to the south are large and yield losses from shading are high in the first 30-60 feet. There are some small spots south of the diversion between this field and 4A that stay wetter in the spring, although not to the extent as in some other fields. Deer damage is common on the northern and eastern edges of this field.
- Field 4E - 6.8 acres: Located north of Horn Rd. and south of 4B. Good soils. A few wetter spots in the southwest and northwest corners. Low wildlife impact.
- Field 6A - 4.5 acres: Located just east of Tracey School Rd. Average soils. The trees that border this field are tall and yield losses due to shading in the first 30-60 feet are high. Deer damage is average
- Field 6C - 1.6 acres: Located east of 6A. Average soils. Average deer damage.
- Field 6D - 15 acres: Located east of 6C. Average to poor soils. The majority of the soil in this field is average but the northeastern corner and southern 2/3rds of the western edge have shallower and poorer soils. The trees on the eastern and southern edge are tall and cause large yield losses in the first 30-60 ft. This field consistently has the worst deer damage on the farm. It is normally focused in the eastern third of the field and in some high pressure years over 1acre of the field has no yield due to deer grazing.
- Field 7A - 3 acres: Located north and west of the incubator farm fields next to the water pumping station. This field is on both the Horn Farm and the neighboring property to the west. Only 3 acres of the field are on the Horn Farm. Good soils. Gets moderate wildlife damage on the eastern edge.
- Field 8A - 2 acres: Located between Horn Rd. and Rt. 30 and west of 8B. Good soils. The trees along Rt. 30 cause large yield losses in the first 30-60 ft. of this field.
- Field 8B - 2.3 acres: Located between Horn Rd. and Rt. 30 and just west of Accomac Rd. Poor soils. The soils in this field are poor due to a large portion of the field being poorly drained. This is the wettest field on the farm and sometimes must be planted after the rest of the farm. Groundhog damage to soybeans can be high at the east end.

Infrastructure:

- Several fields have agricultural drain tile installed in them to drain excess water from the soil. Those fields are as follows:
- 3A, 3D - starting in the steep hillside of 3A near the two waterways, crossing the diversion and 3D and emptying into the northern end of the central woods.
- 3F - Starting in the northeast quadrant and emptying into the stream.
- 4E - Starting in the northwest quadrant and emptying into the stream.
- 7C (incubator farms field) - starting in south center part of field and emptying into drainage ditch near crossing.
- A spring house is located just east of field 3E. Water from the spring house feeds to 500 gallon concrete tanks that are buried just in front of the spring house. The overflow from these tanks is piped into the stream to the east. Two pipes outlet out of the tanks. the first runs from the tanks across field 3F to the center frost free hydrant at the community gardens. The second runs from the tanks, across fields 3E and 3F to Horn Rd. It crosses Horn Rd. and goes along the north side of the pole barn and from there to the pond.
- A high voltage power line crosses the eastern portion of the farm. The lines run above fields 6D and 8B. A tower for this line is located in the southwestern part of field 6D A 30 inch natural gas pipeline runs parallel to the power line on the west side. It crosses fields 6C, 6D, and 8B. It was installed in 2011 and is owned by Spectra Energy.

f. Hunting program

Hunting on the Horn Farm property is a privilege that is under the supervision of the Horn Farm Center Executive Director. Both the Horn Farm Center and York County require that hunters sign appropriate permission forms and follow certain rules and regulations. Failure to adhere to these could cause the loss of hunting privileges. The Horn Farm Center retains the right and the discretion to revoke hunting privileges if any hunter is not adhering to the intentions of these rules and regulations.

- Hunters must have appropriate licenses.
- A signed waiver and permission agreement must be submitted to the Horn Farm Center and must contain the hunter's name, address, phone number, email address, hunting license numbers, and description/license plate numbers of all vehicles that might be parked on the property during hunting season. A dated permit will be provided to display in window of your vehicle.
- When parking your vehicle, leave access to farm buildings.
- There is to be no hunting on days of Horn Farm Center events. The Center will notify hunters of these dates and times.
- Hunters on the property must treat each other with respect and equality.
- Only archery and muzzleloader deer hunting is permitted.
- There is a limit of 12 approved hunters for a hunting season.

In addition, the Center asks that hunters help patrol for non-registered hunters and make note of vehicle license plate numbers of those hunters. Please relay that information to the Executive Director via phone or email.

The following is the process for hunting at the Horn Farm Center:

- We allow up to 12 hunters per season to hunt on the Horn Farm Center property.
- All current hunters have the first opportunity to submit their names to be considered for the next hunting season. Information regarding the next season will be sent to all current hunters prior to September 1 of the current year. This information will include a Rules and Regulation Letter and Volunteer Hour Record Form. A signed Rules and Regulations Letter is evidence of submitting your intent to continue hunting at the Horn Farm Center for the next year. However, 20 hours of volunteer time must be completed by August 31st of that hunting year for you to be APPROVED to hunt.
- Hunters not currently on the list may submit their contact information to the Executive Director of the Horn Farm Center to be considered if an opening becomes available. A signed Rules and Regulations Letter is evidence of submitting your intent to be considered for an open position. You are encouraged to begin volunteering and tracking your hours in case a spot opens. The individuals who have the most volunteer hours already accrued when an opening occurs will have the best chance of getting on the list.
- Volunteer hours run from September 1 – August 31 preceding the hunting season. For the 2015-2016 season all hours must have been completed between September 1, 2014 and August 31, 2015. The 2016-2017 Hunting Season hours begin to accumulate on September 1, 2015.

g. Edible hedgerow

The goal of the edible hedgerow project is to establish a healthy, multi-functional hedgerow that supports beneficial wild species of plants and animals, generates an output, and supports the incubator farms project.

A hedgerow is a semi-wild buffer strip that separates parcels of land while providing valuable ecosystem services and multiple other benefits.

Maintaining functional semi-wild areas within and surrounding small-scale diversified vegetable farms is essential to the long-term viability of these types of operations. In a permaculture framework, we look at various systems that are at work, how they are connected, and how we can obtain yields from those beneficial relationships. Understanding the relationship between the semi-wild areas and the cultivated field

reveals many beneficial connections that are present.

Hedgerows are typically considered to be simple divider strips between fields or properties and not seen as a valuable part of the farm operation itself. However, a functional hedgerow provides valuable services, many unseen, that not only increases yields on a farm, but financial income as well. Hedgerows provide important habitat for beneficial insects which are the main source of pollination and the first line of defense against other insect pests. These beneficial insects rely on uncultivated areas for breeding grounds and overwintering to improve their populations. Flowering plants and trees also provide them with additional food sources. Hedgerows also provide habitat for predator species. Foxes use these corridors as safe passage to travel from field to field helping to control rabbit and rodent populations. Birds require shelter and nesting areas and are voracious insects eaters. Hawks and other raptors hunt rodents from the edges. Other hedgerow benefits include – sound and pollution buffer, windbreaks, creation of microclimates, aesthetics, and educational opportunities.

We can take these benefits a step further while designing hedgerows and focus plantings on species with edible parts – nuts, berries, fruits, leaves, etc. The potential harvest from the hedgerow can be another income generator for small business farmers.

The goals of the hedgerow project include, but are not limited to: establishing a healthy system of multi-functional edible hedgerows, improving yield for the incubator farm project, increasing the income for the incubator farmers, creating educational opportunities, and acting as a model of environmental stewardship.

The program, which began in June 2014, is monitored by the farm manager and the executive director.

h. Foraging

Foraging is the act of finding and gathering wild foods. For the majority of our existence on this planet, human beings lived as hunter-gatherers. By engaging in this age-old practice, we can provide ourselves with healthy and FREE food and medicine, become more self-reliant, and connect on a much deeper level to the landscape in which we live. There are many green things that are safe and delicious, and easy to find once you know what to look for.

During the intensive series, in the course of eight months, you will go from learning foraging basics to incorporating wild plants into your everyday life and gain the knowledge to confidently share what you know with others. Classes will span from

March to October and run 2-3 hours each. The course will be a combination of classroom based sessions and outdoor hands-on learning as well as two off-site field trips.

There are also monthly sessions that can be taken on an individual basis. These are offered March through December and give all year round opportunities to learn what the natural world has to offer.

i. Pawpaw orchard

Horn Farm's pawpaw orchard was planted in 2012. It consists of 48 tree locations in four east-west rows, of 12 trees each. Of these there are 34 trees alive and thriving, and 14 springs which have died, which are scheduled to be replaced the spring of 2016. Neil Peterson, one of the world's top pawpaw researchers, is an informal consultant on the project and has advised on watering levels, and plant diseases.

Paw Paws are small trees native to our Region's woods. The fleshy fruits are flavorful and savored by animals and humans alike. The HFC orchard grows twelve Peterson varieties, as well as straight natives. They are: Shenandoah (7), Susquehanna (7), Rappahannock (2), Allegheny (2), Sunflower (8), Potomac (2), NC-1 (4), Overlease (4), PA Golden (2), Wabash (4), Prolific (2), Mango (2), and Wild Native (2). These were chosen for taste and maintainability. Pawpaws when mature, are not preferred by deer, and are resistant to almost all pests. There are a few fungus diseases, but in general these trees are quite hardy and with a plant culture, naturally consistent with organic farming practices.

Watering is important especially in the spring. Pawpaws like moderate moisture. As the trees are small, it is easier to water directly with watering cans, though the trees already had drip irrigation lines, which were laid (prematurely) in the first year.

As far as the big job of weed suppression, we are working on a system of cardboard and wood chips between the trees, and Dutch White Clover between the rows. These need to be occasionally cut with the tractor; estimating six times a season. Volunteers have been very helpful for the occasional cardboard and chip laying between the trees.

The program goals are to grow 48 healthy Pawpaw trees, and to harvest anywhere from 10 to 20 pounds per tree, four or five years from now. Rates per pound will vary widely from \$7.00 in the DC market to \$3.00 locally. There are no rules here, and all proceeds would be towards the HFC. Restaurants, local markets, and sales at the HFC itself, are all possibilities, and some have already inquired, for the time when the trees are bigger.

Today the tallest trees are approaching 5 feet, so it will be a few years before we can hope for consistent harvest. Last year, 2015, the first pawpaw was harvested....only one!

Monitoring of the orchard is entirely by Jon Darby. Others include the volunteers, so far mostly from Bell Socialization Services, and fellow HFC incubator farmers. The orchard, donated by Richard and Judy Bono, is for the benefit of the HFC, to be defined and determined by the HFC.

j. Pollinator Garden

In 2012, Dallas Diehl presented Horn Farm Center with his proposal to plant a pollinator friendly garden as his Eagle Scout Service Project that would act as a model for other community members trying to build their own pollinator gardens and also help promote pollination throughout the Horn Farm Center and York County. Dallas and his team cleared approx. 1,500 sq. ft. of land full of weeds, laid mulch, planted numerous shrubs, native perennial plants, and larvae host plants, following his well-researched plan. They also installed a stone path, butterfly puddling dishes, and bee boxes, providing shelter and water for pollinators. The garden, completed in 2013, provides food and habitat for native insects which, in turn, provide the pollination needed to protect our plant diversity and food sources.

k. 19th Century Kitchen Garden

Farm Kitchen Gardens of the 19th century typically included vegetables and herbs planted in neat rows and not grown in large quantities. This garden uses a four-square design, typical of the period. Some vegetables commonly planted in kitchen gardens included horseradish, cabbage, beans, salsify, radishes and lettuce. Currently this garden is maintained by volunteers and provides food for HFC events and is used as a teaching tool for permaculture methods and design.

l. Trails

The Informal Walking Trail is a scenic way to enjoy Horn Farm Center. Along your walk, check out the Squirrel Tail Oven, the Greenhouse, and the Community Gardens. You can also enjoy the Bluebird Trail's eight bird houses (which may be home to tree swallows and chickadees, as well as bluebirds) added in 2013 as part of Tarisa Kelly's and McKenna Keller's Girl Scout Silver Award Project.

<http://hornfarmcenter.org/wp-content/uploads/2014/02/HFC-Tour-Bluebirdmap2014.pdf>

m. property lines, easements, rights-of-way

York County Preserved/Protected Lands: Of the four (4) watersheds in York County, the

Kreutz-Muddy Creeks Watershed has the highest percentage (13%) of preserved land. Although the preserved land exists to some degree in each township in the Region, the greatest concentration is in Chanceford, East Hopewell, Hopewell, and Lower Chanceford. Only two percent (2%) of the land is protected, with most of that land comprised of Sam Lewis State Park , High Point County Park, and Native Lands County Park in Lower Windsor Township; Apollo County Park in Chanceford Township, and State Gamelands in Lower Chanceford Township.

Conservation Easement: The York County Commissioners approved a permanent conservation easement on the HFC land in July 2016 through the Farm and Natural Lands Trust limiting future development and permanently preserving the open space nature of the property.

n. existing zones of land and water use

The HFC land is zoned rural agricultural and is located within the Transfer Development Right's district.

Transfer Development Rights: A zoning tool to protect agricultural land within the rural area townships is the transfer of development rights (TDR). The purpose of TDR is to allow the owner of a parcel of land in an agricultural area to transfer available development rights to another parcel which is more suitable for development. Within York County, some municipalities permit the transfer of development rights within the agricultural, conservation, and/or rural residential zones; some permit development rights to be transferred to a designated receiving area outside the agricultural and/or conservation zone; while others permit both transfers within the agricultural and conservation zones and transfers to a designated receiving area outside these zones. With regard to transfers within the agricultural, conservation, and/or rural residential zones, the intended purpose of the TDR provision is two-fold: to preserve prime agricultural land by transferring development rights onto less productive soils and, by clustering development, to leave larger uninterrupted areas for agricultural use. Transfers to areas outside the agricultural zone are typically to areas designated for growth, such as residential, commercial, and/or industrial zones. These transfers are preferable as they remove development from the agricultural areas resulting in greater protection of resources and less impact on farming operations.

Hellam Township has a Storm Water Management Ordinance (SWM) that was adopted in September 1996 and revised in 2012. The purpose of a stormwater management ordinance is to minimize problems that are associated with stormwater runoff and soil erosion and sedimentation both during and upon completion of a land disturbance activity, by regulating activities which cause such problems. In addition, the ordinance helps to preserve natural drainages, encourage groundwater recharge, maintain and/or

improve the flow and quality of streams and watercourses and preserve and/or restore the flood carrying capacity of streams and watercourses.

- o. Use history and impacts on land, current or future uses

Currently the Horn Farm Center leases the land from the County of York. The financial cost is minimal and the County is entrusting the HFC as stewards of the land. In July of 2016, the County extended the lease agreement to 99 years. This enables the HFC to maximize development and expansion of our mission, be sustainable and reach the most citizens of York County.

This will also enable access to financial resources and community support that have been inaccessible because the organization was tied to a revocable lease. A long-term lease, coupled with a conservation easement with FNLT, will greatly increase community confidence in the HFC and see to it this asset remains viable in perpetuity.

The Horn Farm currently leases 89 acres to the Flinchbaugh Family for large-scale no-till conventional farming. The lease is a three-year lease beginning on January 1, 2016.

Other:

1. Maintenance strategies
2. Protection strategies
3. Growth management best practices
4. Soil Fertility and Management

The York County Integrated Water Resource Plan states; the predominant soil groups in this Watershed are the Chester-Glenelg and Mt. Airy-Manor soils. Chester-Glenelg soils are well-drained and somewhat excessively-drained soils that are, for the most part, undulating and rolling. Mt. Airy-Manor soils, on the other hand, are well-drained and are primarily hilly and steep. Moderate to high infiltration rates occur throughout the watershed.

- a. soil types: texture, structure, consistence, profile, drainage
 - b. Soil toxins: lead, mercury, cadmium, asbestos, etc..
 - c. Soil Management
 - d. Map
5. Coordination with current County guidelines/regulations
 6. Identification of LUMP partners
 - a. York County Agricultural Land Preservation Board: It is the mission of the YCALPB to protect York County's agricultural resources through the preservation of economically viable farms with the creation and maintenance of stable agricultural communities. They

provide information and outreach to help ensure the continuation of York County's vibrant and viable agricultural community.

- b. Farm and Natural Lands Trust: Dedicated to preserving our farm and natural lands for future generations
- c. YCCD: The York County Conservation District is the county government office devoted to assisting residents with their natural resource and environmental concerns. The York County Conservation District is committed to the improvement and protection of our environment and the wise use of our County's diverse natural resources. To achieve that vision, The York County Conservation District will be proactive providing conservation education, technical services, and financial assistance, in order to enable the citizens of York County be good stewards of our natural resources.
- d. Penn State University – Extension
- e. York County Watershed Alliance: The Watershed Alliance of York (WAY) is a coalition of stakeholders committed to being innovative leaders educating the public and encouraging watershed planning, restoration and protection, through locally led conservation, education and stewardship initiatives, in York County and beyond.

Maps/Appendix

1. Horn Farm Base Map with 3 Layers:
 - a. Access/Circulation/Zones of Use
 - b. Water/Buildings/Infrastructure
 - c. Aesthetics/Experience of Place
2. Horn Farm Base Map - Campus Detail
3. Elevation Contours
4. HFC Parcel – Aerial Photo
5. Wetland Areas
6. York Water Service Area
7. York Water Service Area – 2
8. Relevant Streams
9. Flinchbaugh Field Map
10. Electric Facilities – Met-Ed
11. Hellam Township Zoning Map
12. Hellam Township – Restricted Development Overlay
13. Hellam Township – Natural Features
14. Hellam Township – Soils
15. Hellam Township – Prime Agricultural Soils

Resources

1. [York County Comprehensive Plan](#)

2. [York County Environmental Resources Inventory](#)
3. Hellam Township Comprehensive Plan
4. [York County Integrated Water Resources Plan](#)
5. [Hellam Township Environmental Resources Inventory](#)