

# **Landscaping Report and Recommendations**

**First Unitarian Universalist Congregation of Ann Arbor  
4001 Ann Arbor-Saline Rd  
Ann Arbor, MI**



Graham Sustainability Scholars Team 2020-2021

Author:  
Eloise Janssen

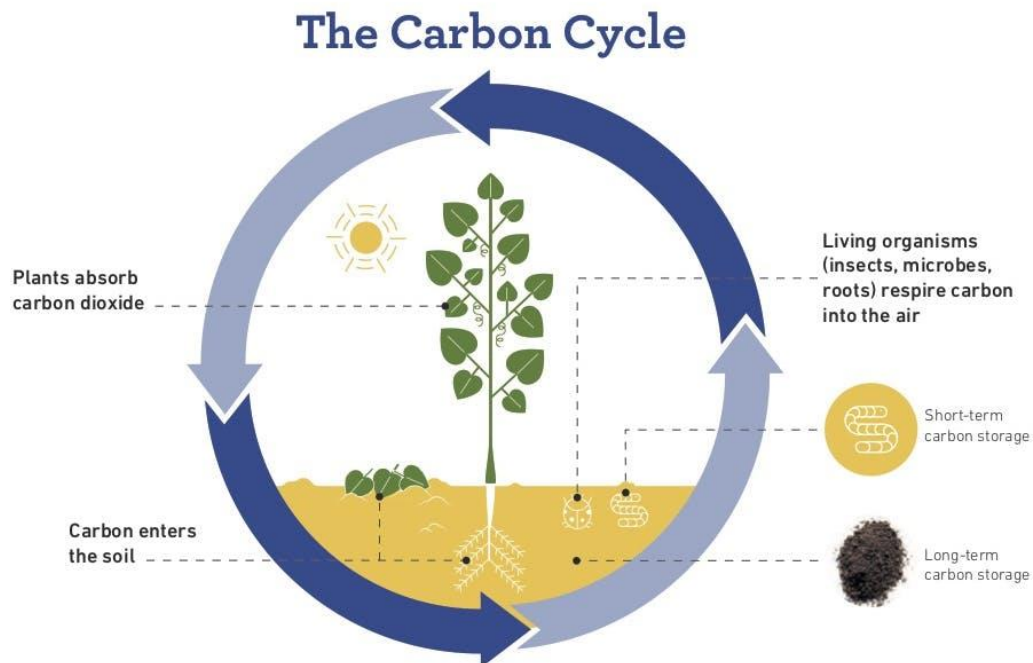
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**How can landscaping help First Unitarian Universalist Congregation of Ann Arbor reach their carbon neutrality goal?**

We all know that trees are suitable for the planet and the fight against climate change but why? Plants produce oxygen through photosynthesis, but plants also help create balance in the unbalanced carbon cycle. By planting the correct plants and creating a healthy ecosystem on your property, you can make your carbon sink. The carbon cycle, much like the water cycle, revolves around the movement of carbon from one system to the next. Carbon naturally exists in water, the ground, and in the air. Human interference has created an unequal distribution of carbon on the planet, exuding thousands of carbon tons into the atmosphere. Creating healthy and sustainable landscaping can help balance the carbon system by having the plants sequester the carbon into the soil to promote carbon offsetting.

The science on how much carbon is stored by plants in the soil is still ongoing. The University of Minnesota conducted a study on prairie lands and found that one acre of prairie/prairie plantings can store 1 ton of carbon in roots/soil per year. This was contingent on the plants being native and having healthy soil. Planning your landscaping will require a mindset for the future as your plants lay roots and sequester more and more carbon throughout their lifetime.

In addition to a carbon sink creating a healthy landscaping plan relies on solid biodiversity. Creating a haven for insects, birds, mammals, and many other creatures is key to obtaining a robust and healthy landscape. The following report will outline soil needs, plant basics, and projects to take place at UUA. These are long term goals and clearly provides information to help the congregation and the landscape grow.

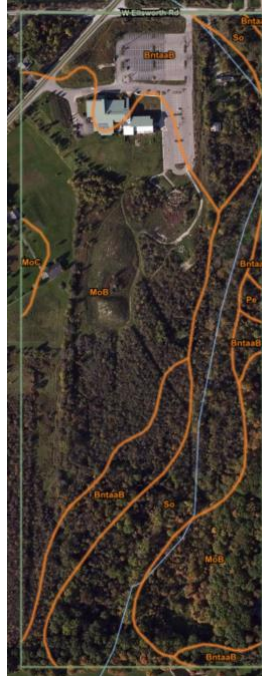


## Soil

- Soil tests
  - o Type
    - Soil type tests help to identify soils and their characteristics like density and water capacity. This is necessary to do in order to best see what plants will grow best on your property. This should also let you know the nutrient and lime levels in your soil, helping later to figure out what fertilizers might be needed.
  - o pH levels

- Testing for pH levels allows land stewards figure out how to adjust soil pH to the optimum range (6.0-7.0), which makes nutrients more available for plant growth.
      - Ideally, your topsoil should be somewhere between 5.5 and 7.5 for gardening.
    - Tests
      - [MSU home soil test kit](#) provides information on the soil texture, pH value, nutrient levels for phosphorus (P), potassium (K), calcium (Ca), and magnesium (Mg), the soil organic matter (OM) level, and personalized recommendations for fertilizer and any needed pH modifications.
        - Cost - \$25, can only perform one soil test per kit
      - This [at home kit](#) from amazon is a simple test kit for soil science education or garden analysis. Rapid test procedures, diagrammed instructions, and laminated color charts are used to measure concentrations of nitrogen, phosphorus, potassium (15 tests each), and soil pH (30 tests). The Garden Guide manual and LaMotte Soil Handbook are included to interpret test results and give lime and fertilizer recommendations.
        - Cost – \$94.99
    - [Method for at home soil testing](#) loam soils is described below by SF Gate.
      - “There's a simple test, as described by [the Clemson Cooperative Extension](#), to assess the silt loam [soil](#) classification of your [garden](#) and determine if you are working with silty loam [soil](#). Place a handful of [soil](#) in a clear, quart-size jar; fill it two-thirds with water and shake vigorously for about 30 seconds. The first [soil](#) particles that fall to the bottom are sand; next, the silt falls in a distinct layer. If you let it sit for a day or two, the tiny clay particles will finally settle on the surface. Once the water is clear, measure the thickness of the three layers and calculate the relative percentage of each. Silty loam [soil](#) is composed of roughly two-thirds silt particles, with the remainder split equally between sand and clay.”
- Where to get soil
  - [Recycle Ann Arbor](#) sells compost, mulch and wood chips with a \$5 loading fee and 1 bushel is roughly 10 US gallons.
    - Compost - per bushel \$2.50
    - Mulch - per cubic yd \$22
    - Woodchips - per cubic yd \$17 or per bushel \$2
  - [Lodi Farms](#) is a local farm that supplies We sell shredded bark mulch, wood chips, topsoil, and compost for all your garden needs.
    - Topsoil - \$29/cubic yard picked up
    - Compost - \$31/cubic yard picked up
    - Planting Mix - \$29/cubic yard picked up
    - Hardwood Bark Mulch - \$36/cubic yard picked up
- [National Soil Survey Information](#) - pictured below.

Map Unit Legend			
Washtenaw County, Michigan (MI161)			
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Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BntaaB	Blount loam, 2 to 6 percent slopes	15.8	25.6%
MoB	Glynnwood loam, 2 to 6 percent slopes	32.4	52.3%
MoC	Morley loam, 6 to 12 percent slopes	0.6	1.0%
Pe	Pewamo clay loam, 0 to 2 percent slopes	0.3	0.5%
So	Sloan silt loam, 0 to 1 percent slopes, frequently flooded	12.7	20.5%
<b>Totals for Area of Interest</b>		<b>62.0</b>	<b>100.0%</b>



- Above is the state soil survey indicating that the soil on the UAAA property has 5 distinct soil types. More information on the [soils](#).
  - o Blount loam- clay or clay loam that is very deep, somewhat poorly drained soil that is very dense
  - o Glynnwood loam – silt loam that is a moderately well drained soil
  - o Morley loam – clay or clay loam that is a moderately well drained soil
  - o Pewamo clay loam – silty clay or clay loam that is a very deep, very poorly drained soil
  - o Sloan silt loam - very deep, very poorly drained soils formed in loamy alluvium on flood plains that are mainly silty clay loam
- The soil indicated to be on the property is not the best for planting perennial plants, but this can be mediated by seasonal burnings and addition of compost to the soil where new plants are to be planted. A benefit to heavy clay soil is that it is nutrient rich.
- When working with solid and planting new plants make sure to try and clear it of rocks and twigs especially if planting seedlings. These obstacles can be hard for a baby plant to overcome so to create a happy environment sift through your soil removing any large objects.
- Fertilizers
  - o Sometimes soils need help to give plants everything they need to grow and be healthy, that is where fertilizer comes in. The main fertilizer needed should be nitrogen based with other nutrients and components. In order to reduce use of nitrogen-based fertilizers and save on costs try to place in the fertilizer close to planting season and when the plants will be able to take it in.
  - o There are no affordable carbon neutral fertilizers on the market currently so try to buy local is the best option.

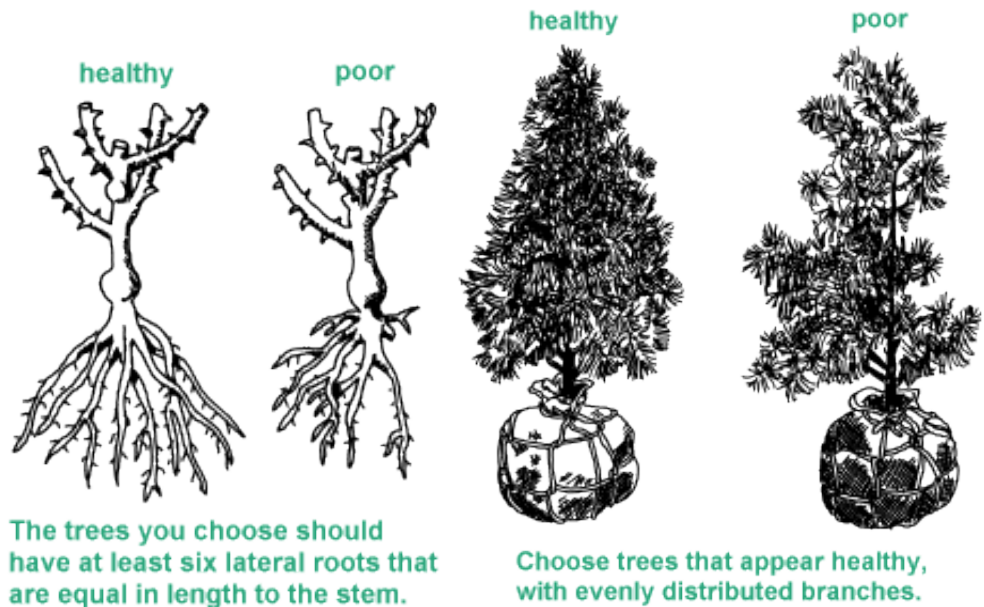
## Plants

- Where to plant?
  - o Around the Building
    - Perennial trees for shade and for space to grow large root systems
    - Garden on the south side of the building to maximize the sun in fall and spring. A successful garden needs at least 10 hours of sunlight a day. Make sure to observe the planned site for the garden for sun exposure before planting.
    - When it rains note what areas hold water and what areas are well drained. Plants have specific water needs and rooting them in a place where they might drown is not good for the plant or for your wallet.
    - If there is a walnut tree on the property avoid planting the garden near there. The seeds alter the pH and release a chemical called juglone, which is toxic to certain vegetables, especially tomatoes, potatoes, eggplant and peppers.
    - Strawberries and mint coverage on the lawn in the shady to promote a more sensory environment.
- What to plant?
  - o Trees play an important role in carbon farming because their size allow high carbon sequestration and being perennial means, this can happen year-round.

- Apple trees and other fruiting perennials that have large root systems that help sequester carbon.
  - Here is an extensive list of edible trees that are perennials (not all native) and their ideal soil types. Listed are trees that will grow in the clay soil on the property. (Once pH is known will narrow down list)
    - [https://leafnetworkaz.org/resources/CHOOSE/Soil%20Types%20for%20%20Selected%20Edible%20Trees%20\(2%20pgs\).pdf](https://leafnetworkaz.org/resources/CHOOSE/Soil%20Types%20for%20%20Selected%20Edible%20Trees%20(2%20pgs).pdf)
    - Apple
    - Fig
    - Hawthorn
    - Mesquite
    - Oak
    - Persimmon
    - Plum
- Native plants that help keep the natural carbon cycle in balance and local ecosystems happy. A full list can be found on the Ann Arbor government website [here](#).
- General Native Species to plant
  - Grasses
    - Hardstem bulrush
    - Indian grass
    - Rush, soft-stemmed
    - Sedge
    - Wool-grass
  - Shrub
    - Adler
    - Birch bog
    - Bladdernut
    - Blueberry
    - Buttonbush
    - Chokeberry
    - Cinquefoil
    - Dogwood
    - Elderberry American
    - Gooseberry
    - Holly
    - Meadowsweet
    - Ninebark
    - Rose swamp
    - Spicebush
    - Viburnum
  - Ferns
    - Cinnamon fern
    - Marsh fern
    - Ostrich fern
    - Royal fern
    - Woodfern crested
  - Perennials – try to focus on these, they sequester the most carbon
    - Aster new England
    - Bearded-tongue foxglove

- Blazing-star marsh
  - Sweet black-eyed Susan
  - Culver's root
  - Evening primrose
  - False dragon head
  - Golden Alexanders
  - Golden Ragwort
  - Iris
  - Iron weed
  - Jewelweed
  - Joe Pye weed
  - Marsh marigold
  - Purple meadow rue
  - Milkweed
  - Bishop's cap
  - Mountain mint
  - Wild onion
  - Sneezeweed
  - Starry false
  - Vervain blue
- Trees
- Here is a list of all native trees in Michigan  
[https://www.michigan.gov/documents/IC4212MichiganNativeTrees\\_139986\\_7.pdf](https://www.michigan.gov/documents/IC4212MichiganNativeTrees_139986_7.pdf)
  - Here is the list of native trees in the area from Ann Arbor Government website.  
<https://www.a2gov.org/departments/Parks-Recreation/NAP/Native-Plants/pages/nativetrees.aspx>
  - These are the best trees to plant on your property with the poor drainage and clay heavy soil. Defined as moist forest trees that can tolerate wet soil. Bolded trees do well in wet, poorly drained areas and clay soils. Italicized trees can handle high acidity in soil. List subject to change based on pH tests.
    - Aspen, trembling
    - **Basswood; linden**
    - Beech, American
    - Birch, yellow
    - *Blackgum*
    - Cedar, northern white; arborvitae
    - **Hackberry**
    - Hawthorn, downy
    - Hickory, bitternut
    - Hickory, shagbark
    - *Maple, red*
    - **Maple, sugar**
    - Muscledwood; Blue beech; American hornbeam
    - **Oak, swamp white**
    - **Sycamore**
    - Tuliptree
- Vegetables and Fruits for the Garden

- The Open-Source Seed Initiative (OSSI) has the goal to maintain fair and open access to plant genetic resources worldwide in order to ensure the availability of germplasm (seeds) to farmers, gardeners, breeders, and communities of this and future generations. Consider purchasing seeds through or approved by this organization. OSSI approved seeds are sold by Nature & Nurture Seeds out of Ann Arbor. <https://natureandnurtureseeds.com/collections/open-source-seed-initiative-ossi-seeds>
- Further OSSI seed providers are listed here - <https://www.canr.msu.edu/foodsystems/uploads/files/organic-seed-suppliers-vegetables.pdf>
- Frog-Holler Farm provides organic garden starts aka seedlings of vegetables, herbs and fruits. <https://froghollergardenclub.square.site/>
- Where to buy plants?
  - Nurseries that source locally
    - Wild Type - <https://www.wildtypeplants.com/>
      - This is their plant catalogue with pricing [https://a707df11-b8c1-4193-9708-c6ddc99deb2c.filesusr.com/ugd/8a6639\\_8bf6169c4c6549589f4e6464c27c5404.pdf](https://a707df11-b8c1-4193-9708-c6ddc99deb2c.filesusr.com/ugd/8a6639_8bf6169c4c6549589f4e6464c27c5404.pdf)
      - They provide seedlings and plugs of native plants including trees.
    - Ypsilanti Native Plant Nursery - <https://www.ypsilantinativeplantnursery.com/>
    - The Native Plant Nursery - <http://www.nativeplant.com/>
  - Visual tips before buying plants - especially for trees

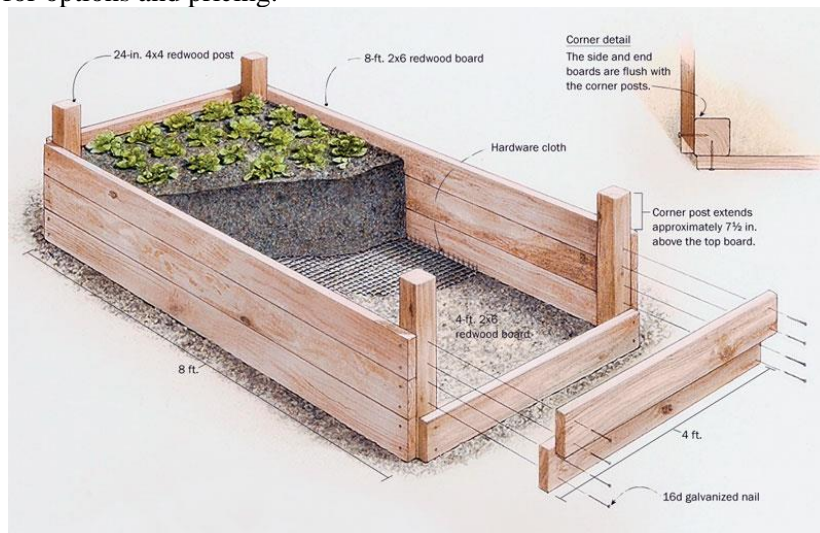




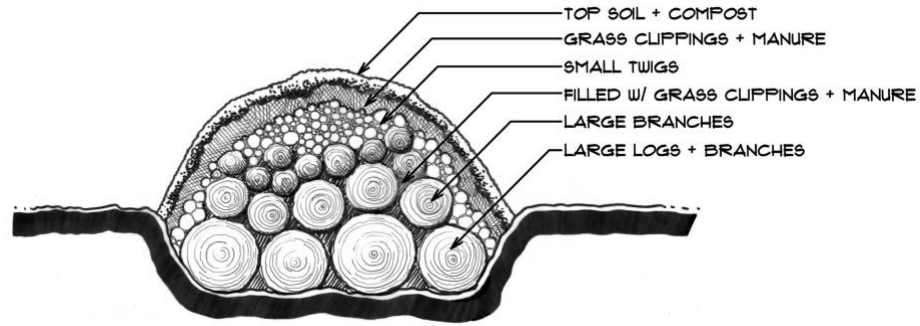
## Projects

### - Garden

- A raised wooden soil beds needed for a successful crop since the soil is not ideal for agricultural plants. Basic plan below. Soil or compost will be needed for this. See soil section for options and pricing.



- There needs to be at least 2 to 3 inches of topsoil in order for seedlings to grow. Placing natural mulches, such as wood chips, on top of the topsoil can prevent weeds, conserve water, and moderate soil temperatures.
- Alternatively, a Hügelkultur would be another sustainable way to incorporate agriculture into the landscape. These are layered raised beds for growing crops that once made require little maintenance and can be constructed in organic shapes to awaken the landscape making it more interactive. They also work well in low drainage soil areas and for hilly properties.



- Below is a basic construction layout for a Hugelkultur. This will also be able to be made by utilizing logs and fallen trees found in the 'Back 40'. This will also lend itself to be a great community project for the whole congregation to get involved in!
- This is a [complete guide](#) for making and constructing your Hugelkultur.
- [Here](#) is an excellent guide to gardening in Michigan provided by MSU.
- These are easy and bountiful vegetable and fruit plants to grow in your garden.
  - Beets
  - Lettuce
  - Carrot
  - Peas
  - Radish
  - Spinach
  - Beans
  - Corn
  - Melon
  - Pepper
  - Tomatoes
- Rain Garden
  - This is a garden situated in a space to catch all the runoff rainwater from the building. At the UUAA site this might be next to the existing garden or on the far east side of the property. See Certificates for Natural Land on Private Property for more information on the Rain Garden Certificate and class.
- Trail
  - See Maintenance section for more resources for trails.
- Wetland/Back 40
  - There are many places on the property that hold and sustain water, these areas need plants specific to Michigan wetlands.
  - These are native trees to plant near particularly wet part of the property as well as in standing water. Consider planting these near streams or drainage areas.
    - Black Maple
    - Swamp White Oak
    - Plane Tree or Sycamore
    - Red Maple
    - River Birch
    - Basswood
- Fire Circle
  - Earthen seating is a great way to activate a landscape and create a welcoming green space outdoors. Fire pits need to be dug into the ground in order to protect the flames, so this utilizes the fires need to create a space from the offset soil.



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- This grass chair is constructed by building up soil to make that form. Bases like wood or rocks can be used to help with the base structure of the seating.
- This style can be implemented in with two half circle benches that surround the earthen firepit.
- Playground
  - Create a green space for children to foster skills needed for life and to engage more with a natural landscape at a young age – for sensory and physical engagement.
  - Utilization of logs and boulders is a simple yet effective means for a natural playground.
  - [Here](#) is a great website to spark ideas and to see what others are doing in the realm of natural playgrounds. The main thing to remember is the playground is a space for kids to grow, this entails building strength, coordination, and sensory experiences with nature.
- Overall Beautification
  - Church sign currently is scarce of landscaping. In order to bring life to the sign, flowering native plants and evergreen shrubs will bring life year-round.
    - Plants to grow next to the sign should be evergreens like Arborvitae.
    - Colorful flowering native plants to grow around the sign or the church’s building include:
      - Joe Pye Weed
      - Purple Coneflower
      - Columbine
      - Bee Balm
      - Blackeye Susan
      - Trillium
      - Evening Primrose
      - Michigan Rose
      - Astilbe
  - Around the building
    - South side
      - Plants on the south side should need strong direct sun.
    - North side

- These plants should be hardy and need minimal daylight. The north side of buildings are cooler and get less direct sunlight as winter creeps in.
  - Daycare
    - In the summer it gets extremely hot, and the sun can wear out children. For this region the main goal will be to create a shaded and engaging environment for children. The best means for this is canopy trees. These include:
      - Maple trees
      - Oak trees
      - Willow
      - Northern Catalpa Tree
- Things to remember when constructing and building on your land -
  - Think about the life of what you are building – How long do you want it to last? Can everything going into thing return to the earth safely? Are you using the materials available as much as you can? How can you work with the land to build this? How will the community use this space?
  - Building materials that may be cheaper are not always the best choice – if you want to use concrete try to use a natural clay plaster or stone instead (concrete processing emits 8% of the worlds CO2 emissions!)
  - Try to buy Forest Stewardship Council (FSC) timber or reclaimed wood from old barns and construction sites

## Maintenance

- Invasive plants
  - [Here](#) is an extensive guide on how to identify invasive Michigan species and how to go about identifying and removing them from your property. The picture guide is very helpful.
  - Main invasive plants to watch out for are
    - Hemlock woolly-adelgid
    - Oriental bittersweet
    - Garlic mustard
    - Buckthorn
    - Japanese knotweed
    - Autumn olive
    - Purple loosestrife

- Japanese barberry
- Bush honeysuckle
- Spotted knapweed
- Black and Pale swallow

- Soil Maintenance

- It is important to keep up with your soil to maintain its nutrient and pH levels to maintain a healthy biosphere. Working compost into your soil every year is important to replenish the soil nutrients levels that the plants have taken.
- When the soil is wet try not to walk too much on it in order to not compact it. Just like topsoil ecosystems soil needs to be aerated. More compacted soil also makes it hard for plants to extend roots and for new plants to grow.

- Season Burnings

- Fire seems counteractive to maintain a healthy landscape, but it is integral for plant and soil health. Burnings promote new growth and burn away decaying trees and plants emitting CO2 over a long time. Fire also helps promote biodiversity in the region keeping the area healthy for birds and mammals in the region.



○ Resources for Prescribed Burns

- <https://restoringnaturewithfire.com/prescribed-fire.html>
- [https://www.michigan.gov/dnr/0,4570,7-350-79136\\_79237\\_80917---,00.html](https://www.michigan.gov/dnr/0,4570,7-350-79136_79237_80917---,00.html)
- [https://www.michigan.gov/dnr/0,4570,7-350-79136\\_79237\\_80917\\_81046---,00.html](https://www.michigan.gov/dnr/0,4570,7-350-79136_79237_80917_81046---,00.html)

- Certificates for Natural Land on Private Property

○ [Natural Areas Preservation Program](#)

- NAPP acquires property that will be owned and maintained by the Washtenaw County Parks and Recreation Commission. WCPARC also partners with other land preservation organizations to find creative ways to protect and preserve natural areas. This may be a good option to open your 'Back 40' up to the public more and to ensure the forest health.

○ [Private Lands Program](#)

- The primary goal of the Private Lands Program (PLP) is to provide private landowners with the resources to create and manage habitat to benefit a variety of



wildlife. The PLP provides technical and financial assistance to eligible landowners for habitat improvements that address wildlife needs.

- [Master Rain Garden Certification](#)
  - This is another Washtenaw County program. This is both a class and a certification program. You enroll in the class that teaches you how to implement and build your own rain garden. At the end you will receive a certification for your work. Due to social distancing policies the course is FREE.

Key points to remember from [Ecological Gardening](#):

- Think in four-dimensions. Your four-dimensional space extends as tall as your tallest tree grows, deeper than your plants' deepest roots delve, and includes the time it takes for the garden community to form the relationships that foster carbon sequestration.
- If you have room, plant a woodland garden with native trees, shrubs and understory plants. Start with young stock so they can grow together as a community.
- Or, conversely, plant a prairie/meadow garden with native flowers, sedges and grasses.
- Improve the soil by adopting management methods that reduce soil disturbance and use of chemicals.
- Let fallen leaves accumulate under shrubs where they can contribute to soil building and create habitat for overwintering bees and butterflies.
- Learn to think like a butterfly or a bird or an oak and assess your garden with an eye to what they might need to thrive, then make needed changes.

### **Goals**

Choosing the right plants – to sequester as much carbon as possible, for as long as possible.

Caring for the soil to boost its carbon capture capability.

Protecting and restoring existing carbon sink ecosystems at UUAA.

Thank you!